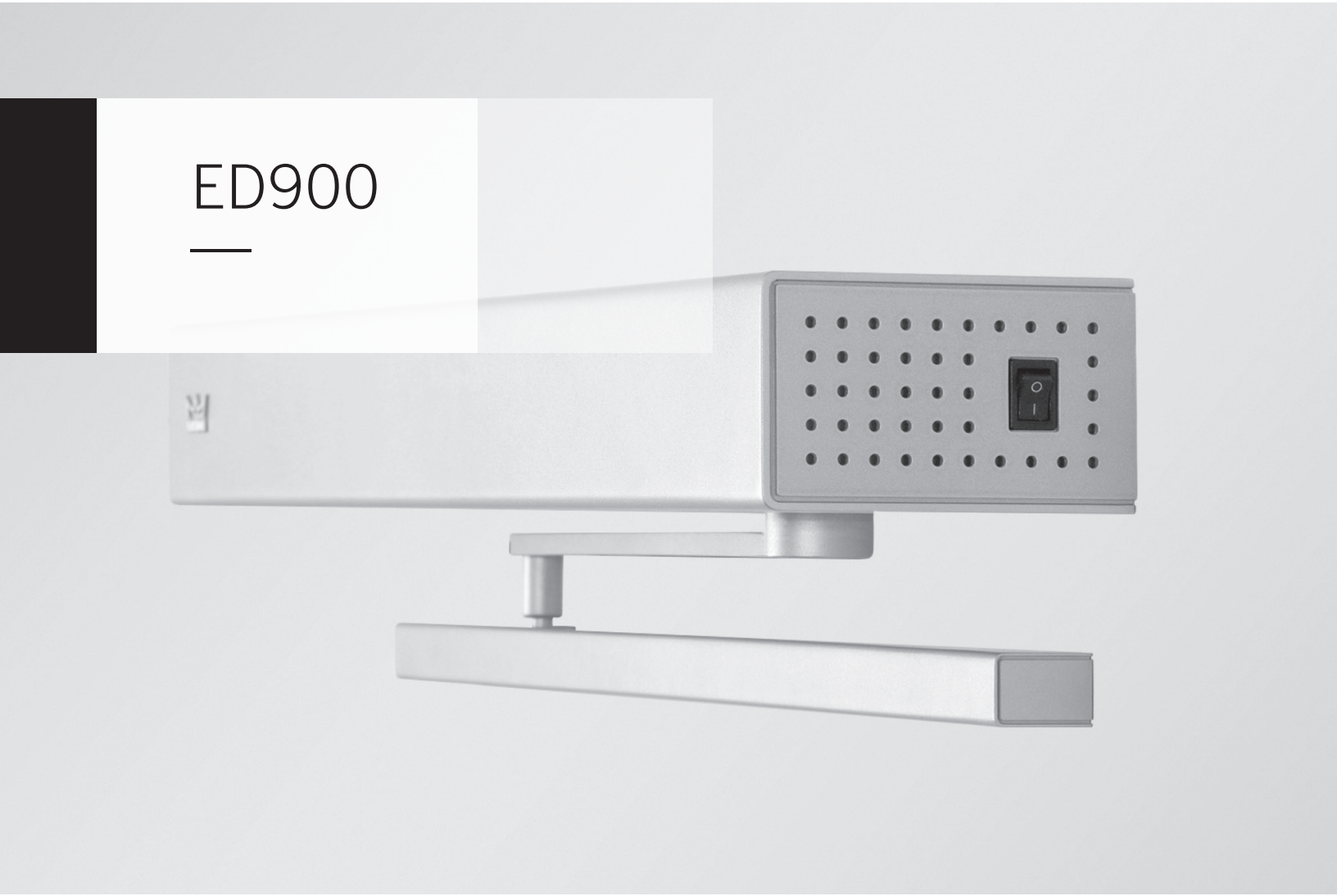
DORMA

ED900



Low Energy Swing Door Operators

CONTENTS

DORMA USA quality and environmental management systems in Reamstown, PA and Steeleville, IL are certified to ISO 9001:2008 and ISO 14001:2004.

ED900 SWING DOOR OPERATORS

DORMA's most advanced low-energy swing door power operator.

The ED900 is fully ADA compliant – helpful for children, the elderly, persons with disabilities, or those carrying or pushing objects.
The operator is exceptionally quiet, safe, and easy to use. Doors open at precisely controlled speeds and forces, assuring safety for all users.

The ED900 features Contur design for a highly aesthetic look especially when used with the TS93 family of closers.

Technical Details

- Onboard power supply for access control devices: 1.5 A @ 24 VDC.
- Maximum door size: 48" (1219 mm) wide.
- Maximum door weight: 220 lb (100 kg).
- Operator weight: 26.58 lb (12 kg).
- Operating temperatures: 5° F to 122° F (–15° C to 50° C).
- Standard operator dimensions: 27" W × 2-3/4" H × 5-1/8" D (685 mm × 70 mm × 130 mm).
- Maximum opening angle: Powered—110°, Manual—180°.
- Non-handed.
- On-board cycle counter.
- 27" cover standard.
- One unit for push/pull track and top jamb applications.
- Axel extensions: 0, 5/16" (9 mm), 3/4" (20 mm), 1-3/16" (30 mm), and 2-3/8" (60 mm) — standard.

Certifications

- ANSI/BHMA 156.19 Power Assist and Low Energy Power Operated Doors.
- UL and CUL listed for fire door operators with automatic closers.
- ICC/ANSI A117.1 Accessible and Usable buildings and facilities.
- Underwriters Laboratories: ANSI/UL 325 Door, Drapery, Gate, Louver, and Window Operators and Systems.
- California State Fire Marshall (CSFM) approved.

Specifications

DORMA ED900 Series low energy operators with selectable low energy or power assist. Low energy function to cycle the door open as programmed. Power assist function for decreased opening force when manually operated. Operator to have a programmable push and go. All operators to have programmable sweep speed, latch speed, and backcheck cushioning.

Operators to have the following programmable options for power open functions: delay time, opening time/ opening force, opening angle, and door width selector. Operators to have selectable jumper to accommodate push or pull side applications. Operators to have on/off strike delay when the ED900 must delay while a locking device releases. Push side (top jamb) and pull side (track) arms to be available.
All operators will be hard wired. All operators to have selectable on/off obstacle detection on closing.

Optional Specifications

All operators to have remote switch wiring for tamper-resistance. Hold open function is deleted. On/off status can be controlled from a remote location. Specify RS. All operators to be powered with a power cord plugged into a 120 VAC receptacle. Specify PC.

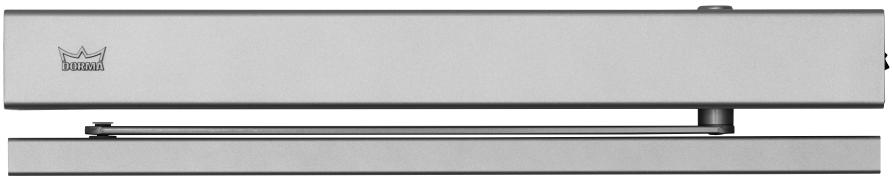
Electrical Specifications

- Power requirements: 115 VAC +/– 10%, 50/60 Hz, 6.6 A max.
- Current: 6.6 A.
- Fuse: 3 Amp – type AGC – size 1/4" – 1-1/4".
- Branch circuit protection: 15 A min.
- Auxiliary power output 24 V (normally) filtered, unregulated 1.5 A max range 24 +/– 10%.
- Form "C" relay contact for controlling fail-secure or fail-safe locking devices 50 VAC or DC at 1 A max.

When incorporating the ED900 into a system with other electrical components, DORMA's Technical Services Department offers assistance with point-to-point wiring diagrams. Please contact them with specific requirements.

Programmable Features

- Opening and closing speed.
- Hold open time: from 0–30 seconds.
- Backcheck & latching angles.
- Blow open/night bank hold open.
- Wall blanking on pull side.
- Safety sensor testing.
- Delayed opening for unlocking: From 0–400 milliseconds. Use with electromechanical access control peripherals such as electric strikes or exit devices with electric latch retraction.
- Closing force prior to unlocking: Works with the delayed unlocking feature and accommodates reduction of latch bolt locking force prior to releasing the electro-mechanical access control device.
- Opening and closing force.
- Latching action force: Power boost during latching cycle to overcome resistance for door seals, locking devices, or door/ frame misalignment.



Programmable Features (Continued)

- Keep closed force: designed to keep the door in the closed position when unlocked.
- Latching action angle: For engaging the programmable latching action feature. Opening angle range 2°–5°.
- Push and go.
- Program switch type.
- Behavior following a power reset.
- Cycle counter.
- Opening angle.
- Door closer/ automatic function.
- Activation angle for Helping Force function and Helping Force function.
- Remote interface.
- Backcheck when door is opened manually.
- Astragal angles for double-leaf doors—Opening of the second door can be delayed up to 30° of when the first door is opened.
- Wind load control: Opening and closing cycles. Variable include door size and weight, hinging, alignment, wind loads, HVAC imbalance. Forces measured at each door must confirm with ANSI 156.19 to maintain ADA compliance.
- After hours access hold open times: From 0–30 seconds.
- Day/night (push/pull): Unlocking during business hours.
- Door position status: Monitors when door has reached fully open or fully closed position. Can communicate status to external monitoring device or console.
- Activation via safety sensor on push side.
- Thickness of door.
- Deactivation of operator depending on contact setting.
- Hinge clearance.
- Reset of service interval display.
- Level of factory settings.
- Deletion of error log.
- Internal program switch delayed activation.
- Unlock in "Automatic" mode.
- Function of status relay.

Activation (Trigger) Options
The ED900 Automatic Operator can utilize a Normally Open (N.O.) dry contact activation input to automatically open a door. See DORMA's Electronic Access Control Components brochure for other options.

ED900 & Motorized Latch Retraction Exit Devices
The ED900 Automatic Operator can be used in conjunction with DORMA's Motorized Latch Retraction (MLR) 9000 Series Exit Device. The onboard 1.5 A power supply of the ED900 can directly power and control one MLR device, providing seamless operation of an automatic latch retraction door without the need for an auxiliary power supply. See DORMA's 9000 Series Exit Device brochure for additional information.

ED900, Electric Strikes & Electromagnetic Locks
The ED900 Automatic Operator can be used in conjunction with DORMA's Electric Strikes to provide Access Control to an opening. See DORMA's Electronic Access Control (EAC) section of our website for additional information.

Finishes

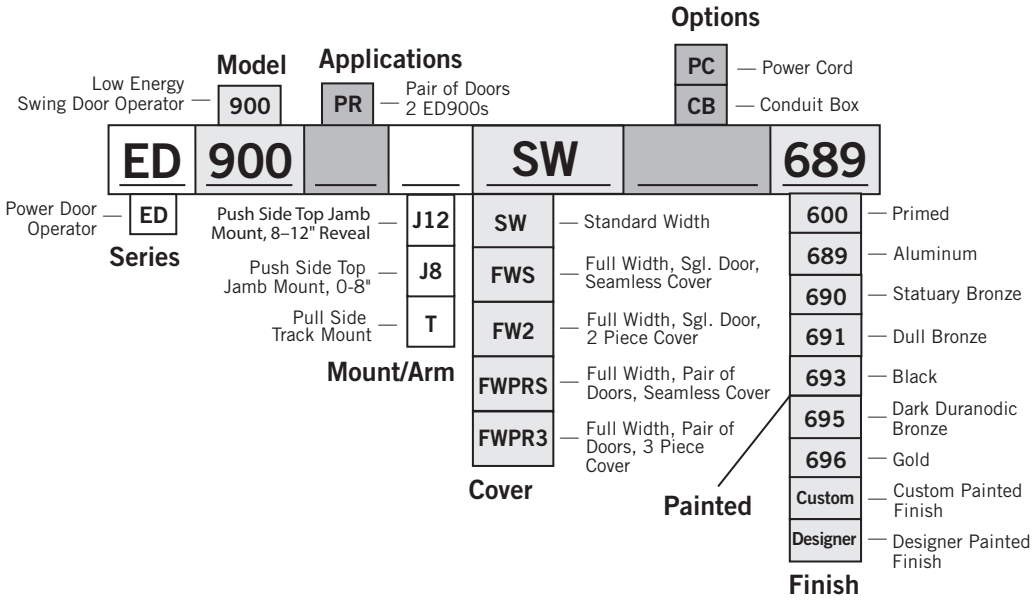
Standard Sprayed Finishes
- Aluminum: 689
- Bronze: 690 (Statuary), 691 (Dull), or 695 (Dark Duranodic)
- Gold: 696
- Black: 693

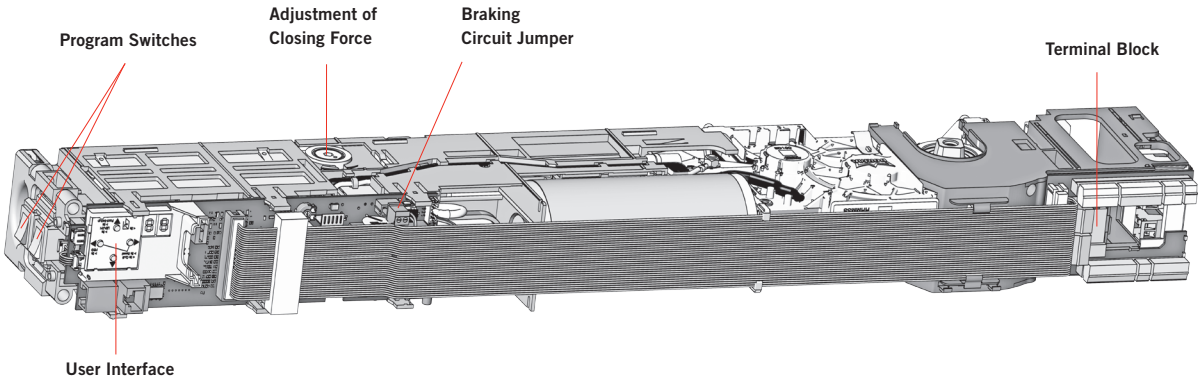
Optional DORMA Custom Color or Designer Color Finishes
Contact Customer Service.

Fire Door Applications
The ED900 is UL/CUL Listed for your installation on labeled fire doors.

Warranty
For details, refer to **DORMA Limited Warranty** on our website at **go.dorma.com/terms**.

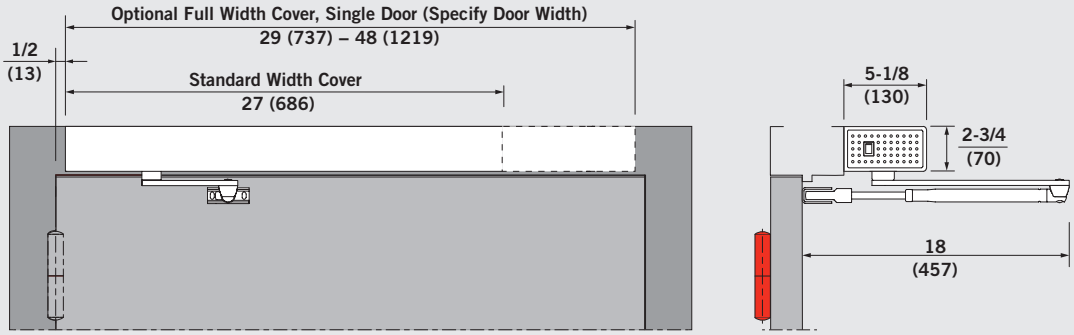
HOW TO ORDER ED900 SERIES





TOP JAMB INSTALLATION—SINGLE

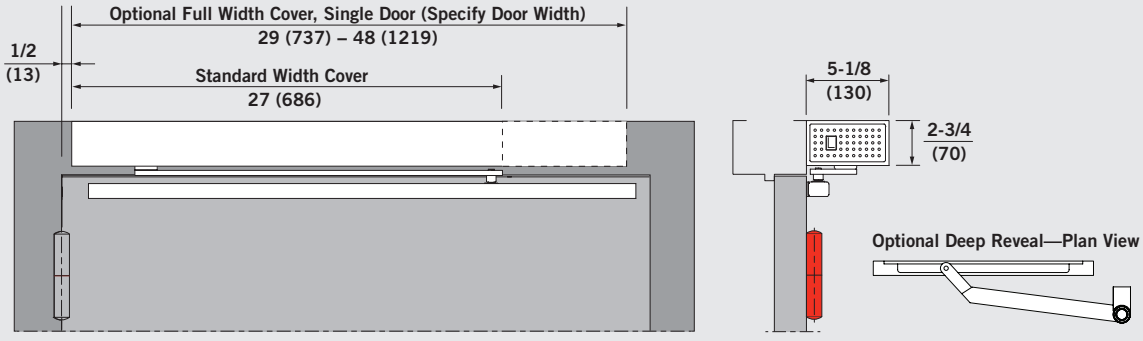
ED900 J



NOTE: Refer to the included bumper/stop to limit door travel to a maximum 110° to prevent possible damage to the ED900 arm. Where this is not practical, the ED900 J × Drop Mount with a surface door stop is recommended.

TRACK INSTALLATION—SINGLE

ED900 T

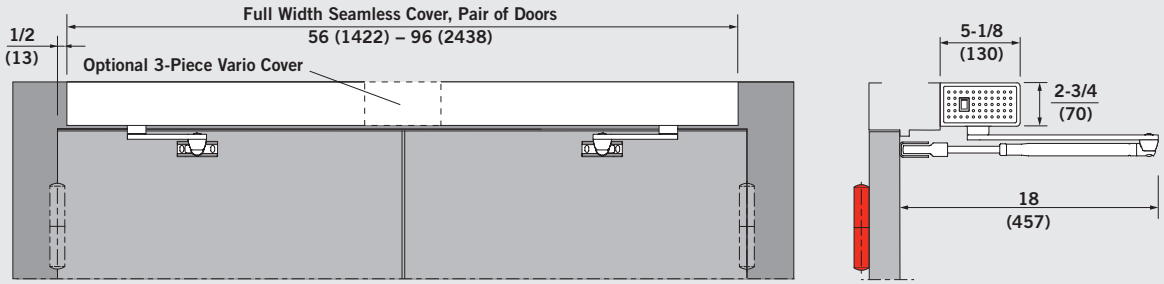


NOTES

- Refer to the included bumper/stop to limit door travel to a maximum 110° to prevent possible damage to the ED900 arm. Where this is not practical, the ED900 J × Drop Mount with a surface door stop is recommended.
- For deep reveal installations, consult DORMA Technical Support for arm options.

TOP JAMB INSTALLATION—PAIR

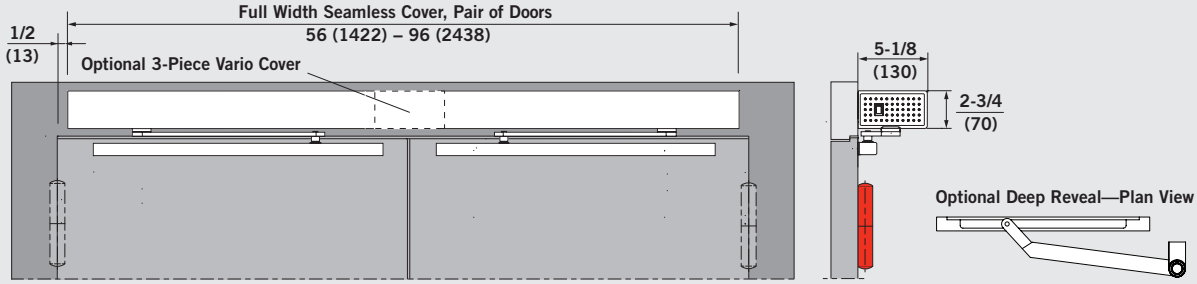
ED900 J



NOTE: Refer to the included bumper/stop to limit door travel to a maximum 110° to prevent possible damage to the ED900 arm. Where this is not practical, the ED900 J × Drop Mount with a surface door stop is recommended.

TRACK INSTALLATION—PAIR

ED900 T

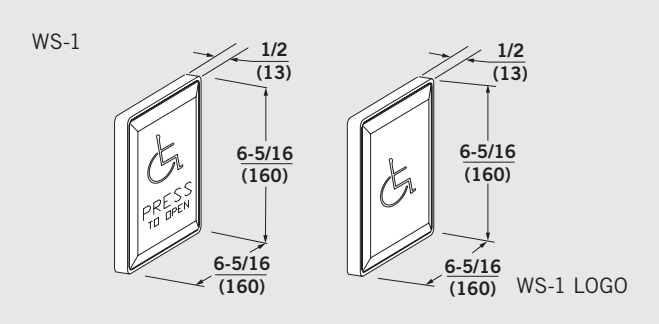


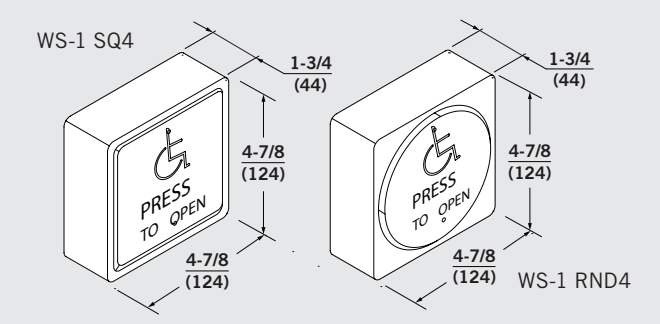
NOTES

- Refer to the included bumper/stop to limit door travel to a maximum 110° to prevent possible damage to the ED900 arm. Where this is not practical, the ED900 J × Drop Mount with a surface door stop is recommended.
- For deep reveal installations, consult DORMA Technical Support for arm options.

ACCESSORIES

Wall Switches





WS-1 — Tamper-resistant 6" × 6" wall plate with a normally open switch. Includes a heavy duty injection molded black ABS mounting box. Satin stainless steel wall plate with blue engraving. Wall plate displays the accessibility symbol and "PRESS TO OPEN."

Fits a standard 4" × 4" electrical box. Must be hard wired. Flush design allows the optimum in weather resistance, in surface, or recessed applications.

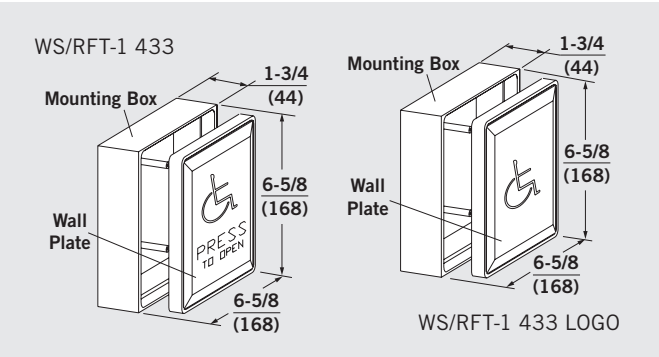
WS-1 LOGO — Same as the WS-1, except that the wall plate displays the accessibility symbol only.

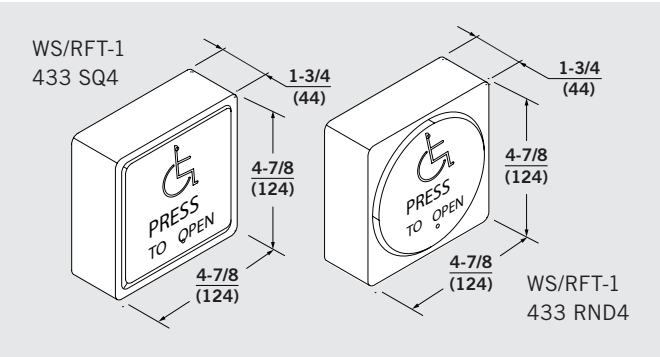
WS-1 SQ4 — Tamper-resistant 4-1/2" × 4-1/2" wall plate with a normally open switch. Includes a heavy duty injection molded black ABS mounting box. Satin stainless steel wall plate with blue engraving. Wall plate displays the accessibility symbol and "PRESS TO OPEN."

Fits a standard 4" × 4" electrical box. Must be hard wired. Flush design allows the optimum in weather resistance, in surface, or recessed applications.

WS-1 RND4 — Same as the WS-1 SQ4, except that the wall plate displays the accessibility symbol only. Wall plate is 4-1/2" round.

Wireless Wall Switches





WS/RFT-1 433 MHz — Tamper-resistant 6" × 6" wall plate with a normally open wireless switch. Includes a heavy duty injection molded black ABS mounting box with a radio frequency transmitter and 9 VDC battery. Must be used in conjunction with the RFR receiver. Maximum range is 50 ft. Satin stainless steel wall plate with blue engraving.

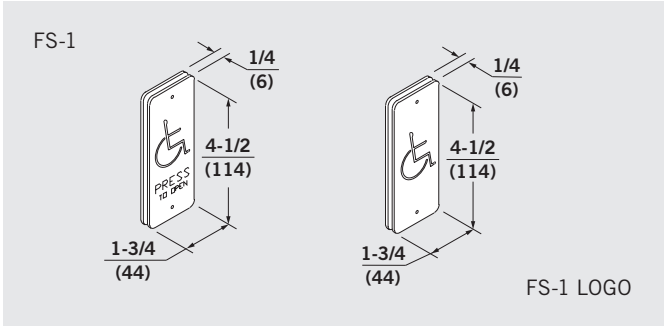
Wall plate displays the accessibility symbol and "PRESS TO OPEN." Flush design allows the optimum in weather-resistance, in surface, or recessed applications. Ideal where conditions prohibit hard wiring.

WS/RFT-1 LOGO 433 MHz — Same as WS/RFT-1, except that the wall plate displays the accessibility symbol only.

WS/RFT-1 433 MHz SQ4 — Same as WS/RFT-1, except that the wall plate displays the accessibility symbol only. Wall plate is 4-1/2" × 4-1/2" square.

WS/RFT-1 433 MHz RND4 — Same as WS/RFT-1, except that the wall plate displays the accessibility symbol only. Wall plate is 4-1/2" round.

Frame Switches

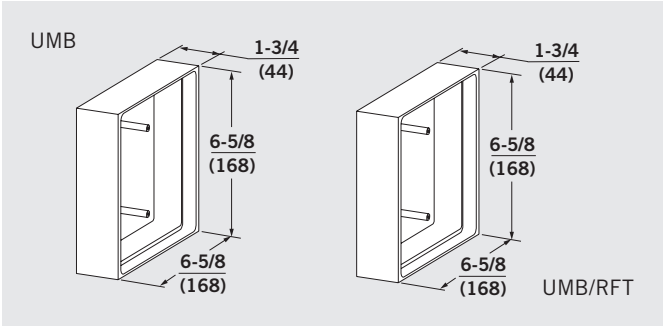


FS-1 — 1-3/4" × 4-1/2" frame plate with a normally open switch. Satin stainless steel frame plate with blue engraving. Frame plate displays the accessibility symbol and "PRESS TO OPEN."

Fits a minimum 1-3/4" × 4" frame section. Must be hard wired.

FS-1 LOGO — Same as FS-1, except that wall plate displays the accessibility symbol only.

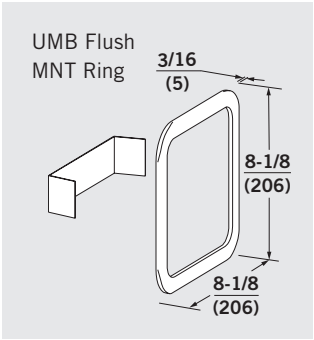
Mounting Boxes



UMB — Black ABS universal replacement mounting box for WS-1 type switches.

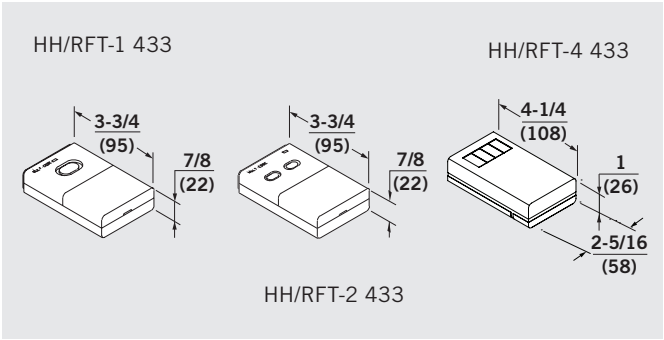
UMB/RFT — Black ABS universal replacement mounting box for WS/RFT-1 type switches. Includes a radio frequency transmitter.

Flush Mount Ring



UMB Flush MNT Ring — Black ABS flush mount ring and metal mounting bracket. The ring is designed to cover the gap between the mounting box and the switch plate cutout in the wall for a nice clean look.

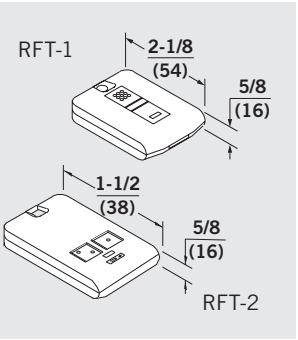
Hand Held Transmitters



HH/RFT-1 433 MHz (Single Frequency), HH/RFT-2 433 MHz (Dual Frequency), HH/RFT-4 433 MHz (Quad Frequency) — Compact, portable switches. Must be used with RFR receiver. Maximum range is approx. 50 ft (depending on conditions). Works with, or in place of, WS/RFT-1. Powered by 9 V DC battery.

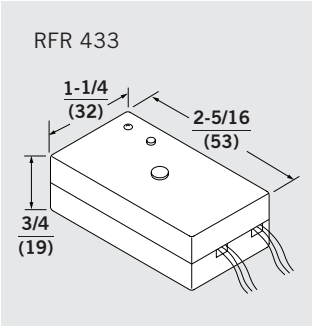
Well suited where multiple users must activate ED900 for accessibility, security, convenience, or where use of an exposed switch is not practical. Neutral case with grained finish. RFT-2 requires one RFR per frequency.

Key Chain Transmitters



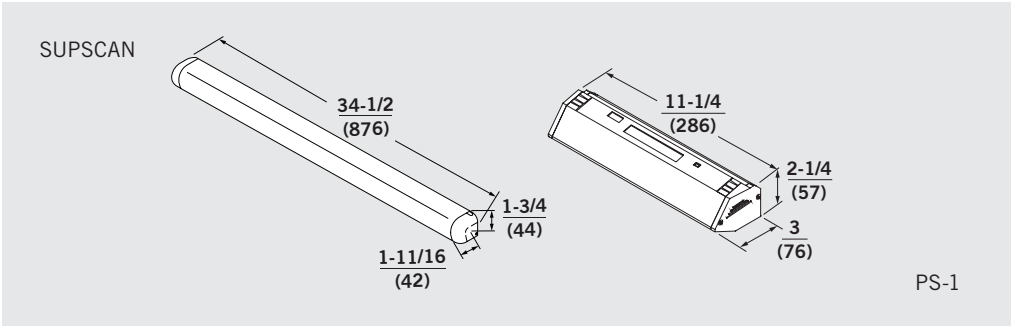
KC/RFT-1 433 MHz (Single Frequency), 800 KC/RFT-2 433 MHz (Dual Frequency) — Similar to HH/RFT-1 or HH/RFT-2, but more compact. Must be used with RFR receiver. RFT-2 requires one RFR per frequency. The small size permits the use as a key chain or in cases where the hand held transmitter is too large. Powered by a watch battery.

Receiver



RFR 433 MHz — Radio frequency receiver. Required for use with all DORMA transmitter switches. Powered from the onboard power supply of the ED900. Ideal for applications with range and signal strength problems. Maximum range typically 50 ft (conditions permitting). Surface applies remotely. Operates on 12 or 24 Volts AC or DC. 16 mA nominal (50 mA max. when relay is triggered).

Presence Sensors



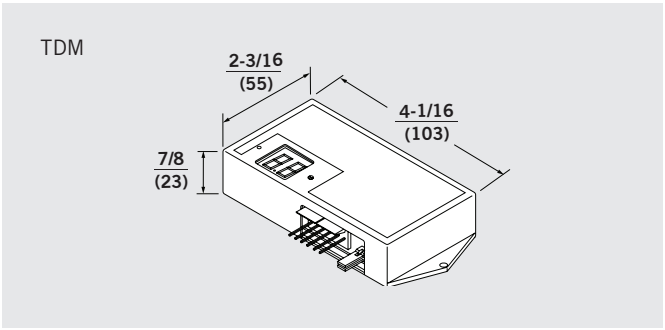
Supscan — Door mounted presence sensor that uses distance measuring technology to project focused active infrared patterns that can be used for safety and reactivation.

- Detection range from 2'–12'.
- Can be mounted at various angles for multiple, custom applications.
- A focused pattern may be ideal for many applications where precision is key.
- Background elements such as texture, color, or reflectivity do not effect detection sensitivity.

PS-1 — Ties to ED900 safety circuit for ultimate user protection. Prohibits opening of door if obstacle is sensed. Requires use of optional **transformer.**

PS-1 RMT — Hand held remote control required to program PS-1 or MS-1 RV1. One remote programs unlimited presence or motion sensors.

Time Delay Module



TDM — Advanced time delay module, allowing the installer to use only one time delay for any automatic door operation, electrically or magnetically locked doors, or vestibule sequencing applications.

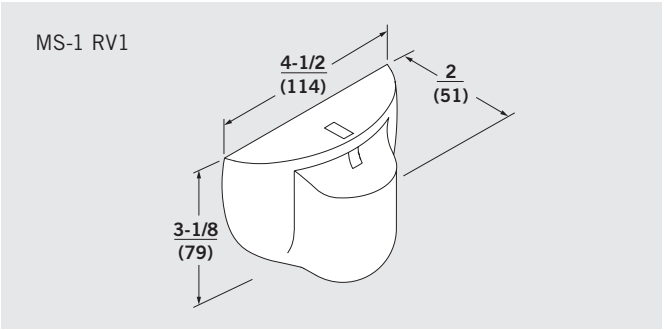
Takes one to four inputs and converts them to sequential relay outputs.

As a make/break relay, it eliminates mechanical binding of the locking mechanism on an automatic door. Make relay can be configured as a wet output to directly apply power to an electric locking device.

To sequence vestibule sets of doors, unit provides an initial relay output for the first door, a delay between outputs 1 and 2, and another output for the second door. Also provides a delay between outputs 2 and 1, allowing you to sequence your vestibule in both directions with only one TDM. Each delay adjustable from 0.0 to 99 seconds.

Power Requirements
12–24 V AC or DC +/– 10%, 50 or 60 Hz, 83 mA @ 24 VDC

Motion Sensors



MS-1 RV1 — Unidirectional K band sensor. Adjustable elliptical sensing pattern. Adjustments include unidirectional, unidirectional with motion tracking feature, bidirectional sensing capability, wide or narrow patterns, 3-dimensional angle adjustment, and heightened immunity to highly sensitive motion settings. Adjustments via PS-1 RMT remote control. Self-monitored ready out of the box, used with or without a self-monitored ready system. Includes 0°–90° vertical and –30°–+30° lateral tilt angle, powered by 12–24 VAC (±10%) or 12–24 VDC (+30%) (–10%).

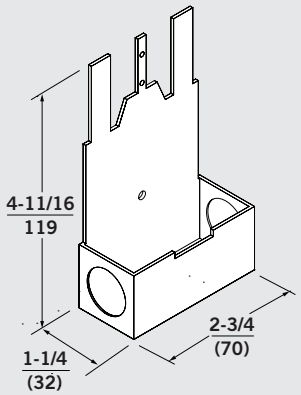
PS-1 RMT required for initial setup. Designed for use in openings designated specifically for barrier-free accessibility.

IMPORTANT NOTE: Cannot be used as primary activation without additional safety sensors.

Should not be used in combination with ED900 in openings used for pedestrian traffic or where high-speed operation/opening is needed. Precise setup of the motion sensor detection area is necessary so nearby traffic is not picked up.

Conduit Box

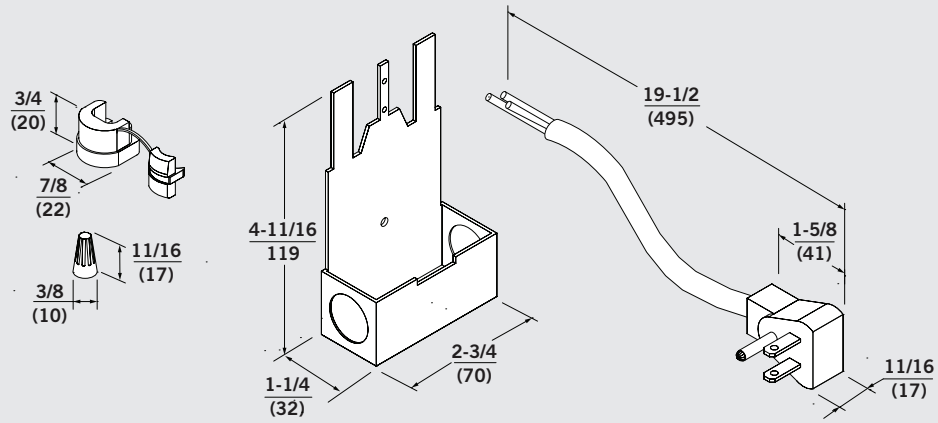
CB



CB — UL approved conduit box accessory to provide surface wiring of 120 VAC power to ED900.

Wiring Kit

PC



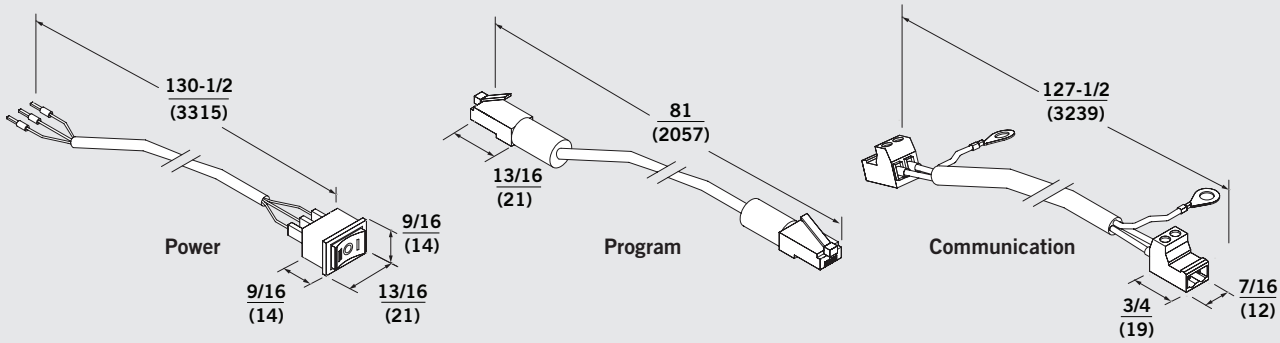
PC — Eliminates need for hard wiring. Permits ED900 to plug directly into 120 VAC/60 Hz receptacle. Cord measures 15" from end cap to center of plug.

Kit includes

- Power cord
- Wire nut
- Cord grip
- Conduit box

Full-Width Three Piece Cover Kit

PRCONKIT5560



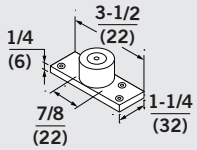
PRCONKIT5560 — Allows installation and communication of two ED900s on a pair of doors.

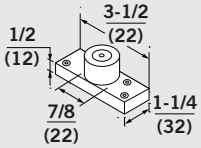
Includes

- Communication cable to program coordination of the two operators.
- Power cable to link operators.
- New programming switch to enable proper commissioning.
- Backplate, middle cover, and seam covers.
- Kit can accommodate paired openings 86" to 110".

Bumper Stops

BSTP25



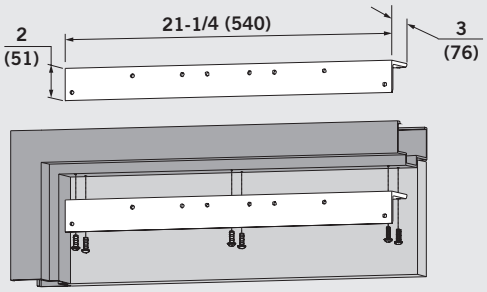


BSTP50

BSTP25 (1/4" thick base plate)/ BSTP50 (1/2" thick base plate) — Header mounted bumper stop provides protection for ED900J operator and door by limiting degree of opening when bumper stop is correctly located and installed.

Angle Bracket

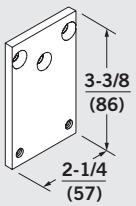
970



970 — For mounting ED900 J easily on deep reveal frame conditions or when frame face is less than 1-3/4". Frame must be properly reinforced to secure bracket. Requires 2-3/4" minimum soffit width.

Drop Plate

930



930 — For mounting arm shoe in top jamb drop application when top door rail is less than 4-5/8" (2" minimum required).

DORMA

www.dorma.com

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07000472 · 6.15CT · 2.5M · USA

DORMA ED100 ED250

Compact
Low Energy/
Full Energy
Swing Door
Operators

ED100 & ED250
Low Energy/Full Energy Compact Swing Door Operators

The **DORMA ED100** and **ED250** are compact next generation electromechanical swing door operators that are **innovative**, **simple**, and **elegant**.

Innovative

- State-of-the-art microprocessor motion control system continuously monitors and controls the door through the entire cycle.
- Wind load control and power boost options ensure safe and secure opening and closing in changing conditions.
- Optimized settings for primarily manual or automatic use.
- Advanced automatic power assist combines minimal push forces (as low as ANSI size 1) with reliable closing.
- Modular design allows new applications to be added and adjustments made post installation without replacing the operator.
- Integrated connections for safety sensors and other accessories.

Green design & performance

The ED100/ED250 operators reflect DORMA's commitment to the environment in both manufacture and performance. Each unit is smaller and lighter than previous swing door operators. Lower weight in turn reduces the amount of energy required for shipping. Once installed, the ED100/ED250 helps to minimize heat loss due to doors closing improperly.

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Simple

- The ED100/ED250 operator is exceptionally easy to install. The low-profile height (less than 3") makes installation easy and minimizes modifications to adjacent work.
- The universal design allows the same operator to be used for any hand of door.
- Mounting plate installation provides a simple one-person install process with easy electrical hookup and without heavy lifting.
- Modular concept and intelligent coordination make it simple to field-fit the operator to any application, single or pair.
- Fully integrated electronics and optional mechanical coordinator minimize the need for extra devices.
- Simple configuration with on-board electronics and easy-to-install design make the system fast to install and maintain.

DORMA Entrance Systems
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Elegant

The compact ED100 and ED250 operators are discreet both visually and audibly. Their elegant Contur design blends into and enhances any décor. With virtually silent operation, the automation of the door can be easily integrated without compromising the style and feel of the entrance.

- DORMA ED100: for doors up to 220 lb (100 kg)
- DORMA ED250: for doors up to 550 lb (250 kg)
- Dimensions: 27" long × 2-3/4" high × 5-1/8" deep
- The operators can be installed as push versions with standard arms or pull versions with a slide channel.

DORMA Entrance Systems™

DORMA Automatics

Swinging/Folding Door Systems

The DORMA ED400 — Powerful, Reliable, Flexible, and Intelligent

Powerful

The DORMA ED400 full power operator is designed for demanding applications such as retail centers, airports, and health care facilities. Engineered for high traffic entrances and heavy-duty applications, the ED400 can handle doors up to 320 lb per door leaf.

Reliable

DORMA Automatics products are tested for one million cycles in climate-controlled test chambers that replicate severe weather conditions. A built-in power boost helps keep the door closed even when it is exposed to high wind or stack pressure buildup.

Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self closing. Virtually maintenance free, this unit provides smooth, silent door operation.

Flexible

This unit functions as either a low energy operator or a full energy unit and can be modified with the flip of a switch. These complete factory-engineered door systems meet all of the stringent requirements of ANSI 156.10, ANSI 156.19, and UL325, as well as NFPA 252 90 minute fire rating when used with rated doors and hardware.

The ED400 operator is ideal for applications that require an ADA-comliant entrance. With a multitude of adjustable features, you have the flexibility to fine tune the door to meet your specific needs—all without the need for special tools or hand-held programming terminals.

In the event of power loss, the controller has fuse and electronic power-surge protection. This function allows the closing system to act like a door closer, providing easy manual operation.

Intelligent

This operator is built with the most technologically advanced encoder and microprocessor control, utilizing the most innovative user interface on the market today. The microprocessor is self-learning for the door weight and inertia, providing the smoothest operation. The controller has dedicated circuits and LED status indicators for up to five safety sensors, which means no more doubled up circuits or decreased performance. The easy 3-digit display allows you to monitor the performance of every function for easy diagnostic evaluation.

ED400

Integrated Features

- Optional power boost mode is built in to help keep your door closed when your application has a windy exposure or stack pressure build-up.
- Microprocessor control encoder motor has built-in diagnostics.
- Push-&-Go feature is selectable at your choice.
- Power assist opening self-engages whenever the door is pushed manually.
- Built-in lock delay eliminates the need for another expensive interface module.
- The safety touch feature initiates door reopening whenever an obstruction occurs during the closing cycle.
- A hard stop prevents wall damage, with an additional electronic stop that allows the door to be set at any desired angle.
- Indefinite hold open function allows for faster traffic control and fresh air.

Highly Adjustable

A multitude of adjustable features gives you the flexibility to customize the application to your specific needs.

- Full energy mode for high volume traffic areas such as retail stores, airports, and hospitals.
- Heavy-duty low energy mode for doors with higher traffic patterns requires ADA compliance without the need to change the springs.
- Inswing or outswing models are available in surface mount or overhead concealed.
- Single, double, or double egress door applications are all available.
- A built-in circuit allows for fire alarm integration and control.
- ED400 operator can handle doors up to 320 lb per door leaf.
- Handed door is field-adjustable as needed.

The DORMA ED1200 — Advanced Design, Wider Clear Opening, Versatile Application

Advanced design

The advanced DORMA ED1200 Bi-Fold Door is another option for meeting your automatic door needs. The ED1200 combines proven mechanical design with easily programmable control units, creating a reliable, durable, easy-to-install door. The ED1200 Bi-fold Door uses the heavy-duty ED400 controller and operator as its drive platform. This strong, intelligent, and flexible platform ensures that the bi-fold doors operate smoothly.

Wider clear opening

The ED1200 Bi-Fold Door provides a wider clear opening than sliding or swinging doors—its easy breakout mechansim allows the ED1200 to utilize the full door opening. The result is easy 2-way traffic for your building entrance.

Versatile application

The ED1200 is available for both interior and exterior surface-applied applications. It features double weathering at lead and pivot edges and will continue operating in extremes of hot or cold.

Key Features

- Double weathering at lead and pivot edge.
- Finger protection at fold points and pivot points.
- Interior or exterior applications.
- Microprocessor control encoder motor has built-in diagnostics.
- Ultra-quiet motor gearbox.
- Available in surface-applied applications.
- Available in configurations that break out to the fold or non-fold side.
- A built-in circuit allows for fire alarm integration and control.

Integrated Performance Functions

- Opening Time: Adjustable from 2.3 to 5.0 seconds.
- Closing Time: Adjustable from 2.5 to 5.0 seconds.
- Hold Open Delay: Adjustable from 2 to 30 seconds.
- Power Hold Close: Extra closing force for stack pressure and wind conditions.
- Delay Before Opening: Adjustable from 0.0 to 3.0 seconds.

ED400-IG

DORMA Automatics Low Energy Operators

DORMA Automatics offers several products specifically designed for applications requiring low energy swing door operators. For more information, ask for the *DORMA Automatics Low Energy Operators* brochure.

ED700 Easy to install, the DORMA ED700 makes existing doors accessible. Every ED700 closer is custom ordered to meet application requirements.

ED400-IG The DORMA ED400-IG in-ground floor closer enables your application to meet access requirements and still maintain the desired architectural design.

ED700

Green Design & Performance

The ED100/ED250 operators reflect DORMA's commitment to the environment in both manufacture and performance. Each unit is smaller and lighter than previous swing door operators. Lower weight in turn reduces the amount of energy required for shipping. Once installed, the ED100/ED250 helps to minimize heat loss due to doors closing improperly.

ED100 & ED250 — Low Energy/Full Energy Compact Swing Door Operators

The DORMA ED100 and ED250 are compact next generation electromechanical swing door operators that are innovative, simple, and elegant.

Innovative

- State-of-the-art micro-processor motion control system continuously monitors and controls the door through the entire cycle.
- Wind load control and power boost options ensure safe and secure opening and closing in changing conditions.
- Optimized settings for primarily manual or automatic use.
- Advanced automatic power assist combines minimal push forces (as low as ANSI size 1) with reliable closing.
- Modular design allows new applications to be added and adjustments made post installation without replacing the operator.
- Integrated connections for safety sensors and other accessories.

Simple

- The ED100/ED250 operator is exceptionally easy to install. The low-profile height (less than 3") makes installation easy and minimizes modifications to adjacent work.
- The universal design allows the same operator to be used for any hand of door.
- Mounting plate installation provides a simple one-person install process with easy electrical hookup and without heavy lifting.
- Modular concept and intelligent coordination make it simple to field-fit the operator to any application, single or pair.
- Fully integrated electronics and optional mechanical coordinator minimize the need for extra devices.
- Simple configuration with on-board electronics and easy-to-install design make the system fast to install and easy to maintain.

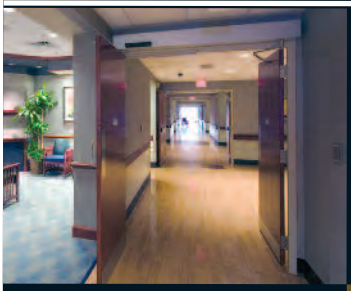
Elegant

The compact ED100 and ED250 operators are discreet both visually and audibly. Their elegant Contur design blends into and enhances any décor. With virtually silent operation, the automation of the door can be easily integrated without compromising the style and feel of the entrance.

- DORMA ED100: for doors up to 220 lb (100 kg)
- DORMA ED250: for doors up to 550 lb (250 kg)
- Dimensions: 27" long × 2-3/4" high × 5-1/8" deep
- The operators can be installed as push versions with standard arms or pull versions with a slide channel.

DORMA Entrance Systems™

Providing entrance systems that meet or exceed industry standards while maintaining architectural appeal.



DORMA Automatics
A leading innovator of automatic door systems, DORMA Automatics offers products for practically any application: retail, health care, office buildings, airports, hospitality, and more.

Crane Revolving Doors
The choice of leading architects for commercial and institutional buildings, Crane Manual, Automatic, & Security Revolving Doors can be found in buildings worldwide.

DORMA Americas

DORMA Entrance Systems™
Pedestrian Flow, Safety & Security

DORMA Architectural Hardware
Providing Safety & Security Around the Door

DORMA Glas
Elegance, Versatility & Beauty

Modernfold
Sound & Space Management

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DORMA LOW ENERGY OPERATORS

ED700 LOW ENERGY OPERATOR

Barrier-free Access

The DORMA ED700 Low Energy Operator is the perfect solution for barrier-free access applications. Simple and easy to install, the ED700 provides many features and functions to make existing doors easily accessible.

The DORMA ED700 is custom ordered to match the application. All common applications for outswing and inswing doors—either with push arm or slide track arm for tight side clearance—can be adapted for barrier-free access.

Extruded aluminum covers in custom lengths are available to match aesthetically with the door frame.

The ED700 may be used for door widths up to 48" (1220 mm) and a maximum weight of 200 lb (91 kg).

For best accessibility, the operator can open the door up to an opening angle of 110°.

ED700 LOW ENERGY OPERATOR

Features

- Slide track arm available for inswing applications.
- Full length header available on request.
- 5.5" W × 5" H Extruded Aluminum Header (140 × 127 mm).
- For inswing & outswing doors.
- Scissor-arm for inswing & outswing applications.

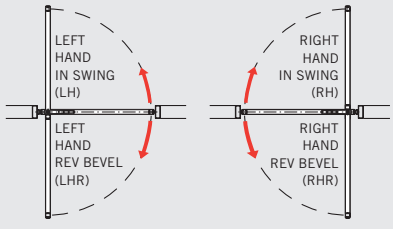
Finishes

- 204-R1 clear anodized.
- 313-R1 dark bronze anodized.
- Special finishes available (custom anodized, paint, architectural metal cladding).

Standards

- ETL listed for US and Canada (UL325).
- Full compliance with ANSI A156.19 – American National Standard for Power Assist and Low Energy Power Operated Doors.
- Full compliance with the Americans with Disabilities Act of 1990.
- NFPA 252 90 minute fire rating when used with rated door and hardware.

Door Handing Definition



AS VIEWED FROM EXTERIOR

CUTTING EDGE TECHNOLOGY

ED700 Features & Functions

Settings and Adjustments
All major adjustments are easily accessible on the control unit allowing correct settings for varying door and pedestrian requirements. Main adjustments are as follows:

- Open speed.
- Time delay (hold open time, 1–30 seconds).
- Close speed.
- Open check speed.
- Open force.

Electrical Requirements

- 120 VAC, 50/60 Hz, 5 A minimum.

Options for Activation

- Pushbutton (momentary actuation opens door; time-delayed closing).
- Internal Push-&-Go (Slight push of door will initiate powered door opening).
- Card Readers.
- Power Assist.
- Remote Controls.

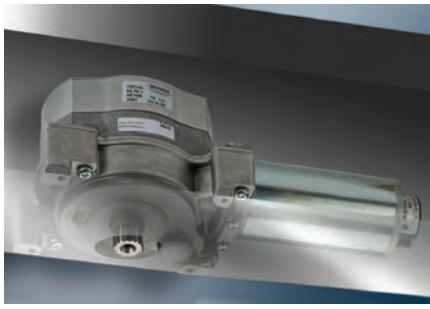
3-Position Door Control Switch

- OFF (easy manual operation).
- ON (low energy mode operation).
- OPEN (door fully opens and remains).

Built-in Power Supply for Sensors

Optional Accessory Interface

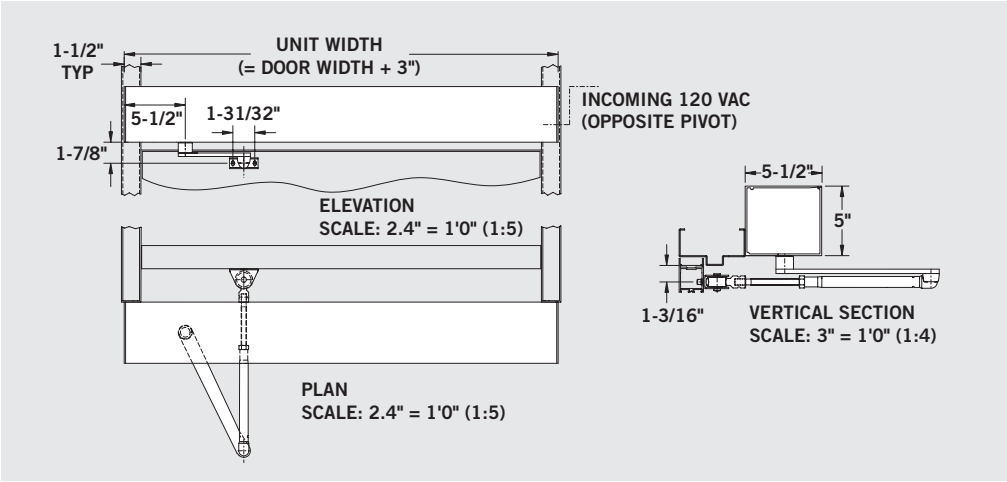
- Motion sensor (door opens and remains until sensor zone clears; time-delayed closing).
- Presence sensor (swing area protection; prevents closed door from opening/ open door from closing).
- Built-in lock-out function and support for dual-state overhead safety sensors.
- Door-Mounted Sensors (Approach/Door Open; Swing Side/Door Inhibit).



ED700 Configurations

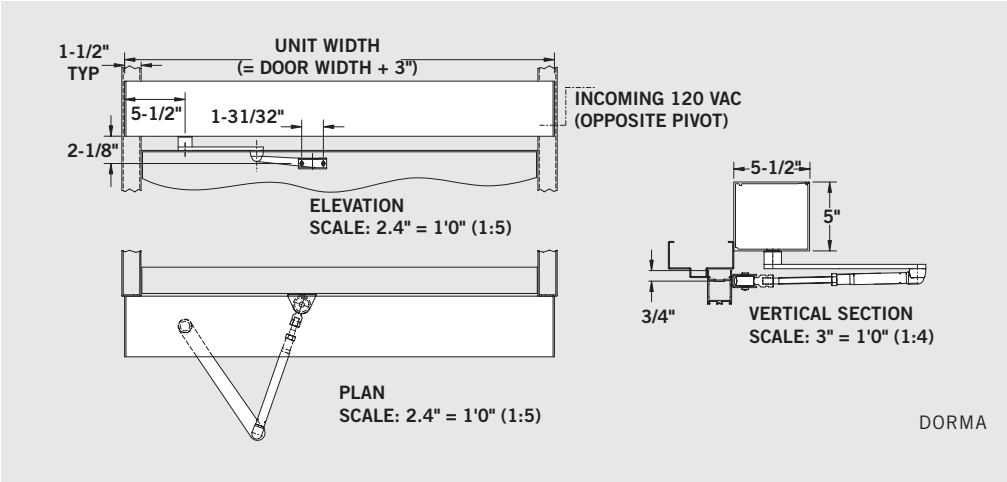
Surface Applied Outswing Scissor-Arm (Push Application)

Surface applies the operator to the door frame with a push arm assembly attached to the top door rail.



Surface Applied Inswing Scissor-Arm (Pull Application) (Standard)

Surface applies the operator to the door frame with push arm assembly attached to the top door rail.



ED400-IG CONCEALED IN-GROUND FLOOR CLOSER

Dual Mode: Low Energy or Full Power

DORMA offers the ED400-IG Automatic Floor Closer for applications that need to both meet access requirements and maintain a classic look, such as an arched door or an all-glass façade. This revolutionary operator conceals the automatic components in the floor near the door threshold.

The ED400-IG functions in either low energy or full power mode, and can be used in both new construction and retrofit applications. DORMA partnered with Opcon Manufacturing Systems to construct this closer, which directs energy generated by the ED400 drive unit to the pivot in a rotating motion, thus allowing consistent, smooth operation.

The install box that stores the operator is completely weather proof and is only 7" deep. All ED400 operator functions, such as Push & Go, Power Close, and Lock Interface, are fully available in this application, which DORMA is nonetheless able to offer at a value-conscious price.

ED100 & ED250 COMPACT SWING DOOR OPERATORS

Low Energy/Full Energy

The DORMA ED100 and ED250 are compact next generation electro-mechanical swing door operators.

Innovative engineering makes them safe, reliable, and energy-efficient at any level of traffic and in variable atmospheric conditions. Their modular design allows them to be pre-configured with plug-ins for specific applications. Their sleek, minimalist Contur profile makes them a perfect fit for any application, interior or exterior.

Unlike conventional electro-hydraulic operators, the ED100 and ED250 are able to respond automatically to changes in the surrounding environment. A state-of-the-art drive system and built-in sensors can quickly adjust how the unit operates, boosting power when required to open and close reliably and consistently.

A wide array of applications can be realized due to built-in functions and options including wind-load control, mechanical coordinator, automatic power assist, sensor/lock timing, and more.

Universal modular design and high-tech functionality combine with ultra-compact form and award-winning Contur aesthetics to make this operator a beautiful way to automate easily without drawing unwanted attention.

DORMA ED100:
for doors up to 220 lb (100 kg)

DORMA ED250:
for doors up to 550 lb (250 kg)

DORMA MAGNEO SLIDING ENTRANCE SYSTEM

Linear Magnetic Drive Technology (LMD)

Powered by linear magnetic drive technology (LMD), the MAGNEO entrance system is designed for any modern interior. Innovative LMD technology ensures that the MAGNEO is safe, reliable, whisper quiet, and resistant to wear.

DORMA MAGNEO is ideal for both new and retrofit interior applications. Its modern design and easy operation make it an attractive and efficient way to update both the function and appearance of existing interior doorways.

The versatile MAGNEO meets all safety requirements for low energy applications. Its extra sensitive operation instantly detects any obstruction. Activation is achieved via touchless design push plate, radio remote control, or traditional infrared motion detectors.

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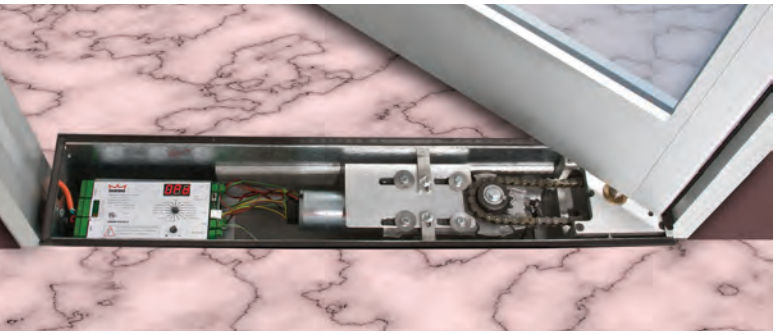
DORMA ED400-IG

Low energy operator



DORMA USA, Inc.
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With the ED400-IG Automatic Floor Closer, applications can meet access requirements and maintain a classic look at the same time—such as an arched door or an all-glass façade. This revolutionary operator conceals the automatic components in the floor near the door threshold.

The ED400-IG functions in either low energy or full power mode, and can be used in both new construction and retro-fit applications. DORMA partnered with Opcon Manufacturing Systems to construct a closer that directs the energy generated by the ED400 drive unit to the pivot in a rotating motion, thus allowing consistent, smooth operation.

The install box that stores the operator is completely weather proof and is only 7" deep. Product features include Push & Go, Power Close, and Lock Interface.

07000396 • 5.13CT • 1.5M • USA

ED400 Concealed “In Floor” AUTOMATIC SWING DOOR

Controller Installer’s Manual

Distributed by:

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ED-400 SWING DOOR CONCEALED “IN FLOOR” OPENERCONTROLLER INSTALLER'S MANUAL Rev0.56

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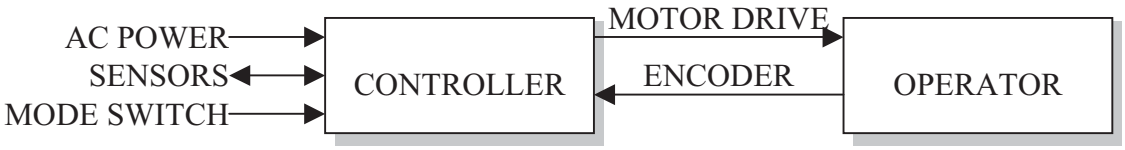
INTRODUCTION

The ED400 is an electro mechanical, automatic opener, for single direction swing doors (left or right hand). The opener opens the door using electrical power, and closes it using a return spring. The manager may turn it Off, turn it On (automatic) or place it in Hold Open (to keep the door open indefinitely). When turned Off, or in the absence of power, it operates as a passive door closer. Its operation may be controlled by a variety of sensors.

This is the manual for just the controller.



INSTALLATION

We'll first install the operator (and the header, surface mount), then the controller and its wiring, then the door (OCM) or the arm (surface mount).

Operator installation

Refer to the operator's manual for instructions on mounting it.

WARNING! When the operator is not connected to a controller, it may slam shut, endangering you and harming the adjustment bolt.

Controller installation

To install the controller, do the following:

Controller

- Install it in the cement case, using T-bolts to the bottom of the cement case, with the side with the display facing upwards.
- The controller is grounded through the AC power connector and the motor connector; there's no need for direct grounding from the controller's case.

Motor

- Connect the 3-screw, black terminal block at the end of the motor cable to the controller's "Motor" connector (on right side panel). The appendix has instructions on wiring the motor cable to a connector.
- Check that the motor is connected properly. Install the arm on the pinion, and rotate it in the opening direction; if that's hard to do, the motor is connected backwards. Let the arm go; if it slams closed, the motor is connected backwards. In either case, swap the back and red wires. Then test it again. For more inform ation, see the troubleshooting section.

Encoder

- To report their position , the operator uses an encoder. Connect its cable to the controller's white "Encoder" connector, on the right side of the controller's front panel. The appendix shows how to wire this connector, if it isn't already wired.

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DL3128-010
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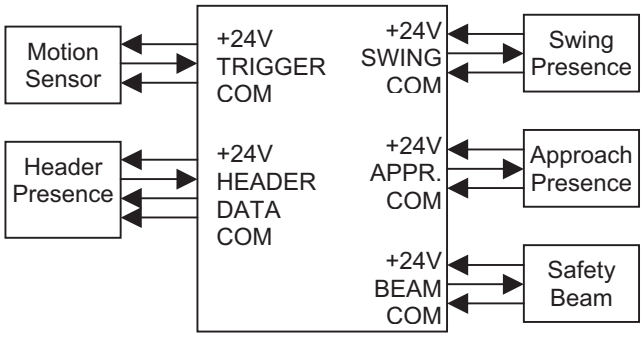
Sensors

- Get power for any sensors that require it from any of the screws in the "+24" terminal block, and any of the screws in the "GND" terminal block. These are the 2, 8-screw, blue terminal blocks on the right end of the front panel.



- The trigger device (motion sensor (radar) or other device) goes to the "TRIG" terminal. Connect its common to the Ground terminal, and, if required, connect its power to the +24 V terminal.
- The header (jamb) mounted presence sensorgoes to the "HEADER" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal. A dual zone sensor (such as the BEA DK-12) needs a "DATA" signal: connect it to the "DATA" terminal.
- The door-mounted, approach side presence sensor goes to the "APPR" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal.
- The door-mounted, swing side presence sensor goes to the "SWING" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal.
- If the installation has a safety beam, connect it to the "BEAM" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal.

Electric lock

The controller may power an electric strike plate (a.k.a. electric lock), through a relay or access control device. The appendix has more information.

Program Switch

- This is the On/Auto/Hold-Open switch
- Install the switch by the door
- Route its cable to the controller
- Cut off excess cable, strip the 3 wires
- Connect the 3 wires to the removable, 3-screw terminal block in the lower right corner of the controller's front panel. (Note that when you press one end of a rocker switch, it connects the middle terminal to the one on the oppositeend; this could be counterintuitive.)
    - The common wire (black) goes to the middle screw.
    - The lower wire when the switch is mounted (white) goes to the upper screw (this is the Hold-Open wire).
    - The upper wire (red) goes to the lower screw (this is the Off wire).

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Emergency: Fire and Break-Out

- The controller comes from factory with a jumper between the “FIRE” and “GND” terminals, and between the "BRK.O.” and “GND” terminals. If either one of these jumpers is open or missing, the controller will not operate: it will flash an "Emergency" alarm.
- If the installation requires it, remove the jumper between the "FIRE" and "GND" screws and wire a fire alarm to those two screws. The fire alarm output must be a normally closed, dry contact.
- If the door has a breakout mechanism, witha switch, remove the jumper between the "BRK.O." and "GND" screws and wire the switch to those two screws. Use the normally closed contacts of the switch.

AC Power

- Connect power to the controller's "Power" connector (onright side panel). See the appendix for the wiring.
  - Make sure the AC power source is off.
  - Route the AC power cable to the opener
  - Cut off excess cable, strip the 3 wires
  - Unplug the 3-screw, green terminal block from the controller
  - Connect the 3 wires to the terminal block
  - Plug the terminal block to the controller

WARNING! Do not plug the AC power into the MOTOR connector, or the controller will be damaged! The AC power plugs provided are keyed so that they cannot be plugged into the Motor connector. However, if you use other plugs, nothing prevents you from plugging them in the wrong connector.

Door or arm installation

Refer to either the Surface Applied or Ovoerhead Concealed Mount, ED400 Installation Instructions on mounting the door or the arm.

If the installation procedure requires that the operator’s pinion be in moved in the open position, you may use the controller to do so, as follows.

- Turn on AC power to the controller.
- Set the Mode switch to the Off position.
- Turn the "Selector" knob to the "Learn" position.
- Set the Mode switch to the "On" position
- The pinion will start turning slowly in the open direction, and stop indefinitely at Back-Stop.

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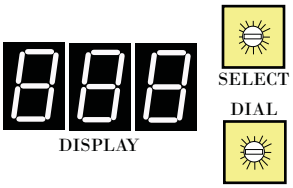
SET-UP

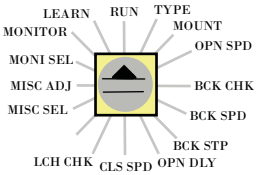
User Interface

The controller user interface is quite intuitive.

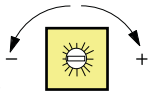
It includes a display and two rotary switches (knobs).



Use the top knob ("SELECTOR") to select the function.



Use the bottom knob ("DIAL") to change a setting.



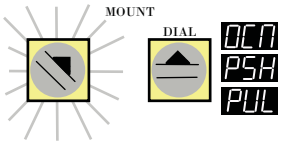
The display shows letters using only 7-segments, so some letters may not be obvious.

Quick Start

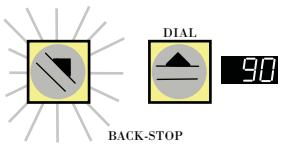
In this quick-start we'll use only a few of the available menus. For a complete list of settings see the Menu Reference section.

To adjust the opener, do the following (for an alternate procedure, see "Set-up without temporary stop" in the Appendix):

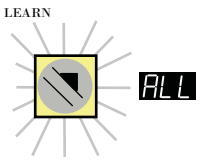
- Turn on the controller
  - Apply AC power to the controller.
  - The controller will light up.
  - Set the Program Switch in the "Off" position.



- Indicate the door mount.
  - Turn the Selector knob to the position "Mount"
  - Turn the Dial knob to select
- Prepare to teach the opener where you want Electrical Back-Stop to be.
  - If the operator has an internal hard-stopin the open position, set it to keep the door from banging at the open end, and, at the sametime as wide as possible, so that the door can reach the desired Back-Stop position (the Electrical Back-Stop) without hitting the operator's hard stop.
  - Turn the "Selector" knob to the "Back-Stop" position. The display should show "90", the programmed Back-Stop angle in degrees. If not, or if you want the Electrical Back-Stop to be elsewhere, change it with the Dial knob. Get ready to stop the door, such as with your foot, at the desired Electrical Back-Stop.



- Do a learn cycle.
  - Turn the "Selector" knob to the "Learn" position. The display shows the Learn State. If it doesn't say "ALL" (meaning it needs a full learn), turn the "Dial" knob counter-clockwise until it does.



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- Move the Program Switch from the "Off" position the "Auto" position.
- The door stays closed for 10 seconds to let you get out of its way.
- Then the door will start opening slowly.
- Temporarily, place a hard stop (such as your foot) at the desired Back-Stop.
- Wait for the door to touch that stop and start closing. (Do not let anything else stop the door beforehand, else the wrong Back-Stop will be learned.) **It is important that the door is stopped in the desired Back-Stop position during the full learn cycle.**
- Remove that stop.
- The door will close slowly to Latch-Stop.
- **Get out of the way!**
- The door will **slam open** (to measure its inertia), then close.
- The display will show "CyC", meaning that the opener needs a cycle learn. 
  - The door will cycle open and closed at normal speed.
- Then the display will show "Rdy", meaning that it no longer needs a cycle learn and it is ready. 
- The door will continue cycling open and close, non-stop, until you place the Program Switch in the Off position.

Note that the opener has **reduced obstacle detection** while learning: **do not interfere with the door**!

Basic Adjustments

- Adjust the opener's operation. You can do this during a learn cycle (as the door is cycling open and closed). Or you can do this later; but if the parameter affects the door motion, you'll have to do a new learn cycle.
  - Turn the Selector knob to the position for the parameter you want to change:
    - Open speed to Back-Check
    - Back-Check angle (this is the one you'll want to play with first)
    - Back-Stop angle (hint: place the Program Switch in Hold Open to keep the door at Back-Stop, then adjust this parameter and watch the door move to that angle)
    - Close Delay
    - Closing speed to Latch-Check
    - Latch -Check angle
  - The display will show the present value for the selected item`
  - Use the Dial knob to change that value
  - If not already doing learn cycles, start them.

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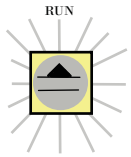
This table lists the basic settings.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Type	Opener Type	"L.E.": Low Energy, "P.A.": Power Assist; "Ful": full power	
Mount	Select door mount	Use "OCN" Setting	
Open Speed	increment/decrement	Opening speed to Back-Check	°/s
Back-Check	increment/decrement	Back-Check angle	°
Back-Speed	increment/decrement	Speed reaching Back-Check	°/s
Back-Stop	increment/decrement	Back-Stop angle	°
Close delay	increment/decrement	(a.k.a.: "Hold Open Time") Time at Back-Stop	s
Colse speed	increment/decrement	Max closing speed to Latch-Check	°/s
Latch-Check	increment/decrement	Latch-Check able	°
Latch-speed	increment/decrement	Max closing speed to Latch-Stop	°/s

Triggers are enabled while the Selector knob is in the Run or Monitor value position, and disabled otherwise.

For more information on these items see the Menu Reference section.

- Test full operation. When you're happy with the cycle, stop the Learn Cycle.
  - Set the Program Switch in the "Off"position. The door will stop cycling.
  - Turn the "Selector" knob to the "Run" position. The display shows the present State of the opener. If there's an exception, it will show a code for it.



- Test the opener's operation with the sensors

Advanced adjustments

While the basic settings are typically sufficient to set-up the opener, additional ones are abailable through the Misc Menus, such as:

- Push-and-go
- Power Hold
- Obstacle detection sensitivity

For a complete list of settings see the Menu Reference / Misc Menus section.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Misc-select	Select a miscellaneous setting to be adjusted	Code for the selected setting	-
Misc-adjust	Adjust the selected miscellaneous setting	Value of the selected setting	-

These settings are selected and adjusted indirectly, in two steps, with the Selector and Dial knobs.

- Turn the "Selector" knob to the "Misc Select" position.
- Turn the "Dial" knob until the desired setting is shown in the display.
- Turn the "Selector" knob to the "Misc Adjust" position. The display will show the present value of that setting
- Turn the "Dial" knob to adjust the value of that setting.

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Monitoring

For troubleshooting purposes, the controller displays its Program State when the Selector knob is in the Run position, and its Learn State when the Selector knob is in the Learn position. The state and value of many more variables can be seen through the Monitor menus, such as:

- The Help display, showing what the opener is waiting for
- The number of cycles
- A Log of recent events
- The door angle and speed

For a complete list see the Menu Reference section.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Monitor Select	Select variable to be monitored	Code for variable monitored	-
Monitor Value	Depends on variable	Value of selected variable	-

To monitor one of those variables:

- Turn the "Selector" knob to the "Mon Select " position.
- Turn the "Dial" knob until the desired variable is shown in the display.
- Turn the "Selector" knob to the " MonitorValue" position. The display will show thepresent value of that variable.
- Usually the Dial knob has no function, though in some cases it can be used to get additional information.

OPERATION

The opener's behavior depends on

- Whether there's AC power,
- The Opener Type
- Any selected features
- The position of the Program Switch

AC power

No AC power

When there's no AC power, the controller places a passive brake across the motor leads, to slow it down when closing. The user may use the door manually. The door closes very slowly. The pinion speed is constant (therefore, for surface mount, the door speed isn't constant). There is no Latch-Check nor Back-Check (so the user could slam the door against the open hard stop). The speed is sufficiently slow that the time closing through Latch-Check meets A.N.S.I. specs.

AC Power is OK

When there's power, the controller is ON, even if the ProgramSwitch is in the Off position. It disables the passive brake, and instead it controls the motor directly. In this case, the opener's behavior depends on

- the Opener Type
- any selected features
- the position of the Program Switch

Opener Type

Full Power

When the user triggers the opener (for example, by walking towards a motion detector), the door opens, stays open for a while, then closes. If, while closing, another user retriggers the door, the door starts reopening.

Low Energy

This is the same as Full Power, but the installer must adjust some parameters for sloweroperation. To select this, the “Low Energy” switch must be in the “ON” position.

Power assist

When the user triggers the opener, the opener helps the user, so that the user may open the door with very little force; after a while, the door closes.

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Selected Features

Push-and-go

If this feature is on, and if the Program Switch is in Auto, the user may also trigger an opening by starting to open the door by hand. Also, if the door is closing, and the user reopens it manually, the opener is retriggered. Note that if the user simply stops the closing door, the opener will consider that an obstacle, not a Push-and-go trigger.

Program Switch

At any given time, the opener may be in one of 3 modes, based on the position of the ProgramSwitch:

- Off
- Auto
- Hold-Open

Off

The opener emulates the operation of a hydraulic passive door closer (except that, when the door is closed, it may press against the hard-stop). The user may use the door manually; there's no Power Opening, nor holding the door open. (**Again**: with the Program Switch in the Off position, the opener is actually on; it's just that it doesn't open the door nor assist the user.) In the simplest case, the door starts at Latch-Stop; a user may open the door manually , and then release the door; then, the closer lets the door close.

Auto

The opener opens or assists the user automatically (though the user may still use the door manually). In the simplest case, the door starts at Latch-Stop; the opener detects that a user is approaching, and opens the door and holds it at the Back-Stop; then, the closer lets the door close. If, while closing, the opener detects a new user, it reopens the door. If a user opens the door manually, then the opener behaves as it does in the Off mode. If the door encounters an obstacle (while opening or closing), or a presence is detected, the opener stops the door; then the opener either opens or closes the door. In the simplest case, the door starts at Latch-Stop; when a user triggers the opener, the opener helps the user as she opens the door; then, the closer lets the door close.If another user retriggers the opener as the door is closing, the opener returns to helping the user.If, while closing, the door encounters an obstacle, the opener stops the door; then the opener lets the door close. If a user opens the door manually, then the opener be haves as it does in the Off mode.

Hold-Open

The opener opens the door and holds it open.

Unusual circumstances

User intervention

The way the opener responds to user intervention depends on what the door is doing at the time, and other factors.

Closed, OffMode or Push-and-GoOff - The opener lets the user open the door against the force of the return spring. As soon as the user lets go of the door, it starts closing.

Closed, Auto Mode and Push-and-Go On - If the user open the door manually, the door opens.

Opening full speed - If the user tries to open the door faster than the opener wants to, the opener resists, trying to maintain speed. If the user tries to force the door closed, the opener considers it an obstacle (see later).

Creeping open - If the user tries to open the door faster than the opener wants to, the opener resists lightly; as soon as the userlets go of the door, it finishes opening the door. If the user tries to force the door closed, the opener considers it an obstacle (see later).

Open - If the user opens the door away from Back-Stop, the opener fights against it, and tries to return the door to Back-Stop. After some time, to protect the motor, the opener starts a Over-Current alarm and shuts down.

Closing, Off Mode or Push-and-GoOff - If the user reopens a closing door, the opener lets her do so, working against the force of the return spring. As soon as the user lets go of the door, it starts closing. If the user forces the door to close faster than the opener wants to, the opener reverts to passive closing, until the door reaches Latch-Stop.

Closing, Auto Mode and Push-and-Go On - If the opener is retriggered the door reopens. If the user forces the door to close faster than the opener wants to, the opener reverts to passive closing, until the door reaches Latch-Stop.

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Presence

The opener may detect people or objects in the proximity of the door. In that case, the opener modifies its behavior to avoid hitting anyone or anything in its path.

Before a Power Opening - The opener waits for the swing area to be clear.
During a Power Opening - The opener stops the door before moving again.
Before closing - The opener restarts the Closing Delay.
While closing, Auto Mode - The opener stops the door before moving again.
While closing, Off Mode - The door keeps on closing.

Obstacle

The opener detects if someone or somebody slows down or even stops the door. This includes the situation of the door being locked, or propped open with a door stop.

During a Full Speed Power Opening - The door stops, waits for a bit, then usually it creeps open.
While creeping open - The door immediately re-closes.
While closing, Auto Mode - The door stops, waits for a bit, then usually it creeps open.
While closing, Off Mode - The door just rests against the obstacle.

Alarm

If the opener detects certain alarm conditions, it stops running. Users maystill use the door manually. The controller flashes a code for the Alarm (the Selector knob must be in the RUN position). The code is also added to the log (Mon Sel / Log; Mon Val) Alarms are cleared by turning the Program Switch to Off and back to Auto.

MENU REFERENCE

The controller offers a menu of 15 items. The Selector knob is used to select one of them. Two of those items offer dozens of additional submenus.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Type	Opener Type	"L.E.": Low Energy, "P.A.": Power Assist; "Ful": full power	Type
Help	-	Why the door won't move	
Mount	Select door mount	Use "OCN" Setting	
Open Speed	increment/decrement	Opening speed to Back-Check	°/s
Back-Check	increment/decrement	Back-Check angle	°
Back-Speed	increment/decrement	Speed reaching Back-Check	°/s
Back-Stop	increment/decrement	Back-Stop angle	°
Close delay	increment/decrement	(a.k.a.: "Hold Open Time") Time at Back-Stop	s
Colse speed	increment/decrement	Max closing speed to Latch-Check	°/s
Latch-Check	increment/decrement	Latch-Check able	°
Misc-select	Select a miscellaneous setting to be adjusted	Code for the selected setting	2
Misc-adjust	Adjust the selected miscellaneous setting	Value of the selected setting	2
Monitor-Select	Select variable to be monitored	Code for variable monitored	3
Monitor Value	Depends on variable	Value of selected variable	3, T
Learn	Downgrade the Learn State	The Learn State	4

Notes:

1) Leave in this position during normal operation
2) See Misc. Settings table
3) See Monitor table
4) Place here to do a learn cycle. At next power-up, does learn the appropriate learn
T) In this position the trigger input is enabled

When selecting an item with the Selector knob, the display shows a code for that item, dimmed, for 1/2 second, then it shows the value for that item. For example, if you turn the Selector Knob to the Back-Stop position, the display shows  dimly for 1/2 second, and then  , the selected Back-Stop angle.

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Run menu

Usually, the "Run" menu displays a code for the State of the opener. See the Program State section, later. However, if there is an exception, the Run menu flashes a code for the exception; it does so from the moment when it occurs, until the next opening cycle starts. You can also stop the flashing code by turning the Dial knob. See the "Events" section, later, for description of the Exception codes.

Type menu

This menu displays a code for the mount of the door and lets you select it. If you change this, you must do a full learn afterwards.

Mount		
LE	Low Energy	The “Low Energy” switch must be On for this option to be available
PA	Power Assist	
FUL	Full Power	

Itisuptoyou, the installer, to makesure that the door doesn't violate A.N.S.I. standards! The opener does not ensure that the door moves within A.N.S.I. limits:

- Nothing keeps the installer from selecting the wrong setting in this menu.
- Nothing keeps the installer from setting the operating parameters in such way that the door moves faster than what the applicable BHMA/ANSI Standards allows.

Mount menu

This menu displays a code for the mount of the door and lets you select it. Use “OCM” setting for “IN FLOOR” mounting.

Mount		
OCM	OCM	Overhead concealed (direct drive)
PSH	Push	Push (scissor arm) surface mount
PUL	Pull	Pull (track) surface mount

Open Speed menu

This menu displays and lets you set the opening speed of the door during a Power Opening, up to Back-Check (in °/s). Use this adjustment to ensure that the opening time is lower than what A.N.S.I. specifies (lower values in Low Energy openers). If you change this, you must do just a cycle learn afterwards.

Back-Check menu

This menu displays and lets you set the Back-Check angle (in °). During a Power Opening, after this angle the door will slow down. The rate of deceleration is set by the "Deceleration" menu,described later. If you change this, you must do just a cycle learn afterwards.

End-Speed submenu

This submenu is used to display and set the minimum speed (after it slows down) at which the door reaches the Back-Stop, in °/sec.

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Back-Stop menu

This menu displays and lets you set the Electrical Back-Stop angle (in °). During a Power Opening, this is where the door stops. This should be less than the mechanical Back-Stop (which may be set by the operator, or by where the door would encounter a physical stop). You can use it in 2 ways:

- Before a full learn, use it to tell the controller at what angle you'll stop the door.
- Use it to change the opening angle. (Hint: put the Program Switch in "Hold-Open" and change the setting, while watching the door follow your setting. You can do this any time the Learn State is "Ready", even during a learn cycle.) If you change this, you must do a cycle learn afterwards.

Close Delay menu

This menu displays and lets you set the minimumtime that the door stays at Back-Stop during a Power Opening cycle (in °) (a.k.a.: "Hold-Open Time"). This is also the minimum time that the opener assist the user during an assist opening cycle. In Low Energy openers, you may need to extend this time to meet A.N.S.I. specs. This is **not** the time that the door stops after a presence or an obstacle: that's the Obstacle delay. If you change this, you must do just a cycle learn afterwards.

Close Speed menu

This menu displays and lets you set the maximum closing speed of the door, down to Latch-Check (in °/s). This is applicable regardless of how the door was opened (manually, or automatically). Use this adjustment to ensure that the closing time to Latch-Check is lower than what A.N.S.I. specifies (lower values in Low Energy openers). If you change this, you must do just a cycle learn afterwards.

Latch-Check menu

This menu displays and lets you set the Latch-Check angle (in °). While closing, below this angle the door will slow down. This is applicable regardless of how the door was opened (manually, or automatically). If you change this, you must do just a cycle learn afterwards.

Misc. Adjustments menus

These 2 menus work together to handle many minorsettings. The first one is used to select an item, and the second one to display its value and to adjust it.

Misc. submenu item	Function of "Dial" knob	Display	Units, notes
HLd - Power	Hold increment/decrement	"OFF": passive; or motor current that holds door closed	A
P.n.G. - Push-&-Go	Turn feature On or Off	"nO"; normal "yES": pressing on door starts a cycle	-
O.Ob - Open Obstacle	increment/decrement	If actual current > expected current by this amount: opening obstacle	A
C.Ob - Close Obstacle	increment/decrement	If actual current < expected current by this amount: closing obstacle	A
WAL - Wall Mask	increment/decrement	Door angle beyond which the swing side sensor is ignored	°
OPd - Lock open delay	increment/decrement	"OFF": normal,or delay before opening	s
OCd - Occupied delay	increment/decrement	Delay after obstacle or after the area clears before moving again	s °/s^2
dEC - Deceleration	increment/decrement	Deceleration after Back-Check	
PCE - Power Close Engaged	Turn feature On or Off	“nO” or “yES” “nO” is default after reset	-
PCA - Power Close Anlge	increment/decrement	OFF, 1-30 degrees “20 degrees” is default after reset	-
PCd - Power Close Time Delay	increment/decrement	00.1-10 seconds “4 seconds” is default after reset	-
PCC - Power Close Current	increment/decrement	OFF, 0.01-1.00 Amps “1.00 Amps” is default after reset	-
CLC - Power Boost	increment/decrement	OFF, or 0.01-1.00 Amps “0.50 Amps” is default after reset	-
rSt - Reset / restore	Reset the controller / Restore factory defaults	"nO": normal "yES": restore factory defaults	-

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Items that use a numeric value show OFF instead of '0'. Features show YES or nO.

Power Hold submenu - HLd
If the door has a hard-stop at Latch-Stop, the opener may use additional force to press the door against the stop. This submenu is used to select the amount of that force, in terms of motor current (in Amps). At its minimum, this current is 0 (the door is held against the hard stop just by the return spring), and the display shows "OFF".

Push-and-Go submenu - P.n.G.
This submenu is used to turn on or off the Push-and-Go feature, and to display the present selection.

- nO If the user opens the door by hand, or reopens a closing door, the opener lets him/her do so, working against the return spring.
- YES If the user opens the door by hand, the opener opens the door. If the user reopens a closing door by hand, the opener reopens the door.

Opening Obstacle submenu - O.Ob
This submenu is used to display and set the Opening Obstacle threshold (in Amps). Higher values mean less sensitivity to obstacles.

Closing Obstacle submenu - C.Ob
This submenu is used to display and set the Closing Obstacle threshold (in Amps). Higher values mean less sensitivity to obstacles.

Wall Mask Angle submenu - WAL
When opening, beyond a certain angle, a door-mounted, swing-side sensor may see a wall and give a false reading. This submenu is used to display and set the door angle (in degrees) beyond which that sensor is ignored.

Lock Opening delay submenu - OP.d
If an electric strike plate (electric lock) is used, it may be necessary to wait for it to retract,before opening the door. This submenu is used to display and set that delay, in seconds. If that delay is zero, the display shows "OFF".

Occupied delay submenu - OC.d
This submenu is used to display and set how long (in seconds) a door stops after it encounters an obstacle or presence, before it resumes moving.

Deceleration submenu - dEC
This submenu is used to display and set how quickly the door slows down after Back-Check, in °/sec^2. (A higher number means faster slowing down). If you change this, you must do just a cycle learn afterwards.

Power Close Engaged - PCE
This adjustment turns the **Power Close** On or Off

Power Close Angle - PCA
When power boost closing is needed only in the last 30° of door closing, this is used to set angle desired.

Power Close Time Delay - PCd
This adjusts the time delay before the operator starts pawer boost after encountering an obstruction.

Power Close Current - PCC
This adjusts the closing force during the swing path of “PCA”.

Power Boost - CLC
When power boost closing is needed throughout the entire closing swing of the door the closing force is adjusted here.

Reset / restore submenu - rSt
This submenu is used to restore the factory defaults (including clearing the password) ○Turn the Dial knob clockwise. The controller will reload the factory defaults; the program will restart from the beginning; the display will show the start-up logo. (Just to force a new learn cycle, use the "Learn" menu instead.)

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Monitor Select and Monitor Value menus

These 2 menus work together to display the valueof many minor items. The first one is used to select an item, and the second one to display its value.

Misc. submenu item	Function of "Dial" knob	Display	Units, notes
LOG - Log	Select one of the 16 events in the log	Code for the event	-
OBS - Obstacles	Clear it	Number of obstacles since the last cleared	-
CYC - Cycles	Scroll the display	Number of openings cycles since the controller was manufactured	-
rEL - Release	-	Software release level	-
AnG - Angle	-	Angle of door	°
CUr - Current	-	Motor current (absolute value)	A

Items that use a list show a code for their value.

Log submenu - LOG

The controller logs the last 16 unusual events. This submenu is used to display the log of events. Normally it shows the most recent event. Turning the Dial know counter-clockwise (back in time) selects the previous events; and vice-versa. Once one end of the log is reached, turning the Dial knob further in the same direction will have no effect. The codes for the events are described later in the Event Codes section.

Obstacles submenu - OBS

Each time the door meets an obstacle, the controller increments a counts, up to 255. This submenu is used to display that count. Turning the Dial know counter-clockwise clears that count.

Cycles submenu - CYC

This submenu is used to display the number of full opening and closing cycles that the controllerdid, up to 9,999,999. This is not necessarily the number of cycles that the operator did, as the controller may have been mated to another operator at some other time. If the door is reopened while closing, this doesn't count as an additional cycle. If the controller is powered down, it resets the units digit (for example, if the count was 123 cycles, upon restoring power to the controller, it will show 120 cycles). As the display has only 3 digits, the Dial knob may be used to scroll the number of cycles, so that the rest of the number maybe viewed (for example, if the number of cycles is 12345, initially the number ".345" will be shown; turning the Dial knob one step clockwise will scroll the number to the right, and "2.34" will be shown; turning the know further will show "12.3", "012." and "001".

Release submenu - rEL

This submenu is used to display the software release in the controller.

Angle submenu - AnG

This submenu is used to display the approximate door angle, in degrees.

Current submenu - CUr

This submenu is used to display the motor current, in amps.

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TROUBLESHOOTING

Electrical

Fuse replacement

The controller has 2 fuses, one on the AC line input, one on the motor output. If the input fuse blows, the controller is completely off (no display). If the output fuse blows, the controller comeson, but there's no motor drive. Regardless, the passive braking keeps on working, because it's directly connected to the motor connector.

This is the fuse information:

F1	Line input fuse	Input plug	5 x 20 mm	2.0 A, fast
F2	Motor fuse	Motor-plug	5 x 20 mm	4.0 A, fast

To replace a fuse:

- Disconnect the AC power
- Unscrew the appropriate fuse holder cap
  - Right side for the motor fuse
  - Left side for the line input fuse
- Replace the fuse with an identical one
- Close the fuse holder
- Reconnect the AC power

Plugging AC to Motor Connector

Plugging AC power into the Motor connector will damage the controller. The AC power plugs provided with the controller are keyed in such way that you can't do so. However, if you use other plugs, nothing prevents you from doing so.

Troubleshooting tools

For troubleshooting purposes, the controller displays:

- the state of its inputs, with LEDs
- the Learn State (when the Selector knob is in the Learn position)
- the present exception, if any (when the Selector knob is in the Run position)
- recent exceptions (Log menu)

Input LEDs

Each sensor input line, and the Fire and Breakout lines, have LEDs a to indicate their status. This is what it means when the LEDs are lit:

LED		Reason for being lit
	Trigger	The trigger (radar) sensor is active, or this lineis shorted to ground
	Pres	The approach-side sensor is active, or this line is shorted to ground
	Approach	The jamb-mounted sensor is active, or this line is shorted to ground
	Swing	The swing-side presence sensor isactive, or this line is shorted to ground
	Beam	The light beam sensor is active, or this line is shorted to ground
	Break Out	The link between this line and ground is open, or the door is in breakout
	Fire	The link between thisline and ground is open, or the fire detector is active

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Output LEDs

Each output line has an LED a to indicate its status. This is what it means when the LEDs are lit:

LED		Reason for being lit
	Data	A DK12 is connected to the controller, and the door is not closed, telling the DK12 to use the Open Pattern. (If no DK-12 is connected, the LED remains Off.)
	Lock	The controller is driving an electriclock (whether or not a lock is present)

Learn State

In addition to the Program State, at any given time, the controller is in one of 3 Learn States.

Learn State		
ALL	All	The opener needs to do a complete learn cycle
CYC	Cycle	The opener needs to do just an opening and closing cycle
rdy	Ready	The operator is ready

The controller is in the first two Learn States ("All" and Cycle") during set-up. From then on it'sin the "Ready" State, ready to operate normally. If the installer changes an Operating Parameter,the controller reverts to the "Cycle" Learn State, After a complete learn cycle, the controllerreturns to the "Ready" State.

When the Selector knob is in the "Learn" position, the display shows the Learn State.

Event codes

If the controller detects an abnormal condition, is displays a code for it (when the Selector knob is in the "Run" position).The controller maintains a list of the most recent 16 significant events, which you can view with the Monitor function.The controller catches certain unusual Events, and stores them in the log. Some events are Exceptions. Exceptions are also displayed when the Selector knob is in the "Run" position (fromthe moment when they occur, until the next opening cycle starts).

Event		
SEt	Not set-up	Not set-up
Obs	Opening Obstacle	The door encountered an obstacle while opening
Cbs	Closing Obstacle	The door encountered an obstacle while closing
LOC	Locked	The door encountered an obstacle while at Latch-Stop
Swb	Swing	The swing-side, door mounted presence sensor was activated
EME	Emergency	An emergency link (smoke detector, breakout) was opened
MEr	Motor	The motor is not connected
dIr	Direction	The motor is wired backwards
tO	Time-out	A state lasted too long
bAd	Bad value	A variable's value was outside its allowed limits. See next.
HEA	Over-Heat	The motor overheated
CUr	Over-Current	The motor current exceeded the maximum for too long
EnC	Encoder	The encoder is not working, is disconnected, it has a broken wire
FAI	Failure	The controller failed

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Bad value

Due to unusual circumstances, an operating parameter may take a value outside its allowed limits. The controller constantlychecks the operating parameter; if it finds a problem with their value, it logs the problem and restarts the program from scratch. After the  entry, the next 2 items in the log are the address of the variable, and the bad value. This table lists the addresses (N is the number shown in the log).
For example:

Position of DIAL knob	Display	Meaning
Fully CW (most recent)		Automatic Power-up after the bad value was detected
1 step CCW (previous)		The bad value: 140 degrees (*see below)
2 steps CCW		Address of the variable with the bad value: 41, which, form the previous table, we see is the Wall Mask Angle
3 steps CCW		A bad value was detected
4 steps CCW (previous)		Previous power-up
Further CCW		No other event in the log

Particular situations

Power off: ease of motion

With the power off, the door should open easily and close slowly. If not, use this table to troubleshoot it.

Symptoms	Possiblecause	Solution
The door is hard to open and slams shut.	The motor wiring is backwards.	Reverse the red and black wired in the motor connector.
The door is hard to open and closes very slowly.	Try disconnecting the motor cable. If that makes no difference, the operator is bad; if the door opens easily and slams shut, the controller is bad.	Replace the controller.
The door is easy to open and slams shut.	• The motor is not wired to the controller (checkthe cable and the motorconnector) • The controller is bad • The motor is bad	• Fix the wiring • Try replacing the controller • Replace the operator

Power off: time through Latch-Check

With the power off, the Passive Brake, inside the controller, limits the closing speed. The PassiveBrake is not adjustable. The closing time from 10°to Latch-Stop should be 1.5 seconds or more, per BHMS/ANSI. For OCM applications, the door mayclose faster than that. If so, you only have 2 options: reducing the spring preload, or adding mechanical friction to the door.

Display is dark

The opener may not open the door for these reasons:

- There's no AC power to the controller
- The AC plug to the controller is disconnected
- The line input fuse (on the right side panel) is blown
- The software is hung up

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Opener won't learn

To start a learn cycle, the following must happen:

- Power must be on
- There must not be an alarm
- The Selector knob must be in the Learn position
- The Program Switch must be moved to Off and Auto If the opener doesn't start the Learn Cycle, use the following table to troubleshoot it.

Action	Check	Solution
Move the Selector knob to the "RUN" position.	Is there a code flashing?	Check that code and see what it means in the Event Codes table. Solve it accordingly. Check that code and see what it means in
Move the Selector knob to the"MONI SEL" position. Turn the Dial Knob until you see "LOG".	Is there a code?	the Event Codes table. Solve it accordingly.

If the Learn Cycle starts, but then the display shows that the controllerrestarted (the display goes through the 3 opening logos), the controller believes that it found a problem. Use the Log to find out what that problem is. If the door will open and close slowly, but then not do anything else, it may be because you stopped the door too soon. Just do a new learn cycle, but this time make sure that you stop the door at the desired Back-Stop.

Opener won't open, manual opening is OK

The opener may not open the door for these reasons:

- The opener needs a learn cycle (probably because you changed a parameter that affect motion) – turn the Selector knob to the Learn position; if it doesn't say "Rdy", do a learn cycle
- The Program Switch is in the Off position – switch it to the Auto position
- The controller detected an alarm condition – place the Selector switch in the Run position; if an exception code is flashing, note the code; turn Off power to the opener; read about that failure in the troubleshooting section, and, if possible, correct the problem; try again.
- A wire from the Program Switch is shorted to ground
- The trigger source is not working, or it's not wired properly – in that case the Trig LEDon the controller will not light up
- The software is hung-up – turn Off and On power to the opener In any case, look at the Help menu for a hint.

Opener keeps door open at Back-Stop

The opener may not open the door for these reasons:

- The Program Switch is in the Hold-Open position – move it to Auto
- There's a door stop holding the door open – try moving the door by hand
- The controller is receiving a trigger signal – see if the Trig LED is lit
- The controller is receiving a header presence signal – see if the Pres LED is lit
- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- A wire from the Program Switch is shorted to ground
- The delay is set very long and it hasn't yet expired

Opener pushes door hard against the Latch-Stop

This may happen for these reasons:

- The Power-Hold feature is on – troubleshoot why the trigger won't open the door
- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

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Opener keeps door open against the operator's hard-stop

This may happen for these reasons:

- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

Opener stuck assisting

The opener may keep on assisting the user (the door can be moved in either direction with little effort) for these reasons:

- The controller is receiving a trigger signal – see if the Trig LED is lit
- The controller is receiving a header presence signal – see if the Pres LED is lit
- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving an swing presence signal – see if the Swing LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- The delay is set very long and it hasn't yet expired
- A wire from the Program Switch is shorted to ground
- The trigger source is not working, or it's not wired properly – in that case the Trig LEDon the controller will not light up
- The software is hung-up – turn Off and On power to the opener In any case, look at the Help menu for a hint.

Opener keeps door open at Back-Stop

The opener may not open the door for these reasons:

- The Program Switch is in the Hold-Open position – move it to Auto
- There's a door stop holding the door open – try moving the door by hand
- The controller is receiving a trigger signal – see if the Trig LED is lit
- The controller is receiving a header presence signal – see if the Pres LED is lit
- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- A wire from the Program Switch is shorted to ground
- The delay is set very long and it hasn't yet expired

Opener pushes door hard against the Latch-Stop

This may happen for these reasons:

- The Power-Hold feature is on – troubleshoot why the trigger won't open the door
- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

Opener keeps door open against the operator's hard-stop

This may happen for these reasons:

- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

Opener stuck assisting

The opener may keep on assisting the user (the door can be moved in either direction with little effort) for these reasons:

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- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving an swing presence signal – see if the Swing LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- The delay is set very long and it hasn't yet expired

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Opening door bumps against the hard-stop

The controller learned the Electrical Back-Stop to be the same as the mechanical hard-stop. That is probably because either

- you didn't stop the door at the Electrical Back-Stop during the slow learning cycle, during initial set-up, or
- the hard-stop in the operator is set too far closed.

Back-Check or Latch-Check angles seem wrong

Move the door manually and compare the actual door angle with the angle displayed (turn the Selector knob to Monitor Select, turn the Dial Knob to select "AnG", turn the Selector knob to Monitor Value).

- If they do match, remember that the door slows down *before* Latch-Check.
- If they don't match, see the next paragraph.

Angle displayed doesn't match door angle

If the angles do match at Back-Stop:

- Check the setting for Door Mount in the controller.
- For surface mount doors, check the placement of the operator with respect to the doorhinge.
- For Push mounts, check the point where the arm is mounted to the door, and the angle of the arm when the door is closed.
- If all of these are correct, then the problem may be that the reveal is very different from the standard that was used to calculate the controller's parameters.

If the angles don't match anywhere:

- During initial set-up, the Back-Stop angle you specified in the controller was not the same as the angle where you stopped the door during the slow learning cycle. Do a new Full learn Cycle

DATA LED doesn’t light

This LED lights if the door is anywhere but at Latch-Stop, and a DK-12 dual-zone sensor is properly connected. If this LED doesn’t light when the door is open, it’s probably because a DK-12 is not properly connected to the DATA line. You may test this LED by connecting the DATA line to Ground.

LOCK LED doesn’t light

This LED lights if the controller is driving an electric lock (whether or not a lock is actually connected to the LOCK line). If this LED doesn’t light, or is always lit, the problem is probably that the driver inside the controller was damaged by being improperly connected

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SPECIFICATIONS

Main features

- Overhead Concealed Mount or surface mount (push or pull)
- Center pivot or offset hinges
- Complete: doesn't require a power-boost module, nor a brake box
- Hand is field reversible

Control inputs

- Seven sensor inputs (individual LEDs indicate status):
  - Trigger (radar, motion detector, push plate, access control, RF receiver…)
  - Header (jamb) mounted presence sensor
  - Door mounted, approach side presence sensor○Door mounted, swing side presence sensor
  - Safety beam presence sensor
  - Fire (Smoke alarm)
  - Breakout switch
- Input for Program switch (Off/Auto/Hold Open)
- All inputs, except for the Fire and Breakout inputs, are active low, compatible with:
  - dry contact
  - open collector
  - TTL
  - any signal up to 24 Vdc
- Fire and Breakout inputs are active open.

Control outputs

- Electric strike lock, open collector 100 mA max, 24 Vdc max. **not protected**. (requires additional relay, not included; requires external supply, not included, for electric locks other than 24 Vdc)
- Data (for dual zone sensors, such as BEA DK-12)
  - Door closed: open circuit (0 Vdc)
  - Door closing: 500 Hz square wave
  - Door opening or open: 12 Vdc unregulated, 100 mA source max

Control inputs/outputs

- Synch cable for side-by-side openers (part number DS2715-010)
  - RXD TXD.

Power

- Input: 115 Vac, 2 A Max
- Output: 24 Vdc, 0.8 A, unregulated, short circuit protected, for sensors and accessories

Safety

- Operates as a passive door closer in case of power failure or controller failure
- Smoke alarm and breakout switch input

Misc

- Operating air temperature -40 to 50 °C
- Small size: 8" wide x 4 " tall x 2.5" deep
- Microprocessor controlled, FLASH re-programmable, replaceable
- Two controllers may be synchronized for side-by-side doors
- Closed loop control

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APPENDIX

WIRING

Encoder / Cam Switch wiring

Encoder only

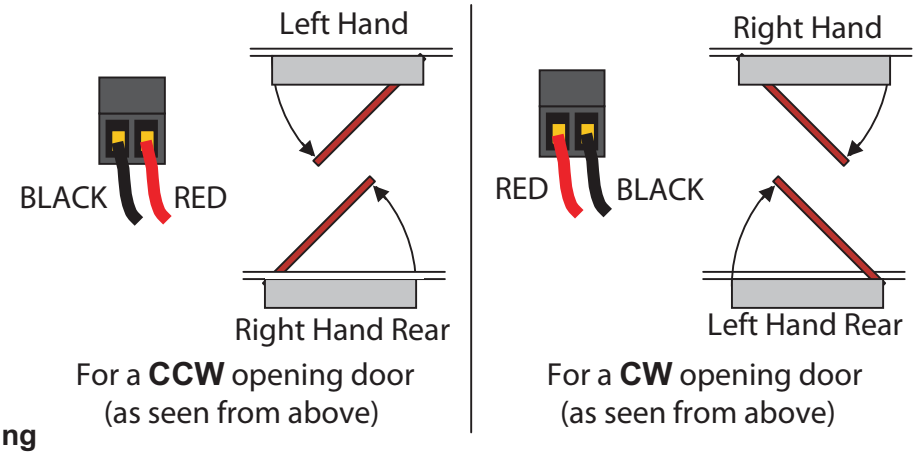
the 4 wires from the encoder should already be connected properly to the 5-position connector. If you need to wire it, here is how.

The 2 middle wires (Phase A and B, Yellow and Green) can be swapped without a problem: the software is smart enough to figure which way the motor is turning, and it interprets the 2 phases correctly.

Motor wiring

From the factory, the motor wires are already connected properly to their 2-screw terminal block. If you need to rewire it, here is how.

The red and black wires go to the other 2 screws, depending on the opening direction of the door. For CW opening (as seen from above – that's a right hand door), the back wire goes to the screw closest to the side of the box. For CCW opening (that's a left hand door), the red wire goes to the screw closest to the side of the box. The black wire goes to the opposite screw.



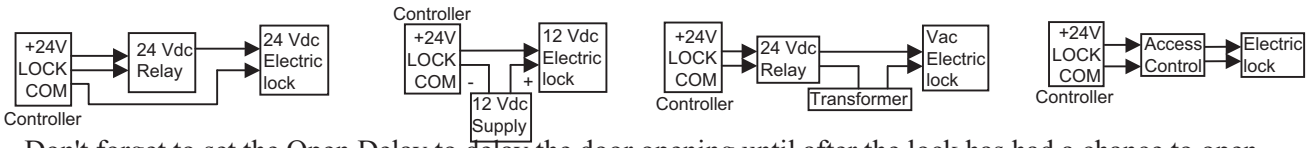
AC Power wiring

The green wire goes to the middle screw. When looking at wire openings, with the screws towards up, the line wire (usually black) goes the left hole, and the neutral (usually white) goes to the right one.

ELECTRIC LOCK

The controller may power an electric lock through a relay or access control device.

- If the installation has a 24 Vdc electric strike plate (a.k.a. electric lock), the controller is able to power it directly. For DC lock of other voltages, you will need a separate power supply. For AC locks, you will need a separate transformer and a relay.



- Don't forget to set the Open Delay to delay the door opening until after the lock has had a chance to open.
- The controller drives the electric lock from when it receives a valid trigger (at Latch-Stop), while waiting to open (because of a non-zero Open Delay, or because the swing area is occupied) and until some time after the door has begun to open. It also drives it ifthe door reaches Latch-Stop as it is retriggered. The LOCK LED lights up while the controller drives an electric lock, whether or nor a lock is actually present.

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Pair of Doors

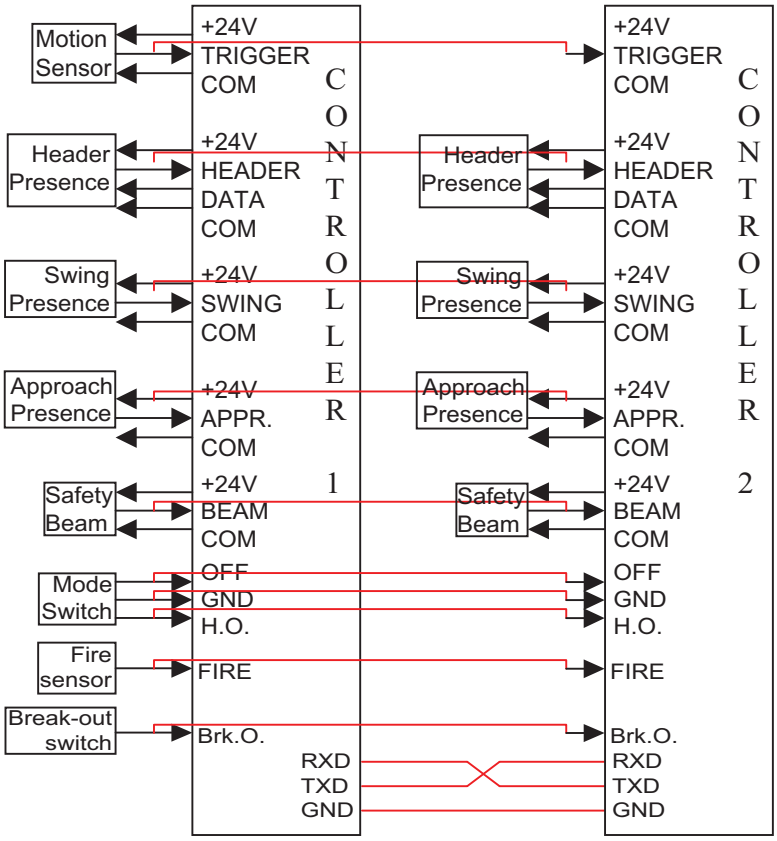
Two openers may be used to open two side-by-side doors. The doors may be synchronized or not. This operator is not compatible with over-rebated doors.

Synchronized doors

The doors behave as if they are mechanically interconnected. In case of a presence at one door, both doors react identically. In case of an obstacle at one door, the other door stops too, though a bit afterwards.

Wiring:

- Connect the grounds of the two controllers together
- Connect the motion sensor to both controllers, in parallel



- Connect each presence sensor from each door to both controllers, in parallel (but not the DATA line)
- Let each controller power its presence sensors (either controller can power the motionsensor)
- Connect a single Program Switch to both doors, in parallel
- Connect the RXD line of each controller to the TXD line of the other controller
- If you use the “Fire” input, connect the fire sensor to both controllers.
- If you use the “Break-out” input, connect the break-out switch to both controllers.
- Power the controllers from the same AC power source

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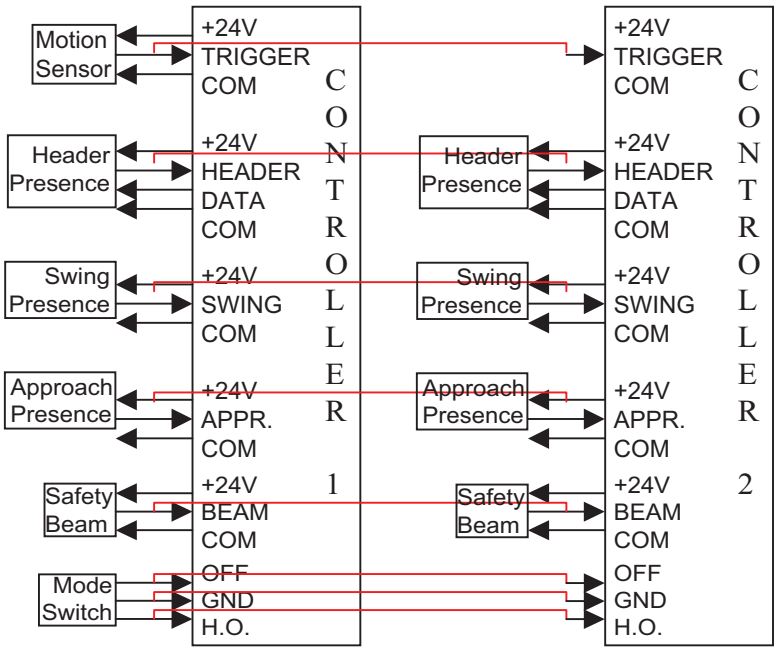
Set-up:

- Program the two controllers identically. However, in particular situations you may wantto program them slightly differently, so that one door opens and/or closes first.
- Let the openers do a learn cycle (it's easier if you do them separately). Tip to stagger the opening of the doors during the learn cycle:
  - place both controllers in "Learn";
  - open one door;
  - as it's closing, flip the Program switch from Off to Auto;
  - the door that was still closed will start a learn cycle,
  - the one that you opened will first finish closing and then start a learn cycle.
  - this will give you a chance to stop the first door at Back-Stop, and then walk to the second door and stop it at Back-Check when it gets there a while later.
- When both openers are ready, trigger an automatic opening, and, as the doors are opening, block one of doors. When they start moving again, block the other one. This will let each opener tell the other of having detected an obstacle, so that each will knowof the presence of a second door. Knowing that, the openers will extend the Hold-Open time after an obstacle, to ensure that both doors remain in synchronization afterwards.

Semi-independent doors

The doors open and close at the same time. However, if one opener reacts to a presence or an obstacle, the other door continues as nothing happened, so the two doors become un-synched. The door return to being synched only after there's no traffic long enough for both doors to return home. For coordinated doors (one must close first) it's possible that the doors will close in the wrong order. To let the door operate independently:

- Program the two controllers identically (for coordinated doors - one must close first - increase slightly the Closing Delay of the controller for the door that must close last)



- Connect the grounds of the two controllers together
- Connect one door's presence sensors just to the controller for that door
- Connect the motion sensor to both controllers, in parallel
- Let each controller power its presence sensors (either controller can power the motionsensor)
- Connect a single Program Switch to both doors, in parallel
- Power the controllers from the same AC power source

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OPERATION

Restore factory defaults

To reset the unit to the factory defaults, do the following:

- Turn the "Selector" knob to the "Misc Sel" position.
- Turn the "Dial" knob until "rSt" is shown in the display.
- Turn the "Selector" knob to the "Misc Adj" position. The display will show "nO".

Turn the "Dial" knob right. The display will show "yES" for just a split second, and thecontroller will restart.

Set-up without temporary stop

If for some reason you don't want stop the door at Electrical Back-Stopduring set-up, use this alternate procedure:

- Manually open the door until it hits a mechanical stop (such as a wall or the operator'sinternal Hard-Stop). Measure that opening angle exactly.
- Turn on the controller
- Indicate the type of door opener and the door mount.
- Turn the "Selector" knob to the "Back-Stop" position. Use the Dial knob to change the Back-Stop angle to the angle you just measured.
- Turn the "Selector" knob to the "Learn" position.
- Set the Program Switch in the "Auto" position.
- The door will start opening slowly and hit the hard-stop.
- As the door closes slowly to Latch-Stop, turn the "Selector" knob to the "Back-Stop" position. Use the Dial knob to change the Back-Stop angle to the desired Electrical Back-Stop Angle (such as 90°).
- **Get out of the way!**
- The door will slam open to 45°, then close.
- The display will show "CyC", meaningthat the opener needs a cycle learn.
- The door will cycle open and closed at normal speed once.

Cycle testing

To cycle test the operator, do the following:

- Apply AC power to the controller.
- Set the Program Switch in the "Off" position.
- Turn the "Selector" knob to the "Back-Stop" position. The display shows the programmed Back-Stop angle in degrees.
- Turn the "Dial" knob to adjust the programmed Back-Stop angle to the actual Back-Stop angle of the door.
- Turn the "Selector" knob to the "Learn" position. The display shows the Learn State. If it doesn't say "ALL" (meaning it needs a complete learn), turn the"Dial" knob counter-clockwise until it does.
- Set the Program Switch in the "Auto" position. The opener will start a learn:
  - The door will open slowly to Back-Stop.
  - The door will close slowly to Latch-Stop.
  - The door may slam partially open, then close.
  - The door will start cycling open and close, non stop.Note that the opener has limited obstacle detection while learning: do not stop the door!
- Turn the "Selector" knob to the "Mon Sel" position.
- Turn the "Dial" knob until that "CyC" (for Number of Cycles) is shown in the display.
- Turn the "Selector" knob to the " Monitor" position. The display will show the number of cycles. If there are morethan 999 cycles, use the "Dial" knob to scroll the display.

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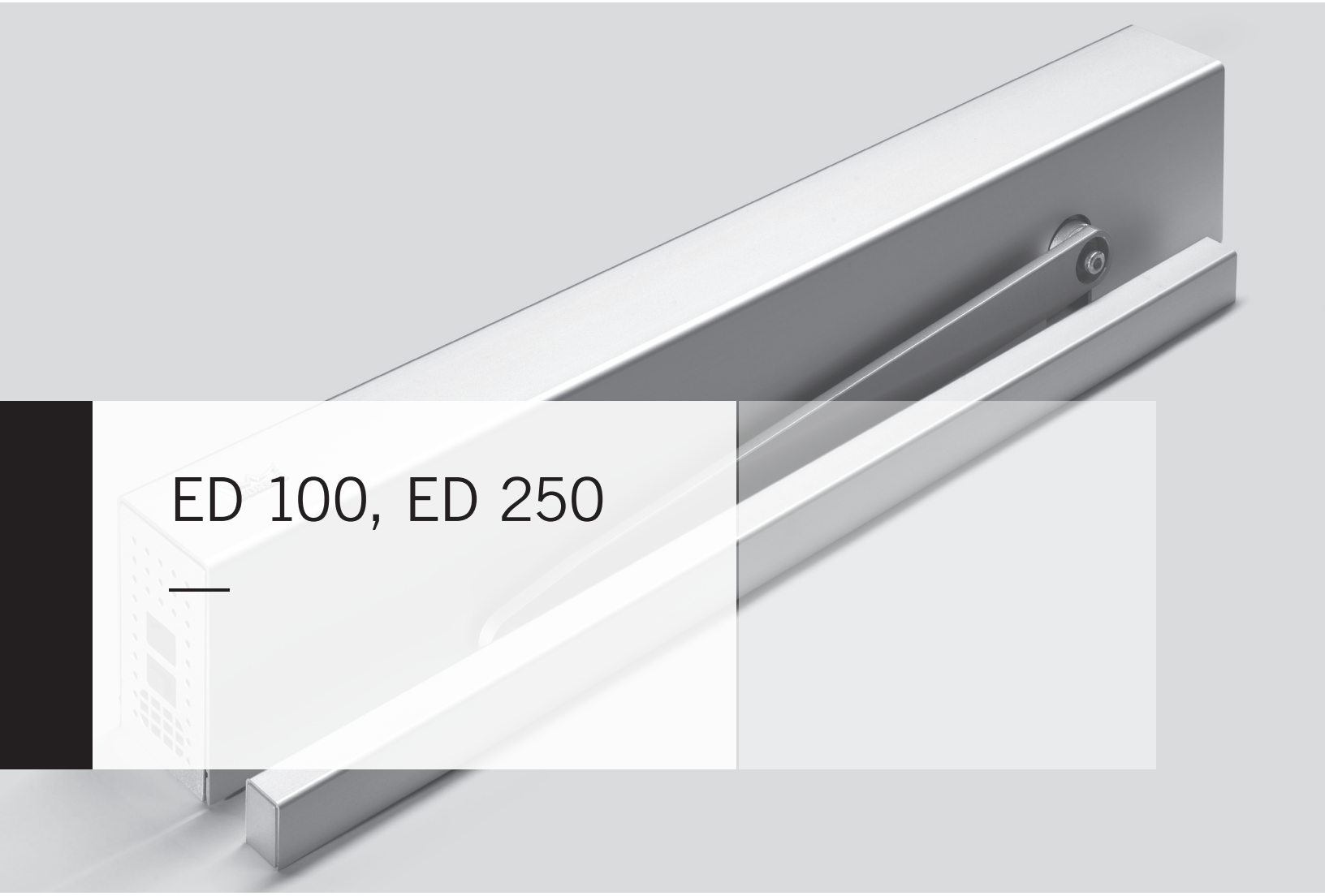

ED 100, ED 250

Technical Documentation

Read this manual carefully
before starting the installation

Contents

1. For your safety

This documentation contains important information regarding the mounting and the safe operation of the door system.
Read these instructions carefully before operating the **ED 100/250.**

It is important for your personal safety to abide by all enclosed instructions.

An incorrectly performed installation might cause serious injuries.
Using control elements, making adjustments or performing procedures that are not described in this documentation might cause electric shocks, danger caused by electric voltage/current and/or danger due to mechanical incidents.
Please keep these documents for further reference and hand them over to the person in charge in case the system is transferred to another party.

Explanation of symbols

NOTE **This symbol underlines important information that may facilitate your work.**

REMARK **This symbol warns you of possible system damage and explains how to avoid this damage.**

WARNING **This symbol indicates dangers that might cause personal or material damage or even kill people.**

Intended application

As electromechanical swing door operators, the **ED 100 and the ED 250 are only designed to open and close swing doors with a door-leaf weight of up to 220 and 550 lbs [100 and 250 kg] respectively.**
Simply select the suitable version according to your door-leaf width and weight.
Both operators are suitable for installation as pull-version with ED slide channel set and as push-version with the ED standard arm.

The closing force paths have been optimized for the respective ways of mounting and comply with the requirements of DIN 18263 part 4.
Please ensure that the system is approved for installation at the respective door before installing the system at a fire or smoke door.
Before you start with the installation of the system, please ensure that your operator is suitable for the door situation as explained in the technical specifications in chapter 2 and that the door is equipped with adequate hinges for operation with an automatic operator.
The maximum cable length for external components must not exceed 98' 5'' [30 m].

Limitation of liability

The ED 100/250 may only be used according to their specified intended application. DORMA GmbH + Co. KG will not accept any liability for damage resulting from unauthorized modifications of the ED 100/250. Furthermore components/accessories that have not been approved by DORMA are exempted from liability.

Safety instructions

Work on electrical equipment may only be performed by properly qualified staff (electricians).

- Do not allow children to play with the **ED 100/250 or its rigidly mounted adjustment and control devices.**
- Keep remote controls out of reach of children.
- Never stick metal objects into the openings of the **ED 100/250; otherwise you might sustain an electric shock.**
- If the **ED 100/250 is mounted onto a metal door leaf, you have to ground the door leaf properly.**
- Always use safety glass when mounting glass door panels.
- Only operate the mains switch at the header profile while the door stands still or is permanently open.

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- No pushbuttons/switches, pictures etc. must be located within the door's movement range.
- Switch must be located so that door operation can be observed by person operatingthe switch.
- Your door system must be maintained in compliance with the standards of the industry, BHMA/ANSI.
- Proper decals and labels be applied, per BHMA/ANSI Standards, and maintained on your doors. If decals are removed, or cannot be read, request labels to be replaced when calling for service.

Standards, laws, codes and regulations
The latest versions of the common and country-specific standards, laws, codes and regulations have to be observed.

Formation/provisions regarding the application of the ED 100/250 at fire and smoke doors:

- Please consider the technical bulletin for the application of hold-open devices.

Low-energy product
The ED 100/250 may be adjusted so that it meets the requirements of a low-energy application (low-energy operator) to DIN 18650, ANSI 156.19 and BS 7036-4. During commissioning, the operator has to be adjusted in accordance with the appropriate standard and then verified after installation is complete. Compliance to these low energy standards has not been evaluated by UL.
The required system safety is ensured by the following means:

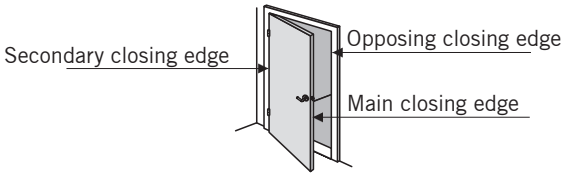
- Reduced dynamic force at door leaf/contact force
- Low driving speed
- Reduced static force at door leaf/contact force
- Force limitation

The application of additional safety sensors to protect the swing path is not explicitly stipulated but should be considered as an option if the individual risk assessment reveals that further sensors are required. The protection of the secondary closing edge has to be assessed individually.

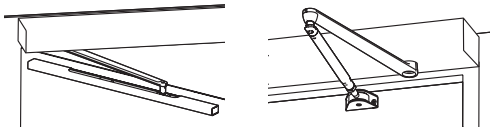
Risk assessment on the part of the installer
Due to special spatial conditions and the expected user groups of the door, the application of safety sensors may, however, also be reasonable for a low-energy operator. Therefore the manufacturer, i.e. the installer of the system, has to perform an individual risk assessment during the planning of the door system in order to decide whether additional safety equipment is required or not.
Please refer to our homepage **www.dorma-usa.com**

Special requirements regarding the protection of people in need of protection
In case the risk assessment reveals that there is a health risk or risk of injury caused by the door hitting a person using the door with an unacceptable force, an additional protection with the aid of appropriate safety equipment (connection of a safety sensor) is required.
This is especially necessary when people in need of protection (children, elderly people or disabled people) use the door.

Dangers at closing edges
Automatic doors may cause hazards by crushing, shearing, hitting and drawing-in at the different closing edges.



Dangers caused by slide channel and arm
The slide channel and the arm may cause hazards by crushing and shearing.



Residual risk
Depending on the structural conditions, the door version and the available safety equipment, residual risks (such as crushing and hitting – with limited force) cannot be excluded. All people using a door are generally aware of the danger spot at the secondary closing edge of every swing door (also at manually operated doors). This danger spot cannot be influenced by the manufacturer of the operator and a protection of this closing edge often cannot be realized due to its construction and technical function. A suitable clamping protection (like a rubber or textile cover) is available in the specialized trade and not part of the scope of delivery.

Recycling and disposal
Both the **ED 100/250 and its packing mainly consist of recyclable raw material.**
The **ED 100/250 and the respective accessories must not be disposed of as domestic waste.**
Please ensure that the old appliance and the respective accessories (if available) are properly disposed of.
Abide by the prevailing national statutory provisions!

Safety during mounting

- The door is designed to be installed by trained and knowledgeable installers. The installation technician should be experienced in the installation of automatic entrances. They should know all local code requirements and be familiar with the requirements of the current ANSI A156.10 & 156.19 Standards for Power Operated Pedestrian Doors.
- The working area has to be secured against unauthorized access from other people. Falling items or tools might cause injuries.
- The **ED 100/250 has to be secured against water and other liquids.**
- In any case, the way of mounting and the mounting equipment, like for example screws and wall plugs, have to be adequate with regard to the structural conditions (steel structure, wood, concrete etc.).
- Before mounting the **ED 100/250, the door leaf has to be checked with respect to proper mechanical condition and smooth running.**
- **The mounting of the ED 100/250 described herein is only an example.**
  Structural or local conditions, available tools or other conditions might suggest a different approach.
- Following the successful installation of the system, the settings and the proper function of the **ED 100/250 and the safety equipment have to be checked.**
- Only specially qualified staff may open the power supply housing.
- Disconnect the **ED 100/250 from power supply (de-energize the system) before removing the cover of the power supply housing.**
- After installation, the door must be adjusted to conform to **DORMA** recommendations and all code requirements. Carefully study the requirements in these instructions.
- After installation and adjustment, the installer's final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with the manual.
- Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the **DORMA** Technical Assistance Group for assistance.

Safety during commissioning

- Only specially qualified staff may open the power supply housing.
- The protective earth conductor has to be connected.
- Separately supplied components such as the program switch, the EMERGENCY OFF pushbutton and activators (radar motion detectors, NIGHT-/BANK key switches) have to be mounted and connected.
- Ensure that the door leaves run smoothly.
- The operator and the door leaf must be properly linked.

Inspection and system approval

Before the first commissioning and depending on requirements, however, at least once a year, the **ED 100/250 has to be inspected by a properly qualified technician and serviced if required.**
A person trained by DORMA has to perform the inspection and approve the system with the aid of the inspection book.
The respective results have to be documented and the facility operator has to keep these documents for at least one year.

We would recommend taking out a maintenance agreement with DORMA.

Briefing:

Following the adjustment, commissioning and functional testing of the door system, the operating instructions have to be handed over to the facility operator and a briefing has to be made.

Maintenance

The system has to be de-energized/disconnected from power supply before any kind of maintenance work is performed (switch off fuse).
Please consider the leaflet regarding the application of hold-open devices for further information and instructions regarding the application of the **ED 100/250 at fire and smoke doors.**

Care

The system has to be de-energized (disconnected from power supply) before cleaning the system.
Remove power plug or, with permanent power supply, switch off fuse.
You may clean the **ED 100/250 with a damp cloth and standard commercial detergents.**
You should not use scouring agents for cleaning purposes as they might damage the surface finish.
Pay attention that no water or other liquids drop on or into the **ED 100/250.**
Never stick metal objects into the openings of the **ED 100/250; otherwise you might sustain an electric shock.**

Wear

The following wear parts have to be inspected once a year and replaced if required:

- Arm
- Slide shoe
- Slide channel

Only use original replacement parts.

2. Technical specifications

The following technical specifications will help you to check additionally if the system fulfills the requirements. You can start mounting if the system complies with the parameters.

Required operating conditions

Ambient temperature	5 to 122° F [-15 to 50° C]
Only suitable for dry environments	relative humidity max. 93% non-condensing
Power supply	115 V AC +/- 10% 50/60 Hz 6.6 A max.
Class of protection	IP 20
Branch circuit protection (by others)	15 A
Power cable type	14 AWG
Max. operating noise	50 db (A)

General specifications

Dimensions (WxHxD)	27 x 2 3/4 x 5 1/8" [685 x 70 130 mm]
Min. distance between hinges (double-leaf systems)	55 1/8" [1,400 mm]
Min. distance between hinges (double-leaf systems) with ESR (door coordinator)	57 1/8" [1,450 mm]
Min. distance between hinges (double-leaf systems) with VARIO Cover	59 1/16" [1,500 mm]
Operator weight	26.5 lb [12 kg]
Power supply for external accessories	24 V DC +/- 10%, 1.5 A
Opening angle	Max. 110°

Inputs

Connections	14 AWG Max. [2 mm^2]
Potential-free activator	Inside and outside (NO contact)
Night-/Bank (intercom system)	8 - 24 V DC / AC + 10%
Night-/Bank (key switch)	NO contact/NC contact
Safety sensor	Hinge side and opposite hinge side (NC contact)
Test signal for safety sensor	Hinge side and opposite hinge side
Deactivation of operator function (lock switch)	NC contact/NO contact

Outputs

Connections	14 AWG Max. [2 mm^2]
Potential-free status indicator	Door closed Door open Malfunction

Integrated functions

Latching action	Force adjustable
Hold-open time	0 - 30 seconds
Night-/Bank hold-open time	0 - 30 seconds
Blocking behavior during closing cycle	Reversing / Door closer function
Delayed opening for locking mechanism (electric strike)	0 - 1 second/s
Locking feedback contact	Motor lock
Wind load control	up to 33,7 lbf [150 N]
Power failure speed control	Adjustable via potentiometer
LED status indicator green red yellow	- power supply available - malfunction - service interval indicator
Integrated program switch	OFF AUTOMATIC PERMANENT OPEN EXIT ONLY (only for single-leaf systems)
User interface with information display	Status indicator and settings
Slot for DORMA Upgrade Cards	Extension of functional range
Update interface	Firmware update
TMP – Temperature Management Program	Overload protection
IDC – Initial Drive Control	Driving phase optimization
Cycle counter	0 – 1,000,000 (reasonably subdivided)
Power Assist Function	Servo-supported manual opening
Push & Go Function	The door opens when it is moved manually by 4°

ED 100, ED 250

ED 100	
Max. steady state power consumption	120 Watts
Max. door-leaf weight for lintel depths of up to 11 3/4 " [300 mm]	220.4 lbs [100 kg]
Door-leaf width	27 9/16" to 43 1/4" [700 to 1,100 mm]
Max. opening speed	**50° (27°*)/second
Max. closing speed	**50° (27°*)/second
Axle extension	5/16" [9mm] 3/4" [20 mm] 1 3/16" [30 mm] 2 3/8" [60 mm]
Lintel depth for slide channel	+/- 1 3/16" [30 mm]
Lintel depth for standard arm	0" to 11 13/16" [0-300 mm]

* The values in brackets indicate the maximum speed in Low-Energy Mode without Full-Energy or Fire Protection Upgrade Cards.

** Depending on the door-leaf weight automatically limited according to DIN 18650, BS 7036-4 and ANSI 156.19.

ED 250	
Max. steady state power consumption	240 Watts
Max. door-leaf weight for lintel depths of up to 11 3/4" [300 mm]	551.1 lbs [250 kg] for door-leaf widths of up to 55" [1,400 mm] 418.8 lbs [190 kg] for door-leaf widths of up to 63" [1,600 mm]
Max. door-leaf weight for lintel depths from 11 3/4 " to 19 5/8" [301 to 500mm]	352.7 lbs [160 kg]
Door-leaf width	27 9/16" to 63" [700 to 1,600 mm]
Door-leaf width for fire protection doors	27 9/16" to 55" [700 to 1,400 mm]
Max. opening speed	**60° (27°*)/second
Max. closing speed	**60° (27°*)/second
Axle extension	5/16" [9mm] 3/4" [20 mm] 1 3/16" [30 mm] 2 3/8" [60 mm] 3 1/2" [90 mm]
Lintel depth for slide channel	+/- 1 3/16" [30 mm]
Lintel depth for standard arm	0" to 19 11/16" [0 to 500 mm]

Automatic-Power-Assist Function

The Automatic-Power-Assist Function may be activated while the door is in door closer mode (parameter Hd = 1). As soon as a user opens the door manually by some degrees, the servo-function supports the manual opening cycle. The servo support automatically adapts to the adjusted size of the door closer. The level of servo support is adjustable in order to meet the requirements of DIN 18040, DIN Spec 1104, CEN/TR 15894, BS 8300/2100 and document "M", even up to class EN 6. The smallest adjustable opening torque amounts to 17 ft-lbf [23 Nm], unless the hold-open device is triggered or in the event of a power failure. With the aid of the Automatic-Power-Assist Function, the system meets the requirements of the European standard EN 1154 and provides barrier-free access during standard operation. However, it is not possible to use the system in conjunction with the Push & Go Function or the wind load control as these functions may affect the easy manual opening.

Door closer mode & Automatic mode

Users may choose between two operation modes: door closer and Automatic mode. While adjusted to door closer mode (parameter hd = 1), the system is optimized for manual operation. With its optional Automatic-Power-Assist Function, the door closer mode is tailored to predominantly manually-operated doors where a door closer function is desired. The Automatic mode (parameter hd = 0) in turn is especially suitable for mainly automatic access via motion detector or pushbutton. In addition, the door reverses as soon as it runs into an obstruction while closing. On activation of the Automatic mode, also the wind load control is available. However, the doors are still ready for manual access. In this case we would recommend the Push & Go function.

Wind load control

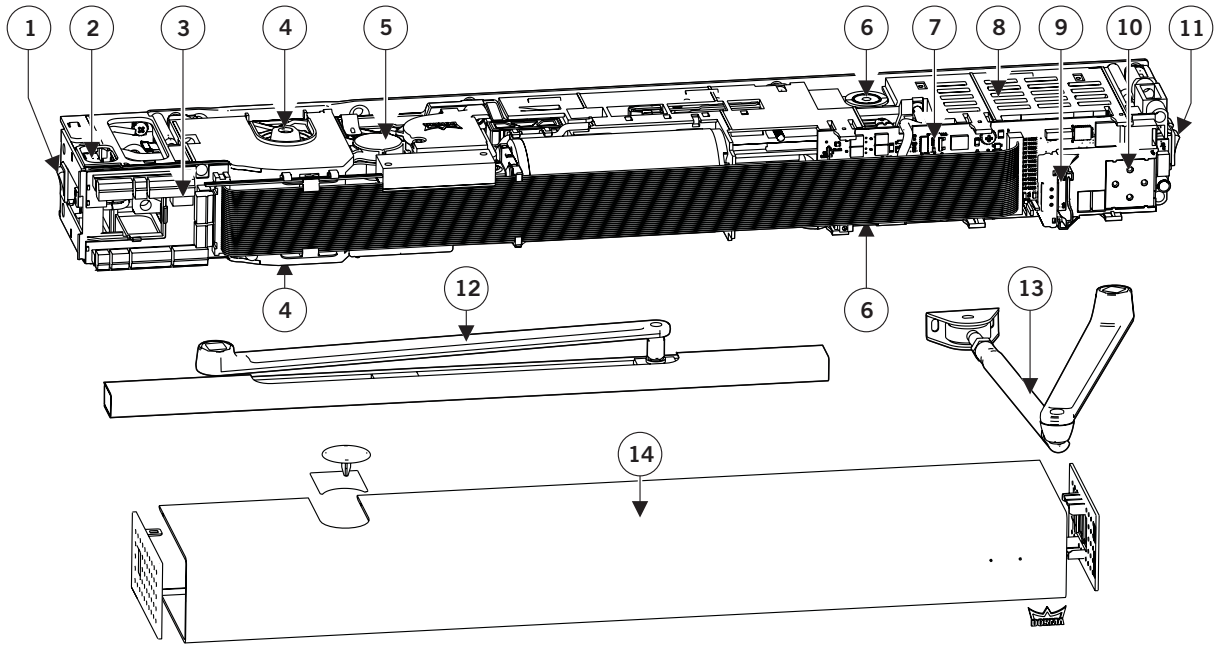
ED 100 and ED 250 operators are especially suitable for application at exterior doors that are subject to varying wind loads and for interior doors separating rooms where different pressure prevails. While the system is in AUTOMATIC mode, the wind load control monitors the actual driving speed and adjusts the speed correspondingly if it does not correspond to the adjusted value. In conjunction with the Full-Energy Upgrade Card, the operator provides a force of up to 33.7 lbf [150 N] at the main closing edge – which is then used to compensate environmental influences.
The electronic latching action is activated during the last 5° of the closing cycle in order to support the closing action.

3. System setup

Operator system

The operator system comprises all core components.
Select the system in accordance with the door-leaf width and the door-leaf weight.

1. Power switch
2. Mains connection
3. Connection unit
4. Axle connection on both sides
5. Drive system (motor/gear/ spring)
6. Adjustment of closing force
7. Control unit
8. Switching power supply unit
9. Slot for DORMA Upgrade Cards
10. User interface with information display
11. Internal program switches
12. Slide channel pull arm assembly
13. Standard push arm assembly
14. Cover assembly



Functions of Internal Program Switches

OFF The door opens automatically when the Night-/Bank activator is triggered and closes on expiry of the Night-/Bank hold-open time.

AUTOMATIC The door opens automatically when one of the activators is triggered and closes on expiry of the adjusted hold-open time.

PERMANENT OPEN The door opens automatically and remains open until the function is deactivated.

EXIT ONLY The door only opens automatically after the internal activator or the Night-/Bank activator has been activated. The door closes on expiry of the adjusted hold-open time.

Selection of functions

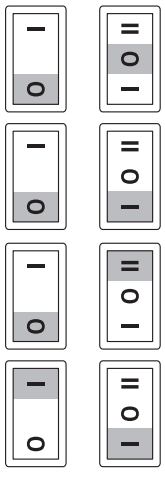
Activate the desired function by pushing the respective key on the external program switch (see picture at the bottom of the left column).
When performing adjustments with the aid of the internal program switch, you have to adjust both switches in a certain combination:
The front switch is only adjusted to **" I "** if you want to adjust the EXIT ONLY function.

OFF
Adjust both switches to **"0"**.

AUTOMATIC
Adjust the front switch to **"0"**, and the other switch to **"I"**.

PERMANENT OPEN
Adjust the front switch to **"0"**, and the other switch to **"II"**.

EXIT ONLY
Adjust the front switch to **"I"**, and the other switch to **"I"**.



4. Accessories

Electrical connection

Apart from the broad range of **DORMA** accessories, other manufacturers offer various activators, locking devices, safety sensors and further accessories that are compatible with **ED 100** and **ED 250** operators.

External activation device

In general external activation devices need to be normally open dry contact.

Minimum requirements

Operating voltage with power supply via operator:
24 V DC +/- 10%
Pulse width:
min. 200 ms
Potential-free output
(When installed at internal signal input, external detector or Night-/Bank)
Energized output (telephone systems):
8 - 24 V DC / AC + 10%

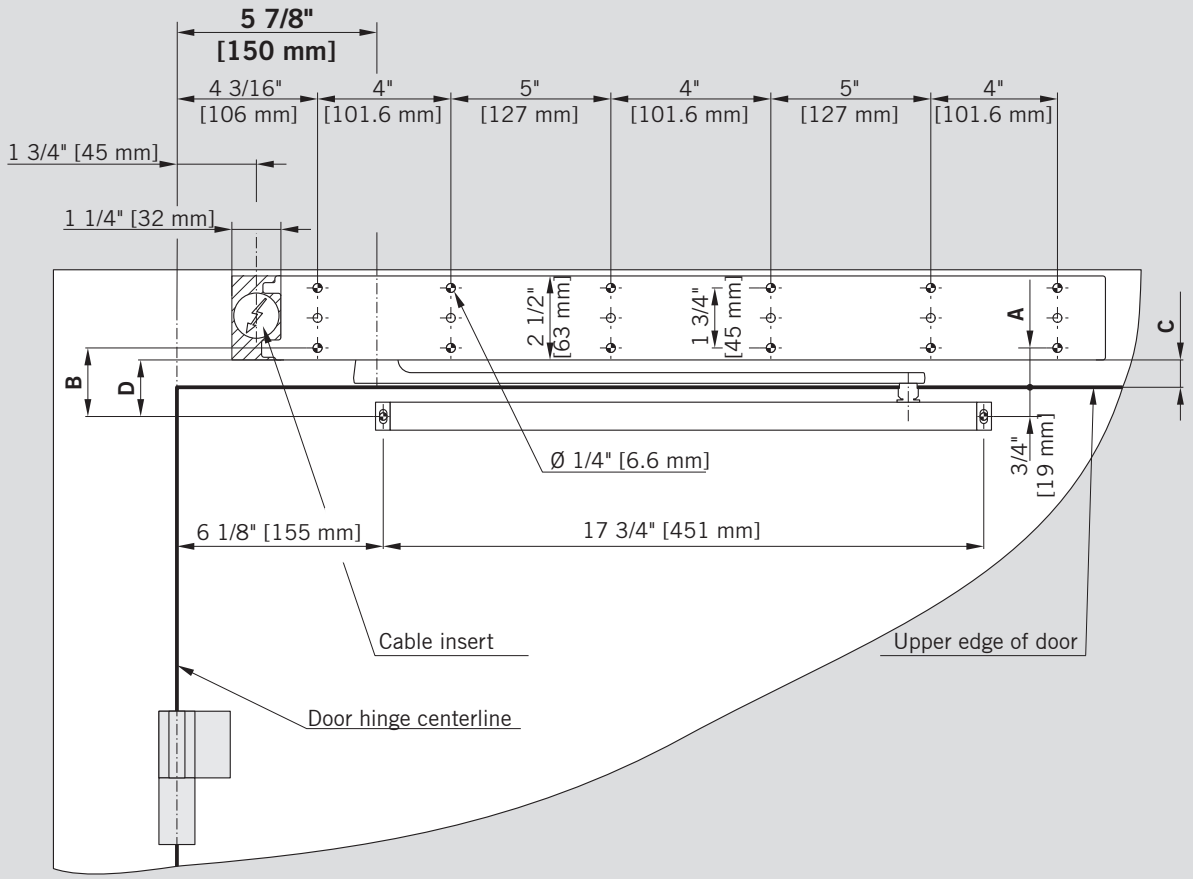
Locking device

Motor locks without a feedback contact can be directly connected to the operator as long as the delayed opening for the locking mechanism amounts to less than 4 seconds. In order to ensure that the operator and the locking device work together properly, the locking device has to comply with the following specifications:

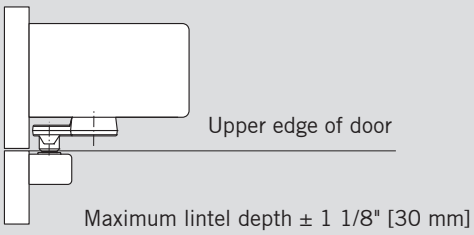
Minimum requirements

Operating voltage with power supply via operator:
24 V DC +/- 10%
Operating voltage with external power supply:
max. 48 V DC/AC
Current load for relay contact of locking device:
max. 1 A
Rated for continuous duty: electric strike:
min. 30%
Rated for continuous duty: motor lock:
100 %
Power consumption for accessories:
The operator may provide a maximum of 1.5 A at 24 V DC for external accessories. In case you need more power (even if only for a short period of time), an external power supply unit is required in order to avoid malfunctions.

5. Pull arm mounting with 1/2" [12.5 mm] mm pivot pin

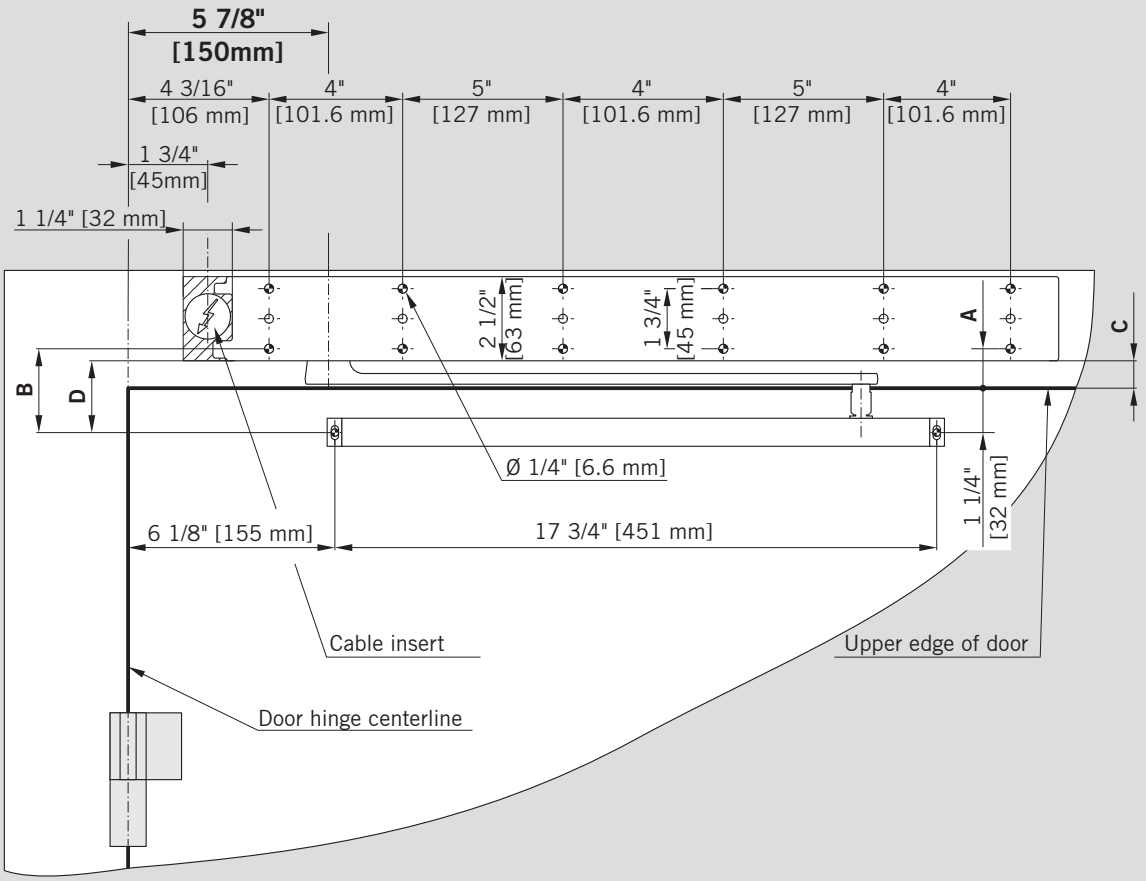


Door without rabbet

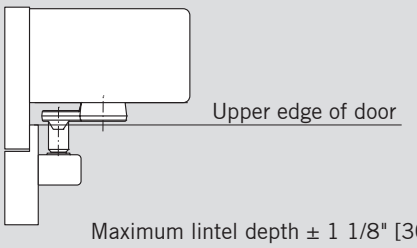


Axle extension	ED 100	ED 250	A	B	C	D
Standard 5/16" [9 mm]	●	●	1 1/4" [31 mm]	2" [50 mm]	7/8" [22 mm]	1 5/8" [41 mm]
3/4" [20 mm]	●	●	2" [51 mm]	2 3/4" [70 mm]	1 5/8" [42 mm]	2 3/8" [61 mm]
1 3/16" [30 mm]	●	●	2 14" [61 mm]	3 1/8" [80 mm]	2 1/16" [52 mm]	2 13/16" [71 mm]
2 3/8" [60 mm]	●	●	3 9/16" [91 mm]	4 5/16" [110 mm]	3 1/4" [82 mm]	4" [101 mm]
3 1/2" [90 mm]	---	●	4 3/4" [121 mm]	5 1/2" [140 mm]	5 3/16" [131 mm]	5 3/16" [131 mm]

6. Pull arm mounting with 1" [25 mm] pivot pin



Door with rabbet



Maximum lintel depth ± 1 1/8" [30 mm]

Axle extension	ED 100	ED 250	A	B	C	D
Standard 5/16" [9 mm]	●	●	1 1/8" [31 mm]	2 1/2" [63 mm]	7/8" [22 mm]	2 1/8" [54 mm]
3/4" [20 mm]	●	●	2" [51 mm]	3 1/4" [83 mm]	1 5/8" [42 mm]	3" [74 mm]
1 3/16" [30 mm]	●	●	2 3/8" [61 mm]	3 11/16" [93 mm]	2 1/16" [52 mm]	3 5/16" [84 mm]
2 3/8" [60 mm]	●	●	3 9/16" [91 mm]	4 13/16" [123 mm]	3 1/4" [82 mm]	4 1/2" [114 mm]
3 1/2" [90 mm]	---	●	4 3/4" [121 mm]	6" [153 mm]	7/16" [112 mm]	5 11/16" [144 mm]

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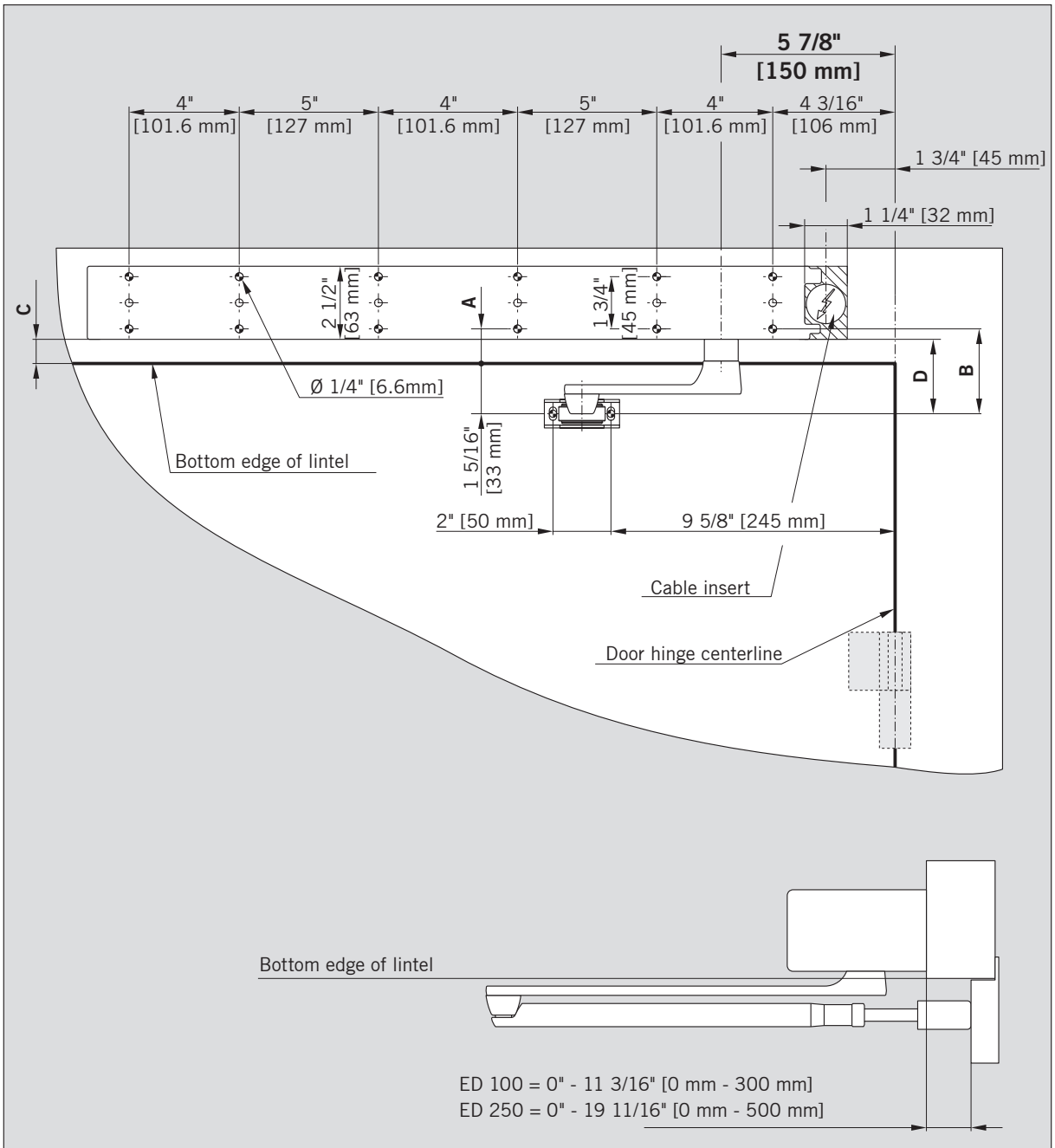
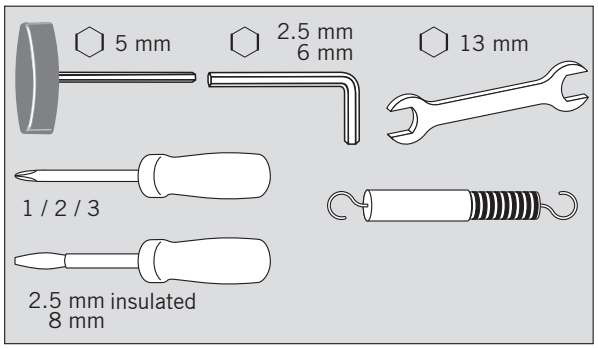
7. Push arm mounting



Axle extension	ED 100	ED 250	A	B	C	D
5/16" [9 mm]	●	●	3/4" [19 mm]	2" [51 mm]	5/16" [9 mm]	1 5/8" [42 mm]
Standard 3/4" [20 mm]	●	●	1 9/16" [39 mm]	2 13/16" [71 mm]	1 1/16" [29 mm]	2 7/16" [62 mm]
1 3/16" [30 mm]	●	●	1 15/16" [49 mm]	3 3/16" [81 mm]	1 9/16" [39 mm]	2 13/16" [72 mm]
2 3/8" [60 mm]	●	●	3 1/8" [79 mm]	4 3/8" [111 mm]	2 11/16" [69 mm]	2 11/16" [69 mm]
3 1/2" [90 mm]	---	●	4 5/16" [109 mm]	5 9/16" [141 mm]	3 7/8" [99 mm]	5 3/16" [132 mm]

8. Installation instructions

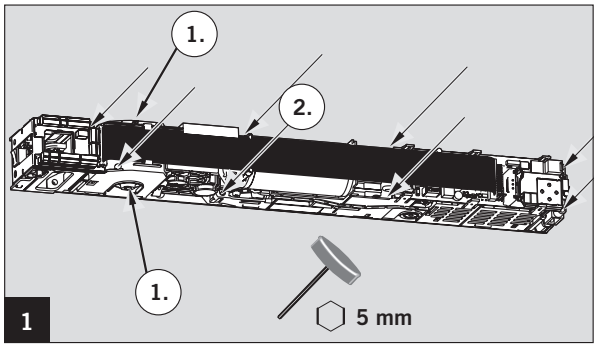
Required tools



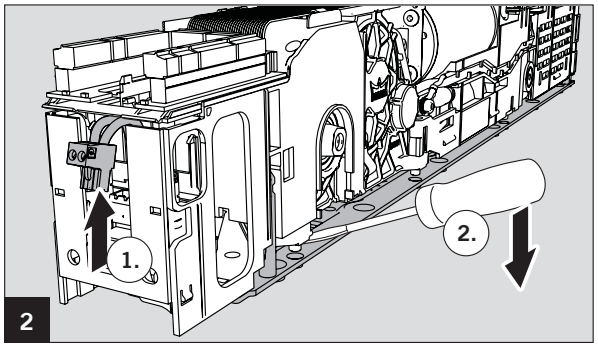
1. Remove the two transport safety screws and the cardboard.

The transport screws are not self-locking screws; therefore they must not be used to attach the arm.

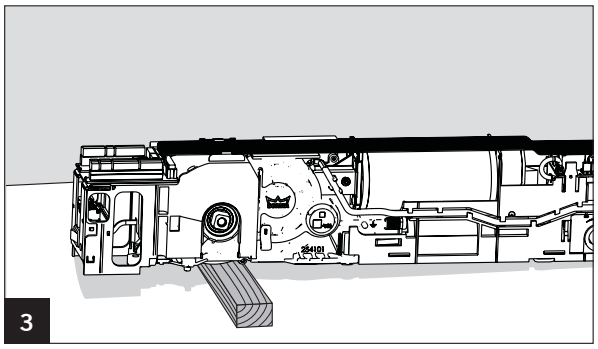
2. Loosen the 8 screws to loosen the mounting plate from the operator body.



1. Remove 115 V plug.
2. Remove operator from mounting plate.
   If needed, carefully usese a screwdriver to pry the operator off the base plate.



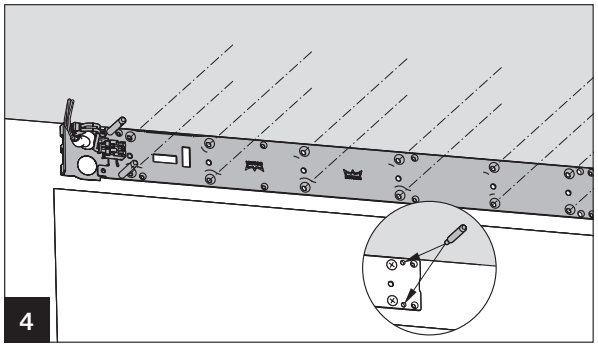
Prop the unit up with a wooden block or similar (see picture 3) so that the operator does not start to disassemble.



1. Install the mounting plate and conduit bracket with 12 screws through the provided holes.

   Use adequate inserts and fasteners in accordance with the substructure to attach the mounting plate.

2. Screw the provided retaining pin into one of the two tapped holes.



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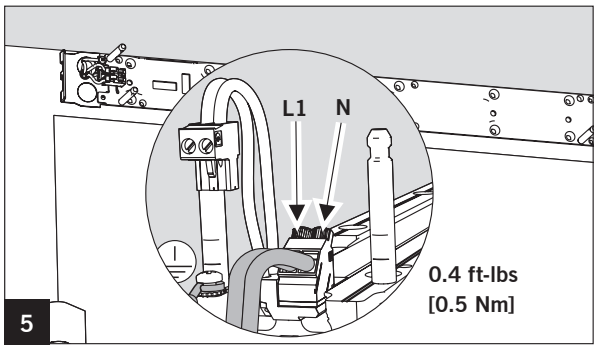
Connect the 115 V power supply.

Work on electrical equipment may only be performed by properly qualified staff (electricians).

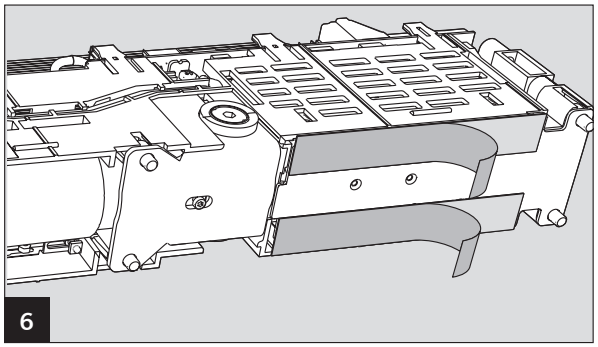
Connect grounding cable.
Form a loop of the end of the cable.

Tighten mains terminal to 0.4 ft-lbs



Remove the protective foil from the heat conductive pads at the bottom of the power supply unit.

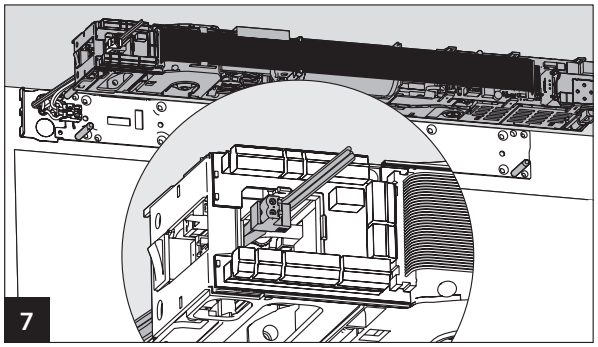
The heat conductive pads must remain clean.



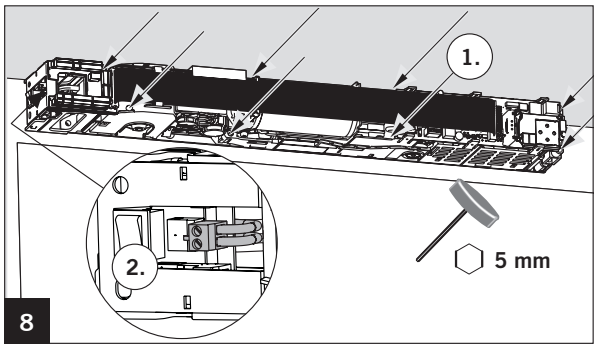
Attach the operator to the bolts on the base plate.

Lay the connection cables through the housing.

Press against the operator until you hear it lock in position.

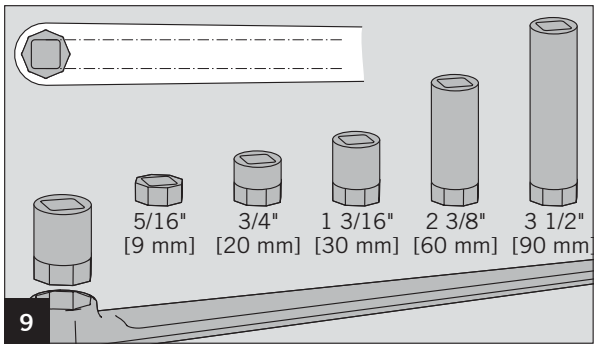


1. Screw down the 8 screws thoroughly.
2. Plug in mains connection.



Drive the axle extension into the arm.

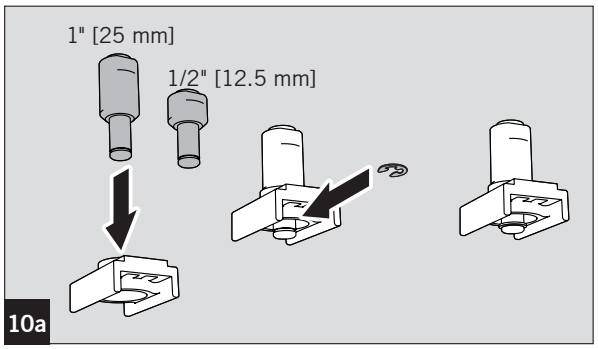
Turn the square end so that its mounting position corresponds to the picture.



a Mounting of slide channel (hinge side)

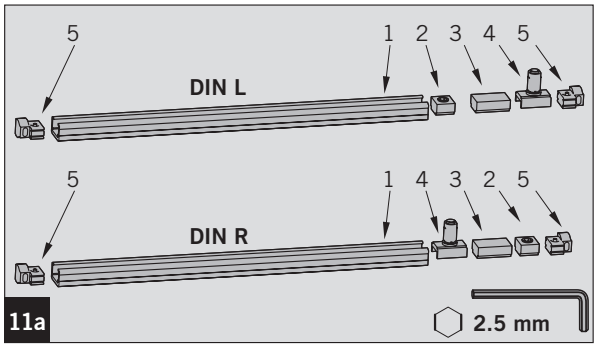
Assemble slide shoe.
Insert the pivot pin in the slide shoe
(1/2" [12.5 mm] or 1" [25 mm])
and secure with lock washer.

Use the short pin for doors without rabbet.

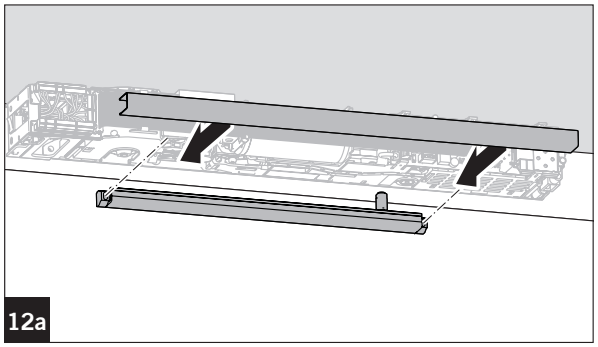


Position the individual components inside the slide channel and screw down the fittings.

1 - Slide channel
2 - End stop
3 - Buffer
4 - Slide shoe
5 - Fitting



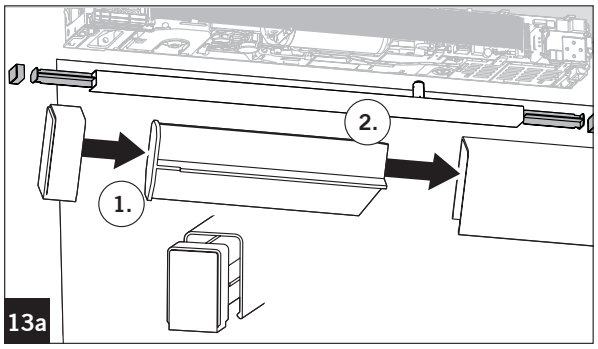
Install the slide channel with 2 screws through the provided holes.
Mount the slide channel cover.



1. Assemble the end caps onto the spacers.
2. Insert both components into the cover.

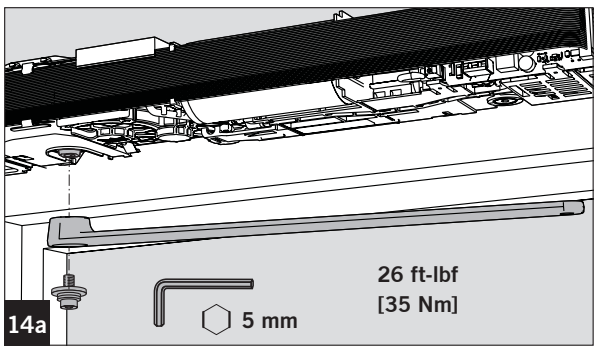
Ensure that the mounting position is correct. Install the spacers and end caps as indicated on the picture.

Align the system so that the end caps are flush with the cover on both sides.



Use a high torque (26 ft-lbf [35 Nm]) to attach the arm to the operator axle.

Only use the provided self-locking screw. In case the screw has to be removed during repair or maintenance work, it has to be replaced by a new self-locking screw.



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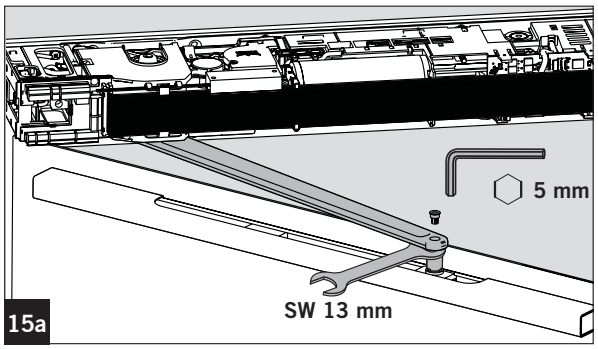
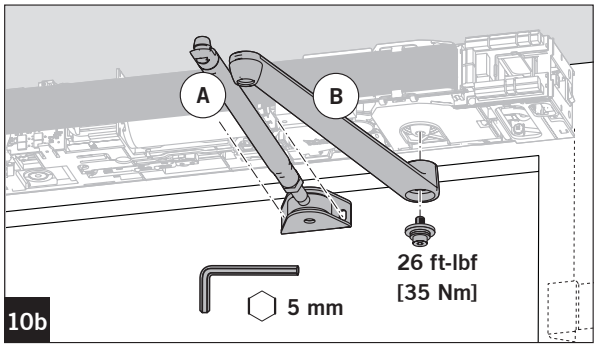
Install arm to slide channel.



b Standard arm (opposite hinge side)

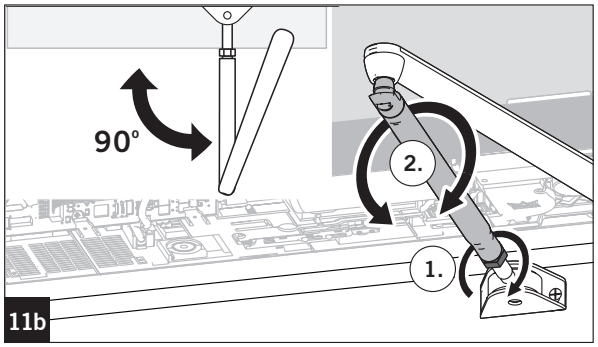
Install the adjustment screw (A) with 2 screws through the provided holes. Use a high torque (26 ft-lbf [35 Nm]) to attach the arm (B) to the operator axle.

Only use the provided self-locking screw. In case the screw has to be removed during repair or maintenance work, it has to be replaced by a new self-locking screw.

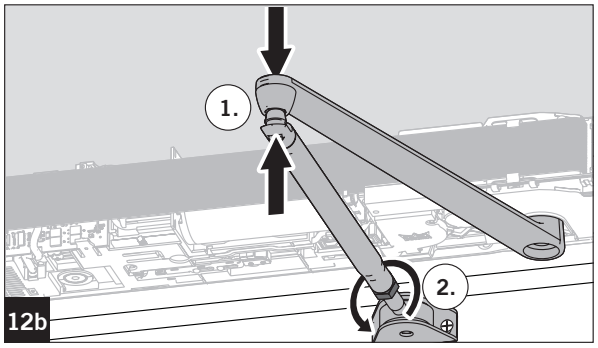


The adjustment screw must be positioned at right angles to the door leaf.

1. Loosen the counter nut at the adjustment screw.
2. Turn the adjustment screw so that it is at right angles to the door leaf when the arm is clipped together.



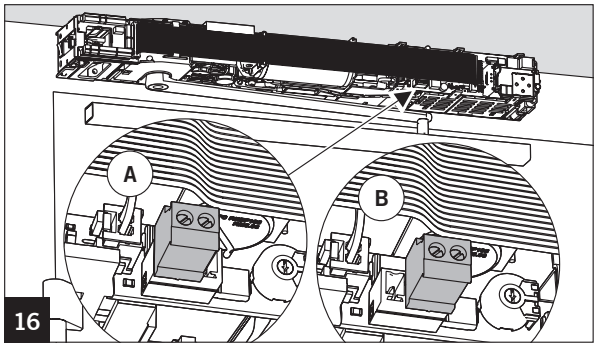
1. Press the ball head of the adjustment screw into the provided hole inside the arm.
2. Secure the adjustment screw with the aid of the hexagon nut.



Adjustment of braking circuit

1. **Ensure that the power supply is switched off!**
2. Insert connector according to the respective way of mounting.
   (A) = Mounting with slide channel.
   (B) = Mounting with arm.

The brake circuit will not work if the connector is improperly connected. The door might close at high speed and be difficult to open.



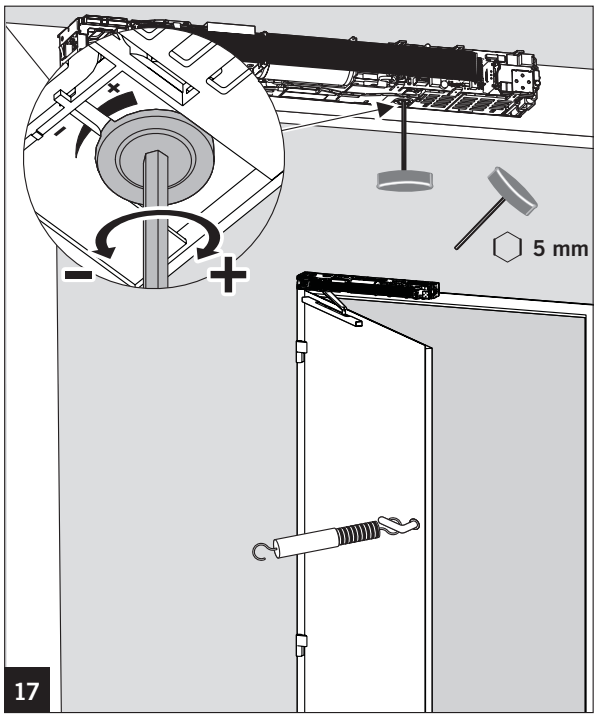
Adjustment of spring force

When the system is delivered, the spring tension needs to be lowered all the way first.

Then the spring has to be pre-tensioned - at least 10 revolutions are required to operate the system.

The system checks the spring adjustment during the learning cycle; the cycle will be interrupted if the spring is insufficiently tensioned.

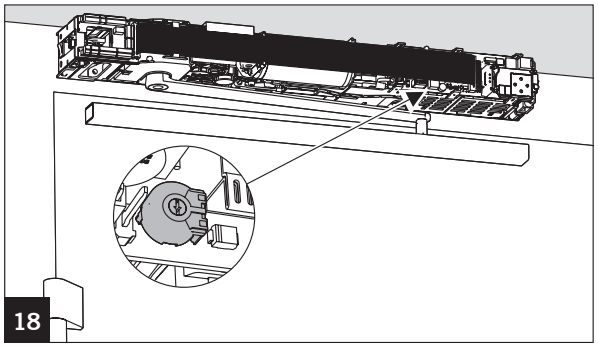
A learning cycle has to be performed whenever the spring is readjusted.



Adjustment of closing speed under power failure conditions

Adjust closing speed.

The speed have to be adjusted in any case!
If the door requires less than 3 seconds to close, error message 73 (braking circuit test) will be emitted.

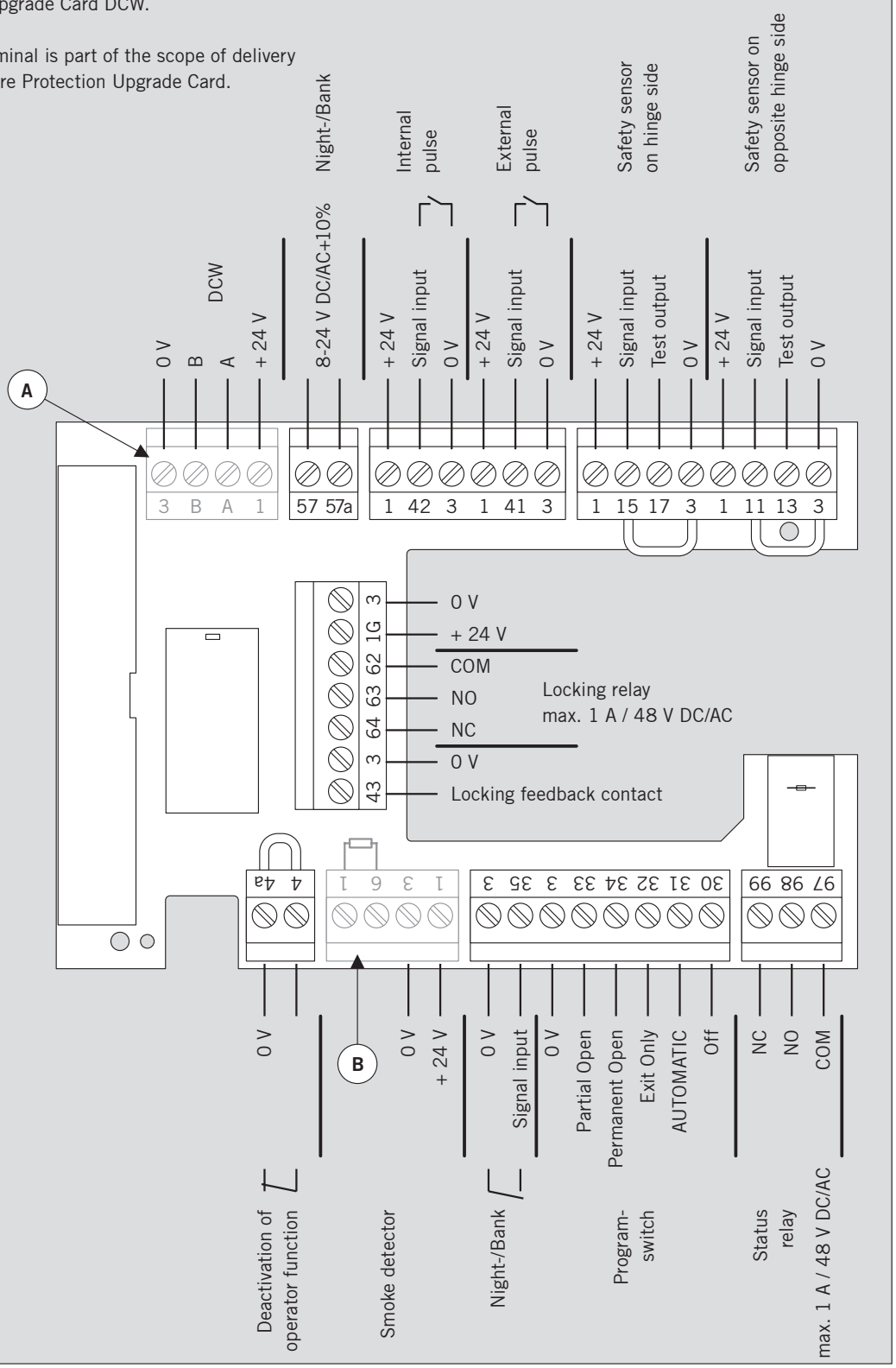


9. Connection diagram

Connect the cables to the connection terminals and attach them to the PCB.
The maximum current load at terminal 1, 1G and 3 amounts to 1.5 A.
The cable length must not exceed 98' 5" [30 m] when using J-Y (ST) Y 1/32" [0.8 mm].

A This terminal is part of the scope of delivery of the Upgrade Card DCW.

B This terminal is part of the scope of delivery of the Fire Protection Upgrade Card.

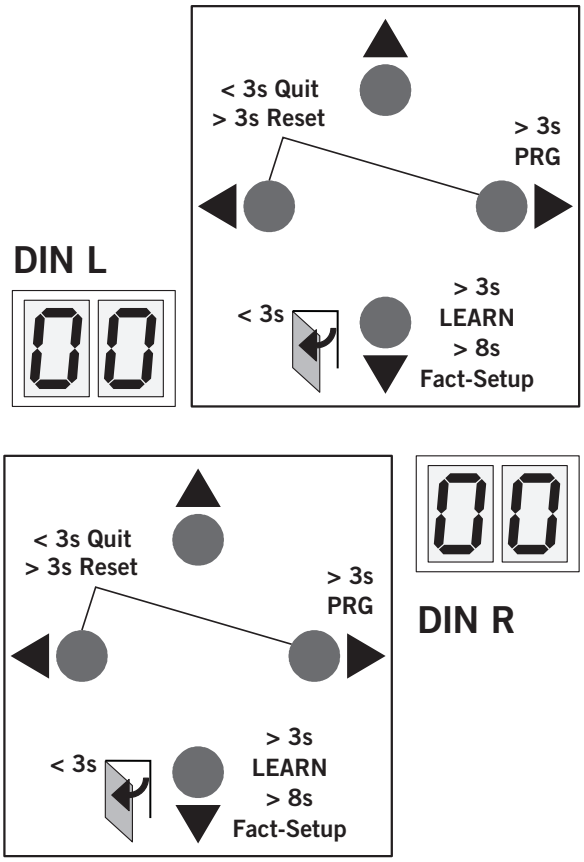


10. Commissioning

The **DORMA ED 100 and ED 250 are electromechanical operators. Only if the motor gear unit and the control unit work together properly, can the door open and close automatically. Thus the control unit requires certain parameters in order to achieve the best possible operating behavior.**
The control unit is equipped with a user interface and an information display. With the aid of this equipment you can perform all adjustments that are stipulated on the settings list.

Information display
The information display is a two-digit display. It is configured during commissioning so that the display will indicate the figures and numbers correctly no matter in which direction the system is mounted.

User interface
Use the four keys to enter information. Among others, also the function of the keys is adapted to the mounting direction during commissioning. This ensures that the keys are always allocated in the same way.
You can remove and turn the key designation.



Use the keys to activate the following functions:

▼ **Key at bottom**
- Adjustment of mounting direction following a power reset
- Scrolling through parameters and error messages
- Reducing the parameter value Opening pulse - Activate the key for less than 3 seconds
- Learning cycle - Activate the key for more than 3 seconds (PGS Off)
- To reset system to factory settings - Activate the key for more than 8 seconds (PGS Off)

▲ **Key at TOP**
- Scrolling through parameters and error messages
- Increasing the parameter value

▶ **Right key**
- Opening the parameter menu - Activate the key for more than 3 seconds
- Changing the selected parameters
- Saving the changed parameter value

◀ **Left key**
- Cancelling the parameter adjustment
- Quitting the parameter menu

◀ ▶ **Left and right key simultaneously**
- Error acknowledgement - Activate the key for less than 3 seconds
- Reset - Activate the key for more than 3 seconds

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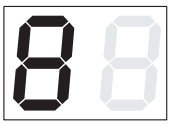
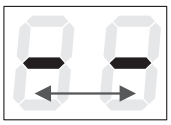
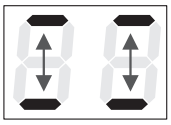
First commissioning or after the system has been reset to factory settings

When starting with the commissioning, the operator must be completely installed and the door must be closed.
The motor needs to be cold during the subsequent learning cycle.
Switch on power supply: The display will indicate a sequence of symbols to indicate the current status.

Meaning	Display	What to do
The system is being checked.		
Two moving segments in the middle of the display indicate that the control unit is waiting for internal signals (max. 1 second).		
Two underscores that move up and down indicate that it is now time to enter the mounting position. In case your entry was incorrect, the symbols will be displayed upside down.		Activate the key at the bottom (only required during first commissioning).

The device code "runs" through the display. ED 100 or ED 250 and the firmware version (shown by **XX XX**)

A small, rotating "o" and a "P" indicate that the system requires a further settings. (Only during first commissioning or following the system has been reset to factory settings).

The following parameters have to be adjusted: Way of mounting (AS), lintel depth (rd) and door-leaf width (Tb)

Changing the parameters

1.	Open parameter menu	with key ▶	Press and hold key for 3 seconds
2.	Select desired parameter	with key ▼ or ▲	
3.	Show parameter value	with key ▶	
4.	Select the value to change	with key ▶	=> the value blinks
5.	Adjust desired value	with key ▼ or ▲	
6.	Store new value	with key ▶	
7.	Return to parameter menu	with key ◀	
8.	Select next parameter	with key ▼ or ▲	

Parameters/Display	Range	Unit factory setting = bold print	Explanation
Configuration			
Way of mounting AS	0 to 1	**0**	Lintel mounting on hinge side with slide channel, pull-version
		1	Lintel mounting on opposite hinge side with standard arm, push-version
Lintel depth rd	**ED 100: -3 to 30** **ED 250: -3 to 50**	**0**	The lintel depth is indicated in steps of 25/64" [10 mm]. Consider the installation drawings to find the required dimension.
Door-leaf width Tb	**ED 100: 7 to 11** **ED 250: 7 to 15**	**10**	The rabbet is included in the door-leaf width. The door width is indicated in steps of 3 15/16" [100 mm].

After leaving the settings mode, the display shows a small, rotating "o" and "O".

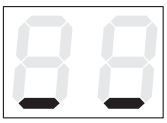
Start learning cycle.

Learning cycle

The door must be closed and the program switch has to be set to **OFF before you start the learning cycle.**
The following three parameters must have been adjusted:
Way of mounting (arm or slide channel), lintel depth and door width (See page 19 "First commissioning").

The learning cycle has to be performed while the motor is cold. You must not move the door leaf manually or hold the door open during the learning cycle; otherwise the control unit cannot determine the parameters correctly.

Safety sensors and activators are switched off during the learning cycle to ensure that the cycle is not interrupted. The movement range of the door leaf must be safeguarded manually.
Smoke detectors are activated and the operator functions are deactivated (deactivation of operator function).

Meaning	Display	What to do
A small rotating "o" and "O" indicate that a learning cycle is required.		Press and hold the lower key ▼ for 3 seconds.
The door performs several movements and the display shows a sequence of symbols. You must not interrupt the movements of the door leaf.		
The door stands at an angle of 70° and waits for the opening width to be adjusted.		Move the door to the desired "open" position and press the lower key ▼
The door performs several movements and the display shows a sequence of symbols. You must not interrupt the movements of the door leaf.		
In case the spring force is insufficient, the display will show a small rotating "o" and "F".		Increase spring force and restart learning cycle.
The door is ready for operation.		

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11. Upgrade Cards

DORMA Upgrade Cards are designed to improve the functional range of ED 100 and ED 250 swing door operators. During the installation of Upgrade Cards, the control unit and the Upgrade Card will exchange information and the respective Upgrade Card will be allocated to the control unit. The system can perform the desired function as long as the Upgrade Card remains installed in the operator system.
As the cards offer different functions, they are of different color so that you can distinguish one card from the other.

Possible combinations

Upgrade Card	Color	ED 100	ED 250
Full-Energy	blue	**X**	
Full-Energy	transparent blue		**X**
Fire protection	red	**X**	
Fire protection	transparent red		**X**
Professional	green	**X**	**X**
DCW	yellow	**X**	**X**

Upgrade Card Full-Energy – blue / transparent blue
As soon as the card has been activated, the complete adjustable opening and closing speed range as well as the full opening and closing force range is available.

Upgrade Card Fire Protection – red / transparent red
Following the activation of the card, the drive unit may be used as hold-open device. In addition, the Full-Energy Function is activated.

The hold-open device operates as follows:

Triggering
- The system is triggered via the DORMA RM-ED detector input with line monitoring.
- Manual triggering of hold-open device by moving the door leaf (by 10°).
- Triggering via failure of supply voltage

Display
- The red LED at the end cap on the hinge side indicates that the system has been triggered.
- The display of the system shows message In 11.

Reset
- Reset via program switch: set switch form X position to OFF.
- Reset via door leaf: open the door manually to the adjusted opening angle minus 5°.
- Reset via internal user interface: press and hold L and R key for > 3 seconds.

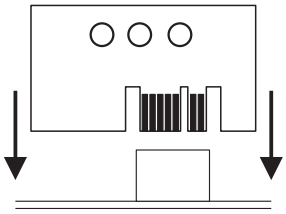
Upgrade Card Professional - green
You can select the following functions as soon as the card has been activated:
- Nurse-Bed Function
  Partial Open Function for double-leaf systems
- Extended hold-open time 0- 180 seconds
- Alternate action (toggle mode)

Upgrade Card DCW – yellow
You can select the following functions as soon as the card has been activated:
- External key switch ST 32x DCW
- SVP DCW motor lock function
- DCW program switch

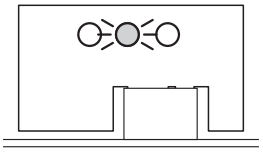
Installation of Upgrade Cards
Please install the Upgrade Cards after the operator has been fully installed and the learning cycle has been completed successfully.
The power supply must be switched on.
Adjust program switch to OFF in order to avoid an undesired activation of the system.
The information display indicates that the system is in stand-by mode.

Installation of first Upgrade Card
Insert the Upgrade Card into the provided slot (see No. 9 on page 7).
The yellow LED blinks once while you insert the card, then the green LED blinks slowly - this indicates that the two modules communicate properly.
The first Upgrade Card becomes a Container module and the green LED blinks slowly. The corresponding function is now available and ready for activation (see page 27, parameter F1 to F8).

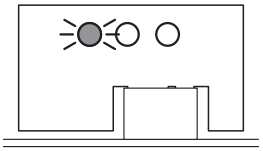
1. Remove new Upgrade Card



2. Data transfer in progress



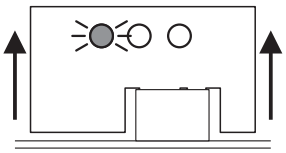
3. System ready - the function is ready for activation.



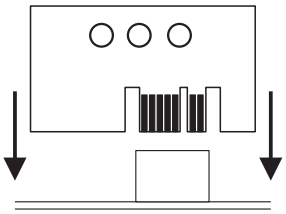
Installation of further Upgrade Cards
You can now install further Upgrade Cards.
The first Upgrade Card was installed becomes the Container Module. All desired functions are available as long as the **Container Module is installed in the operator system.**

Remove Container Module and insert the next, additional Upgrade Card. The function of the card is copied into the operator system and the Upgrade Card becomes invalid. The yellow LED indicates that the procedure is complete. Then remove the Upgrade Card and plug in the Container Module. The control unit will recognize the Container Module and store the new functions on the Container Module. The system works properly if the green LED blinks slowly.

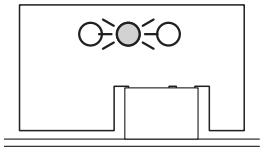
1. Remove Container Module



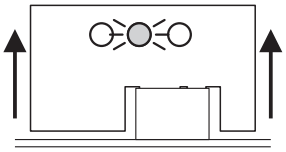
2. Insert new Upgrade Card



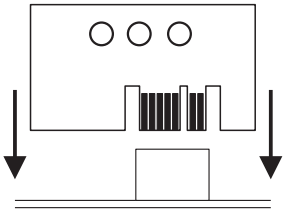
3. The Upgrade Card is now invalid



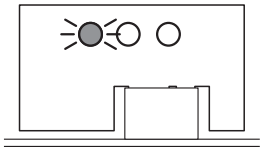
4. Remove Upgrade Card



5. Plug in Container Module



6. System ready - the function is ready for activation.



Handling of Upgrade Cards

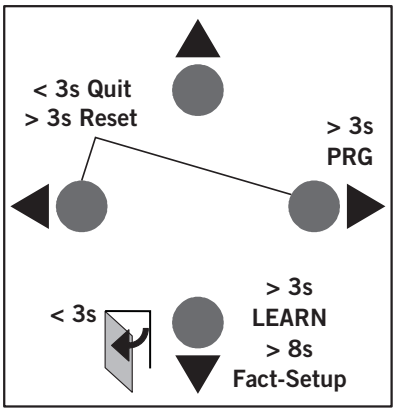
- Every control unit has only a single Container Module. This module provides all available functions.
- If the Container Module is removed, all activated functions will be deactivated after a certain period of time.
- In case the control unit has to be replaced just unplug the Container Module from the control unit and insert it into the new one. The new control unit and the Container Module will synchronize so that all functions are available.
- The system does not accept Upgrade Cards that have already been allocated to another system. The yellow LED will blink fast to indicate this error. In this case the module does not become invalid.
- If a Container Module that has been allocated to another control is connected, the system will not accept the module. The yellow and green LED will blink quickly to indicate this error. You can only synchronize a module with one control unit. You have to activate the extended factory settings to reinstall the card.
- In case the Container Module is defective, you have to use a new set of function modules.
- Three integrated LED indicate the status of the Upgrade Card. The red LED will light up as soon as DCW systems have been registered (for systems with DCW Upgrade Card) to show that DCW telegrams are being exchanged.

Application in double-leaf systems

Professional:	**If required, the Upgrade Card "Professional" is only installed at the active-leaf operator.**
Fire protection:	**The Upgrade Card "Fire Protection" must be installed at both operators.**
Full-Energy:	**The Upgrade Card "Full-Energy" may be installed at one operator or at both operators.**
DCW:	**The Upgrade Card "DCW" is only installed at the operator where the respective DCW components are connected.**
Exception:	**As soon as a DCW locking device is installed, a "DCW" Upgrade Card has to be installed at both operators.**

12. Settings / Service

The operator is ready for operation with basic parameters as soon as the learning cycle has been performed successfully. The system also enables you to adapt the driving parameters to the installation conditions and to activate extended functions. It is advisable to adapt these parameters to the customer's requirements during the commissioning of the system.



Parameters/Display	Range	Unit factory setting = bold print	Explanation
Configuration			
Way of mounting AS	0 to 1	**0**	Lintel mounting on hinge side with slide channel, pull-version
		1	Lintel mounting on opposite hinge side with standard arm, push-version
Lintel depth rd	**ED 100: -3 to 30** **ED 250: -3 to 50**	**0**	The lintel depth is adjusted in steps of 3/8" [10 mm]. Consider the installation drawings to find the required dimension.
Door-leaf width rb	**ED 100: 7 to 11** **ED 250: 7 to 15**	**10**	The rabbet is included in the door-leaf width. The door width is indicated in steps of 4" [100 mm].
Door type dL	0 to 4	**0**	Single-leaf door
		1	Double-leaf door, active leaf, with rabbet (overlapping)
		2	Double-leaf door, passive leaf, with rabbet (overlapping)
		3	Double-leaf door, active leaf, without rabbet
		4	Double-leaf door, passive leaf, without rabbet
Driving parameters and functions			
Opening speed So	**ED 100: 8 to 50** **ED 250: 8 to 60** (in Low-Energy Mode reduced to 25°/sec. respectively)	Degrees / Second **25**	The opening speed refers to Automatic mode. Abide by country-specific limits and check after adjustment. The full adjustable range is only available when the Upgrade Card Full-Energy is installed. You can also adjust the speed via this parameter. An internal monitoring function checks if the selected adjustments are admissible. In case the adjusted parameter exceeds the admissible value, the adjusted and the operative value are displayed alternately.
Closing speed Sc	**ED 100: 8 to 50** **ED 250: 8 to 60** (in Low-Energy Mode reduced to 25°/sec. respectively)	Degrees / Second **25**	The closing speed refers to Automatic mode. Abide by country-specific limits and check after adjustment. The full adjustable range is only available when the Upgrade Card Full-Energy is installed. Also the speed can be adjusted via this parameter. An internal monitoring function checks if the selected adjustments are admissible. In case the adjusted value exceeds the admissible value, the adjusted and the operative value are displayed alternately.

Parameters/Display	Range	Unit factory setting = bold print	Explanation
Hold-open time dd	0 to 30 (default setting for Low-Energy Function = min. 5 s) 0 to 180 with Upgrade Card Professional	Seconds **5**	Adjust the hold-open time so that users have sufficient time to pass the door system. In case you would like to extend the hold-open time, you may adjust the time to 180 s with the aid of the Upgrade Card Professional. The hold-open time starts as soon as the contact / voltage at the following activator inputs opens / drops: internal and external activator, safety, Push & Go. The signal may be retriggered. A minimum hold-open time of 5 s is required when the system is operated in Low-Energy Mode. Values from 0 - 30 seconds are adjustable in steps of 1 second; values above 30 seconds are adjustable in steps of 5 seconds.
Night-/Bank hold-open time dn	0 to 30	Seconds **10**	The Night-/Bank hold-open time (key switch) can be adjusted separately. The Night-/Bank hold-open time starts when the contact at the Night-/Bank activator input is being opened and the door is open. The signal may be retriggered.
Wall blanking on hinge side Sb	60 to 99 99 = disabled	Degrees **80**	When the door reaches the adjusted angle, the system will ignore incoming signals from the safety sensor on the hinge side. The wall blanking is required if the door opens against an obstacle. The larger the detection range of the installed sensor, the bigger the area where the system has to ignore the emitted signal. In order to ensure user safety, we would recommend selecting this area as small as possible. If the door exceeds the angle of the wall blanking while opening, a fast blinking dot will appear in the upper left corner of the display at the control unit. The display goes out as soon as the door is within the required angle.
Safety sensor test Sr	0 to 6	**0**	Test off: The safety sensors will not be tested. Required for systems with IRS-2 safety sensor. In combination with safety sensors complying with DIN 18650, you have to select one of the parameters from 1 to 6. The test level (low and high active) depends on the sensor and the sensor has to be adjusted to the same value.
		1	Sensor test on hinge side – level: high active
		2	Sensor test on opposite hinge side – level: high active
		3	Sensor test on hinge side & opposite hinge side – level: high active
		4	Sensor test on hinge side – level: low active
		5	Sensor test on opposite hinge side – level: low active
		6	Sensor test on hinge side & opposite hinge side – level: low active
		7	Header mounted sensor with data line (USA) - lock monitoring not available
Activation via safety sensor on opposite hinge side SA	0 to 1	**0**	The system will ignore incoming signals from the safety sensor as soon as the door is closed.
		1	The safety sensor can trigger an opening pulse while the door is closed.
Delayed opening for locking mechanism Ud	0 to 40	100 ms **4**	The delay starts as soon as the system has been activated. The door opens on expiration of the adjusted time. When the parameter is adjusted to "0" and the input for the locking feedback contact is bridged, the door will not perform the "pulling before opening" function before the system unlocks. Depending on the installed locking device and feedback contact the procedure might change.

Parameters/Display	Range	Unit factory setting = bold print	Explanation
Ease of preload prior to unlocking Pu	0 to 9	**0**	The ease of preload prior to unlocking is the force with which the door is pushed in closing direction before it opens. The respective delay for the function is determined with the aid of the parameter “Delayed opening for locking mechanism”. It may be reasonable to push the door in closing direction in order to release the electric strike (if available) and thus to ensure that it opens. The higher the adjusted force, the higher is the strain on the fitting of the arm; therefore you should adjust the force as low as possible in order to ensure that the system remains operable in the long run.
Static force in opening direction (basic parameter for wind load control) Fo	2 to 15 (reduced correspondingly with Low-Energy Mode)	2.25 lbf [10 N] **6**	You can adjust the forces that impact on the closing edge via this parameter. An internal monitoring function checks if the selected adjustments are admissible. In case the adjusted parameter exceeds the admissible value, the adjusted and the operative value are displayed alternately. Due to system tolerances, the actual force at the door leaf has to be measured and changed (if required) following the automatic learning cycle in order to ensure compliance with local standards and regulations.
Static force in closing direction (basic parameter for wind load control) Fc	2 to 15 (reduced correspondingly with Low-Energy Mode)	2.25 lbf [10 N] **6**	You can adjust the forces that impact on the closing edge via this parameter. An internal monitoring function checks if the selected adjustments are admissible. In case the adjusted parameter exceeds the admissible value, the adjusted and the operative value are displayed alternately. Due to system tolerances, the actual force at the door leaf has to be measured and changed (if required) following the automatic learning cycle in order to ensure compliance with local standards and regulations.
Latching action EP	0 to 9	**0**	Apart from the mechanical latching action, the Automatic function also offers a motor-driven latching action. The motor-driven latching action is designed to overcome door seals or locking devices. Adjust a low parameter value and increase the value step by step in order to avoid damage to the door system. You must ensure that the door itself as well as the arm and the slide channel fitting are suitable for the additional permanent forces. In case you are not sure, we would suggest selecting the lowest possible adjustment.
Angle of latching action EA	2 to 10	Degrees **3**	The angle of the latching action determines the opening angle at which the motor-driven latching action is activated.
Keep-closed force FH	0 to 9	**0 = off** 1 to 9 = on	The keep-closed force is always adjusted after the latching action and designed to keep the door in its "closed" position – even if wind acts on the door. The keep-closed force (parameter FH) is adjustable from 0 (off) to 9 (maximum).
Push & Go PG	0 to 1	**0 = off** **1 = on**	When the function is activated, an automatic opening cycle is triggered as soon as the door is moved manually by 4° from its “closed" position into opening direction. In order to activate this function, also the “hd” value (see page 27) has to be adjusted to 0.
Program switch type PS	0 to 2	**0**	The internal program switch is activated.
		1	An external program switch is connected to the PCB. You have to remove the connection of the internal program switch.
		2	An external DCW program switch is connected to the PCB. You have to remove the connection of the internal program switch.

Parameters/Display	Range	Unit factory setting = bold print	Explanation
EPS DCW Behavior following a power reset	0 to 1	**0**	In the event of a power failure or if the operator is switched off deliberately, the program switch will automatically switch to the previously adjusted function as soon as the power supply returns. **Please note** that the time when the power supply returns might not be within the business hours and thus has an influence on the insurance compliant locking.
		1	In the event of a power failure or if the operator is switched off deliberately, the program switch is automatically adjusted to OFF position as soon as the power supply is available. This function is to be used if an insurance-compliant locking is required.
Internal program switch – delayed activation 	0 to 1	**0**	The operator will perform the function of the internal program switch as soon as the switch has been moved.
		1	After the internal program switch has been moved, the system will perform the adjusted function with a 10-second delay. This function is reasonable if the user has to pass the door and the connected standard detectors after the function has been adjusted. An additional Night-/Bank activator is not required.
Unlocking during business hours 	0 to 1	**0**	The door is always locked while it is in "closed" position.
		1	The door does not lock when the door reaches "closed" position while the system is adjusted to Automatic Function. The locking feedback contact remains permanently switched. This achieves faster opening features when the system is equipped with motor locks. The electric strike must be rated for continuous duty of 100% in order to avoid damage.
Function of status relay 	0 to 3	0	The status relay is deactivated.
		1	The status relay is switched as soon as the door has reached the adjusted "closed" position.
		2	The status relay is switched as soon as the door has reached the adjusted "open" position.
		3	Malfunction: All malfunctions displayed as messages on the internal display will be emitted via the output of the status relay.
Triggering the hold-open function by closing the door leaf 	0 to 1	1	Function activated: If the operator is used as a hold-open device, moving the door leaf manually by 10° (+/- 2°) in closing direction from the taught hold-open position may tigger the hold-open function. No manual release pushbutton is required.
		0	Function de-activated: If the operator is used as a hold-open device, a manual release pushbutton must be installed to trigger the function.
De-activation of operator depending on contact setting (NO/NC) 	0 to 1	**0**	NC contact The operator is de-activated while the contact is open. This contact setting is required for lock switches with changeover or NC contact.
		1	NO contact The operator is de-activated while the contact is closed. This setting is required for lock switches with NO contact.
Night-/Bank Function depending on contact setting (NO/NC) 	0 to 1	**0**	NO contact The Night-/Bank Function is triggered while the contact is closed. DORMA suggests this contact setting for systems with a key switch or access control system.
		1	NC contact The Night-/Bank Function is triggered while the contact is open. This contact setting is frequently used to control systems with smoke and heat extraction systems or building management systems.

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Parameters/Display	Range	Unit factory setting = bold print	Explanation
Diagnosis			
Cycle counter CC	0 to 99	10,000 cycles	The number of cycles is displayed in steps of 10,000 cycles. For example: Display shows 4 = 40,000 cycles, display shows 53 = 530,000 cycles. You can read out the exact number of cycles with the aid of the DORMA hand-held terminal. A value of 99 on the internal display means that the actual number of cycles amounts to 990,000 or beyond.
Deletion of error log EC	0 to 1	**0**	No function
		1	The error log is being deleted. Then the parameter is automatically adjusted to 0.
Reset of service interval display (yellow LED) CS	0 to 1	**0**	No function
		1	The service cycle counter and the elapsed-time meter are reset to 200,000 cycles and 12 month. You require the DORMA hand-held terminal to adjust another value. (also see function of Service-LED)
Level of factory settings SL	1 to 2	**1**	Standard Factory Settings: All parameters are reset to factory (original) settings; already installed Upgrade Cards remain valid and do not require reinstallation.
		2	Extended Factory Settings: During the next reset to factory (original) settings, not only the standard settings but also the installed Upgrade Cards are deleted from the control unit. **Reset power supply to start the control unit.** Now the control unit and the Upgrade Card may be used independently (delivery status). Then the parameter is automatically reset to 1.
Opening angle OA	0 to 110	Degrees	Here the system displays the opening angle that has been adjusted during the learning cycle. This setting can only be adjusted via a learning cycle. Due to mounting and parameter tolerances, the display may vary from the actual position of the door.
Door closer/ Automatic Mode hd	0 to 1	0	The **Automatic** function is especially suitable whenever the door is mainly opened automatically and where motion detectors are installed. In case the door is blocked during a closing cycle, the operator will reverse automatically. The driving phase is optimized to ensure reliable closing cycles. **Wind load control and Push & Go Function are only available in AUTOMATIC mode.**
		1	The door closer mode is especially suitable whenever the door is mainly used manually and only rarely opened automatically. In case the door is blocked during a closing cycle, it will stop at its current position. The door's driving phase is optimized for manual opening cycles. **Power Assist Function is only available in door closer mode.**
Activation angle for Power Assist Function hA	1 to 5	Degrees **3**	Adjustment of activation angle for Power Assist Function: The lower the value the more sensitive the Power Assist Function will respond.
Power Assist Function (force adjustment) hF	0 to 10	**0**	Force adjustment for Power Assist Function: The higher the adjusted value, the easier it is to open the door manually. The function is de-activated when the value is adjusted to 0. The Power Assist Function is only available while the door is in door closer mode (hd = 1). Please note that the door may open unintentionally, if the Power Assist support is adjusted too high.

Parameters/Display	Range	Unit factory setting = bold print	Explanation
Upgrade Cards			
Upgrade Card fire protection F1	0 to 3		
Upgrade Card Full-Energy F2			
Upgrade Card PROFESSIONAL			
d F3		0	not available
		1	available, but not activated
Extended hold-open time F4		2	activated
		3	Upgrade Card has been removed, therefore the function is no longer available.
Nurse-Bed-Function F5			
Upgrade Card "restroom for the handicapped" F7			
Upgrade Card DCW F8			
Miscellaneous			
Configuration of COM1 interface (see connector) C1	0 to 2	**0**	Operation via hand-held The interface is programmed for communication with the DORMA hand-held.
		1	DORMA debugging service (internal analysis module)
		2	DORMA remote service (internal test module)
Backcheck when the door is opened by hand bc	5 to 20	**10°**	Enter the angle from which the door will be decelerated when it is opened by hand. The stipulated value is deducted from the adjusted opening angle. For example: Opening angle: 90° Backcheck parameter (bc): 12° => Backcheck starts at 78°
Thickness of door rd	0 to 80	0"...**1 3/8"**... 3 19/128" [0...**35**...80 mm]	The thickness of the door also has an influence on the measured opening angle. If a more detailed value is required, you may enter the exact thickness of the door.
Castor angle for double-leaf doors Ad	0 to 30	0...**30°**	Here you can adjust the angle the active leaf must have reached before the passive leaf starts its opening cycle.
Hinge clearance HS	+5 to -5	**3**	The hinge clearance determines the door angle. Although this only has little effect, the clearance may be adjusted to increase the accuracy in extreme cases. The original setting of parameter HS is “3” for 1 3/16" [30 mm]. With center-pivoted doors, the setting must be changed to a negative value. Then you have to perform a learning cycle as the system creates a table with the respective angles, which is based on the adjusted parameters.

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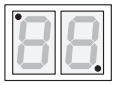
13. Diagnosis / Troubleshooting

DORMA operators meet high safety standards and fulfill all required technical rules and requirements. The system monitors internal as well as external safety circuits that are governed by the operator.
While the operator is in use, certain situations might cause error messages. The operator tries to find the reason for the error and responds accordingly. The reaction depends on how severe the error was and may vary from a simple notification to the deactivation of the Automatic Function. In this case the operator will switch to emergency operation and act like a door closer. Users may access the door manually.
Information "In" and error messages "E0"... "E9" are displayed on the user interface display and by the red LED at the internal program switch. The LED emits a blink code that is to be found in the error code table.
Error messages "E0" ... "E9" are stored in the error log and can be read out at the user interface display or with the aid of the DORMA hand-held terminal. The current (latest) error message is always stored as error message E0.
As soon as another error occurs or after the error has been acknowledged, the former error will become error E1.
Thus a total of not more than 9 errors can be stored in error memory E1 – E9. If the same error occurs several times in a row, it will not be stored anew.
Press ▶ for a short time in order to select error messages E0 ... E9.

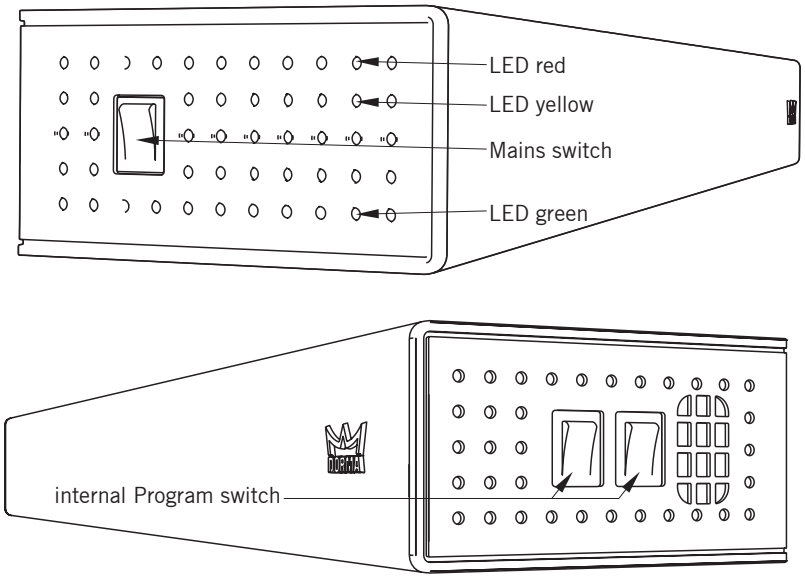
Handling "In" information
The provided information is designed to enhance the service friendliness of the operator and indicates faulty system statuses as well as operating statuses that interrupt the Automatic Function of the operator.
For example:
In08 -> The Emergency Off pushbutton has been activated and thus the operator does not perform Automatic functions.
In01 -> The system is blocked and the operator continues operation.
If an info message occurs several times, it might be modulated into an error message.

Handling error messages "E0" ... "E9"
Error messages are an indicator for defective hardware. However, improper mounting and the manual use of the door system during safety tests may cause error messages so that the system switches to emergency operation. You have the following options to reset errors:
1. Set program switch to OFF or reset the system via the Reset button of the user interface while the cover is open.
2. Power reset. Switch off mains switch then wait ten seconds before you switch it on again.

Always analyze and remove the cause for the malfunction before you acknowledge the respective error message. The following table is designed for your assistance.

Malfunction	Possible reason	Remedy
The door can only be used manually or the door does not open automatically after an opening pulse has been emitted.	Check the green LED. In case the green LED is not on, there is a problem with the power supply.	The mains switch must be switched on.
		Check and restore power supply if required.
		In case the power supply is properly connected and activated and no 24 V DC power supply is available, the power supply unit has to be replaced.
	Check the red LED. In case the red LED at the main switch blinks, the control unit has detected a malfunction and the system now operates in emergency mode.	You will find troubleshooting instructions in the following list: Information and error messages.
	The program switch is adjusted to OFF or EXIT ONLY.	Adjust program switch to AUTOMATIC or PERMANENT OPEN.
	The safety sensor on the hinge side has emitted a signal and thus the door does not open.	The signals of the safety sensors are indicated via the two decimal points on the LED display of the user interface. The respective decimal point illuminates if the sensor has detected something. Check the wiring and the sensor for proper functioning. If the LED in the upper left corner blinks, the wall blanking is activated – the blinking does not indicate an error. 
During installation: It is extremely difficult to open the door manually and the door closes at high speed.	The connector of the braking circuit is positioned incorrectly.	The connector has to be positioned according to the correct type of arm. See picture 16 on page 15.

Malfunction	Possible reason	Remedy
The system does not start the learning cycle.	The program switch is adjusted to the wrong position.	Set program switch to OFF.
	Signal 4/4a (deactivation of operator function) is activated.	Check cabling of smoke detector or interrupt signal at 4/4a.
The internal/external program switch does not work properly or faulty.	The parameter for the program switch type is adjusted incorrectly.	Adjust the parameter for the installed program switch type properly.
	The cable of the internal program switch is not connected.	Check and connect cable if required.
	Faulty connection/defective switch.	Check the wiring and the function of the switch.
The door opens automatically, however, it does not respond at all or only after a sustained period of time.	The hold-open time is adjusted too long.	Reduce corresponding parameter.
	The program switch is adjusted to PERMANENT OPEN.	Change program switch position.
	The safety sensor on the opposite hinge side has emitted a signal and thus the door does not close.	The signals of the safety sensors are indicated via the two decimal points on the LED display of the user interface. The respective decimal point illuminates if the sensor has detected something. Check the wiring and the sensor for proper functioning. If the LED in the upper left corner blinks, the wall blanking is activated – the blinking does not indicate an error.
	One of the connected activators emits a signal so that the door cannot close.	Check the wiring of the connected activators. A NO contact has to be installed. Signal input 57/57a may be operated with external voltage. Signal input 35, 57, 42 and 41 must be removed one after the other in order to localize the error.
The driving speeds vary heavily from the adjusted parameters.	The learning cycle has been performed while the motor was hot, therefore the system has calculated an incorrect door-leaf weight.	Restart learning cycle while the motor is cold.



14. Error messages

Display	LED indicator	Meaning / Cause	Troubleshooting
In 01	none	**Obstruction** The door is obstructed by an obstacle and the operator-driven door cycle has been stopped.	Check the movement of the door while the system is de-energized and remove cause for unsmooth running. If a defective door is operated over a sustained period of time, the operator might be damaged. Users who access the door system are often the reason for blockings. This may be due to the fact that the detection range of the sensors does not fit to the opening speed of the operator and thus users will always get in contact with the door while they pass the door system. In this case you should increase the detection range of the sensors and/or the opening speed of the operator. Test/prove system efficiency by using the door system.
In 03	none	**Temperature Management Program activated** The TMP is designed to prevent the operator system from overheating. It responds to an overload of the operator system in different ways: It may reduce the driving dynamics if the nominal load is exceeded, increase the hold-open time or switch on the integrated fan if the system is heavily used.	Check and improve heat transmission if required. Avoid direct sunlight. Make sure that there is sufficient space between the system and external heat sources, air curtains and hot water pipes. Check if the heat conductive pads have been removed during the mounting of the system (see picture 6 on page 13).
In 08	none	**Deactivation of operator function** Contact 4/4a is open. The operator switches to emergency operation and the door can only be accessed manually.	An emergency pushbutton, a lock switch or another safety system may be connected via the input. Either this system has actually triggered a signal or it is defective. Reset the activation. The operator will automatically start operation. If this is not the case, please check the cabling and the systems that have caused the malfunction.
In 09	none	**Signal error of Upgrade Card** The installed Upgrade Card has been removed or in case of two Upgrade Cards, the one that has been installed first (Container Module) has not been plugged in again.	Installed Upgrade Cards have to remain connected to the control unit permanently and must not be removed. If several Upgrade Cards are installed, the first Upgrade Card that was plugged in will become the Container Module. This card finally has to be reconnected to the control unit. See chapter Upgrade Cards.
In 11	The red LED illumi-nates	**Triggering of hold-open device** The hold-open device has been triggered.	The hold-open device can be triggered automatically via the smoke detector or manually via a manual release pushbutton or by moving the door leaf. According to DIN 18263-4, the system must be reactivated via an active process. Depending on the configuration of the system, the device is reactivated if the door is opened manually to the learned opening angle, the PGS is switched to OFF, or if the system is reset via the keys ◀ and ▶ the internal control panel. Pay attention that the smoke detector has not triggered a signal. In case the reset was not successful, the smoke detector connection might be defective and the system requires inspection by qualified staff.

Display	LED indicator	Meaning / Cause	Troubleshooting
In 23	none	**Door locked signal** The door is blocked while in “closed“ position. The door cannot be opened.	This error mainly occurs because the door is locked. You can avoid this error by installing a lock switch. The lock switch recognizes the switching status of the lock bolt and will switch the operator off if required. We recommend installing a lock switch as the operator or the door might be damaged if the operator permanently tries to open the door although it is locked.
In 61	none	**Communication error of double-leaf systems** The two operators do not communicate properly as their communication is interrupted.	Check the linking cable of the two operators. First perform a visual inspection; then check if the suitable control unit interface is used.
In 72	none	**Current measuring circuit** The system could not successfully perform the cyclical test of the internal current measuring circuit.	System tolerances and environmental conditions affect the current measuring. Thus the test is not always successful at first try. In this case the system displays an information message. The test might for example fail if someone uses the door manually while the test is in progress. In this event the test will be repeated automatically.
In 73	none	**Braking circuit test** The cyclical test (performed every 24 hours) of the internal braking circuit has failed.	System tolerances and environmental conditions may affect the braking circuit test. Thus the test is not always successful at first attempt. In this case the system displays an information message. The test might for example fail if someone uses the door manually while the test is in progress. In case the test fails 10 times in a row, the system will emit error message E 73.
In 91	none	**DCW communication** At least one of the registered DCW devices is missing.	Reconnect the respective DCW device. In case this is not possible, a restart has to be performed. Press and hold both the ◀ and the ▶ key at the internal control panel for at least 3 seconds.
E 02	2 blinks	**Error of locking device** The operator tries to open or close a locking device with feedback contact or a DCW locking device. An error has occurred during this process.	In this case it is likely that the locking device is defective or that the wiring has been performed incorrectly. The locking feedback contact must be checked and replaced if required.
E 04	4 blinks	**Safety sensor test error** The test of the moving safety sensors failed. The system sends a test signal to the corresponding sensor before every opening or closing cycle and waits a certain period of time for the sensor to respond.	First you have to check if the parameter for the “safety sensor test“ has been adjusted according to the respective equipment. Then check if the test has also been activated at the sensors and has the same level. The test is switched off when the sensors are delivered.
E 10	10 blinks	**Interruption of motor connection** The door closer mode is not available as the system cannot brake due to the interruption.	The error may be due to a defective motor or short-circuit in the electric circuit of the locking device. Always replace the motor-gear unit when the motor is defective.
E 12	12 blinks	**EEPROM error** The internal memory test failed. The operator is in door closer mode.	You can try to upload the current firmware in order to re-initialize the system. Replace control unit if this fails.
E 13	13 blinks	**Overcurrent recognition** More current is withdrawn than the power supply unit can provide.	The motor consumes too much current or the control amplifier is defective. In case this error message appears frequently, the components of the motor gear unit and/or control unit must be replaced.
E 15	15 blinks	**Faulty learning cycle** The system could not complete the learning cycle.	This error may occur if the learning cycle has been interrupted, for example if the door has been manipulated during the testing process. The learning cycle has to be restarted.

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Display	LED indicator	Meaning / Cause	Troubleshooting
E 51 E 52 E 53	5 blinks	**Incremental encoder error** The monitoring feature of the incremental encoder has detected a faulty status.	In the event of an error, always check the plug connection at the incremental encoder and the motor and make sure there is no short-circuit at the electrical circuit of the locking device. Replace the motor-gear unit if you cannot detect any of the above-mentioned errors.
E 62	6 blinks	The firmware version of the second system is not suitable for double-leaf operation.	Install the same firmware version at both control units.
E 63	6 blinks	The fire protection setting of the second system is not compatible.	Both control units of a double-leaf system require installation of a Fire Protection Upgrade Card.
E 71	7 blinks	**System error 1 (2. shutdown option)** In order to be able to deactivate the operator safely at any time several control elements are required. These elements will be tested at cyclical intervals for proper functioning.	In case the test fails permanently, the control unit has to be replaced.
E 72	7 blinks	**System error 2 (current measuring circuit)** The current measuring circuit is part of the safety equipment and will be tested in cyclical intervals for proper functioning. The operator is in emergency mode.	In case the test fails permanently, the control unit has to be replaced.
E 73	7 blinks	**System error 3 (braking circuit)** As safety system, the braking circuit is tested in cyclical intervals. It is activated while the system is in door closer mode. Test procedure: the motor is switched off during the closing cycle and the door moves until it has reached an adjusted angle. The test might be noticeable as a short jerk on the door leaf and is no reason for complaint.	The door closes too fast (within less than 3 seconds) while the system is de-energized (disconnected from power supply). Check and decrease closing speed, if required (see page 16, picture 18: potentiometer adjustment). In case the test fails permanently, although the closing speed is properly adjusted, the control unit has to be replaced.

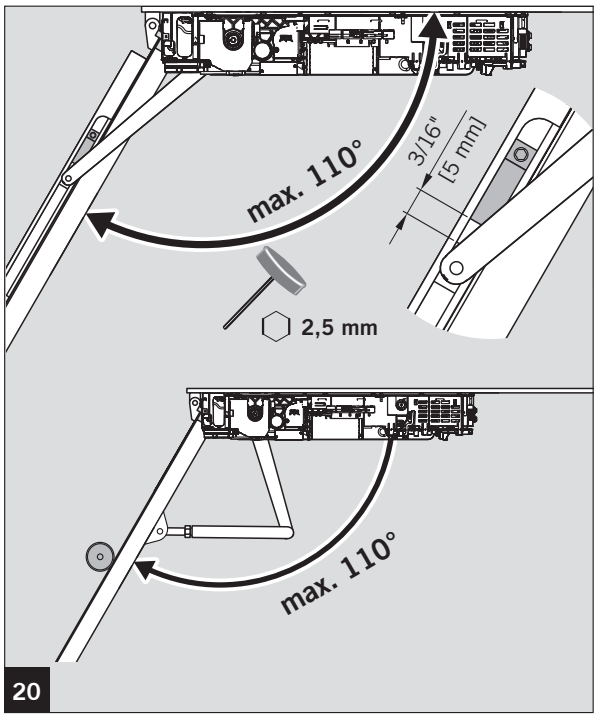
15. Mounting continued

End stop adjustment for systems with slide channel
The end stop has to be adjusted so that the adjusted opening angle cannot be exceeded when the door is pushed manually in opening direction.

1. Set program switch to PERMANENT OPEN.
   - The door opens until it has reached the adjusted opening width.
2. Move the buffer and the end stop until they are located 3/16" [5 mm] from the sliding shoe.
3. Fix end stop thoroughly with screws.

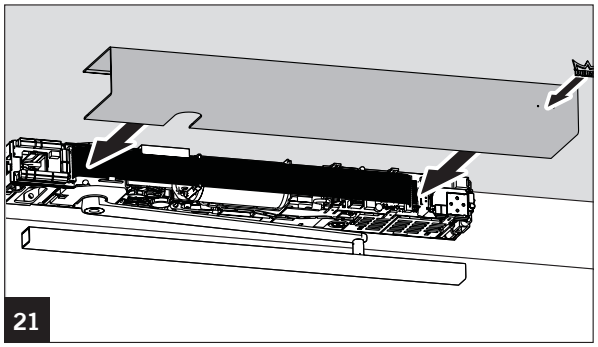
We would recommend to install a door stop.

A door stop must be installed when the system is operated with standard arm.

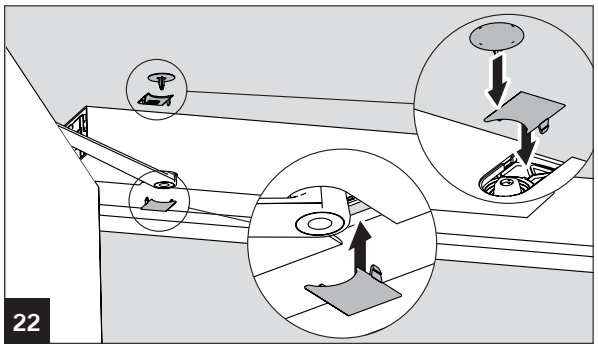


Position operator cover and push until you can hear it snapping in.

Pay attention not to pinch any cables.

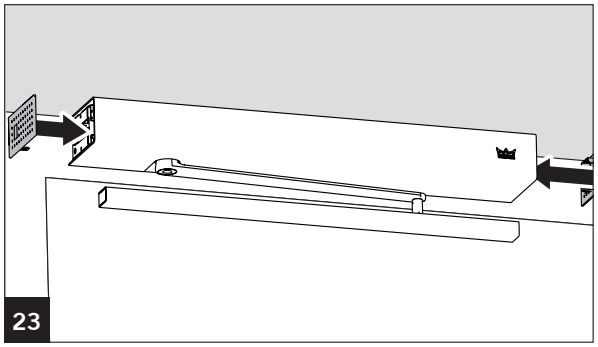


Install axle cover.



Install end caps.

On the side of the program switch, the depth is variable via notches in order to compensate minor length tolerances of the cover.



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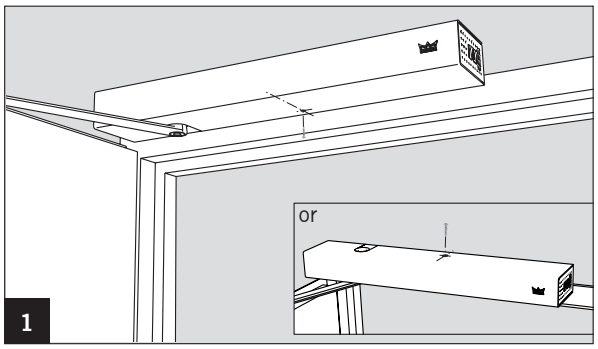
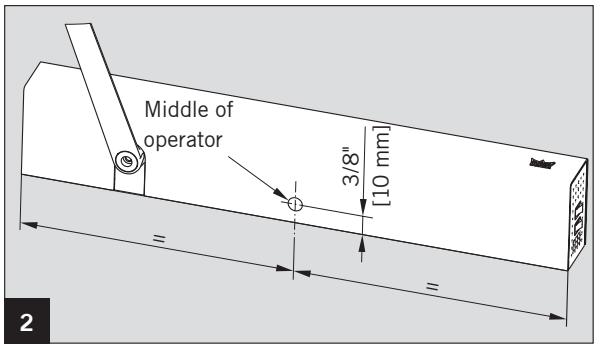
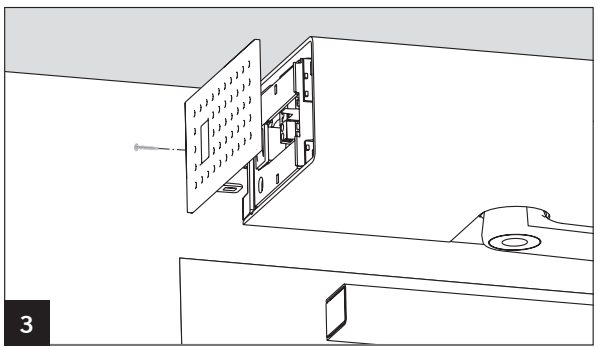
16. Cover and end cap securing screws

The cover and power side end cap must be secured with a fastener to be compliant to UL 325 and CSA C22.2 No. 247.



Drill for self threading screw with pan head drill size 31 (0.12")

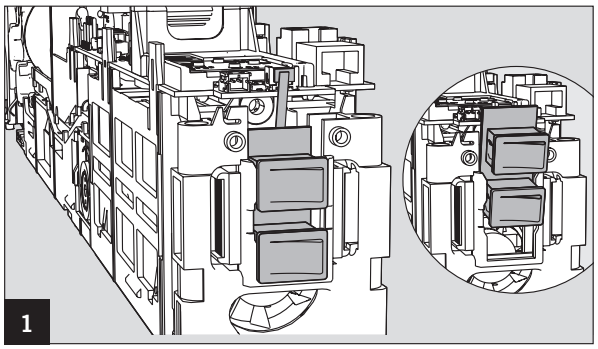




17. Option: Double-leaf door

The following steps have to be performed in addition to the information mentioned in the mounting instructions:

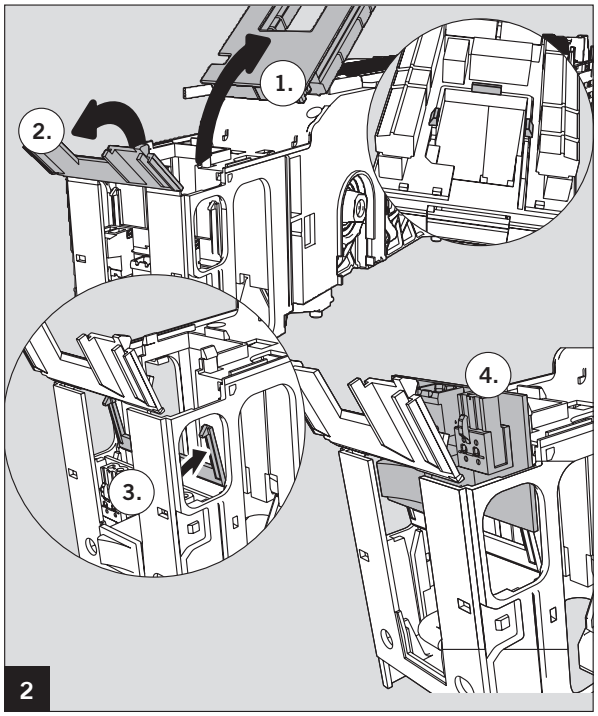
Remove the PCBs with the internal program switches from both operators.
First remove the connection cable, then move the PCB upwards and pull it out.



Remove the mains switch from the operator that is not installed at the side where the power supply is connected.

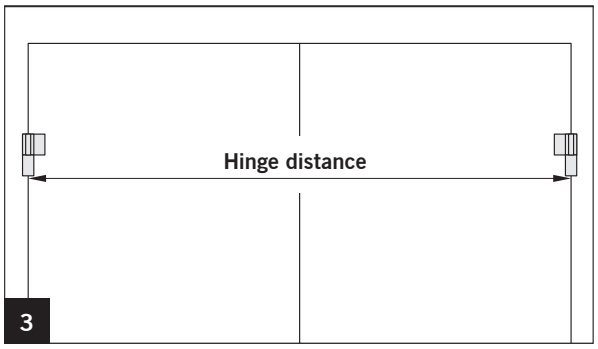
1. Push the 3 brackets inwards in order to remove the connection unit.
2-3. Then open the two covers above the mains supply PCB and remove the connectors.
4. Pull out the mains supply PCB.

Close the two covers and connect the connection unit.

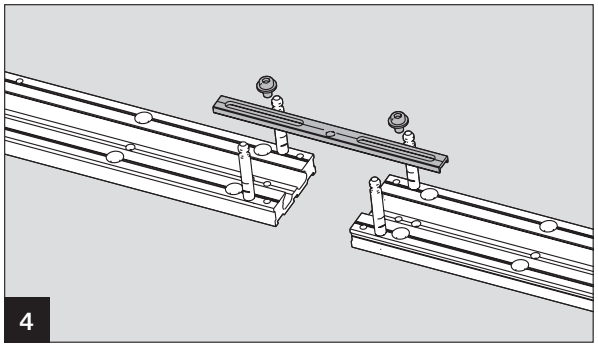


Assembly of mounting plates
There are 3 ways to connect the mounting plates. The suitable way of mounting depends on the prevailing distance between the hinges.

Hinge distance:	connection version
55 1/8" to 55 11/16" [1,400 to 1,415 mm]	**"A"**
55 3/4" to 58" [1,416 to 1,475 mm]	**"B"**
more than 58" [1,476 mm]	**"C"**



Connection version "A"
Hinge distance: 55 1/8" to 55 11/16" [1,400 to 1,415 mm]
Use the long connection piece.



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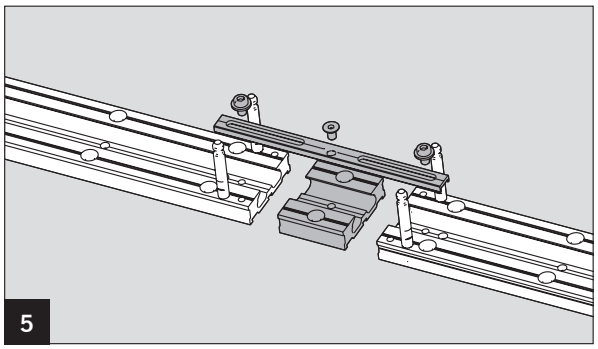
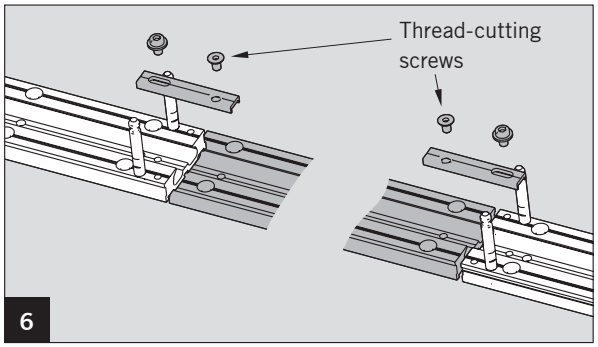
Connection version "B"
Hinge distance: 55 3/4" to 58" [1,416 to 1,475 mm]
Use the long connection piece and the small intermediate plate.



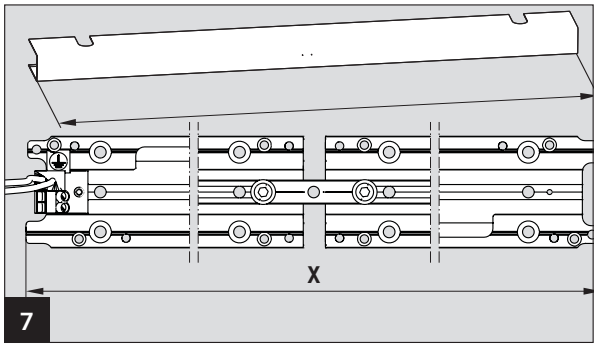
Connection version "C"
Hinge distance: more than 58" [1,476 mm]
Use the two short connection pieces and the intermediate plate (cut to the proper length).



Assemble and align the mounting plates and the intermediate plate on a level surface.
Measure the length of the cover and determine the total length for the assembled mounting plates with the aid of the following formula:

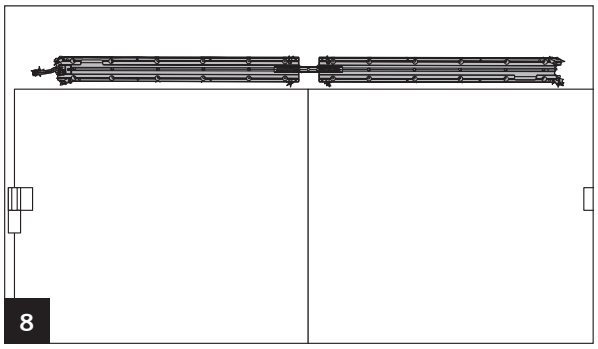
Length of cover - 91 = X (see picture)

HINT: First assemble the mounting plates, then mount the operators and check if the cover fits.



Mounting of mounting plates

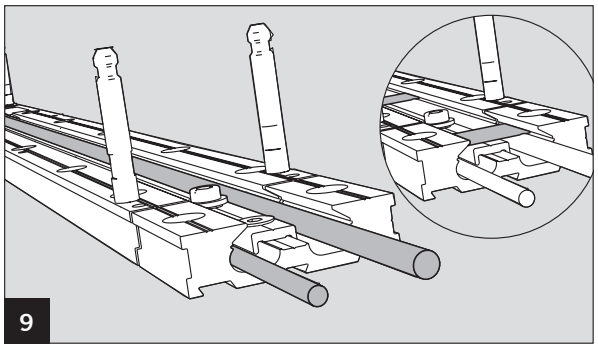
1. Use the respective drilling template to drill the required attachment holes (see pages 9-11)
2. Install both mounting plates with at least 12 screws through the provided holes.
   Use adequate inserts and fasteners in accordance with the substructure to attach the mounting plate.
3. Connect the 115 V power supply
   (See picture 5 on page 13).



Lay the mains cable for the second operator and, if required, the program switch cable inside the groove of the mounting plates and route the cables with the provided small plastic pads.

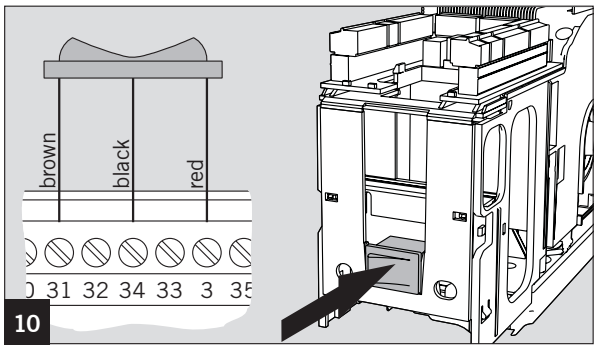
If you want to equip your system with an ESR, you have to install it at this point (see installation instructions ED100/250 ESR WN 057380-45532).

Mount both operators.
See "Mounting instructions" starting on page 13.



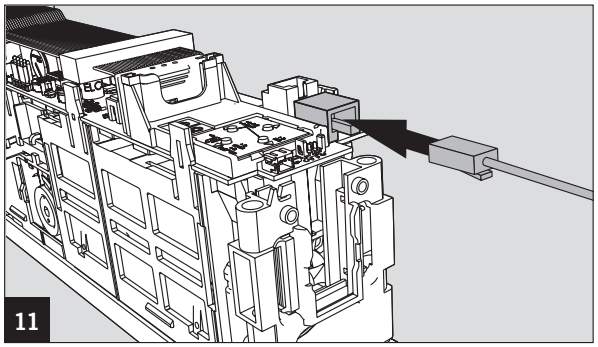
Insert (clip) the new program switch into the provided slot where you have removed the mains switch.
Connect the program switch to the active-leaf operator.
It is connected at the connection unit. Use the terminals for the external program switch.

If the program switch is installed on the active-leaf operator, the connection cable has to be cut to length (shortened).
In this case install ring connectors at the ends of the cables.



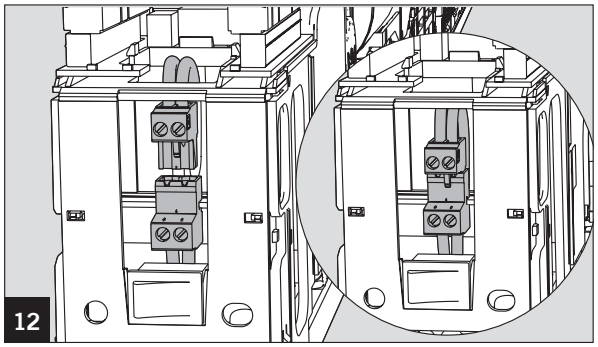
10

Connect the enclosed linking cable to the two “horizontal” connectors on the control unit.


11

Connect the mains cable of the second operator.

1. At the active leaf.


12

2. At the passive leaf.


13

Commissioning of a double-leaf system

1. Put the active leaf into operation. (See "Commissioning instructions" starting on page 18.)
2. Following the learning cycle, adjust the program switch to PERMANENT OPEN.
3. Put the passive leaf into operation. (See “commissioning instructions” starting on page 18.)
4. Additional settings:
   - At active leaf:
     Adjust parameter >dL< (Door type) to “1“.
     Adjust parameter >Ad< (Castor angle) to the desired value.
   - At passive leaf:
     Adjust parameter >dL< to “2“.

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AUTOMATIC SWING DOOR

OWNER'S MANUAL

Distributed by:

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924 Sherwood Drive
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E-mail: automatics@dorma-usa.com
Toll-Free: 877-367-6211

Rev: 12/04

Important Installation Instructions

ALL INSTALLATIONS AND SERVICE SHOULD ONLY BE PERFORMED BY TRAINED OR AUTHORIZED PERSONS

Warning - To reduce the risk of injury:

1. Carefully Read And Follow All Installation Instructions
2. This unit should only be installed in a rough opening capable of providing proper structural support.
3. Always disconnect the power supply before servicing.

CAUTION

Improperly Adjusted Door
can cause injury and equipment damage.

Inspect door operation daily using
safety checklist in owners manual
and at door.

Have door adjusted as described in Owners Manual.

Safety devices should be in place and operational.

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To Our Customers

The purpose of this manual is to familiarize you with your automatic door system. It is essential that you "know your system" and that you recognize the importance of maintaining your door system in compliance with the industry standards for safety.

It is your responsibility,
as owner or caretaker of the equipment, to inspect the operation of your door system on a daily basis to insure that it is safe for use by your customers or employees.

This manual provides you with a description of the operation and maintenance requirements of your door. It also provides the instructions for the Daily Safety Check.

Should the door fail to operate as prescribed in the Daily Safety Check, or at any other time for any other reason, do not attempt to repair or adjust the door. Call a qualified service technician. These technicians are trained to service your door in accordance with applicable industry safety standards.

Service Availability

DORMA Automatics, Inc. products are distributed through a nationwide network of authorized distributors for sales, installation and service.

Compliance with Safety Standards

Your door system was designed to the latest operating and safety standards. In order to ensure the continued safe operation of your door, it is important that:

- Your door system be maintained in compliance with the standards of the industry.

- Proper decals and labels be applied and maintained on your doors. If decals are removed or cannot be read, request labels to be replaced when calling for service.

Electric swing door installation instructions

Instructions to Installer

We are pleased that a DORMA automatic swing door has been chosen for this installation. DORMA carefully designed, tested and built the door of high quality materials and it will provide many years of service.

Now the door must be installed and adjusted properly to ensure its proper operation and safe use.

To install and adjust the door for proper and safe operation, the installer must carefully read this instruction book before proceeding, then follow the instructions exactly.

The door is designed to be installed only by trained and knowledgeable installers. The installation technician should be experienced in the installation of automatic entrances. They should know all local code requirements and be familiar with the requirements of the current ANSI A156.10 Standards for Power Operated Pedestrian Doors.

After installation, the door must be adjusted to conform with DORMA recommendations and all code requirements. Carefully study the requirements in these instructions.

After installation and adjustment, the installers final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with the ED400 Owner's Manual and carefully explain how to perform the daily safety check test.

Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the DORMA Technical Assistance Group for assistance.

What You Should Know

Be sure that a DORMA Automatics, Inc. distributor has provided the following for each door:

1. Instruction on how to conduct the Daily Safety Check (by walk-through example).

2. Location of function switches and instruction in their use.

3. Circuit breaker or power disconnect location for each door system.

4. Discussion of problems that could result from door being allowed to operate after a malfunction is observed.

5. Number to call for service or questions about your system if you are uncertain of any condition or situation.

   Note:
   If there are any problems, discontinue door operation immediately and secure the door in a safe manner. Call your local authorized DORMA Automatics, Inc. distributor for repair.

Daily Safety Check

Perform these safety checks daily on each automatic swinging door to insure your customers' safety and your own protection. Perform these tests while traffic is restricted from all detection and sensing zones.

Sensor Activation / Presence Detection Safety

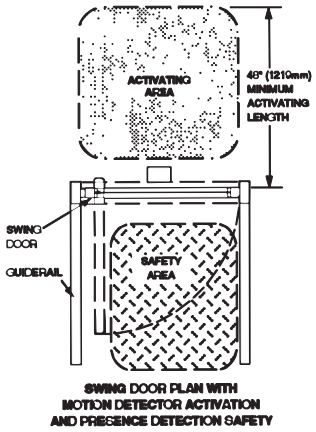

Figure 1

1. Check electronic sensor by walking toward the door opening at a moderate speed. The door should start opening when you are about four feet from the door, should swing open smoothly stop without impact. Move slowly through the door (6 in. per second). The door should remain open.

2. Step out of the sensor zone. After a brief time delay (at least 1 1/2 seconds) the door should close to 10° from fully closed, then noticeably slow down and take at least 1 1/2 seconds for the final 10° closing.

3. Approach the safety side of the door first, then have someone else approach the activating side of the door, as long as you are in the safety area of the door it should not open. (See Figure 1)

4. Crouch motionless in the door opening for at least 4 seconds. The door should not close.

Caution: If safety sensor is not working, door may swing toward you without stopping.

Floor Mat Activation/Floor Mat Safety

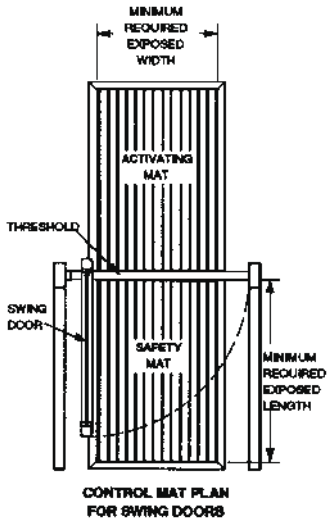

Figure 2

1. Step on the "opening" (activating) mat.

2. It is necessary to have a safety mat covering the entire area the door swings over. Step through the doorway onto the safety mat and remain motionless for 4 seconds. The door should remain open. Repeat at several locations on the mat. (See Figure 2 or 3)

3. Step off the safety mat. After a brief time delay (at least 1 1/2 seconds) the door should close to 10° from fully closed, then slow down. The last 10° of closing should be noticeably slower (at least 1 1/2 seconds).

4. With the door closed, step on the safety mat. Have someone step on the opening mat. Door should remain closed as long as someone remains on the safety mat.

Caution: If safety mat is not working, door may swing toward you

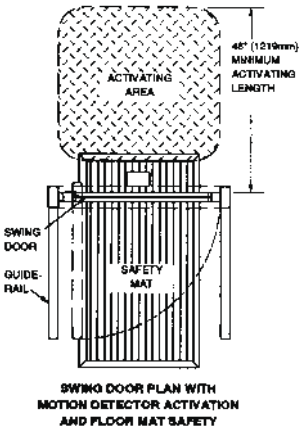

Figure 3

5. Check the mat molding and threshold. It should be completely secured with all required screws.

6. Crouch motionless in the door opening for at least 4 seconds. The door should not close.

7. Do not move heavy objects over floor mats.

General Safety

1. Breakout Stop. Center pivoted in-swinging doors may be supplied with an emergency breakout stop or switch that will allow the door to open to 90° in the opposite direction of normal traffic. Call your supplier for details.

   When the door is pushed into the breakout mode, the electrical power to the operator is removed. Check that door will not activate.

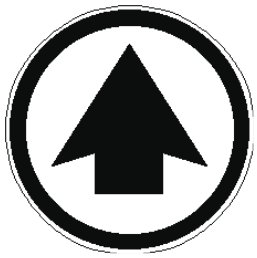

Figure 4

2. Decals. The door should have traffic decals properly displayed as follows:

   A. An arrow sign (See Figure 4) shall be visible from the approach side of a swinging door, mounted on the door at a height 58 in., ±5 in. (147 cm, ± 13 cm) from the floor to the centerline of the sign. The sign shall be minimum of 6 in. (15.2 cm) in diameter, having a green circle surrounding a black arrow on a white background.

Figure 5

   B. An international "DO NOT ENTER" sign (See Figure 5) shall be visible from the side that would swing toward pedestrians attempting to travel in the wrong direction. It should be mounted on the door at a height of 58 in., ±5 in. (147 cm, ±13 cm) from the floor to the centerline of the sign. The sign shall be minimum of 6 in. (15.2 cm) in diameter, having a red circle with the wording, "Do Not Enter", in white letters in the red circle.

Figure 6

   C. Swinging doors serving two-way traffic shall be marked with a decal, visible from both sides of the door, with the words "CAUTION, Automatic Door". (See Figure 6) The words "Automatic Door" must be at least 1/2 in. letters. It should be mounted on the door at a height of 58 in., ±5 in. (147 cm).

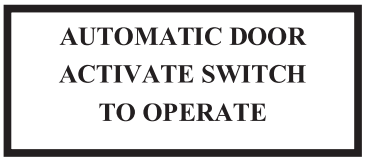

Figure 7

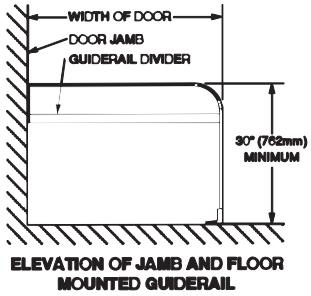

Figure 8

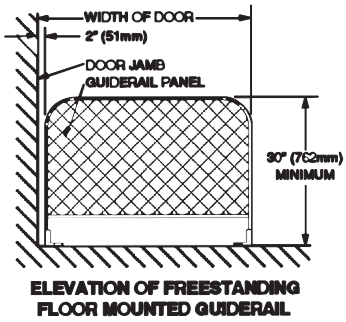

Figure 9

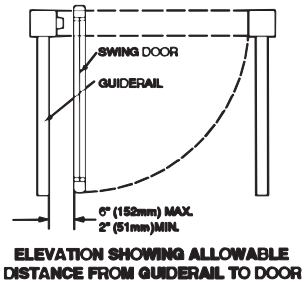

Figure 10

D. An AAADM safety information sticker should be affixed on the door or frame in a protected, visible location. If you need additional decals for your automatic doors, call your automatic door supplier.

3. Activating Switch. (Knowing Act)
Doors equipped with a manual operate switch shall, when activated, hold the door open for five seconds minimum after release of activating switch. Reactivate door and crouch motionless in door opening for 10 seconds. Door should not close. Doors equipped with a manual activating switch shall have signs as follows: "Automatic Door. Activate Switch to Operate." The sign should be visible from both sides of the door. (See Figure 7)

4. Guide Rails.
Check that guide rails or other barriers or separators are present (two per swing door side) and firmly anchored. (See Figures 8, 9, 10)

5. Lock Stile
With door open, grasp lock stile of door and attempt to move vertically and horizontally. There should be no looseness in the door pivots or in connections between door and operator.

6. Housekeeping.
Check the door area for tripping or slipping hazards.

Check all door panels for damage. Make sure that all covers are properly secured. There should be no bulletin boards, literature racks, merchandise displays, or other attractions in the door area that would interfere with the use of the door.

7. Traffic Patterns.
Observe traffic patterns. Plan routing so people enter and exit in a straight approach, directly onto the center of the door opening.

8. Finger Guard
If installed, inspect finger guard to see that it is secure and in good repair. (See Figure 10)

IF YOU HAVE A PROBLEM, TURN OFF THE DOOR OPERATING EQUIPMENT AND CALL YOUR AUTOMATIC DOOR SUPPLIER.

AUTOMATIC SWING DOOR

OWNER'S MANUAL

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and at door.

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It is your responsibility,
as owner or caretaker of the equipment, to inspect the operation of your door system on a daily basis to insure that it is safe for use by your customers or employees.

This manual provides you with a description of the operation and maintenance requirements of your door. It also provides the instructions for the Daily Safety Check.

Should the door fail to operate as prescribed in the Daily Safety Check, or at any other time for any other reason, do not attempt to repair or adjust the door. Call a qualified service technician. These technicians are trained to service your door in accordance with applicable industry safety standards.

Service Availability

DORMA Automatics, Inc. products are distributed through a nationwide network of authorized distributors for sales, installation, and service.

Compliance with Safety Standards

Your door system was designed to the latest operating and safety standards. In order to ensure the continued safe operation of your door, it is important that:

- Your door system be maintained in compliance with the standards of the industry .

- Proper decals and labels be applied and maintained on your doors. If decals are removed or cannot be read, request labels to be replaced when calling for service.

Electric low energy swing door installation instructions

Instructions to Installer

We are pleased that a DORMA automatic swing door has been chosen for this installation. DORMA carefully designed, tested and built the door of high quality materials and it will provide many years of service.

Now the door must be installed and adjusted properly to ensure its proper operation and safe use.

To install and adjust the door for proper and safe operation, the installer must carefully read this instruction book before proceeding, then follow the instructions exactly.

The door is designed to be installed only by trained and knowledgeable installers. The installation technician should be experienced in the installation of automatic entrances. He should know all local code requirements and be familiar with the requirements of the current ANSI A156.19 Standards for Power Assist and Low Energy Power Operated Doors.

After installation, the door must be adjusted to conform with DORMA recommendations and all code requirements. Be sure and carefully study the requirements in these instructions.

After installation and adjustment, the installers final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with the ED700 Owner' s Manual and carefully explain how to perform the daily safety check test.

Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the DORMA T echnical Assistance Group for assistance.

What You Should Know

Be sure that a DORMA Automatics, Inc. distributor has provided the following for each door:

1. Instruction on how to conduct the Daily Safety Check (by walk-through example).

2. Location of function switches and instruction in their use.

3. Circuit breaker or power disconnect location for each door system.

4. Discussion of problems that could result from door being allowed to operate after a malfunction is observed.

5. Number to call for service or questions about your system if you are uncertain of any condition or situation.

   Note:
   If there are any problems, discontinue door operation immediately and secure the door in a safe manner. Call your local authorized DORMA Automatics, Inc. distributor for repair.

Check / Inspection

Operator Adjustments:

Backcheck (BC) Angle:
Check for compliance with 10 degree backcheck requirement under ANSI Section 10.5, as explained in Chapter 3, Figure 2, page 3-12 of this manual.

Opening Time to Backcheck:
Check for compliance with ANSI 156.19 Section 4.1.

Backcheck Force:
Check for compliance with force requirement of ANSI 156.19 Section 4.4.

Latch Angle / Time:
Check for timing requirements under ANSI 156.19 Section 4.2.

Closing Time to Latch:
Check for timing requirements under ANSI 156.19 Section 4.2.

Closing Force:
Check for compliance with ANSI 156.19 Section 4.5.

Time Delay:
Check for compliance with timing requirements under ANSI 156.19 Section 4.1.

Safety Sensor: (Optional)

Pattern:
Indicate results of sensitivity walk test on exit side of door (safety zone) (field approximation of ANSI Section 8.1.2). As you walk through and exit, door should remain open and not close until you are out of required pattern. Also check time delay, per above. Check that door will not open out onto someone standing or walking on exit side of door.
Sensitivity:
Walk test moving at rate of 6" per second or approximately 8-9 seconds through zone.

Signage:

"Caution / Automatic Door":
Check for compliance with ANSI Section 11.2.3, including colors, sign and lettering size and height.

"Automatic Door":
Check for compliance with ANSI Section 11.1.

Knowing Act ("Activate Switch to Operate"):
See ANSI Section 11.5.

Other:

Are AAADM Stickers applied?
See if the AAADM Information Sticker is applied to the door frame, summarizing the daily safety check. Absence of a sticker does not result in a failing mark. However, you should recommend use of a sticker, and have a supply available. Review the daily safety check with the customer.

Are all safety systems operational?
If you are aware of manufacturer's specifications in addition to the ANSI requirements, indicate here whether the system complies with them. You are not expected to know every manufacturer's specifications, but if you observe that a system that is intended to be operational is not, you should note it here. For example, if safety system in addition to the ANSI requirements are installed, indicate here whether they are operational. Failure to comply with such additional non-ANSI specifications does not result in a failing mark, since the inspection checklist is only intended to indicate compliance with field tests based on the ANSI standard. However, you should use the comment box on the Compliance Report to refer to any such additional system and recommendations.

Apply Annual Compliance Inspection Sticker.
If the system complies, complete an "Annual Compliance Inspection" Sticker and affix it to the bottom of the "Safety Information" (Daily Safety Checklist) Sticker.

Figure 1

Figure 2

Figure 3

Figure 4

General Safety

1. Decals. The door should have traffic decals properly displayed as follows:

   A Swinging doors serving two-way traffic shall be marked with a decal, visible from both sides of the door, with the words "CAUTION, Automatic Door". (See Figure 1) The words "Automatic Door" must be at least 1/2 in. letters. It should be mounted on the door at a height 58 in., ±5 in. (147 cm, ±13 cm) from the floor to the centerline of the sign. The sign shall be minimum of 6 in. (15.2 cm) in diameter and made with black lettering on yellow background.

   B. When a separate wall switch is used to initiate the operation of the door operator, the doors shall be provided with signs on both sides of the door with the message" ACTIVA TE SWITCH TO OPERA TE." The lettering shall be white and the background shall be blue.

   When door motion is used to initiate the operation of the door operator, the doors shall be provided with the message "PUSH TO OPERA TE" on the push side of the door and "PULL TO OPERA TE

D. An AAADM safety information sticker should be affixed on the door or frame in a protected, visible location. If you need additional decals for your automatic doors, call your automatic door supplier.

2. Activating Switch. (Knowing Act)
Doors equipped with a manual operate switch shall, when activated, hold the door open for five seconds minimum after release of activating switch. Reactivate door and crouch motionless in door opening for 10 seconds. Door should not close.

Doors equipped with a manual activating switch shall have signs as follows: "Automatic Door. Activate Switch to Operate."
The sign should be visible from both sides of the door.

3. Housekeeping.
Check the door area for tripping or slipping hazards.

Check all door panels for damage. Make sure that all covers are properly secured. There should be no bulletin boards, literature racks, merchandise displays, or other attractions in the door area that would interfere with use of the door.

4. Traffic Patterns.
Observe traffic patterns. Plan routing so people enter and exit in a straight approach, directly onto the center of the door opening.

IF YOU HAVE A PROBLEM , TURN OFF THE DOOR OPERATING EQUIPMENT AND CALL YOUR AUTOMATIC DOOR SUPPLIER.

ED900

Low energy operator

Safety and Technical Specifications:
Book 1 of 3

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08281800 07/2013 Reamstown, PA 17567 Fax: 800-274-9724

Contents

1. For Your Safety

This documentation contains important information regarding the mounting and the safe operation of the door system. Read these instructions carefully before operating the **ED900.**

It is important for your personal safety to abide by all enclosed instructions.

An incorrectly performed installation might cause serious injuries.

Using control elements, making adjustments or performing procedures that are not described in this documentation might cause electric shocks, danger caused by electric voltage/current and/or danger due to mechanical incidents.

Please keep these documents for further reference and hand them over to the person in charge in case the system is transferred to another party.

Explanation of symbols

	**NOTE**	**This symbol underlines important information that may facilitate your work.**
	**REMARK**	**This symbol warns you of possible system damage and explains how to avoid this damage.**
	**WARNING**	**This symbol indicates dangers that might cause personal or material damage or even kill people.**

Intended application

As an electromechanical swing door operator, the **ED900 is only designed to open and close swing doors with a door-leaf weight of up to 220lb with a max width of 48**".

This operator is suitable for installation as slide channel pull arm assembly or double lever push arm assembly.

The closing force paths have been optimized for the respective ways of mounting and comply with the requirements of ANSI 156.19.

Please ensure that the system is approved for installation at the respective door before installing the system at a fire or smoke door.

Before you start with the installation of the system, please ensure that your operator is suitable for the door situation as explained in the technical specifications in chapter 2 and that the door is equipped with adequate hinges for operation with an automatic operator.

The maximum cable length for external components must not exceed 98' 5'' [30 m].

Limitation of liability

The ED900 may only be used according to their specified intended application. DORMA will not accept any liability for damage resulting from unauthorized modifications of the ED900. Furthermore components/accessories that have not been approved by DORMA are exempted from liability.

Safety instructions

Work on electrical equipment may only be performed by properly qualified staff (electricians).

- Do not allow children to play with the **ED900 or its rigidly mounted adjustment and control devices.**
- Keep remote controls out of reach of children.
- Never stick metal objects into the openings of the **ED900; otherwise you might sustain an electric shock.**
- Always use safety glass when mounting glass door panels.
- Only operate the mains switch at the header profile while the door stands still or is permanently open.
- No push buttons/switches, pictures etc. must be located within the door's movement range.
- Switch must be located so that door operation can be observed by person operating the switch.
- Your door system must be maintained in compliance with the standards of the industry, BHMA/ANSI.
- Proper decals and labels be applied, per BHMA/ANSI Standards, and maintained on your doors. If decals are removed, or cannot be read, request labels to be replaced when calling for service.

Standards, laws, codes and regulations

The latest versions of the common and local-specific standards, laws, codes and regulations have to be observed.

Application of the ED900 swinging fire door operators:

- Intended for use on swinging type fire door assemblies, equipped with electric strikes or single point latches/ locks or fire exit hardware with remotely activated retractable latch bolts.

Low-energy product

The ED900 can be adjusted so that it meets the requirements of a low-energy application (low-energy operator) to ANSI 156.19. During commissioning, the operator has to be adjusted in accordance with the appropriate standard and then verified after installation is complete.

The required system safety is ensured by the following means:

- Reduced dynamic force at door leaf/contact force
- Low driving speed
- Reduced static force at door leaf/contact force
- Force limitation

The application of additional safety sensors to protect the swing path is not explicitly stipulated but should be considered as an option if the individual risk assessment reveals that further sensors are required. The protection of the secondary closing edge has to be assessed individually.

Risk assessment on the part of the installer

Due to special spatial conditions and the expected user groups of the door, the application of safety sensors may, however, also be reasonable for a low-energy operator. Therefore the manufacturer, i.e. the installer of the system, has to perform an individual risk assessment during the planning of the door system in order to decide whether additional safety equipment is required or not.

Please refer to our homepage **www.dorma-usa.com**

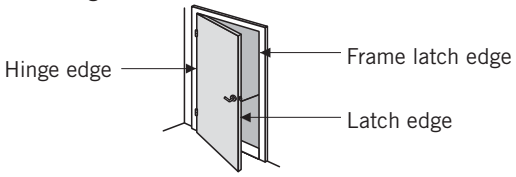
Special requirements regarding the protection of people in need of protection

In case the risk assessment reveals that there is a health risk or risk of injury caused by the door hitting a person using the door with an unacceptable force, an additional protection with the aid of appropriate safety equipment (connection of a safety sensor) is required.

This is especially necessary when people in need of protection (children, elderly people or disabled people) use the door.

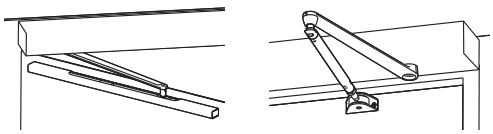
Dangers at closing edges

⚠ **Automatic doors may cause hazards by crushing, shearing, hitting and drawing-in at the different closing edges.**



Dangers caused by slide channel and arm

⚠ **The slide channel and the arm may cause hazards by crushing and shearing.**



Residual risk

Depending on the structural conditions, the door version and the available safety equipment, residual risks (such as crushing and hitting – with limited force) cannot be excluded. All people using a door are generally aware of the danger spot at the secondary closing edge of every swing door (also at manually operated doors). This danger spot cannot be influenced by the manufacturer of the operator and a protection of this closing edge often cannot be realized due to its construction and technical function. A suitable clamping protection (like a rubber or textile cover) is available in the specialized trade and not part of the scope of delivery.

Recycling and disposal

The **ED900 and its packing mainly consist of recyclable raw material.**

The **ED900 and the respective accessories must not be disposed of as domestic waste.**

Please ensure that the old appliance and the respective accessories (if available) are properly disposed of.

Abide by the prevailing national statutory provisions!

Safety during mounting

- The door is designed to be installed by trained and knowledgeable installers. The installation technician should be experienced in the installation of automatic entrances. They should know all local code requirements and be familiar with the requirements of the current ANSI A156.10 & 156.19 Standards for Power Operated Pedestrian Doors.
- The working area has to be secured against unauthorized access from other people. Falling items or tools might cause injuries.
- This unit should not be mounted in exterior conditions.
- The way of mounting and the mounting equipment, must be adequate with regard to the structural conditions (steel structure, wood, concrete etc.).
- Before mounting the **ED900, the door leaf has to be checked with respect to proper mechanical condition and smooth running. No other closing mechanisms can be attached to this door in anyway.**
- **The mounting of the ED900 described herein is only an example.**
  Structural or local conditions, available tools or other conditions might suggest a different approach.
- Following the successful installation of the system, the settings and the proper function of the **ED900 and the safety equipment have to be checked.**

- Only specially qualified staff may open the power supply housing.
- Disconnect the **ED900 from power supply (de-energize the system) before removing the cover of the power supply housing.**
- After installation, the door must be adjusted to conform to **DORMA** recommendations and all code requirements. Carefully study the requirements in these instructions.
- After installation and adjustment, the installer's final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with the manual.
- Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the **DORMA** Technical Assistance Group for assistance.

Safety during commissioning

- Only specially qualified staff may open the power supply housing.
- The protective earth conductor ground has to be connected.
- Ensure that the door leaves run smoothly.
- The operator and the door leaf must be properly linked.

Inspection and system approval

Before the first commissioning and depending on requirements, however, at least once a year, the **ED900 has to be inspected by a properly qualified technician and serviced if required.**

Briefing:

Following the adjustment, commissioning and functional testing of the door system, the operating instructions have to be handed over to the facility operator and a briefing has to be made.

Maintenance

The system has to be de-energized/disconnected from power supply before any kind of maintenance work is performed (turn main power supply breaker OFF).
Please consider the leaflet regarding the application of hold-open devices for further information and instructions regarding the application of the **ED900 at fire and smoke doors.**

Care

The system has to be de-energized (disconnected from power supply) before cleaning the system.
Remove power plug or, with permanent power supply, switch off breaker.
You may clean the **ED900 with a damp cloth and standard commercial detergents.**
You should not use scouring agents for cleaning purposes as they might damage the surface finish.
Pay attention that no water or other liquids drop on or into the **ED900.**
Never stick metal objects into the openings of the **ED900; otherwise you might sustain an electric shock.**

Wear

The following wear parts have to be inspected once a year and replaced if required:

- Arm
- Slide shoe
- Slide channel

Only use DORMA original replacement parts.

2. Technical Specifications

The following technical specifications will help you to check additionally if the system fulfills the requirements. You can start mounting if the system complies with the parameters.

Required operating conditions

Ambient temperature	5 to 122° F [-15 to 50° C]
Only suitable for dry environments	relative humidity max. 93% non-condensing
Power supply	115 V AC +/- 10% 50/60 Hz 6.6 A max.
Class of protection	IP 20
Branch circuit protection (by others)	15 A
Power cable type	14 AWG / 12 AWG
Max. operating noise	50 db (A)

General specifications

Dimensions (WxHxD)	27 x 2 3/4 x 5 1/8" [685 x 70 130 mm]
Min. distance between hinges (double-leaf systems)	55 1/8" [1,400 mm]
Min. distance between hinges (double-leaf systems) with Full Width Cover	59 1/16" [1,500 mm]
Operator weight	26.5 lb [12 kg]
Power supply for external accessories	24 V DC +/- 10%, 1.5 A
Opening angle	Max. 110°

Inputs

Connections	14 AWG Max. [2 mm^2]
Dry contact	Inside and outside (NO contact)
Override (intercom system)	8 - 24 V DC / AC + 10%
Override (key switch)	NO contact/NC contact
Safety sensor	Pull side and push side (NC contact)
Test signal for safety sensor	Pull side and pull side
Deactivation of operator function (lock switch)	NC contact/NO contact

Outputs

Connections	14 AWG Max. [2 mm^2]
Status relay	Door closed Door open Malfunction

Integrated functions

Latching action	Adjustable from 5° to 0°
Hold-open time	0 - 30 seconds
Override hold-open time	0 - 30 seconds
Obstruction detection during closing cycle	Reversing / Automative mode
Delayed opening for locking mechanism (electric strike)	0 - 4 second/s
Locking feedback contact	Latch / Lock monitor
Wind load control	up to 33,7 lbf [150 N]
Power failure speed control	Adjustable via potentiometer
Closing force prior to close	Force adjustable
LED status indicator green red yellow	- power supply available - malfunction - service interval indicator
Internal mode switch	OFF AUTOMATIC PERMANENT OPEN EXIT ONLY (only for single-leaf systems)
Program panel with 2 digit display	Status indicator and settings / parameters
TMP – Temperature Management Program	Overload protection
IDC – Initial Drive Control	Driving phase optimization
Cycle counter	0 – 1,000,000 (reasonably subdivided)
Power Assist Function / Helping Force	Servo-supported manual opening
Push & Go Function	The door opens when it is moved manually by 4°

ED900	
Max. steady state power consumption	120 Watts
Max. door-leaf weight for lintel depths of up to 11 3/4 " [300 mm]	220.4 lbs [100 kg]
Door-leaf width	27 9/16" to 43 1/4" [700 to 1,100 mm]
Opening speed	(27°*)/second
Closing speed	(27°*)/second
Axle extension	0" [0mm] 3/4" [20 mm] standard 1 3/16" [30 mm] 2 3/8" [60 mm]
Pull side track mount lintel depth for slide channel	+/- 1 3/16" [30 mm]
Push side top jamb lintel depth for standard arm	0" to 11 13/16" [0-300 mm]

Power-Assist / Helping Force Mode
The Automatic-Power-Assist Function may be activated while the door is in door closer mode (parameter hd = 1). As soon as a user opens the door manually by some degrees, the servo-function supports the manual opening cycle. The servo support automatically adapts to the adjusted size of the door closer. The level of servo support is adjustable in order to meet the requirements of ANS: 156.19 Power Assist Mode. The maximum adjustable opening torque amounts to 15 ft-lbf [20 Nm], unless the hold-open device is triggered or in the event of a power failure.
It is not possible to use the system in conjunction with the Push & Go Function or opening and closing force (wind load control) as these modes may affect the easy manual opening.

Door closer mode & Automatic mode
Users may choose between two operation modes: door closer and Automatic mode. While adjusted to door closer mode (setting 32 hd = 1), the system is optimized for manual operation. With its optional Power-Assist / Helping Force Mode, the door closer mode is tailored to predominantly manually-operated doors where a door closer function is desired. The Automatic mode (setting 32 hd = 0) in turn is especially suitable for mainly automatic access via pushbutton. In addition, the door reverses as soon as it runs into an obstruction while closing. On activation of the Automatic mode, also the wind load control is available. However, the doors are still ready for manual egress. In this case we would recommend the Push & Go function.

Wind load control
ED900 operators are suitable for application at exterior doors that are subject to varying wind loads and for interior doors separating rooms where different pressure prevails. While the system is in AUTOMATIC mode, the wind load control monitors the actual driving speed and adjusts the speed correspondingly if it does not correspond to the adjusted value.
The electronic latching action is activated during the last 5° of the closing cycle in order to support the closing action.

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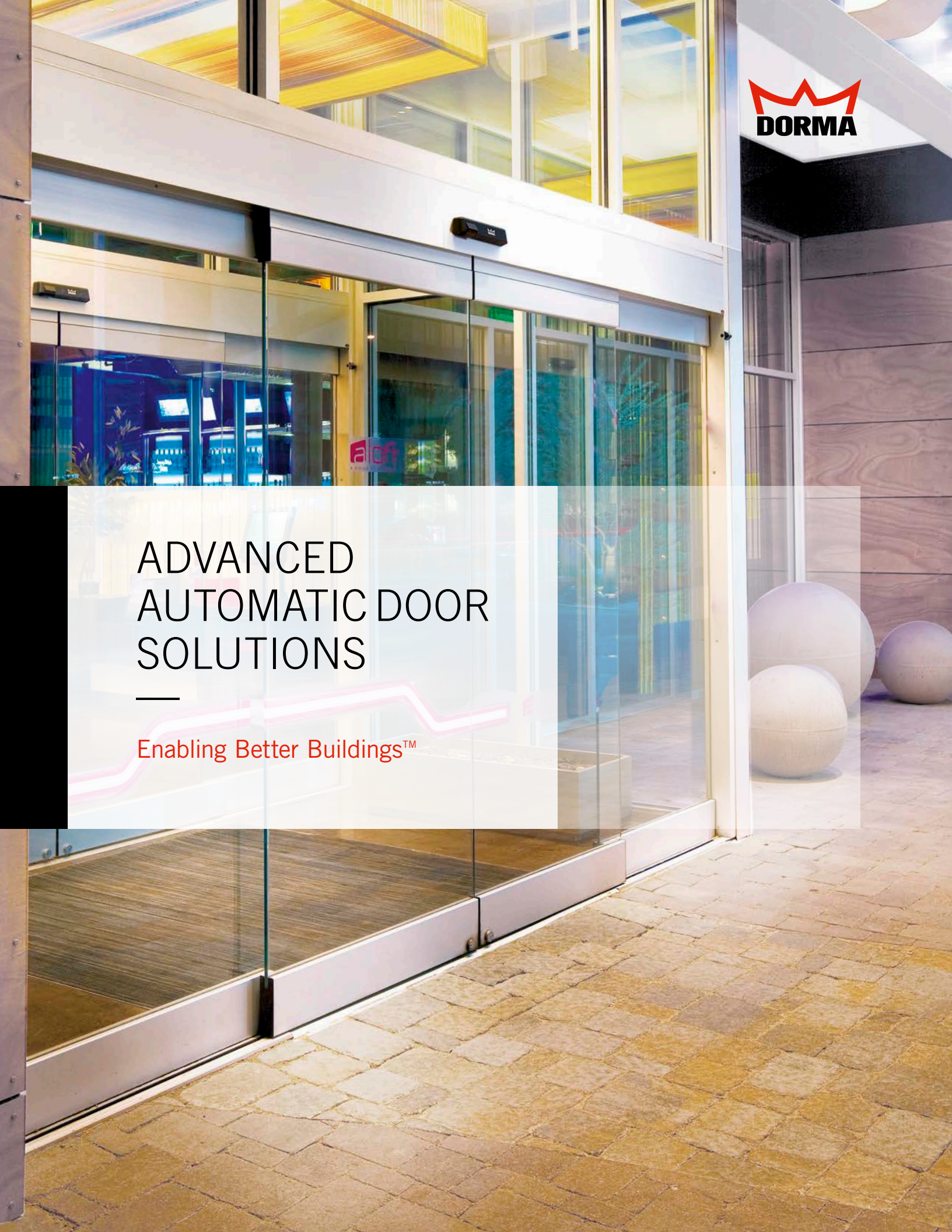
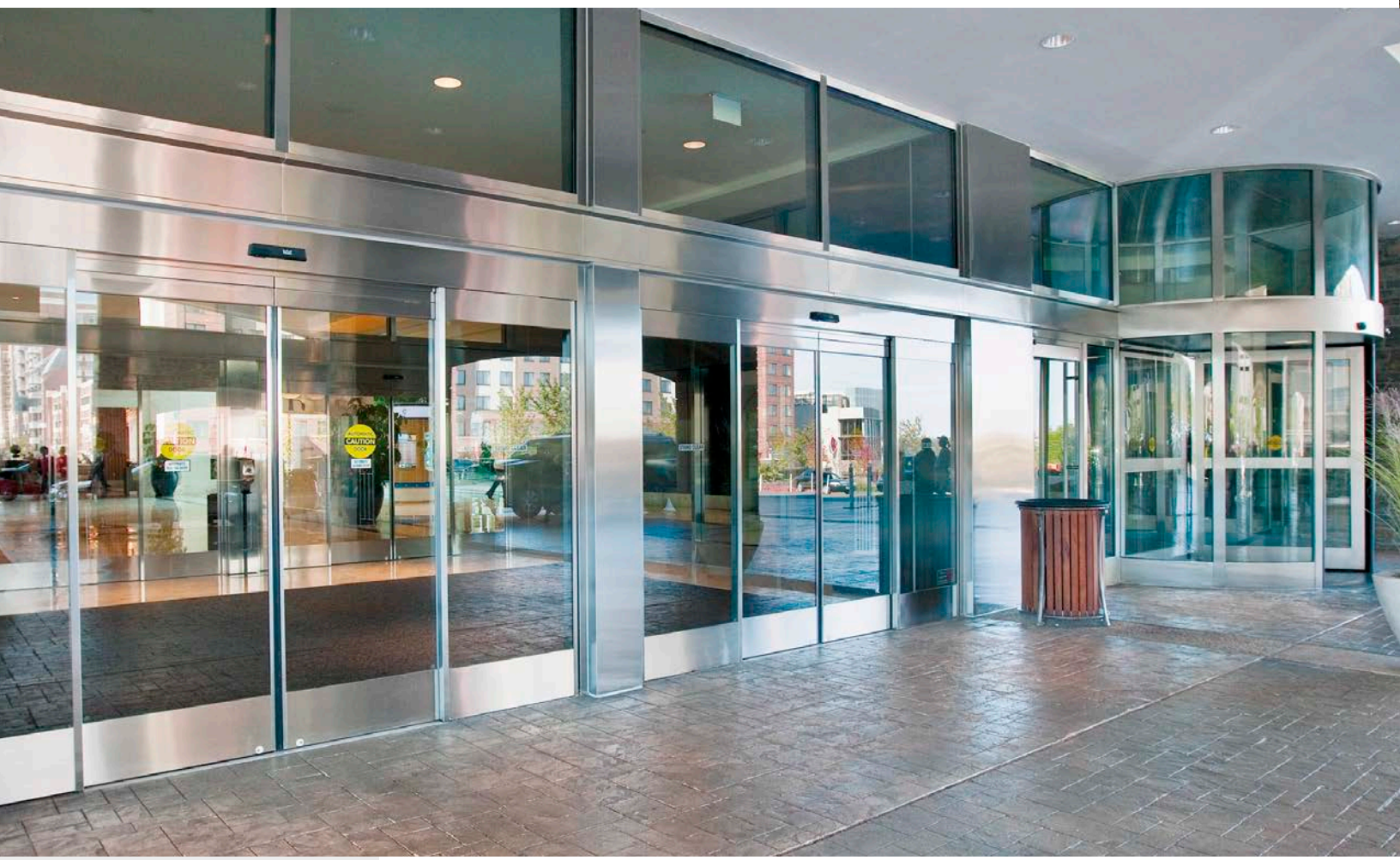


ADVANCED AUTOMATIC DOOR SOLUTIONS

Enabling Better Buildings™

ADVANCED AUTOMATIC DOOR SOLUTIONS



For project specification, design, and code-compliance assistance, call the DORMA Architectural Support Desk at 866-401-6063.

DORMA can review your product selection to insure it is project specific and code compliant.

DORMA is a leading innovator of automatic door systems, with entrance solutions for practically any application—retail, health care, office buildings, airports, hospitality, and more.

Our sliding and swinging door systems cover a wide range of applications and finishes.

Both custom designed and standard systems are available. Each product offers exclusive features, such as an advanced microprocessor controller for precision performance and long lasting reliability. A variety of sensors engineered to provide optimum safety are available to meet every application.

DORMA also offers both Crane manual and automatic revolving doors, which are ideal for high traffic applications that require simultaneous entry and exit, controlled access, or an air lock to help control energy costs.

DORMA ESA

Stylish, durable, and powerful automatic sliding doors

Providing strength, beauty, and technology all in one package, the **ESA Automatic Sliding Door** is one of the most intelligent, efficient, and technologically advanced sliding doors on the market. Powerful ESA doors operate door panels weighing up to 350 lb, while a continuous self-monitoring control system adds an extra measure of safety and efficiency.

The impressive low-profile, 4.5" × 7.5" ESA header means the doors are installed flush with the surrounding structure—creating a sleek, unbroken sight line that blends the doors into the overall architectural design.

DORMA uses a 1/4" (6 mm) thick structure to create one of the strongest headers in the industry. The self-supporting header can span up to 16' without additional reinforcement.

ESA100, 200, 300—Three intelligent, strong, low-profile ESA models suit different requirements: the non-breakout ESA100, the ESA200 with fixed sidelite, and the full-breakout ESA300.

ESA400 Fine Frame—The Fine Frame style is a perfect marriage of beauty and functionality. Also featuring full breakout capability, the ESA400 combines full view aesthetics with excellent weather-sealing qualities.

ESA500 All-Glass—The all-glass ESA500 door has no vertical trim so it offers an uninterrupted horizontal expanse for blending with an all-glass façade.

DORMA also creates custom ESA doors. For example, doors utilizing stainless steel or polished bronze can be welded to eliminate seams and ensure a beautiful appearance for the lifetime of the door.

DORMA ESA Auto-Telescopic sliding doors driven by proven ESA technology

NOTE: All DORMA ESA Series automatic sliding doors are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ESA-200-B1 Blast Rated Doors

The **ESA200-B1** is specifically designed to meet US DoD requirements for antiterrorism building standards (UFC 4-010-01) with conventional standoff distances, commonly required on military bases and public buildings. These doors are available at standard height and up to 14' wide packages with medium stiles and enhanced security 3- or 5-point locking.

DORMA ESA-HP Hurricane-Resistant Doors

The **ESA-HP** automatic sliding door meets Dade County and Florida Building Code regulations, keeps your building safe and secure, provides smooth and durable operation—all the while providing an aesthetically pleasing entrance for your place of business.

MIAMI-DADE COUNTY APPROVED

DORMA ED400

Powerful, reliable, flexible, and intelligent

The **DORMA ED400 Swing Door Operator** is designed for demanding applications such as retail centers, airports, and health care facilities. Built for high traffic applications, it can handle doors up to 51" wide and 320 lb per leaf and can be configured for full energy (156.10) or low energy (156.19) operation.

DORMA tests the ED400 operator for one million cycles in climate-controlled test chambers. A built-in power boost helps keep the door closed when exposed to high wind or stack pressure buildup.

Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self-closing. The virtually maintenance-free unit provides smooth, silent operation.

The ED400 operator offers advanced encoder and microprocessor control, allowing it to self-learn the door weight and inertia, ensuring ultra smooth operation. The controller has dedicated circuits and LED status indicators for up to five safety sensors—no more doubled-up circuits or decreased performance. The easy three-digit display allows you to monitor the performance of every function for easy diagnostic evaluation.

DORMA ED700

Smooth, quiet operation, elegant slimline design

The **DORMA ED700 Low Energy Swing Door Operator** is the perfect solution for applications requiring barrier-free access. Simple and easy to install, the ED700 provides many features and functions to make existing doors easily accessible. The DORMA ED700 is custom ordered to match the application. All common applications for outswing and inswing doors—with either push arm or slide track arm for tight side clearance—can be adapted for barrier-free access.

The ED700's advanced encoder and microprocessor control is a feature of the ED400 as well—ensuring the same level of intelligent and smooth operation. Extruded aluminum covers in custom lengths are available to match aesthetically with the door frame.

The ED700 may be used for door widths up to 48" (1220 mm) and a maximum weight of 200 lb (91 kg). For best accessibility, the operator can open the door up to an opening angle of 110°.

NOTE: The DORMA ED400 and ED700 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ED100 & ED250

Low energy/full energy compact swing door operators

NOTE: The DORMA ED100 and ED250 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AADM certified installers.

The **DORMA ED100 and ED250** are compact next generation electromechanical swing door operators.

Innovative engineering makes them safe, reliable, and energy-efficient at any level of traffic and in variable atmospheric conditions. Their modular design allows them to be pre-configured with plug-ins for specific applications. A minimalist DORMA Contur profile makes them a perfect fit for any application, interior or exterior.

Unlike conventional electro-hydraulic operators, the ED100 and ED250 are able to respond automatically to changes in the surrounding environment. Built-in sensors and a state-of-the-art drive system can quickly adjust how the unit operates, boosting power when required to open and close reliably and consistently.

A wide array of applications can be realized due to built-in functions and options, including wind-load control, mechanical coordinator, automatic power assist, sensor/lock timing, and more.

Universal modular design and high-tech functionality combine with ultra compact form and award-winning Contur aesthetics to make this operator a beautiful way to automate easily without drawing unwanted attention.

DORMA ED100: for doors up to 220 lb (100 kg)

DORMA ED250: for doors up to 550 lb (250 kg)

DORMA MAGNEO

Powered by advanced LMD technology

Powered by linear magnetic drive technology (LMD), the **DORMA MAGNEO** is a sliding entrance system designed for any modern interior, whether public, commercial, or private. Its sleek Contur design has minimalist clean lines that blend seamlessly to meet discriminating applications. Innovative magnetic technology ensures that the MAGNEO is safe, reliable, whisper quiet, and resistant to wear.

Ideal for both new and retrofit interior applications, the MAGNEO's modern design and easy operation make it an attractive and efficient way to update both the function and appearance of existing interior doorways.

The versatile MAGNEO meets all safety requirements for low energy applications. Its extra sensitive operation instantly detects any obstruction. Activation is achieved via touchless design push plate, radio remote control, or traditional infrared motion detectors.

DORMA ICU300

Adaptable space separation

DORMA offers a complete line of ICU manual sliding doors for special care facilities such as hospitals and surgical centers. The **DORMA ICU300** enables continuous observation of patients, while allowing quick and easy access during emergency situations.

DORMA ICU300 doors come in a wide range of sizes, configurations, and finishes. Single, bi-parting, or telescopic doors are available with either two, three, four, or six panels. A recessed track or trackless guide system allows for smooth operation.

Standard features include premature breakout prevention, remote panel status monitoring, and electrostatic discharge grounding, to protect sensitive medical equipment from static electricity.

DORMA ICU1200

Combined multi-dimensional swing and bi-fold operation

The easy-to-install **DORMA ICU1200** is a perfect fit for installations with limited width and self-closing requirements. The ICU1200 combines two types of door: a double-acting swing door on one side and a bi-fold manual door on the other. Narrow stiles and an optional muntin ensure clear views for observing patients. For normal traffic, the swing door conveniently opens in either direction.

For a wider opening, the bi-fold door collapses to open up nearly the full width of the doorway.

The DORMA ICU1200 features a low profile 1.75" × 4.5" header and stainless steel pull handles on both the swing and bi-fold doors. The hinge on the bi-fold door is designed to protect fingers.

CRANE REVOLVING DOORS

1000-M/1000-A Series

The **Crane 1000 Series** is the solution when your budget-conscious project calls for the look, function, traffic flow advantage, and energy savings of a revolving door. Fabricated with rigid aluminum construction, the 1000 Series offers choices that allow you to match the doors to your entrance requirements—several size options, canopy choices, and custom painted or anodized finishes. The operating mode can be manual, automatic, or security mode.

Crane 1000-M Series doors use the same 100:1 gear manual speed control and bookfold mechanism provided on all Crane manual revolving doors. We use .125 thickness aluminum construction as the primary material, and all door construction is completed by the experienced craftsmen in our Chicago facility. The Crane 1000 series also offers an expedited production lead time for jobs with a fast-tracked completion date.

Crane 1000-A Series doors feature the same automatic drive system as Crane's higher end custom series doors. The MDS-A Modular Drive System includes an advanced microprocessor control and is torque driven for safety.

DORMA ED400-IG

Automatic in-ground floor operator

Meet access requirements and simultaneously maintain a classic look such as an arched door or an all-glass façade, with the **DORMA ED400-IG**. This revolutionary operator conceals the automatic components in the floor near the door threshold.

The ED400-IG functions in low energy or full power mode, and can be used in new construction and retrofit applications. It directs energy generated by the ED400 drive unit to the pivot in a rotating motion—ensuring consistently smooth operation.

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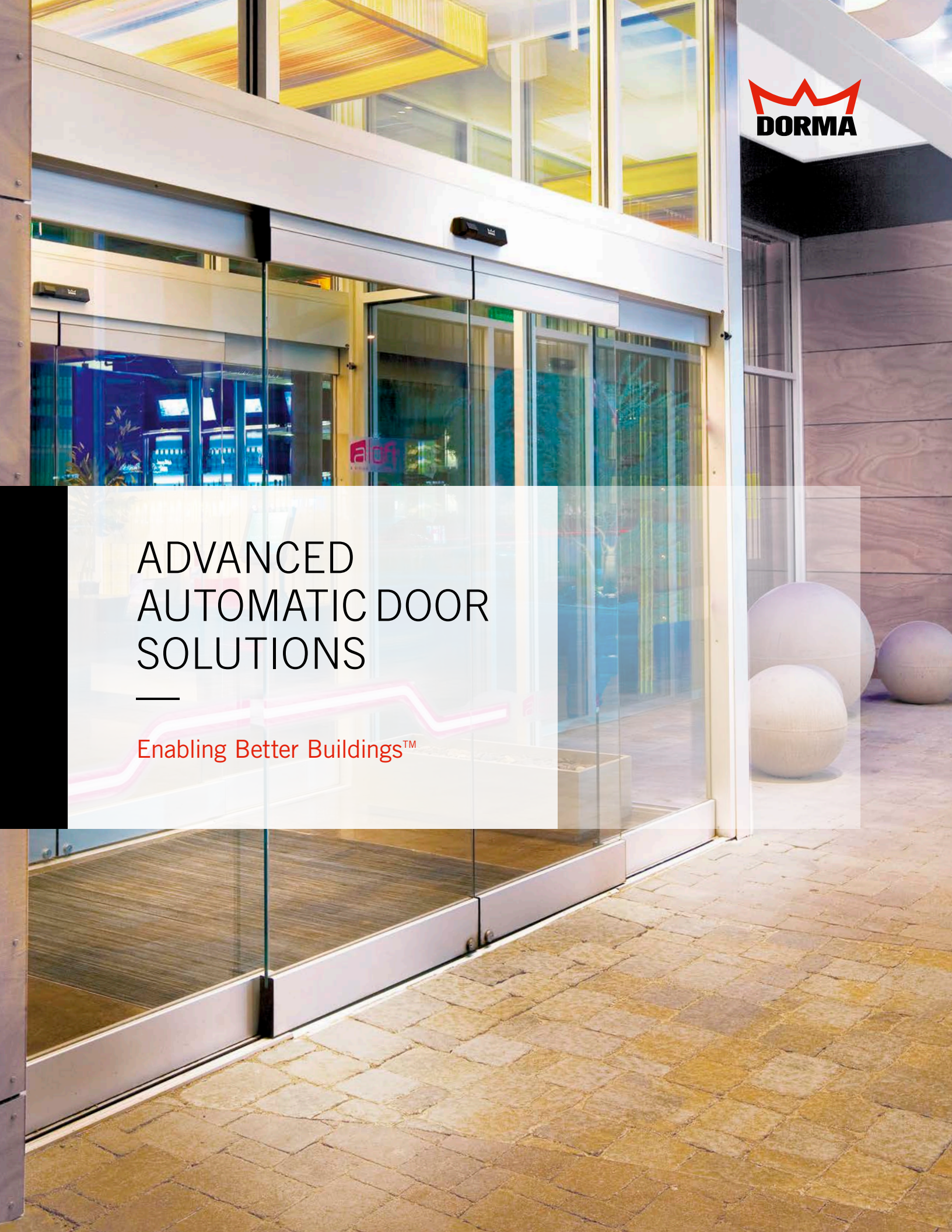

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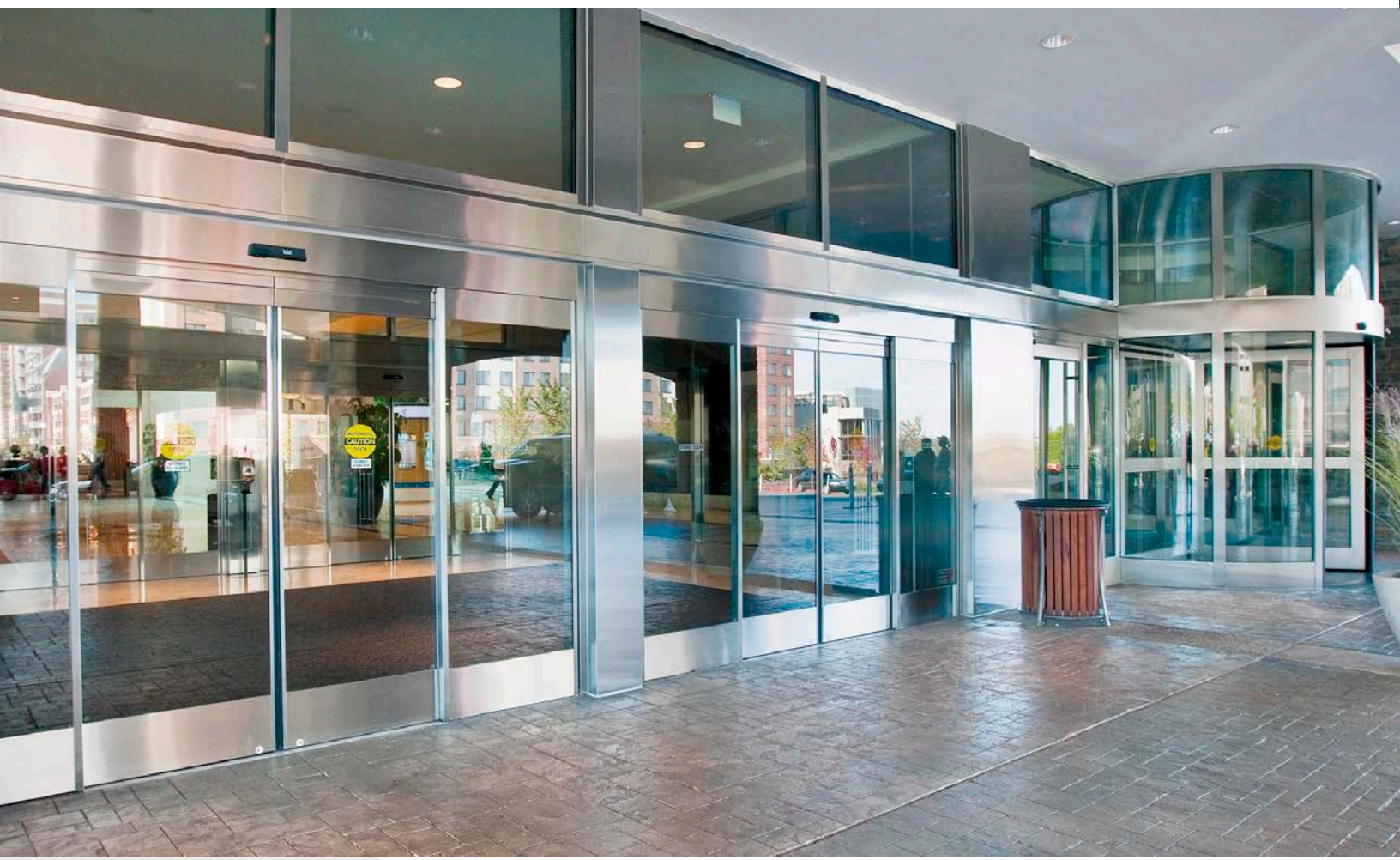

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DORMA is a leading innovator of automatic door systems, with entrance solutions for practically any application—retail, health care, office buildings, airports, hospitality, and more.

Our sliding and swinging door systems cover a wide range of applications and finishes.

Both custom designed and standard systems are available. Each product offers exclusive features, such as an advanced microprocessor controller for precision performance and long lasting reliability. A variety of sensors engineered to provide optimum safety are available to meet every application.

DORMA also offers both Crane manual and automatic revolving doors, which are ideal for high traffic applications that require simultaneous entry and exit, controlled access, or an air lock to help control energy costs.

DORMA ESA

Stylish, durable, and powerful automatic sliding doors

Providing strength, beauty, and technology all in one package, the **ESA Automatic Sliding Door** is one of the most intelligent, efficient, and technologically advanced sliding doors on the market. Powerful ESA doors operate door panels weighing up to 350 lb, while a continuous self-monitoring control system adds an extra measure of safety and efficiency.

The impressive low-profile, 4.5" × 7.5" ESA header means the doors are installed flush with the surrounding structure—creating a sleek, unbroken sight line that blends the doors into the overall architectural design.

DORMA uses a 1/4" (6 mm) thick structure to create one of the strongest headers in the industry. The self-supporting header can span up to 16' without additional reinforcement.

ESA100, 200, 300—Three intelligent, strong, low-profile ESA models suit different requirements: the non-breakout ESA100, the ESA200 with fixed sidelite, and the full-breakout ESA300.

ESA400 Fine Frame—The Fine Frame style is a perfect marriage of beauty and functionality. Also featuring full breakout capability, the ESA400 combines full view aesthetics with excellent weather-sealing qualities.

ESA500 All-Glass—The all-glass ESA500 door has no vertical trim so it offers an uninterrupted horizontal expanse for blending with an all-glass façade.

DORMA also creates custom ESA doors. For example, doors utilizing stainless steel or polished bronze can be welded to eliminate seams and ensure a beautiful appearance for the lifetime of the door.

DORMA ESA Auto-Telescopic sliding doors driven by proven ESA technology

NOTE: All DORMA ESA Series automatic sliding doors are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ESA-200-B1 Blast Rated Doors

The **ESA200-B1** is specifically designed to meet US DoD requirements for antiterrorism building standards (UFC 4-010-01) with conventional standoff distances, commonly required on military bases and public buildings. These doors are available at standard height and up to 14' wide packages with medium stiles and enhanced security 3- or 5-point locking.

DORMA ESA-HP Hurricane-Resistant Doors

The **ESA-HP** automatic sliding door meets Dade County and Florida Building Code regulations, keeps your building safe and secure, provides smooth and durable operation—all the while providing an aesthetically pleasing entrance for your place of business.

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DORMA ED400

Powerful, reliable, flexible, and intelligent

The **DORMA ED400 Swing Door Operator** is designed for demanding applications such as retail centers, airports, and health care facilities. Built for high traffic applications, it can handle doors up to 51" wide and 320 lb per leaf and can be configured for full energy (156.10) or low energy (156.19) operation.

DORMA tests the ED400 operator for one million cycles in climate-controlled test chambers. A built-in power boost helps keep the door closed when exposed to high wind or stack pressure buildup.

Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self-closing. The virtually maintenance-free unit provides smooth, silent operation.

The ED400 operator offers advanced encoder and microprocessor control, allowing it to self-learn the door weight and inertia, ensuring ultra smooth operation. The controller has dedicated circuits and LED status indicators for up to five safety sensors—no more doubled-up circuits or decreased performance. The easy three-digit display allows you to monitor the performance of every function for easy diagnostic evaluation.

DORMA ED700

Smooth, quiet operation, elegant slimline design

The **DORMA ED700 Low Energy Swing Door Operator** is the perfect solution for applications requiring barrier-free access. Simple and easy to install, the ED700 provides many features and functions to make existing doors easily accessible. The DORMA ED700 is custom ordered to match the application. All common applications for outswing and inswing doors—with either push arm or slide track arm for tight side clearance—can be adapted for barrier-free access.

The ED700's advanced encoder and microprocessor control is a feature of the ED400 as well—ensuring the same level of intelligent and smooth operation. Extruded aluminum covers in custom lengths are available to match aesthetically with the door frame.

The ED700 may be used for door widths up to 48" (1220 mm) and a maximum weight of 200 lb (91 kg). For best accessibility, the operator can open the door up to an opening angle of 110°.

NOTE: The DORMA ED400 and ED700 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ED100 & ED250

Low energy/full energy compact swing door operators

NOTE: The DORMA ED100 and ED250 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AADM certified installers.

The **DORMA ED100 and ED250** are compact next generation electromechanical swing door operators.

Innovative engineering makes them safe, reliable, and energy-efficient at any level of traffic and in variable atmospheric conditions. Their modular design allows them to be pre-configured with plug-ins for specific applications. A minimalist DORMA Contur profile makes them a perfect fit for any application, interior or exterior.

Unlike conventional electro-hydraulic operators, the ED100 and ED250 are able to respond automatically to changes in the surrounding environment. Built-in sensors and a state-of-the-art drive system can quickly adjust how the unit operates, boosting power when required to open and close reliably and consistently.

A wide array of applications can be realized due to built-in functions and options, including wind-load control, mechanical coordinator, automatic power assist, sensor/lock timing, and more.

Universal modular design and high-tech functionality combine with ultra compact form and award-winning Contur aesthetics to make this operator a beautiful way to automate easily without drawing unwanted attention.

DORMA ED100: for doors up to 220 lb (100 kg)

DORMA ED250: for doors up to 550 lb (250 kg)

DORMA MAGNEO

Powered by advanced LMD technology

Powered by linear magnetic drive technology (LMD), the **DORMA MAGNEO** is a sliding entrance system designed for any modern interior, whether public, commercial, or private. Its sleek Contur design has minimalist clean lines that blend seamlessly to meet discriminating applications. Innovative magnetic technology ensures that the MAGNEO is safe, reliable, whisper quiet, and resistant to wear.

Ideal for both new and retrofit interior applications, the MAGNEO's modern design and easy operation make it an attractive and efficient way to update both the function and appearance of existing interior doorways.

The versatile MAGNEO meets all safety requirements for low energy applications. Its extra sensitive operation instantly detects any obstruction. Activation is achieved via touchless design push plate, radio remote control, or traditional infrared motion detectors.

DORMA ICU300

Adaptable space separation

DORMA offers a complete line of ICU manual sliding doors for special care facilities such as hospitals and surgical centers. The **DORMA ICU300** enables continuous observation of patients, while allowing quick and easy access during emergency situations.

DORMA ICU300 doors come in a wide range of sizes, configurations, and finishes. Single, bi-parting, or telescopic doors are available with either two, three, four, or six panels. A recessed track or trackless guide system allows for smooth operation.

Standard features include premature breakout prevention, remote panel status monitoring, and electrostatic discharge grounding, to protect sensitive medical equipment from static electricity.

DORMA ICU1200

Combined multi-dimensional swing and bi-fold operation

The easy-to-install **DORMA ICU1200** is a perfect fit for installations with limited width and self-closing requirements. The ICU1200 combines two types of door: a double-acting swing door on one side and a bi-fold manual door on the other. Narrow stiles and an optional muntin ensure clear views for observing patients. For normal traffic, the swing door conveniently opens in either direction.

For a wider opening, the bi-fold door collapses to open up nearly the full width of the doorway.

The DORMA ICU1200 features a low profile 1.75" × 4.5" header and stainless steel pull handles on both the swing and bi-fold doors. The hinge on the bi-fold door is designed to protect fingers.

CRANE REVOLVING DOORS

1000-M/1000-A Series

The **Crane 1000 Series** is the solution when your budget-conscious project calls for the look, function, traffic flow advantage, and energy savings of a revolving door. Fabricated with rigid aluminum construction, the 1000 Series offers choices that allow you to match the doors to your entrance requirements—several size options, canopy choices, and custom painted or anodized finishes. The operating mode can be manual, automatic, or security mode.

Crane 1000-M Series doors use the same 100:1 gear manual speed control and bookfold mechanism provided on all Crane manual revolving doors. We use .125 thickness aluminum construction as the primary material, and all door construction is completed by the experienced craftsmen in our Chicago facility. The Crane 1000 series also offers an expedited production lead time for jobs with a fast-tracked completion date.

Crane 1000-A Series doors feature the same automatic drive system as Crane's higher end custom series doors. The MDS-A Modular Drive System includes an advanced microprocessor control and is torque driven for safety.

DORMA ED400-IG

Automatic in-ground floor operator

Meet access requirements and simultaneously maintain a classic look such as an arched door or an all-glass façade, with the **DORMA ED400-IG**. This revolutionary operator conceals the automatic components in the floor near the door threshold.

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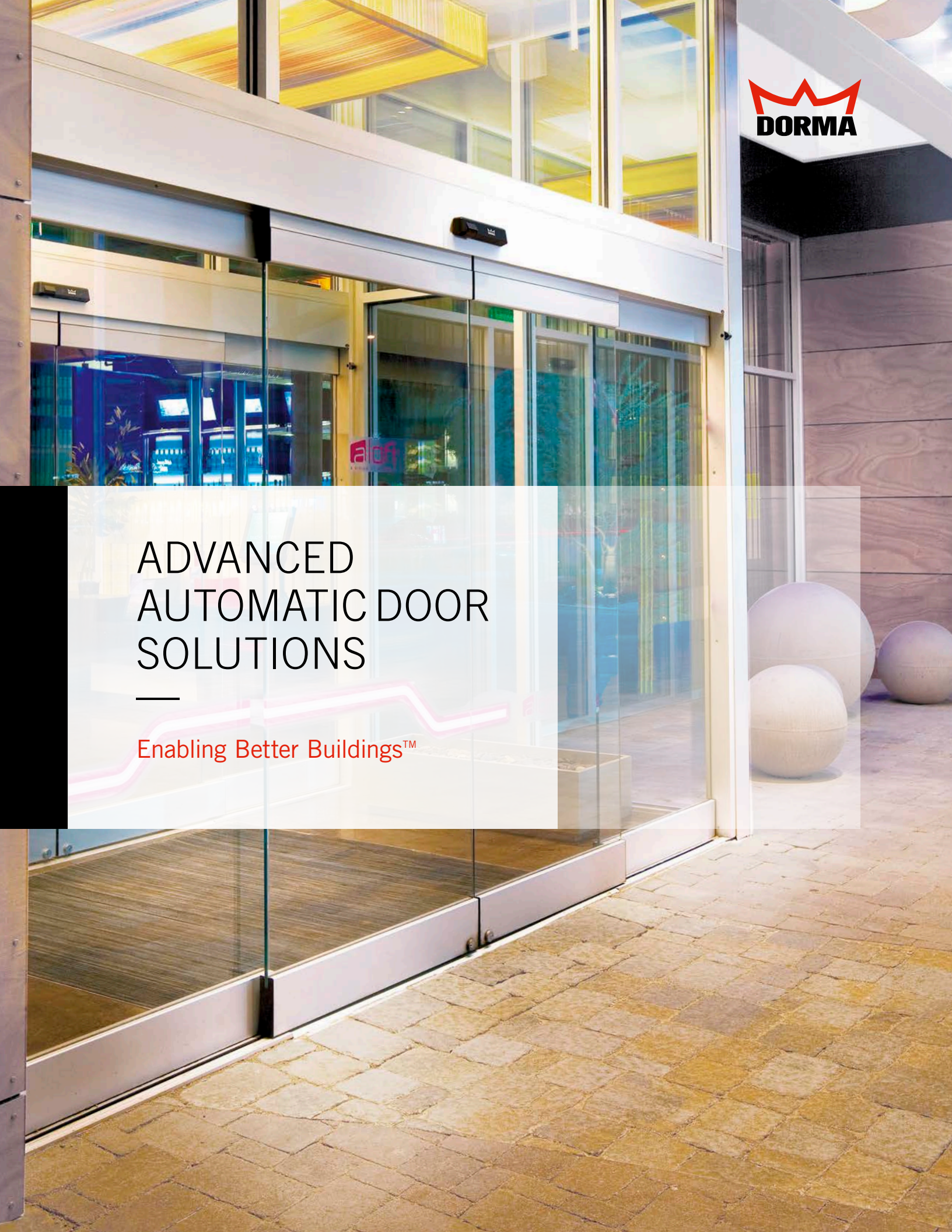

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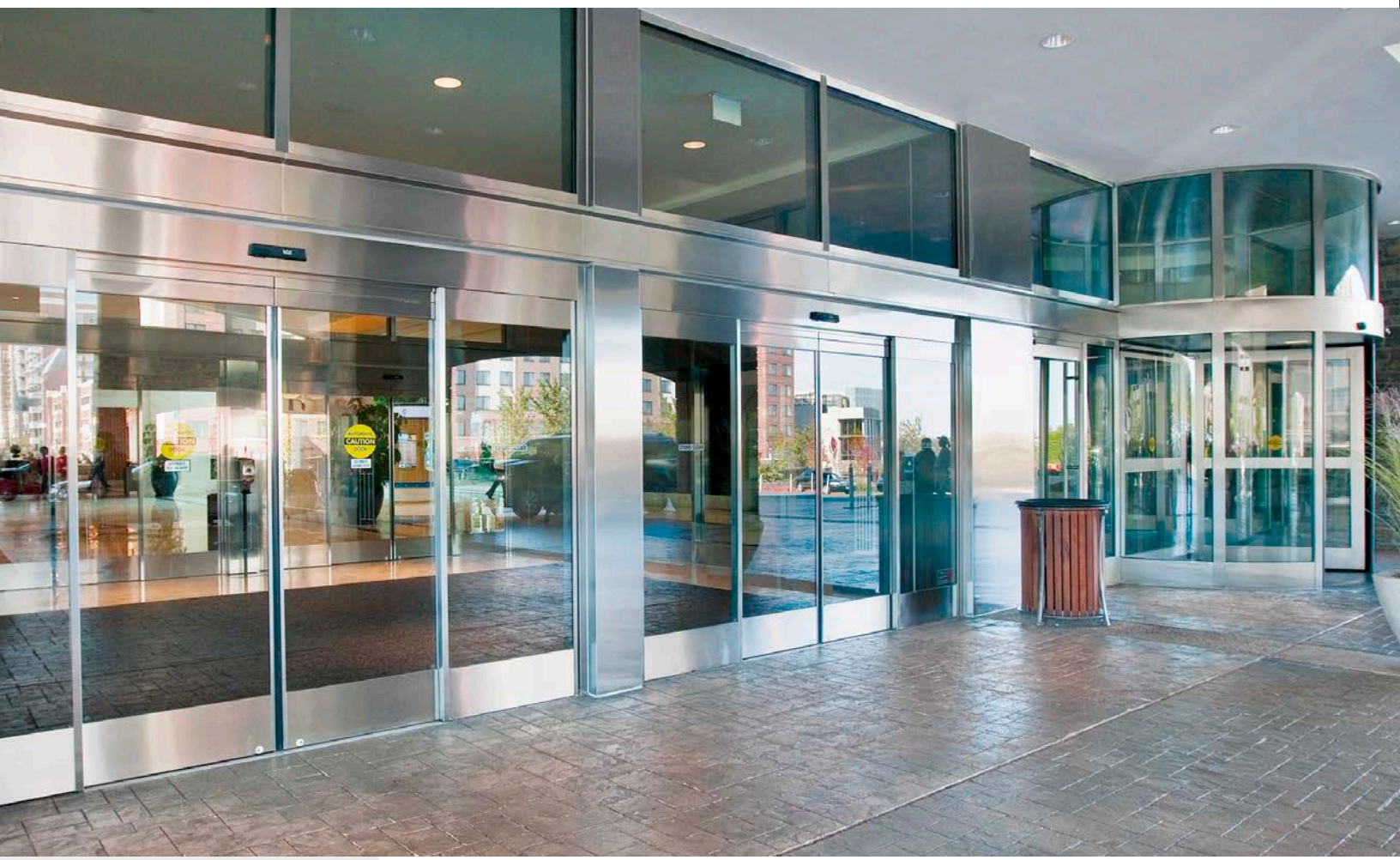

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Our sliding and swinging door systems cover a wide range of applications and finishes.

Both custom designed and standard systems are available. Each product offers exclusive features, such as an advanced microprocessor controller for precision performance and long lasting reliability. A variety of sensors engineered to provide optimum safety are available to meet every application.

DORMA also offers both Crane manual and automatic revolving doors, which are ideal for high traffic applications that require simultaneous entry and exit, controlled access, or an air lock to help control energy costs.

DORMA ESA

Stylish, durable, and powerful automatic sliding doors

Providing strength, beauty, and technology all in one package, the **ESA Automatic Sliding Door** is one of the most intelligent, efficient, and technologically advanced sliding doors on the market. Powerful ESA doors operate door panels weighing up to 350 lb, while a continuous self-monitoring control system adds an extra measure of safety and efficiency.

The impressive low-profile, 4.5" × 7.5" ESA header means the doors are installed flush with the surrounding structure—creating a sleek, unbroken sight line that blends the doors into the overall architectural design.

DORMA uses a 1/4" (6 mm) thick structure to create one of the strongest headers in the industry. The self-supporting header can span up to 16' without additional reinforcement.

ESA100, 200, 300—Three intelligent, strong, low-profile ESA models suit different requirements: the non-breakout ESA100, the ESA200 with fixed sidelite, and the full-breakout ESA300.

ESA400 Fine Frame—The Fine Frame style is a perfect marriage of beauty and functionality. Also featuring full breakout capability, the ESA400 combines full view aesthetics with excellent weather-sealing qualities.

ESA500 All-Glass—The all-glass ESA500 door has no vertical trim so it offers an uninterrupted horizontal expanse for blending with an all-glass façade.

DORMA also creates custom ESA doors. For example, doors utilizing stainless steel or polished bronze can be welded to eliminate seams and ensure a beautiful appearance for the lifetime of the door.

DORMA ESA Auto-Telescopic sliding doors driven by proven ESA technology

NOTE: All DORMA ESA Series automatic sliding doors are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ESA-200-B1 Blast Rated Doors

The **ESA200-B1** is specifically designed to meet US DoD requirements for antiterrorism building standards (UFC 4-010-01) with conventional standoff distances, commonly required on military bases and public buildings. These doors are available at standard height and up to 14' wide packages with medium stiles and enhanced security 3- or 5-point locking.

DORMA ESA-HP Hurricane-Resistant Doors

The **ESA-HP** automatic sliding door meets Dade County and Florida Building Code regulations, keeps your building safe and secure, provides smooth and durable operation—all the while providing an aesthetically pleasing entrance for your place of business.

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DORMA ED400

Powerful, reliable, flexible, and intelligent

The **DORMA ED400 Swing Door Operator** is designed for demanding applications such as retail centers, airports, and health care facilities. Built for high traffic applications, it can handle doors up to 51" wide and 320 lb per leaf and can be configured for full energy (156.10) or low energy (156.19) operation.

DORMA tests the ED400 operator for one million cycles in climate-controlled test chambers. A built-in power boost helps keep the door closed when exposed to high wind or stack pressure buildup.

Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self-closing. The virtually maintenance-free unit provides smooth, silent operation.

The ED400 operator offers advanced encoder and microprocessor control, allowing it to self-learn the door weight and inertia, ensuring ultra smooth operation. The controller has dedicated circuits and LED status indicators for up to five safety sensors—no more doubled-up circuits or decreased performance. The easy three-digit display allows you to monitor the performance of every function for easy diagnostic evaluation.

DORMA ED700

Smooth, quiet operation, elegant slimline design

The **DORMA ED700 Low Energy Swing Door Operator** is the perfect solution for applications requiring barrier-free access. Simple and easy to install, the ED700 provides many features and functions to make existing doors easily accessible. The DORMA ED700 is custom ordered to match the application. All common applications for outswing and inswing doors—with either push arm or slide track arm for tight side clearance—can be adapted for barrier-free access.

The ED700's advanced encoder and microprocessor control is a feature of the ED400 as well—ensuring the same level of intelligent and smooth operation. Extruded aluminum covers in custom lengths are available to match aesthetically with the door frame.

The ED700 may be used for door widths up to 48" (1220 mm) and a maximum weight of 200 lb (91 kg). For best accessibility, the operator can open the door up to an opening angle of 110°.

NOTE: The DORMA ED400 and ED700 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ED100 & ED250

Low energy/full energy compact swing door operators

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The **DORMA ED100 and ED250** are compact next generation electromechanical swing door operators.

Innovative engineering makes them safe, reliable, and energy-efficient at any level of traffic and in variable atmospheric conditions. Their modular design allows them to be pre-configured with plug-ins for specific applications. A minimalist DORMA Contur profile makes them a perfect fit for any application, interior or exterior.

Unlike conventional electro-hydraulic operators, the ED100 and ED250 are able to respond automatically to changes in the surrounding environment. Built-in sensors and a state-of-the-art drive system can quickly adjust how the unit operates, boosting power when required to open and close reliably and consistently.

A wide array of applications can be realized due to built-in functions and options, including wind-load control, mechanical coordinator, automatic power assist, sensor/lock timing, and more.

Universal modular design and high-tech functionality combine with ultra compact form and award-winning Contur aesthetics to make this operator a beautiful way to automate easily without drawing unwanted attention.

DORMA ED100: for doors up to 220 lb (100 kg)

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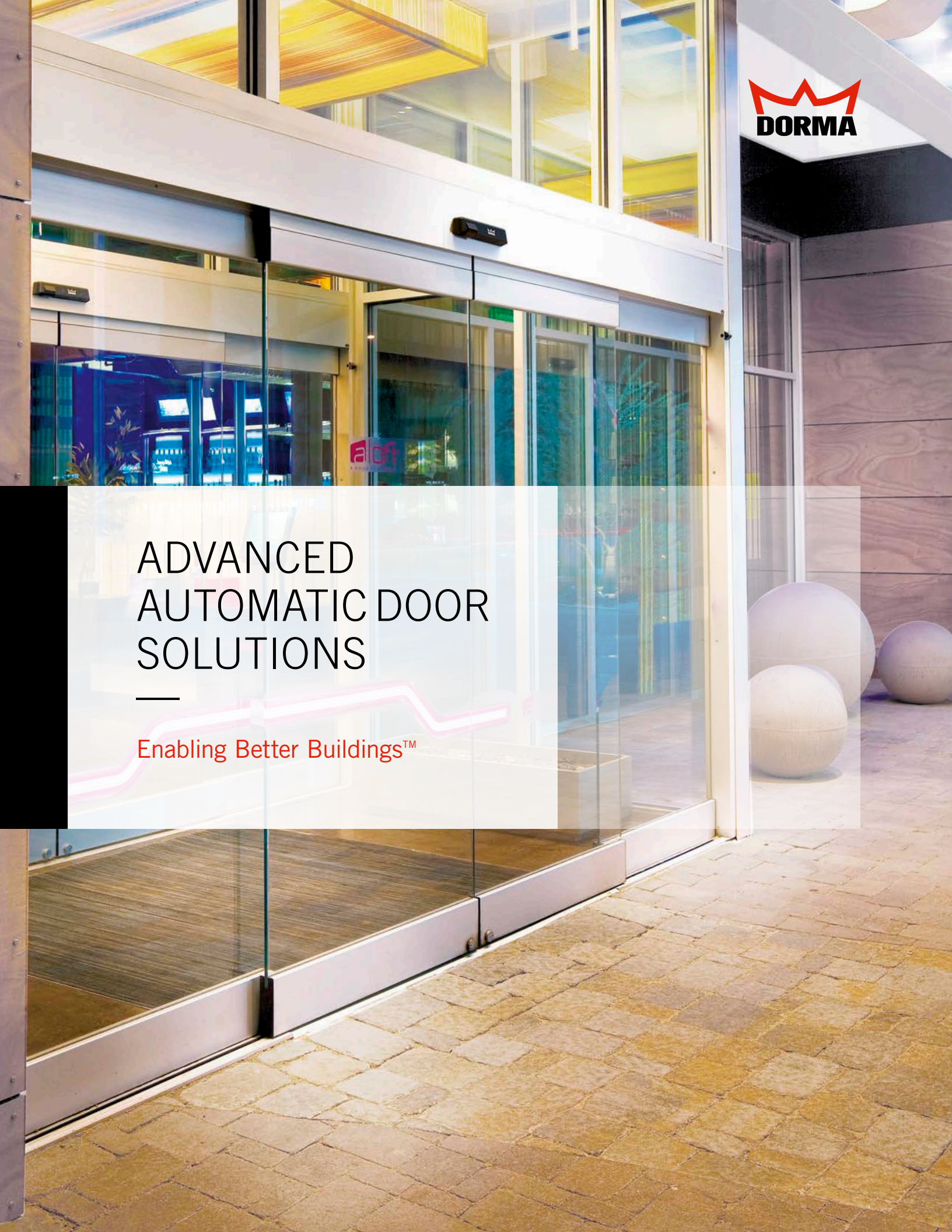

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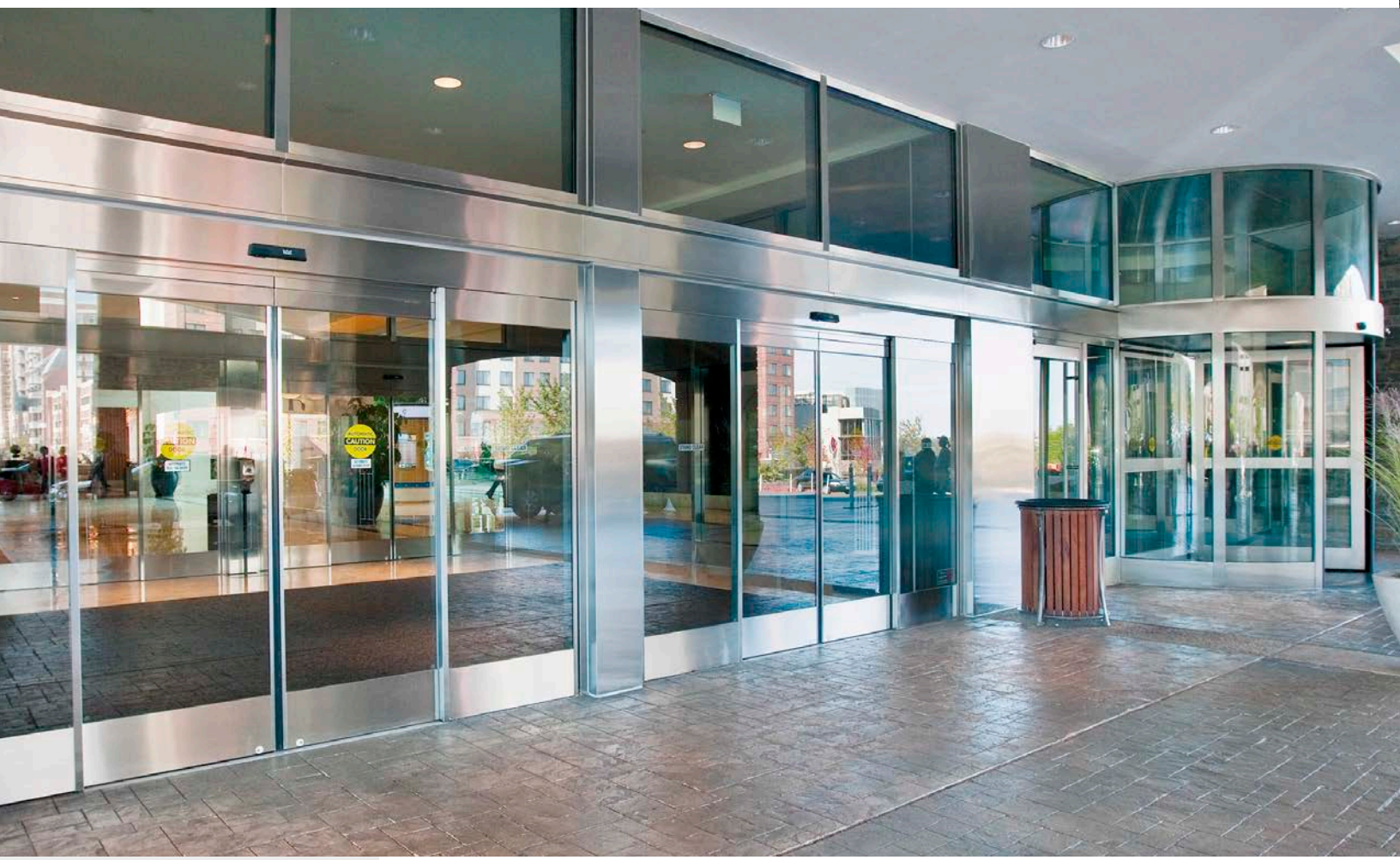

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The impressive low-profile, 4.5" × 7.5" ESA header means the doors are installed flush with the surrounding structure—creating a sleek, unbroken sight line that blends the doors into the overall architectural design.

DORMA uses a 1/4" (6 mm) thick structure to create one of the strongest headers in the industry. The self-supporting header can span up to 16' without additional reinforcement.

ESA100, 200, 300—Three intelligent, strong, low-profile ESA models suit different requirements: the non-breakout ESA100, the ESA200 with fixed sidelite, and the full-breakout ESA300.

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ESA500 All-Glass—The all-glass ESA500 door has no vertical trim so it offers an uninterrupted horizontal expanse for blending with an all-glass façade.

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DORMA ESA Auto-Telescopic sliding doors driven by proven ESA technology

NOTE: All DORMA ESA Series automatic sliding doors are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ESA-200-B1 Blast Rated Doors

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DORMA ESA-HP Hurricane-Resistant Doors

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MIAMI-DADE COUNTY APPROVED

DORMA ED400

Powerful, reliable, flexible, and intelligent

The **DORMA ED400 Swing Door Operator** is designed for demanding applications such as retail centers, airports, and health care facilities. Built for high traffic applications, it can handle doors up to 51" wide and 320 lb per leaf and can be configured for full energy (156.10) or low energy (156.19) operation.

DORMA tests the ED400 operator for one million cycles in climate-controlled test chambers. A built-in power boost helps keep the door closed when exposed to high wind or stack pressure buildup.

Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self-closing. The virtually maintenance-free unit provides smooth, silent operation.

The ED400 operator offers advanced encoder and microprocessor control, allowing it to self-learn the door weight and inertia, ensuring ultra smooth operation. The controller has dedicated circuits and LED status indicators for up to five safety sensors—no more doubled-up circuits or decreased performance. The easy three-digit display allows you to monitor the performance of every function for easy diagnostic evaluation.

DORMA ED700

Smooth, quiet operation, elegant slimline design

The **DORMA ED700 Low Energy Swing Door Operator** is the perfect solution for applications requiring barrier-free access. Simple and easy to install, the ED700 provides many features and functions to make existing doors easily accessible. The DORMA ED700 is custom ordered to match the application. All common applications for outswing and inswing doors—with either push arm or slide track arm for tight side clearance—can be adapted for barrier-free access.

The ED700's advanced encoder and microprocessor control is a feature of the ED400 as well—ensuring the same level of intelligent and smooth operation. Extruded aluminum covers in custom lengths are available to match aesthetically with the door frame.

The ED700 may be used for door widths up to 48" (1220 mm) and a maximum weight of 200 lb (91 kg). For best accessibility, the operator can open the door up to an opening angle of 110°.

NOTE: The DORMA ED400 and ED700 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ED100 & ED250

Low energy/full energy compact swing door operators

NOTE: The DORMA ED100 and ED250 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AADM certified installers.

The **DORMA ED100 and ED250** are compact next generation electromechanical swing door operators.

Innovative engineering makes them safe, reliable, and energy-efficient at any level of traffic and in variable atmospheric conditions. Their modular design allows them to be pre-configured with plug-ins for specific applications. A minimalist DORMA Contur profile makes them a perfect fit for any application, interior or exterior.

Unlike conventional electro-hydraulic operators, the ED100 and ED250 are able to respond automatically to changes in the surrounding environment. Built-in sensors and a state-of-the-art drive system can quickly adjust how the unit operates, boosting power when required to open and close reliably and consistently.

A wide array of applications can be realized due to built-in functions and options, including wind-load control, mechanical coordinator, automatic power assist, sensor/lock timing, and more.

Universal modular design and high-tech functionality combine with ultra compact form and award-winning Contur aesthetics to make this operator a beautiful way to automate easily without drawing unwanted attention.

DORMA ED100: for doors up to 220 lb (100 kg)

DORMA ED250: for doors up to 550 lb (250 kg)

DORMA MAGNEO

Powered by advanced LMD technology

Powered by linear magnetic drive technology (LMD), the **DORMA MAGNEO** is a sliding entrance system designed for any modern interior, whether public, commercial, or private. Its sleek Contur design has minimalist clean lines that blend seamlessly to meet discriminating applications. Innovative magnetic technology ensures that the MAGNEO is safe, reliable, whisper quiet, and resistant to wear.

Ideal for both new and retrofit interior applications, the MAGNEO's modern design and easy operation make it an attractive and efficient way to update both the function and appearance of existing interior doorways.

The versatile MAGNEO meets all safety requirements for low energy applications. Its extra sensitive operation instantly detects any obstruction. Activation is achieved via touchless design push plate, radio remote control, or traditional infrared motion detectors.

DORMA ICU300

Adaptable space separation

DORMA offers a complete line of ICU manual sliding doors for special care facilities such as hospitals and surgical centers. The **DORMA ICU300** enables continuous observation of patients, while allowing quick and easy access during emergency situations.

DORMA ICU300 doors come in a wide range of sizes, configurations, and finishes. Single, bi-parting, or telescopic doors are available with either two, three, four, or six panels. A recessed track or trackless guide system allows for smooth operation.

Standard features include premature breakout prevention, remote panel status monitoring, and electrostatic discharge grounding, to protect sensitive medical equipment from static electricity.

DORMA ICU1200

Combined multi-dimensional swing and bi-fold operation

The easy-to-install **DORMA ICU1200** is a perfect fit for installations with limited width and self-closing requirements. The ICU1200 combines two types of door: a double-acting swing door on one side and a bi-fold manual door on the other. Narrow stiles and an optional muntin ensure clear views for observing patients. For normal traffic, the swing door conveniently opens in either direction.

For a wider opening, the bi-fold door collapses to open up nearly the full width of the doorway.

The DORMA ICU1200 features a low profile 1.75" × 4.5" header and stainless steel pull handles on both the swing and bi-fold doors. The hinge on the bi-fold door is designed to protect fingers.

CRANE REVOLVING DOORS

1000-M/1000-A Series

The **Crane 1000 Series** is the solution when your budget-conscious project calls for the look, function, traffic flow advantage, and energy savings of a revolving door. Fabricated with rigid aluminum construction, the 1000 Series offers choices that allow you to match the doors to your entrance requirements—several size options, canopy choices, and custom painted or anodized finishes. The operating mode can be manual, automatic, or security mode.

Crane 1000-M Series doors use the same 100:1 gear manual speed control and bookfold mechanism provided on all Crane manual revolving doors. We use .125 thickness aluminum construction as the primary material, and all door construction is completed by the experienced craftsmen in our Chicago facility. The Crane 1000 series also offers an expedited production lead time for jobs with a fast-tracked completion date.

Crane 1000-A Series doors feature the same automatic drive system as Crane's higher end custom series doors. The MDS-A Modular Drive System includes an advanced microprocessor control and is torque driven for safety.

DORMA ED400-IG

Automatic in-ground floor operator

Meet access requirements and simultaneously maintain a classic look such as an arched door or an all-glass façade, with the **DORMA ED400-IG**. This revolutionary operator conceals the automatic components in the floor near the door threshold.

The ED400-IG functions in low energy or full power mode, and can be used in new construction and retrofit applications. It directs energy generated by the ED400 drive unit to the pivot in a rotating motion—ensuring consistently smooth operation.

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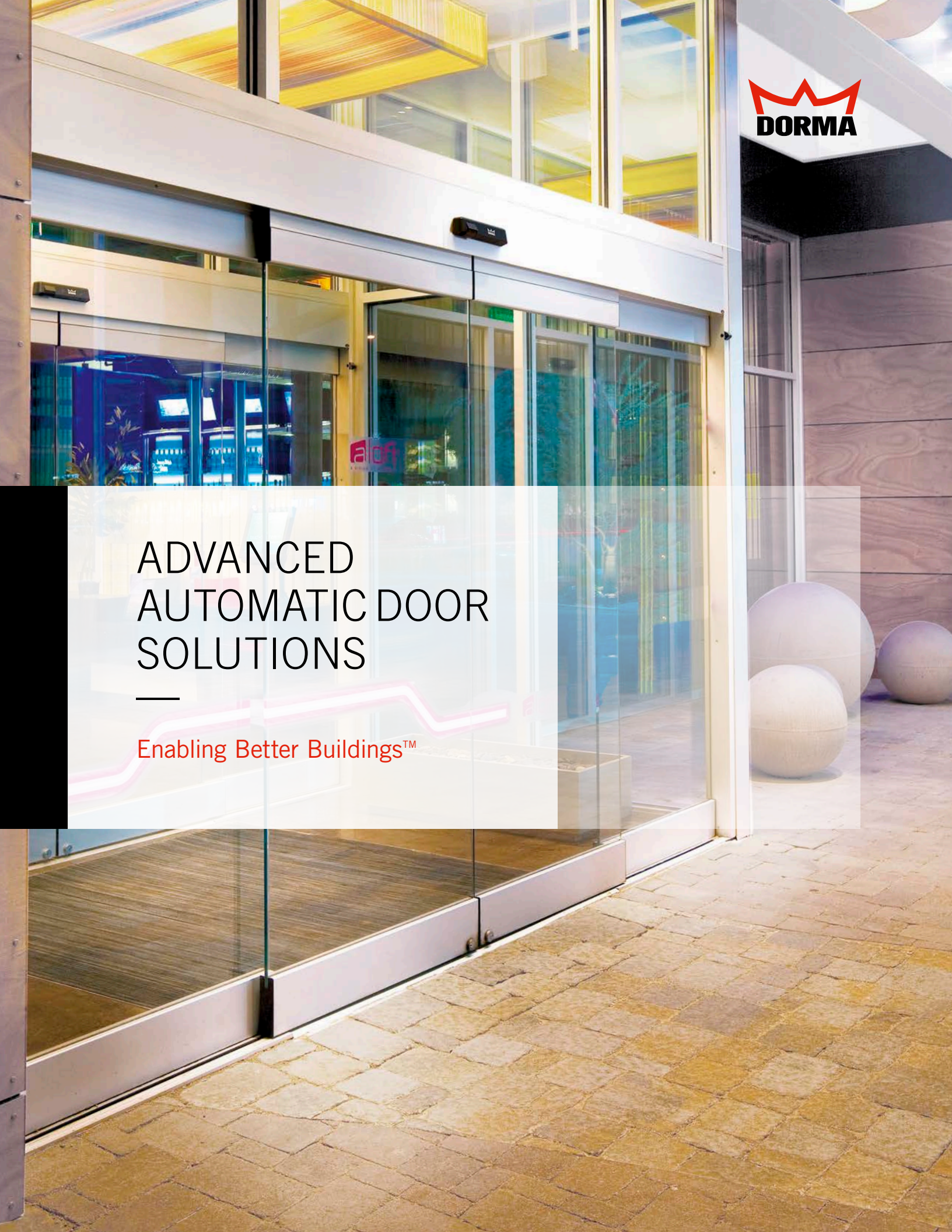

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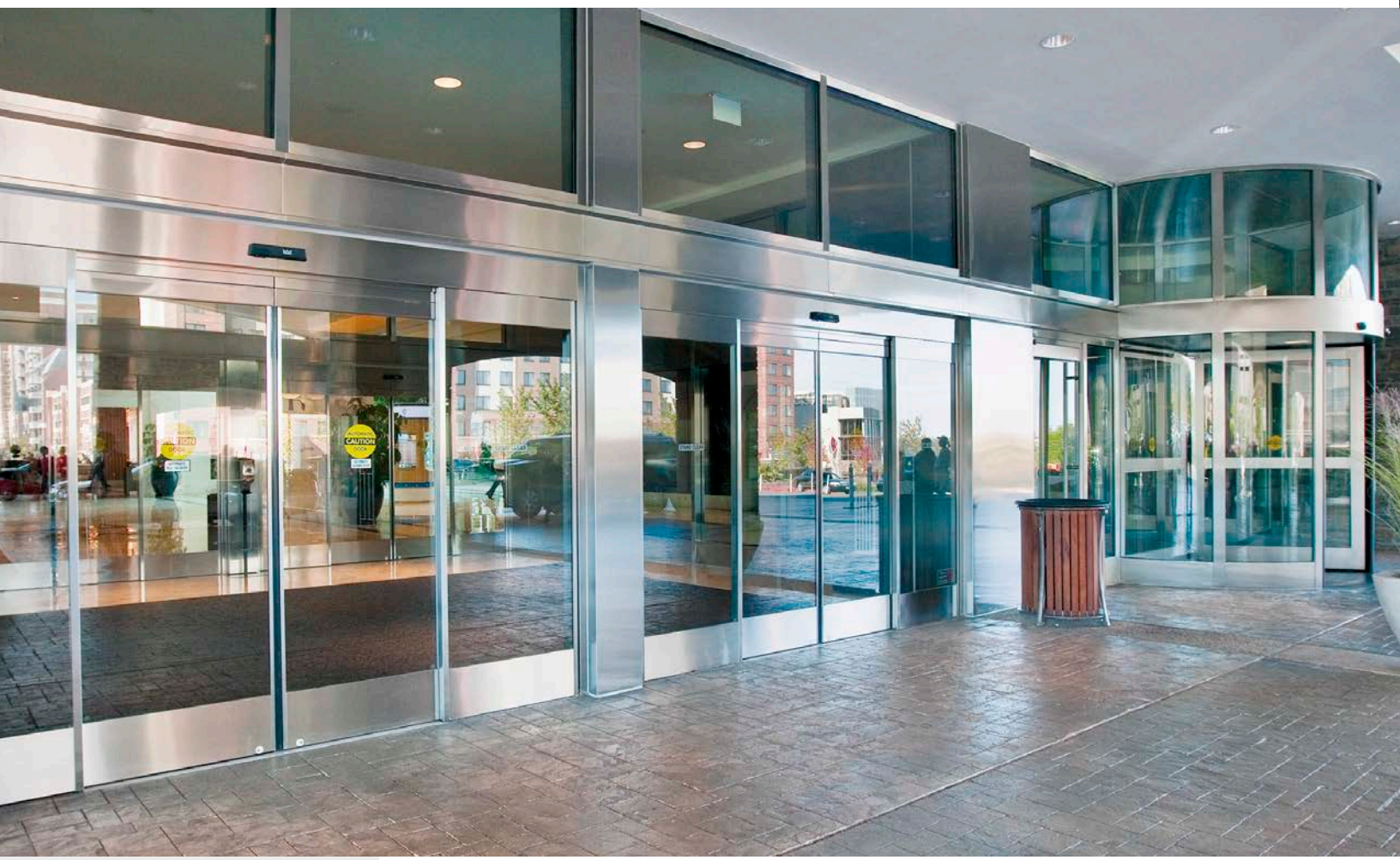

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DORMA can review your product selection to insure it is project specific and code compliant.

DORMA is a leading innovator of automatic door systems, with entrance solutions for practically any application—retail, health care, office buildings, airports, hospitality, and more.

Our sliding and swinging door systems cover a wide range of applications and finishes.

Both custom designed and standard systems are available. Each product offers exclusive features, such as an advanced microprocessor controller for precision performance and long lasting reliability. A variety of sensors engineered to provide optimum safety are available to meet every application.

DORMA also offers both Crane manual and automatic revolving doors, which are ideal for high traffic applications that require simultaneous entry and exit, controlled access, or an air lock to help control energy costs.

DORMA ESA

Stylish, durable, and powerful automatic sliding doors

Providing strength, beauty, and technology all in one package, the **ESA Automatic Sliding Door** is one of the most intelligent, efficient, and technologically advanced sliding doors on the market. Powerful ESA doors operate door panels weighing up to 350 lb, while a continuous self-monitoring control system adds an extra measure of safety and efficiency.

The impressive low-profile, 4.5" × 7.5" ESA header means the doors are installed flush with the surrounding structure—creating a sleek, unbroken sight line that blends the doors into the overall architectural design.

DORMA uses a 1/4" (6 mm) thick structure to create one of the strongest headers in the industry. The self-supporting header can span up to 16' without additional reinforcement.

ESA100, 200, 300—Three intelligent, strong, low-profile ESA models suit different requirements: the non-breakout ESA100, the ESA200 with fixed sidelite, and the full-breakout ESA300.

ESA400 Fine Frame—The Fine Frame style is a perfect marriage of beauty and functionality. Also featuring full breakout capability, the ESA400 combines full view aesthetics with excellent weather-sealing qualities.

ESA500 All-Glass—The all-glass ESA500 door has no vertical trim so it offers an uninterrupted horizontal expanse for blending with an all-glass façade.

DORMA also creates custom ESA doors. For example, doors utilizing stainless steel or polished bronze can be welded to eliminate seams and ensure a beautiful appearance for the lifetime of the door.

DORMA ESA Auto-Telescopic sliding doors driven by proven ESA technology

NOTE: All DORMA ESA Series automatic sliding doors are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ESA-200-B1 Blast Rated Doors

The **ESA200-B1** is specifically designed to meet US DoD requirements for antiterrorism building standards (UFC 4-010-01) with conventional standoff distances, commonly required on military bases and public buildings. These doors are available at standard height and up to 14' wide packages with medium stiles and enhanced security 3- or 5-point locking.

DORMA ESA-HP Hurricane-Resistant Doors

The **ESA-HP** automatic sliding door meets Dade County and Florida Building Code regulations, keeps your building safe and secure, provides smooth and durable operation—all the while providing an aesthetically pleasing entrance for your place of business.

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DORMA ED400

Powerful, reliable, flexible, and intelligent

The **DORMA ED400 Swing Door Operator** is designed for demanding applications such as retail centers, airports, and health care facilities. Built for high traffic applications, it can handle doors up to 51" wide and 320 lb per leaf and can be configured for full energy (156.10) or low energy (156.19) operation.

DORMA tests the ED400 operator for one million cycles in climate-controlled test chambers. A built-in power boost helps keep the door closed when exposed to high wind or stack pressure buildup.

Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self-closing. The virtually maintenance-free unit provides smooth, silent operation.

The ED400 operator offers advanced encoder and microprocessor control, allowing it to self-learn the door weight and inertia, ensuring ultra smooth operation. The controller has dedicated circuits and LED status indicators for up to five safety sensors—no more doubled-up circuits or decreased performance. The easy three-digit display allows you to monitor the performance of every function for easy diagnostic evaluation.

DORMA ED700

Smooth, quiet operation, elegant slimline design

The **DORMA ED700 Low Energy Swing Door Operator** is the perfect solution for applications requiring barrier-free access. Simple and easy to install, the ED700 provides many features and functions to make existing doors easily accessible. The DORMA ED700 is custom ordered to match the application. All common applications for outswing and inswing doors—with either push arm or slide track arm for tight side clearance—can be adapted for barrier-free access.

The ED700's advanced encoder and microprocessor control is a feature of the ED400 as well—ensuring the same level of intelligent and smooth operation. Extruded aluminum covers in custom lengths are available to match aesthetically with the door frame.

The ED700 may be used for door widths up to 48" (1220 mm) and a maximum weight of 200 lb (91 kg). For best accessibility, the operator can open the door up to an opening angle of 110°.

NOTE: The DORMA ED400 and ED700 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ED100 & ED250

Low energy/full energy compact swing door operators

NOTE: The DORMA ED100 and ED250 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AADM certified installers.

The **DORMA ED100 and ED250** are compact next generation electromechanical swing door operators.

Innovative engineering makes them safe, reliable, and energy-efficient at any level of traffic and in variable atmospheric conditions. Their modular design allows them to be pre-configured with plug-ins for specific applications. A minimalist DORMA Contur profile makes them a perfect fit for any application, interior or exterior.

Unlike conventional electro-hydraulic operators, the ED100 and ED250 are able to respond automatically to changes in the surrounding environment. Built-in sensors and a state-of-the-art drive system can quickly adjust how the unit operates, boosting power when required to open and close reliably and consistently.

A wide array of applications can be realized due to built-in functions and options, including wind-load control, mechanical coordinator, automatic power assist, sensor/lock timing, and more.

Universal modular design and high-tech functionality combine with ultra compact form and award-winning Contur aesthetics to make this operator a beautiful way to automate easily without drawing unwanted attention.

DORMA ED100: for doors up to 220 lb (100 kg)

DORMA ED250: for doors up to 550 lb (250 kg)

DORMA MAGNEO

Powered by advanced LMD technology

Powered by linear magnetic drive technology (LMD), the **DORMA MAGNEO** is a sliding entrance system designed for any modern interior, whether public, commercial, or private. Its sleek Contur design has minimalist clean lines that blend seamlessly to meet discriminating applications. Innovative magnetic technology ensures that the MAGNEO is safe, reliable, whisper quiet, and resistant to wear.

Ideal for both new and retrofit interior applications, the MAGNEO's modern design and easy operation make it an attractive and efficient way to update both the function and appearance of existing interior doorways.

The versatile MAGNEO meets all safety requirements for low energy applications. Its extra sensitive operation instantly detects any obstruction. Activation is achieved via touchless design push plate, radio remote control, or traditional infrared motion detectors.

DORMA ICU300

Adaptable space separation

DORMA offers a complete line of ICU manual sliding doors for special care facilities such as hospitals and surgical centers. The **DORMA ICU300** enables continuous observation of patients, while allowing quick and easy access during emergency situations.

DORMA ICU300 doors come in a wide range of sizes, configurations, and finishes. Single, bi-parting, or telescopic doors are available with either two, three, four, or six panels. A recessed track or trackless guide system allows for smooth operation.

Standard features include premature breakout prevention, remote panel status monitoring, and electrostatic discharge grounding, to protect sensitive medical equipment from static electricity.

DORMA ICU1200

Combined multi-dimensional swing and bi-fold operation

The easy-to-install **DORMA ICU1200** is a perfect fit for installations with limited width and self-closing requirements. The ICU1200 combines two types of door: a double-acting swing door on one side and a bi-fold manual door on the other. Narrow stiles and an optional muntin ensure clear views for observing patients. For normal traffic, the swing door conveniently opens in either direction.

For a wider opening, the bi-fold door collapses to open up nearly the full width of the doorway.

The DORMA ICU1200 features a low profile 1.75" × 4.5" header and stainless steel pull handles on both the swing and bi-fold doors. The hinge on the bi-fold door is designed to protect fingers.

CRANE REVOLVING DOORS

1000-M/1000-A Series

The **Crane 1000 Series** is the solution when your budget-conscious project calls for the look, function, traffic flow advantage, and energy savings of a revolving door. Fabricated with rigid aluminum construction, the 1000 Series offers choices that allow you to match the doors to your entrance requirements—several size options, canopy choices, and custom painted or anodized finishes. The operating mode can be manual, automatic, or security mode.

Crane 1000-M Series doors use the same 100:1 gear manual speed control and bookfold mechanism provided on all Crane manual revolving doors. We use .125 thickness aluminum construction as the primary material, and all door construction is completed by the experienced craftsmen in our Chicago facility. The Crane 1000 series also offers an expedited production lead time for jobs with a fast-tracked completion date.

Crane 1000-A Series doors feature the same automatic drive system as Crane's higher end custom series doors. The MDS-A Modular Drive System includes an advanced microprocessor control and is torque driven for safety.

DORMA ED400-IG

Automatic in-ground floor operator

Meet access requirements and simultaneously maintain a classic look such as an arched door or an all-glass façade, with the **DORMA ED400-IG**. This revolutionary operator conceals the automatic components in the floor near the door threshold.

The ED400-IG functions in low energy or full power mode, and can be used in new construction and retrofit applications. It directs energy generated by the ED400 drive unit to the pivot in a rotating motion—ensuring consistently smooth operation.

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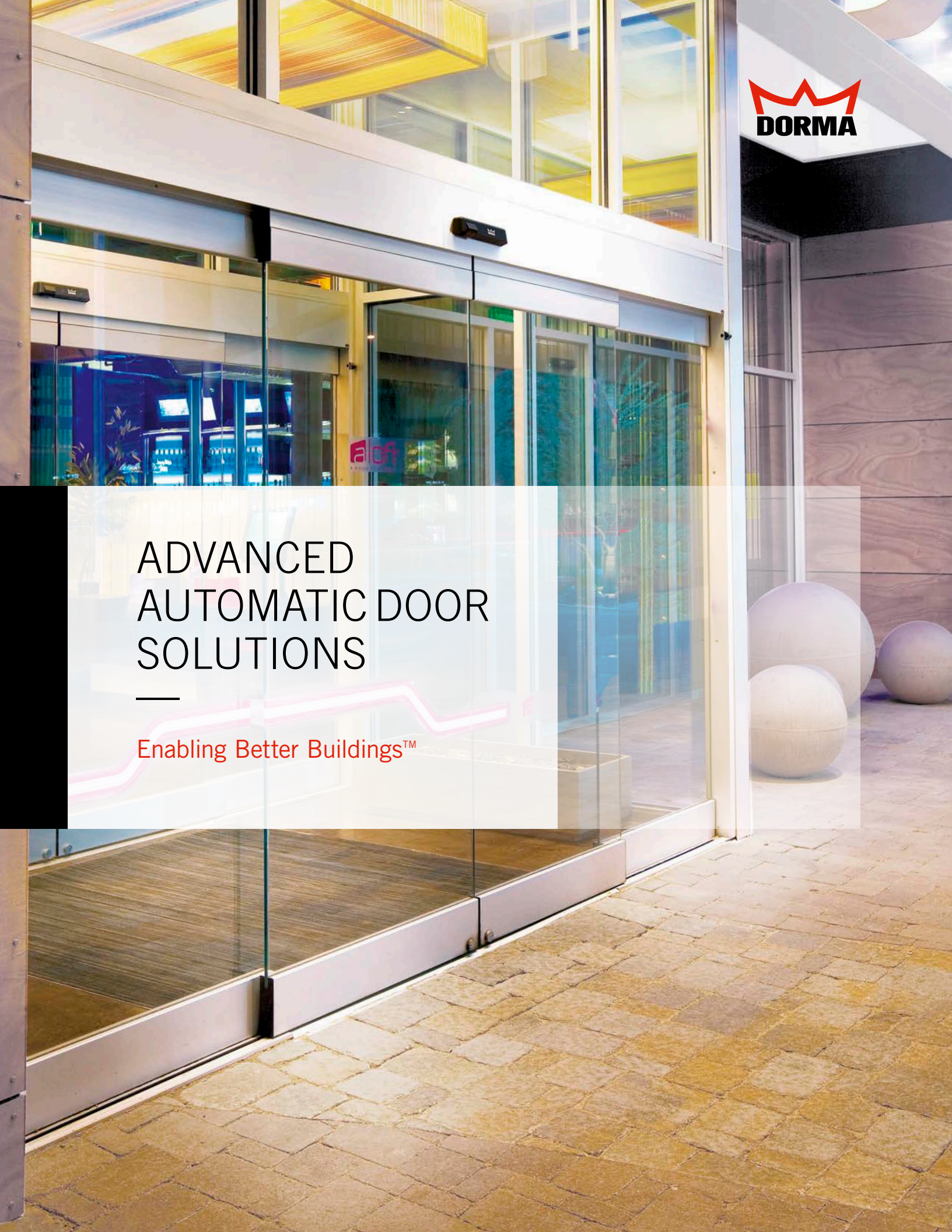

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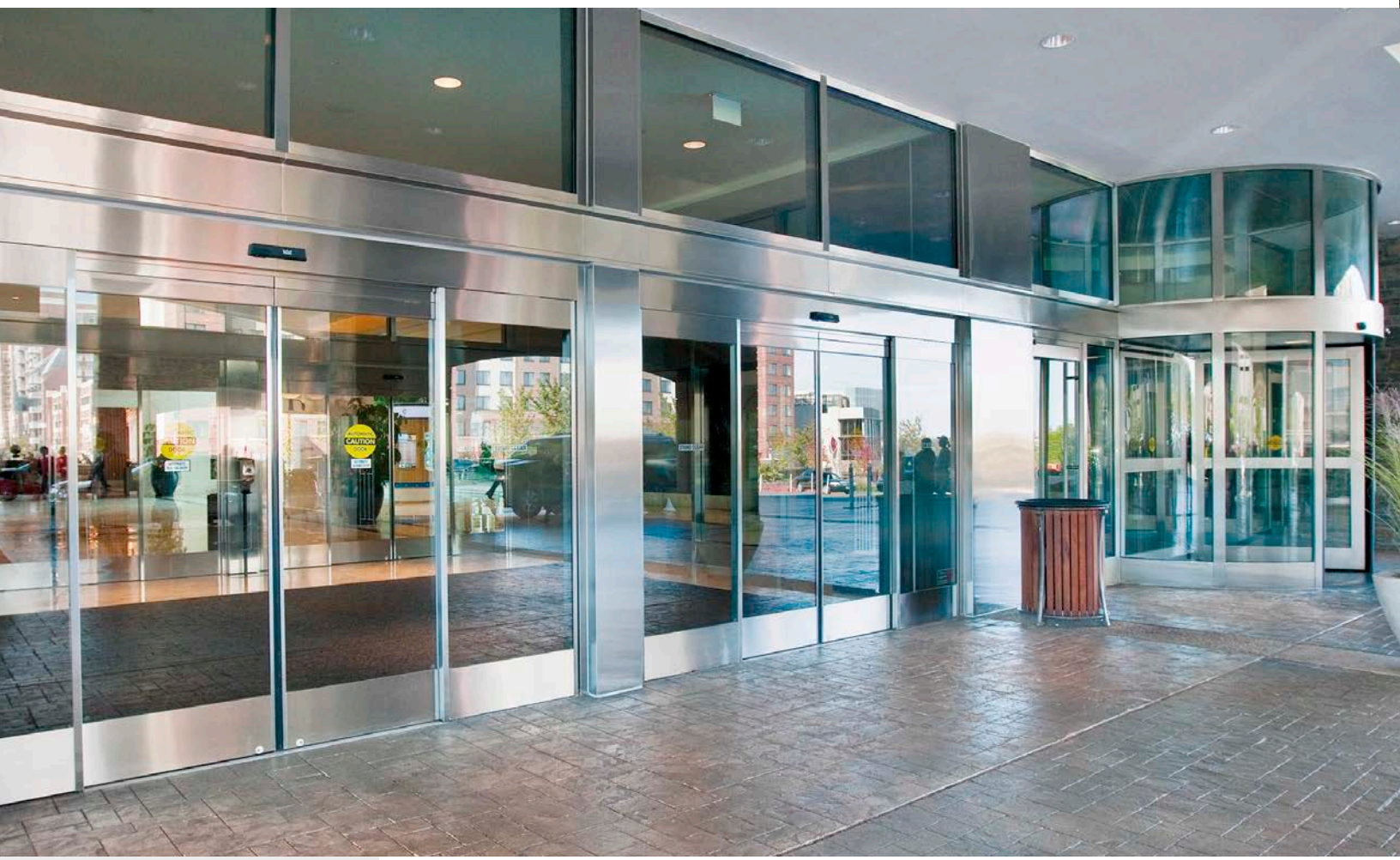

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Our sliding and swinging door systems cover a wide range of applications and finishes.

Both custom designed and standard systems are available. Each product offers exclusive features, such as an advanced microprocessor controller for precision performance and long lasting reliability. A variety of sensors engineered to provide optimum safety are available to meet every application.

DORMA also offers both Crane manual and automatic revolving doors, which are ideal for high traffic applications that require simultaneous entry and exit, controlled access, or an air lock to help control energy costs.

DORMA ESA

Stylish, durable, and powerful automatic sliding doors

Providing strength, beauty, and technology all in one package, the **ESA Automatic Sliding Door** is one of the most intelligent, efficient, and technologically advanced sliding doors on the market. Powerful ESA doors operate door panels weighing up to 350 lb, while a continuous self-monitoring control system adds an extra measure of safety and efficiency.

The impressive low-profile, 4.5" × 7.5" ESA header means the doors are installed flush with the surrounding structure—creating a sleek, unbroken sight line that blends the doors into the overall architectural design.

DORMA uses a 1/4" (6 mm) thick structure to create one of the strongest headers in the industry. The self-supporting header can span up to 16' without additional reinforcement.

ESA100, 200, 300—Three intelligent, strong, low-profile ESA models suit different requirements: the non-breakout ESA100, the ESA200 with fixed sidelite, and the full-breakout ESA300.

ESA400 Fine Frame—The Fine Frame style is a perfect marriage of beauty and functionality. Also featuring full breakout capability, the ESA400 combines full view aesthetics with excellent weather-sealing qualities.

ESA500 All-Glass—The all-glass ESA500 door has no vertical trim so it offers an uninterrupted horizontal expanse for blending with an all-glass façade.

DORMA also creates custom ESA doors. For example, doors utilizing stainless steel or polished bronze can be welded to eliminate seams and ensure a beautiful appearance for the lifetime of the door.

DORMA ESA Auto-Telescopic sliding doors driven by proven ESA technology

NOTE: All DORMA ESA Series automatic sliding doors are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ESA-200-B1 Blast Rated Doors

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DORMA ESA-HP Hurricane-Resistant Doors

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DORMA ED400

Powerful, reliable, flexible, and intelligent

The **DORMA ED400 Swing Door Operator** is designed for demanding applications such as retail centers, airports, and health care facilities. Built for high traffic applications, it can handle doors up to 51" wide and 320 lb per leaf and can be configured for full energy (156.10) or low energy (156.19) operation.

DORMA tests the ED400 operator for one million cycles in climate-controlled test chambers. A built-in power boost helps keep the door closed when exposed to high wind or stack pressure buildup.

Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self-closing. The virtually maintenance-free unit provides smooth, silent operation.

The ED400 operator offers advanced encoder and microprocessor control, allowing it to self-learn the door weight and inertia, ensuring ultra smooth operation. The controller has dedicated circuits and LED status indicators for up to five safety sensors—no more doubled-up circuits or decreased performance. The easy three-digit display allows you to monitor the performance of every function for easy diagnostic evaluation.

DORMA ED700

Smooth, quiet operation, elegant slimline design

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The ED700's advanced encoder and microprocessor control is a feature of the ED400 as well—ensuring the same level of intelligent and smooth operation. Extruded aluminum covers in custom lengths are available to match aesthetically with the door frame.

The ED700 may be used for door widths up to 48" (1220 mm) and a maximum weight of 200 lb (91 kg). For best accessibility, the operator can open the door up to an opening angle of 110°.

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Low energy/full energy compact swing door operators

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Unlike conventional electro-hydraulic operators, the ED100 and ED250 are able to respond automatically to changes in the surrounding environment. Built-in sensors and a state-of-the-art drive system can quickly adjust how the unit operates, boosting power when required to open and close reliably and consistently.

A wide array of applications can be realized due to built-in functions and options, including wind-load control, mechanical coordinator, automatic power assist, sensor/lock timing, and more.

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CRANE REVOLVING DOORS

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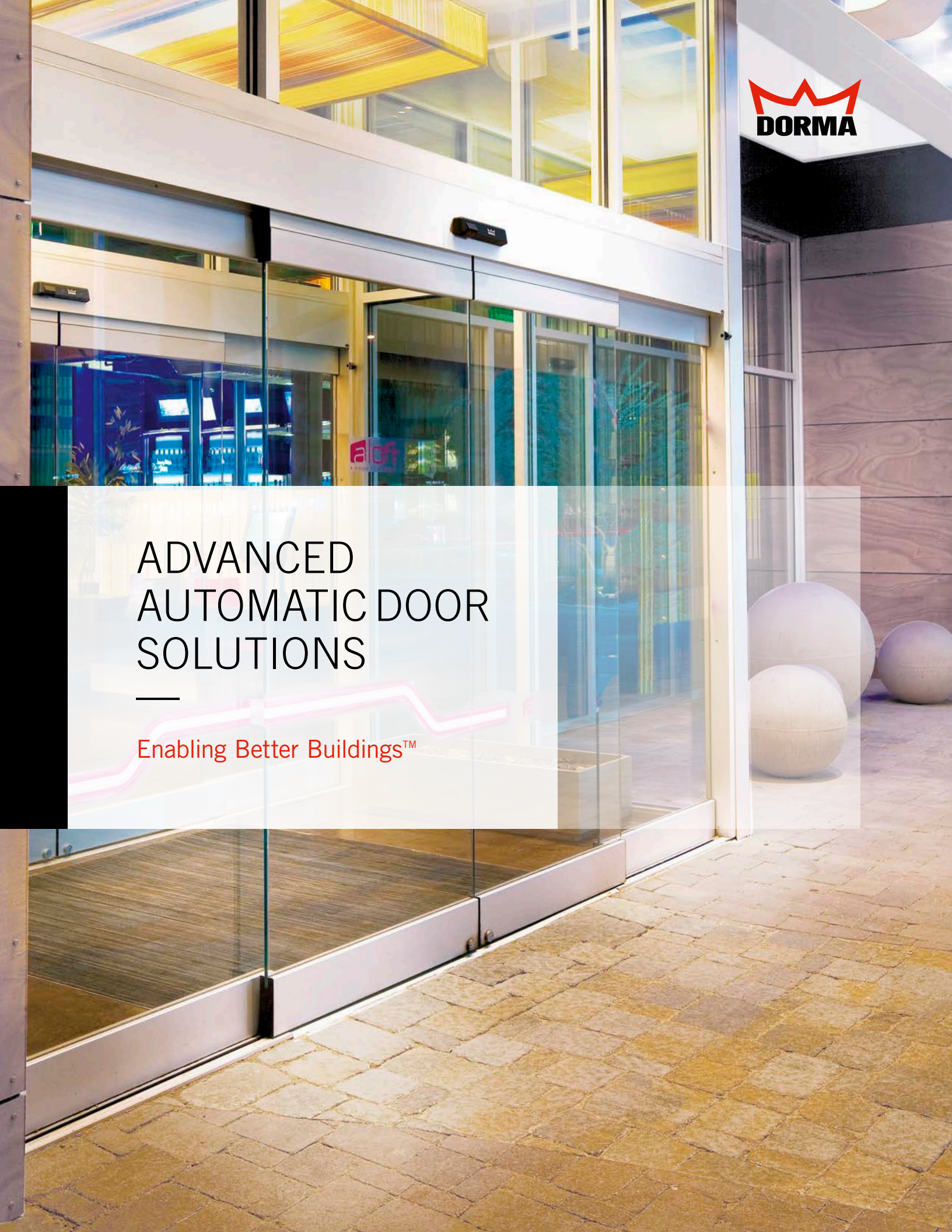

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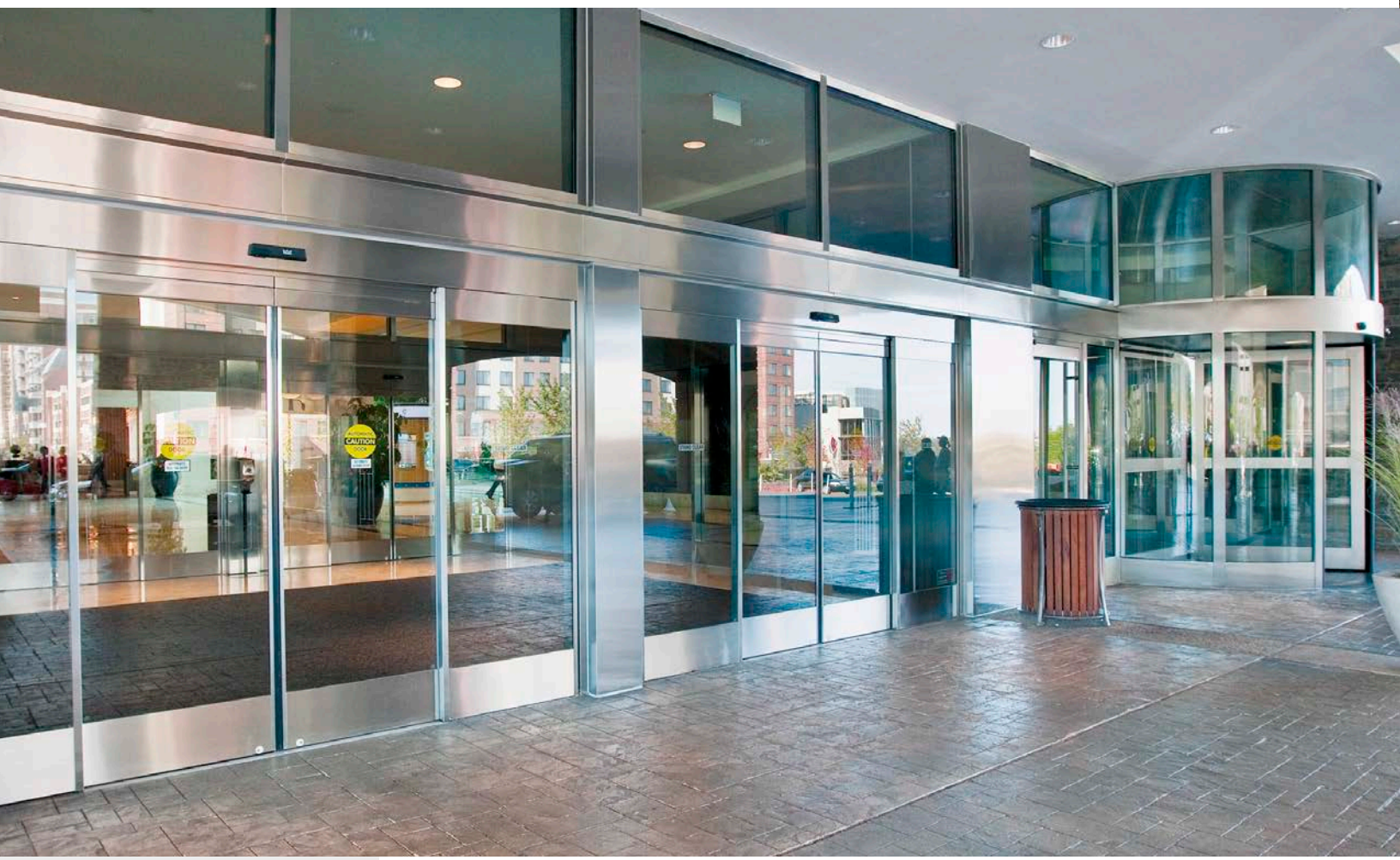

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DORMA also offers both Crane manual and automatic revolving doors, which are ideal for high traffic applications that require simultaneous entry and exit, controlled access, or an air lock to help control energy costs.

DORMA ESA

Stylish, durable, and powerful automatic sliding doors

Providing strength, beauty, and technology all in one package, the **ESA Automatic Sliding Door** is one of the most intelligent, efficient, and technologically advanced sliding doors on the market. Powerful ESA doors operate door panels weighing up to 350 lb, while a continuous self-monitoring control system adds an extra measure of safety and efficiency.

The impressive low-profile, 4.5" × 7.5" ESA header means the doors are installed flush with the surrounding structure—creating a sleek, unbroken sight line that blends the doors into the overall architectural design.

DORMA uses a 1/4" (6 mm) thick structure to create one of the strongest headers in the industry. The self-supporting header can span up to 16' without additional reinforcement.

ESA100, 200, 300—Three intelligent, strong, low-profile ESA models suit different requirements: the non-breakout ESA100, the ESA200 with fixed sidelite, and the full-breakout ESA300.

ESA400 Fine Frame—The Fine Frame style is a perfect marriage of beauty and functionality. Also featuring full breakout capability, the ESA400 combines full view aesthetics with excellent weather-sealing qualities.

ESA500 All-Glass—The all-glass ESA500 door has no vertical trim so it offers an uninterrupted horizontal expanse for blending with an all-glass façade.

DORMA also creates custom ESA doors. For example, doors utilizing stainless steel or polished bronze can be welded to eliminate seams and ensure a beautiful appearance for the lifetime of the door.

DORMA ESA Auto-Telescopic sliding doors driven by proven ESA technology

NOTE: All DORMA ESA Series automatic sliding doors are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ESA-200-B1 Blast Rated Doors

The **ESA200-B1** is specifically designed to meet US DoD requirements for antiterrorism building standards (UFC 4-010-01) with conventional standoff distances, commonly required on military bases and public buildings. These doors are available at standard height and up to 14' wide packages with medium stiles and enhanced security 3- or 5-point locking.

DORMA ESA-HP Hurricane-Resistant Doors

The **ESA-HP** automatic sliding door meets Dade County and Florida Building Code regulations, keeps your building safe and secure, provides smooth and durable operation—all the while providing an aesthetically pleasing entrance for your place of business.

MIAMI-DADE COUNTY APPROVED

DORMA ED400

Powerful, reliable, flexible, and intelligent

The **DORMA ED400 Swing Door Operator** is designed for demanding applications such as retail centers, airports, and health care facilities. Built for high traffic applications, it can handle doors up to 51" wide and 320 lb per leaf and can be configured for full energy (156.10) or low energy (156.19) operation.

DORMA tests the ED400 operator for one million cycles in climate-controlled test chambers. A built-in power boost helps keep the door closed when exposed to high wind or stack pressure buildup.

Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self-closing. The virtually maintenance-free unit provides smooth, silent operation.

The ED400 operator offers advanced encoder and microprocessor control, allowing it to self-learn the door weight and inertia, ensuring ultra smooth operation. The controller has dedicated circuits and LED status indicators for up to five safety sensors—no more doubled-up circuits or decreased performance. The easy three-digit display allows you to monitor the performance of every function for easy diagnostic evaluation.

DORMA ED700

Smooth, quiet operation, elegant slimline design

The **DORMA ED700 Low Energy Swing Door Operator** is the perfect solution for applications requiring barrier-free access. Simple and easy to install, the ED700 provides many features and functions to make existing doors easily accessible. The DORMA ED700 is custom ordered to match the application. All common applications for outswing and inswing doors—with either push arm or slide track arm for tight side clearance—can be adapted for barrier-free access.

The ED700's advanced encoder and microprocessor control is a feature of the ED400 as well—ensuring the same level of intelligent and smooth operation. Extruded aluminum covers in custom lengths are available to match aesthetically with the door frame.

The ED700 may be used for door widths up to 48" (1220 mm) and a maximum weight of 200 lb (91 kg). For best accessibility, the operator can open the door up to an opening angle of 110°.

NOTE: The DORMA ED400 and ED700 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ED100 & ED250

Low energy/full energy compact swing door operators

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The **DORMA ED100 and ED250** are compact next generation electromechanical swing door operators.

Innovative engineering makes them safe, reliable, and energy-efficient at any level of traffic and in variable atmospheric conditions. Their modular design allows them to be pre-configured with plug-ins for specific applications. A minimalist DORMA Contur profile makes them a perfect fit for any application, interior or exterior.

Unlike conventional electro-hydraulic operators, the ED100 and ED250 are able to respond automatically to changes in the surrounding environment. Built-in sensors and a state-of-the-art drive system can quickly adjust how the unit operates, boosting power when required to open and close reliably and consistently.

A wide array of applications can be realized due to built-in functions and options, including wind-load control, mechanical coordinator, automatic power assist, sensor/lock timing, and more.

Universal modular design and high-tech functionality combine with ultra compact form and award-winning Contur aesthetics to make this operator a beautiful way to automate easily without drawing unwanted attention.

DORMA ED100: for doors up to 220 lb (100 kg)

DORMA ED250: for doors up to 550 lb (250 kg)

DORMA MAGNEO

Powered by advanced LMD technology

Powered by linear magnetic drive technology (LMD), the **DORMA MAGNEO** is a sliding entrance system designed for any modern interior, whether public, commercial, or private. Its sleek Contur design has minimalist clean lines that blend seamlessly to meet discriminating applications. Innovative magnetic technology ensures that the MAGNEO is safe, reliable, whisper quiet, and resistant to wear.

Ideal for both new and retrofit interior applications, the MAGNEO's modern design and easy operation make it an attractive and efficient way to update both the function and appearance of existing interior doorways.

The versatile MAGNEO meets all safety requirements for low energy applications. Its extra sensitive operation instantly detects any obstruction. Activation is achieved via touchless design push plate, radio remote control, or traditional infrared motion detectors.

DORMA ICU300

Adaptable space separation

DORMA offers a complete line of ICU manual sliding doors for special care facilities such as hospitals and surgical centers. The **DORMA ICU300** enables continuous observation of patients, while allowing quick and easy access during emergency situations.

DORMA ICU300 doors come in a wide range of sizes, configurations, and finishes. Single, bi-parting, or telescopic doors are available with either two, three, four, or six panels. A recessed track or trackless guide system allows for smooth operation.

Standard features include premature breakout prevention, remote panel status monitoring, and electrostatic discharge grounding, to protect sensitive medical equipment from static electricity.

DORMA ICU1200

Combined multi-dimensional swing and bi-fold operation

The easy-to-install **DORMA ICU1200** is a perfect fit for installations with limited width and self-closing requirements. The ICU1200 combines two types of door: a double-acting swing door on one side and a bi-fold manual door on the other. Narrow stiles and an optional muntin ensure clear views for observing patients. For normal traffic, the swing door conveniently opens in either direction.

For a wider opening, the bi-fold door collapses to open up nearly the full width of the doorway.

The DORMA ICU1200 features a low profile 1.75" × 4.5" header and stainless steel pull handles on both the swing and bi-fold doors. The hinge on the bi-fold door is designed to protect fingers.

CRANE REVOLVING DOORS

1000-M/1000-A Series

The **Crane 1000 Series** is the solution when your budget-conscious project calls for the look, function, traffic flow advantage, and energy savings of a revolving door. Fabricated with rigid aluminum construction, the 1000 Series offers choices that allow you to match the doors to your entrance requirements—several size options, canopy choices, and custom painted or anodized finishes. The operating mode can be manual, automatic, or security mode.

Crane 1000-M Series doors use the same 100:1 gear manual speed control and bookfold mechanism provided on all Crane manual revolving doors. We use .125 thickness aluminum construction as the primary material, and all door construction is completed by the experienced craftsmen in our Chicago facility. The Crane 1000 series also offers an expedited production lead time for jobs with a fast-tracked completion date.

Crane 1000-A Series doors feature the same automatic drive system as Crane's higher end custom series doors. The MDS-A Modular Drive System includes an advanced microprocessor control and is torque driven for safety.

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Automatic in-ground floor operator

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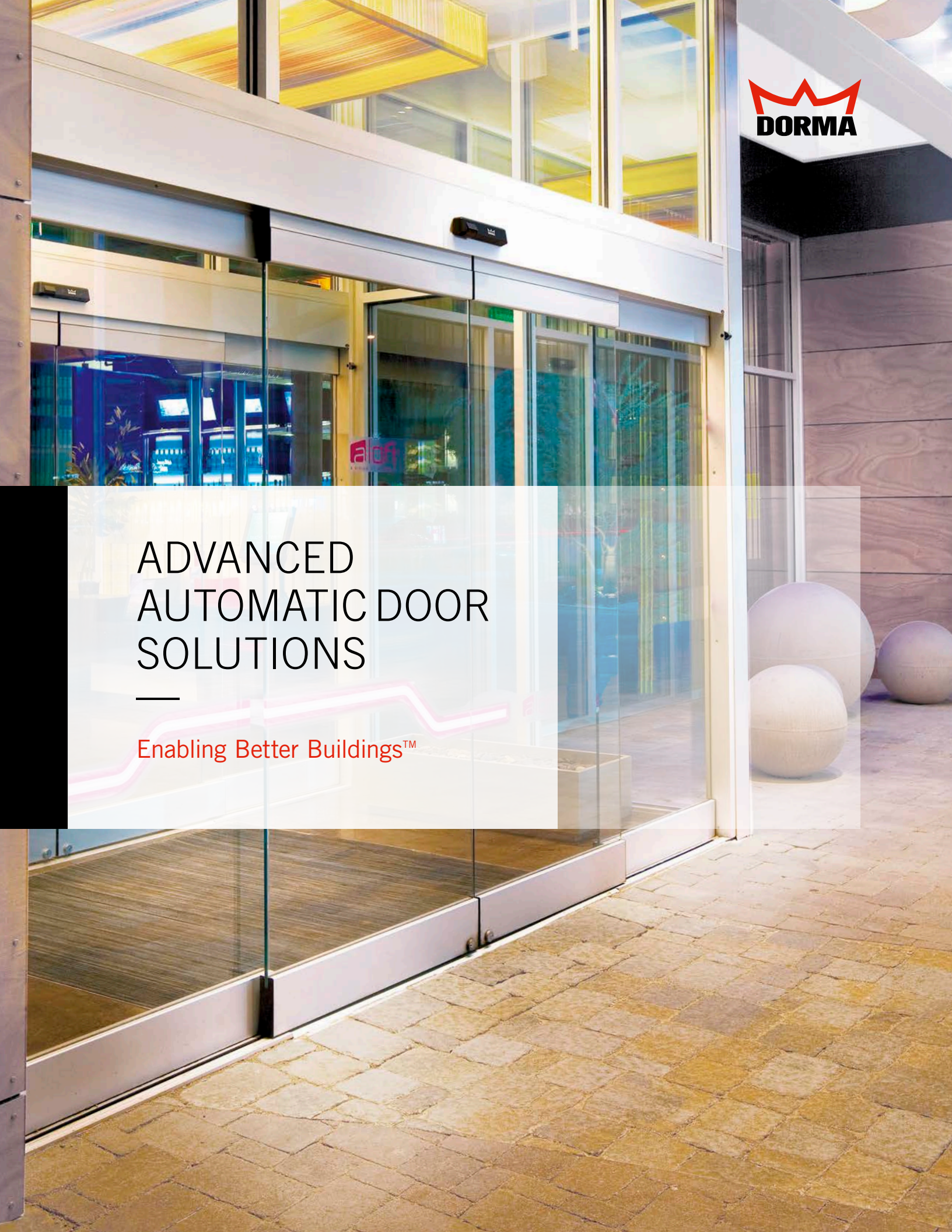

ADVANCED AUTOMATIC DOOR SOLUTIONS

Enabling Better Buildings™

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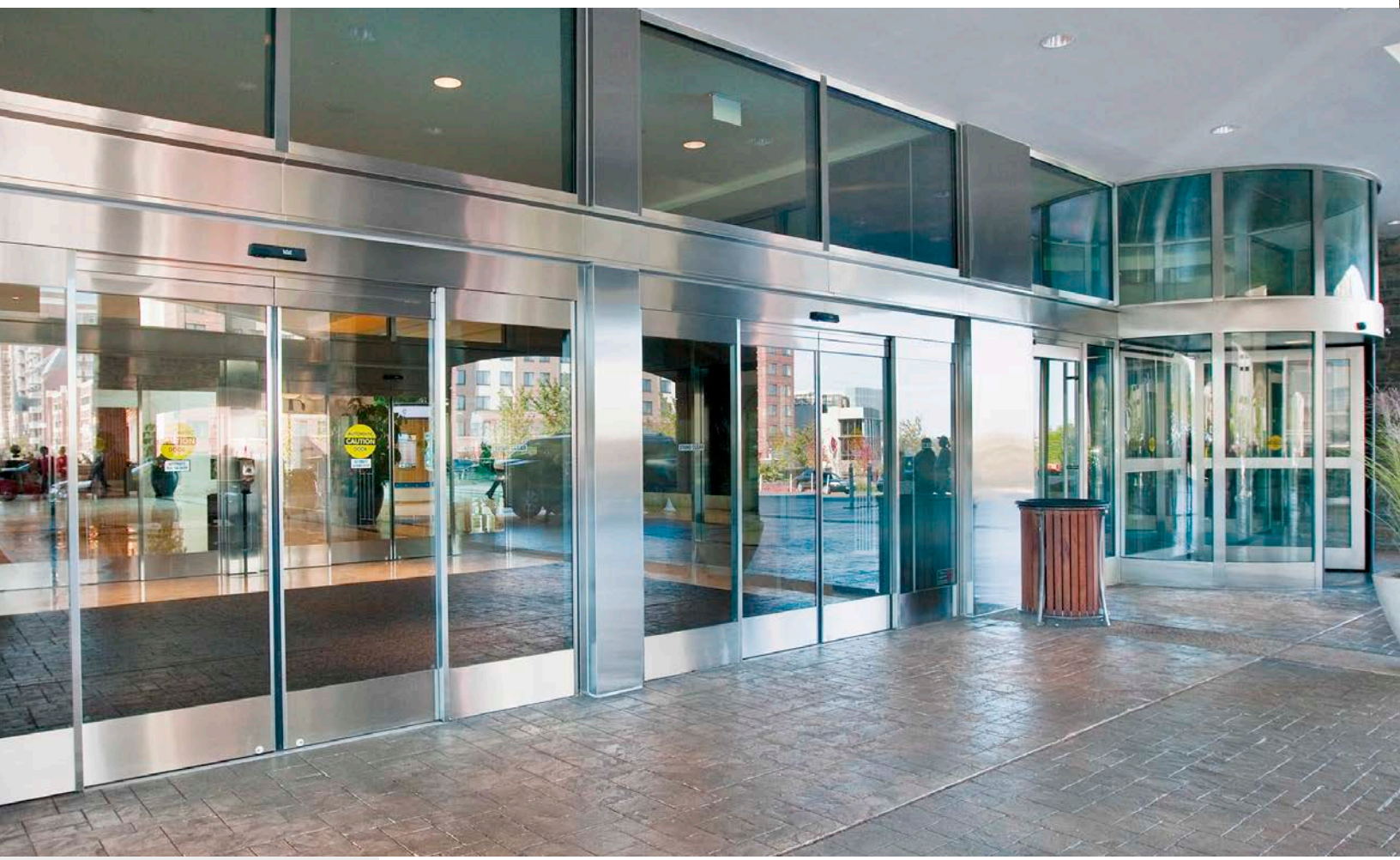

For project specification, design, and code-compliance assistance, call the DORMA Architectural Support Desk at 866-401-6063.

DORMA can review your product selection to insure it is project specific and code compliant.

DORMA is a leading innovator of automatic door systems, with entrance solutions for practically any application—retail, health care, office buildings, airports, hospitality, and more.

Our sliding and swinging door systems cover a wide range of applications and finishes.

Both custom designed and standard systems are available. Each product offers exclusive features, such as an advanced microprocessor controller for precision performance and long lasting reliability. A variety of sensors engineered to provide optimum safety are available to meet every application.

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Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self-closing. The virtually maintenance-free unit provides smooth, silent operation.

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800-523-8483
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Automatic Sliding Door

Owner's Manual

Distributed by:

DORMA AUTOMATICS, Inc.
924 Sherwood Drive
Lake Bluff, IL 60044
E-mail: automatics@dorma-usa.com
Toll-Free: 877-367-6211
Fax: 877-423-7999

Important Installation Instruction

ALL INSTALLATIONS SHOULD ONLY BE PERFORMED BY TRAINED OR AUTHORIZED PERSONS

Warning - To reduce the risk of injury:

1. **Carefully Read And Follow All Installation Instructions**
2. This unit should only be installed in a rough opening capable of providing proper structural support. Have a qualified service person make repairs to surrounding electrical cables and/or other surrounding structure to ensure proper anchoring of unit before installation.
3. Always disconnect the power supply before servicing.

Caution
Improperly Adjusted Door can cause injury and equipment damage.

Inspect door operation daily
using safety checklist in
owner's manual and at door.

Have door adjusted as described in Owner's Manual.

Safety devices should be in place and operational.

To Our Customers

The purpose of this manual is to familiarize you with your automatic door system. It is essential that you "know your system" and that you recognize the importance of maintaining your door system in compliance with the industry standards for safety.

It is your responsibility,
as owner or caretaker of the equipment, to inspect the operation of your door system on a daily basis to ensure that it is safe for use by your customers or employees.

This manual will provide you with a description of the operation and maintenance requirements of your door. It also provides the instructions for the Daily Safety Check.

Should the door fail to operate as prescribed in the Daily Safety Check, or at any other time for any other reason, do not attempt to repair or adjust the door. Call a qualified service technician.
These technicians are trained to service your door in accordance with applicable industry safety standards.

Service Availability

DORMA Automatics, Inc. products are distributed through a nationwide network of DORMA Automatics, Inc. authorized distributors for sales, installation and service.

Compliance with Safety Standards

Your door system was designed to the latest operating and safety standards. In order to ensure the continued safe operation of your door, it is important that:

- Your door system be maintained in compliance with the standards of the industry.
- Proper decals and labels be applied and maintained on your doors. If decals are removed or cannot be read, request labels to be replaced when calling for service.

Electric Sliding Door Installation Instructions

Instructions to Installer

We are pleased that a DORMA automatic sliding door has been chosen for this installation. DORMA carefully designed, tested and built the door of high quality materials as it will provide many years of service.

Now the door must be installed and adjusted properly to ensure its proper operation and safe use.

To install and adjust the door for proper and safe operation, the installer must carefully read this instruction book before proceeding, then follow the instructions exactly.

The door is designed to be installed only by trained and knowledgeable installers. The installation technician should be experienced in the installation of automatic entrances. He should know all local code requirements and be familiar with the requirements of the current ANSI A 156.10 Standards for Power Operated Pedestrian Doors.

After installation, the door must be adjusted to conform with DORMA recommendations and all code requirements. Be sure to carefully study the requirements in these instructions.

After installation and adjustment, the installers final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with the ES-A Owner's Manual and carefully explain how to perform the daily safety check test.

Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the DORMA Technical Assistance Group for assistance.

What You Should Know

Be sure that a DORMA Automatics distributor has provided the following for each door.

1. Instruction on how to conduct the Daily Safety Check (by walk-through example).
2. Location of function switches and instruction in their use.
3. Circuit breaker or power disconnect location for each door system.
4. Discussion of problems that could result from door being allowed to operate after a malfunction is observed.
5. Number to call for service or questions about your system if you are uncertain of any condition or situation.

Note: If there are any problems, discontinue door operation immediately and secure the door in a safe manner. Call your local authorized DORMA Automatics distributor for repair.

Daily Safety Check

Perform these safety checks daily on each automatic sliding door to ensure your customers safety and your own protection. Perform these tests while traffic is restricted from all detection and sensing zones.

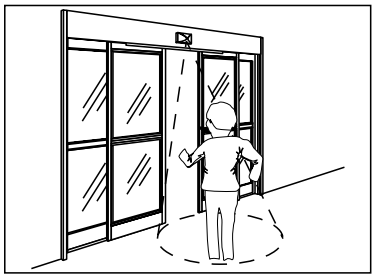

Figure 1

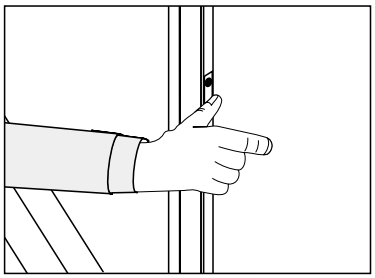

Figure 2

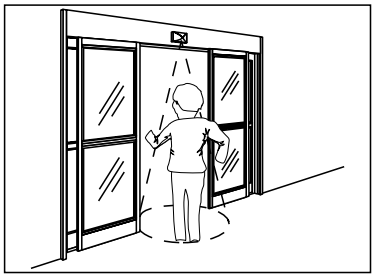

Figure 3

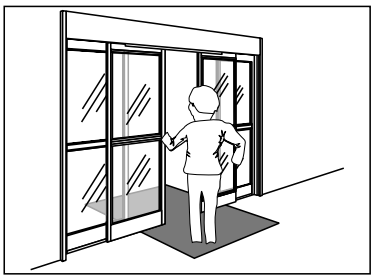

Figure 4

Motion Detector Actuation

1. Check electronic sensor by walking toward the door opening at a moderate speed. Door should start opening when you enter the motion zone and should slide open smoothly, then stop without impact. Repeat on other side of opening. Move slowly through the door. The door should remain open. (See Figure 1)

   NOTE: If your door is set-up for one-way traffic, the detector on the side not intended for use should be active until the door is within 6 inches of fully closed. The sensor should reopen the closing door if an object is detected a minimum of 24 inches from the door.

2. Step out of the sensor zone. After a brief time delay (at least 1-1/2 seconds) the door should slide closed smoothly and close fully without impact. Doors should be adjusted so they do not close faster than 1 foot per second.
3. Observe traffic routing to door. Plan traffic routing so persons will approach the door straight on and not from an angle.
4. Walk parallel to the face of the door and check that the detection pattern is at least as wide as the door opening. This test should be performed about 2-1/2 feet from the door face.
5. Open the door. Cover each doorway holding beam (if applicable) with your hand and stand motionless for several seconds. (See Figure 2). The door should remain open. Remove your hand and the door should close after the delay expires. If other safety devices are being used, stand motionless in the door opening for 10 seconds. The door should not close. (See Figure 3)

Floor Mat Actuation

6. Step on the "opening" mat in several places. Door should slide open smoothly and stop without impact. (See Figure 4).
7. Step through the doorway onto the mat on the other side. Door should remain fully open without interruption.

   NOTE: If there is more than one mat on each side, each mat should be tested.

8. Check the mat molding and threshold. It should be complete and secured with all screws required.
9. Step off the mat. After a brief time delay (at least 1-1/2 seconds), the door should close slowly and smoothly without impact. Doors should be adjusted so they do not close faster than 1 foot per second.

General Safety

Disconnect the appliance before servicing.

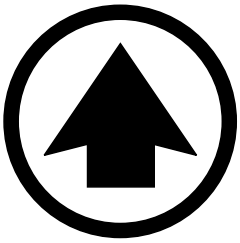

Figure 1

Figure 2

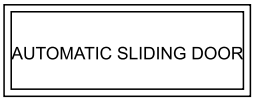

Figure 3

Figure 4

Decals

Door should have decals properly displayed. Each leaf should have a decal that includes the statements:

"AUTOMATIC DOOR" with an arrow (See Figure 1) should be visible from each side of Door, OR

If the door is designed for one-way traffic, the door should have an arrow on the egress side and " DO NOT ENTER" on the controlled traffic side of door. (See Figure 2)

"IN EMERGENCY PUSH TO OPEN" should be visible from the direction of egress. (See Figure4)

Each sidelite should have a decal visible from the sliding leaf side of the door that reads "STAND CLEAR AUTOMATIC SLIDING DOOR" (See Figure3) This decal is not required on fully pocketed door.

Closing Speed

Sliding doors must be adjusted to comply with ANSI A156.10-1999.

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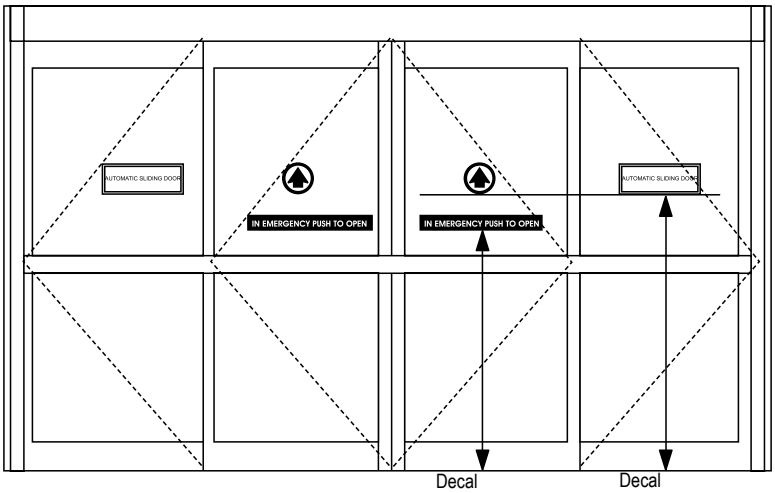

Automatic Sliding Door

Owner's Manual

Distributed by:

DORMA AUTOMATICS, Inc.
924 Sherwood Drive
Lake Bluff, IL 60044
E-mail: automatics@dorma-usa.com
Toll-Free: 877-367-6211
Fax: 877-423-7999

Important Installation Instruction

ALL INSTALLATIONS SHOULD ONLY BE PERFORMED BY TRAINED OR AUTHORIZED PERSONS

Warning - To reduce the risk of injury:

1. **Carefully Read And Follow All Installation Instructions**
2. This unit should only be installed in a rough opening capable of providing proper structural support. Have a qualified service person make repairs to surrounding electrical cables and/or other surrounding structure to ensure proper anchoring of unit before installation.
3. Always disconnect the power supply before servicing.

Caution
Improperly Adjusted Door can cause injury and equipment damage.

Inspect door operation daily using safety checklist in owner's manual and at door.

Have door adjusted as described in Owner's Manual.

Safety devices should be in place and operational.

To Our Customers

The purpose of this manual is to familiarize you with your automatic door system. It is essential that you "know your system" and that you recognize the importance of maintaining your door system in compliance with the industry standards for safety.

It is your responsibility,
as owner or caretaker of the equipment, to inspect the operation of your door system on a daily basis to ensure that it is safe for use by your customers or employees.

This manual will provide you with a description of the operation and maintenance requirements of your door. It also provides the instructions for the Daily Safety Check.

Should the door fail to operate as prescribed in the Daily Safety Check, or at any other time for any other reason, do not attempt to repair or adjust the door. Call a qualified service technician.
These technicians are trained to service your door in accordance with applicable industry safety standards.

Service Availability

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Compliance with Safety Standards

Your door system was designed to the latest operating and safety standards. In order to ensure the continued safe operation of your door, it is important that:

- Your door system be maintained in compliance with the standards of the industry.
- Proper decals and labels be applied and maintained on your doors. If decals are removed or cannot be read, request labels to be replaced when calling for service.

Electric Sliding Door Installation Instructions

Instructions to Installer

We are pleased that a DORMA automatic sliding door has been chosen for this installation. DORMA carefully designed, tested and built the door of high quality materials as it will provide many years of service.

Now the door must be installed and adjusted properly to ensure its proper operation and safe use.

To install and adjust the door for proper and safe operation, the installer must carefully read this instruction book before proceeding, then follow the instructions exactly.

The door is designed to be installed only by trained and knowledgeable installers. The installation technician should be experienced in the installation of automatic entrances. He should know all local code requirements and be familiar with the requirements of the current ANSI A 156.10 Standards for Power Operated Pedestrian Doors.

After installation, the door must be adjusted to conform with DORMA recommendations and all code requirements. Be sure to carefully study the requirements in these instructions.

After installation and adjustment, the installers final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with the ES-A Owner's Manual and carefully explain how to perform the daily safety check test.

Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the DORMA Technical Assistance Group for assistance.

What You Should Know

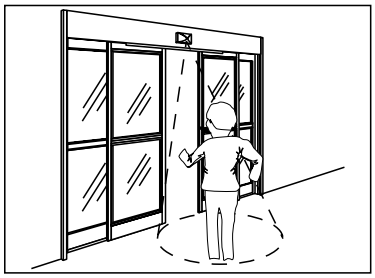
Be sure that a DORMA Automatics distributor has provided the following for each door.

1. Instruction on how to conduct the Daily Safety Check (by walk-through example).
2. Location of function switches and instruction in their use.
3. Circuit breaker or power disconnect location for each door system.
4. Discussion of problems that could result from door being allowed to operate after a malfunction is observed.
5. Number to call for service or questions about your system if you are uncertain of any condition or situation.

Note: If there are any problems, discontinue door operation immediately and secure the door in a safe manner. Call your local authorized DORMA Automatics distributor for repair.

Daily Safety Check

Perform these safety checks daily on each automatic sliding door to ensure your customers safety and your own protection. Perform these tests while traffic is restricted from all detection and sensing zones.



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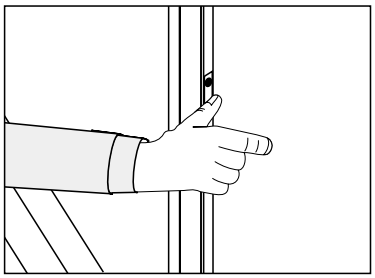

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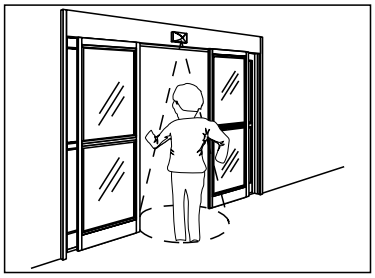

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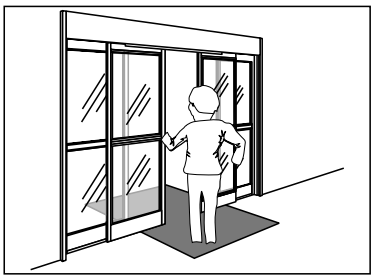

Figure 4

Motion Detector Actuation

1. Check electronic sensor by walking toward the door opening at a moderate speed. Door should start opening when you enter the motion zone and should slide open smoothly, then stop without impact. Repeat on other side of opening. Move slowly through the door. The door should remain open. (See Figure 1)

   NOTE: If your door is set-up for one-way traffic, the detector on the side not intended for use should be active until the door is within 6 inches of fully closed. The sensor should reopen the closing door if an object is detected a minimum of 24 inches from the door.

2. Step out of the sensor zone. After a brief time delay (at least 1-1/2 seconds) the door should slide closed smoothly and close fully without impact. Doors should be adjusted so they do not close faster than 1 foot per second.
3. Observe traffic routing to door. Plan traffic routing so persons will approach the door straight on and not from an angle.
4. Walk parallel to the face of the door and check that the detection pattern is at least as wide as the door opening. This test should be performed about 2-1/2 feet from the door face.
5. Open the door. Cover each doorway holding beam (if applicable) with your hand and stand motionless for several seconds. (See Figure 2). The door should remain open. Remove your hand and the door should close after the delay expires. If other safety devices are being used, stand motionless in the door opening for 10 seconds. The door should not close. (See Figure 3)

Floor Mat Actuation

6. Step on the "opening" mat in several places. Door should slide open smoothly and stop without impact. (See Figure 4).
7. Step through the doorway onto the mat on the other side. Door should remain fully open without interruption.

   NOTE: If there is more than one mat on each side, each mat should be tested.

8. Check the mat molding and threshold. It should be complete and secured with all screws required.
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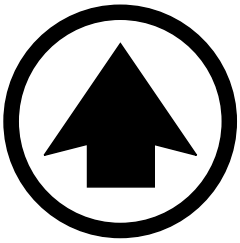
General Safety

Disconnect the appliance before servicing.



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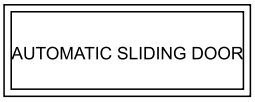

Figure 3

Figure 4

Decals

Door should have decals properly displayed. Each leaf should have a decal that includes the statements:

"AUTOMATIC DOOR" with an arrow (See Figure 1) should be visible from each side of Door, OR

If the door is designed for one-way traffic, the door should have an arrow on the egress side and " DO NOT ENTER" on the controlled traffic side of door. (See Figure 2)

"IN EMERGENCY PUSH TO OPEN" should be visible from the direction of egress. (See Figure4)

Each sidelite should have a decal visible from the sliding leaf side of the door that reads "STAND CLEAR AUTOMATIC SLIDING DOOR" (See Figure3) This decal is not required on fully pocketed door.

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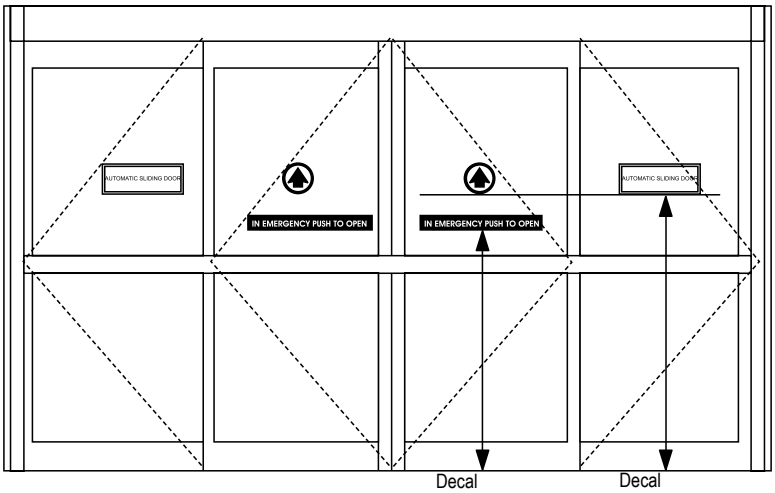

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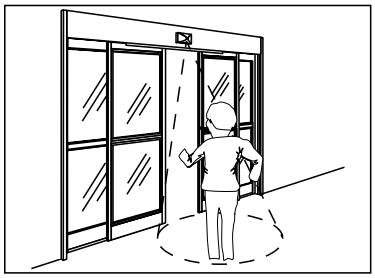

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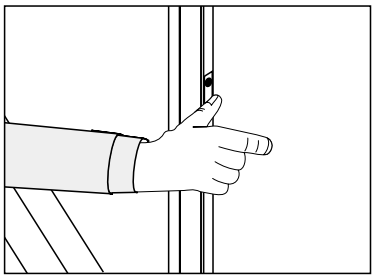

2. Step out of the sensor zone. After a brief time delay (at least 1-1/2 seconds) the door should slide closed smoothly and close fully without impact. Doors should be adjusted so they do not close faster than 1 foot per second.
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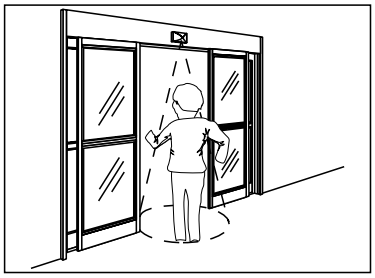

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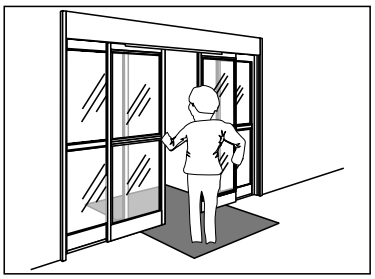

Figure 4

6. Step on the "opening" mat in several places. Door should slide open smoothly and stop without impact. (See Figure 4).
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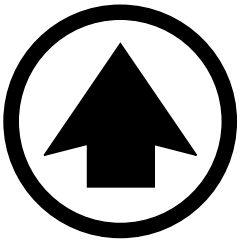

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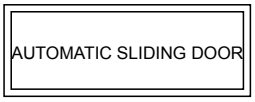

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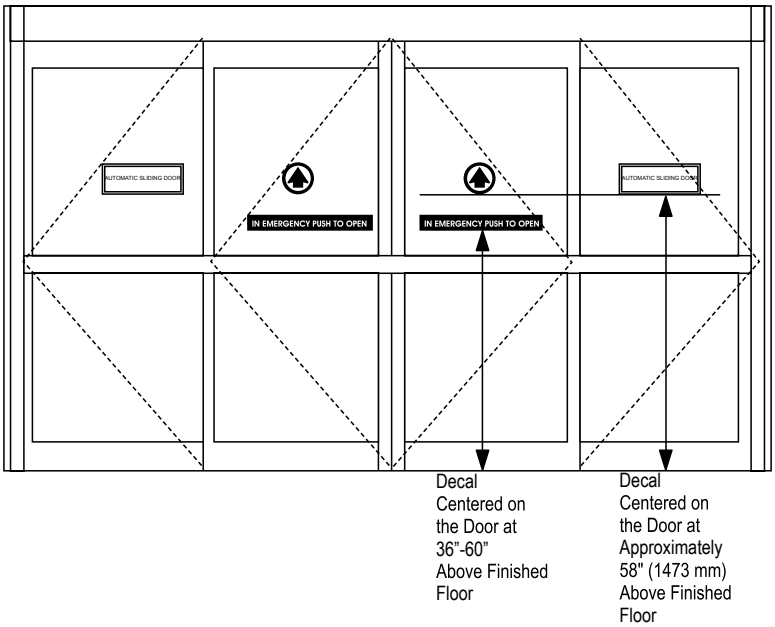

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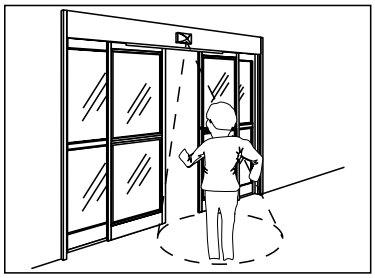

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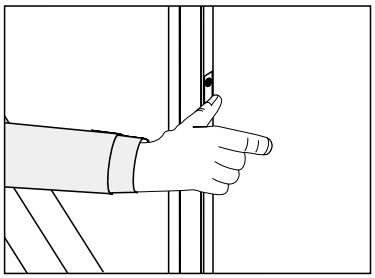

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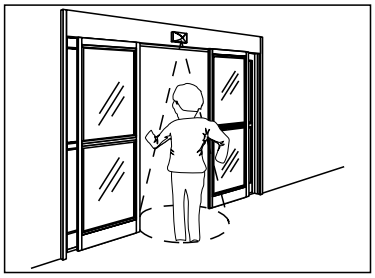

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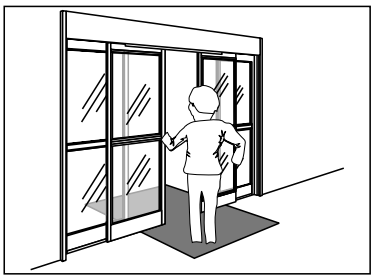

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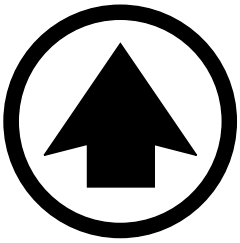


Figure 1

If the door is designed for one-way traffic, the door should have an arrow on the egress side and " DO NOT ENTER" on the controlled traffic side of door. (See Figure 2)

Figure 2

"IN EMERGENCY PUSH TO OPEN" should be visible from the direction of egress. (See Figure4)

Each sidelite should have a decal visible from the sliding leaf side of the door that reads "STAND CLEAR AUTOMATIC SLIDING DOOR" (See Figure3) This decal is not required on fully pocketed door.

Closing Speed

Sliding doors must be adjusted to comply with ANSI A156.10- 2005.

The operator and the ES-A control-board are self-learning and self-monitored. All necessary adjustments in accordance to ANSI A156.10 are made automatically during the initial self-learning cycle of the operator. No manual adjustments are necessary.

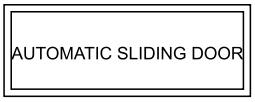
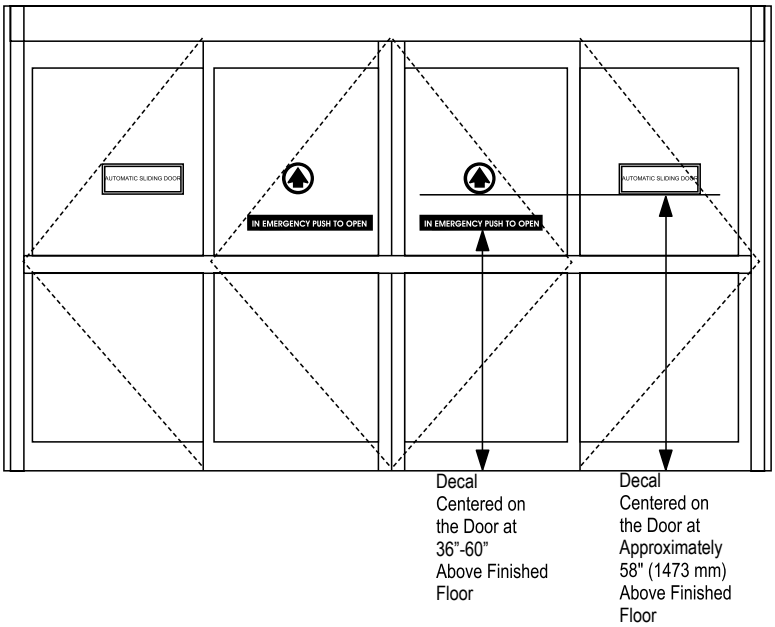


Figure 3

Figure 4



Automatic Sliding Door

Owner's Manual

Distributed by:

DORMA AUTOMATICS, Inc. 924 Sherwood Drive
Lake Bluff, IL 60044
E-mail: automatics@dorma-usa.com
Toll-Free: 877-367-6211
Fax: 877-423-7999

Important Installation Instruction

ALL INSTALLATIONS SHOULD ONLY BE PERFORMED BY TRAINED OR AUTHORIZED PERSONS

Warning - To reduce the risk of injury:

1. **Carefully Read And Follow All Installation Instructions**
2. This unit should only be installed in a rough opening capable of providing proper structural support. Have a qualified service person make repairs to surrounding electrical cables and/or other surrounding structure to ensure proper anchoring of unit before installation.
3. Always disconnect the power supply before servicing.

Caution
Improperly Adjusted Door can cause injury and equipment damage.

Inspect door operation daily using safety checklist in owner's manual and at door.

Have door adjusted as described in Owner's Manual.

Safety devices should be in place and operational.

To Our Customers

The purpose of this manual is to familiarize you with your automatic door system. It is essential that you "know your system" and that you recognize the importance of maintaining your door system in compliance with the industry standards for safety.

It is your responsibility,
as owner or caretaker of the equipment, to inspect the operation of your door system on a daily basis to ensure that it is safe for use by your customers or employees.

This manual will provide you with a description of the operation and maintenance requirements of your door. It also provides the instructions for the Daily Safety Check.

Should the door fail to operate as prescribed in the Daily Safety Check, or at any other time for any other reason, do not attempt to repair or adjust the door. Call a qualified service technician.
These technicians are trained to service your door in accordance with applicable industry safety standards.

Service Availability

DORMA Automatics, Inc. products are distributed through a nationwide network of DORMA Automatics, Inc. authorized distributors for sales, installation and service.

Compliance with Safety Standards

Your door system was designed to the latest operating and safety standards. In order to ensure the continued safe operation of your door, it is important that:

- Your door system be maintained in compliance with the standards of the industry.
- Proper decals and labels be applied and maintained on your doors. If decals are removed or cannot be read, request labels to be replaced when calling for service.

Electric Sliding Door Installation Instructions

Instructions to Installer

We are pleased that a DORMA automatic sliding door has been chosen for this installation. DORMA carefully designed, tested and built the door of high quality materials as it will provide many years of service.

Now the door must be installed and adjusted properly to ensure its proper operation and safe use.

To install and adjust the door for proper and safe operation, the installer must carefully read this instruction book before proceeding, then follow the instructions exactly.

The door is designed to be installed only by trained and knowledgeable installers. The installation technician should be experienced in the installation of automatic entrances. He should know all local code requirements and be familiar with the requirements of the current ANSI A 156.10 Standards for Power Operated Pedestrian Doors.

After installation, the door must be adjusted to conform with DORMA recommendations and all code requirements. Be sure to carefully study the requirements in these instructions.

After installation and adjustment, the installers final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with the ES-A Owner's Manual and carefully explain how to perform the daily safety check test.

Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the DORMA Technical Assistance Group for assistance.

To Our Customers

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Your door system was designed to the latest operating and safety standards. In order to ensure the continued safe operation of your door, it is important that:

- Your door system be maintained in compliance with the standards of the industry.
- Proper decals and labels be applied and maintained on your doors. If decals are removed or cannot be read, request labels to be replaced when calling for service.

Daily Safety Check

Perform these safety checks daily on each automatic sliding door to ensure your customers safety and your own protection. Perform these tests while traffic is restricted from all detection and sensing zones.

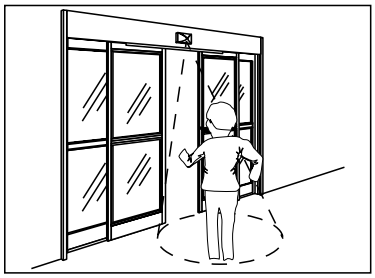

Figure 1

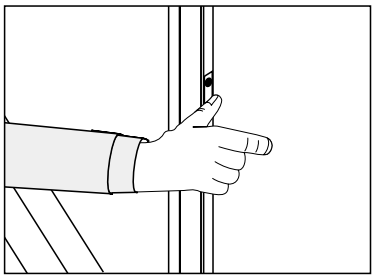

Figure 2

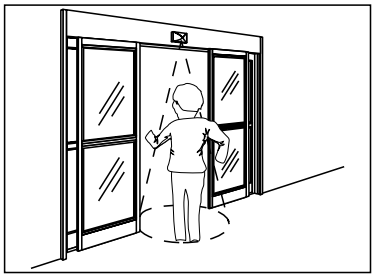

Figure 3

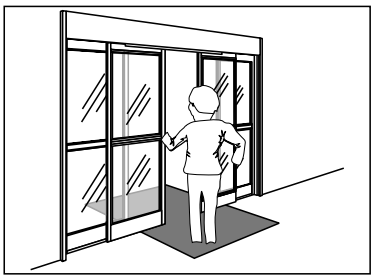

Figure 4

Motion Detector Actuation

1. Check electronic sensor by walking toward the door opening at a moderate speed. Door should start opening when you enter the motion zone and should slide open smoothly, then stop without impact. Repeat on other side of opening. Move slowly through the door. The door should remain open. (See Figure 1)

   NOTE: If your door is set-up for one-way traffic, the detector on the side not intended for use should be active until the door is within 6 inches of fully closed. The sensor should reopen the closing door if an object is detected a minimum of 24 inches from the door.

2. Step out of the sensor zone. After a brief time delay (at least 1-1/2 seconds) the door should slide closed smoothly and close fully without impact. Doors should be adjusted so they do not close faster than 1 foot per second.
3. Observe traffic routing to door. Plan traffic routing so persons will approach the door straight on and not from an angle.
4. Walk parallel to the face of the door and check that the detection pattern is at least as wide as the door opening. This test should be performed about 2-1/2 feet from the door face.
5. Open the door. Cover each doorway holding beam (if applicable) with your hand and stand motionless for several seconds. (See Figure 2). The door should remain open. Remove your hand and the door should close after the delay expires. If other safety devices are being used, stand motionless in the door opening for 10 seconds. The door should not close. (See Figure 3)

Floor Mat Actuation

6. Step on the "opening" mat in several places. Door should slide open smoothly and stop without impact. (See Figure 4).
7. Step through the doorway onto the mat on the other side. Door should remain fully open without interruption.

   NOTE: If there is more than one mat on each side, each mat should be tested.

8. Check the mat molding and threshold. It should be complete and secured with all screws required.
9. Step off the mat. After a brief time delay (at least 1-1/2 seconds), the door should close slowly and smoothly without impact. Doors should be adjusted so they do not close faster than 1 foot per second.

General Safety

Disconnect the appliance before servicing.

Decals

Door should have decals properly displayed. Each leaf should have a decal that includes the statements:

"AUTOMATIC DOOR" with an arrow (See Figure 1) should be visible from each side of Door, OR

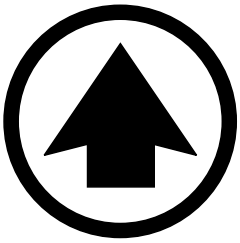

Figure 1

If the door is designed for one-way traffic, the door should have an arrow on the egress side and " DO NOT ENTER" on the controlled traffic side of door. (See Figure 2)

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Each sidelite should have a decal visible from the sliding leaf side of the door that reads "STAND CLEAR AUTOMATIC SLIDING DOOR" (See Figure3) This decal is not required on fully pocketed door.

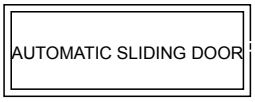
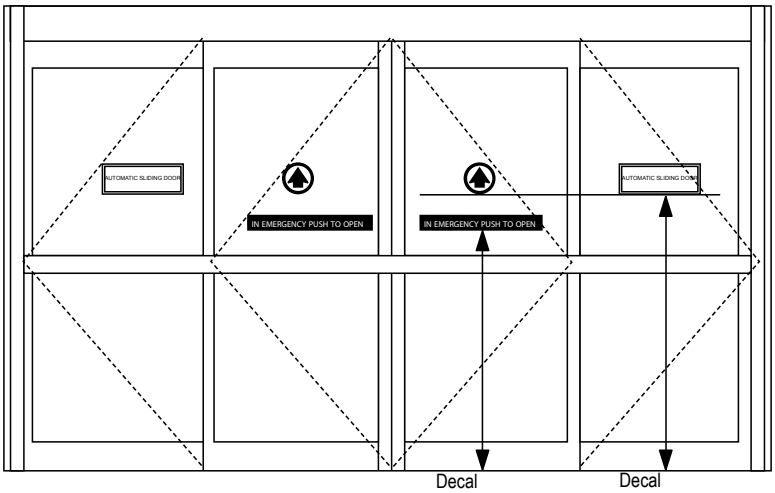


Figure 3

Closing Speed

Sliding doors must be adjusted to comply with ANSI A156.10 - 2005.

The operator and the ES-A control-board are self-learning and self-monitored. All necessary adjustments in accordance to ANSI A156.10 are made automatically during the initial self-learning cycle of the operator. No manual adjustments are necessary.



CS 80 MAGNEO
Automatic sliding door operator

Installation and maintenance manual

CS 80 MAGNEO

—

Installation and Maintenance Manual

Contents 02.2012 Page

„Original documentation“

Read this manual carefully before starting the installation.

	**REMARK**	**A remark will call your attention to important information that will facilitate your work with the CS 80 MAGNEO.**
	**ADVISE**	**An advice will warn you that you could damage the CS 80 MAGNEO and explain how to avoid this.**
	**ATTENTION**	**Here we will inform you of dangers that might cause damage to property or injure or kill people.**

1.Technical data and features

Power supply:	115VAC ±10%; 50/60 Hz
Branch circuit protection (by others):	15 A
Cable type:	14 AWG (12 Max) [max. 3 x 1.5 mm^2]

Power consumption without external accessories:

Stand-By-Mode:	5.6W
Automatic-Mode:	max.60W

General information:

Temperaturerange:	0 - 104° F [0 - 40° C]
Operating noise of operator:	max.55 dB (A)
Door panel height:	max. 118" [max. 3000 mm]
Door panel weight:	44 lbs - 175 lbs [20 kg - 80 kg]

Weight of operator:

max.passage width	Operator length without cover	Weight of operator
34.4" [875 mm]	68.9" [1750 mm]	18.9 lbs [8.6 kg]
39.4" [1000 mm]	78.7" [2000 mm]	20.7 lbs [9.4 kg]
44.3" [1125 mm]	88.6" [2250 mm]	22.4 lbs [10.2 kg]

FCC 15.105 (a)
NOTE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Dear customer,

We are pleased that a DORMA automatic sliding door has been chosen for this installation. DORMA carefully designed, tested and built the door of high quality materials as it will provide many years of service.

Now the door must be installed and adjusted properly to ensure its proper operation and safe use.

To install and adjust the door for proper and safe operation, the installer must carefully read this instruction book before proceeding, then follow the instructions exactly.

The door is designed to be installed only by trained and knowledgeable installers.
The installation technician should be experienced in the installation of the automatic entrance product line.

After installation, the door must be adjusted to confirm with DORMA recommendations and all code requirements. Be sure to carefully study the requirements in these instructions.

After installation and adjustment, the installer's final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with the CS 80 MAGNEO Owner's Manual and carefully explain how to perform the daily safety check test.

Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the DORMA Technical Support Group for assistance.

Yours faithfully,
The DORMA-Team

Required tools:

- Tape measure
- Spirit level
- Pencil
- Electric Drill
- Masonry drill bit Ø 1/4"
- Metal drill bit Ø 1/8" + Ø5/16"
- Socket wrench (10mm)
- Small flat head screwdriver to connect the terminals on the control unit.
- Phillips screwdriver for countersunk screws of wall connection.
- Allen (Hex) key, 4mm
- Combination wrench, wrench size 10 mm and 13 mm
- Long-nosed pliers for connection to terminals.
- Adequate screws and wall achors for the structures, in case they are not made of brickwork or concrete.

Additionally for DORMA MANET fixing:

- Allen (Hex) key, 3 mm and 5 mm

Important Installation Instructions

ALL INSTALLATIONS AND SERVICE SHOULD ONLY BE PERFORMED BY TRAINED OR AUTHORIZED PERSONS

Warning - To reduce the risk of injury or death:

1. Carefully Read And Follow All Installation Instructions.
2. This unit should only be installed in a rough opening capable of providing proper structural support.
3. Always disconnect the power supply before servicing.
4. To install and adjust the door for proper and safe operation, the installer must carefully read this instruction book before proceeding, then follow the instructions exactly.
5. The door is designed to be installed only by trained and knowledgeable installers. The installation technician should be experienced in the installation of automatic entrances. They should know all local code requirements and be familiar with the requirements of the current ANSI A156.10 & 156.19 Standards for Power Operated Pedestrian Doors.
6. After installation, the door must be adjusted to conform with DORMA recommendations and all code requirements. Carefully study the requirements in these instructions.
7. After installation and adjustment, the installers final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with this manual.
8. Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the DORMA Technical Assistance Group for assistance.
9. Save these instructions for future reference.

Compliance with Safety Standards

Your door system was designed to the latest operating and safety standards. In order to ensure the continued safe operation of your door, it is important that:

- Your door system be maintained in compliance with the standards of the industry, BHMA/ANSI.
- Proper decals and labels be applied, per BHMA/ANSI Standards, and maintained on your doors. If decals are removed, or cannot be read, request labels to be replaced when calling for service.

4. Safety Instructions

4.1 Specified standard operation

⚠ The CS 80 MAGNEO is only designed to open and close doors.
Do not allow children to play with the CS 80 MAGNEO or rigidly mounted adjustment and/or control devices. Keep remote controls out of reach of children.

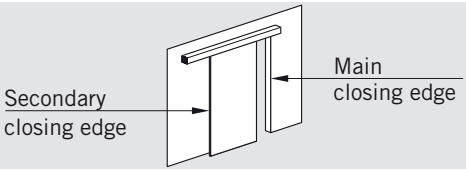
4.2 Product-specific characteristics

The CS 80 MAGNEO is intended for use on interior single-panel sliding doors.
The CS 80 MAGNEO is neither suitable for application in escape routes, nor on fire and smoke doors nor on exterior doors.

4.3 Standards, laws, codes and regulations

CS 80 MAGNEO is a low energy product and complies with the kinetic force limitations of the ANSI 156.19 Low Energy Standards.
The standard only covers swing doors at this point.

⚠ **Danger spots at closing edges**
Automatic doors might cause hazards by crushing, shearing, hitting and closing edges.



Systems with CS 80 MAGNEO offer the following benefits:

- The system does not have to be equipped with additional protection equipment (not compulsory).
- The application of safety sensors at the closing edges as additional protection measure is optional and lies in the discretion of the person performing the installation of the door system under consideration of the result of the individual risk assessment.

Risk assessment on the part of the installer:

Special spatial conditions and certain user groups might make it sensible to equip the application with safety sensor even when the system is operated in Low-Energy-Mode. Whether this is required or not has to be assessed with the aid of an individual risk assessment and must be considered during the planning of the system and by the manufacturer, i.e. the party performing the installation of the system. We would therefore ask you to have a look at our risk assessment form, which is available on our homepage www.dorma-magneo.com and will help you to perfom the risk assessment.
Special requirements regarding the protection of people in need of protection. In case the risk assessment reveals that there is a health risk of injury when the door hits a user in an unacceptable way, additional protection via safety equipment (connection of safety sensors) is required. This is especially necessary when people in need of protection (children, elderly people or disabled people) use the door.

4.4 Limitation of liability

The CS 80 MAGNEO must only be used according to its specified standard operation. DORMA will not accept any liability for damages resulting from unauthorized modifications, unsafe, or improper installation or use of the CS 80 MAGNEO.

4.5 Documentation

⚠ Using control elements, making adjustments or performing procedures that are not described herein might cause electric shocks, danger caused by electric voltage/current and/or dangers due to mechanical incidents.

This documentation contains important information for the safe installation of the system. Read these instructions thoroughly before you mount, install and use the CS 80 MAGNEO.

⚠ It is important for your personal safety to abide by the instructions mentioned in this documentation. An incorrectly performed installation of the system might cause serious injuries.

Please keep this documentation for later reference.

4.6 General information regarding the installation of the system

⚠ The CS 80 MAGNEO must be disconnected from power supply (de-energized) when performing mounting or installation work. Remove the power plug, or, in case of permanent power supply, switch off fuse.

- Secure the working area against unauthorized access of other people. Falling items or tools might cause injuries.
- In any case, the way of mounting and the mounting equipment, like for example screws and wall plugs, have to be adequate with regard to the structural conditions (concrete, wood, plasterboard etc.)
- As soon as you have loosen the screws of the end stop, both the end stop and the carrier could fall out of the operator. Therefore you should always hold the operator straight.
- Pay attention that no water or other liquids drop on or into the CS 80 MAGNEO.
- Never stick metal objects inside the openings of the CS 80 MAGNEO. Otherwise you could sustain an electric shock.
- Never put your hand inside the CS 80 MAGNEO in order to avoid injuries.
- Lay the power cord so that nobody can trip over the cable or unplug it by mistake.
- Do not operate the CS 80 MAGNEO when the power cord is damaged.
- Always pull at the plug and never at the cable when unplugging the power supply.
- Only operate the mains switch at the header profile while the door stands still or is permanently open.
- No push buttons/switches, pictures etc. must be located within the door‘s movement range. Baseboards have to be removed if required.
- If a switch is used for activation of the door it must be located so that the door operation can be observed by the person operating the switch.
- Following the successful installation of the system, you have to check the settings as well as the CS 80 MAGNEO and the safety devices for proper functioning.
- The installation described herein is only an example. Structural or local conditions, avaible tools or other conditions might suggest a different approach.
- Permanent wiring is to be employed as required by local codes.

4.7 Residual risks

Automatic doors might cause hazards by crushing, shearing, hitting and drawing-in. Depending on the structural conditions, the door version and the safety equipment, residual risks can not be excluded.

4.8 Waste Electrical and Electronic Equipment (WEEE) Directive

Within the European Union, this device must not be disposed of as domestic waste. It has to be disposed of at as pecial facility so that it can be recycled.

CS 80 MAGNEO - Awarded safety

Developed according to the latest safety standards:

+ Low-Energy-Mode in accordance with DIN standard
+ Tested Safety
+ CE -mark
+ c UL us -mark (UL 325/CSA 22.2)
+ FC -mark (Part 15.105(a))

5. Functional Characteristics

5.1 General information

The CS 80 MAGNEO is a single-panel Low-Energy-Mode sliding door operator for small and light interior doors with an admissible weight from 44 lbs to 175 lbs per door panel. The opening and closing speed respectively depend on the weight of the door panel and can be adjusted via a potentiometer (infinitely variable).

5.2 Commissioning

During the first commisioning of the operator, the installer has to perform a learning cycle according to the commissioning instructions. When the installer connects the system to the power supply (plugs it in) the light indicator at the operator will blink and the operator has no function. The door can be opened and closed manually. Following the learning cycle the light indicator goes on and the operator is ready for operation.

5.3 Energy Modes (Maximum Force Limited)

With the aid of a sealed switch (located inside the operator), the system can be switched from Low-Energy-Mode to Full-Energy-Mode.

Low-Energy-Mode

The standard ANSI 156.19 states the energy with which a swing door panel hits an obstacle must be limited. The CS 80 MAGNEO operator moves the sliding panel at a low speed corresponding to ANSI 156.19 energy. The potentiometer (located inside the operator) can only be used to reduce this calculated speed.

Full-Energy-Mode

The forces are limited in this mode as well. The speed is infinitely variable with the aid of a potentiometer (located inside the operator). Even though the door may open at a fast speed. The closing cycle always remains in Low-Energy-Mode

5.4 Operation modes

OFF:	The operator is switched off. You can move the door by hand.
AUTOMATIC:	When the system has been activated via pushbutton, radio remote control or similar, the operator opens the door and closes after expiration of the adjusted hold-open time.
PERMANENT OPEN:	The operator opens the door and holds it in “open“ position until it receives an other signal.

When the system is delivered, the CS 80 MAGNEO is adjusted to AUTOMATIC Mode.


An external program switch is required to change the operation mode.

5.5 Functions in AUTOMATIC Mode

Push & Go

As soon as the door is moved manually into opening direction by approximately 3/8” [10 mm], the operator will automatically move the door panel further in the desired direction. The door closes automatically.

Permanent Open via double-click

A double-click on the push button (activate the pushbutton twice in quick succession) will open the door. When you double-click on the button for a second time or move the door panel by hand, the door will close.

Opening/closing via pushbutton

As soon as you push the button or move the door manually the door will open. When you push the button for a second time or move the door panel by hand, the door will close.

Express-Function

The door can be moved manually in its driving direction and there will be no extra resistance. However, when the maximum speed is exceeded, the driving resistance will increase in line with the speed by which it is exceeded. As soon as the user has released the door panel, the operator will softly slow it down to maximum speed. This function is activated during all opening and closing cycles.

5.6 Safety functions

Static forces in Low-Energy-Mode.
The system does not exceed a value of 15 lb during opening and closing cycles.

Opening cycle

As soon as the door hits an obstacle during an opening cycle, it will immediately stop and remain in its position for 3 seconds. Then the operator will try to continue the opening cycle. If the door panel hits an obstacle three time during an opening cycle, it will close.

Closing cycle

When the door panel hits an obstacle while closing, it will immediately stop and perform an opening cycle.

5.7 Safety sensors

You can install sensors to detect obstacles. An automatic sensor test can be activated or deactivated via the DIP switches located inside the operator.
The door will stop immediately when the sensor detects an obstacle during an opening cycle and will continue the cycle as soon as the obstacle has been removed. In case the obstacle is not removed, the door will close on completion of the adjusted hold-open time.
The door will stop immediately and reverse when the sensor detects an obstacle during the closing cycle. This function is not activated while the door is in closed position (then the sensor is deactivated).

5.8 Power failure

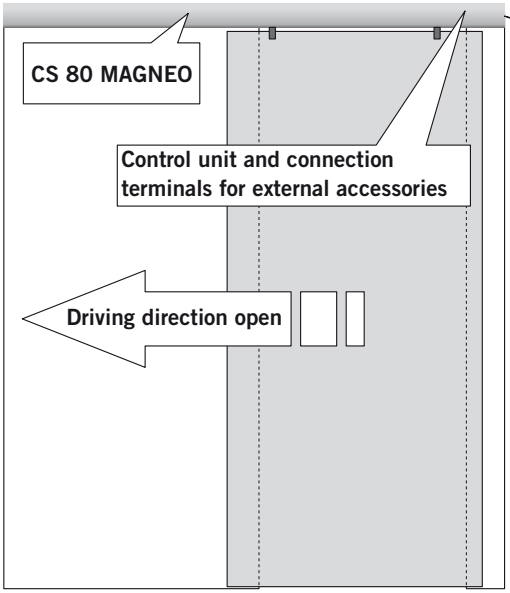
In the event of a power failure, the door can be opened and closed by hand.

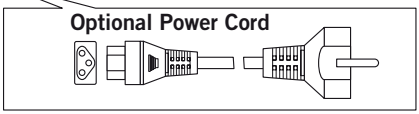
☞ However, in this case the operator does not slow down (brake) the door panel, so that the user has to move (hold) it all the way by hand.

As soon as the voltage returns, the operator will automatically perform a position initialization.

☞ During this position initialization, it is essential that the movement range of the door is free of obstacles.

6. System Overview

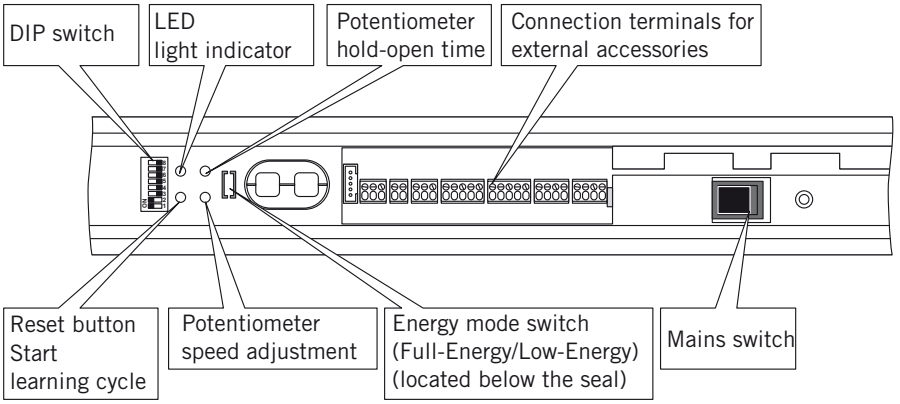




To reduce the risk of electric shock, this equipment has a grounding type plug that has a third (GROUNDING) pin.This plug will only fit into a grounding type outlet. If the plug does not fit into the outlet, contact a qualified electrician to intall the proper outlet.

DO NOT CHANGE THE PLUG IN ANY WAY.

Control unit and connection terminals for external accessories



7. Before Mounting

Basic requirements:

⚠ Work on electrical equipment may only be perfomed by properly qualified personnel (electricians)

- The floor has to be level
- Glass door panels have to be made of safety glass.
- The connection cables for external accessories (program switch etc.) must be located in the close range of the operator before starting the installation of the system. (See Page 12)
- With In-Wall mounting, the wall must not be closed before the system has been mounted.

⚠ When the system is installed with permanent power supply (the cable comes directly out of the wall), ensure that the power supply line is dead (de-energized) during installation.

⚠ The power supply line must have the apropriate fuse protection in compliance with electrical codes. Use only copper conductors for permanent connection, or use DORMA'S optional power cord (refer to "For optional power cord connection" below for more details).

Opening direction:

✎ The connections of the operator are always located on the side where the door is when it is in the closed position.

Therefore the operator is symmetrical and can be turned the way your equire it. This installation instructions show the system with connection on the right side. For left hand, just reverse the orientation of the operator.

Please note:

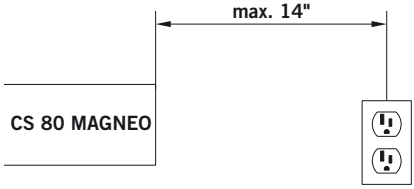
In case you require additional accessories, please contact your local dealer. If you have technical questions or require help during the installation of the system, please contact our hotline under the following number:

Please call the following number in case of technical problems or further questions: **1-877-367-6211**

For optional power cord connection

⚠ Use only DORMA'S DX3310-010 18" [457 mm]. (Nema 5-15 compatible). UL listed power cord.

⚠ The flexible power cord should not be routed through doorways, window openings, walls, ceilings, floor, or the like. The cord should also not be, attached or secured to the building structure; the cord cannot be concealed behind walls and the like. Make sure the power cord does not become entrapped in any moving parts of the operator, door, or system.

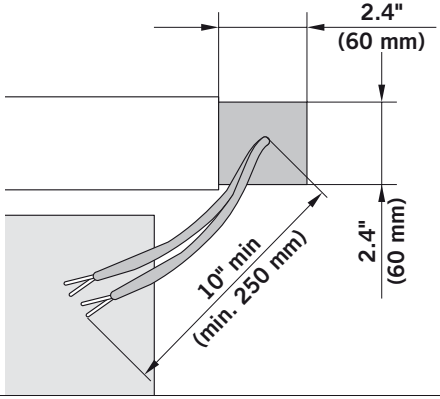


For in-wall mounting:

✎ When installing the socket, please remember that you should be able to reach it by hand. (Max 14" away)

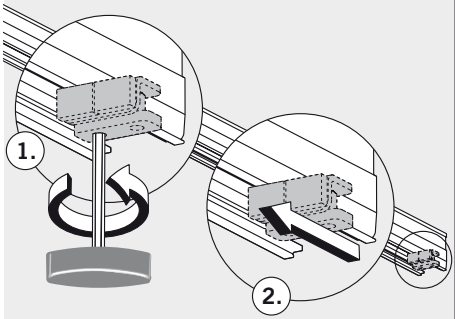
In order to facilitate the cabling inside the operator, all cables should have a length of at least 10".

For **on-wall mounting**
If you want all connection cables that are coming out of the wall not to be seen after the installation (only possible with permanent power supply), they have to come out of the wall within an area of 2.4" x 2.4" on the side where the connections of the operator are located.



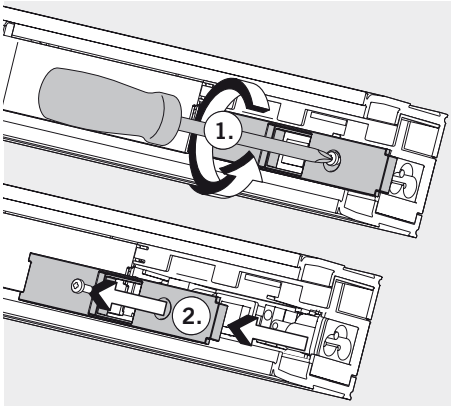
Installation with permanent power supply: When the system is installed with permanent power supply, the internal power supply socket has to be removed.
Proceed as follows:
Loosen the screws at the end stop and move the end stop to the center of the system.

Do not remove or screw down the end stop.

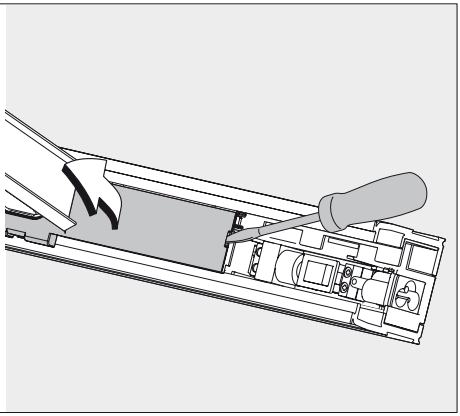


Then loosen the screw in the cover of the power supply housing and remove the cover (on the side where the connections are located).

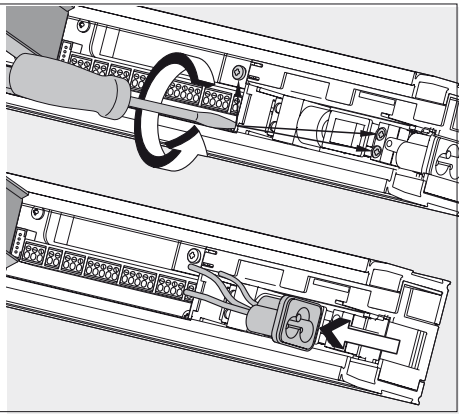
Keep the cover and the screw in a safe place as you will require it later.



Carefully open the cover of the control unit housing by levering it out with the tip of a flat head screwdriver

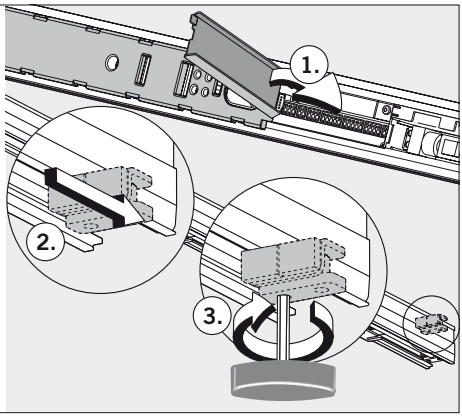


Loosen the screws of the connection terminals and remove the internal Schuko-type shockproof socket.



Then close the cover of the control unit housing. Move the end stop to the end of the channel and screw it down.

☞ The end stop must overlap.



8. Installation instructions for on-wall mounting

Mounting procedure

If there is a door frame, you have to shim the angle brackets with the shim plate (optional).

1. Auxiliary lines for positioning purposes. See bottom of this page.

2.a Installation without shim plate. See Page 16 and 17.

2.b Installation with shim plate. See Page 18.

3. Further installation. See Page 19 - 22.

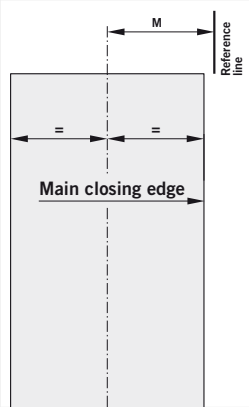
****Dimensions marked (=) are equal.****

Positioning Guide

For the installation without shim plate mark the center of the passage on the wall.

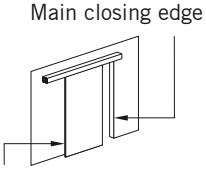
For the installation with shim plate mark the center of the passage on the wall. Please have a look at the table for the required dimension M for your operator. L corresponds to the operator length.

Now mark the reference line. Always mark the reference line on the side of the main closing edge.

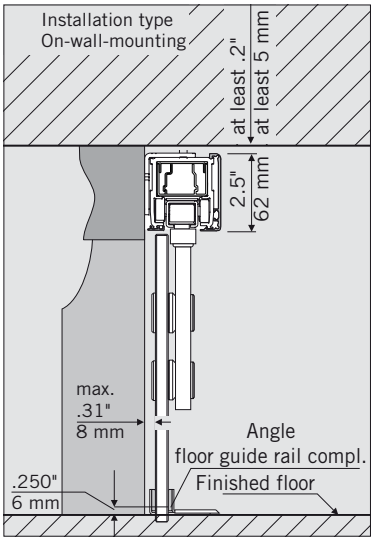


	34.4“ [875]	39.4” [1000]	44.3” [1125]
L	68.9“ [1750]	78.7“ [2000]	88.6“ [2250]
M	17.2“ [437.5]	19.7“ [500]	22.1“ [562.5]

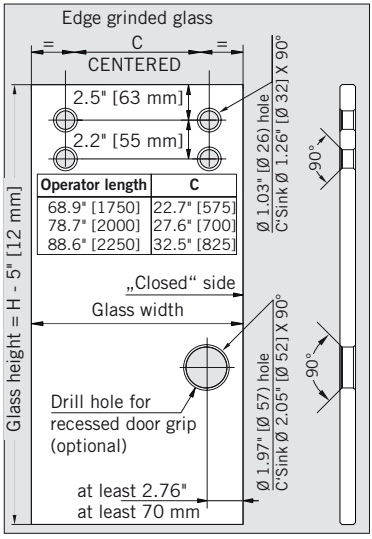
In case the door panel shall not be positioned in the center of the passage, the bracket or shim plate has to be shifted by the desired dimension.

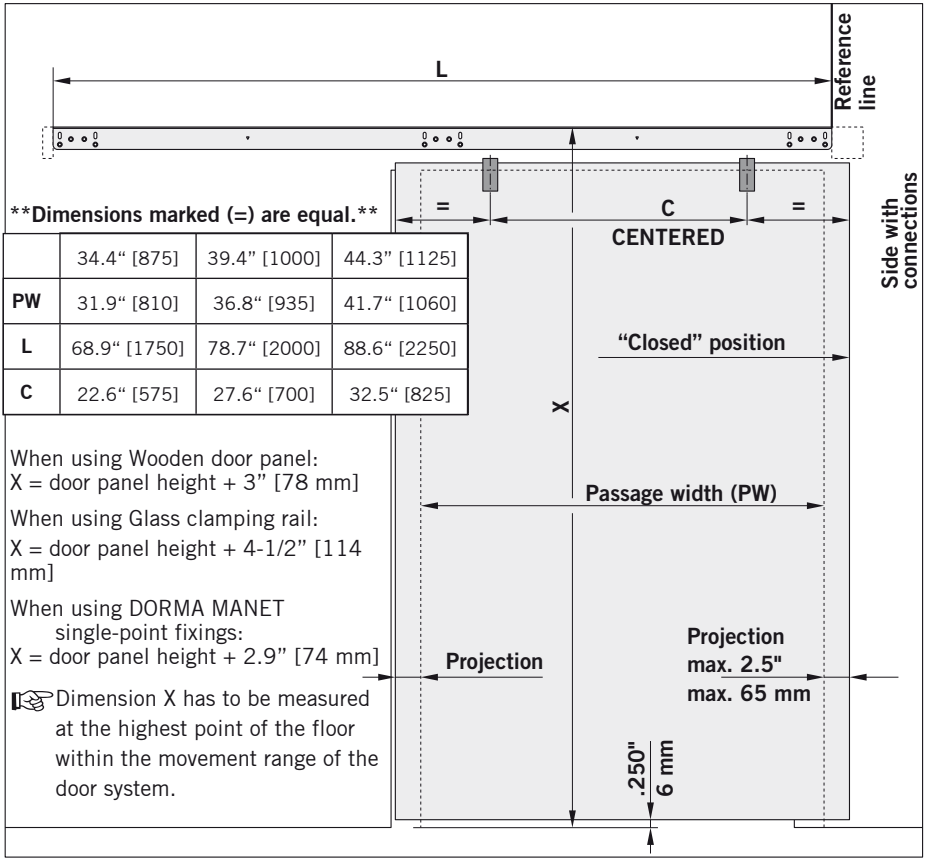


Glass door panels with MANET single-point fixings



Door panel information





	34.4" [875]	39.4" [1000]	44.3" [1125]
PW	31.9" [810]	36.8" [935]	41.7" [1060]
L	68.9" [1750]	78.7" [2000]	88.6" [2250]
C	22.6" [575]	27.6" [700]	32.5" [825]

- The "closed" position is always located on the side where the connections are.
- Dimension L (Length of operator and fixing bracket) is measured without end caps.

Take dimension X from floor level; then position and mark the upper edge of the fixing bracket onto the wall.

☞ Dimension X has to be measured at the highest point of the floor within the movement range of the door system.

☞ The distance between the bottom edge of the door panel and the floor should amount to .250" [6 mm], however, it must not exceed .3125" [8 mm].

☞ Before drilling any holes, make sure there are no cables and/or pipes in the way.

Position the fixing bracket onto the center line.

Ensure that the bottom vertex of the triangle is located exactly on the center line.

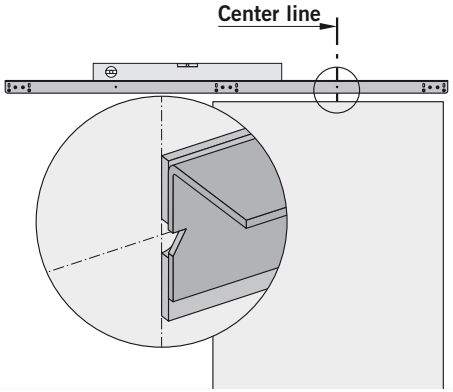
Aling the fixing bracket so that it is level.

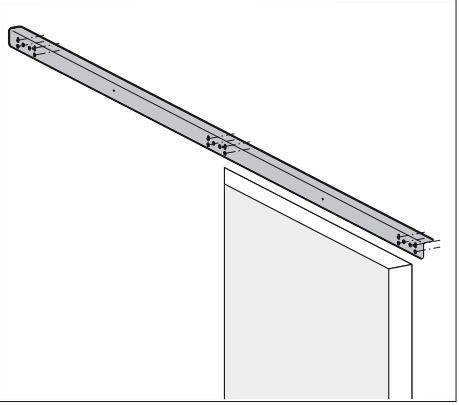
Fix the bracket with screws
(one screw respectively per one oblong hole on each side).

☞ Use adequate wall plugs and screws depending on the prevailing structure when fixing the bracket.
The supplied screws and wall plugs are suitable for concrete and brickwork.

Recheck the fixing bracket for exact positioning.

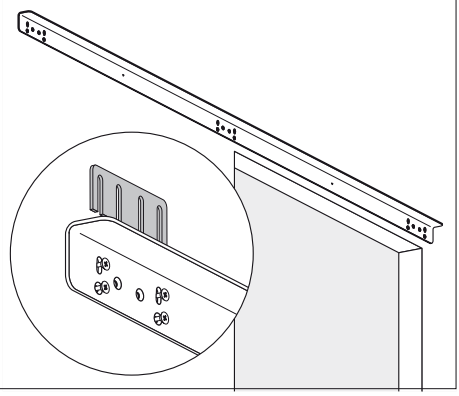
Drill the further holes through the drill holes in the fixing bracket and fix the bracket with at least 12 screws.





In case of uneven walls you have to shim the bracket so that it does not bend.

Use the enclosed distance plates in different sizes for this purpose.



Mounting with shim plate

Position the shim plate at the reference line.

Calculate the dimension from the floor to the upper edge of the shim plate as follows:

Door panel height + 3.1" [78 mm]

When using DORMA MANET single-point fixings:

Door panel height + 2.9" [74 mm]

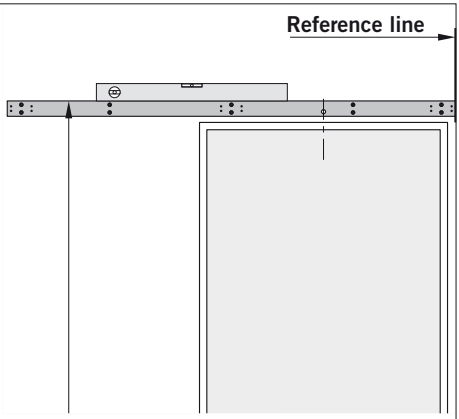
Align the shim plate so that it is level and mark the drill holes.

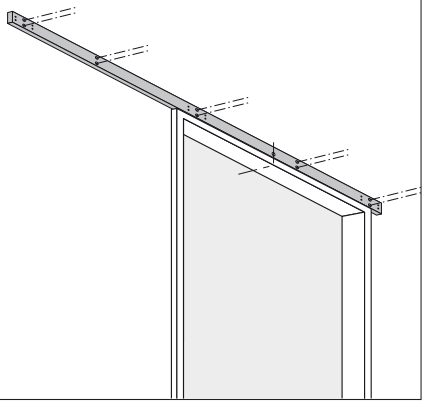
☞ Before drilling any holes, make sure there are no cables and/or pipes in the way.

Drill the marked holes and fix the shim plate.

☞ Use adequate wall plugs and screws with respect to the prevailing structure.
The supplied screws and wall plugs are suitable for concrete and brickwork.

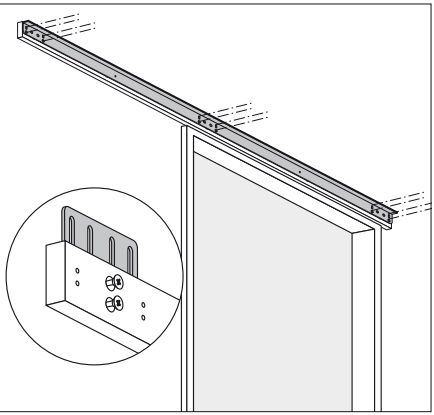
⚠ The load-bearing capacity of the fixing bracket must amount to at least 528 lbs.





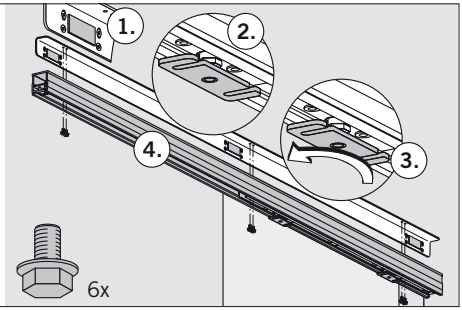
✎ In case the frame is thicker than .375" you have to underlay the shim plate with the enclosed distance plates so that it is flush with the door frame.

Use 12 screws to fix the bracket to the shim plate.



1. Adhere 3 pieces of felt equally onto the bracket.
2. The openings of the door panel suspension have to point to the front
3. Wenn using MANET fixings, the door panel suspensions have to be unscrewed.
4. Fix the operator below the bracket with 6 hexagon screws (lock screws) (8 Nm).

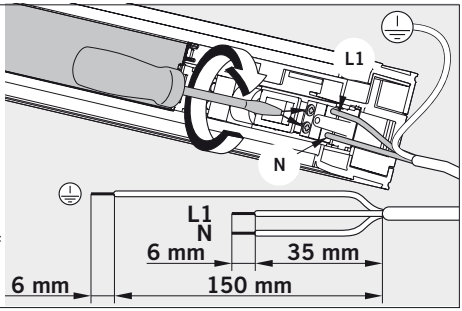
You will have to move the carrier in order to reach all 6 holes.



Connection of 120 V permanent power supply.

Working on electrical equipment may only be performed by properly qualified staff (electricians). Before starting with the installation, make sure that the power supply lines are dead (disconnected).

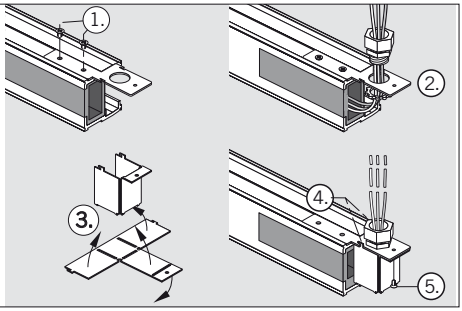
Loosen the end stop and move it to the center of the system (see page 13, picture in the middle). Cut the leads to length, dismantle them and connect L1 and N to the connection terminals of the power supply.



When connecting to conduit, use the included conduit cover, mounting plate and phillips screws

Step:

1. Attach plate to operator with (2) screws.
2. Route the wires and connect to the operator.
3. Fold the conduit cover as shown.
4. Hook conduit cover to the plate.
5. Secure conduit cover onto the plate with remaining screw.

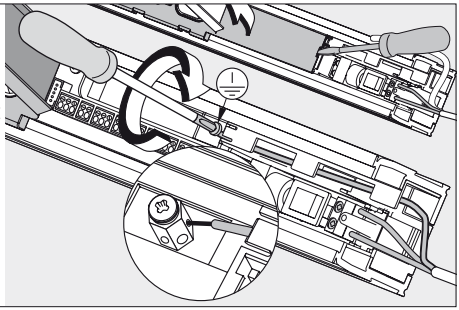


Lever out the cover at the control unit housing with the aid of a screwdriver.

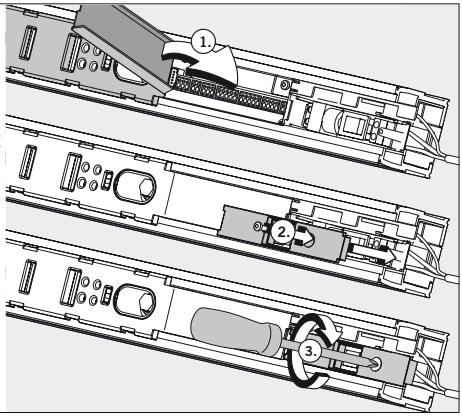
Lay the grounding line through the housing of the operator as shown in the picture and connect it to the grounding terminal (PE).

The grounding (PE) has to be connected in any case.

Connect all external accessories but the safety sensors. Please refer to the instructions for the cable channel on page 30.

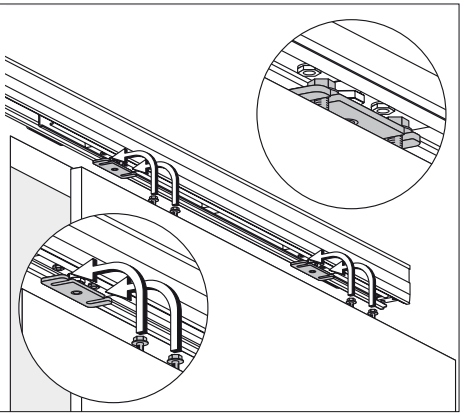


Close the cover of the control unit housing.
Fix and screw down the cover of the power supply housing.
Move the end stop to the end of the channel and screw it down thoroughly (see page14, picture at the bottom).

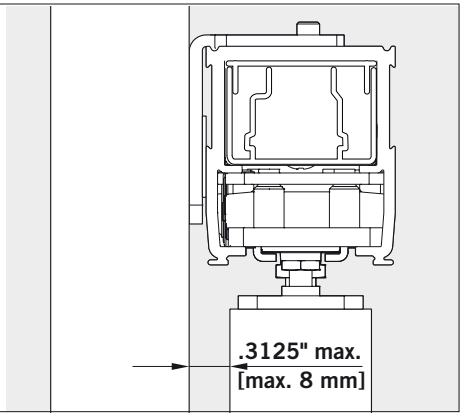


Insert the panel into the door panel suspension as indicated in the picture, align it so that it is parallel to the wall and screw it down.

When using MANET fixings, please consider the instructions enclosed with the MANET fixings.

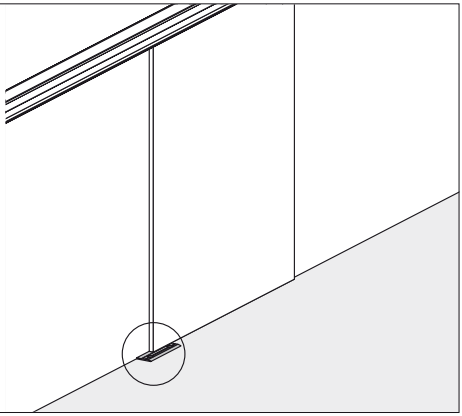


☞ The distance between door panel and wall must not exceed .3125".



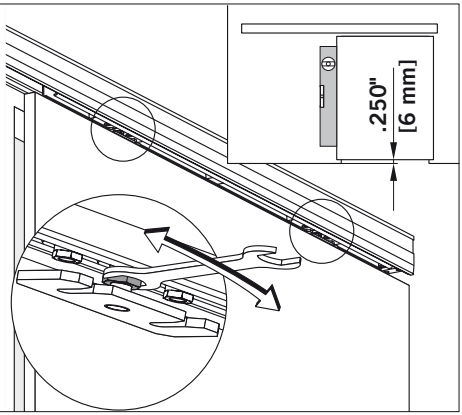
Locate and fix the provided floor guide rail. Please refer to the mounting instructions of the floor guide.

When adjusting the floor guide you have to make sure that the door panel runs smoothly through the floor guide (does not rub against the floor guide).



Align the door panel with the aid of the adjustment nuts so that it is level.

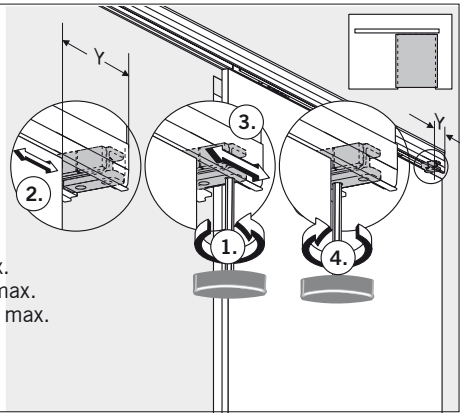
The distance between the bottom edge of the door panel and the floor should amount to .250", however, it must not exceed .3125"



Loosen the screws of the end stop on the side where the connections are and move the door to the desired closed position. Move the end stop next to the door panel and screw down tight (5Nm).

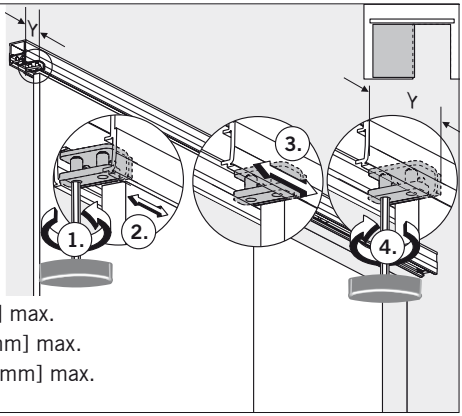
The end stop may only be moved to the inside by a certain dimension.

34.4" [875 mm] operator=>7.9" [200 mm] max.
39.4" [1000 mm] operator => 9.5" [250 mm] max.
48.2" [1125 mm] operator => 11.8" [300 mm] max.



Loosen the screws of end stop on the other side and move the door to the desired open position. Move the end stop next to the door panel and screw down tight (3.7 ft/lb).

☞ The end stop may only be moved to the inside by a certain dimension.



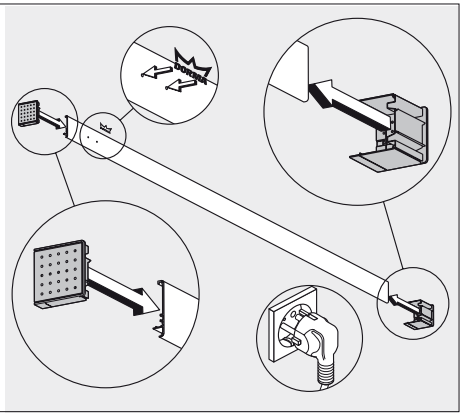
34.4" [875 mm] operator=>7.9" [200 mm] max.
39.4" [1000 mm] operator => 9.5" [250 mm] max.
48.2" [1125 mm] operator => 11.8" [300 mm] max.

Fix the DORMA logo in the two drill holes.
Insert the end caps into the cover.

✎ Depending on the prevailing structural conditions, the end caps can either be cut to length or broke out at the predetermined breaking points.

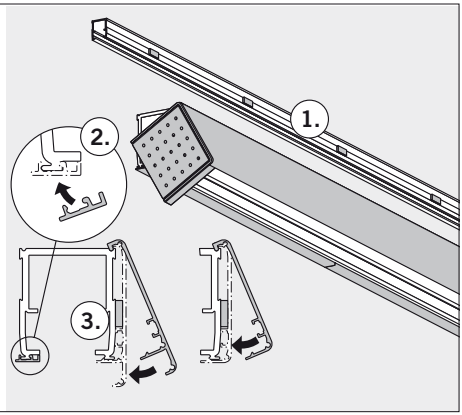
Please install radio receivers, program switches and/or sensors and lay the cables as indicated in the enclosed instructions.

When the system is operated with a power plug, plug it in.



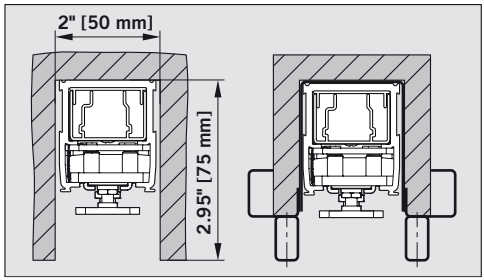
1. Adhere the 4 provided pieces of foam rubber equally onto the operator.
2. Fix the black wall connection profiles at the bottom of the operator on the side where it is connected to the wall. Cut the last profile to length with the aid of a knife.
3. Place the cover onto the operator and clip it shut. When using DORMA MANET single-point fixings, you have to use the shorter cover (displayed on the right side).

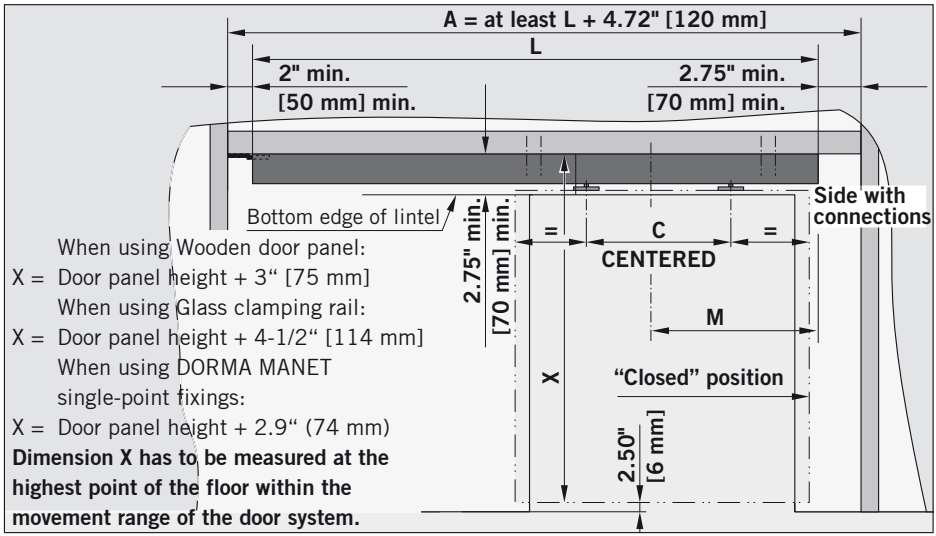
Continue with the commissioning of the system as indicated starting from page 32.



9. Installation instructions for in-wall mounting

The CS 80 MAGNEO sliding door operator is also suitable for an “invisible” in-wall mounting. For this kind of mounting a recess with a width of at least 2” [50 mm] and adepth of 2.95” [75 mm] is required. Furthermore a special door frame made by BOS can be used. For this purpose you will have to talk about some details with the manufacturer.
Phone number BOS: 877-367-6211
URL: BestOfSteel.de
****Dimensions marked (=) are equal.****





When using Wooden door panel:
X = Door panel height + 3“ [75 mm]
When using Glass clamping rail:
X = Door panel height + 4-1/2“ [114 mm]
When using DORMA MANET single-point fixings:
X = Door panel height + 2.9“ (74 mm)
Dimension X has to be measured at the highest point of the floor within the movement range of the door system.

The wall must not be closed before the system has been installed.

The connections should always be on the side where the door panel is when the door is in closed position.

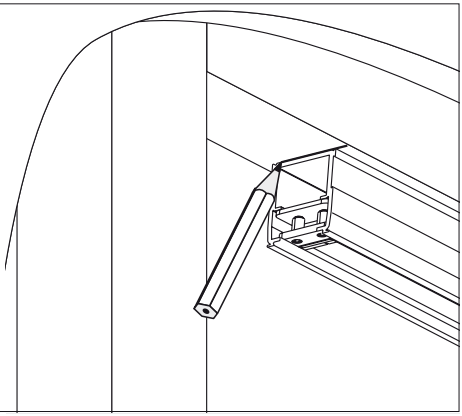
- Dimension L stands for the operator length.
- Dimension M indicates the distance from the centre of the passage area to the side of the operator where the connections are located.
- The distance between the door panel and the floor should amount to .24” [6 mm] and must not exceed .315” [8 mm].

The holes for the cables must be sufficiently big and must not have sharp edges.

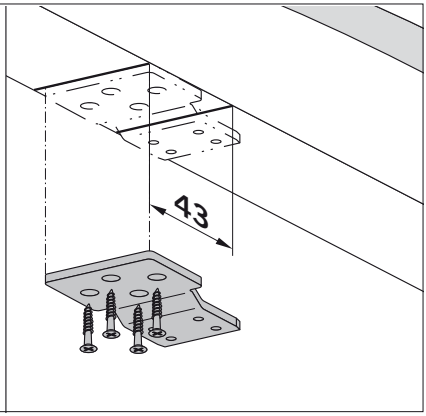
Please have a look at the table and the drawing for the dimensions regarding your operator.

L	68.9“ [1750 mm]	78.7“ [2000 mm]	88.6“ [2250 mm]
M	17.2“ [437,5 mm]	19.7“ [500 mm]	22.1“ [5625 mm]
A	73.6“ min. [1750 mm] min.	83.5“ min. [2120 mm] min.	93.3“ min. [2370 mm] min.
C	22.6“ [575 mm]	27.6“ [700 mm]	32.5“ [825 mm]

Hold the operator in the desired position and mark the end of the operator on the side opposite the connections.



Draw a further line at a distance of 1.7" [43 mm].
Then position the fixing bracket at the second line and mark the drill holes.
Drill the holes and fix the fixing bracket with adequate screws.

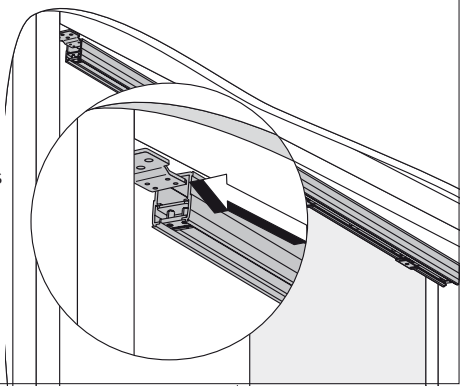


Then move the operator over the fixing bracket as far as it will go.

Make sure to position the operator correctly, i.e. the side with the connections must be opposite the fixing bracket.

Never leave the operator on the fixing bracket without holding it in position as this would deform the fixing bracket.

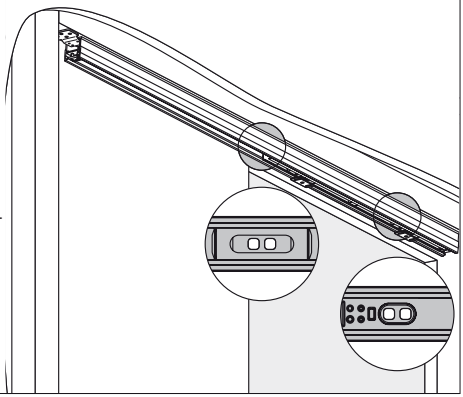
Align the operator so that it is parallel to the wall.



Then mark the fixing holes through the holes in the operator.

In order to reach all 4 holes, you have to move the carrier.

Remove the operator and drill fixing holes with a diameter of .165" [4.2 mm] for the supplied sheet metal screws. The sheet metal must at least be .08" [2 mm] thick and the subconstruction must at least carry 528 lbs. [240 kg.]

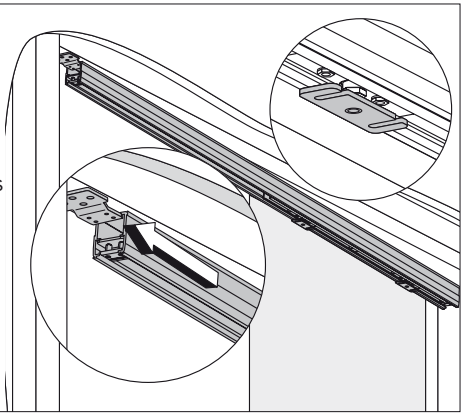


Then move the operator over the fixing bracket as far as it will go.

The side with the connections must be opposite the fixing bracket.

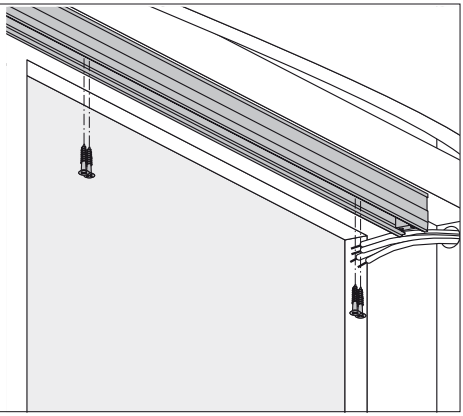
Never leave the operator on the fixing bracket without holding it in position as this would deform the fixing bracket.

The openings of the door panel suspension have to point to the front as you can not turn them following the installation of the system.



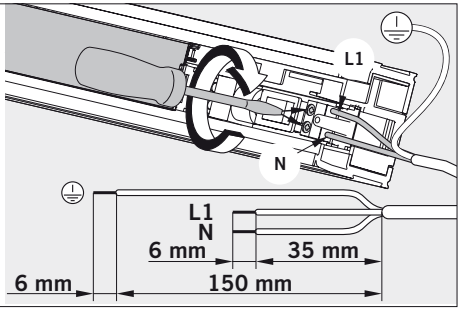
Fix the operator under the cross girder with the selected screws.

The operator has to be fixed so that it is exactly level and parallel to the wall.
All connection cables have to be laid in the close range of the operator at this point.
The holes for the cables must be sufficiently big and must not have sharp edges.



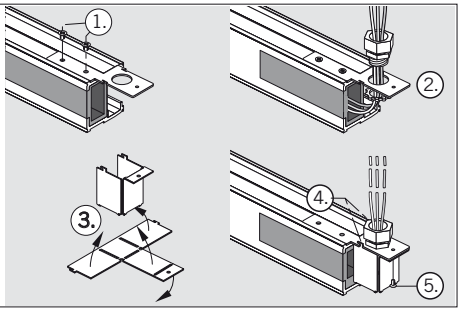
Connection of 120 V permanent power supply.

⚠ Work on ellectrical equipment may only be performed by properly qualified staff (electricians) before starting with the installation, make sure that the power supply lines are dead (disconnected).
Relax the end stop and move it to the center of the system (see page 13, picture in the middle). Cut the leads to length, dismantle them and connect L1 and N to the connection terminals of the power supply.



When connecting to conduit, use the included conduit cover, mounting plate and phillips screws

Step:
1. Attach plate to operator with (2) screws.
2. Route the wires and connect to the operator.
3. Fold the conduit cover as shown.
4. Hook conduit cover to the plate.
5. Secure conduit cover onto the plate with remaining screw.

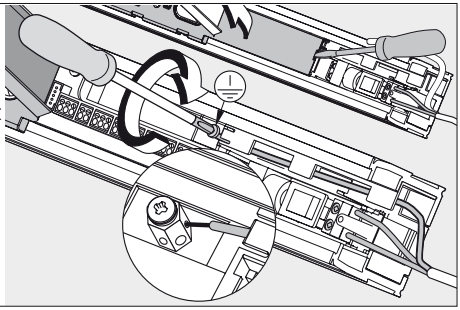


Lever out the cover at the control unit housing with the aid of a screwdriver.

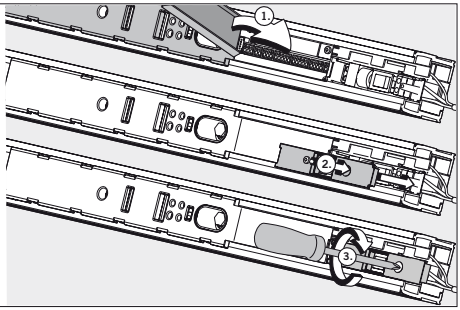
Lay the grounding line through the housing of the operator as shown in the picture and connect it to the grounding terminal (PE).

⚠ The grounding (PE) has to be connected in any case.

Connect all external accessories but the safety sensors. Please refer to the instructions for the cable channel on page 30.



Close the cover of the control unit housing. Fix and screw down the cover of the power supply housing. Move the end stop to the end of the channel and screw it down thoroughly (see page14, picture at the bottom).

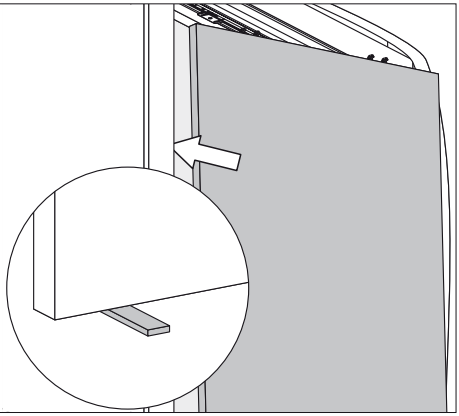


Move the end stop to the end of the channel.

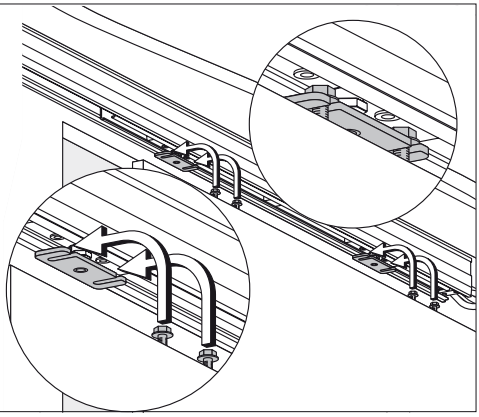
☞ The end stop must not fall out of the operator.

Place the door panel inside the door frame. As the door panel is wider than the doorway, you will have to tilt it.

As it will be difficult to get hold of the door panel with in-wall mounting, you should use wooden wedges to help you to lift the door panel.

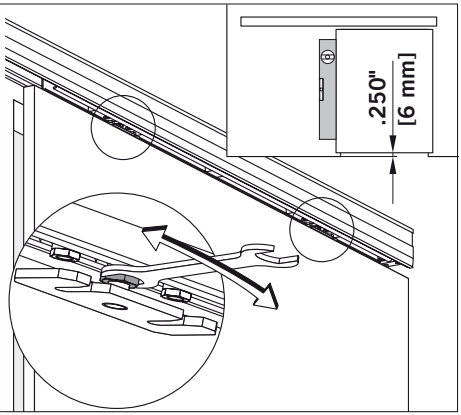


Insert the door panel into the door panel suspension, align it so that it is parallel to the wall and screw it down.



Align the door panel with the aid of the adjustment nuts so that it is level.

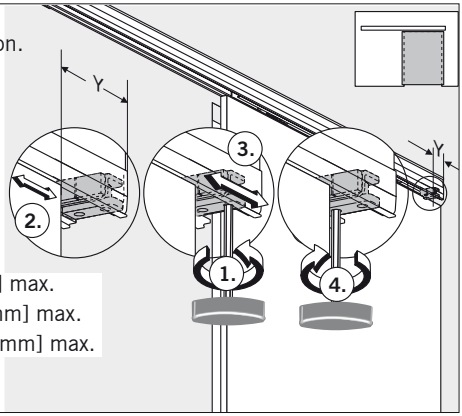
☞ The distance between the bottom edge of the door panel and the floor should amount to .250" [6 mm], however, it must not exceed .3125" [8 mm].



Move the door panel to the desired closed position.
Move the end stop next to the door
panel and screw down tight (3.7 ft/lb).

☞ The end stop may only be moved to the inside by a certain dimension.

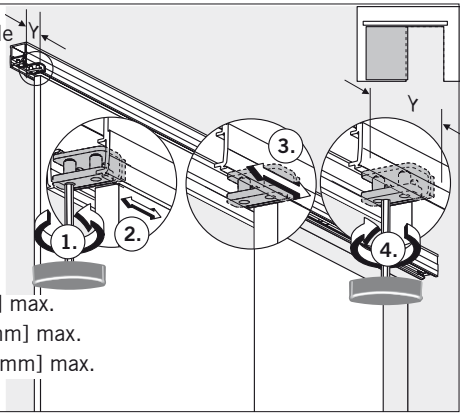
34.4" [875 mm] operator=>7.9" [200 mm] max.
39.4" [1000 mm] operator => 9.5" [250 mm] max.
48.2" [1125 mm] operator => 11.8" [300 mm] max.



Relax the screws of the end stop on the other side
and move the door to the desired open position.
Move the end stop next to the door
panel and screw down tight (3.7 ft/lb).

☞ The end stop may only be moved to the inside by a certain dimension.

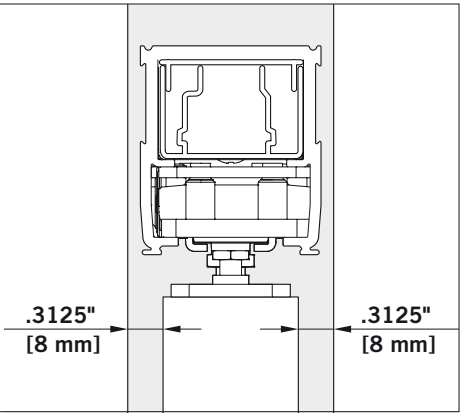
34.4" [875 mm] operator=>7.9" [200 mm] max.
39.4" [1000 mm] operator => 9.5" [250 mm] max.
48.2" [1125 mm] operator => 11.8" [300 mm] max.



☞ The distance between door panel and wall must not exceed .3125" [8 mm]
The clearance has to be covered with brushes or similar, if required.

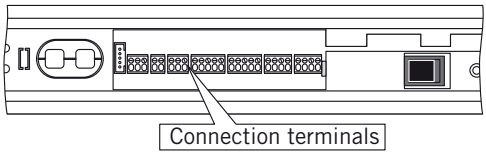
Please install radio receivers, program switches and/or sensors and lay the cables as indicated in the enclosed instructions.

Continue with the commissioning of the system as indicated starting from page 32.



10. Connection diagrams

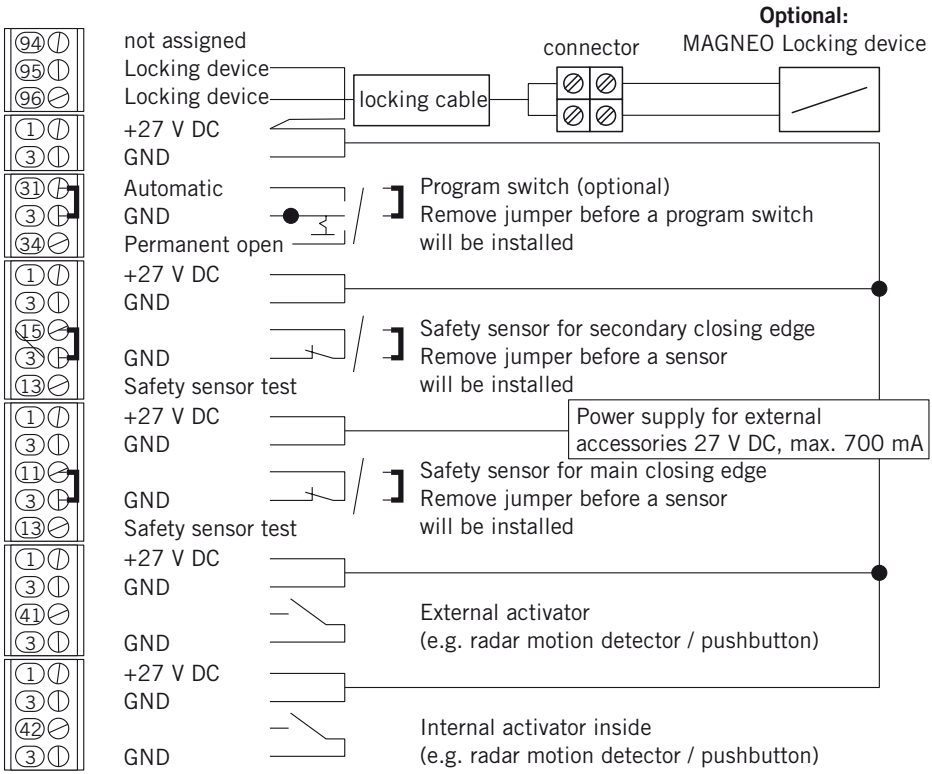
In order to facilitate the connection of the wires, the different terminal blocks can be removed with pointed pliers.



☞ Main closing edge is the leading edge of the door.
Activating the sensor will disable automatic operation in the closing direction.
Secondary closing edge is the trailing edge of the door. Activating the sensor will disable automatic operation in the opening direction.

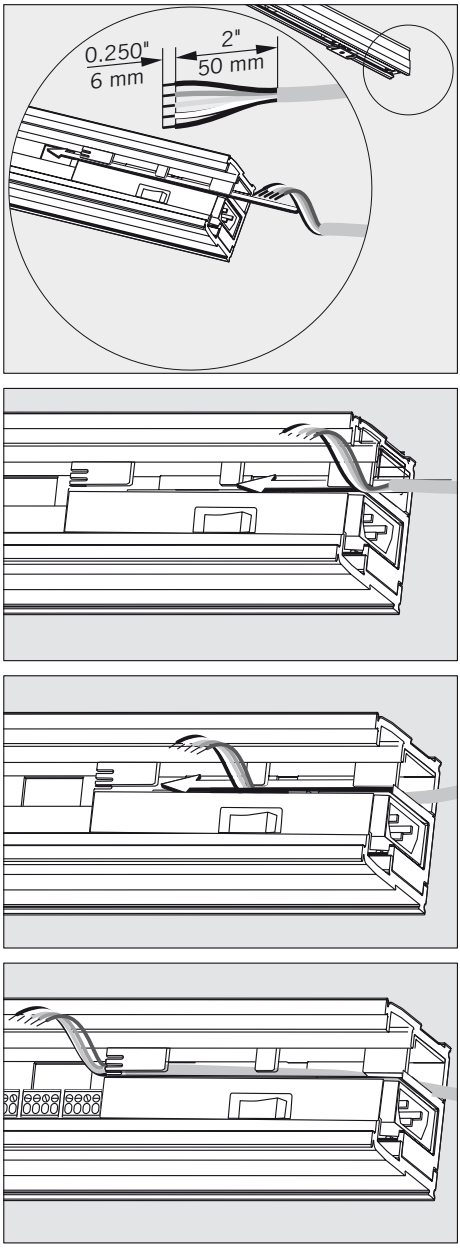
Approach in case of a short circuit at the connection terminal:

1. Remove short-circuit.
2. Switch mains switch off and on again.



11.Cable channel

The cables for external accessories (sensors, pushbuttons etc.) have to be laid inside the cable channel as indicated in the picture.



12. Connection of closing edge protection

☞ This work may only be performed by properly qualified staff.

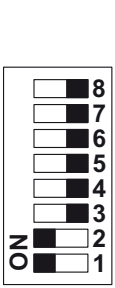
☞ Main closing edge is the leading edge of the door.
Activating the sensor will disable automatic operation in the closing direction.
Secondary closing edge is the trailing edge of the door.
Activating the sensor will disable automatic operation in the opening direction.

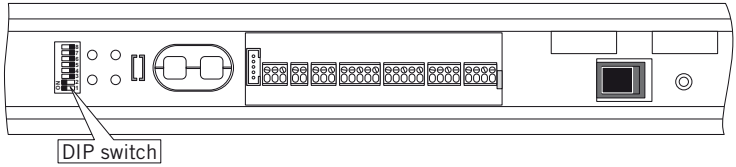
When testable sensors for the protection of the closing edges are connected, the control unit has to be adjusted to the sensors via the DIP switches.

When a sensor is connected to the main closing edge
Set DIP switch 1 to ON and DIP switch 3 to OFF.

When a sensor is connected to the secondary closing edge
Set DIP switch 2 to ON and DIP switch 3 to OFF.

When sensors are connected to the main and secondary closing edge





3 ON = test high active
OFF = test low active
2 ON = sensor test for secondary closing edge activated
OFF = sensor test for secondary closing edge deactivated
1 ON = sensor test for main closing edge activated
OFF = sensor test for main closing edge deactivated

12. Commissioning

Basic requirements

- The CS 80 MAGNEO is completely mounted.
- You can move the door smoothly over the complete movement range.

General information

When you connect the system to the power supply (plug it in) the green light indicator blinks and the operator has no function. You can access the door manually.

In order to make the operator ready for operation, you have to perform a learning cycle.

The green LED goes on following the learning cycle. The CS 80 MAGNEO is now ready for operation and operates in Low-Energy-Mode.

Apart from during commissioning, a learning cycle has to be performed every time the position of an end stop has been adjusted or the weight of the door has changed.

This „approach“ describes the commissioning of the standard door system. Accessories and different operation modes can be adjusted after the system has been commissioned.

Sensors are connected and adjusted following the successful commissioning of the system.

The light indicator (LED) will give you visual feedback.

The settings stored during the commissioning of the system can be overwritten by performing a new commissioning.

Learning cycle

In order to start the learning cycle:

- The door must be open.
- The operator must be switched on.
- The movement range of the door must be free of obstacles.

The green LED will blink before the first learning cycle.

Press and hold the „Reset“ button for more than 3 seconds.

Do not interrupt the learning cycle as the system currently learns all values it requires.

During the learning cycle the door will:

Open twice and close again. The LED will blink green at certain intervals then it will show a permanent green light.

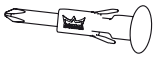
The CS 80 MAGNEO is now ready for operation.

How to switch the system from Low-Energy- to Full-Energy-Mode

Only authorized staff (authorization on the part of DORMA required) may switch the CS 80 MAGNEO to Full-Energy-Mode. As there are higher forces in Full-Energy-Mode, the closing edges have to be protected by safety sensors.

Therefore we do not explain how to switch the system to Full-Energy-Mode in these instructions.

Only use the enclosed red screwdriver to perform potentiometer adjustments!



Speed adjustment

The maximum speed depends on the weight of the door panel. You can reduce the speed with the aid of the potentiometer (infinitely variable).

Adjustment of hold-open time

The door will close automatically on expiry of the adjusted hold-open time following it has reached „open“ position. You can adjust the hold-open time infinitely from 5 to 30 seconds with the aid of the potentiometer.

Permanent Open Function via double-click

This function can only be adjusted when a pushbutton is connected.

In order to activate this function, DIP switches 4 and 5 at the control unit have to be set to “ON” position.

Opening/closing via pushbutton

This function is only available with pushbutton or Push & Go Function.

In order to activate it, DIP switches 4, 5 and 6 have to be set to „ON“ position.

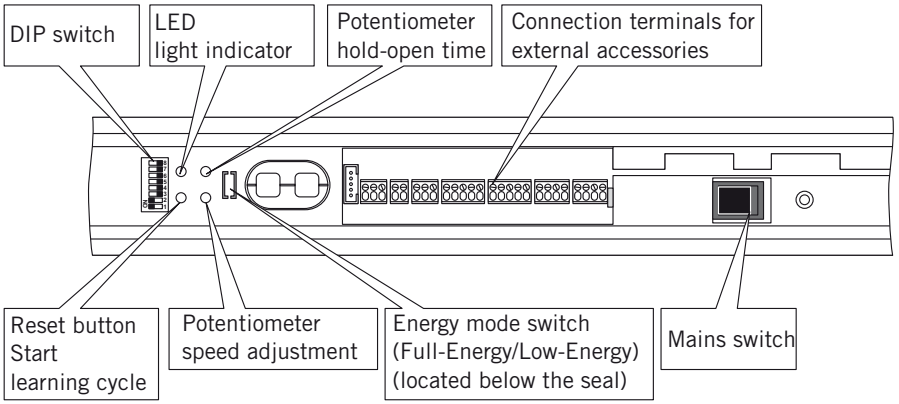
Closing force

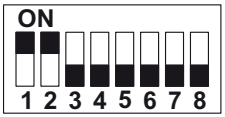
In case the door does not close properly due to the door seals, you can increase the force with which the operator presses the door against the seal.

In order to do so, set DIP switch 7 to “ON” position.

Compliance check

Check speed, forces, and function of sensors to ensure safe operation.





DIP switch settings

You can activate different inputs at the connection terminals via these switches and thus adjust different operation modes.

8	OFF = No locking function	ON = Locking function
7	OFF = Reduced closing force	ON = Enhanced closing force
6	OFF = Automatic Function activated	ON = Permanent Open Function activated
5	OFF = External motion detector activated	ON = External pushbutton activated
4	OFF = Internal motion detector activated	ON = Internal pushbutton activated
3	OFF = Test low active	ON = Test high active
2	OFF = Sensor test at secondary closing edge deactivated ON = Sensor test at secondary closing edge activated	
1	OFF = Sensor test at main closing edge deactivated ON = Sensor test at main closing edge activated	

14. Operating instructions

1. Opening the door in AUTOMATIC Function

When the system is delivered, the CS 80 MAGNEO is adjusted to AUTOMATIC Function. Depending on the installed accessories, the door can be opened in different ways.

Push & Go

As soon as the door is moved manually into opening direction by approximately .4“ [10 mm], the operator automatically moves the door panel further in the desired direction.
The door closes automatically.

Pushbutton:

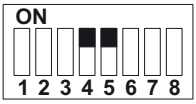
Following the activation of the pushbutton (e. g. wall-mounted pushbutton or radio transmitter) the operator opens and closes the door.

Sensors:

Where presence sensors (radar motion detectors or similar) are connected, the door opens automatically as soon as a person approaches the door system.
The door closes automatically.

PERMANENT OPEN via double-click

When this function is activated, the door can be opened permanently by double-clicking the pushbutton. In order to close the door, a further double-click on the pushbutton is required.
To activate this function set DIP switch 4 and 5 to ON position.



Opening/Closing via pushbutton (alternate action)

As soon as you push the button or move the door manually the door will open. When you push the button for a second time or move the door panel by hand, the door will close.

To activate this function set DIP switch 4, 5 and 6 to ON position.

Express-Function

The door can be moved manually into its driving direction without extra resistance. When the maximum speed is exceeded, the operational resistance will increase in line with the speed by which it is exceeded.
As soon as the user has released the door panel, the operator will softly slow it down to maximum speed. This function is activated during all opening and closing cycles.

2. In the event of a power failure

In the event of a power failure, the door can be opened and closed by hand.

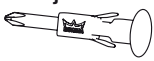
☞ However, in this case the system does not brake the door panel, which means that the user has to move (hold) it all the way by hand.

As soon as the voltage returns, the operator will automatically perform a position initialization.

☞ During this position initialization, the movement range of the door has to be free of obstacles.

3. Adjustments

⚠ **Only use the enclosed red screwdriver to perform potentiometer adjustments!**



Speed adjustment

The maximum speed depends on the weight of the door panel. You can reduce the speed with the aid of the potentiometer (infinitely variable).

Adjustment of hold-open time

The door will close automatically on expiry of the adjusted hold-open time following it has reached “open” position. You can adjust the hold-open time infinitely from 5 to 30 seconds with the aid of the potentiometer.

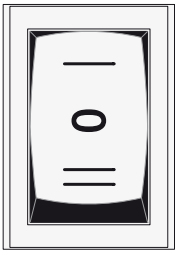
4. Closing force

In case the door does not close properly due to the door seals, you can increase the force with which the operator presses the door against the seal.

In order to do so, set DIP switch 7 to „ON“ position.

5. Internal program switch (optional)

The internal program switch (if available) is installed in the lateral cover on the side where the door is when „closed“.



AUTOMATIC

OFF

PERMANENT OPEN

Changing the operation mode

In order to change the operation mode, just adjust the program switch to the desired function.

15.Daily Safety Checks

The following points have to be observed:

- An inspection and acceptance test according to the below-mentioned checklist has to be performed after the first commissioning of the system by trained staff (trained by DORMA).
- Regular maintenance and inspections have to be performed (at least once a year) under consideration of our specifications for the CS 80 MAGNEO by properly trained staff.
- According to safety standards, documentation of the daily safety check should be kept for a minimum of 1 year.

Checklist (start-up test, maintenance, regular inspections) according to standards.

- ☐ The system has been installed properly inaccordance with the instructions of the manufacturer.
- ☐ The door panel runs smoothly.
- ☐ The door works properly (check the opening and closing cycle respectively).
- ☐ Function if installed activators like radar motion dectectors, pushbuttons or remote controls has been checked.
- ☐ The constactless safety equipment (safety sensors), if installed, has been checked for proper function.
- ☐ Effective safety equipment if installed to avoid or protect danger spots between certain parts of the door system and between the door and its structural environment (like for example safety clearances or the protection of the secondary closing edges).
- ☐ Test badge has been fixed.
- ☐ The inspection and maintenance work has been documented.

The CS 80 MAGNEO has to be switched off and secured against unintended and unauthorized switching on before performing maintenance work (cleaning or maintenance).

Care

Prior to first use and periodically thereafter, but at least once a year, the system must be checked and maintained by a qualified, knowledgeable technician. During the cleaning operation the Program Switch must be either be in the “OFF” or HOLD OPEN” position to avoid automatic movement of the door. Always disconnect the power before servicing. The entire door (Aluminum, Glass, Stainless Steel) can be cleaned with a moist towel and/or common commercial cleaners. Any safety sensors are to be cleaned with a dry, soft, non-abrasive towel. The floor and or threshold (if any) must be kept clean.

16. Troubleshooting

Malfunction	Possible causes	Remedy
The door does not respond. The green LED light indicator is off.	No power supply.	Switch on mains switch.
	Loose cable connections.	Connect cable connections thoroughly
	Damaged power cord.	Replace power cord.
	Damaged power plug.	Replace operator.
The door does not respond. The green LED light indicator is on.	The program switch is set to [0] (OFF).	Set the program switch to the desired function.
	The program switch is set to [II] (Permanent Open).	Set the program switch to the desired function.
	The door has been adjusted to Permanent Open Function via double-click.	Close door via double-click.
	The safety sensors at the door are activated (there is something within the detection range of the sensor).	Remove obstacles. Adjust safety sensors if required.
	Damaged sensor cable.	Check and replace cables if required. Check and replace jumpers if required.
	No safety sensors are connected	Terminals must be bridged.
	The operator is defective.	Replace operator.
The green LED light indicator blinks at certain intervals.	The learning cycle has not been performed properly.	Restart learning cycle (Page 32).
	The operator is defective.	Replace operator.
The door stops during a cycle.	The door does not run smoothly.	Check movement range and remove cause for unsmooth running.
The door moves beyond the adjusted “open” or “closed” position.	The corresponding end stop has shifted its position.	Readjust end stop and tighten screws. Start learning cycle (Page 32).
The red LED light indicator illuminates permanently.	Defective control unit.	Switch mains switch off and on.
		Replace operator.
The red LED light indicator blinks twice at certain intervals.	Defective control unit.	Switch mains switch off and on.
		Replace operator.

16. Troubleshooting

Malfunction	Possible causes	Remedy
The red LED blinks 3 times at regular intervals.	The power mode switch of the door has been switched to an other position.	Switch on mains switch off and on.
The red LED blinks 4 times at regular intervals.	Testable safety sensors are defective.	Check and replace safety sensors if required.
	Damaged sensor cable.	Check and replace cables if required.
	DIP switches 1 to 3 are not set correctly.	Check settings of DIP switches and readjust if required.
The red LED blinks 5 times at regular intervals.	Incremental encoder or cable of incremental encoder is defective.	Switch mains switch off and on. Replace operator.
	The opening width is adjusted incorrectly.	Readjust opening width (end stops). Start learning cycle (Page 32).
The red LED blinks 6 times at regular intervals.	There is an obstacle within the door's movement range.	Remove obstacles from movement range.
	The opening width has been adjusted incorrectly.	Readjust opening width (end stops).
		Start learning cycle (Page 32).
The red LED blinks 10 times at regular intervals.	Stator or cable of stator is defective.	Switch mains switch off and on. Replace operator.
	Short circuit at the terminal connection.	1. Remove the short circuit. 2. The operator has to be switched off and then on with the aid of the mains switch.
Humming noise while door is in end position.	Inappropriate end position of door panel.	Shift end stop by at least 2 mm. Start learning cycle (Page 32).
The door panel vibrates when moving.	The guide mechanism is under tension.	Readjust the door panel connection and the floor guide if required. Turn the nuts several times in order to fix the door panels.

Operating cycle indicator

When you press the „Reset“ button on the control unit for a short time, the door will open. In case the LED light indicator lights up for one second (yellow light), the system has performed more than 200,000 cycles.

You should contact the Service Department in order to have the system checked.

Please call the following number in case of technical problems or further questions:  **1-877-367-6211**

If the unit is defective and needs to be replaced, please contact the local distributor where the unit was purchased from. If the product needs to be replaced, the entire unit would have to be returned, except for the door panel, mounting hardware and any hanging brackets.

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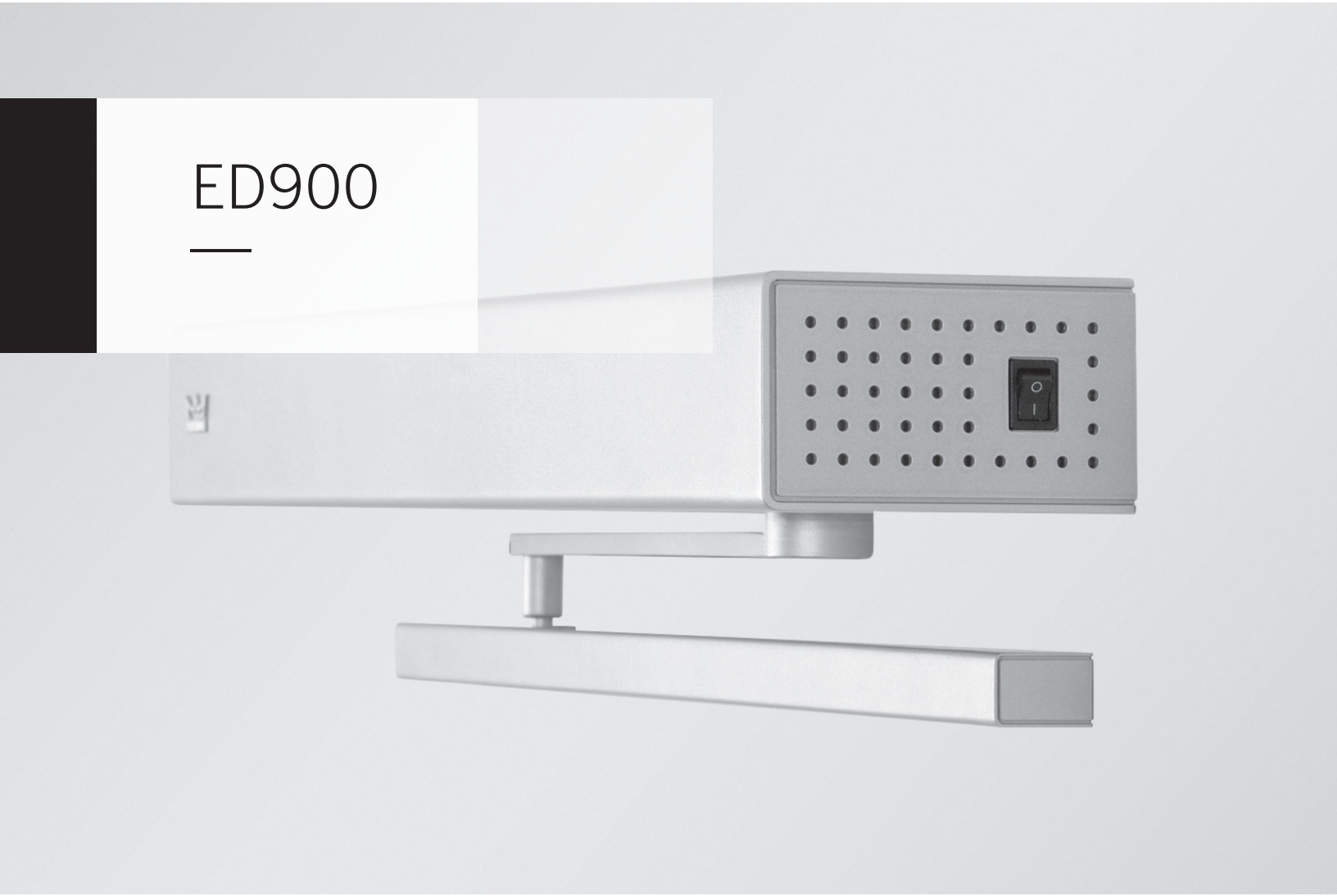
WN 058200 45532, 12/12, Subject to change without notice

DORMA

ED900



Low Energy Swing Door Operators

CONTENTS

DORMA USA quality and environmental management systems in Reamstown, PA and Steeleville, IL are certified to ISO 9001:2008 and ISO 14001:2004.

ED900 SWING DOOR OPERATORS

DORMA's most advanced low-energy swing door power operator.

The ED900 is fully ADA compliant – helpful for children, the elderly, persons with disabilities, or those carrying or pushing objects.
The operator is exceptionally quiet, safe, and easy to use. Doors open at precisely controlled speeds and forces, assuring safety for all users.

The ED900 features Contur design for a highly aesthetic look especially when used with the TS93 family of closers.

Technical Details

- Onboard power supply for access control devices: 1.5 A @ 24 VDC.
- Maximum door size: 48" (1219 mm) wide.
- Maximum door weight: 220 lb (100 kg).
- Operator weight: 26.58 lb (12 kg).
- Operating temperatures: 5° F to 122° F (–15° C to 50° C).
- Standard operator dimensions: 27" W × 2-3/4" H × 5-1/8" D (685 mm × 70 mm × 130 mm).
- Maximum opening angle: Powered—110°, Manual—180°.
- Non-handed.
- On-board cycle counter.
- 27" cover standard.
- One unit for push/pull track and top jamb applications.
- Axel extensions: 0, 5/16" (9 mm), 3/4" (20 mm), 1-3/16" (30 mm), and 2-3/8" (60 mm) — standard.

Certifications

- ANSI/BHMA 156.19 Power Assist and Low Energy Power Operated Doors.
- UL and CUL listed for fire door operators with automatic closers.
- ICC/ANSI A117.1 Accessible and Usable buildings and facilities.
- Underwriters Laboratories: ANSI/UL 325 Door, Drapery, Gate, Louver, and Window Operators and Systems.
- California State Fire Marshall (CSFM) approved.

Specifications

DORMA ED900 Series low energy operators with selectable low energy or power assist. Low energy function to cycle the door open as programmed. Power assist function for decreased opening force when manually operated. Operator to have a programmable push and go. All operators to have programmable sweep speed, latch speed, and backcheck cushioning.

Operators to have the following programmable options for power open functions: delay time, opening time/ opening force, opening angle, and door width selector. Operators to have selectable jumper to accommodate push or pull side applications. Operators to have on/off strike delay when the ED900 must delay while a locking device releases. Push side (top jamb) and pull side (track) arms to be available.
All operators will be hard wired. All operators to have selectable on/off obstacle detection on closing.

Optional Specifications

All operators to have remote switch wiring for tamper-resistance. Hold open function is deleted. On/off status can be controlled from a remote location. Specify RS. All operators to be powered with a power cord plugged into a 120 VAC receptacle. Specify PC.

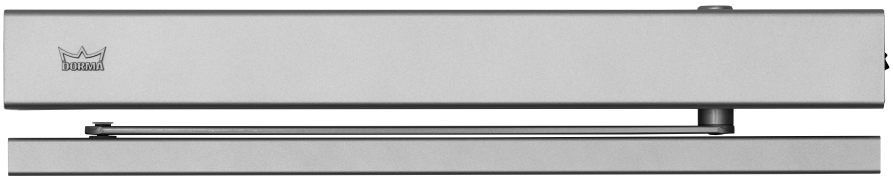
Electrical Specifications

- Power requirements: 115 VAC +/– 10%, 50/60 Hz, 6.6 A max.
- Current: 6.6 A.
- Fuse: 3 Amp – type AGC – size 1/4" – 1-1/4".
- Branch circuit protection: 15 A min.
- Auxiliary power output 24 V (normally) filtered, unregulated 1.5 A max range 24 +/– 10%.
- Form "C" relay contact for controlling fail-secure or fail-safe locking devices 50 VAC or DC at 1 A max.

When incorporating the ED900 into a system with other electrical components, DORMA's Technical Services Department offers assistance with point-to-point wiring diagrams. Please contact them with specific requirements.

Programmable Features

- Opening and closing speed.
- Hold open time: from 0–30 seconds.
- Backcheck & latching angles.
- Blow open/night bank hold open.
- Wall blanking on pull side.
- Safety sensor testing.
- Delayed opening for unlocking: From 0–400 milliseconds. Use with electromechanical access control peripherals such as electric strikes or exit devices with electric latch retraction.
- Closing force prior to unlocking: Works with the delayed unlocking feature and accommodates reduction of latch bolt locking force prior to releasing the electro-mechanical access control device.
- Opening and closing force.
- Latching action force: Power boost during latching cycle to overcome resistance for door seals, locking devices, or door/ frame misalignment.



Programmable Features (Continued)

- Keep closed force: designed to keep the door in the closed position when unlocked.
- Latching action angle: For engaging the programmable latching action feature. Opening angle range 2°–5°.
- Push and go.
- Program switch type.
- Behavior following a power reset.
- Cycle counter.
- Opening angle.
- Door closer/ automatic function.
- Activation angle for Helping Force function and Helping Force function.
- Remote interface.
- Backcheck when door is opened manually.
- Astragal angles for double-leaf doors—Opening of the second door can be delayed up to 30° of when the first door is opened.
- Wind load control: Opening and closing cycles. Variable include door size and weight, hinging, alignment, wind loads, HVAC imbalance. Forces measured at each door must confirm with ANSI 156.19 to maintain ADA compliance.
- After hours access hold open times: From 0–30 seconds.
- Day/night (push/pull): Unlocking during business hours.
- Door position status: Monitors when door has reached fully open or fully closed position. Can communicate status to external monitoring device or console.
- Activation via safety sensor on push side.
- Thickness of door.
- Deactivation of operator depending on contact setting.
- Hinge clearance.
- Reset of service interval display.
- Level of factory settings.
- Deletion of error log.
- Internal program switch delayed activation.
- Unlock in "Automatic" mode.
- Function of status relay.

Activation (Trigger) Options
The ED900 Automatic Operator can utilize a Normally Open (N.O.) dry contact activation input to automatically open a door. See DORMA's Electronic Access Control Components brochure for other options.

ED900 & Motorized Latch Retraction Exit Devices
The ED900 Automatic Operator can be used in conjunction with DORMA's Motorized Latch Retraction (MLR) 9000 Series Exit Device. The onboard 1.5 A power supply of the ED900 can directly power and control one MLR device, providing seamless operation of an automatic latch retraction door without the need for an auxiliary power supply. See DORMA's 9000 Series Exit Device brochure for additional information.

ED900, Electric Strikes & Electromagnetic Locks
The ED900 Automatic Operator can be used in conjunction with DORMA's Electric Strikes to provide Access Control to an opening. See DORMA's Electronic Access Control (EAC) section of our website for additional information.

Finishes

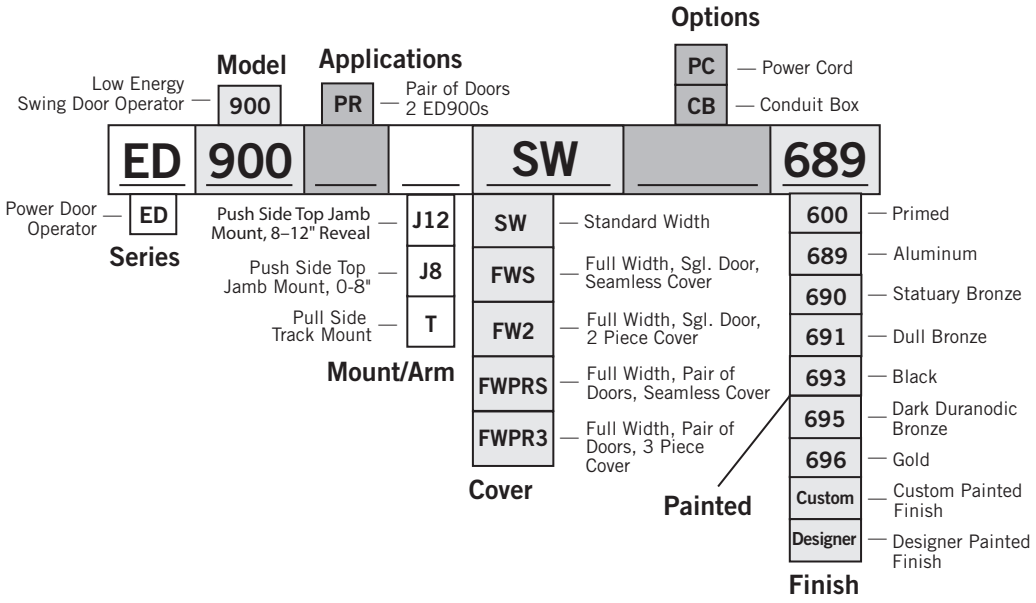
Standard Sprayed Finishes
- Aluminum: 689
- Bronze: 690 (Statuary), 691 (Dull), or 695 (Dark Duranodic)
- Gold: 696
- Black: 693

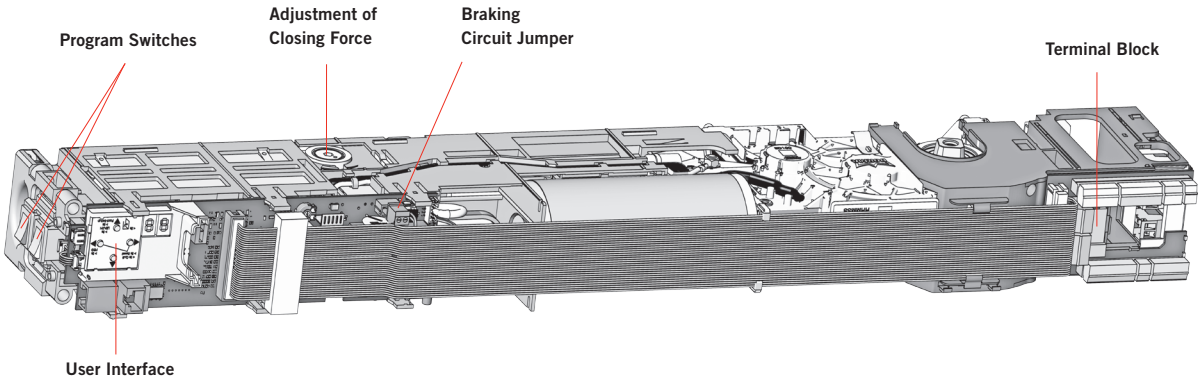
Optional DORMA Custom Color or Designer Color Finishes
Contact Customer Service.

Fire Door Applications
The ED900 is UL/CUL Listed for your installation on labeled fire doors.

Warranty
For details, refer to **DORMA Limited Warranty** on our website at **go.dorma.com/terms**.

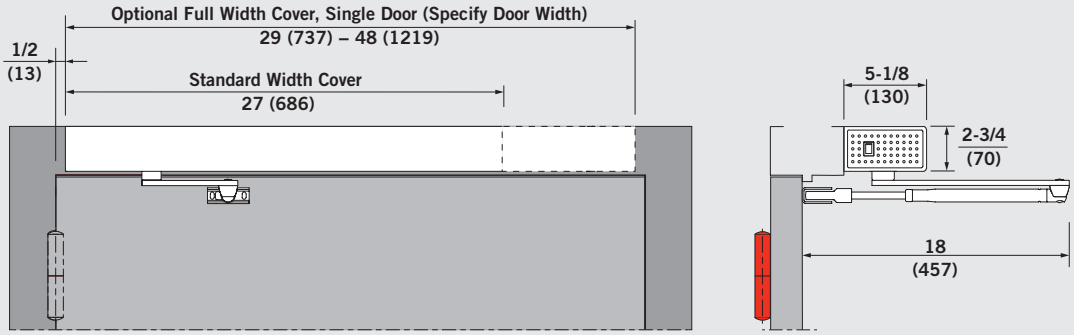
HOW TO ORDER ED900 SERIES





TOP JAMB INSTALLATION—SINGLE

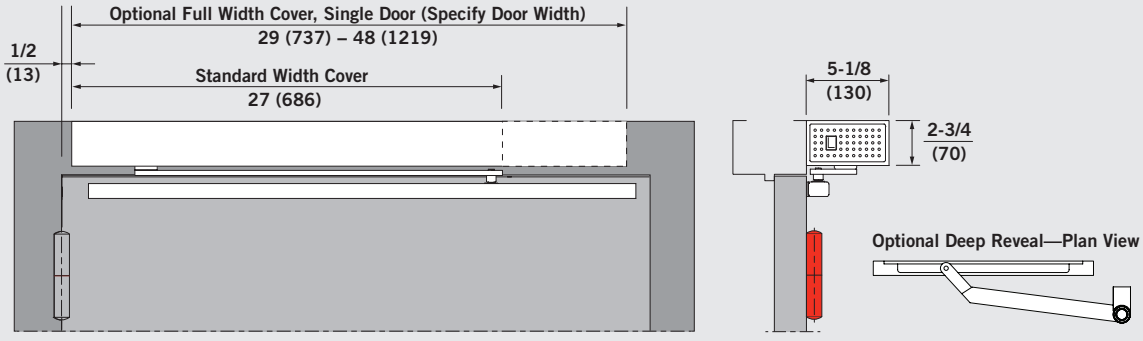
ED900 J



NOTE: Refer to the included bumper/stop to limit door travel to a maximum 110° to prevent possible damage to the ED900 arm. Where this is not practical, the ED900 J × Drop Mount with a surface door stop is recommended.

TRACK INSTALLATION—SINGLE

ED900 T

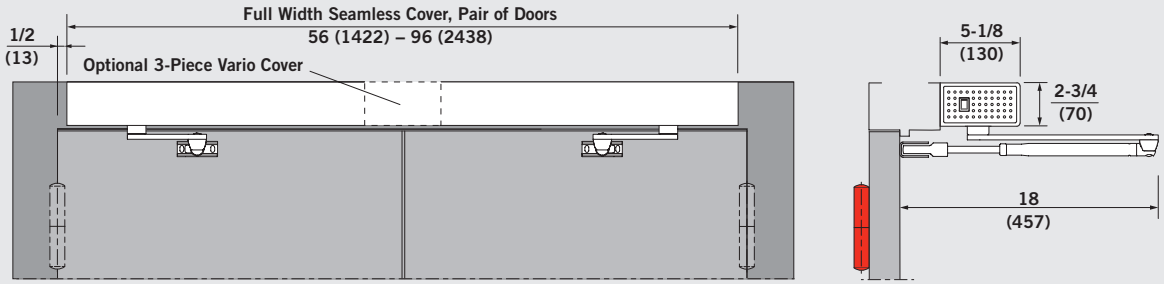


NOTES

- Refer to the included bumper/stop to limit door travel to a maximum 110° to prevent possible damage to the ED900 arm. Where this is not practical, the ED900 J × Drop Mount with a surface door stop is recommended.
- For deep reveal installations, consult DORMA Technical Support for arm options.

TOP JAMB INSTALLATION—PAIR

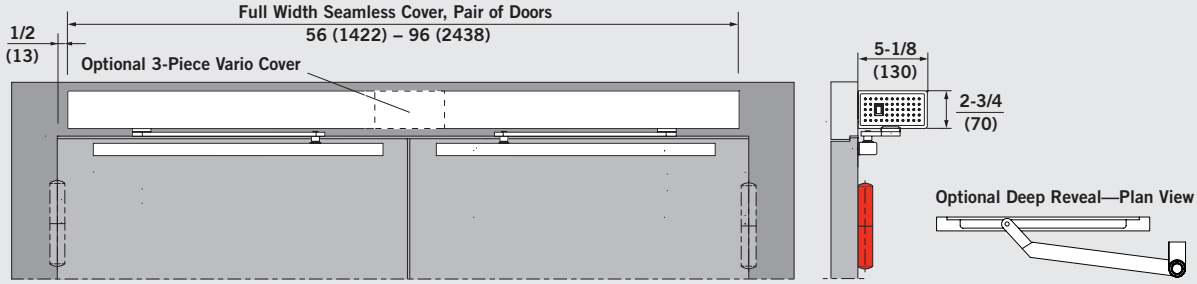
ED900 J



NOTE: Refer to the included bumper/stop to limit door travel to a maximum 110° to prevent possible damage to the ED900 arm. Where this is not practical, the ED900 J × Drop Mount with a surface door stop is recommended.

TRACK INSTALLATION—PAIR

ED900 T



NOTES

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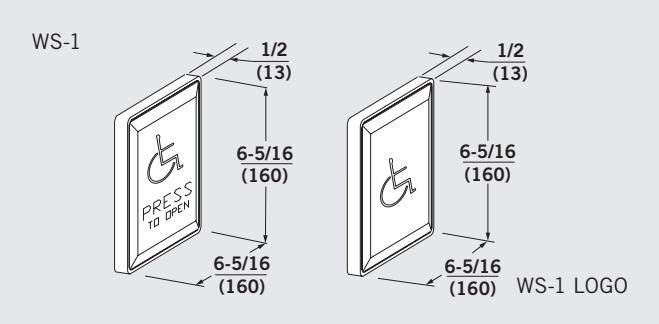
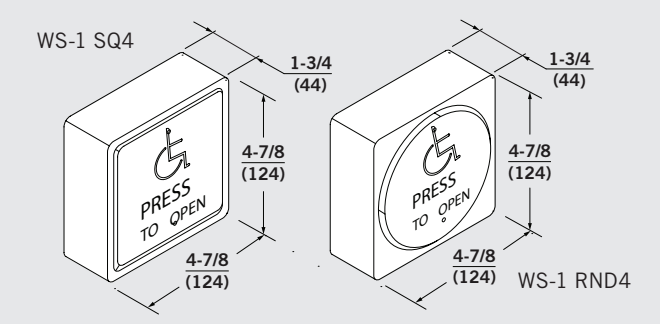
ACCESSORIES

Wall Switches





WS-1 — Tamper-resistant 6" × 6" wall plate with a normally open switch. Includes a heavy duty injection molded black ABS mounting box. Satin stainless steel wall plate with blue engraving. Wall plate displays the accessibility symbol and "PRESS TO OPEN."

Fits a standard 4" × 4" electrical box. Must be hard wired. Flush design allows the optimum in weather resistance, in surface, or recessed applications.

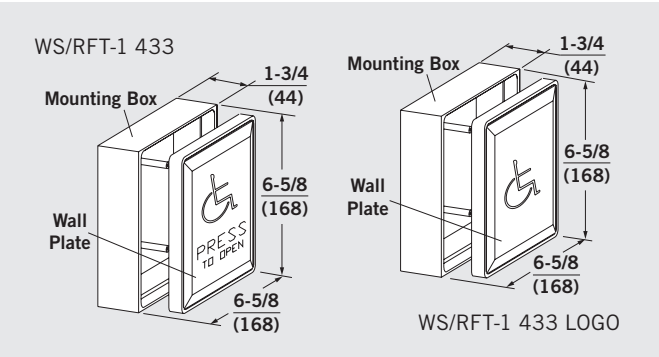
WS-1 LOGO — Same as the WS-1, except that the wall plate displays the accessibility symbol only.

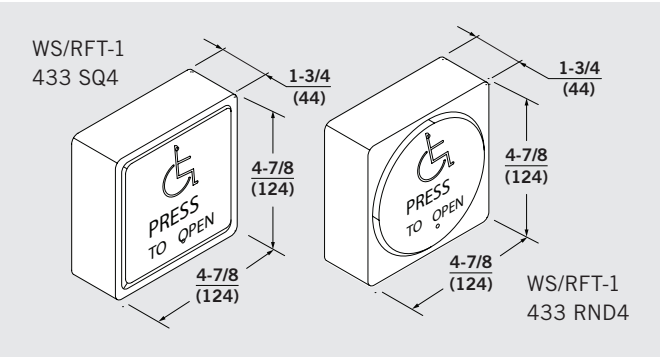
WS-1 SQ4 — Tamper-resistant 4-1/2" × 4-1/2" wall plate with a normally open switch. Includes a heavy duty injection molded black ABS mounting box. Satin stainless steel wall plate with blue engraving. Wall plate displays the accessibility symbol and "PRESS TO OPEN."

Fits a standard 4" × 4" electrical box. Must be hard wired. Flush design allows the optimum in weather resistance, in surface, or recessed applications.

WS-1 RND4 — Same as the WS-1 SQ4, except that the wall plate displays the accessibility symbol only. Wall plate is 4-1/2" round.

Wireless Wall Switches





WS/RFT-1 433 MHz — Tamper-resistant 6" × 6" wall plate with a normally open wireless switch. Includes a heavy duty injection molded black ABS mounting box with a radio frequency transmitter and 9 VDC battery. Must be used in conjunction with the RFR receiver. Maximum range is 50 ft. Satin stainless steel wall plate with blue engraving.

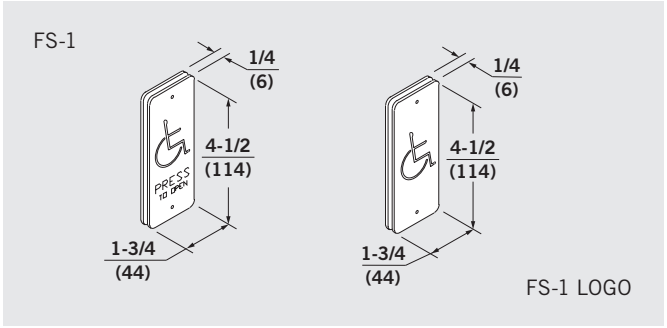
Wall plate displays the accessibility symbol and "PRESS TO OPEN." Flush design allows the optimum in weather-resistance, in surface, or recessed applications. Ideal where conditions prohibit hard wiring.

WS/RFT-1 LOGO 433 MHz — Same as WS/RFT-1, except that the wall plate displays the accessibility symbol only.

WS/RFT-1 433 MHz SQ4 — Same as WS/RFT-1, except that the wall plate displays the accessibility symbol only. Wall plate is 4-1/2" × 4-1/2" square.

WS/RFT-1 433 MHz RND4 — Same as WS/RFT-1, except that the wall plate displays the accessibility symbol only. Wall plate is 4-1/2" round.

Frame Switches

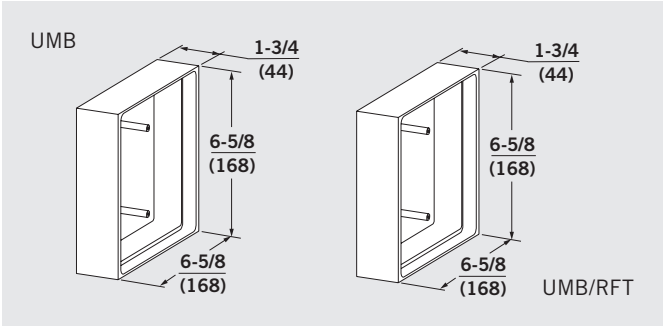


FS-1 — 1-3/4" × 4-1/2" frame plate with a normally open switch. Satin stainless steel frame plate with blue engraving. Frame plate displays the accessibility symbol and "PRESS TO OPEN."

Fits a minimum 1-3/4" × 4" frame section. Must be hard wired.

FS-1 LOGO — Same as FS-1, except that wall plate displays the accessibility symbol only.

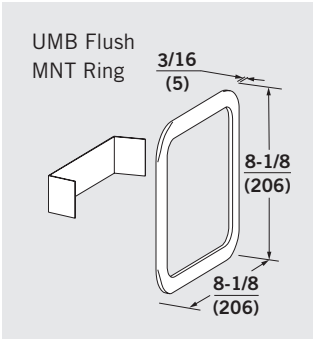
Mounting Boxes



UMB — Black ABS universal replacement mounting box for WS-1 type switches.

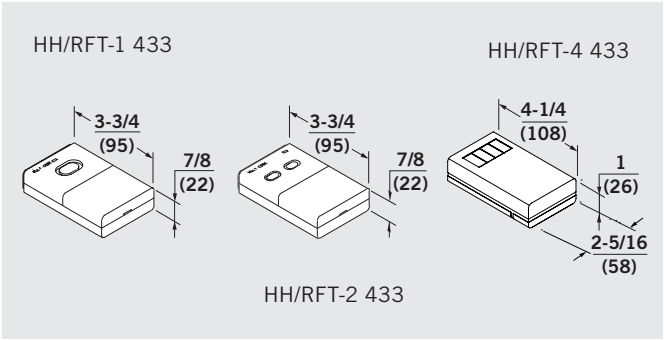
UMB/RFT — Black ABS universal replacement mounting box for WS/RFT-1 type switches. Includes a radio frequency transmitter.

Flush Mount Ring



UMB Flush MNT Ring — Black ABS flush mount ring and metal mounting bracket. The ring is designed to cover the gap between the mounting box and the switch plate cutout in the wall for a nice clean look.

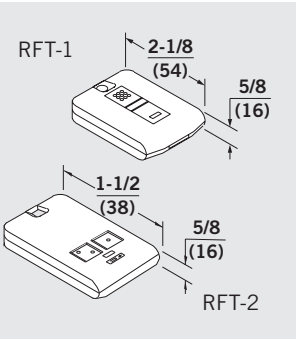
Hand Held Transmitters



HH/RFT-1 433 MHz (Single Frequency), HH/RFT-2 433 MHz (Dual Frequency), HH/RFT-4 433 MHz (Quad Frequency) — Compact, portable switches. Must be used with RFR receiver. Maximum range is approx. 50 ft (depending on conditions). Works with, or in place of, WS/RFT-1. Powered by 9 V DC battery.

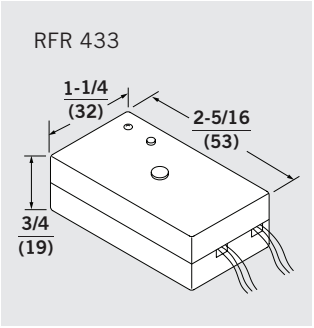
Well suited where multiple users must activate ED900 for accessibility, security, convenience, or where use of an exposed switch is not practical. Neutral case with grained finish. RFT-2 requires one RFR per frequency.

Key Chain Transmitters



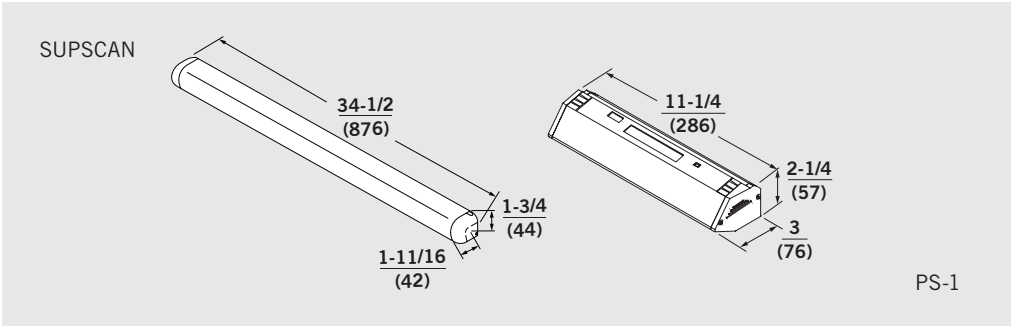
KC/RFT-1 433 MHz (Single Frequency), 800 KC/RFT-2 433 MHz (Dual Frequency) — Similar to HH/RFT-1 or HH/RFT-2, but more compact. Must be used with RFR receiver. RFT-2 requires one RFR per frequency. The small size permits the use as a key chain or in cases where the hand held transmitter is too large. Powered by a watch battery.

Receiver



RFR 433 MHz — Radio frequency receiver. Required for use with all DORMA transmitter switches. Powered from the onboard power supply of the ED900. Ideal for applications with range and signal strength problems. Maximum range typically 50 ft (conditions permitting). Surface applies remotely. Operates on 12 or 24 Volts AC or DC. 16 mA nominal (50 mA max. when relay is triggered).

Presence Sensors



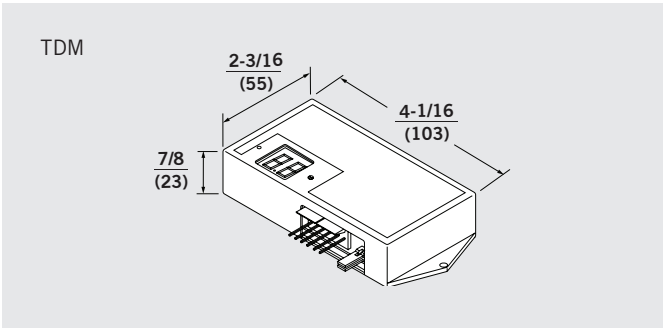
Supscan — Door mounted presence sensor that uses distance measuring technology to project focused active infrared patterns that can be used for safety and reactivation.

- Detection range from 2'–12'.
- Can be mounted at various angles for multiple, custom applications.
- A focused pattern may be ideal for many applications where precision is key.
- Background elements such as texture, color, or reflectivity do not effect detection sensitivity.

PS-1 — Ties to ED900 safety circuit for ultimate user protection. Prohibits opening of door if obstacle is sensed. Requires use of optional **transformer.**

PS-1 RMT — Hand held remote control required to program PS-1 or MS-1 RV1. One remote programs unlimited presence or motion sensors.

Time Delay Module



TDM — Advanced time delay module, allowing the installer to use only one time delay for any automatic door operation, electrically or magnetically locked doors, or vestibule sequencing applications.

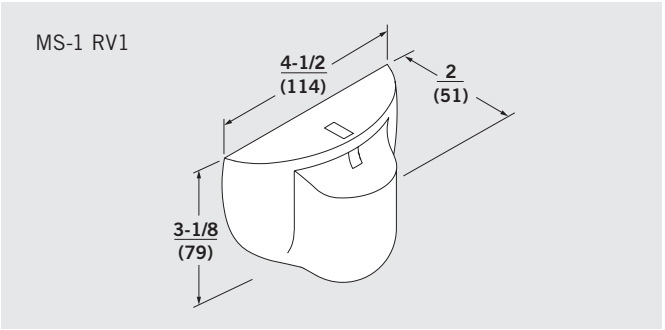
Takes one to four inputs and converts them to sequential relay outputs.

As a make/break relay, it eliminates mechanical binding of the locking mechanism on an automatic door. Make relay can be configured as a wet output to directly apply power to an electric locking device.

To sequence vestibule sets of doors, unit provides an initial relay output for the first door, a delay between outputs 1 and 2, and another output for the second door. Also provides a delay between outputs 2 and 1, allowing you to sequence your vestibule in both directions with only one TDM. Each delay adjustable from 0.0 to 99 seconds.

Power Requirements
12–24 V AC or DC +/– 10%, 50 or 60 Hz, 83 mA @ 24 VDC

Motion Sensors



MS-1 RV1 — Unidirectional K band sensor. Adjustable elliptical sensing pattern. Adjustments include unidirectional, unidirectional with motion tracking feature, bidirectional sensing capability, wide or narrow patterns, 3-dimensional angle adjustment, and heightened immunity to highly sensitive motion settings. Adjustments via PS-1 RMT remote control. Self-monitored ready out of the box, used with or without a self-monitored ready system. Includes 0°–90° vertical and –30°–+30° lateral tilt angle, powered by 12–24 VAC (±10%) or 12–24 VDC (+30%) (–10%).

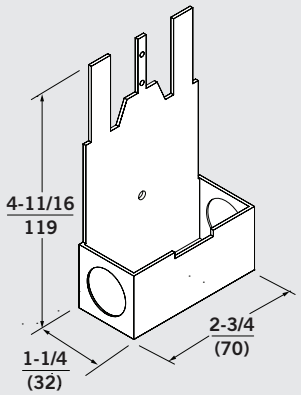
PS-1 RMT required for initial setup. Designed for use in openings designated specifically for barrier-free accessibility.

IMPORTANT NOTE: Cannot be used as primary activation without additional safety sensors.

Should not be used in combination with ED900 in openings used for pedestrian traffic or where high-speed operation/opening is needed. Precise setup of the motion sensor detection area is necessary so nearby traffic is not picked up.

Conduit Box

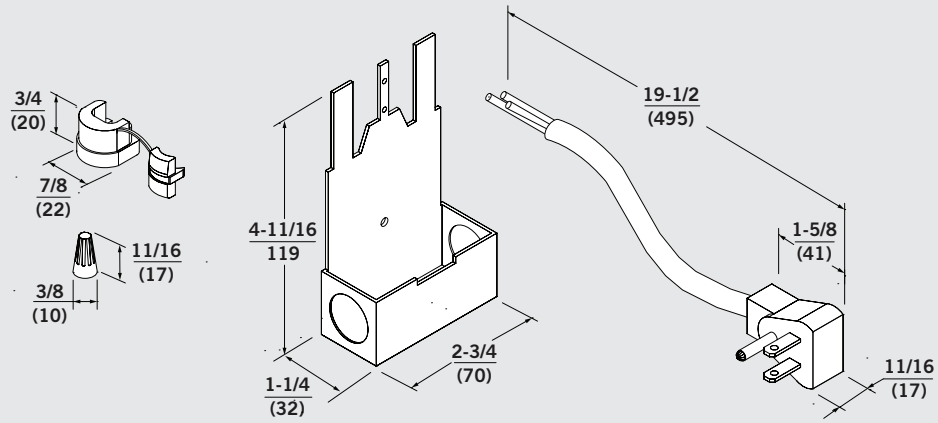
CB



CB — UL approved conduit box accessory to provide surface wiring of 120 VAC power to ED900.

Wiring Kit

PC



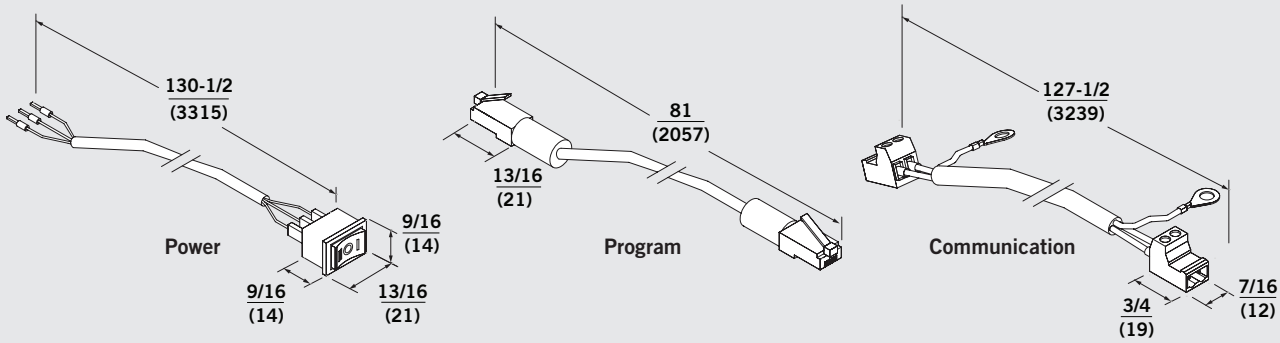
PC — Eliminates need for hard wiring. Permits ED900 to plug directly into 120 VAC/60 Hz receptacle. Cord measures 15" from end cap to center of plug.

Kit includes

- Power cord
- Wire nut
- Cord grip
- Conduit box

Full-Width Three Piece Cover Kit

PRCONKIT5560



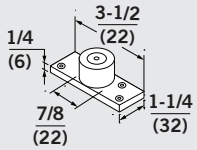
PRCONKIT5560 — Allows installation and communication of two ED900s on a pair of doors.

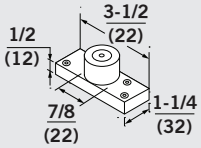
Includes

- Communication cable to program coordination of the two operators.
- Power cable to link operators.
- New programming switch to enable proper commissioning.
- Backplate, middle cover, and seam covers.
- Kit can accommodate paired openings 86" to 110".

Bumper Stops

BSTP25



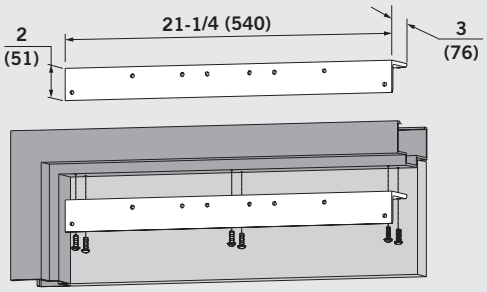


BSTP50

BSTP25 (1/4" thick base plate)/ BSTP50 (1/2" thick base plate) — Header mounted bumper stop provides protection for ED900J operator and door by limiting degree of opening when bumper stop is correctly located and installed.

Angle Bracket

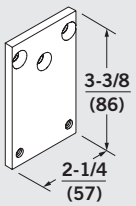
970



970 — For mounting ED900 J easily on deep reveal frame conditions or when frame face is less than 1-3/4". Frame must be properly reinforced to secure bracket. Requires 2-3/4" minimum soffit width.

Drop Plate

930



930 — For mounting arm shoe in top jamb drop application when top door rail is less than 4-5/8" (2" minimum required).

DORMA

www.dorma.com

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07000472 · 6.15CT · 2.5M · USA

DORMA ED100 ED250

Compact
Low Energy/
Full Energy
Swing Door
Operators

ED100 & ED250
Low Energy/Full Energy Compact Swing Door Operators

The **DORMA ED100** and **ED250** are compact next generation electromechanical swing door operators that are **innovative**, **simple**, and **elegant**.

Innovative

- State-of-the-art microprocessor motion control system continuously monitors and controls the door through the entire cycle.
- Wind load control and power boost options ensure safe and secure opening and closing in changing conditions.
- Optimized settings for primarily manual or automatic use.
- Advanced automatic power assist combines minimal push forces (as low as ANSI size 1) with reliable closing.
- Modular design allows new applications to be added and adjustments made post installation without replacing the operator.
- Integrated connections for safety sensors and other accessories.

Green design & performance

The ED100/ED250 operators reflect DORMA's commitment to the environment in both manufacture and performance. Each unit is smaller and lighter than previous swing door operators. Lower weight in turn reduces the amount of energy required for shipping. Once installed, the ED100/ED250 helps to minimize heat loss due to doors closing improperly.

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Simple

- The ED100/ED250 operator is exceptionally easy to install. The low-profile height (less than 3") makes installation easy and minimizes modifications to adjacent work.
- The universal design allows the same operator to be used for any hand of door.
- Mounting plate installation provides a simple one-person install process with easy electrical hookup and without heavy lifting.
- Modular concept and intelligent coordination make it simple to field-fit the operator to any application, single or pair.
- Fully integrated electronics and optional mechanical coordinator minimize the need for extra devices.
- Simple configuration with on-board electronics and easy-to-install design make the system fast to install and maintain.

DORMA Entrance Systems
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Elegant

The compact ED100 and ED250 operators are discreet both visually and audibly. Their elegant Contur design blends into and enhances any décor. With virtually silent operation, the automation of the door can be easily integrated without compromising the style and feel of the entrance.

- DORMA ED100: for doors up to 220 lb (100 kg)
- DORMA ED250: for doors up to 550 lb (250 kg)
- Dimensions: 27" long × 2-3/4" high × 5-1/8" deep
- The operators can be installed as push versions with standard arms or pull versions with a slide channel.

DORMA Entrance Systems™

DORMA Automatics

Swinging/Folding Door Systems

The DORMA ED400 — Powerful, Reliable, Flexible, and Intelligent

Powerful

The DORMA ED400 full power operator is designed for demanding applications such as retail centers, airports, and health care facilities. Engineered for high traffic entrances and heavy-duty applications, the ED400 can handle doors up to 320 lb per door leaf.

Reliable

DORMA Automatics products are tested for one million cycles in climate-controlled test chambers that replicate severe weather conditions. A built-in power boost helps keep the door closed even when it is exposed to high wind or stack pressure buildup.

Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self closing. Virtually maintenance free, this unit provides smooth, silent door operation.

Flexible

This unit functions as either a low energy operator or a full energy unit and can be modified with the flip of a switch. These complete factory-engineered door systems meet all of the stringent requirements of ANSI 156.10, ANSI 156.19, and UL325, as well as NFPA 252 90 minute fire rating when used with rated doors and hardware.

The ED400 operator is ideal for applications that require an ADA-comliant entrance. With a multitude of adjustable features, you have the flexibility to fine tune the door to meet your specific needs—all without the need for special tools or hand-held programming terminals.

In the event of power loss, the controller has fuse and electronic power-surge protection. This function allows the closing system to act like a door closer, providing easy manual operation.

Intelligent

This operator is built with the most technologically advanced encoder and microprocessor control, utilizing the most innovative user interface on the market today. The microprocessor is self-learning for the door weight and inertia, providing the smoothest operation. The controller has dedicated circuits and LED status indicators for up to five safety sensors, which means no more doubled up circuits or decreased performance. The easy 3-digit display allows you to monitor the performance of every function for easy diagnostic evaluation.

ED400

Integrated Features

- Optional power boost mode is built in to help keep your door closed when your application has a windy exposure or stack pressure build-up.
- Microprocessor control encoder motor has built-in diagnostics.
- Push-&-Go feature is selectable at your choice.
- Power assist opening self-engages whenever the door is pushed manually.
- Built-in lock delay eliminates the need for another expensive interface module.
- The safety touch feature initiates door reopening whenever an obstruction occurs during the closing cycle.
- A hard stop prevents wall damage, with an additional electronic stop that allows the door to be set at any desired angle.
- Indefinite hold open function allows for faster traffic control and fresh air.

Highly Adjustable

A multitude of adjustable features gives you the flexibility to customize the application to your specific needs.

- Full energy mode for high volume traffic areas such as retail stores, airports, and hospitals.
- Heavy-duty low energy mode for doors with higher traffic patterns requires ADA compliance without the need to change the springs.
- Inswing or outswing models are available in surface mount or overhead concealed.
- Single, double, or double egress door applications are all available.
- A built-in circuit allows for fire alarm integration and control.
- ED400 operator can handle doors up to 320 lb per door leaf.
- Handed door is field-adjustable as needed.

The DORMA ED1200 — Advanced Design, Wider Clear Opening, Versatile Application

Advanced design

The advanced DORMA ED1200 Bi-Fold Door is another option for meeting your automatic door needs. The ED1200 combines proven mechanical design with easily programmable control units, creating a reliable, durable, easy-to-install door. The ED1200 Bi-fold Door uses the heavy-duty ED400 controller and operator as its drive platform. This strong, intelligent, and flexible platform ensures that the bi-fold doors operate smoothly.

Wider clear opening

The ED1200 Bi-Fold Door provides a wider clear opening than sliding or swinging doors—its easy breakout mechansim allows the ED1200 to utilize the full door opening. The result is easy 2-way traffic for your building entrance.

Versatile application

The ED1200 is available for both interior and exterior surface-applied applications. It features double weathering at lead and pivot edges and will continue operating in extremes of hot or cold.

Key Features

- Double weathering at lead and pivot edge.
- Finger protection at fold points and pivot points.
- Interior or exterior applications.
- Microprocessor control encoder motor has built-in diagnostics.
- Ultra-quiet motor gearbox.
- Available in surface-applied applications.
- Available in configurations that break out to the fold or non-fold side.
- A built-in circuit allows for fire alarm integration and control.

Integrated Performance Functions

- Opening Time: Adjustable from 2.3 to 5.0 seconds.
- Closing Time: Adjustable from 2.5 to 5.0 seconds.
- Hold Open Delay: Adjustable from 2 to 30 seconds.
- Power Hold Close: Extra closing force for stack pressure and wind conditions.
- Delay Before Opening: Adjustable from 0.0 to 3.0 seconds.

ED400-IG

DORMA Automatics Low Energy Operators

DORMA Automatics offers several products specifically designed for applications requiring low energy swing door operators. For more information, ask for the *DORMA Automatics Low Energy Operators* brochure.

ED700 Easy to install, the DORMA ED700 makes existing doors accessible. Every ED700 closer is custom ordered to meet application requirements.

ED400-IG The DORMA ED400-IG in-ground floor closer enables your application to meet access requirements and still maintain the desired architectural design.

ED700

Green Design & Performance

The ED100/ED250 operators reflect DORMA's commitment to the environment in both manufacture and performance. Each unit is smaller and lighter than previous swing door operators. Lower weight in turn reduces the amount of energy required for shipping. Once installed, the ED100/ED250 helps to minimize heat loss due to doors closing improperly.

ED100 & ED250 — Low Energy/Full Energy Compact Swing Door Operators

The DORMA ED100 and ED250 are compact next generation electromechanical swing door operators that are innovative, simple, and elegant.

Innovative

- State-of-the-art micro-processor motion control system continuously monitors and controls the door through the entire cycle.
- Wind load control and power boost options ensure safe and secure opening and closing in changing conditions.
- Optimized settings for primarily manual or automatic use.
- Advanced automatic power assist combines minimal push forces (as low as ANSI size 1) with reliable closing.
- Modular design allows new applications to be added and adjustments made post installation without replacing the operator.
- Integrated connections for safety sensors and other accessories.

Simple

- The ED100/ED250 operator is exceptionally easy to install. The low-profile height (less than 3") makes installation easy and minimizes modifications to adjacent work.
- The universal design allows the same operator to be used for any hand of door.
- Mounting plate installation provides a simple one-person install process with easy electrical hookup and without heavy lifting.
- Modular concept and intelligent coordination make it simple to field-fit the operator to any application, single or pair.
- Fully integrated electronics and optional mechanical coordinator minimize the need for extra devices.
- Simple configuration with on-board electronics and easy-to-install design make the system fast to install and easy to maintain.

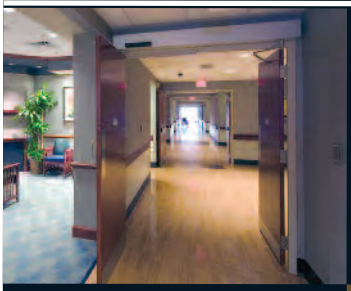
Elegant

The compact ED100 and ED250 operators are discreet both visually and audibly. Their elegant Contur design blends into and enhances any décor. With virtually silent operation, the automation of the door can be easily integrated without compromising the style and feel of the entrance.

- DORMA ED100: for doors up to 220 lb (100 kg)
- DORMA ED250: for doors up to 550 lb (250 kg)
- Dimensions: 27" long × 2-3/4" high × 5-1/8" deep
- The operators can be installed as push versions with standard arms or pull versions with a slide channel.

DORMA Entrance Systems™

Providing entrance systems that meet or exceed industry standards while maintaining architectural appeal.



DORMA Automatics
A leading innovator of automatic door systems, DORMA Automatics offers products for practically any application: retail, health care, office buildings, airports, hospitality, and more.

Crane Revolving Doors
The choice of leading architects for commercial and institutional buildings, Crane Manual, Automatic, & Security Revolving Doors can be found in buildings worldwide.

DORMA Americas

DORMA Entrance Systems™
Pedestrian Flow, Safety & Security

DORMA Architectural Hardware
Providing Safety & Security Around the Door

DORMA Glas
Elegance, Versatility & Beauty

Modernfold
Sound & Space Management

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DORMA LOW ENERGY OPERATORS

ED700 LOW ENERGY OPERATOR

Barrier-free Access

The DORMA ED700 Low Energy Operator is the perfect solution for barrier-free access applications. Simple and easy to install, the ED700 provides many features and functions to make existing doors easily accessible.

The DORMA ED700 is custom ordered to match the application. All common applications for outswing and inswing doors—either with push arm or slide track arm for tight side clearance—can be adapted for barrier-free access.

Extruded aluminum covers in custom lengths are available to match aesthetically with the door frame.

The ED700 may be used for door widths up to 48" (1220 mm) and a maximum weight of 200 lb (91 kg).

For best accessibility, the operator can open the door up to an opening angle of 110°.

ED700 LOW ENERGY OPERATOR

Features

- Slide track arm available for inswing applications.
- Full length header available on request.
- 5.5" W × 5" H Extruded Aluminum Header (140 × 127 mm).
- For inswing & outswing doors.
- Scissor-arm for inswing & outswing applications.

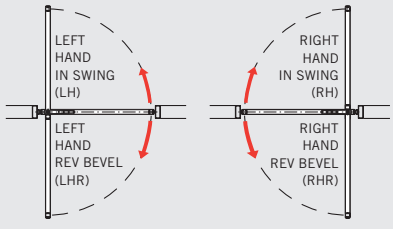
Finishes

- 204-R1 clear anodized.
- 313-R1 dark bronze anodized.
- Special finishes available (custom anodized, paint, architectural metal cladding).

Standards

- ETL listed for US and Canada (UL325).
- Full compliance with ANSI A156.19 – American National Standard for Power Assist and Low Energy Power Operated Doors.
- Full compliance with the Americans with Disabilities Act of 1990.
- NFPA 252 90 minute fire rating when used with rated door and hardware.

Door Handing Definition



AS VIEWED FROM EXTERIOR

CUTTING EDGE TECHNOLOGY

ED700 Features & Functions

Settings and Adjustments
All major adjustments are easily accessible on the control unit allowing correct settings for varying door and pedestrian requirements. Main adjustments are as follows:

- Open speed.
- Time delay (hold open time, 1–30 seconds).
- Close speed.
- Open check speed.
- Open force.

Electrical Requirements

- 120 VAC, 50/60 Hz, 5 A minimum.

Options for Activation

- Pushbutton (momentary actuation opens door; time-delayed closing).
- Internal Push-&-Go (Slight push of door will initiate powered door opening).
- Card Readers.
- Power Assist.
- Remote Controls.

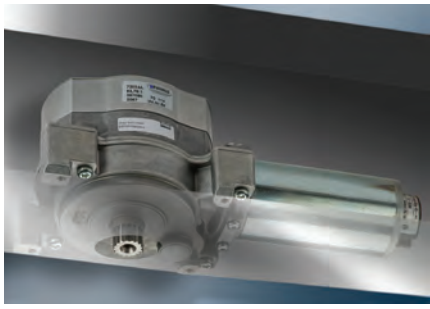
3-Position Door Control Switch

- OFF (easy manual operation).
- ON (low energy mode operation).
- OPEN (door fully opens and remains).

Built-in Power Supply for Sensors

Optional Accessory Interface

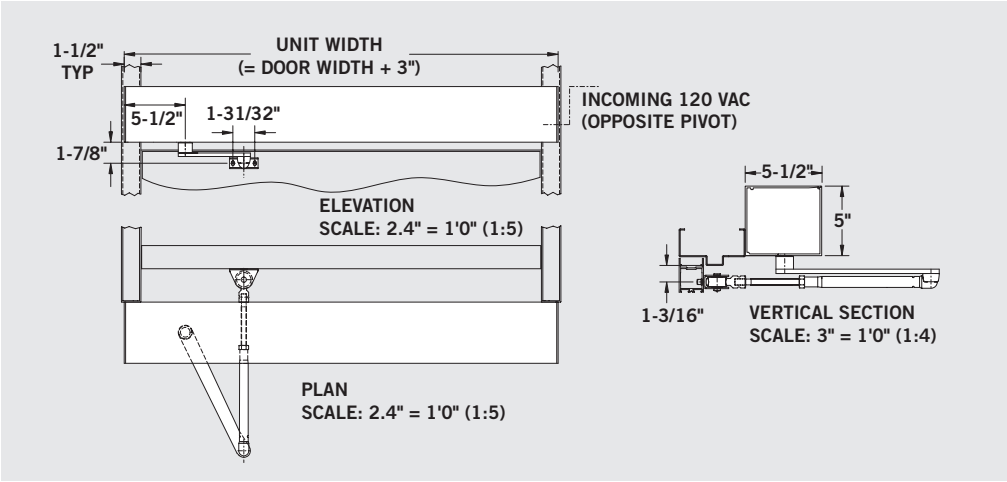
- Motion sensor (door opens and remains until sensor zone clears; time-delayed closing).
- Presence sensor (swing area protection; prevents closed door from opening/ open door from closing).
- Built-in lock-out function and support for dual-state overhead safety sensors.
- Door-Mounted Sensors (Approach/Door Open; Swing Side/Door Inhibit).



ED700 Configurations

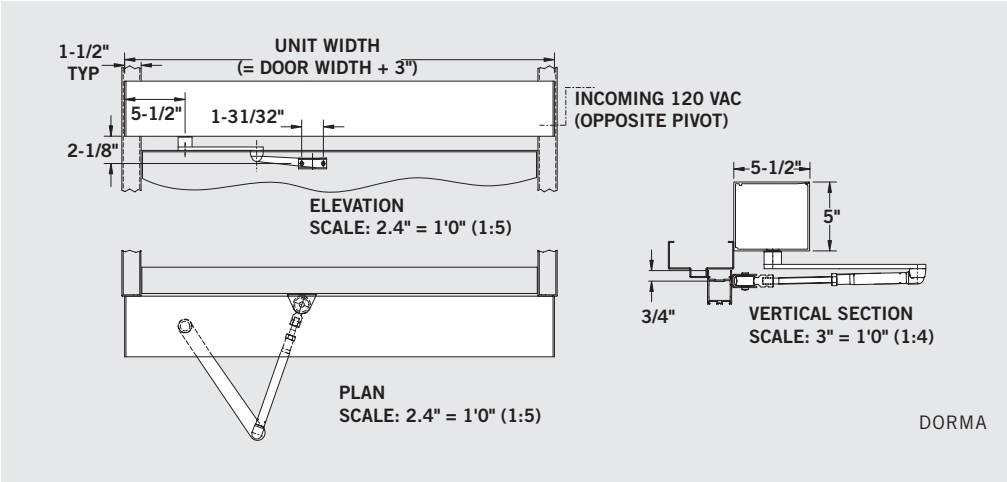
Surface Applied Outswing Scissor-Arm (Push Application)

Surface applies the operator to the door frame with a push arm assembly attached to the top door rail.



Surface Applied Inswing Scissor-Arm (Pull Application) (Standard)

Surface applies the operator to the door frame with push arm assembly attached to the top door rail.



ED400-IG CONCEALED IN-GROUND FLOOR CLOSER

Dual Mode: Low Energy or Full Power

DORMA offers the ED400-IG Automatic Floor Closer for applications that need to both meet access requirements and maintain a classic look, such as an arched door or an all-glass façade. This revolutionary operator conceals the automatic components in the floor near the door threshold.

The ED400-IG functions in either low energy or full power mode, and can be used in both new construction and retrofit applications. DORMA partnered with Opcon Manufacturing Systems to construct this closer, which directs energy generated by the ED400 drive unit to the pivot in a rotating motion, thus allowing consistent, smooth operation.

The install box that stores the operator is completely weather proof and is only 7" deep. All ED400 operator functions, such as Push & Go, Power Close, and Lock Interface, are fully available in this application, which DORMA is nonetheless able to offer at a value-conscious price.

ED100 & ED250 COMPACT SWING DOOR OPERATORS

Low Energy/Full Energy

The DORMA ED100 and ED250 are compact next generation electro-mechanical swing door operators.

Innovative engineering makes them safe, reliable, and energy-efficient at any level of traffic and in variable atmospheric conditions. Their modular design allows them to be pre-configured with plug-ins for specific applications. Their sleek, minimalist Contur profile makes them a perfect fit for any application, interior or exterior.

Unlike conventional electro-hydraulic operators, the ED100 and ED250 are able to respond automatically to changes in the surrounding environment. A state-of-the-art drive system and built-in sensors can quickly adjust how the unit operates, boosting power when required to open and close reliably and consistently.

A wide array of applications can be realized due to built-in functions and options including wind-load control, mechanical coordinator, automatic power assist, sensor/lock timing, and more.

Universal modular design and high-tech functionality combine with ultra-compact form and award-winning Contur aesthetics to make this operator a beautiful way to automate easily without drawing unwanted attention.

DORMA ED100:
for doors up to 220 lb (100 kg)

DORMA ED250:
for doors up to 550 lb (250 kg)

DORMA MAGNEO SLIDING ENTRANCE SYSTEM

Linear Magnetic Drive Technology (LMD)

Powered by linear magnetic drive technology (LMD), the MAGNEO entrance system is designed for any modern interior. Innovative LMD technology ensures that the MAGNEO is safe, reliable, whisper quiet, and resistant to wear.

DORMA MAGNEO is ideal for both new and retrofit interior applications. Its modern design and easy operation make it an attractive and efficient way to update both the function and appearance of existing interior doorways.

The versatile MAGNEO meets all safety requirements for low energy applications. Its extra sensitive operation instantly detects any obstruction. Activation is achieved via touchless design push plate, radio remote control, or traditional infrared motion detectors.

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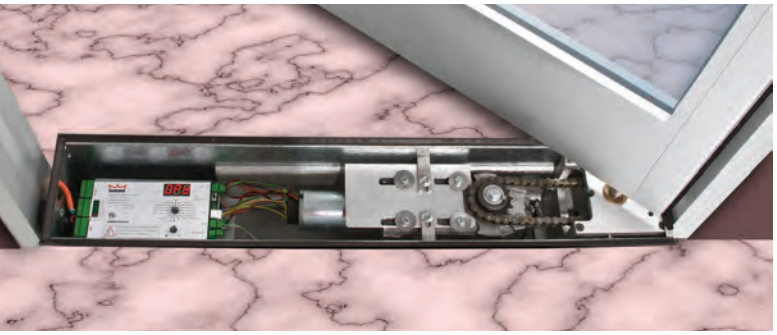
DORMA ED400-IG

Low energy operator



DORMA USA, Inc.
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With the ED400-IG Automatic Floor Closer, applications can meet access requirements and maintain a classic look at the same time—such as an arched door or an all-glass façade. This revolutionary operator conceals the automatic components in the floor near the door threshold.

The ED400-IG functions in either low energy or full power mode, and can be used in both new construction and retro-fit applications. DORMA partnered with Opcon Manufacturing Systems to construct a closer that directs the energy generated by the ED400 drive unit to the pivot in a rotating motion, thus allowing consistent, smooth operation.

The install box that stores the operator is completely weather proof and is only 7" deep. Product features include Push & Go, Power Close, and Lock Interface.

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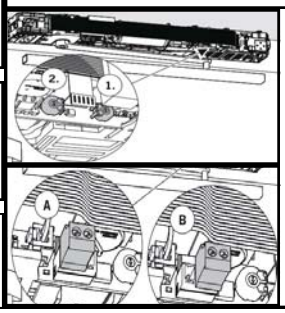
DORMA ED100/250 Quick Start Guide

STEP 1	The operator must be completely installed and the door must be closed. The arm must be installed according to the installation directions. All terminal blocks need to be installed with no safety sensors connected. Both Program switches need to be in "0" position. Then switch on the power supply, a series of numbers and letters will show on the display. This will stop after two horizontal dashes side by side move up and down several times.
STEP 2	While the dashes are moving up and down, push the bottom button on the display . This will identify which way the unit is mounted. Letters and numbers will now display right side up.

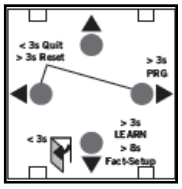
The display will show a "P" on the right with a rotating segment on the left.

IMPORTANT:
Verify the no power closing speed and jumper setting before programming the door and completing a learn cycle. The door must be adjusted to close in no less than 3 seconds but a minimum of 5 seconds is recommend.



When the jumper is in the correct position the door will push open easily and close slowly. If the door is very hard to push open change the jumper position

STEP	DIRECTIONS	EXPECTED RESULTS
3	Push and hold the right button for three seconds	Parameter ID will appear (ex: AS)
4	Push the right button again	Will display the current setting (ex: 00)
5	Push the right button again	Display will flash the current setting
6	Use the up and down buttons to change the settings	All three required settings must be made to flash even if the value does not need to be changed before the door will move to the learn cycle.
7	Push the right button again to accept the changes	
8	Push the left button again to go back to the menu	
9	Push the down button to go to the next setting (or) Push the left button again to exit programming menu	Go back to step 4 under programming. Display will show a rotating segment and a "0"



STEP	CONFIGURATION	RANGE FACTORY SETTINGS	Units [ ]= factory setting	DESCRIPTION
10	Door arm type Push or Pull Mounting **A S**	0 to 1	[0]	Operator installed on the pull side (hinge side)
			1	Operator installed on the push side (non hinge side).
11	Reveal **r d**	-3 to 30 ED250 -3 to 50	[0]	The reveal depth is adjusted in steps of 3/8". (Ex: 4 = 1 1/2")
12	Door Width **r b**	7 to 11 ED250 7 to 15	[10]	The astragal is included in the door width. The door width is indicated in steps of 4". (Ex. 9 = 36") (Ex. 11= 44")

-3= -1 1/8"	9= 3 3/8"
-2= -3/4"	10= 3 3/4"
-1= - 3/8"	11= 4 1/8"
0=0	12= 4 1/2"
1= 3/8"	13= 4 7/8"
2= 3/4"	14= 5 1/4"
3= 1 1/8"	15= 5 5/8"
4= 1 1/2"	16= 6"
5= 1 7/8"	24= 9"
6= 2 1/4"	32= 12"
7= 2 5/8"	40= 15"
8= 3"	48= 18'

DOOR SIZES

7= 28"	10= 40"
8= 32"	11= 44"
9= 36"	12= 48"

Notice:

This guide is intended to be used as a reference to assist a trained and certified AAADM technician in programming the DORMA ED100/250 operator in accordance with ANSI A156.19 Standard for Low Energy Automatic Doors or ANSI 156.10 for Full Power Automatic Doors

A "0" displayed on the right side and a rotating segment on the left indicates the unit is ready for a Learn Cycle. To start the learn cycle: Push and hold the bottom button for 3 seconds, until the display changes.

The door will make several movements and the display will cycle through several letters and numbers. When it stops at "4" push the door open to the desired opening angle between 90 and 110 degrees, then let go of the door and push the bottom button momentarily to continue the learn cycle.

If the door stops and displays "F", this is an indication that the spring force is too low. Turn off the power and push or let the door close. Increase the spring force and restart the learn cycle by pushing the bottom button for 3 seconds. The spring should have a minimum of 10 turns and a maximum of 18 to 24 turns. (24 on ED250)

The operator will complete the Learn cycle. When finished there will be two horizontal bars side by side on the display. You can now continue with the programming and customize the door as desired.

If a "P" is displayed again on the right side, the systems requires further settings. Reset the previous 3 settings, steps 3 - 12. Remember they all have to flash.

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PED
2 April 2013
Subject to change without notice

AUTOMATIC SWING DOOR

OWNER'S MANUAL

Distributed by:

DORMA AUTOMATICS, Inc.
924 Sherwood Drive
Lake Bluff, IL 60044
E-mail: automatics@dorma-usa.com
Toll-Free: 877-367-6211

Important Installation Instructions

ALL INSTALLATIONS SHOULD ONLY BE PERFORMED BY TRAINED OR AUTHORIZED PERSONS

Warning - To reduce the risk of injury:

1. Carefully Read And Follow All Installation Instructions

2. This unit should only be installed in a rough opening capable of providing proper structural support.

3. Always disconnect the power supply before servicing.

CAUTION

Improperly Adjusted Door
can cause injury and equipment damage.

Inspect door operation daily using
safety checklist in owners manual
and at door.

Have door adjusted as described in Owners Manual.

To Our Customers

The purpose of this manual is to familiarize you with your low energy automatic swing door system. It is essential that you "know your system" and that you recognize the importance of maintaining your door system in compliance with the industry standards for safety.

It is your responsibility,
as owner or caretaker of the equipment, to inspect the operation of your door system on a daily basis to insure that it is safe for use by your customers or employees.

This manual provides you with a description of the operation and maintenance requirements of your door. It also provides the instructions for the Daily Safety Check.

Should the door fail to operate as prescribed in the Daily Safety Check, or at any other time for any other reason, do not attempt to repair or adjust the door. Call a qualified service technician. These technicians are trained to service your door in accordance with applicable industry safety standards.

Service Availability

DORMA Automatics, Inc. products are distributed through a nationwide network of authorized distributors for sales, installation, and service.

Compliance with Safety Standards

Your door system was designed to the latest operating and safety standards. In order to ensure the continued safe operation of your door, it is important that:

- Your door system be maintained in compliance with the standards of the industry .

- Proper decals and labels be applied and maintained on your doors. If decals are removed or cannot be read, request labels to be replaced when calling for service.

Electric low energy swing door installation instructions

Instructions to Installer

We are pleased that a DORMA automatic swing door has been chosen for this installation. DORMA carefully designed, tested and built the door of high quality materials and it will provide many years of service.

Now the door must be installed and adjusted properly to ensure its proper operation and safe use.

To install and adjust the door for proper and safe operation, the installer must carefully read this instruction book before proceeding, then follow the instructions exactly.

The door is designed to be installed only by trained and knowledgeable installers. The installation technician should be experienced in the installation of automatic entrances. He should know all local code requirements and be familiar with the requirements of the current ANSI A156.19 Standards for Power Assist and Low Energy Power Operated Doors.

After installation, the door must be adjusted to conform with DORMA recommendations and all code requirements. Be sure and carefully study the requirements in these instructions.

After installation and adjustment, the installers final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with the ED700 Owner' s Manual and carefully explain how to perform the daily safety check test.

Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the DORMA T echnical Assistance Group for assistance.

What You Should Know

Be sure that a DORMA Automatics, Inc. distributor has provided the following for each door:

1. Instruction on how to conduct the Daily Safety Check (by walk-through example).

2. Location of function switches and instruction in their use.

3. Circuit breaker or power disconnect location for each door system.

4. Discussion of problems that could result from door being allowed to operate after a malfunction is observed.

5. Number to call for service or questions about your system if you are uncertain of any condition or situation.

   Note:
   If there are any problems, discontinue door operation immediately and secure the door in a safe manner. Call your local authorized DORMA Automatics, Inc. distributor for repair.

Check / Inspection

Operator Adjustments:

Backcheck (BC) Angle:
Check for compliance with 10 degree backcheck requirement under ANSI Section 10.5, as explained in Chapter 3, Figure 2, page 3-12 of this manual.

Opening Time to Backcheck:
Check for compliance with ANSI 156.19 Section 4.1.

Backcheck Force:
Check for compliance with force requirement of ANSI 156.19 Section 4.4.

Latch Angle / Time:
Check for timing requirements under ANSI 156.19 Section 4.2.

Closing Time to Latch:
Check for timing requirements under ANSI 156.19 Section 4.2.

Closing Force:
Check for compliance with ANSI 156.19 Section 4.5.

Time Delay:
Check for compliance with timing requirements under ANSI 156.19 Section 4.1.

Safety Sensor: (Optional)

Pattern:
Indicate results of sensitivity walk test on exit side of door (safety zone) (field approximation of ANSI Section 8.1.2). As you walk through and exit, door should remain open and not close until you are out of required pattern. Also check time delay, per above. Check that door will not open out onto someone standing or walking on exit side of door.
Sensitivity:
Walk test moving at rate of 6" per second or approximately 8-9 seconds through zone.

Signage:

"Caution / Automatic Door":
Check for compliance with ANSI Section 11.2.3, including colors, sign and lettering size and height.

"Automatic Door":
Check for compliance with ANSI Section 11.1.

Knowing Act ("Activate Switch to Operate"):
See ANSI Section 11.5.

Other:

Are AAADM Stickers applied?
See if the AAADM Information Sticker is applied to the door frame, summarizing the daily safety check. Absence of a sticker does not result in a failing mark. However, you should recommend use of a sticker, and have a supply available. Review the daily safety check with the customer.

Are all safety systems operational?
If you are aware of manufacturer's specifications in addition to the ANSI requirements, indicate here whether the system complies with them. You are not expected to know every manufacturer's specifications, but if you observe that a system that is intended to be operational is not, you should note it here. For example, if safety system in addition to the ANSI requirements are installed, indicate here whether they are operational. Failure to comply with such additional non-ANSI specifications does not result in a failing mark, since the inspection checklist is only intended to indicate compliance with field tests based on the ANSI standard. However, you should use the comment box on the Compliance Report to refer to any such additional system and recommendations.

Apply Annual Compliance Inspection Sticker.
If the system complies, complete an "Annual Compliance Inspection" Sticker and affix it to the bottom of the "Safety Information" (Daily Safety Checklist) Sticker.

Figure 1

Figure 2

Figure 3

Figure 4

General Safety

1. Decals. The door should have traffic decals properly displayed as follows:

   A Swinging doors serving two-way traffic shall be marked with a decal, visible from both sides of the door, with the words "CAUTION, Automatic Door". (See Figure 1) The words "Automatic Door" must be at least 1/2 in. letters. It should be mounted on the door at a height 58 in., ±5 in. (147 cm, ±13 cm) from the floor to the centerline of the sign. The sign shall be minimum of 6 in. (15.2 cm) in diameter and made with black lettering on yellow background.

   B. When a separate wall switch is used to initiate the operation of the door operator, the doors shall be provided with signs on both sides of the door with the message" ACTIVA TE SWITCH TO OPERA TE." The lettering shall be white and the background shall be blue.

   When door motion is used to initiate the operation of the door operator, the doors shall be provided with the message "PUSH TO OPERA TE" on the push side of the door and "PULL TO OPERA TE

D. An AAADM safety information sticker should be affixed on the door or frame in a protected, visible location. If you need additional decals for your automatic doors, call your automatic door supplier.

2. Activating Switch. (Knowing Act)
Doors equipped with a manual operate switch shall, when activated, hold the door open for five seconds minimum after release of activating switch. Reactivate door and crouch motionless in door opening for 10 seconds. Door should not close.

Doors equipped with a manual activating switch shall have signs as follows: "Automatic Door. Activate Switch to Operate."
The sign should be visible from both sides of the door.

3. Housekeeping.
Check the door area for tripping or slipping hazards.

Check all door panels for damage. Make sure that all covers are properly secured. There should be no bulletin boards, literature racks, merchandise displays, or other attractions in the door area that would interfere with use of the door.

4. Traffic Patterns.
Observe traffic patterns. Plan routing so people enter and exit in a straight approach, directly onto the center of the door opening.

IF YOU HAVE A PROBLEM , TURN OFF THE DOOR OPERATING EQUIPMENT AND CALL YOUR AUTOMATIC DOOR SUPPLIER.

ED400 Concealed “In Floor” AUTOMATIC SWING DOOR

Controller Installer’s Manual

Distributed by:

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ED-400 SWING DOOR CONCEALED “IN FLOOR” OPENERCONTROLLER INSTALLER'S MANUAL Rev0.56

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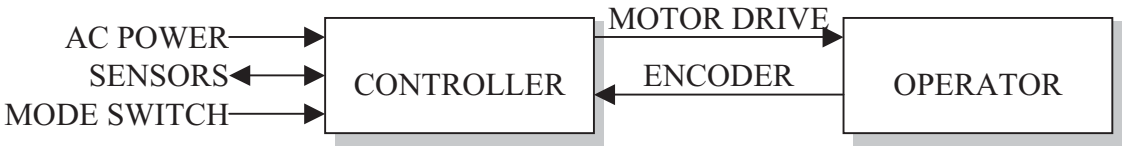
INTRODUCTION

The ED400 is an electro mechanical, automatic opener, for single direction swing doors (left or right hand). The opener opens the door using electrical power, and closes it using a return spring. The manager may turn it Off, turn it On (automatic) or place it in Hold Open (to keep the door open indefinitely). When turned Off, or in the absence of power, it operates as a passive door closer. Its operation may be controlled by a variety of sensors.

This is the manual for just the controller.



INSTALLATION

We'll first install the operator (and the header, surface mount), then the controller and its wiring, then the door (OCM) or the arm (surface mount).

Operator installation

Refer to the operator's manual for instructions on mounting it.

WARNING! When the operator is not connected to a controller, it may slam shut, endangering you and harming the adjustment bolt.

Controller installation

To install the controller, do the following:

Controller

- Install it in the cement case, using T-bolts to the bottom of the cement case, with the side with the display facing upwards.
- The controller is grounded through the AC power connector and the motor connector; there's no need for direct grounding from the controller's case.

Motor

- Connect the 3-screw, black terminal block at the end of the motor cable to the controller's "Motor" connector (on right side panel). The appendix has instructions on wiring the motor cable to a connector.
- Check that the motor is connected properly. Install the arm on the pinion, and rotate it in the opening direction; if that's hard to do, the motor is connected backwards. Let the arm go; if it slams closed, the motor is connected backwards. In either case, swap the back and red wires. Then test it again. For more inform ation, see the troubleshooting section.

Encoder

- To report their position , the operator uses an encoder. Connect its cable to the controller's white "Encoder" connector, on the right side of the controller's front panel. The appendix shows how to wire this connector, if it isn't already wired.

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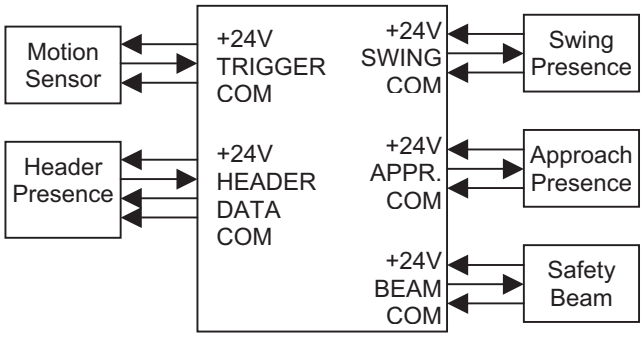
Sensors

- Get power for any sensors that require it from any of the screws in the "+24" terminal block, and any of the screws in the "GND" terminal block. These are the 2, 8-screw, blue terminal blocks on the right end of the front panel.



- The trigger device (motion sensor (radar) or other device) goes to the "TRIG" terminal. Connect its common to the Ground terminal, and, if required, connect its power to the +24 V terminal.
- The header (jamb) mounted presence sensorgoes to the "HEADER" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal. A dual zone sensor (such as the BEA DK-12) needs a "DATA" signal: connect it to the "DATA" terminal.
- The door-mounted, approach side presence sensor goes to the "APPR" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal.
- The door-mounted, swing side presence sensor goes to the "SWING" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal.
- If the installation has a safety beam, connect it to the "BEAM" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal.

Electric lock

The controller may power an electric strike plate (a.k.a. electric lock), through a relay or access control device. The appendix has more information.

Program Switch

- This is the On/Auto/Hold-Open switch
- Install the switch by the door
- Route its cable to the controller
- Cut off excess cable, strip the 3 wires
- Connect the 3 wires to the removable, 3-screw terminal block in the lower right corner of the controller's front panel. (Note that when you press one end of a rocker switch, it connects the middle terminal to the one on the oppositeend; this could be counterintuitive.)
    - The common wire (black) goes to the middle screw.
    - The lower wire when the switch is mounted (white) goes to the upper screw (this is the Hold-Open wire).
    - The upper wire (red) goes to the lower screw (this is the Off wire).

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Emergency: Fire and Break-Out

- The controller comes from factory with a jumper between the “FIRE” and “GND” terminals, and between the "BRK.O.” and “GND” terminals. If either one of these jumpers is open or missing, the controller will not operate: it will flash an "Emergency" alarm.
- If the installation requires it, remove the jumper between the "FIRE" and "GND" screws and wire a fire alarm to those two screws. The fire alarm output must be a normally closed, dry contact.
- If the door has a breakout mechanism, witha switch, remove the jumper between the "BRK.O." and "GND" screws and wire the switch to those two screws. Use the normally closed contacts of the switch.

AC Power

- Connect power to the controller's "Power" connector (onright side panel). See the appendix for the wiring.
  - Make sure the AC power source is off.
  - Route the AC power cable to the opener
  - Cut off excess cable, strip the 3 wires
  - Unplug the 3-screw, green terminal block from the controller
  - Connect the 3 wires to the terminal block
  - Plug the terminal block to the controller

WARNING! Do not plug the AC power into the MOTOR connector, or the controller will be damaged! The AC power plugs provided are keyed so that they cannot be plugged into the Motor connector. However, if you use other plugs, nothing prevents you from plugging them in the wrong connector.

Door or arm installation

Refer to either the Surface Applied or Ovoerhead Concealed Mount, ED400 Installation Instructions on mounting the door or the arm.

If the installation procedure requires that the operator’s pinion be in moved in the open position, you may use the controller to do so, as follows.

- Turn on AC power to the controller.
- Set the Mode switch to the Off position.
- Turn the "Selector" knob to the "Learn" position.
- Set the Mode switch to the "On" position
- The pinion will start turning slowly in the open direction, and stop indefinitely at Back-Stop.

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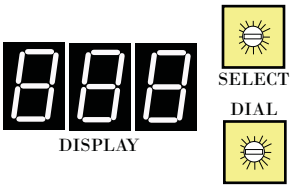
SET-UP

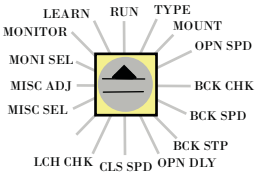
User Interface

The controller user interface is quite intuitive.

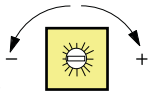
It includes a display and two rotary switches (knobs).



Use the top knob ("SELECTOR") to select the function.



Use the bottom knob ("DIAL") to change a setting.



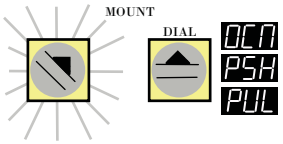
The display shows letters using only 7-segments, so some letters may not be obvious.

Quick Start

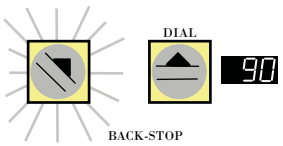
In this quick-start we'll use only a few of the available menus. For a complete list of settings see the Menu Reference section.

To adjust the opener, do the following (for an alternate procedure, see "Set-up without temporary stop" in the Appendix):

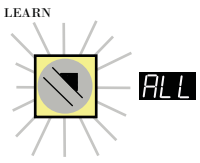
- Turn on the controller
  - Apply AC power to the controller.
  - The controller will light up.
  - Set the Program Switch in the "Off" position.



- Indicate the door mount.
  - Turn the Selector knob to the position "Mount"
  - Turn the Dial knob to select
- Prepare to teach the opener where you want Electrical Back-Stop to be.
  - If the operator has an internal hard-stopin the open position, set it to keep the door from banging at the open end, and, at the sametime as wide as possible, so that the door can reach the desired Back-Stop position (the Electrical Back-Stop) without hitting the operator's hard stop.
  - Turn the "Selector" knob to the "Back-Stop" position. The display should show "90", the programmed Back-Stop angle in degrees. If not, or if you want the Electrical Back-Stop to be elsewhere, change it with the Dial knob. Get ready to stop the door, such as with your foot, at the desired Electrical Back-Stop.



- Do a learn cycle.
  - Turn the "Selector" knob to the "Learn" position. The display shows the Learn State. If it doesn't say "ALL" (meaning it needs a full learn), turn the "Dial" knob counter-clockwise until it does.



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Subject to change without notice

- Move the Program Switch from the "Off" position the "Auto" position.
- The door stays closed for 10 seconds to let you get out of its way.
- Then the door will start opening slowly.
- Temporarily, place a hard stop (such as your foot) at the desired Back-Stop.
- Wait for the door to touch that stop and start closing. (Do not let anything else stop the door beforehand, else the wrong Back-Stop will be learned.) **It is important that the door is stopped in the desired Back-Stop position during the full learn cycle.**
- Remove that stop.
- The door will close slowly to Latch-Stop.
- **Get out of the way!**
- The door will **slam open** (to measure its inertia), then close.
- The display will show "CyC", meaning that the opener needs a cycle learn. 
  - The door will cycle open and closed at normal speed.
- Then the display will show "Rdy", meaning that it no longer needs a cycle learn and it is ready. 
- The door will continue cycling open and close, non-stop, until you place the Program Switch in the Off position.

Note that the opener has **reduced obstacle detection** while learning: **do not interfere with the door**!

Basic Adjustments

- Adjust the opener's operation. You can do this during a learn cycle (as the door is cycling open and closed). Or you can do this later; but if the parameter affects the door motion, you'll have to do a new learn cycle.
  - Turn the Selector knob to the position for the parameter you want to change:
    - Open speed to Back-Check
    - Back-Check angle (this is the one you'll want to play with first)
    - Back-Stop angle (hint: place the Program Switch in Hold Open to keep the door at Back-Stop, then adjust this parameter and watch the door move to that angle)
    - Close Delay
    - Closing speed to Latch-Check
    - Latch -Check angle
  - The display will show the present value for the selected item`
  - Use the Dial knob to change that value
  - If not already doing learn cycles, start them.

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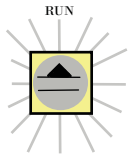
This table lists the basic settings.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Type	Opener Type	"L.E.": Low Energy, "P.A.": Power Assist; "Ful": full power	
Mount	Select door mount	Use "OCN" Setting	
Open Speed	increment/decrement	Opening speed to Back-Check	°/s
Back-Check	increment/decrement	Back-Check angle	°
Back-Speed	increment/decrement	Speed reaching Back-Check	°/s
Back-Stop	increment/decrement	Back-Stop angle	°
Close delay	increment/decrement	(a.k.a.: "Hold Open Time") Time at Back-Stop	s
Colse speed	increment/decrement	Max closing speed to Latch-Check	°/s
Latch-Check	increment/decrement	Latch-Check able	°
Latch-speed	increment/decrement	Max closing speed to Latch-Stop	°/s

Triggers are enabled while the Selector knob is in the Run or Monitor value position, and disabled otherwise.

For more information on these items see the Menu Reference section.

- Test full operation. When you're happy with the cycle, stop the Learn Cycle.
  - Set the Program Switch in the "Off"position. The door will stop cycling.
  - Turn the "Selector" knob to the "Run" position. The display shows the present State of the opener. If there's an exception, it will show a code for it.



- Test the opener's operation with the sensors

Advanced adjustments

While the basic settings are typically sufficient to set-up the opener, additional ones are abailable through the Misc Menus, such as:

- Push-and-go
- Power Hold
- Obstacle detection sensitivity

For a complete list of settings see the Menu Reference / Misc Menus section.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Misc-select	Select a miscellaneous setting to be adjusted	Code for the selected setting	-
Misc-adjust	Adjust the selected miscellaneous setting	Value of the selected setting	-

These settings are selected and adjusted indirectly, in two steps, with the Selector and Dial knobs.

- Turn the "Selector" knob to the "Misc Select" position.
- Turn the "Dial" knob until the desired setting is shown in the display.
- Turn the "Selector" knob to the "Misc Adjust" position. The display will show the present value of that setting
- Turn the "Dial" knob to adjust the value of that setting.

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Monitoring

For troubleshooting purposes, the controller displays its Program State when the Selector knob is in the Run position, and its Learn State when the Selector knob is in the Learn position. The state and value of many more variables can be seen through the Monitor menus, such as:

- The Help display, showing what the opener is waiting for
- The number of cycles
- A Log of recent events
- The door angle and speed

For a complete list see the Menu Reference section.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Monitor Select	Select variable to be monitored	Code for variable monitored	-
Monitor Value	Depends on variable	Value of selected variable	-

To monitor one of those variables:

- Turn the "Selector" knob to the "Mon Select " position.
- Turn the "Dial" knob until the desired variable is shown in the display.
- Turn the "Selector" knob to the " MonitorValue" position. The display will show thepresent value of that variable.
- Usually the Dial knob has no function, though in some cases it can be used to get additional information.

OPERATION

The opener's behavior depends on

- Whether there's AC power,
- The Opener Type
- Any selected features
- The position of the Program Switch

AC power

No AC power

When there's no AC power, the controller places a passive brake across the motor leads, to slow it down when closing. The user may use the door manually. The door closes very slowly. The pinion speed is constant (therefore, for surface mount, the door speed isn't constant). There is no Latch-Check nor Back-Check (so the user could slam the door against the open hard stop). The speed is sufficiently slow that the time closing through Latch-Check meets A.N.S.I. specs.

AC Power is OK

When there's power, the controller is ON, even if the ProgramSwitch is in the Off position. It disables the passive brake, and instead it controls the motor directly. In this case, the opener's behavior depends on

- the Opener Type
- any selected features
- the position of the Program Switch

Opener Type

Full Power

When the user triggers the opener (for example, by walking towards a motion detector), the door opens, stays open for a while, then closes. If, while closing, another user retriggers the door, the door starts reopening.

Low Energy

This is the same as Full Power, but the installer must adjust some parameters for sloweroperation. To select this, the “Low Energy” switch must be in the “ON” position.

Power assist

When the user triggers the opener, the opener helps the user, so that the user may open the door with very little force; after a while, the door closes.

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Selected Features

Push-and-go

If this feature is on, and if the Program Switch is in Auto, the user may also trigger an opening by starting to open the door by hand. Also, if the door is closing, and the user reopens it manually, the opener is retriggered. Note that if the user simply stops the closing door, the opener will consider that an obstacle, not a Push-and-go trigger.

Program Switch

At any given time, the opener may be in one of 3 modes, based on the position of the ProgramSwitch:

- Off
- Auto
- Hold-Open

Off

The opener emulates the operation of a hydraulic passive door closer (except that, when the door is closed, it may press against the hard-stop). The user may use the door manually; there's no Power Opening, nor holding the door open. (**Again**: with the Program Switch in the Off position, the opener is actually on; it's just that it doesn't open the door nor assist the user.) In the simplest case, the door starts at Latch-Stop; a user may open the door manually , and then release the door; then, the closer lets the door close.

Auto

The opener opens or assists the user automatically (though the user may still use the door manually). In the simplest case, the door starts at Latch-Stop; the opener detects that a user is approaching, and opens the door and holds it at the Back-Stop; then, the closer lets the door close. If, while closing, the opener detects a new user, it reopens the door. If a user opens the door manually, then the opener behaves as it does in the Off mode. If the door encounters an obstacle (while opening or closing), or a presence is detected, the opener stops the door; then the opener either opens or closes the door. In the simplest case, the door starts at Latch-Stop; when a user triggers the opener, the opener helps the user as she opens the door; then, the closer lets the door close.If another user retriggers the opener as the door is closing, the opener returns to helping the user.If, while closing, the door encounters an obstacle, the opener stops the door; then the opener lets the door close. If a user opens the door manually, then the opener be haves as it does in the Off mode.

Hold-Open

The opener opens the door and holds it open.

Unusual circumstances

User intervention

The way the opener responds to user intervention depends on what the door is doing at the time, and other factors.

Closed, OffMode or Push-and-GoOff - The opener lets the user open the door against the force of the return spring. As soon as the user lets go of the door, it starts closing.

Closed, Auto Mode and Push-and-Go On - If the user open the door manually, the door opens.

Opening full speed - If the user tries to open the door faster than the opener wants to, the opener resists, trying to maintain speed. If the user tries to force the door closed, the opener considers it an obstacle (see later).

Creeping open - If the user tries to open the door faster than the opener wants to, the opener resists lightly; as soon as the userlets go of the door, it finishes opening the door. If the user tries to force the door closed, the opener considers it an obstacle (see later).

Open - If the user opens the door away from Back-Stop, the opener fights against it, and tries to return the door to Back-Stop. After some time, to protect the motor, the opener starts a Over-Current alarm and shuts down.

Closing, Off Mode or Push-and-GoOff - If the user reopens a closing door, the opener lets her do so, working against the force of the return spring. As soon as the user lets go of the door, it starts closing. If the user forces the door to close faster than the opener wants to, the opener reverts to passive closing, until the door reaches Latch-Stop.

Closing, Auto Mode and Push-and-Go On - If the opener is retriggered the door reopens. If the user forces the door to close faster than the opener wants to, the opener reverts to passive closing, until the door reaches Latch-Stop.

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Presence

The opener may detect people or objects in the proximity of the door. In that case, the opener modifies its behavior to avoid hitting anyone or anything in its path.

Before a Power Opening - The opener waits for the swing area to be clear.
During a Power Opening - The opener stops the door before moving again.
Before closing - The opener restarts the Closing Delay.
While closing, Auto Mode - The opener stops the door before moving again.
While closing, Off Mode - The door keeps on closing.

Obstacle

The opener detects if someone or somebody slows down or even stops the door. This includes the situation of the door being locked, or propped open with a door stop.

During a Full Speed Power Opening - The door stops, waits for a bit, then usually it creeps open.
While creeping open - The door immediately re-closes.
While closing, Auto Mode - The door stops, waits for a bit, then usually it creeps open.
While closing, Off Mode - The door just rests against the obstacle.

Alarm

If the opener detects certain alarm conditions, it stops running. Users maystill use the door manually. The controller flashes a code for the Alarm (the Selector knob must be in the RUN position). The code is also added to the log (Mon Sel / Log; Mon Val) Alarms are cleared by turning the Program Switch to Off and back to Auto.

MENU REFERENCE

The controller offers a menu of 15 items. The Selector knob is used to select one of them. Two of those items offer dozens of additional submenus.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Type	Opener Type	"L.E.": Low Energy, "P.A.": Power Assist; "Ful": full power	Type
Help	-	Why the door won't move	
Mount	Select door mount	Use "OCN" Setting	
Open Speed	increment/decrement	Opening speed to Back-Check	°/s
Back-Check	increment/decrement	Back-Check angle	°
Back-Speed	increment/decrement	Speed reaching Back-Check	°/s
Back-Stop	increment/decrement	Back-Stop angle	°
Close delay	increment/decrement	(a.k.a.: "Hold Open Time") Time at Back-Stop	s
Colse speed	increment/decrement	Max closing speed to Latch-Check	°/s
Latch-Check	increment/decrement	Latch-Check able	°
Misc-select	Select a miscellaneous setting to be adjusted	Code for the selected setting	2
Misc-adjust	Adjust the selected miscellaneous setting	Value of the selected setting	2
Monitor-Select	Select variable to be monitored	Code for variable monitored	3
Monitor Value	Depends on variable	Value of selected variable	3, T
Learn	Downgrade the Learn State	The Learn State	4

Notes:

1) Leave in this position during normal operation
2) See Misc. Settings table
3) See Monitor table
4) Place here to do a learn cycle. At next power-up, does learn the appropriate learn
T) In this position the trigger input is enabled

When selecting an item with the Selector knob, the display shows a code for that item, dimmed, for 1/2 second, then it shows the value for that item. For example, if you turn the Selector Knob to the Back-Stop position, the display shows  dimly for 1/2 second, and then  , the selected Back-Stop angle.

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Run menu

Usually, the "Run" menu displays a code for the State of the opener. See the Program State section, later. However, if there is an exception, the Run menu flashes a code for the exception; it does so from the moment when it occurs, until the next opening cycle starts. You can also stop the flashing code by turning the Dial knob. See the "Events" section, later, for description of the Exception codes.

Type menu

This menu displays a code for the mount of the door and lets you select it. If you change this, you must do a full learn afterwards.

Mount		
LE	Low Energy	The “Low Energy” switch must be On for this option to be available
PA	Power Assist	
FUL	Full Power	

Itisuptoyou, the installer, to makesure that the door doesn't violate A.N.S.I. standards! The opener does not ensure that the door moves within A.N.S.I. limits:

- Nothing keeps the installer from selecting the wrong setting in this menu.
- Nothing keeps the installer from setting the operating parameters in such way that the door moves faster than what the applicable BHMA/ANSI Standards allows.

Mount menu

This menu displays a code for the mount of the door and lets you select it. Use “OCM” setting for “IN FLOOR” mounting.

Mount		
OCM	OCM	Overhead concealed (direct drive)
PSH	Push	Push (scissor arm) surface mount
PUL	Pull	Pull (track) surface mount

Open Speed menu

This menu displays and lets you set the opening speed of the door during a Power Opening, up to Back-Check (in °/s). Use this adjustment to ensure that the opening time is lower than what A.N.S.I. specifies (lower values in Low Energy openers). If you change this, you must do just a cycle learn afterwards.

Back-Check menu

This menu displays and lets you set the Back-Check angle (in °). During a Power Opening, after this angle the door will slow down. The rate of deceleration is set by the "Deceleration" menu,described later. If you change this, you must do just a cycle learn afterwards.

End-Speed submenu

This submenu is used to display and set the minimum speed (after it slows down) at which the door reaches the Back-Stop, in °/sec.

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Back-Stop menu

This menu displays and lets you set the Electrical Back-Stop angle (in °). During a Power Opening, this is where the door stops. This should be less than the mechanical Back-Stop (which may be set by the operator, or by where the door would encounter a physical stop). You can use it in 2 ways:

- Before a full learn, use it to tell the controller at what angle you'll stop the door.
- Use it to change the opening angle. (Hint: put the Program Switch in "Hold-Open" and change the setting, while watching the door follow your setting. You can do this any time the Learn State is "Ready", even during a learn cycle.) If you change this, you must do a cycle learn afterwards.

Close Delay menu

This menu displays and lets you set the minimumtime that the door stays at Back-Stop during a Power Opening cycle (in °) (a.k.a.: "Hold-Open Time"). This is also the minimum time that the opener assist the user during an assist opening cycle. In Low Energy openers, you may need to extend this time to meet A.N.S.I. specs. This is **not** the time that the door stops after a presence or an obstacle: that's the Obstacle delay. If you change this, you must do just a cycle learn afterwards.

Close Speed menu

This menu displays and lets you set the maximum closing speed of the door, down to Latch-Check (in °/s). This is applicable regardless of how the door was opened (manually, or automatically). Use this adjustment to ensure that the closing time to Latch-Check is lower than what A.N.S.I. specifies (lower values in Low Energy openers). If you change this, you must do just a cycle learn afterwards.

Latch-Check menu

This menu displays and lets you set the Latch-Check angle (in °). While closing, below this angle the door will slow down. This is applicable regardless of how the door was opened (manually, or automatically). If you change this, you must do just a cycle learn afterwards.

Misc. Adjustments menus

These 2 menus work together to handle many minorsettings. The first one is used to select an item, and the second one to display its value and to adjust it.

Misc. submenu item	Function of "Dial" knob	Display	Units, notes
HLd - Power	Hold increment/decrement	"OFF": passive; or motor current that holds door closed	A
P.n.G. - Push-&-Go	Turn feature On or Off	"nO"; normal "yES": pressing on door starts a cycle	-
O.Ob - Open Obstacle	increment/decrement	If actual current > expected current by this amount: opening obstacle	A
C.Ob - Close Obstacle	increment/decrement	If actual current < expected current by this amount: closing obstacle	A
WAL - Wall Mask	increment/decrement	Door angle beyond which the swing side sensor is ignored	°
OPd - Lock open delay	increment/decrement	"OFF": normal,or delay before opening	s
OCd - Occupied delay	increment/decrement	Delay after obstacle or after the area clears before moving again	s °/s^2
dEC - Deceleration	increment/decrement	Deceleration after Back-Check	
PCE - Power Close Engaged	Turn feature On or Off	“nO” or “yES” “nO” is default after reset	-
PCA - Power Close Anlge	increment/decrement	OFF, 1-30 degrees “20 degrees” is default after reset	-
PCd - Power Close Time Delay	increment/decrement	00.1-10 seconds “4 seconds” is default after reset	-
PCC - Power Close Current	increment/decrement	OFF, 0.01-1.00 Amps “1.00 Amps” is default after reset	-
CLC - Power Boost	increment/decrement	OFF, or 0.01-1.00 Amps “0.50 Amps” is default after reset	-
rSt - Reset / restore	Reset the controller / Restore factory defaults	"nO": normal "yES": restore factory defaults	-

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Items that use a numeric value show OFF instead of '0'. Features show YES or nO.

Power Hold submenu - HLd
If the door has a hard-stop at Latch-Stop, the opener may use additional force to press the door against the stop. This submenu is used to select the amount of that force, in terms of motor current (in Amps). At its minimum, this current is 0 (the door is held against the hard stop just by the return spring), and the display shows "OFF".

Push-and-Go submenu - P.n.G.
This submenu is used to turn on or off the Push-and-Go feature, and to display the present selection.

- nO If the user opens the door by hand, or reopens a closing door, the opener lets him/her do so, working against the return spring.
- YES If the user opens the door by hand, the opener opens the door. If the user reopens a closing door by hand, the opener reopens the door.

Opening Obstacle submenu - O.Ob
This submenu is used to display and set the Opening Obstacle threshold (in Amps). Higher values mean less sensitivity to obstacles.

Closing Obstacle submenu - C.Ob
This submenu is used to display and set the Closing Obstacle threshold (in Amps). Higher values mean less sensitivity to obstacles.

Wall Mask Angle submenu - WAL
When opening, beyond a certain angle, a door-mounted, swing-side sensor may see a wall and give a false reading. This submenu is used to display and set the door angle (in degrees) beyond which that sensor is ignored.

Lock Opening delay submenu - OP.d
If an electric strike plate (electric lock) is used, it may be necessary to wait for it to retract,before opening the door. This submenu is used to display and set that delay, in seconds. If that delay is zero, the display shows "OFF".

Occupied delay submenu - OC.d
This submenu is used to display and set how long (in seconds) a door stops after it encounters an obstacle or presence, before it resumes moving.

Deceleration submenu - dEC
This submenu is used to display and set how quickly the door slows down after Back-Check, in °/sec^2. (A higher number means faster slowing down). If you change this, you must do just a cycle learn afterwards.

Power Close Engaged - PCE
This adjustment turns the **Power Close** On or Off

Power Close Angle - PCA
When power boost closing is needed only in the last 30° of door closing, this is used to set angle desired.

Power Close Time Delay - PCd
This adjusts the time delay before the operator starts pawer boost after encountering an obstruction.

Power Close Current - PCC
This adjusts the closing force during the swing path of “PCA”.

Power Boost - CLC
When power boost closing is needed throughout the entire closing swing of the door the closing force is adjusted here.

Reset / restore submenu - rSt
This submenu is used to restore the factory defaults (including clearing the password) ○Turn the Dial knob clockwise. The controller will reload the factory defaults; the program will restart from the beginning; the display will show the start-up logo. (Just to force a new learn cycle, use the "Learn" menu instead.)

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Monitor Select and Monitor Value menus

These 2 menus work together to display the valueof many minor items. The first one is used to select an item, and the second one to display its value.

Misc. submenu item	Function of "Dial" knob	Display	Units, notes
LOG - Log	Select one of the 16 events in the log	Code for the event	-
OBS - Obstacles	Clear it	Number of obstacles since the last cleared	-
CYC - Cycles	Scroll the display	Number of openings cycles since the controller was manufactured	-
rEL - Release	-	Software release level	-
AnG - Angle	-	Angle of door	°
CUr - Current	-	Motor current (absolute value)	A

Items that use a list show a code for their value.

Log submenu - LOG

The controller logs the last 16 unusual events. This submenu is used to display the log of events. Normally it shows the most recent event. Turning the Dial know counter-clockwise (back in time) selects the previous events; and vice-versa. Once one end of the log is reached, turning the Dial knob further in the same direction will have no effect. The codes for the events are described later in the Event Codes section.

Obstacles submenu - OBS

Each time the door meets an obstacle, the controller increments a counts, up to 255. This submenu is used to display that count. Turning the Dial know counter-clockwise clears that count.

Cycles submenu - CYC

This submenu is used to display the number of full opening and closing cycles that the controllerdid, up to 9,999,999. This is not necessarily the number of cycles that the operator did, as the controller may have been mated to another operator at some other time. If the door is reopened while closing, this doesn't count as an additional cycle. If the controller is powered down, it resets the units digit (for example, if the count was 123 cycles, upon restoring power to the controller, it will show 120 cycles). As the display has only 3 digits, the Dial knob may be used to scroll the number of cycles, so that the rest of the number maybe viewed (for example, if the number of cycles is 12345, initially the number ".345" will be shown; turning the Dial knob one step clockwise will scroll the number to the right, and "2.34" will be shown; turning the know further will show "12.3", "012." and "001".

Release submenu - rEL

This submenu is used to display the software release in the controller.

Angle submenu - AnG

This submenu is used to display the approximate door angle, in degrees.

Current submenu - CUr

This submenu is used to display the motor current, in amps.

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TROUBLESHOOTING

Electrical

Fuse replacement

The controller has 2 fuses, one on the AC line input, one on the motor output. If the input fuse blows, the controller is completely off (no display). If the output fuse blows, the controller comeson, but there's no motor drive. Regardless, the passive braking keeps on working, because it's directly connected to the motor connector.

This is the fuse information:

F1	Line input fuse	Input plug	5 x 20 mm	2.0 A, fast
F2	Motor fuse	Motor-plug	5 x 20 mm	4.0 A, fast

To replace a fuse:

- Disconnect the AC power
- Unscrew the appropriate fuse holder cap
  - Right side for the motor fuse
  - Left side for the line input fuse
- Replace the fuse with an identical one
- Close the fuse holder
- Reconnect the AC power

Plugging AC to Motor Connector

Plugging AC power into the Motor connector will damage the controller. The AC power plugs provided with the controller are keyed in such way that you can't do so. However, if you use other plugs, nothing prevents you from doing so.

Troubleshooting tools

For troubleshooting purposes, the controller displays:

- the state of its inputs, with LEDs
- the Learn State (when the Selector knob is in the Learn position)
- the present exception, if any (when the Selector knob is in the Run position)
- recent exceptions (Log menu)

Input LEDs

Each sensor input line, and the Fire and Breakout lines, have LEDs a to indicate their status. This is what it means when the LEDs are lit:

LED		Reason for being lit
	Trigger	The trigger (radar) sensor is active, or this lineis shorted to ground
	Pres	The approach-side sensor is active, or this line is shorted to ground
	Approach	The jamb-mounted sensor is active, or this line is shorted to ground
	Swing	The swing-side presence sensor isactive, or this line is shorted to ground
	Beam	The light beam sensor is active, or this line is shorted to ground
	Break Out	The link between this line and ground is open, or the door is in breakout
	Fire	The link between thisline and ground is open, or the fire detector is active

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Output LEDs

Each output line has an LED a to indicate its status. This is what it means when the LEDs are lit:

LED		Reason for being lit
	Data	A DK12 is connected to the controller, and the door is not closed, telling the DK12 to use the Open Pattern. (If no DK-12 is connected, the LED remains Off.)
	Lock	The controller is driving an electriclock (whether or not a lock is present)

Learn State

In addition to the Program State, at any given time, the controller is in one of 3 Learn States.

Learn State		
ALL	All	The opener needs to do a complete learn cycle
CYC	Cycle	The opener needs to do just an opening and closing cycle
rdy	Ready	The operator is ready

The controller is in the first two Learn States ("All" and Cycle") during set-up. From then on it'sin the "Ready" State, ready to operate normally. If the installer changes an Operating Parameter,the controller reverts to the "Cycle" Learn State, After a complete learn cycle, the controllerreturns to the "Ready" State.

When the Selector knob is in the "Learn" position, the display shows the Learn State.

Event codes

If the controller detects an abnormal condition, is displays a code for it (when the Selector knob is in the "Run" position).The controller maintains a list of the most recent 16 significant events, which you can view with the Monitor function.The controller catches certain unusual Events, and stores them in the log. Some events are Exceptions. Exceptions are also displayed when the Selector knob is in the "Run" position (fromthe moment when they occur, until the next opening cycle starts).

Event		
SEt	Not set-up	Not set-up
Obs	Opening Obstacle	The door encountered an obstacle while opening
Cbs	Closing Obstacle	The door encountered an obstacle while closing
LOC	Locked	The door encountered an obstacle while at Latch-Stop
Swb	Swing	The swing-side, door mounted presence sensor was activated
EME	Emergency	An emergency link (smoke detector, breakout) was opened
MEr	Motor	The motor is not connected
dIr	Direction	The motor is wired backwards
tO	Time-out	A state lasted too long
bAd	Bad value	A variable's value was outside its allowed limits. See next.
HEA	Over-Heat	The motor overheated
CUr	Over-Current	The motor current exceeded the maximum for too long
EnC	Encoder	The encoder is not working, is disconnected, it has a broken wire
FAI	Failure	The controller failed

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Bad value

Due to unusual circumstances, an operating parameter may take a value outside its allowed limits. The controller constantlychecks the operating parameter; if it finds a problem with their value, it logs the problem and restarts the program from scratch. After the  entry, the next 2 items in the log are the address of the variable, and the bad value. This table lists the addresses (N is the number shown in the log).
For example:

Position of DIAL knob	Display	Meaning
Fully CW (most recent)		Automatic Power-up after the bad value was detected
1 step CCW (previous)		The bad value: 140 degrees (*see below)
2 steps CCW		Address of the variable with the bad value: 41, which, form the previous table, we see is the Wall Mask Angle
3 steps CCW		A bad value was detected
4 steps CCW (previous)		Previous power-up
Further CCW		No other event in the log

Particular situations

Power off: ease of motion

With the power off, the door should open easily and close slowly. If not, use this table to troubleshoot it.

Symptoms	Possiblecause	Solution
The door is hard to open and slams shut.	The motor wiring is backwards.	Reverse the red and black wired in the motor connector.
The door is hard to open and closes very slowly.	Try disconnecting the motor cable. If that makes no difference, the operator is bad; if the door opens easily and slams shut, the controller is bad.	Replace the controller.
The door is easy to open and slams shut.	• The motor is not wired to the controller (checkthe cable and the motorconnector) • The controller is bad • The motor is bad	• Fix the wiring • Try replacing the controller • Replace the operator

Power off: time through Latch-Check

With the power off, the Passive Brake, inside the controller, limits the closing speed. The PassiveBrake is not adjustable. The closing time from 10°to Latch-Stop should be 1.5 seconds or more, per BHMS/ANSI. For OCM applications, the door mayclose faster than that. If so, you only have 2 options: reducing the spring preload, or adding mechanical friction to the door.

Display is dark

The opener may not open the door for these reasons:

- There's no AC power to the controller
- The AC plug to the controller is disconnected
- The line input fuse (on the right side panel) is blown
- The software is hung up

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Opener won't learn

To start a learn cycle, the following must happen:

- Power must be on
- There must not be an alarm
- The Selector knob must be in the Learn position
- The Program Switch must be moved to Off and Auto If the opener doesn't start the Learn Cycle, use the following table to troubleshoot it.

Action	Check	Solution
Move the Selector knob to the "RUN" position.	Is there a code flashing?	Check that code and see what it means in the Event Codes table. Solve it accordingly. Check that code and see what it means in
Move the Selector knob to the"MONI SEL" position. Turn the Dial Knob until you see "LOG".	Is there a code?	the Event Codes table. Solve it accordingly.

If the Learn Cycle starts, but then the display shows that the controllerrestarted (the display goes through the 3 opening logos), the controller believes that it found a problem. Use the Log to find out what that problem is. If the door will open and close slowly, but then not do anything else, it may be because you stopped the door too soon. Just do a new learn cycle, but this time make sure that you stop the door at the desired Back-Stop.

Opener won't open, manual opening is OK

The opener may not open the door for these reasons:

- The opener needs a learn cycle (probably because you changed a parameter that affect motion) – turn the Selector knob to the Learn position; if it doesn't say "Rdy", do a learn cycle
- The Program Switch is in the Off position – switch it to the Auto position
- The controller detected an alarm condition – place the Selector switch in the Run position; if an exception code is flashing, note the code; turn Off power to the opener; read about that failure in the troubleshooting section, and, if possible, correct the problem; try again.
- A wire from the Program Switch is shorted to ground
- The trigger source is not working, or it's not wired properly – in that case the Trig LEDon the controller will not light up
- The software is hung-up – turn Off and On power to the opener In any case, look at the Help menu for a hint.

Opener keeps door open at Back-Stop

The opener may not open the door for these reasons:

- The Program Switch is in the Hold-Open position – move it to Auto
- There's a door stop holding the door open – try moving the door by hand
- The controller is receiving a trigger signal – see if the Trig LED is lit
- The controller is receiving a header presence signal – see if the Pres LED is lit
- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- A wire from the Program Switch is shorted to ground
- The delay is set very long and it hasn't yet expired

Opener pushes door hard against the Latch-Stop

This may happen for these reasons:

- The Power-Hold feature is on – troubleshoot why the trigger won't open the door
- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

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Opener keeps door open against the operator's hard-stop

This may happen for these reasons:

- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

Opener stuck assisting

The opener may keep on assisting the user (the door can be moved in either direction with little effort) for these reasons:

- The controller is receiving a trigger signal – see if the Trig LED is lit
- The controller is receiving a header presence signal – see if the Pres LED is lit
- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving an swing presence signal – see if the Swing LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- The delay is set very long and it hasn't yet expired
- A wire from the Program Switch is shorted to ground
- The trigger source is not working, or it's not wired properly – in that case the Trig LEDon the controller will not light up
- The software is hung-up – turn Off and On power to the opener In any case, look at the Help menu for a hint.

Opener keeps door open at Back-Stop

The opener may not open the door for these reasons:

- The Program Switch is in the Hold-Open position – move it to Auto
- There's a door stop holding the door open – try moving the door by hand
- The controller is receiving a trigger signal – see if the Trig LED is lit
- The controller is receiving a header presence signal – see if the Pres LED is lit
- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- A wire from the Program Switch is shorted to ground
- The delay is set very long and it hasn't yet expired

Opener pushes door hard against the Latch-Stop

This may happen for these reasons:

- The Power-Hold feature is on – troubleshoot why the trigger won't open the door
- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

Opener keeps door open against the operator's hard-stop

This may happen for these reasons:

- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

Opener stuck assisting

The opener may keep on assisting the user (the door can be moved in either direction with little effort) for these reasons:

- The controller is receiving a trigger signal – see if the Trig LED is lit
- The controller is receiving a header presence signal – see if the Pres LED is lit
- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving an swing presence signal – see if the Swing LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- The delay is set very long and it hasn't yet expired

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Opening door bumps against the hard-stop

The controller learned the Electrical Back-Stop to be the same as the mechanical hard-stop. That is probably because either

- you didn't stop the door at the Electrical Back-Stop during the slow learning cycle, during initial set-up, or
- the hard-stop in the operator is set too far closed.

Back-Check or Latch-Check angles seem wrong

Move the door manually and compare the actual door angle with the angle displayed (turn the Selector knob to Monitor Select, turn the Dial Knob to select "AnG", turn the Selector knob to Monitor Value).

- If they do match, remember that the door slows down *before* Latch-Check.
- If they don't match, see the next paragraph.

Angle displayed doesn't match door angle

If the angles do match at Back-Stop:

- Check the setting for Door Mount in the controller.
- For surface mount doors, check the placement of the operator with respect to the doorhinge.
- For Push mounts, check the point where the arm is mounted to the door, and the angle of the arm when the door is closed.
- If all of these are correct, then the problem may be that the reveal is very different from the standard that was used to calculate the controller's parameters.

If the angles don't match anywhere:

- During initial set-up, the Back-Stop angle you specified in the controller was not the same as the angle where you stopped the door during the slow learning cycle. Do a new Full learn Cycle

DATA LED doesn’t light

This LED lights if the door is anywhere but at Latch-Stop, and a DK-12 dual-zone sensor is properly connected. If this LED doesn’t light when the door is open, it’s probably because a DK-12 is not properly connected to the DATA line. You may test this LED by connecting the DATA line to Ground.

LOCK LED doesn’t light

This LED lights if the controller is driving an electric lock (whether or not a lock is actually connected to the LOCK line). If this LED doesn’t light, or is always lit, the problem is probably that the driver inside the controller was damaged by being improperly connected

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DL3128-010
10/1/2007

SPECIFICATIONS

Main features

- Overhead Concealed Mount or surface mount (push or pull)
- Center pivot or offset hinges
- Complete: doesn't require a power-boost module, nor a brake box
- Hand is field reversible

Control inputs

- Seven sensor inputs (individual LEDs indicate status):
  - Trigger (radar, motion detector, push plate, access control, RF receiver…)
  - Header (jamb) mounted presence sensor
  - Door mounted, approach side presence sensor○Door mounted, swing side presence sensor
  - Safety beam presence sensor
  - Fire (Smoke alarm)
  - Breakout switch
- Input for Program switch (Off/Auto/Hold Open)
- All inputs, except for the Fire and Breakout inputs, are active low, compatible with:
  - dry contact
  - open collector
  - TTL
  - any signal up to 24 Vdc
- Fire and Breakout inputs are active open.

Control outputs

- Electric strike lock, open collector 100 mA max, 24 Vdc max. **not protected**. (requires additional relay, not included; requires external supply, not included, for electric locks other than 24 Vdc)
- Data (for dual zone sensors, such as BEA DK-12)
  - Door closed: open circuit (0 Vdc)
  - Door closing: 500 Hz square wave
  - Door opening or open: 12 Vdc unregulated, 100 mA source max

Control inputs/outputs

- Synch cable for side-by-side openers (part number DS2715-010)
  - RXD TXD.

Power

- Input: 115 Vac, 2 A Max
- Output: 24 Vdc, 0.8 A, unregulated, short circuit protected, for sensors and accessories

Safety

- Operates as a passive door closer in case of power failure or controller failure
- Smoke alarm and breakout switch input

Misc

- Operating air temperature -40 to 50 °C
- Small size: 8" wide x 4 " tall x 2.5" deep
- Microprocessor controlled, FLASH re-programmable, replaceable
- Two controllers may be synchronized for side-by-side doors
- Closed loop control

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APPENDIX

WIRING

Encoder / Cam Switch wiring

Encoder only

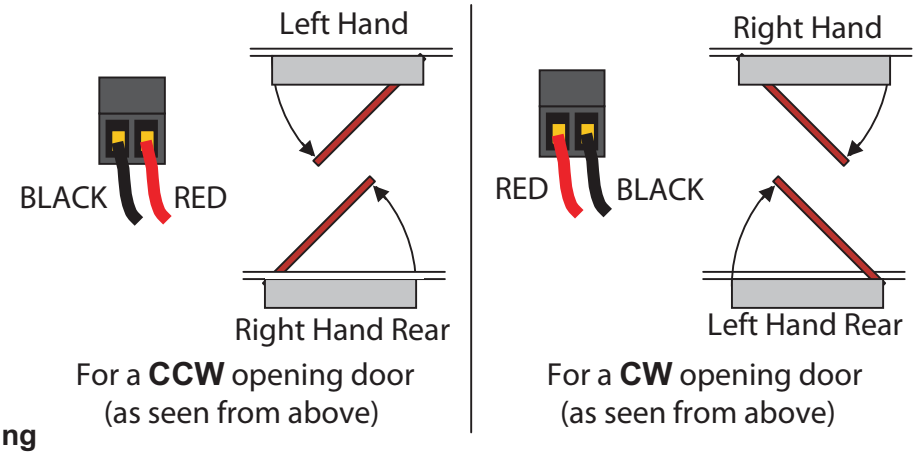
the 4 wires from the encoder should already be connected properly to the 5-position connector. If you need to wire it, here is how.

The 2 middle wires (Phase A and B, Yellow and Green) can be swapped without a problem: the software is smart enough to figure which way the motor is turning, and it interprets the 2 phases correctly.

Motor wiring

From the factory, the motor wires are already connected properly to their 2-screw terminal block. If you need to rewire it, here is how.

The red and black wires go to the other 2 screws, depending on the opening direction of the door. For CW opening (as seen from above – that's a right hand door), the back wire goes to the screw closest to the side of the box. For CCW opening (that's a left hand door), the red wire goes to the screw closest to the side of the box. The black wire goes to the opposite screw.



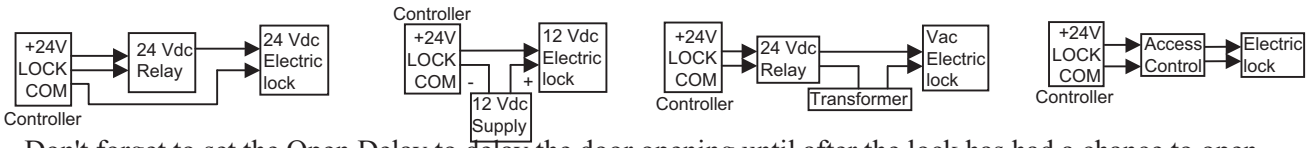
AC Power wiring

The green wire goes to the middle screw. When looking at wire openings, with the screws towards up, the line wire (usually black) goes the left hole, and the neutral (usually white) goes to the right one.

ELECTRIC LOCK

The controller may power an electric lock through a relay or access control device.

- If the installation has a 24 Vdc electric strike plate (a.k.a. electric lock), the controller is able to power it directly. For DC lock of other voltages, you will need a separate power supply. For AC locks, you will need a separate transformer and a relay.



- Don't forget to set the Open Delay to delay the door opening until after the lock has had a chance to open.
- The controller drives the electric lock from when it receives a valid trigger (at Latch-Stop), while waiting to open (because of a non-zero Open Delay, or because the swing area is occupied) and until some time after the door has begun to open. It also drives it ifthe door reaches Latch-Stop as it is retriggered. The LOCK LED lights up while the controller drives an electric lock, whether or nor a lock is actually present.

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Pair of Doors

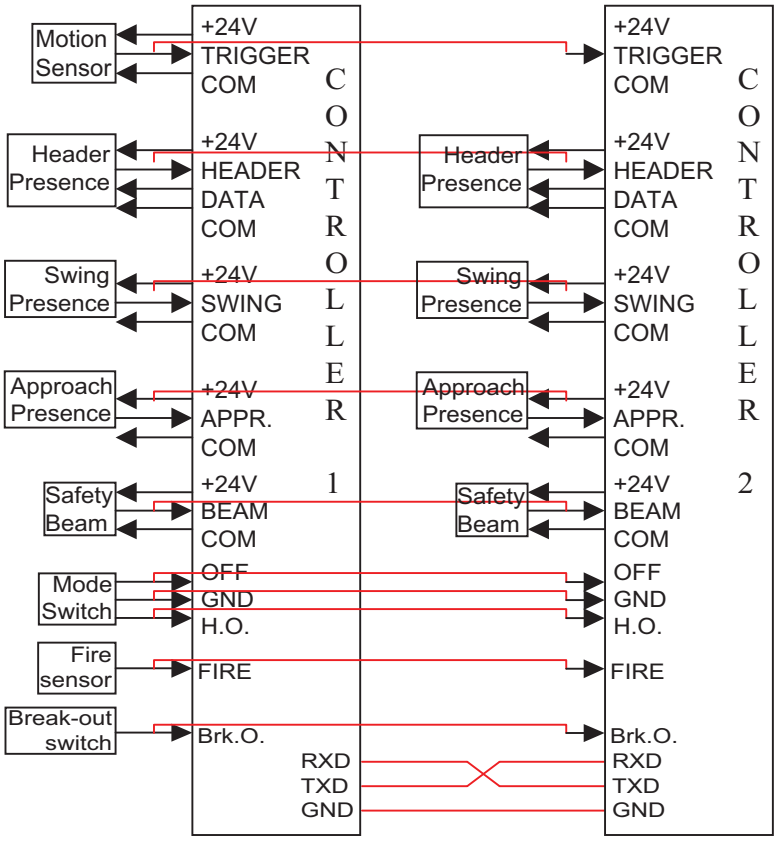
Two openers may be used to open two side-by-side doors. The doors may be synchronized or not. This operator is not compatible with over-rebated doors.

Synchronized doors

The doors behave as if they are mechanically interconnected. In case of a presence at one door, both doors react identically. In case of an obstacle at one door, the other door stops too, though a bit afterwards.

Wiring:

- Connect the grounds of the two controllers together
- Connect the motion sensor to both controllers, in parallel



- Connect each presence sensor from each door to both controllers, in parallel (but not the DATA line)
- Let each controller power its presence sensors (either controller can power the motionsensor)
- Connect a single Program Switch to both doors, in parallel
- Connect the RXD line of each controller to the TXD line of the other controller
- If you use the “Fire” input, connect the fire sensor to both controllers.
- If you use the “Break-out” input, connect the break-out switch to both controllers.
- Power the controllers from the same AC power source

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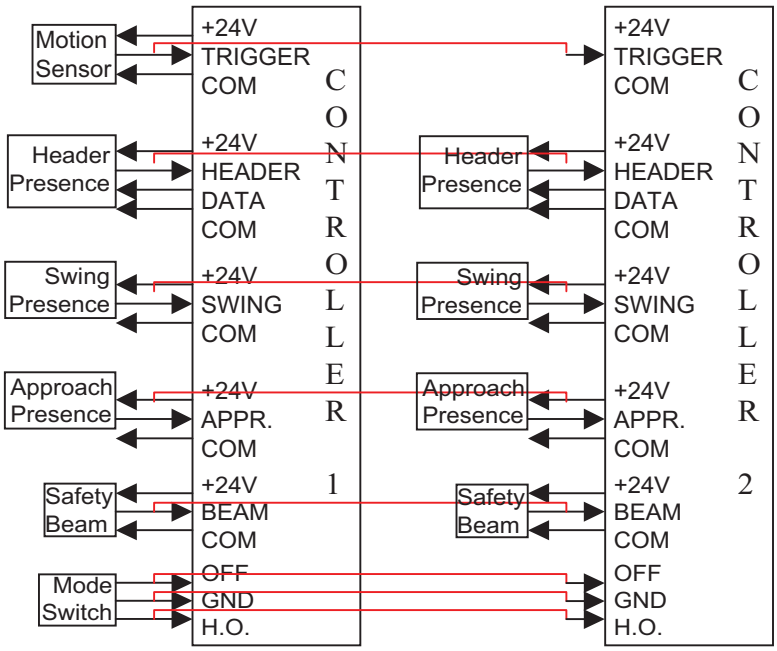
Set-up:

- Program the two controllers identically. However, in particular situations you may wantto program them slightly differently, so that one door opens and/or closes first.
- Let the openers do a learn cycle (it's easier if you do them separately). Tip to stagger the opening of the doors during the learn cycle:
  - place both controllers in "Learn";
  - open one door;
  - as it's closing, flip the Program switch from Off to Auto;
  - the door that was still closed will start a learn cycle,
  - the one that you opened will first finish closing and then start a learn cycle.
  - this will give you a chance to stop the first door at Back-Stop, and then walk to the second door and stop it at Back-Check when it gets there a while later.
- When both openers are ready, trigger an automatic opening, and, as the doors are opening, block one of doors. When they start moving again, block the other one. This will let each opener tell the other of having detected an obstacle, so that each will knowof the presence of a second door. Knowing that, the openers will extend the Hold-Open time after an obstacle, to ensure that both doors remain in synchronization afterwards.

Semi-independent doors

The doors open and close at the same time. However, if one opener reacts to a presence or an obstacle, the other door continues as nothing happened, so the two doors become un-synched. The door return to being synched only after there's no traffic long enough for both doors to return home. For coordinated doors (one must close first) it's possible that the doors will close in the wrong order. To let the door operate independently:

- Program the two controllers identically (for coordinated doors - one must close first - increase slightly the Closing Delay of the controller for the door that must close last)



- Connect the grounds of the two controllers together
- Connect one door's presence sensors just to the controller for that door
- Connect the motion sensor to both controllers, in parallel
- Let each controller power its presence sensors (either controller can power the motionsensor)
- Connect a single Program Switch to both doors, in parallel
- Power the controllers from the same AC power source

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OPERATION

Restore factory defaults

To reset the unit to the factory defaults, do the following:

- Turn the "Selector" knob to the "Misc Sel" position.
- Turn the "Dial" knob until "rSt" is shown in the display.
- Turn the "Selector" knob to the "Misc Adj" position. The display will show "nO".

Turn the "Dial" knob right. The display will show "yES" for just a split second, and thecontroller will restart.

Set-up without temporary stop

If for some reason you don't want stop the door at Electrical Back-Stopduring set-up, use this alternate procedure:

- Manually open the door until it hits a mechanical stop (such as a wall or the operator'sinternal Hard-Stop). Measure that opening angle exactly.
- Turn on the controller
- Indicate the type of door opener and the door mount.
- Turn the "Selector" knob to the "Back-Stop" position. Use the Dial knob to change the Back-Stop angle to the angle you just measured.
- Turn the "Selector" knob to the "Learn" position.
- Set the Program Switch in the "Auto" position.
- The door will start opening slowly and hit the hard-stop.
- As the door closes slowly to Latch-Stop, turn the "Selector" knob to the "Back-Stop" position. Use the Dial knob to change the Back-Stop angle to the desired Electrical Back-Stop Angle (such as 90°).
- **Get out of the way!**
- The door will slam open to 45°, then close.
- The display will show "CyC", meaningthat the opener needs a cycle learn.
- The door will cycle open and closed at normal speed once.

Cycle testing

To cycle test the operator, do the following:

- Apply AC power to the controller.
- Set the Program Switch in the "Off" position.
- Turn the "Selector" knob to the "Back-Stop" position. The display shows the programmed Back-Stop angle in degrees.
- Turn the "Dial" knob to adjust the programmed Back-Stop angle to the actual Back-Stop angle of the door.
- Turn the "Selector" knob to the "Learn" position. The display shows the Learn State. If it doesn't say "ALL" (meaning it needs a complete learn), turn the"Dial" knob counter-clockwise until it does.
- Set the Program Switch in the "Auto" position. The opener will start a learn:
  - The door will open slowly to Back-Stop.
  - The door will close slowly to Latch-Stop.
  - The door may slam partially open, then close.
  - The door will start cycling open and close, non stop.Note that the opener has limited obstacle detection while learning: do not stop the door!
- Turn the "Selector" knob to the "Mon Sel" position.
- Turn the "Dial" knob until that "CyC" (for Number of Cycles) is shown in the display.
- Turn the "Selector" knob to the " Monitor" position. The display will show the number of cycles. If there are morethan 999 cycles, use the "Dial" knob to scroll the display.

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ED900

Low energy operator

Safety and Technical Specifications:
Book 1 of 3

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Contents

1. For Your Safety

This documentation contains important information regarding the mounting and the safe operation of the door system. Read these instructions carefully before operating the **ED900.**

It is important for your personal safety to abide by all enclosed instructions.

An incorrectly performed installation might cause serious injuries.

Using control elements, making adjustments or performing procedures that are not described in this documentation might cause electric shocks, danger caused by electric voltage/current and/or danger due to mechanical incidents.

Please keep these documents for further reference and hand them over to the person in charge in case the system is transferred to another party.

Explanation of symbols

	**NOTE**	**This symbol underlines important information that may facilitate your work.**
	**REMARK**	**This symbol warns you of possible system damage and explains how to avoid this damage.**
	**WARNING**	**This symbol indicates dangers that might cause personal or material damage or even kill people.**

Intended application

As an electromechanical swing door operator, the **ED900 is only designed to open and close swing doors with a door-leaf weight of up to 220lb with a max width of 48**".

This operator is suitable for installation as slide channel pull arm assembly or double lever push arm assembly.

The closing force paths have been optimized for the respective ways of mounting and comply with the requirements of ANSI 156.19.

Please ensure that the system is approved for installation at the respective door before installing the system at a fire or smoke door.

Before you start with the installation of the system, please ensure that your operator is suitable for the door situation as explained in the technical specifications in chapter 2 and that the door is equipped with adequate hinges for operation with an automatic operator.

The maximum cable length for external components must not exceed 98' 5'' [30 m].

Limitation of liability

The ED900 may only be used according to their specified intended application. DORMA will not accept any liability for damage resulting from unauthorized modifications of the ED900. Furthermore components/accessories that have not been approved by DORMA are exempted from liability.

Safety instructions

Work on electrical equipment may only be performed by properly qualified staff (electricians).

- Do not allow children to play with the **ED900 or its rigidly mounted adjustment and control devices.**
- Keep remote controls out of reach of children.
- Never stick metal objects into the openings of the **ED900; otherwise you might sustain an electric shock.**
- Always use safety glass when mounting glass door panels.
- Only operate the mains switch at the header profile while the door stands still or is permanently open.
- No push buttons/switches, pictures etc. must be located within the door's movement range.
- Switch must be located so that door operation can be observed by person operating the switch.
- Your door system must be maintained in compliance with the standards of the industry, BHMA/ANSI.
- Proper decals and labels be applied, per BHMA/ANSI Standards, and maintained on your doors. If decals are removed, or cannot be read, request labels to be replaced when calling for service.

Standards, laws, codes and regulations

The latest versions of the common and local-specific standards, laws, codes and regulations have to be observed.

Application of the ED900 swinging fire door operators:

- Intended for use on swinging type fire door assemblies, equipped with electric strikes or single point latches/ locks or fire exit hardware with remotely activated retractable latch bolts.

Low-energy product

The ED900 can be adjusted so that it meets the requirements of a low-energy application (low-energy operator) to ANSI 156.19. During commissioning, the operator has to be adjusted in accordance with the appropriate standard and then verified after installation is complete.

The required system safety is ensured by the following means:

- Reduced dynamic force at door leaf/contact force
- Low driving speed
- Reduced static force at door leaf/contact force
- Force limitation

The application of additional safety sensors to protect the swing path is not explicitly stipulated but should be considered as an option if the individual risk assessment reveals that further sensors are required. The protection of the secondary closing edge has to be assessed individually.

Risk assessment on the part of the installer

Due to special spatial conditions and the expected user groups of the door, the application of safety sensors may, however, also be reasonable for a low-energy operator. Therefore the manufacturer, i.e. the installer of the system, has to perform an individual risk assessment during the planning of the door system in order to decide whether additional safety equipment is required or not.

Please refer to our homepage **www.dorma-usa.com**

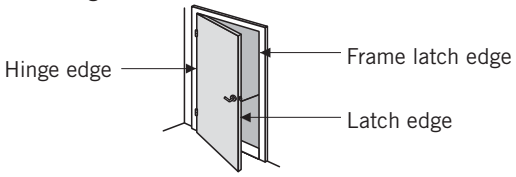
Special requirements regarding the protection of people in need of protection

In case the risk assessment reveals that there is a health risk or risk of injury caused by the door hitting a person using the door with an unacceptable force, an additional protection with the aid of appropriate safety equipment (connection of a safety sensor) is required.

This is especially necessary when people in need of protection (children, elderly people or disabled people) use the door.

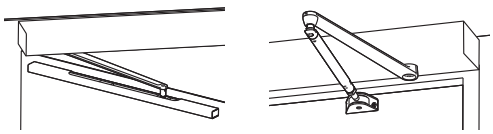
Dangers at closing edges

⚠ **Automatic doors may cause hazards by crushing, shearing, hitting and drawing-in at the different closing edges.**



Dangers caused by slide channel and arm

⚠ **The slide channel and the arm may cause hazards by crushing and shearing.**



Residual risk

Depending on the structural conditions, the door version and the available safety equipment, residual risks (such as crushing and hitting – with limited force) cannot be excluded. All people using a door are generally aware of the danger spot at the secondary closing edge of every swing door (also at manually operated doors). This danger spot cannot be influenced by the manufacturer of the operator and a protection of this closing edge often cannot be realized due to its construction and technical function. A suitable clamping protection (like a rubber or textile cover) is available in the specialized trade and not part of the scope of delivery.

Recycling and disposal

The **ED900 and its packing mainly consist of recyclable raw material.**

The **ED900 and the respective accessories must not be disposed of as domestic waste.**

Please ensure that the old appliance and the respective accessories (if available) are properly disposed of.

Abide by the prevailing national statutory provisions!

Safety during mounting

- The door is designed to be installed by trained and knowledgeable installers. The installation technician should be experienced in the installation of automatic entrances. They should know all local code requirements and be familiar with the requirements of the current ANSI A156.10 & 156.19 Standards for Power Operated Pedestrian Doors.
- The working area has to be secured against unauthorized access from other people. Falling items or tools might cause injuries.
- This unit should not be mounted in exterior conditions.
- The way of mounting and the mounting equipment, must be adequate with regard to the structural conditions (steel structure, wood, concrete etc.).
- Before mounting the **ED900, the door leaf has to be checked with respect to proper mechanical condition and smooth running. No other closing mechanisms can be attached to this door in anyway.**
- **The mounting of the ED900 described herein is only an example.**
  Structural or local conditions, available tools or other conditions might suggest a different approach.
- Following the successful installation of the system, the settings and the proper function of the **ED900 and the safety equipment have to be checked.**

- Only specially qualified staff may open the power supply housing.
- Disconnect the **ED900 from power supply (de-energize the system) before removing the cover of the power supply housing.**
- After installation, the door must be adjusted to conform to **DORMA** recommendations and all code requirements. Carefully study the requirements in these instructions.
- After installation and adjustment, the installer's final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with the manual.
- Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the **DORMA** Technical Assistance Group for assistance.

Safety during commissioning

- Only specially qualified staff may open the power supply housing.
- The protective earth conductor ground has to be connected.
- Ensure that the door leaves run smoothly.
- The operator and the door leaf must be properly linked.

Inspection and system approval

Before the first commissioning and depending on requirements, however, at least once a year, the **ED900 has to be inspected by a properly qualified technician and serviced if required.**

Briefing:

Following the adjustment, commissioning and functional testing of the door system, the operating instructions have to be handed over to the facility operator and a briefing has to be made.

Maintenance

The system has to be de-energized/disconnected from power supply before any kind of maintenance work is performed (turn main power supply breaker OFF).
Please consider the leaflet regarding the application of hold-open devices for further information and instructions regarding the application of the **ED900 at fire and smoke doors.**

Care

The system has to be de-energized (disconnected from power supply) before cleaning the system.
Remove power plug or, with permanent power supply, switch off breaker.
You may clean the **ED900 with a damp cloth and standard commercial detergents.**
You should not use scouring agents for cleaning purposes as they might damage the surface finish.
Pay attention that no water or other liquids drop on or into the **ED900.**
Never stick metal objects into the openings of the **ED900; otherwise you might sustain an electric shock.**

Wear

The following wear parts have to be inspected once a year and replaced if required:

- Arm
- Slide shoe
- Slide channel

Only use DORMA original replacement parts.

2. Technical Specifications

The following technical specifications will help you to check additionally if the system fulfills the requirements. You can start mounting if the system complies with the parameters.

Required operating conditions

Ambient temperature	5 to 122° F [-15 to 50° C]
Only suitable for dry environments	relative humidity max. 93% non-condensing
Power supply	115 V AC +/- 10% 50/60 Hz 6.6 A max.
Class of protection	IP 20
Branch circuit protection (by others)	15 A
Power cable type	14 AWG / 12 AWG
Max. operating noise	50 db (A)

General specifications

Dimensions (WxHxD)	27 x 2 3/4 x 5 1/8" [685 x 70 130 mm]
Min. distance between hinges (double-leaf systems)	55 1/8" [1,400 mm]
Min. distance between hinges (double-leaf systems) with Full Width Cover	59 1/16" [1,500 mm]
Operator weight	26.5 lb [12 kg]
Power supply for external accessories	24 V DC +/- 10%, 1.5 A
Opening angle	Max. 110°

Inputs

Connections	14 AWG Max. [2 mm^2]
Dry contact	Inside and outside (NO contact)
Override (intercom system)	8 - 24 V DC / AC + 10%
Override (key switch)	NO contact/NC contact
Safety sensor	Pull side and push side (NC contact)
Test signal for safety sensor	Pull side and pull side
Deactivation of operator function (lock switch)	NC contact/NO contact

Outputs

Connections	14 AWG Max. [2 mm^2]
Status relay	Door closed Door open Malfunction

Integrated functions

Latching action	Adjustable from 5° to 0°
Hold-open time	0 - 30 seconds
Override hold-open time	0 - 30 seconds
Obstruction detection during closing cycle	Reversing / Automative mode
Delayed opening for locking mechanism (electric strike)	0 - 4 second/s
Locking feedback contact	Latch / Lock monitor
Wind load control	up to 33,7 lbf [150 N]
Power failure speed control	Adjustable via potentiometer
Closing force prior to close	Force adjustable
LED status indicator green red yellow	- power supply available - malfunction - service interval indicator
Internal mode switch	OFF AUTOMATIC PERMANENT OPEN EXIT ONLY (only for single-leaf systems)
Program panel with 2 digit display	Status indicator and settings / parameters
TMP – Temperature Management Program	Overload protection
IDC – Initial Drive Control	Driving phase optimization
Cycle counter	0 – 1,000,000 (reasonably subdivided)
Power Assist Function / Helping Force	Servo-supported manual opening
Push & Go Function	The door opens when it is moved manually by 4°

ED900	
Max. steady state power consumption	120 Watts
Max. door-leaf weight for lintel depths of up to 11 3/4 " [300 mm]	220.4 lbs [100 kg]
Door-leaf width	27 9/16" to 43 1/4" [700 to 1,100 mm]
Opening speed	(27°*)/second
Closing speed	(27°*)/second
Axle extension	0" [0mm] 3/4" [20 mm] standard 1 3/16" [30 mm] 2 3/8" [60 mm]
Pull side track mount lintel depth for slide channel	+/- 1 3/16" [30 mm]
Push side top jamb lintel depth for standard arm	0" to 11 13/16" [0-300 mm]

Power-Assist / Helping Force Mode
The Automatic-Power-Assist Function may be activated while the door is in door closer mode (parameter hd = 1). As soon as a user opens the door manually by some degrees, the servo-function supports the manual opening cycle. The servo support automatically adapts to the adjusted size of the door closer. The level of servo support is adjustable in order to meet the requirements of ANS: 156.19 Power Assist Mode. The maximum adjustable opening torque amounts to 15 ft-lbf [20 Nm], unless the hold-open device is triggered or in the event of a power failure.
It is not possible to use the system in conjunction with the Push & Go Function or opening and closing force (wind load control) as these modes may affect the easy manual opening.

Door closer mode & Automatic mode
Users may choose between two operation modes: door closer and Automatic mode. While adjusted to door closer mode (setting 32 hd = 1), the system is optimized for manual operation. With its optional Power-Assist / Helping Force Mode, the door closer mode is tailored to predominantly manually-operated doors where a door closer function is desired. The Automatic mode (setting 32 hd = 0) in turn is especially suitable for mainly automatic access via pushbutton. In addition, the door reverses as soon as it runs into an obstruction while closing. On activation of the Automatic mode, also the wind load control is available. However, the doors are still ready for manual egress. In this case we would recommend the Push & Go function.

Wind load control
ED900 operators are suitable for application at exterior doors that are subject to varying wind loads and for interior doors separating rooms where different pressure prevails. While the system is in AUTOMATIC mode, the wind load control monitors the actual driving speed and adjusts the speed correspondingly if it does not correspond to the adjusted value.
The electronic latching action is activated during the last 5° of the closing cycle in order to support the closing action.

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08281800 07/2013, Subject to change without notice

Manual Sliding Door

Owner's Manual

Distributed by:

DORMA AUTOMATICS, Inc.
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Lake Bluff, IL 60044
E-mail:automatics@dorma-usa.com
Toll-Free:877-367-6211

Important Installation Instruction

ALL INSTALLATIONS SHOULD ONLY BE PERFORMED BY TRAINED OR AUTHORIZED PERSONS

Warning - To reduce the risk of injury:

1. **Carefully Read And Follow All Installation Instructions**
2. This unit should only be installed in a rough opening capable of providing proper structural support. Have a qualified service person make repairs to surrounding electrical cables and/or other surrounding structure to ensure proper anchoring of unit before installation.

Caution
Improperly Adjusted Door can cause injury and equipment damage. Inspect door operation daily

To Our Customers

The purpose of this manual is to familiarize you with your door system. It is essential that you "know your system" and that you recognize the importance of maintaining your door system .

It is your responsibility,
as owner or caretaker of the equipment, to inspect the operation of your door system on a daily basis to ensure that it is safe for use by your customers or employees.

This manual will provide you with a description of the operation and maintenance requirements of your door.

Should the door fail to operate do not attempt to repair or adjust the door. Call a qualified service technician.
These technicians are trained to service your door in accordance with applicable industry safety standards.

Service Availability
DORMA Automatics, Inc. products are distributed through a nationwide network of DORMA Automatics, Inc. authorized distributors for sales, installation and service.

Manual Sliding Door Installation Instructions

Instructions to Installer

We are pleased that a DORMA manual sliding door has been chosen for this installation. DORMA carefully designed, tested and built the door of high quality materials as it will provide many years of service.

Now the door must be installed and adjusted properly to ensure its proper operation and safe use.

To install and adjust the door for proper and safe operation, the installer must carefully read this instruction book before proceeding, then follow the instructions exactly.

The door is designed to be installed only by trained and knowledgeable installers. The installation technician should be experienced in the installation of automatic entrances.

After installation, the door must be adjusted to conform with DORMA recommendations and all code requirements. Be sure to carefully study the requirements in these instructions.

After installation and adjustment, the installers final responsibility is to properly instruct the owner in the safe use of the door. He must also present the owner with the ICU/CCU owner's Manual.

Each step of the installation, adjustment and instructions are important for proper and safe use of the door being installed. If there are any questions about any items contained in these instructions, call the DORMA Technical Assistance Group for assistance.

Note: If there are any problems, discontinue door operation immediately and secure the door in a safe manner. Call your local authorized DORMA Automatics distributor for repair.

DORMA Automatics, Inc.
924 Sherwood Drive
Lake Bluff, Illinois 60044

Toll Free: (877)637-6211
Fax: (877)423-7999

THE STANDARD PACKAGE CONSISTS OF:

(1) RTS OVERHEAD CONCEALED CLOSER, FRAME, (1) SWING DOOR, (1) BI-FOLD DOOR, SIDELITES WITH VERTICAL AND HORIZONTAL WEATHERSTRIPS.

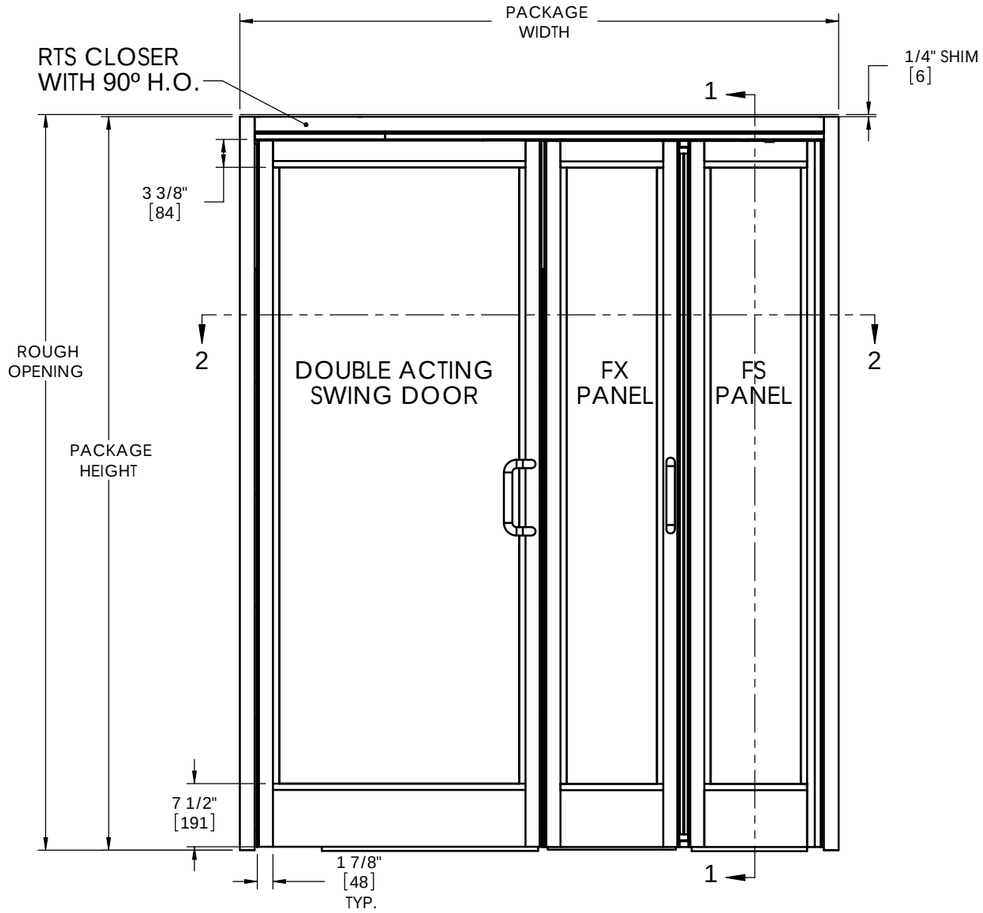
STANDARD FINISHES: CLEAR BHMA 204
DARK BRONZE BHMA 313

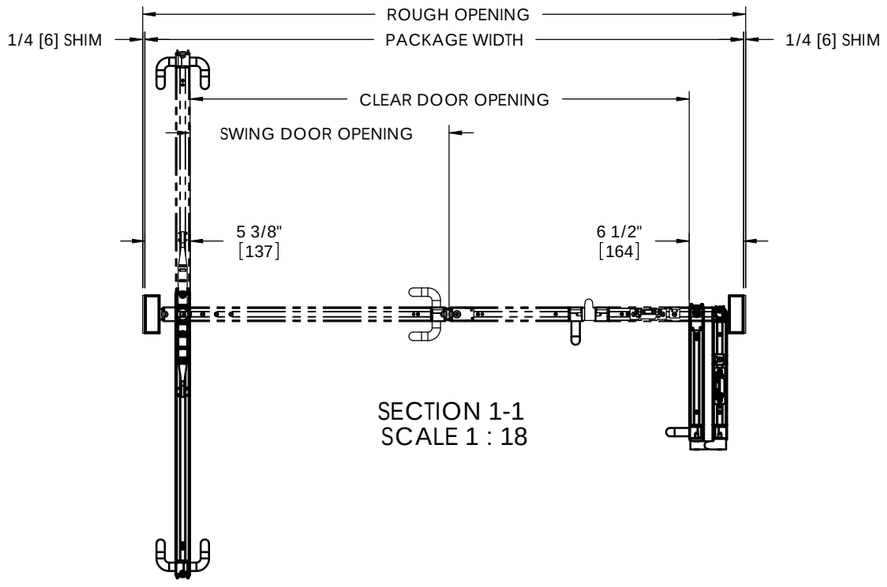
SPECIAL FINISHES ARE AVAILABLE

DRAWING DIMENSIONS ARE IN ENGLISH AND METRIC UNITS. METRICS ARE SHOWN IN MILLIMETERS, AS FOLLOWS: 1" [25.4]

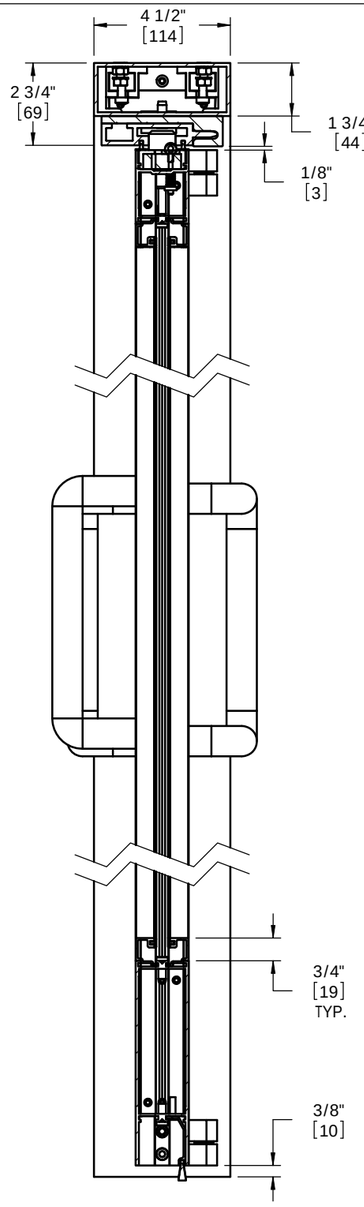
REFER TO APPLICABLE LOCAL, STATE OR NATIONAL BUILDING CODES FOR MINIMUM DOOR HEIGHTS AND WIDTHS FOR ALLOWABLE EGRESS REQUIREMENTS. SEE REFERENCE TABLE BELOW.

SWING DOOR IS USED PRIMARILY WITH BI-FOLD AS BREAKAWAY.





SECTION 1-1
SCALE 1 : 18

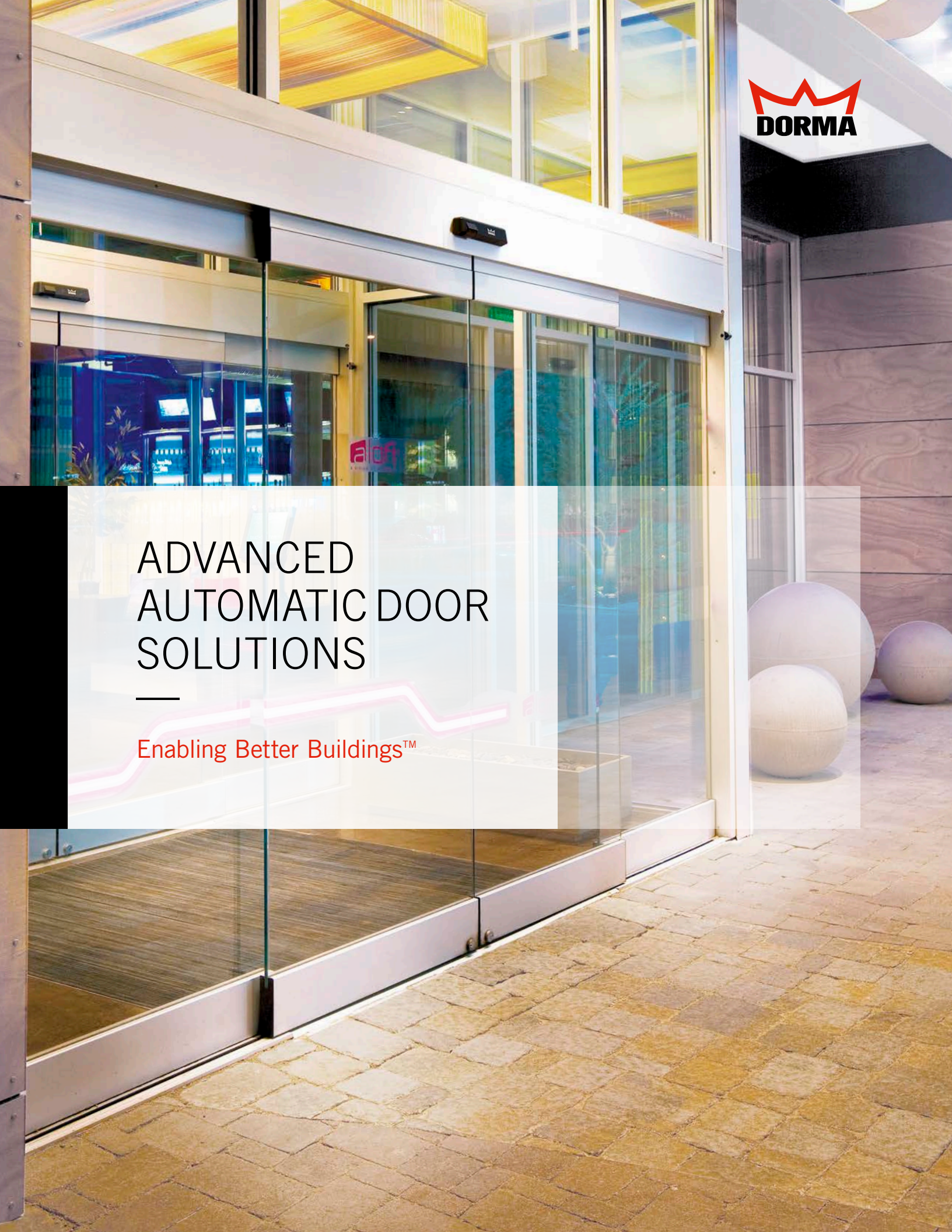


SECTION 1-1
SCALE 1 : 5

STANDARD PACKAGE HEIGHT IS 88"[2235]
SWING DOOR IS AVAILABLE AS 36"[914], 42"[1067], OR 48"[1219]
MAXIMUM RECOMMENDED WIDTH OF BI-FOLD DOOR IS 72"[1829]

Package Width	Swing Door Width	SWING DOOR OPENING	CLEAR DOOR OPENING
84"[2133]	36"[914]	32 3/8"[822]	72 1/8"[1832]
96"[2483]	42"[1067]	38 3/8"[975]	84 1/8"[2137]
120"[3048]	48"[1219]	44 3/8"[1127]	108 1/8"[2746]

ICU1200 SERIES
BI-FOLD/SWING MANUAL DOOR



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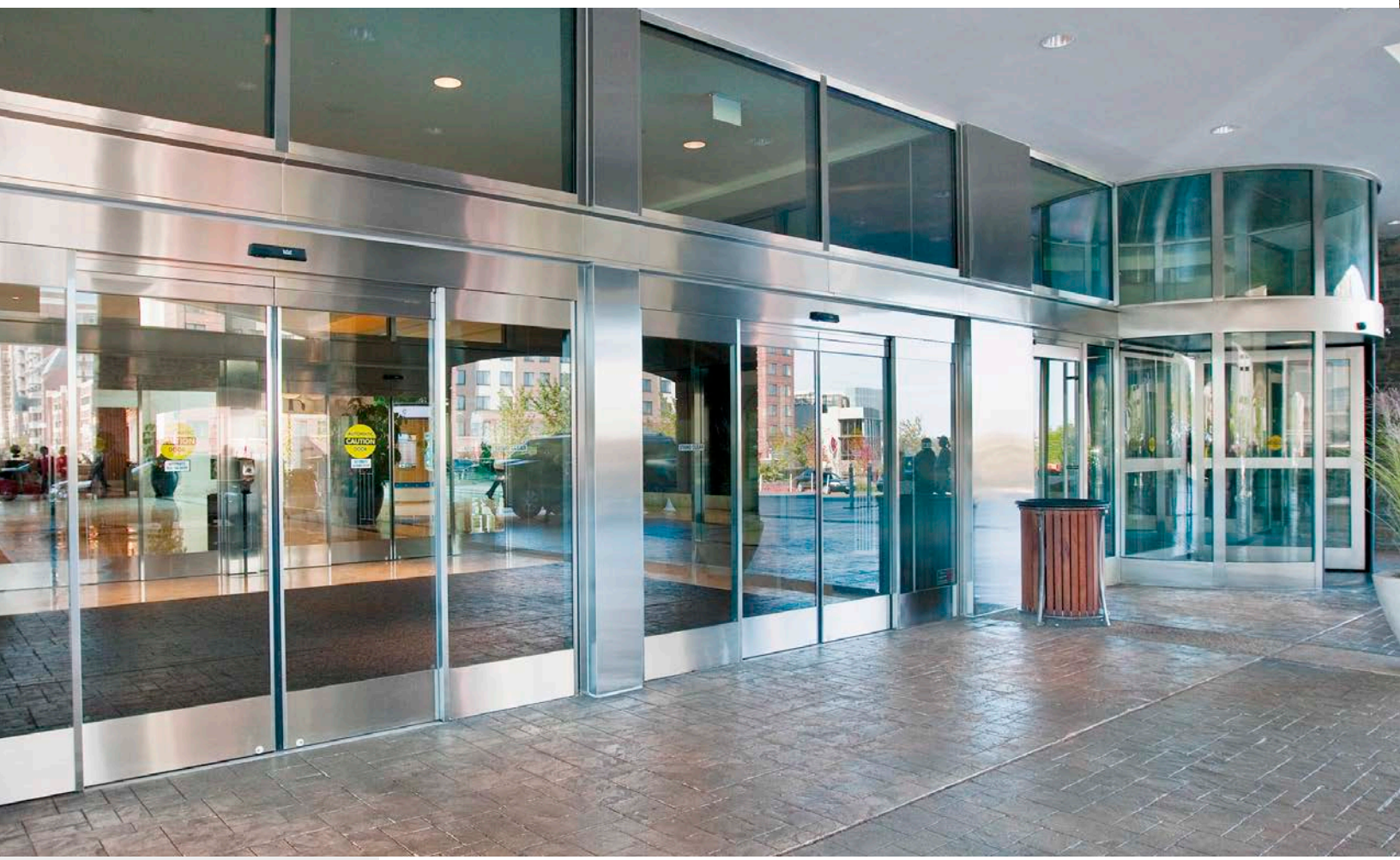

For project specification, design, and code-compliance assistance, call the DORMA Architectural Support Desk at 866-401-6063.

DORMA can review your product selection to insure it is project specific and code compliant.

DORMA is a leading innovator of automatic door systems, with entrance solutions for practically any application—retail, health care, office buildings, airports, hospitality, and more.

Our sliding and swinging door systems cover a wide range of applications and finishes.

Both custom designed and standard systems are available. Each product offers exclusive features, such as an advanced microprocessor controller for precision performance and long lasting reliability. A variety of sensors engineered to provide optimum safety are available to meet every application.

DORMA also offers both Crane manual and automatic revolving doors, which are ideal for high traffic applications that require simultaneous entry and exit, controlled access, or an air lock to help control energy costs.

DORMA ESA

Stylish, durable, and powerful automatic sliding doors

Providing strength, beauty, and technology all in one package, the **ESA Automatic Sliding Door** is one of the most intelligent, efficient, and technologically advanced sliding doors on the market. Powerful ESA doors operate door panels weighing up to 350 lb, while a continuous self-monitoring control system adds an extra measure of safety and efficiency.

The impressive low-profile, 4.5" × 7.5" ESA header means the doors are installed flush with the surrounding structure—creating a sleek, unbroken sight line that blends the doors into the overall architectural design.

DORMA uses a 1/4" (6 mm) thick structure to create one of the strongest headers in the industry. The self-supporting header can span up to 16' without additional reinforcement.

ESA100, 200, 300—Three intelligent, strong, low-profile ESA models suit different requirements: the non-breakout ESA100, the ESA200 with fixed sidelite, and the full-breakout ESA300.

ESA400 Fine Frame—The Fine Frame style is a perfect marriage of beauty and functionality. Also featuring full breakout capability, the ESA400 combines full view aesthetics with excellent weather-sealing qualities.

ESA500 All-Glass—The all-glass ESA500 door has no vertical trim so it offers an uninterrupted horizontal expanse for blending with an all-glass façade.

DORMA also creates custom ESA doors. For example, doors utilizing stainless steel or polished bronze can be welded to eliminate seams and ensure a beautiful appearance for the lifetime of the door.

DORMA ESA Auto-Telescopic sliding doors driven by proven ESA technology

NOTE: All DORMA ESA Series automatic sliding doors are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ESA-200-B1 Blast Rated Doors

The **ESA200-B1** is specifically designed to meet US DoD requirements for antiterrorism building standards (UFC 4-010-01) with conventional standoff distances, commonly required on military bases and public buildings. These doors are available at standard height and up to 14' wide packages with medium stiles and enhanced security 3- or 5-point locking.

DORMA ESA-HP Hurricane-Resistant Doors

The **ESA-HP** automatic sliding door meets Dade County and Florida Building Code regulations, keeps your building safe and secure, provides smooth and durable operation—all the while providing an aesthetically pleasing entrance for your place of business.

MIAMI-DADE COUNTY APPROVED

DORMA ED400

Powerful, reliable, flexible, and intelligent

The **DORMA ED400 Swing Door Operator** is designed for demanding applications such as retail centers, airports, and health care facilities. Built for high traffic applications, it can handle doors up to 51" wide and 320 lb per leaf and can be configured for full energy (156.10) or low energy (156.19) operation.

DORMA tests the ED400 operator for one million cycles in climate-controlled test chambers. A built-in power boost helps keep the door closed when exposed to high wind or stack pressure buildup.

Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self-closing. The virtually maintenance-free unit provides smooth, silent operation.

The ED400 operator offers advanced encoder and microprocessor control, allowing it to self-learn the door weight and inertia, ensuring ultra smooth operation. The controller has dedicated circuits and LED status indicators for up to five safety sensors—no more doubled-up circuits or decreased performance. The easy three-digit display allows you to monitor the performance of every function for easy diagnostic evaluation.

DORMA ED700

Smooth, quiet operation, elegant slimline design

The **DORMA ED700 Low Energy Swing Door Operator** is the perfect solution for applications requiring barrier-free access. Simple and easy to install, the ED700 provides many features and functions to make existing doors easily accessible. The DORMA ED700 is custom ordered to match the application. All common applications for outswing and inswing doors—with either push arm or slide track arm for tight side clearance—can be adapted for barrier-free access.

The ED700's advanced encoder and microprocessor control is a feature of the ED400 as well—ensuring the same level of intelligent and smooth operation. Extruded aluminum covers in custom lengths are available to match aesthetically with the door frame.

The ED700 may be used for door widths up to 48" (1220 mm) and a maximum weight of 200 lb (91 kg). For best accessibility, the operator can open the door up to an opening angle of 110°.

NOTE: The DORMA ED400 and ED700 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AAADM certified installers.

DORMA ED100 & ED250

Low energy/full energy compact swing door operators

NOTE: The DORMA ED100 and ED250 Series automatic swing door operators are listed UL325 / CSA 22.2 and meet requirements of ANSI/BHMA A156.10 or A156.19 and NFPA 101 with proper application and installation by AADM certified installers.

The **DORMA ED100 and ED250** are compact next generation electromechanical swing door operators.

Innovative engineering makes them safe, reliable, and energy-efficient at any level of traffic and in variable atmospheric conditions. Their modular design allows them to be pre-configured with plug-ins for specific applications. A minimalist DORMA Contur profile makes them a perfect fit for any application, interior or exterior.

Unlike conventional electro-hydraulic operators, the ED100 and ED250 are able to respond automatically to changes in the surrounding environment. Built-in sensors and a state-of-the-art drive system can quickly adjust how the unit operates, boosting power when required to open and close reliably and consistently.

A wide array of applications can be realized due to built-in functions and options, including wind-load control, mechanical coordinator, automatic power assist, sensor/lock timing, and more.

Universal modular design and high-tech functionality combine with ultra compact form and award-winning Contur aesthetics to make this operator a beautiful way to automate easily without drawing unwanted attention.

DORMA ED100: for doors up to 220 lb (100 kg)

DORMA ED250: for doors up to 550 lb (250 kg)

DORMA MAGNEO

Powered by advanced LMD technology

Powered by linear magnetic drive technology (LMD), the **DORMA MAGNEO** is a sliding entrance system designed for any modern interior, whether public, commercial, or private. Its sleek Contur design has minimalist clean lines that blend seamlessly to meet discriminating applications. Innovative magnetic technology ensures that the MAGNEO is safe, reliable, whisper quiet, and resistant to wear.

Ideal for both new and retrofit interior applications, the MAGNEO's modern design and easy operation make it an attractive and efficient way to update both the function and appearance of existing interior doorways.

The versatile MAGNEO meets all safety requirements for low energy applications. Its extra sensitive operation instantly detects any obstruction. Activation is achieved via touchless design push plate, radio remote control, or traditional infrared motion detectors.

DORMA ICU300

Adaptable space separation

DORMA offers a complete line of ICU manual sliding doors for special care facilities such as hospitals and surgical centers. The **DORMA ICU300** enables continuous observation of patients, while allowing quick and easy access during emergency situations.

DORMA ICU300 doors come in a wide range of sizes, configurations, and finishes. Single, bi-parting, or telescopic doors are available with either two, three, four, or six panels. A recessed track or trackless guide system allows for smooth operation.

Standard features include premature breakout prevention, remote panel status monitoring, and electrostatic discharge grounding, to protect sensitive medical equipment from static electricity.

DORMA ICU1200

Combined multi-dimensional swing and bi-fold operation

The easy-to-install **DORMA ICU1200** is a perfect fit for installations with limited width and self-closing requirements. The ICU1200 combines two types of door: a double-acting swing door on one side and a bi-fold manual door on the other. Narrow stiles and an optional muntin ensure clear views for observing patients. For normal traffic, the swing door conveniently opens in either direction.

For a wider opening, the bi-fold door collapses to open up nearly the full width of the doorway.

The DORMA ICU1200 features a low profile 1.75" × 4.5" header and stainless steel pull handles on both the swing and bi-fold doors. The hinge on the bi-fold door is designed to protect fingers.

CRANE REVOLVING DOORS

1000-M/1000-A Series

The **Crane 1000 Series** is the solution when your budget-conscious project calls for the look, function, traffic flow advantage, and energy savings of a revolving door. Fabricated with rigid aluminum construction, the 1000 Series offers choices that allow you to match the doors to your entrance requirements—several size options, canopy choices, and custom painted or anodized finishes. The operating mode can be manual, automatic, or security mode.

Crane 1000-M Series doors use the same 100:1 gear manual speed control and bookfold mechanism provided on all Crane manual revolving doors. We use .125 thickness aluminum construction as the primary material, and all door construction is completed by the experienced craftsmen in our Chicago facility. The Crane 1000 series also offers an expedited production lead time for jobs with a fast-tracked completion date.

Crane 1000-A Series doors feature the same automatic drive system as Crane's higher end custom series doors. The MDS-A Modular Drive System includes an advanced microprocessor control and is torque driven for safety.

DORMA ED400-IG

Automatic in-ground floor operator

Meet access requirements and simultaneously maintain a classic look such as an arched door or an all-glass façade, with the **DORMA ED400-IG**. This revolutionary operator conceals the automatic components in the floor near the door threshold.

The ED400-IG functions in low energy or full power mode, and can be used in new construction and retrofit applications. It directs energy generated by the ED400 drive unit to the pivot in a rotating motion—ensuring consistently smooth operation.

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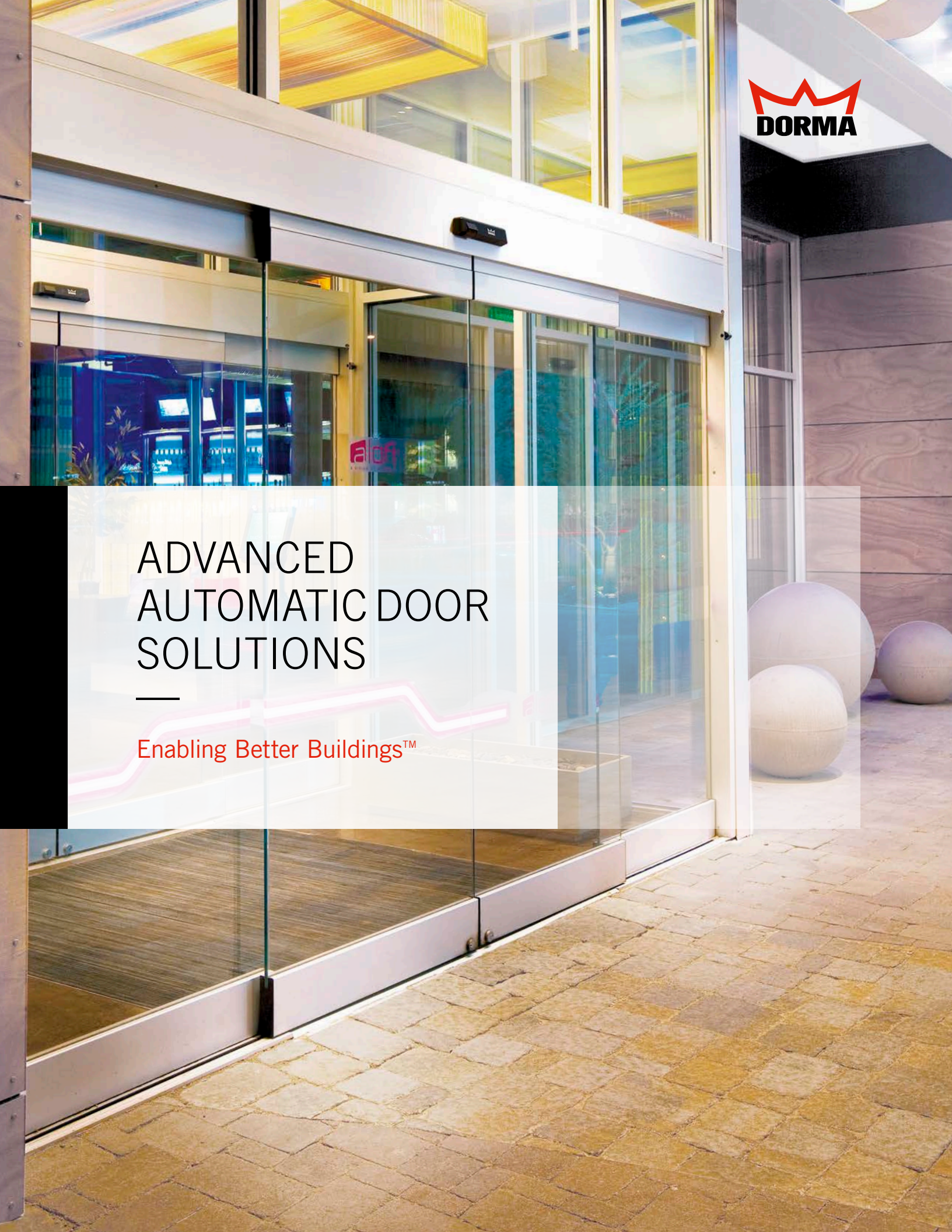

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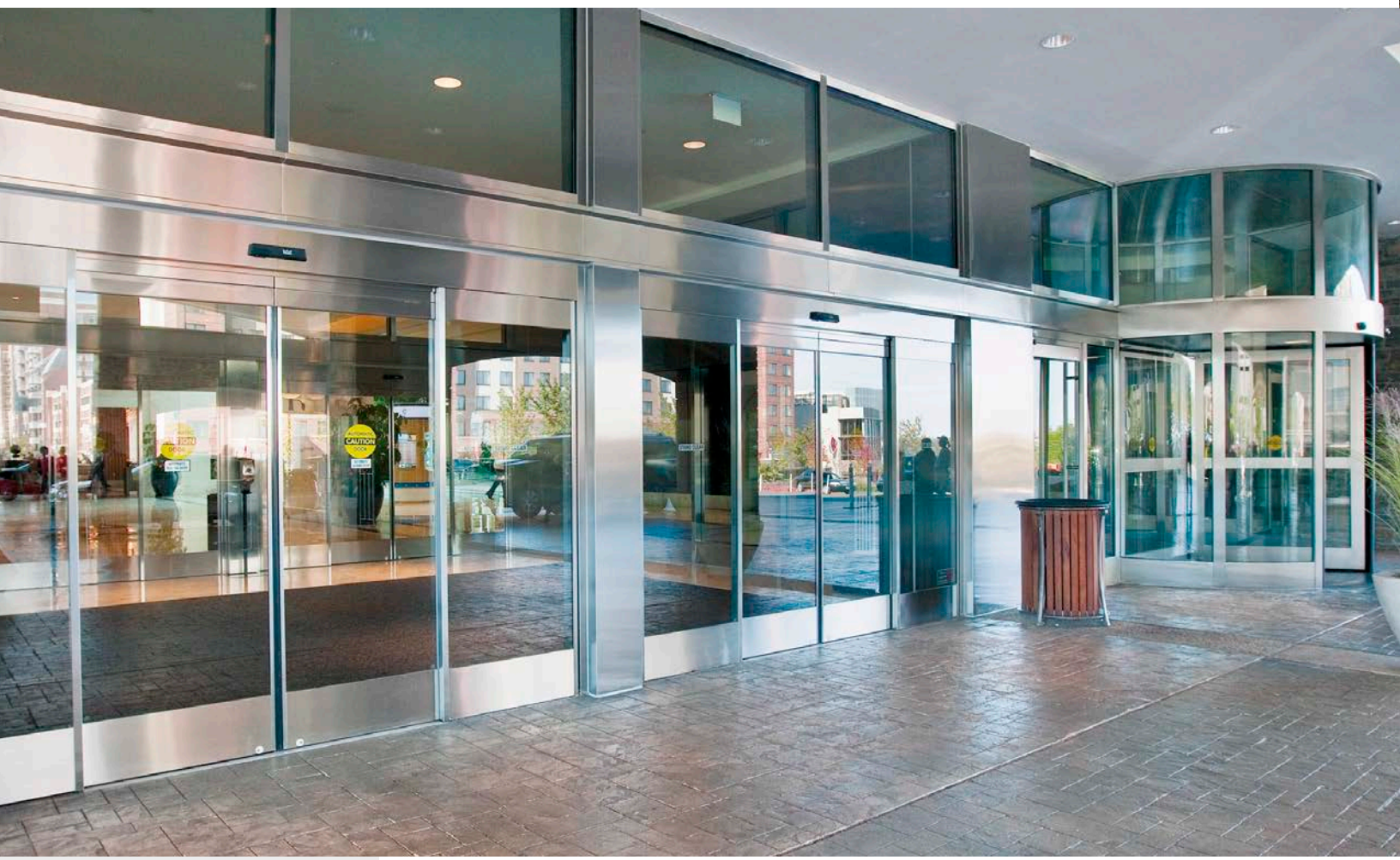

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The impressive low-profile, 4.5" × 7.5" ESA header means the doors are installed flush with the surrounding structure—creating a sleek, unbroken sight line that blends the doors into the overall architectural design.

DORMA uses a 1/4" (6 mm) thick structure to create one of the strongest headers in the industry. The self-supporting header can span up to 16' without additional reinforcement.

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MIAMI-DADE COUNTY APPROVED

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DORMA tests the ED400 operator for one million cycles in climate-controlled test chambers. A built-in power boost helps keep the door closed when exposed to high wind or stack pressure buildup.

Featuring a state of the art microprocessor control, the ED400 has a fully enclosed motor gear box, while the concealed spring package provides powerless self-closing. The virtually maintenance-free unit provides smooth, silent operation.

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Low energy/full energy compact swing door operators

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A wide array of applications can be realized due to built-in functions and options, including wind-load control, mechanical coordinator, automatic power assist, sensor/lock timing, and more.

Universal modular design and high-tech functionality combine with ultra compact form and award-winning Contur aesthetics to make this operator a beautiful way to automate easily without drawing unwanted attention.

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DORMA ED250: for doors up to 550 lb (250 kg)

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The DORMA ICU1200 features a low profile 1.75" × 4.5" header and stainless steel pull handles on both the swing and bi-fold doors. The hinge on the bi-fold door is designed to protect fingers.

CRANE REVOLVING DOORS

1000-M/1000-A Series

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Crane 1000-M Series doors use the same 100:1 gear manual speed control and bookfold mechanism provided on all Crane manual revolving doors. We use .125 thickness aluminum construction as the primary material, and all door construction is completed by the experienced craftsmen in our Chicago facility. The Crane 1000 series also offers an expedited production lead time for jobs with a fast-tracked completion date.

Crane 1000-A Series doors feature the same automatic drive system as Crane's higher end custom series doors. The MDS-A Modular Drive System includes an advanced microprocessor control and is torque driven for safety.

DORMA ED400-IG

Automatic in-ground floor operator

Meet access requirements and simultaneously maintain a classic look such as an arched door or an all-glass façade, with the **DORMA ED400-IG**. This revolutionary operator conceals the automatic components in the floor near the door threshold.

The ED400-IG functions in low energy or full power mode, and can be used in new construction and retrofit applications. It directs energy generated by the ED400 drive unit to the pivot in a rotating motion—ensuring consistently smooth operation.

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Reamstown, PA
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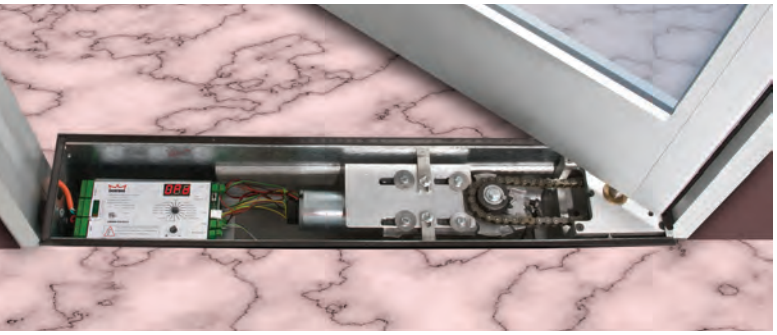
DORMA ED400-IG

Low energy operator



Door Control Services, Inc.
800-356-2025
Fax 877-888-5220
www.doorcontrolservices.com

With the ED400-IG Automatic Floor Closer, applications can meet access requirements and maintain a classic look at the same time—such as an arched door or an all-glass façade. This revolutionary operator conceals the automatic components in the floor near the door threshold.

The ED400-IG functions in either low energy or full power mode, and can be used in both new construction and retro-fit applications. DORMA partnered with Opcon Manufacturing Systems to construct a closer that directs the energy generated by the ED400 drive unit to the pivot in a rotating motion, thus allowing consistent, smooth operation.

The install box that stores the operator is completely weather proof and is only 7" deep. Product features include Push & Go, Power Close, and Lock Interface.

07000396 • 5.13CT • 1.5M • USA

ED400 Concealed “In Floor” AUTOMATIC SWING DOOR

Controller Installer’s Manual

Distributed by:

DORMA AUTOMATICS, Inc.
924 Sherwood Drive
Lake Bluff, IL 60044
E-mail: automatics@dorma-usa.com
Toll-Free: 877-367-6211
Fax: 877-423-7999

ED-400 SWING DOOR CONCEALED “IN FLOOR” OPENERCONTROLLER INSTALLER'S MANUAL Rev0.56

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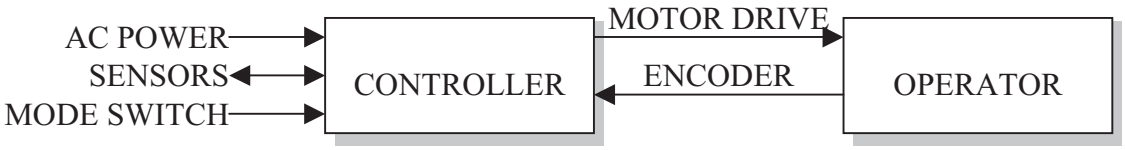
INTRODUCTION

The ED400 is an electro mechanical, automatic opener, for single direction swing doors (left or right hand). The opener opens the door using electrical power, and closes it using a return spring. The manager may turn it Off, turn it On (automatic) or place it in Hold Open (to keep the door open indefinitely). When turned Off, or in the absence of power, it operates as a passive door closer. Its operation may be controlled by a variety of sensors.

This is the manual for just the controller.



INSTALLATION

We'll first install the operator (and the header, surface mount), then the controller and its wiring, then the door (OCM) or the arm (surface mount).

Operator installation

Refer to the operator's manual for instructions on mounting it.

WARNING! When the operator is not connected to a controller, it may slam shut, endangering you and harming the adjustment bolt.

Controller installation

To install the controller, do the following:

Controller

- Install it in the cement case, using T-bolts to the bottom of the cement case, with the side with the display facing upwards.
- The controller is grounded through the AC power connector and the motor connector; there's no need for direct grounding from the controller's case.

Motor

- Connect the 3-screw, black terminal block at the end of the motor cable to the controller's "Motor" connector (on right side panel). The appendix has instructions on wiring the motor cable to a connector.
- Check that the motor is connected properly. Install the arm on the pinion, and rotate it in the opening direction; if that's hard to do, the motor is connected backwards. Let the arm go; if it slams closed, the motor is connected backwards. In either case, swap the back and red wires. Then test it again. For more inform ation, see the troubleshooting section.

Encoder

- To report their position , the operator uses an encoder. Connect its cable to the controller's white "Encoder" connector, on the right side of the controller's front panel. The appendix shows how to wire this connector, if it isn't already wired.

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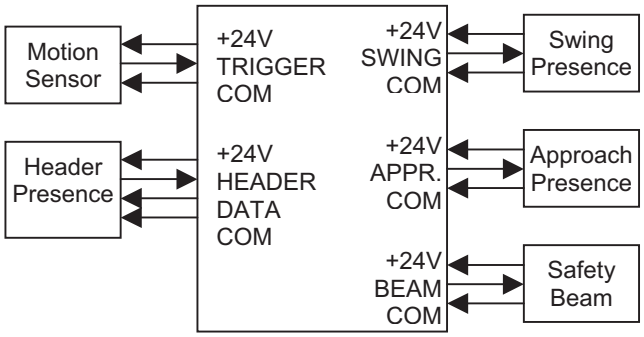
Sensors

- Get power for any sensors that require it from any of the screws in the "+24" terminal block, and any of the screws in the "GND" terminal block. These are the 2, 8-screw, blue terminal blocks on the right end of the front panel.



- The trigger device (motion sensor (radar) or other device) goes to the "TRIG" terminal. Connect its common to the Ground terminal, and, if required, connect its power to the +24 V terminal.
- The header (jamb) mounted presence sensorgoes to the "HEADER" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal. A dual zone sensor (such as the BEA DK-12) needs a "DATA" signal: connect it to the "DATA" terminal.
- The door-mounted, approach side presence sensor goes to the "APPR" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal.
- The door-mounted, swing side presence sensor goes to the "SWING" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal.
- If the installation has a safety beam, connect it to the "BEAM" terminal. Connect its common to the Ground terminal, and its power to the +24 V terminal.

Electric lock

The controller may power an electric strike plate (a.k.a. electric lock), through a relay or access control device. The appendix has more information.

Program Switch

- This is the On/Auto/Hold-Open switch
- Install the switch by the door
- Route its cable to the controller
- Cut off excess cable, strip the 3 wires
- Connect the 3 wires to the removable, 3-screw terminal block in the lower right corner of the controller's front panel. (Note that when you press one end of a rocker switch, it connects the middle terminal to the one on the oppositeend; this could be counterintuitive.)
    - The common wire (black) goes to the middle screw.
    - The lower wire when the switch is mounted (white) goes to the upper screw (this is the Hold-Open wire).
    - The upper wire (red) goes to the lower screw (this is the Off wire).

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Emergency: Fire and Break-Out

- The controller comes from factory with a jumper between the “FIRE” and “GND” terminals, and between the "BRK.O.” and “GND” terminals. If either one of these jumpers is open or missing, the controller will not operate: it will flash an "Emergency" alarm.
- If the installation requires it, remove the jumper between the "FIRE" and "GND" screws and wire a fire alarm to those two screws. The fire alarm output must be a normally closed, dry contact.
- If the door has a breakout mechanism, witha switch, remove the jumper between the "BRK.O." and "GND" screws and wire the switch to those two screws. Use the normally closed contacts of the switch.

AC Power

- Connect power to the controller's "Power" connector (onright side panel). See the appendix for the wiring.
  - Make sure the AC power source is off.
  - Route the AC power cable to the opener
  - Cut off excess cable, strip the 3 wires
  - Unplug the 3-screw, green terminal block from the controller
  - Connect the 3 wires to the terminal block
  - Plug the terminal block to the controller

WARNING! Do not plug the AC power into the MOTOR connector, or the controller will be damaged! The AC power plugs provided are keyed so that they cannot be plugged into the Motor connector. However, if you use other plugs, nothing prevents you from plugging them in the wrong connector.

Door or arm installation

Refer to either the Surface Applied or Ovoerhead Concealed Mount, ED400 Installation Instructions on mounting the door or the arm.

If the installation procedure requires that the operator’s pinion be in moved in the open position, you may use the controller to do so, as follows.

- Turn on AC power to the controller.
- Set the Mode switch to the Off position.
- Turn the "Selector" knob to the "Learn" position.
- Set the Mode switch to the "On" position
- The pinion will start turning slowly in the open direction, and stop indefinitely at Back-Stop.

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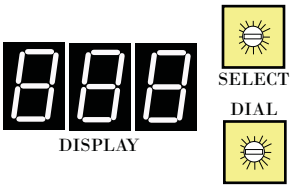
SET-UP

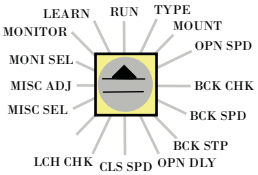
User Interface

The controller user interface is quite intuitive.

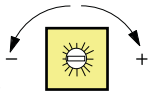
It includes a display and two rotary switches (knobs).



Use the top knob ("SELECTOR") to select the function.



Use the bottom knob ("DIAL") to change a setting.



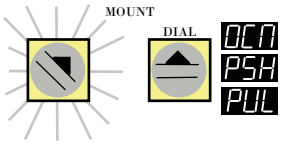
The display shows letters using only 7-segments, so some letters may not be obvious.

Quick Start

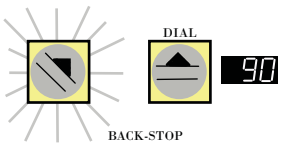
In this quick-start we'll use only a few of the available menus. For a complete list of settings see the Menu Reference section.

To adjust the opener, do the following (for an alternate procedure, see "Set-up without temporary stop" in the Appendix):

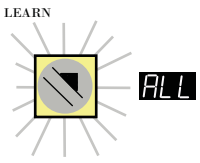
- Turn on the controller
  - Apply AC power to the controller.
  - The controller will light up.
  - Set the Program Switch in the "Off" position.



- Indicate the door mount.
  - Turn the Selector knob to the position "Mount"
  - Turn the Dial knob to select
- Prepare to teach the opener where you want Electrical Back-Stop to be.
  - If the operator has an internal hard-stopin the open position, set it to keep the door from banging at the open end, and, at the sametime as wide as possible, so that the door can reach the desired Back-Stop position (the Electrical Back-Stop) without hitting the operator's hard stop.
  - Turn the "Selector" knob to the "Back-Stop" position. The display should show "90", the programmed Back-Stop angle in degrees. If not, or if you want the Electrical Back-Stop to be elsewhere, change it with the Dial knob. Get ready to stop the door, such as with your foot, at the desired Electrical Back-Stop.



- Do a learn cycle.
  - Turn the "Selector" knob to the "Learn" position. The display shows the Learn State. If it doesn't say "ALL" (meaning it needs a full learn), turn the "Dial" knob counter-clockwise until it does.



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- Move the Program Switch from the "Off" position the "Auto" position.
- The door stays closed for 10 seconds to let you get out of its way.
- Then the door will start opening slowly.
- Temporarily, place a hard stop (such as your foot) at the desired Back-Stop.
- Wait for the door to touch that stop and start closing. (Do not let anything else stop the door beforehand, else the wrong Back-Stop will be learned.) **It is important that the door is stopped in the desired Back-Stop position during the full learn cycle.**
- Remove that stop.
- The door will close slowly to Latch-Stop.
- **Get out of the way!**
- The door will **slam open** (to measure its inertia), then close.
- The display will show "CyC", meaning that the opener needs a cycle learn. 
  - The door will cycle open and closed at normal speed.
- Then the display will show "Rdy", meaning that it no longer needs a cycle learn and it is ready. 
- The door will continue cycling open and close, non-stop, until you place the Program Switch in the Off position.

Note that the opener has **reduced obstacle detection** while learning: **do not interfere with the door**!

Basic Adjustments

- Adjust the opener's operation. You can do this during a learn cycle (as the door is cycling open and closed). Or you can do this later; but if the parameter affects the door motion, you'll have to do a new learn cycle.
  - Turn the Selector knob to the position for the parameter you want to change:
    - Open speed to Back-Check
    - Back-Check angle (this is the one you'll want to play with first)
    - Back-Stop angle (hint: place the Program Switch in Hold Open to keep the door at Back-Stop, then adjust this parameter and watch the door move to that angle)
    - Close Delay
    - Closing speed to Latch-Check
    - Latch -Check angle
  - The display will show the present value for the selected item`
  - Use the Dial knob to change that value
  - If not already doing learn cycles, start them.

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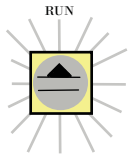
This table lists the basic settings.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Type	Opener Type	"L.E.": Low Energy, "P.A.": Power Assist; "Ful": full power	
Mount	Select door mount	Use "OCN" Setting	
Open Speed	increment/decrement	Opening speed to Back-Check	°/s
Back-Check	increment/decrement	Back-Check angle	°
Back-Speed	increment/decrement	Speed reaching Back-Check	°/s
Back-Stop	increment/decrement	Back-Stop angle	°
Close delay	increment/decrement	(a.k.a.: "Hold Open Time") Time at Back-Stop	s
Colse speed	increment/decrement	Max closing speed to Latch-Check	°/s
Latch-Check	increment/decrement	Latch-Check able	°
Latch-speed	increment/decrement	Max closing speed to Latch-Stop	°/s

Triggers are enabled while the Selector knob is in the Run or Monitor value position, and disabled otherwise.

For more information on these items see the Menu Reference section.

- Test full operation. When you're happy with the cycle, stop the Learn Cycle.
  - Set the Program Switch in the "Off"position. The door will stop cycling.
  - Turn the "Selector" knob to the "Run" position. The display shows the present State of the opener. If there's an exception, it will show a code for it.



- Test the opener's operation with the sensors

Advanced adjustments

While the basic settings are typically sufficient to set-up the opener, additional ones are abailable through the Misc Menus, such as:

- Push-and-go
- Power Hold
- Obstacle detection sensitivity

For a complete list of settings see the Menu Reference / Misc Menus section.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Misc-select	Select a miscellaneous setting to be adjusted	Code for the selected setting	-
Misc-adjust	Adjust the selected miscellaneous setting	Value of the selected setting	-

These settings are selected and adjusted indirectly, in two steps, with the Selector and Dial knobs.

- Turn the "Selector" knob to the "Misc Select" position.
- Turn the "Dial" knob until the desired setting is shown in the display.
- Turn the "Selector" knob to the "Misc Adjust" position. The display will show the present value of that setting
- Turn the "Dial" knob to adjust the value of that setting.

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Monitoring

For troubleshooting purposes, the controller displays its Program State when the Selector knob is in the Run position, and its Learn State when the Selector knob is in the Learn position. The state and value of many more variables can be seen through the Monitor menus, such as:

- The Help display, showing what the opener is waiting for
- The number of cycles
- A Log of recent events
- The door angle and speed

For a complete list see the Menu Reference section.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Monitor Select	Select variable to be monitored	Code for variable monitored	-
Monitor Value	Depends on variable	Value of selected variable	-

To monitor one of those variables:

- Turn the "Selector" knob to the "Mon Select " position.
- Turn the "Dial" knob until the desired variable is shown in the display.
- Turn the "Selector" knob to the " MonitorValue" position. The display will show thepresent value of that variable.
- Usually the Dial knob has no function, though in some cases it can be used to get additional information.

OPERATION

The opener's behavior depends on

- Whether there's AC power,
- The Opener Type
- Any selected features
- The position of the Program Switch

AC power

No AC power

When there's no AC power, the controller places a passive brake across the motor leads, to slow it down when closing. The user may use the door manually. The door closes very slowly. The pinion speed is constant (therefore, for surface mount, the door speed isn't constant). There is no Latch-Check nor Back-Check (so the user could slam the door against the open hard stop). The speed is sufficiently slow that the time closing through Latch-Check meets A.N.S.I. specs.

AC Power is OK

When there's power, the controller is ON, even if the ProgramSwitch is in the Off position. It disables the passive brake, and instead it controls the motor directly. In this case, the opener's behavior depends on

- the Opener Type
- any selected features
- the position of the Program Switch

Opener Type

Full Power

When the user triggers the opener (for example, by walking towards a motion detector), the door opens, stays open for a while, then closes. If, while closing, another user retriggers the door, the door starts reopening.

Low Energy

This is the same as Full Power, but the installer must adjust some parameters for sloweroperation. To select this, the “Low Energy” switch must be in the “ON” position.

Power assist

When the user triggers the opener, the opener helps the user, so that the user may open the door with very little force; after a while, the door closes.

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Selected Features

Push-and-go

If this feature is on, and if the Program Switch is in Auto, the user may also trigger an opening by starting to open the door by hand. Also, if the door is closing, and the user reopens it manually, the opener is retriggered. Note that if the user simply stops the closing door, the opener will consider that an obstacle, not a Push-and-go trigger.

Program Switch

At any given time, the opener may be in one of 3 modes, based on the position of the ProgramSwitch:

- Off
- Auto
- Hold-Open

Off

The opener emulates the operation of a hydraulic passive door closer (except that, when the door is closed, it may press against the hard-stop). The user may use the door manually; there's no Power Opening, nor holding the door open. (**Again**: with the Program Switch in the Off position, the opener is actually on; it's just that it doesn't open the door nor assist the user.) In the simplest case, the door starts at Latch-Stop; a user may open the door manually , and then release the door; then, the closer lets the door close.

Auto

The opener opens or assists the user automatically (though the user may still use the door manually). In the simplest case, the door starts at Latch-Stop; the opener detects that a user is approaching, and opens the door and holds it at the Back-Stop; then, the closer lets the door close. If, while closing, the opener detects a new user, it reopens the door. If a user opens the door manually, then the opener behaves as it does in the Off mode. If the door encounters an obstacle (while opening or closing), or a presence is detected, the opener stops the door; then the opener either opens or closes the door. In the simplest case, the door starts at Latch-Stop; when a user triggers the opener, the opener helps the user as she opens the door; then, the closer lets the door close.If another user retriggers the opener as the door is closing, the opener returns to helping the user.If, while closing, the door encounters an obstacle, the opener stops the door; then the opener lets the door close. If a user opens the door manually, then the opener be haves as it does in the Off mode.

Hold-Open

The opener opens the door and holds it open.

Unusual circumstances

User intervention

The way the opener responds to user intervention depends on what the door is doing at the time, and other factors.

Closed, OffMode or Push-and-GoOff - The opener lets the user open the door against the force of the return spring. As soon as the user lets go of the door, it starts closing.

Closed, Auto Mode and Push-and-Go On - If the user open the door manually, the door opens.

Opening full speed - If the user tries to open the door faster than the opener wants to, the opener resists, trying to maintain speed. If the user tries to force the door closed, the opener considers it an obstacle (see later).

Creeping open - If the user tries to open the door faster than the opener wants to, the opener resists lightly; as soon as the userlets go of the door, it finishes opening the door. If the user tries to force the door closed, the opener considers it an obstacle (see later).

Open - If the user opens the door away from Back-Stop, the opener fights against it, and tries to return the door to Back-Stop. After some time, to protect the motor, the opener starts a Over-Current alarm and shuts down.

Closing, Off Mode or Push-and-GoOff - If the user reopens a closing door, the opener lets her do so, working against the force of the return spring. As soon as the user lets go of the door, it starts closing. If the user forces the door to close faster than the opener wants to, the opener reverts to passive closing, until the door reaches Latch-Stop.

Closing, Auto Mode and Push-and-Go On - If the opener is retriggered the door reopens. If the user forces the door to close faster than the opener wants to, the opener reverts to passive closing, until the door reaches Latch-Stop.

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Presence

The opener may detect people or objects in the proximity of the door. In that case, the opener modifies its behavior to avoid hitting anyone or anything in its path.

Before a Power Opening - The opener waits for the swing area to be clear.
During a Power Opening - The opener stops the door before moving again.
Before closing - The opener restarts the Closing Delay.
While closing, Auto Mode - The opener stops the door before moving again.
While closing, Off Mode - The door keeps on closing.

Obstacle

The opener detects if someone or somebody slows down or even stops the door. This includes the situation of the door being locked, or propped open with a door stop.

During a Full Speed Power Opening - The door stops, waits for a bit, then usually it creeps open.
While creeping open - The door immediately re-closes.
While closing, Auto Mode - The door stops, waits for a bit, then usually it creeps open.
While closing, Off Mode - The door just rests against the obstacle.

Alarm

If the opener detects certain alarm conditions, it stops running. Users maystill use the door manually. The controller flashes a code for the Alarm (the Selector knob must be in the RUN position). The code is also added to the log (Mon Sel / Log; Mon Val) Alarms are cleared by turning the Program Switch to Off and back to Auto.

MENU REFERENCE

The controller offers a menu of 15 items. The Selector knob is used to select one of them. Two of those items offer dozens of additional submenus.

Position of "Selector" knob	Function of "Dial" knob	Display	Units
Type	Opener Type	"L.E.": Low Energy, "P.A.": Power Assist; "Ful": full power	Type
Help	-	Why the door won't move	
Mount	Select door mount	Use "OCN" Setting	
Open Speed	increment/decrement	Opening speed to Back-Check	°/s
Back-Check	increment/decrement	Back-Check angle	°
Back-Speed	increment/decrement	Speed reaching Back-Check	°/s
Back-Stop	increment/decrement	Back-Stop angle	°
Close delay	increment/decrement	(a.k.a.: "Hold Open Time") Time at Back-Stop	s
Colse speed	increment/decrement	Max closing speed to Latch-Check	°/s
Latch-Check	increment/decrement	Latch-Check able	°
Misc-select	Select a miscellaneous setting to be adjusted	Code for the selected setting	2
Misc-adjust	Adjust the selected miscellaneous setting	Value of the selected setting	2
Monitor-Select	Select variable to be monitored	Code for variable monitored	3
Monitor Value	Depends on variable	Value of selected variable	3, T
Learn	Downgrade the Learn State	The Learn State	4

Notes:

1) Leave in this position during normal operation
2) See Misc. Settings table
3) See Monitor table
4) Place here to do a learn cycle. At next power-up, does learn the appropriate learn
T) In this position the trigger input is enabled

When selecting an item with the Selector knob, the display shows a code for that item, dimmed, for 1/2 second, then it shows the value for that item. For example, if you turn the Selector Knob to the Back-Stop position, the display shows  dimly for 1/2 second, and then  , the selected Back-Stop angle.

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Run menu

Usually, the "Run" menu displays a code for the State of the opener. See the Program State section, later. However, if there is an exception, the Run menu flashes a code for the exception; it does so from the moment when it occurs, until the next opening cycle starts. You can also stop the flashing code by turning the Dial knob. See the "Events" section, later, for description of the Exception codes.

Type menu

This menu displays a code for the mount of the door and lets you select it. If you change this, you must do a full learn afterwards.

Mount		
LE	Low Energy	The “Low Energy” switch must be On for this option to be available
PA	Power Assist	
FUL	Full Power	

Itisuptoyou, the installer, to makesure that the door doesn't violate A.N.S.I. standards! The opener does not ensure that the door moves within A.N.S.I. limits:

- Nothing keeps the installer from selecting the wrong setting in this menu.
- Nothing keeps the installer from setting the operating parameters in such way that the door moves faster than what the applicable BHMA/ANSI Standards allows.

Mount menu

This menu displays a code for the mount of the door and lets you select it. Use “OCM” setting for “IN FLOOR” mounting.

Mount		
OCM	OCM	Overhead concealed (direct drive)
PSH	Push	Push (scissor arm) surface mount
PUL	Pull	Pull (track) surface mount

Open Speed menu

This menu displays and lets you set the opening speed of the door during a Power Opening, up to Back-Check (in °/s). Use this adjustment to ensure that the opening time is lower than what A.N.S.I. specifies (lower values in Low Energy openers). If you change this, you must do just a cycle learn afterwards.

Back-Check menu

This menu displays and lets you set the Back-Check angle (in °). During a Power Opening, after this angle the door will slow down. The rate of deceleration is set by the "Deceleration" menu,described later. If you change this, you must do just a cycle learn afterwards.

End-Speed submenu

This submenu is used to display and set the minimum speed (after it slows down) at which the door reaches the Back-Stop, in °/sec.

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Back-Stop menu

This menu displays and lets you set the Electrical Back-Stop angle (in °). During a Power Opening, this is where the door stops. This should be less than the mechanical Back-Stop (which may be set by the operator, or by where the door would encounter a physical stop). You can use it in 2 ways:

- Before a full learn, use it to tell the controller at what angle you'll stop the door.
- Use it to change the opening angle. (Hint: put the Program Switch in "Hold-Open" and change the setting, while watching the door follow your setting. You can do this any time the Learn State is "Ready", even during a learn cycle.) If you change this, you must do a cycle learn afterwards.

Close Delay menu

This menu displays and lets you set the minimumtime that the door stays at Back-Stop during a Power Opening cycle (in °) (a.k.a.: "Hold-Open Time"). This is also the minimum time that the opener assist the user during an assist opening cycle. In Low Energy openers, you may need to extend this time to meet A.N.S.I. specs. This is **not** the time that the door stops after a presence or an obstacle: that's the Obstacle delay. If you change this, you must do just a cycle learn afterwards.

Close Speed menu

This menu displays and lets you set the maximum closing speed of the door, down to Latch-Check (in °/s). This is applicable regardless of how the door was opened (manually, or automatically). Use this adjustment to ensure that the closing time to Latch-Check is lower than what A.N.S.I. specifies (lower values in Low Energy openers). If you change this, you must do just a cycle learn afterwards.

Latch-Check menu

This menu displays and lets you set the Latch-Check angle (in °). While closing, below this angle the door will slow down. This is applicable regardless of how the door was opened (manually, or automatically). If you change this, you must do just a cycle learn afterwards.

Misc. Adjustments menus

These 2 menus work together to handle many minorsettings. The first one is used to select an item, and the second one to display its value and to adjust it.

Misc. submenu item	Function of "Dial" knob	Display	Units, notes
HLd - Power	Hold increment/decrement	"OFF": passive; or motor current that holds door closed	A
P.n.G. - Push-&-Go	Turn feature On or Off	"nO"; normal "yES": pressing on door starts a cycle	-
O.Ob - Open Obstacle	increment/decrement	If actual current > expected current by this amount: opening obstacle	A
C.Ob - Close Obstacle	increment/decrement	If actual current < expected current by this amount: closing obstacle	A
WAL - Wall Mask	increment/decrement	Door angle beyond which the swing side sensor is ignored	°
OPd - Lock open delay	increment/decrement	"OFF": normal,or delay before opening	s
OCd - Occupied delay	increment/decrement	Delay after obstacle or after the area clears before moving again	s °/s^2
dEC - Deceleration	increment/decrement	Deceleration after Back-Check	
PCE - Power Close Engaged	Turn feature On or Off	“nO” or “yES” “nO” is default after reset	-
PCA - Power Close Anlge	increment/decrement	OFF, 1-30 degrees “20 degrees” is default after reset	-
PCd - Power Close Time Delay	increment/decrement	00.1-10 seconds “4 seconds” is default after reset	-
PCC - Power Close Current	increment/decrement	OFF, 0.01-1.00 Amps “1.00 Amps” is default after reset	-
CLC - Power Boost	increment/decrement	OFF, or 0.01-1.00 Amps “0.50 Amps” is default after reset	-
rSt - Reset / restore	Reset the controller / Restore factory defaults	"nO": normal "yES": restore factory defaults	-

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Items that use a numeric value show OFF instead of '0'. Features show YES or nO.

Power Hold submenu - HLd
If the door has a hard-stop at Latch-Stop, the opener may use additional force to press the door against the stop. This submenu is used to select the amount of that force, in terms of motor current (in Amps). At its minimum, this current is 0 (the door is held against the hard stop just by the return spring), and the display shows "OFF".

Push-and-Go submenu - P.n.G.
This submenu is used to turn on or off the Push-and-Go feature, and to display the present selection.

- nO If the user opens the door by hand, or reopens a closing door, the opener lets him/her do so, working against the return spring.
- YES If the user opens the door by hand, the opener opens the door. If the user reopens a closing door by hand, the opener reopens the door.

Opening Obstacle submenu - O.Ob
This submenu is used to display and set the Opening Obstacle threshold (in Amps). Higher values mean less sensitivity to obstacles.

Closing Obstacle submenu - C.Ob
This submenu is used to display and set the Closing Obstacle threshold (in Amps). Higher values mean less sensitivity to obstacles.

Wall Mask Angle submenu - WAL
When opening, beyond a certain angle, a door-mounted, swing-side sensor may see a wall and give a false reading. This submenu is used to display and set the door angle (in degrees) beyond which that sensor is ignored.

Lock Opening delay submenu - OP.d
If an electric strike plate (electric lock) is used, it may be necessary to wait for it to retract,before opening the door. This submenu is used to display and set that delay, in seconds. If that delay is zero, the display shows "OFF".

Occupied delay submenu - OC.d
This submenu is used to display and set how long (in seconds) a door stops after it encounters an obstacle or presence, before it resumes moving.

Deceleration submenu - dEC
This submenu is used to display and set how quickly the door slows down after Back-Check, in °/sec^2. (A higher number means faster slowing down). If you change this, you must do just a cycle learn afterwards.

Power Close Engaged - PCE
This adjustment turns the **Power Close** On or Off

Power Close Angle - PCA
When power boost closing is needed only in the last 30° of door closing, this is used to set angle desired.

Power Close Time Delay - PCd
This adjusts the time delay before the operator starts pawer boost after encountering an obstruction.

Power Close Current - PCC
This adjusts the closing force during the swing path of “PCA”.

Power Boost - CLC
When power boost closing is needed throughout the entire closing swing of the door the closing force is adjusted here.

Reset / restore submenu - rSt
This submenu is used to restore the factory defaults (including clearing the password) ○Turn the Dial knob clockwise. The controller will reload the factory defaults; the program will restart from the beginning; the display will show the start-up logo. (Just to force a new learn cycle, use the "Learn" menu instead.)

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Monitor Select and Monitor Value menus

These 2 menus work together to display the valueof many minor items. The first one is used to select an item, and the second one to display its value.

Misc. submenu item	Function of "Dial" knob	Display	Units, notes
LOG - Log	Select one of the 16 events in the log	Code for the event	-
OBS - Obstacles	Clear it	Number of obstacles since the last cleared	-
CYC - Cycles	Scroll the display	Number of openings cycles since the controller was manufactured	-
rEL - Release	-	Software release level	-
AnG - Angle	-	Angle of door	°
CUr - Current	-	Motor current (absolute value)	A

Items that use a list show a code for their value.

Log submenu - LOG

The controller logs the last 16 unusual events. This submenu is used to display the log of events. Normally it shows the most recent event. Turning the Dial know counter-clockwise (back in time) selects the previous events; and vice-versa. Once one end of the log is reached, turning the Dial knob further in the same direction will have no effect. The codes for the events are described later in the Event Codes section.

Obstacles submenu - OBS

Each time the door meets an obstacle, the controller increments a counts, up to 255. This submenu is used to display that count. Turning the Dial know counter-clockwise clears that count.

Cycles submenu - CYC

This submenu is used to display the number of full opening and closing cycles that the controllerdid, up to 9,999,999. This is not necessarily the number of cycles that the operator did, as the controller may have been mated to another operator at some other time. If the door is reopened while closing, this doesn't count as an additional cycle. If the controller is powered down, it resets the units digit (for example, if the count was 123 cycles, upon restoring power to the controller, it will show 120 cycles). As the display has only 3 digits, the Dial knob may be used to scroll the number of cycles, so that the rest of the number maybe viewed (for example, if the number of cycles is 12345, initially the number ".345" will be shown; turning the Dial knob one step clockwise will scroll the number to the right, and "2.34" will be shown; turning the know further will show "12.3", "012." and "001".

Release submenu - rEL

This submenu is used to display the software release in the controller.

Angle submenu - AnG

This submenu is used to display the approximate door angle, in degrees.

Current submenu - CUr

This submenu is used to display the motor current, in amps.

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TROUBLESHOOTING

Electrical

Fuse replacement

The controller has 2 fuses, one on the AC line input, one on the motor output. If the input fuse blows, the controller is completely off (no display). If the output fuse blows, the controller comeson, but there's no motor drive. Regardless, the passive braking keeps on working, because it's directly connected to the motor connector.

This is the fuse information:

F1	Line input fuse	Input plug	5 x 20 mm	2.0 A, fast
F2	Motor fuse	Motor-plug	5 x 20 mm	4.0 A, fast

To replace a fuse:

- Disconnect the AC power
- Unscrew the appropriate fuse holder cap
  - Right side for the motor fuse
  - Left side for the line input fuse
- Replace the fuse with an identical one
- Close the fuse holder
- Reconnect the AC power

Plugging AC to Motor Connector

Plugging AC power into the Motor connector will damage the controller. The AC power plugs provided with the controller are keyed in such way that you can't do so. However, if you use other plugs, nothing prevents you from doing so.

Troubleshooting tools

For troubleshooting purposes, the controller displays:

- the state of its inputs, with LEDs
- the Learn State (when the Selector knob is in the Learn position)
- the present exception, if any (when the Selector knob is in the Run position)
- recent exceptions (Log menu)

Input LEDs

Each sensor input line, and the Fire and Breakout lines, have LEDs a to indicate their status. This is what it means when the LEDs are lit:

LED		Reason for being lit
	Trigger	The trigger (radar) sensor is active, or this lineis shorted to ground
	Pres	The approach-side sensor is active, or this line is shorted to ground
	Approach	The jamb-mounted sensor is active, or this line is shorted to ground
	Swing	The swing-side presence sensor isactive, or this line is shorted to ground
	Beam	The light beam sensor is active, or this line is shorted to ground
	Break Out	The link between this line and ground is open, or the door is in breakout
	Fire	The link between thisline and ground is open, or the fire detector is active

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Output LEDs

Each output line has an LED a to indicate its status. This is what it means when the LEDs are lit:

LED		Reason for being lit
	Data	A DK12 is connected to the controller, and the door is not closed, telling the DK12 to use the Open Pattern. (If no DK-12 is connected, the LED remains Off.)
	Lock	The controller is driving an electriclock (whether or not a lock is present)

Learn State

In addition to the Program State, at any given time, the controller is in one of 3 Learn States.

Learn State		
ALL	All	The opener needs to do a complete learn cycle
CYC	Cycle	The opener needs to do just an opening and closing cycle
rdy	Ready	The operator is ready

The controller is in the first two Learn States ("All" and Cycle") during set-up. From then on it'sin the "Ready" State, ready to operate normally. If the installer changes an Operating Parameter,the controller reverts to the "Cycle" Learn State, After a complete learn cycle, the controllerreturns to the "Ready" State.

When the Selector knob is in the "Learn" position, the display shows the Learn State.

Event codes

If the controller detects an abnormal condition, is displays a code for it (when the Selector knob is in the "Run" position).The controller maintains a list of the most recent 16 significant events, which you can view with the Monitor function.The controller catches certain unusual Events, and stores them in the log. Some events are Exceptions. Exceptions are also displayed when the Selector knob is in the "Run" position (fromthe moment when they occur, until the next opening cycle starts).

Event		
SEt	Not set-up	Not set-up
Obs	Opening Obstacle	The door encountered an obstacle while opening
Cbs	Closing Obstacle	The door encountered an obstacle while closing
LOC	Locked	The door encountered an obstacle while at Latch-Stop
Swb	Swing	The swing-side, door mounted presence sensor was activated
EME	Emergency	An emergency link (smoke detector, breakout) was opened
MEr	Motor	The motor is not connected
dIr	Direction	The motor is wired backwards
tO	Time-out	A state lasted too long
bAd	Bad value	A variable's value was outside its allowed limits. See next.
HEA	Over-Heat	The motor overheated
CUr	Over-Current	The motor current exceeded the maximum for too long
EnC	Encoder	The encoder is not working, is disconnected, it has a broken wire
FAI	Failure	The controller failed

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Bad value

Due to unusual circumstances, an operating parameter may take a value outside its allowed limits. The controller constantlychecks the operating parameter; if it finds a problem with their value, it logs the problem and restarts the program from scratch. After the  entry, the next 2 items in the log are the address of the variable, and the bad value. This table lists the addresses (N is the number shown in the log).
For example:

Position of DIAL knob	Display	Meaning
Fully CW (most recent)		Automatic Power-up after the bad value was detected
1 step CCW (previous)		The bad value: 140 degrees (*see below)
2 steps CCW		Address of the variable with the bad value: 41, which, form the previous table, we see is the Wall Mask Angle
3 steps CCW		A bad value was detected
4 steps CCW (previous)		Previous power-up
Further CCW		No other event in the log

Particular situations

Power off: ease of motion

With the power off, the door should open easily and close slowly. If not, use this table to troubleshoot it.

Symptoms	Possiblecause	Solution
The door is hard to open and slams shut.	The motor wiring is backwards.	Reverse the red and black wired in the motor connector.
The door is hard to open and closes very slowly.	Try disconnecting the motor cable. If that makes no difference, the operator is bad; if the door opens easily and slams shut, the controller is bad.	Replace the controller.
The door is easy to open and slams shut.	• The motor is not wired to the controller (checkthe cable and the motorconnector) • The controller is bad • The motor is bad	• Fix the wiring • Try replacing the controller • Replace the operator

Power off: time through Latch-Check

With the power off, the Passive Brake, inside the controller, limits the closing speed. The PassiveBrake is not adjustable. The closing time from 10°to Latch-Stop should be 1.5 seconds or more, per BHMS/ANSI. For OCM applications, the door mayclose faster than that. If so, you only have 2 options: reducing the spring preload, or adding mechanical friction to the door.

Display is dark

The opener may not open the door for these reasons:

- There's no AC power to the controller
- The AC plug to the controller is disconnected
- The line input fuse (on the right side panel) is blown
- The software is hung up

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Opener won't learn

To start a learn cycle, the following must happen:

- Power must be on
- There must not be an alarm
- The Selector knob must be in the Learn position
- The Program Switch must be moved to Off and Auto If the opener doesn't start the Learn Cycle, use the following table to troubleshoot it.

Action	Check	Solution
Move the Selector knob to the "RUN" position.	Is there a code flashing?	Check that code and see what it means in the Event Codes table. Solve it accordingly. Check that code and see what it means in
Move the Selector knob to the"MONI SEL" position. Turn the Dial Knob until you see "LOG".	Is there a code?	the Event Codes table. Solve it accordingly.

If the Learn Cycle starts, but then the display shows that the controllerrestarted (the display goes through the 3 opening logos), the controller believes that it found a problem. Use the Log to find out what that problem is. If the door will open and close slowly, but then not do anything else, it may be because you stopped the door too soon. Just do a new learn cycle, but this time make sure that you stop the door at the desired Back-Stop.

Opener won't open, manual opening is OK

The opener may not open the door for these reasons:

- The opener needs a learn cycle (probably because you changed a parameter that affect motion) – turn the Selector knob to the Learn position; if it doesn't say "Rdy", do a learn cycle
- The Program Switch is in the Off position – switch it to the Auto position
- The controller detected an alarm condition – place the Selector switch in the Run position; if an exception code is flashing, note the code; turn Off power to the opener; read about that failure in the troubleshooting section, and, if possible, correct the problem; try again.
- A wire from the Program Switch is shorted to ground
- The trigger source is not working, or it's not wired properly – in that case the Trig LEDon the controller will not light up
- The software is hung-up – turn Off and On power to the opener In any case, look at the Help menu for a hint.

Opener keeps door open at Back-Stop

The opener may not open the door for these reasons:

- The Program Switch is in the Hold-Open position – move it to Auto
- There's a door stop holding the door open – try moving the door by hand
- The controller is receiving a trigger signal – see if the Trig LED is lit
- The controller is receiving a header presence signal – see if the Pres LED is lit
- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- A wire from the Program Switch is shorted to ground
- The delay is set very long and it hasn't yet expired

Opener pushes door hard against the Latch-Stop

This may happen for these reasons:

- The Power-Hold feature is on – troubleshoot why the trigger won't open the door
- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

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Opener keeps door open against the operator's hard-stop

This may happen for these reasons:

- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

Opener stuck assisting

The opener may keep on assisting the user (the door can be moved in either direction with little effort) for these reasons:

- The controller is receiving a trigger signal – see if the Trig LED is lit
- The controller is receiving a header presence signal – see if the Pres LED is lit
- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving an swing presence signal – see if the Swing LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- The delay is set very long and it hasn't yet expired
- A wire from the Program Switch is shorted to ground
- The trigger source is not working, or it's not wired properly – in that case the Trig LEDon the controller will not light up
- The software is hung-up – turn Off and On power to the opener In any case, look at the Help menu for a hint.

Opener keeps door open at Back-Stop

The opener may not open the door for these reasons:

- The Program Switch is in the Hold-Open position – move it to Auto
- There's a door stop holding the door open – try moving the door by hand
- The controller is receiving a trigger signal – see if the Trig LED is lit
- The controller is receiving a header presence signal – see if the Pres LED is lit
- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- A wire from the Program Switch is shorted to ground
- The delay is set very long and it hasn't yet expired

Opener pushes door hard against the Latch-Stop

This may happen for these reasons:

- The Power-Hold feature is on – troubleshoot why the trigger won't open the door
- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

Opener keeps door open against the operator's hard-stop

This may happen for these reasons:

- There is a temporary soft failure – remove power to the controller and turn it back on
- If the problem persists, the controller may have forgotten some parameters – do a learn cycle
- If this happens as soon a power is applied to the controller, there is a hardware failure – replace the controller

Opener stuck assisting

The opener may keep on assisting the user (the door can be moved in either direction with little effort) for these reasons:

- The controller is receiving a trigger signal – see if the Trig LED is lit
- The controller is receiving a header presence signal – see if the Pres LED is lit
- The controller is receiving an approach presence signal – see if the Appr LED is lit
- The controller is receiving an swing presence signal – see if the Swing LED is lit
- The controller is receiving a safety beam signal – see if the Beam LED is lit
- The delay is set very long and it hasn't yet expired

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Opening door bumps against the hard-stop

The controller learned the Electrical Back-Stop to be the same as the mechanical hard-stop. That is probably because either

- you didn't stop the door at the Electrical Back-Stop during the slow learning cycle, during initial set-up, or
- the hard-stop in the operator is set too far closed.

Back-Check or Latch-Check angles seem wrong

Move the door manually and compare the actual door angle with the angle displayed (turn the Selector knob to Monitor Select, turn the Dial Knob to select "AnG", turn the Selector knob to Monitor Value).

- If they do match, remember that the door slows down *before* Latch-Check.
- If they don't match, see the next paragraph.

Angle displayed doesn't match door angle

If the angles do match at Back-Stop:

- Check the setting for Door Mount in the controller.
- For surface mount doors, check the placement of the operator with respect to the doorhinge.
- For Push mounts, check the point where the arm is mounted to the door, and the angle of the arm when the door is closed.
- If all of these are correct, then the problem may be that the reveal is very different from the standard that was used to calculate the controller's parameters.

If the angles don't match anywhere:

- During initial set-up, the Back-Stop angle you specified in the controller was not the same as the angle where you stopped the door during the slow learning cycle. Do a new Full learn Cycle

DATA LED doesn’t light

This LED lights if the door is anywhere but at Latch-Stop, and a DK-12 dual-zone sensor is properly connected. If this LED doesn’t light when the door is open, it’s probably because a DK-12 is not properly connected to the DATA line. You may test this LED by connecting the DATA line to Ground.

LOCK LED doesn’t light

This LED lights if the controller is driving an electric lock (whether or not a lock is actually connected to the LOCK line). If this LED doesn’t light, or is always lit, the problem is probably that the driver inside the controller was damaged by being improperly connected

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SPECIFICATIONS

Main features

- Overhead Concealed Mount or surface mount (push or pull)
- Center pivot or offset hinges
- Complete: doesn't require a power-boost module, nor a brake box
- Hand is field reversible

Control inputs

- Seven sensor inputs (individual LEDs indicate status):
  - Trigger (radar, motion detector, push plate, access control, RF receiver…)
  - Header (jamb) mounted presence sensor
  - Door mounted, approach side presence sensor○Door mounted, swing side presence sensor
  - Safety beam presence sensor
  - Fire (Smoke alarm)
  - Breakout switch
- Input for Program switch (Off/Auto/Hold Open)
- All inputs, except for the Fire and Breakout inputs, are active low, compatible with:
  - dry contact
  - open collector
  - TTL
  - any signal up to 24 Vdc
- Fire and Breakout inputs are active open.

Control outputs

- Electric strike lock, open collector 100 mA max, 24 Vdc max. **not protected**. (requires additional relay, not included; requires external supply, not included, for electric locks other than 24 Vdc)
- Data (for dual zone sensors, such as BEA DK-12)
  - Door closed: open circuit (0 Vdc)
  - Door closing: 500 Hz square wave
  - Door opening or open: 12 Vdc unregulated, 100 mA source max

Control inputs/outputs

- Synch cable for side-by-side openers (part number DS2715-010)
  - RXD TXD.

Power

- Input: 115 Vac, 2 A Max
- Output: 24 Vdc, 0.8 A, unregulated, short circuit protected, for sensors and accessories

Safety

- Operates as a passive door closer in case of power failure or controller failure
- Smoke alarm and breakout switch input

Misc

- Operating air temperature -40 to 50 °C
- Small size: 8" wide x 4 " tall x 2.5" deep
- Microprocessor controlled, FLASH re-programmable, replaceable
- Two controllers may be synchronized for side-by-side doors
- Closed loop control

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APPENDIX

WIRING

Encoder / Cam Switch wiring

Encoder only

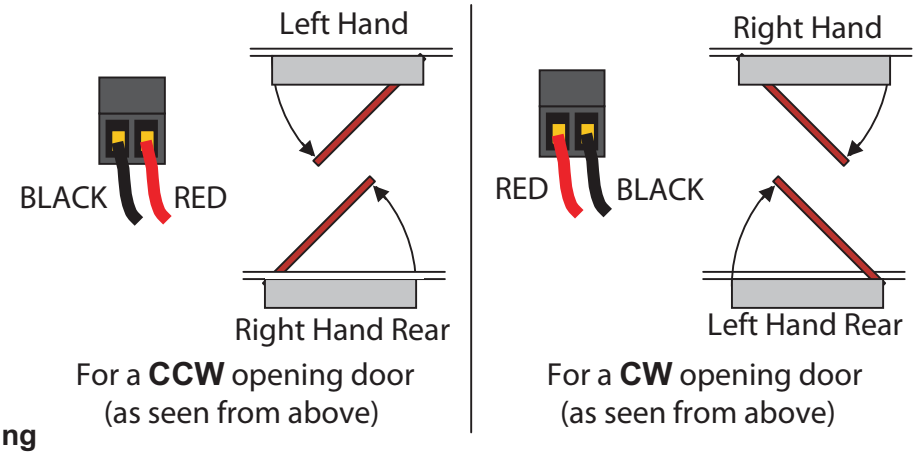
the 4 wires from the encoder should already be connected properly to the 5-position connector. If you need to wire it, here is how.

The 2 middle wires (Phase A and B, Yellow and Green) can be swapped without a problem: the software is smart enough to figure which way the motor is turning, and it interprets the 2 phases correctly.

Motor wiring

From the factory, the motor wires are already connected properly to their 2-screw terminal block. If you need to rewire it, here is how.

The red and black wires go to the other 2 screws, depending on the opening direction of the door. For CW opening (as seen from above – that's a right hand door), the back wire goes to the screw closest to the side of the box. For CCW opening (that's a left hand door), the red wire goes to the screw closest to the side of the box. The black wire goes to the opposite screw.



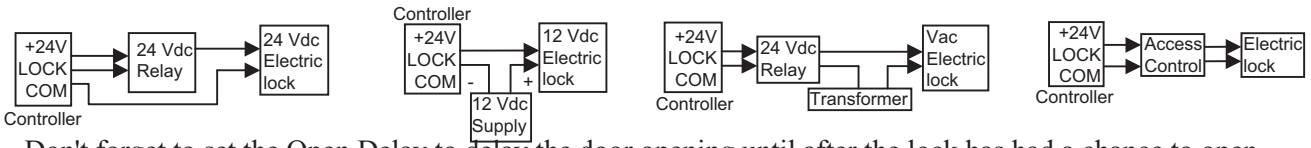
AC Power wiring

The green wire goes to the middle screw. When looking at wire openings, with the screws towards up, the line wire (usually black) goes the left hole, and the neutral (usually white) goes to the right one.

ELECTRIC LOCK

The controller may power an electric lock through a relay or access control device.

- If the installation has a 24 Vdc electric strike plate (a.k.a. electric lock), the controller is able to power it directly. For DC lock of other voltages, you will need a separate power supply. For AC locks, you will need a separate transformer and a relay.



- Don't forget to set the Open Delay to delay the door opening until after the lock has had a chance to open.
- The controller drives the electric lock from when it receives a valid trigger (at Latch-Stop), while waiting to open (because of a non-zero Open Delay, or because the swing area is occupied) and until some time after the door has begun to open. It also drives it ifthe door reaches Latch-Stop as it is retriggered. The LOCK LED lights up while the controller drives an electric lock, whether or nor a lock is actually present.

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Pair of Doors

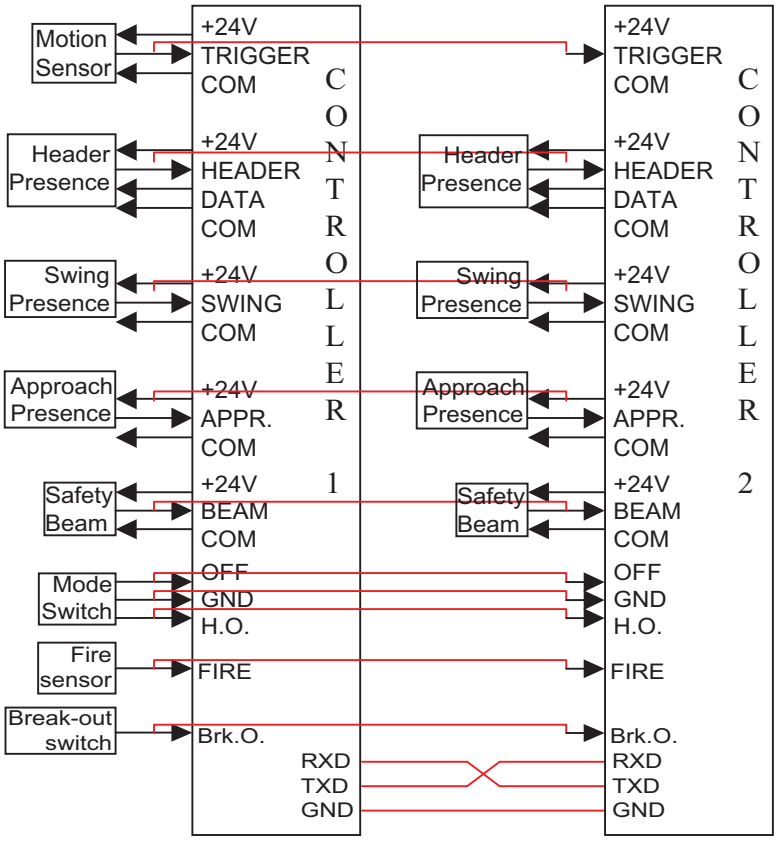
Two openers may be used to open two side-by-side doors. The doors may be synchronized or not. This operator is not compatible with over-rebated doors.

Synchronized doors

The doors behave as if they are mechanically interconnected. In case of a presence at one door, both doors react identically. In case of an obstacle at one door, the other door stops too, though a bit afterwards.

Wiring:

- Connect the grounds of the two controllers together
- Connect the motion sensor to both controllers, in parallel



- Connect each presence sensor from each door to both controllers, in parallel (but not the DATA line)
- Let each controller power its presence sensors (either controller can power the motionsensor)
- Connect a single Program Switch to both doors, in parallel
- Connect the RXD line of each controller to the TXD line of the other controller
- If you use the “Fire” input, connect the fire sensor to both controllers.
- If you use the “Break-out” input, connect the break-out switch to both controllers.
- Power the controllers from the same AC power source

DORMA AUTOMATICS, Inc.
924 Sherwood Drive
Lake Bluff, IL 60044
E-mail: automatics@dorma-usa.com
Toll-Free: 877-367-6211
Fax: 877-423-7999
DL3128-010
10/1/2007

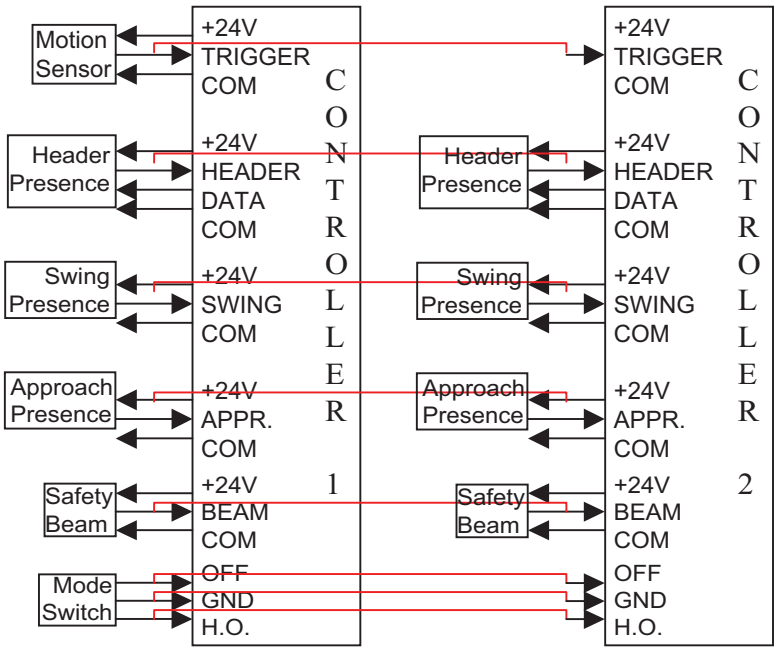
Set-up:

- Program the two controllers identically. However, in particular situations you may wantto program them slightly differently, so that one door opens and/or closes first.
- Let the openers do a learn cycle (it's easier if you do them separately). Tip to stagger the opening of the doors during the learn cycle:
  - place both controllers in "Learn";
  - open one door;
  - as it's closing, flip the Program switch from Off to Auto;
  - the door that was still closed will start a learn cycle,
  - the one that you opened will first finish closing and then start a learn cycle.
  - this will give you a chance to stop the first door at Back-Stop, and then walk to the second door and stop it at Back-Check when it gets there a while later.
- When both openers are ready, trigger an automatic opening, and, as the doors are opening, block one of doors. When they start moving again, block the other one. This will let each opener tell the other of having detected an obstacle, so that each will knowof the presence of a second door. Knowing that, the openers will extend the Hold-Open time after an obstacle, to ensure that both doors remain in synchronization afterwards.

Semi-independent doors

The doors open and close at the same time. However, if one opener reacts to a presence or an obstacle, the other door continues as nothing happened, so the two doors become un-synched. The door return to being synched only after there's no traffic long enough for both doors to return home. For coordinated doors (one must close first) it's possible that the doors will close in the wrong order. To let the door operate independently:

- Program the two controllers identically (for coordinated doors - one must close first - increase slightly the Closing Delay of the controller for the door that must close last)



- Connect the grounds of the two controllers together
- Connect one door's presence sensors just to the controller for that door
- Connect the motion sensor to both controllers, in parallel
- Let each controller power its presence sensors (either controller can power the motionsensor)
- Connect a single Program Switch to both doors, in parallel
- Power the controllers from the same AC power source

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OPERATION

Restore factory defaults

To reset the unit to the factory defaults, do the following:

- Turn the "Selector" knob to the "Misc Sel" position.
- Turn the "Dial" knob until "rSt" is shown in the display.
- Turn the "Selector" knob to the "Misc Adj" position. The display will show "nO".

Turn the "Dial" knob right. The display will show "yES" for just a split second, and thecontroller will restart.

Set-up without temporary stop

If for some reason you don't want stop the door at Electrical Back-Stopduring set-up, use this alternate procedure:

- Manually open the door until it hits a mechanical stop (such as a wall or the operator'sinternal Hard-Stop). Measure that opening angle exactly.
- Turn on the controller
- Indicate the type of door opener and the door mount.
- Turn the "Selector" knob to the "Back-Stop" position. Use the Dial knob to change the Back-Stop angle to the angle you just measured.
- Turn the "Selector" knob to the "Learn" position.
- Set the Program Switch in the "Auto" position.
- The door will start opening slowly and hit the hard-stop.
- As the door closes slowly to Latch-Stop, turn the "Selector" knob to the "Back-Stop" position. Use the Dial knob to change the Back-Stop angle to the desired Electrical Back-Stop Angle (such as 90°).
- **Get out of the way!**
- The door will slam open to 45°, then close.
- The display will show "CyC", meaningthat the opener needs a cycle learn.
- The door will cycle open and closed at normal speed once.

Cycle testing

To cycle test the operator, do the following:

- Apply AC power to the controller.
- Set the Program Switch in the "Off" position.
- Turn the "Selector" knob to the "Back-Stop" position. The display shows the programmed Back-Stop angle in degrees.
- Turn the "Dial" knob to adjust the programmed Back-Stop angle to the actual Back-Stop angle of the door.
- Turn the "Selector" knob to the "Learn" position. The display shows the Learn State. If it doesn't say "ALL" (meaning it needs a complete learn), turn the"Dial" knob counter-clockwise until it does.
- Set the Program Switch in the "Auto" position. The opener will start a learn:
  - The door will open slowly to Back-Stop.
  - The door will close slowly to Latch-Stop.
  - The door may slam partially open, then close.
  - The door will start cycling open and close, non stop.Note that the opener has limited obstacle detection while learning: do not stop the door!
- Turn the "Selector" knob to the "Mon Sel" position.
- Turn the "Dial" knob until that "CyC" (for Number of Cycles) is shown in the display.
- Turn the "Selector" knob to the " Monitor" position. The display will show the number of cycles. If there are morethan 999 cycles, use the "Dial" knob to scroll the display.

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CRANE REVOLVING DOORS

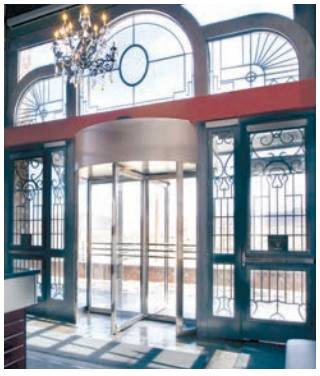
Enabling Better Buildings™

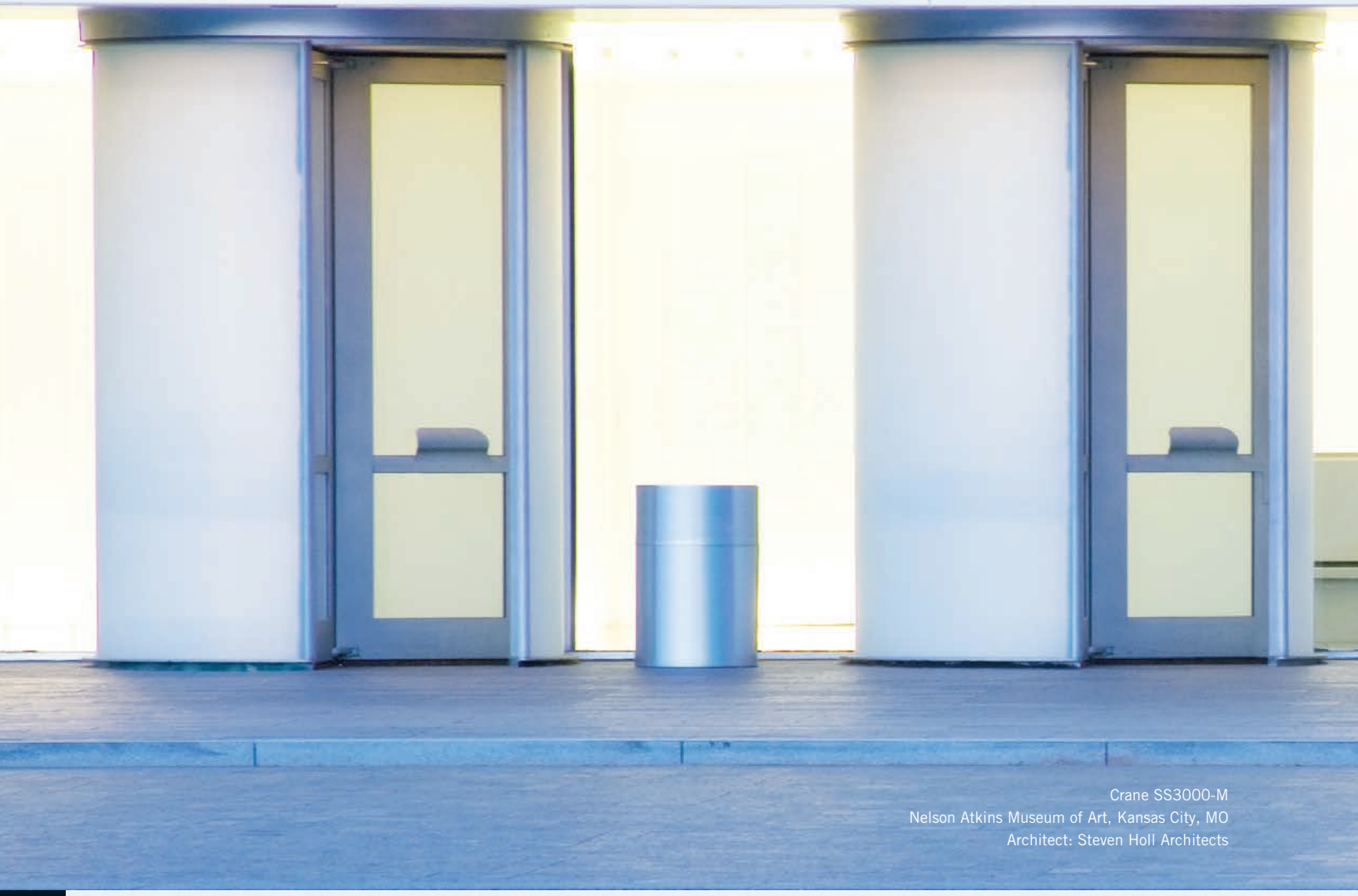
Crane SS3000-M
DTE Energy Headquarters, Detroit, MI
Architect: Neumann/Smith

DORMA is a national member of the the United States Green Building Council (USGBC). We understand the importance of LEED certification and welcome the challenge to build safe and sustainable buildings by aligning our products with standards set by the USGBC.

Cover:
Crane SS4000-M
500 North Lake Shore Drive, Chicago, IL
Architect: Solomon Cordwell Buenz
LEED Gold Certified

CRANE REVOLVING DOORS





Crane SS3000-M
Nelson Atkins Museum of Art, Kansas City, MO
Architect: Steven Holl Architects

CONFIGURED FOR THE MOST DEMANDING APPLICATION—YOURS

Crane Revolving Doors bring your vision to life—from an elegant all-glass door or a timeless classic mahogany wood door to multiple doors combined to create a complete entrance system. Premium construction and unmatched design create a door limited only by your imagination.

Crane is the premier global manufacturer of revolving doors. Our attention to detail is unsurpassed. Virtually every component of the door—push bars, canopies, glass panels, and more—can be customized to complement the building's exterior and interior design theme.

For over 70 years, highly skilled Crane engineers and dedicated craftsmen have created beautiful, state-of-the-art revolving doors for projects all around the world.

To ensure dependable operation, Crane engineers developed and perfected our own operating hardware, including our renowned bookfold system and a uniquely designed weather seal. Our weather seal maintains environmental separation while protecting the door from damaging scratches. With an inferior seal, dirt and debris collecting on the seal may cause metal and glass to be scratched.

On every Crane door is our bookfold mechanism that meets ANSI 156.27, NFPA 101 Life Safety, and International Building Codes. For protection against unintended bookfolding, the patented Crane bookfold lock mechanism offers an aesthetically subtle and code-compliant option. It is standard on security doors and recommended optional equipment for larger doors.

MANUAL REVOLVING DOORS

Crane SS3000-M (Complete Entrance)
800 North Michigan Avenue, Chicago, IL
Architect: Barteluce Architects and Associates

Premium construction and unmatched customization create the access solution you envision.

DORMA representatives and engineers will gladly review your design and specification requirements with the ultimate goal of transforming your vision into a safe and reliable entrance.

Designed to fulfill your vision

- From entry level to high end, Crane manual revolving doors are the most customizable revolving door on the market.
- Manual revolving doors allow for greater traffic volume and provide a quicker traffic flow compared to automatic or swing doors.
- Revolving doors are not just for new construction, but for retrofit projects as well.
- With a 6' to 10' diameter range and multiple attachment plans, Crane manual revolving doors can be fit into virtually any entrance.
- A wide range of finishes is available to meet your project needs, including mahogany and oak. Refer to the Product Selector Guide on page 19 for all options.

Crane SS4000-M
55 Allen Plaza, Atlanta, GA
Architect: Pickard Chilton

The Crane 4000 Series all-glass manual revolving door provides a spectacular first impression. Its rich styling and sleek lines complement any and all entrances and modern façades.

Crane SS2000-M
Cira Centre, Philadelphia, PA
Architects: Caesar Pelli and Associates, Bower Lewis Thrower

The Crane 2000 Series semi-custom revolving door with a glass roof combines traditional revolving door framing with an element of nearly all glass at a lower price point.

NOTE: DORMA offers automatic doors for ADA compliance. See www.dorma.com for information.

AUTOMATIC REVOLVING DOORS

Crane SS1000-A
Greektown Casino Hotel, Detroit, MI
Architect: Steelman Partners

Crane automatic revolving doors are designed to monitor the door itself and its occupants to ensure safe operation. The Crane Modular Drive System includes an advanced micro-processor control and is torque driven for safety.

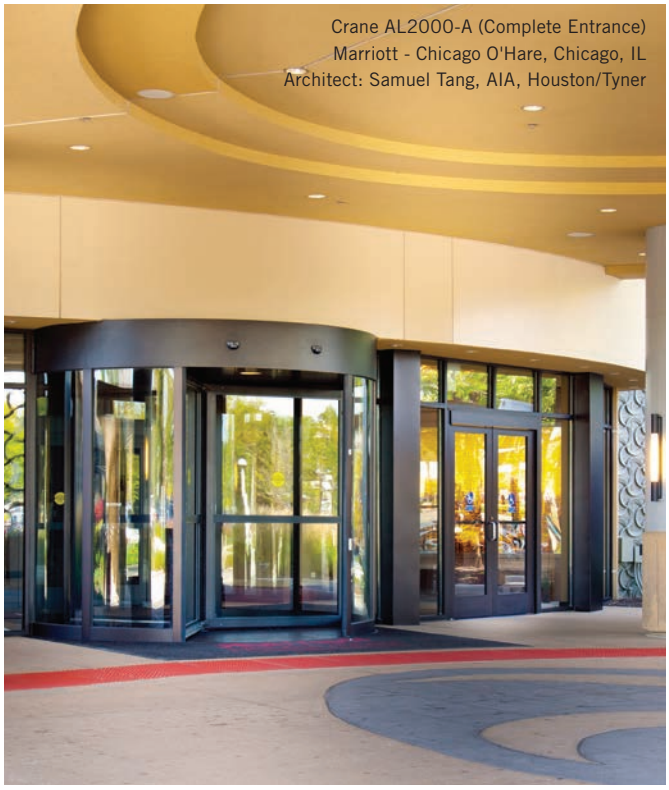
Designed without compromise

- Crane automatic revolving doors can be customized for most applications to provide automatic features while maintaining the entrance's design aesthetics.
- They are designed to meet or exceed all safety and code requirements.
- They can range in size from a minumum 8' outside diameter and up to 12'.
- Automatic doors are available as entry level 1000, semi-custom 2000, or custom 3000 or 4000 Series revolving doors. (See page 16 for descriptions of the four Series.)
- A wide range of finishes is also available to meet your project needs, with the exception of wood. Refer to the Product Selector Guide on page 19 for all options.

Below: A Crane 3000 Series revolving door fabricated with a customized canopy extending to the ceiling.

Crane SS3000-A (Complete Entrance)
Gaylord National Hotel and Convention Center
National Harbor, MD
Architect: Gensler

Crane BZ3000-A (Complete Entrance)
JW Marriott Chicago, Chicago, IL
Architect: Lucien Lagrange & Associates



Crane AL2000-A (Complete Entrance)
Marriott - Chicago O'Hare, Chicago, IL
Architect: Samuel Tang, AIA, Houston/Tyner

Given Crane's wide range of finish options, you can specify a revolving door that matches the look of the surrounding building structure. For example, the BZ3000-A revolving door shown above features a bronze finish that blends perfectly with the JW Marriott Chicago's entrance façade.

Crane automatic doors are custom designed to meet the needs of your specific application. The revolving door canopy houses the Modular Drive System, while maintaining the door's overall aesthetics.

NOTE: DORMA offers automatic doors for ADA compliance. See www.dorma.com for information.

COMPLETE ENTRANCES

Crane BZ3000-A (Complete Entrance), JW Marriott, Chicago, IL
Architect: Lucien Lagrange & Associates

Crane SS4000-M (Complete Entrance)
155 North Wacker Drive, Chicago, IL
Architect: Geottsch Partners
LEED Gold Certified

Designed to unify the entire entrance

- DORMA is a single source provider of complete, custom-fabricated entrance systems for both new construction and renovations. For a seamlessly elegant entrance façade, we are able to match finishes for different types of DORMA doors and hardware.
- Crane Complete Entrances provide more energy efficient solutions than entrances with swinging or sliding doors alone. Revolving doors increase energy savings and can contribute towards LEED certification for your building.
- DORMA offers consultation at the design phase to plan an entrance that matches your vision and your budget. Crane manual or automatic revolving doors, automatic sliding doors, and manual and/or automatic swinging doors from DORMA can all be integrated into the entrance.

Crane SS4000-M
(Complete Entrance)
333 West Wacker Drive
Chicago, IL
Architect: Perkins+Will
LEED Silver Certified

SECURITY REVOLVING DOORS

Designed to meet both your security AND design goals

Crane revolving doors can be built with features that maximize security without compromising aesthetics. The result is a revolving door that is both beautiful and secure. Power and security/safety components include the patented Crane book-fold lock and enclosure posts with safety edge sensor strips.

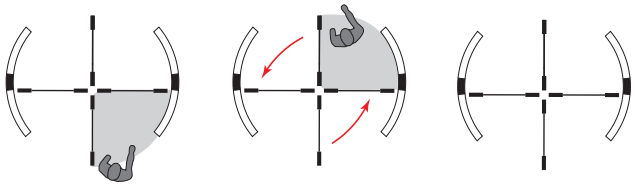
Beyond the basics, three security levels are available. Each security level can be one-way, two-way or exit-only. Various operating modes can also be combined or customized to meet your project specifications exactly.

Crane SS4000-S3

Crane SS2000-S2
Security Door

This custom SS4000-S3 all-glass door provides both beautiful aesthetics and high-end access control. It was constructed with S3 level integrated security systems featuring advanced anti-piggybacking.

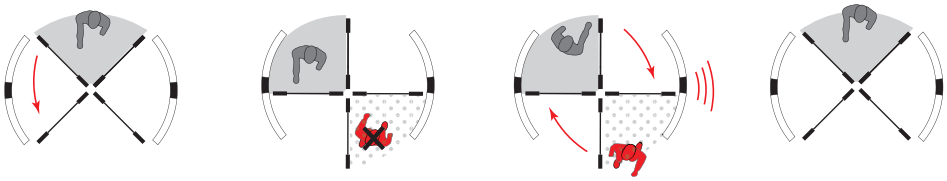
- **S1** – A manual revolving door that can be converted for increased security or access control.



1. **Authorized Person** swipes card and enters door compartment.
2. **Authorized Person** pushes manual door 90° and exits.
3. Revolving door locks and remains locked until the next **Authorized Person** swipes card.

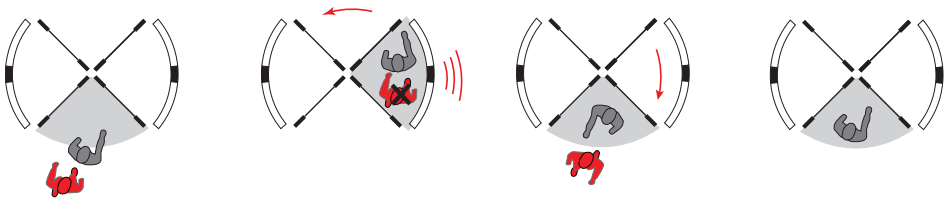
Crane AL1000-S2
Lucent Technology
Lisle, IL
Architect: Kevin Roche John Dinkeloo and Associates LLC

- **S2** – An automatic operated revolving door with anti-tailgating feature that prevents unauthorized access in the opposite direction or following compartment.



1. **Authorized Person** swipes card and enters door compartment.
2. **Intruder** enters opposite compartment.
3. Sensors detect objects in two compartments. The door stops, an intruder alert sounds, and the door reverses direction. Occupants then exit where they entered from.
4. **Authorized Person** swipes card again, re-enters door compartment, then exits.

- **S3** – An automatic operated revolving door with anti-piggybacking feature that restricts access to one person at a time.



1. **Authorized person** swipes card and enters door compartment. **Intruder** follows into same compartment.
2. Sensors detect two occupants in the same compartment. The door stops and an intruder alert sounds.
3. Door reverses direction to clear both occupants from the compartment.
4. **Authorized Person** swipes card again and re-enters door compartment.

LARGE DIAMETER REVOLVING DOORS

DORMA KTC Series

Eye-catching, functional and practical, DORMA KTC Series large diameter doors meet a wide range of applications and are perfect for hospitality and transportation venues where customers are accompanied by luggage, strollers, and large items. Summer configurations enable doors to open for unobstructed flow or passage of bulky items. Offered in outside diameters up to 18'—among the widest in North America—DORMA KTC doors are available in configurations of two, three, or four wings. Optional locked wings and night shields can be incorporated for increased security.

Model KTC-2/2 Large Diameter Revolving Door

DORMA SERVICE & MAINTENANCE

Nationwide coverage with DORMA Service

DORMA can service and maintain Crane revolving doors, as well as automatic and manual doors, operable partitions, and moveable glass walls.

Our nationwide coverage, available via a single toll-free number, offers a variety of service and account programs tailored to your requirements.

DORMA Service and Maintenance plans ensure your entrances function and look their best at all times.

Look to DORMA for:

- Nationwide provider network
- Independent DORMA distribution service
- AAADM-certified technicians
- Dedicated project/account managers
- Centralized dispatch service and trained dispatchers
- Variety of service plans to suit your needs
- Comprehensive service provided for most types of automatic and manual doors.

REVOLVING DOOR REHAB KIT

Make your old revolving door better than new

Crane offers Rehab Kits to replace the wings and hardware of an existing revolving door no matter who manufactured it originally. Made from aluminum, stainless steel, bronze, or wood, each kit is designed to match the original door as closely as possible or to bring fresh new style to an outdated entrance without replacing the entire door.

A Rehab Kit includes everything needed to properly mount and fit into the existing enclosure and canopy, such as:

- Speed control
- Center shaft with cover
- Bookfold mechanism
- Hanger discs
- Hangers
- Pivot bearing
- Pre-glazed wings with weathersweeps
- Push bars
- Bumpers
- Lock cases

ENERGY SAVINGS

Sealed barrier / Reduced infiltration rate

Revolving doors create a sealed barrier between inside and outside environments. In contrast, open swing or sliding doors provide no protection, creating hot or cold bursts on entry and exit, wasting valuable energy, and making HVAC systems work harder.

A study conducted by MIT* showed that opening a swing door causes, on average, 8x more air to be exchanged than a revolving door because open swing doors provide no barrier from the elements.

*Cullum, B.A. "Modifying Habits Towards Sustainability: A Study of Revolving Door Usage on the MIT Campus". MIT

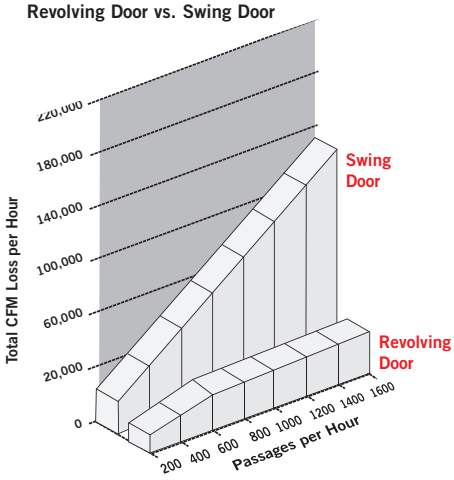
The clear indication is that a revolving door's sealed barrier can dramatically reduce the load on HVAC systems, saving energy in the process, and helping your building achieve LEED certification.

Reduced infiltration rate—Since traffic rate, building height, and outdoor temperatures are uncontrolled, entrance infiltration can be reduced by reducing the entrance pressure differential. This is done by sealing or tightening the building envelope, pressurizing with outdoor air, or sealing with proper doors.

Net outdoor air supply over exhaust reduces the entrance pressure differential, decreasing the infiltration rate. The use of outdoor air in excess of ventilation needs, merely to pressurize entire buildings and reduce infiltration problems, may add an economically unjustified heating load. Pressurizing only the ground floor requires much less outdoor air. But this may cause excessive pressure differentials across stair and elevator doors on the ground floor.

A revolving door mitigates stack effect by allowing traffic while sealing air flow. Infiltration through a revolving door (except for a small amount passing though the door seals) is virtually not affected by building height, indoor-outdoor pressure difference, and fan operation.

Air Infiltration:
Revolving Door vs. Swing Door



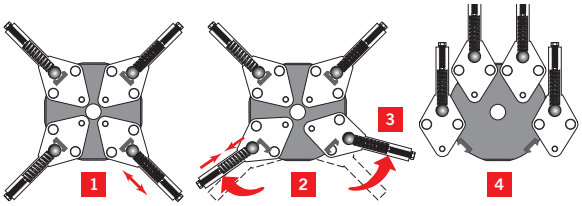
Infiltration rates through a swinging door are about 900 cubic feet (25.5 cubic meters) per person for a single-bank entrance, and 550 cubic feet (15.6 cubic meters) per person for a vestibule entrance. But it is only about 60 cubic feet (1.7 cubic meters) per person for a manually operated revolving door, and 32 cubic feet (0.9 cubic meters) per person for an automatic revolving door.

SAFETY

Dependable operation with little maintenance

Attention to detail goes beyond the aesthetics of a revolving door. To ensure dependable operation with minimum maintenance, we developed and perfected our own operating hardware. All operating hardware used in Crane revolving doors is manufactured by us or under our direct control. For example, our bookfold mechanism features machined cast bronze discs and hangers that are finished to match your door. Required by law on revolving doors in the United States, a bookfold mechanism provides emergency egress. The pressure to engage the bookfold mechanism is adjustable to meet local conditions—for example, stack conditions, negative pressure, and wind conditions. Likewise, our speed control has a precision-machined, cast-steel gear train mounted in the ceiling canopy or floor. The speed control is factory set to ensure that the revolving door does not exceed the revolutions per minute set by governing building codes.

BOOKFOLD MECHANISM



1. During normal operation, spring tension holds ball in socket maintaining proper wing configuration.
2. Panic pressure on wing compresses spring and releases ball.
3. Minimal pressure is required to continue bookfolding.
4. Wings bookfold either way, providing a clear passage on both sides. Release spring tension is adjustable.

Optional patented bookfold lock

- Standard on security doors
- Recommended for larger doors
- Aesthetically subtle and code-compliant

CRANE 1000 SERIES ENTRY-LEVEL DOOR

The Crane 1000 Series door provides the function, traffic flow advantage, and energy savings of a revolving door for budget conscious projects. Fabricated with rigid aluminum construction, the 1000 Series door offers options allowing you to match the door to your entrance requirements. Select from several size options, canopy designs, and custom painted, anodized, or clad finishes.

The 1000 Series includes our reliable Crane speed control; Crane bookfold mechanism; a smooth-surface ceiling without pie wedges or visible supports; and a superior rubber-and-felt weather seal.

Crane AL1000-M

CRANE 2000 SERIES SEMI-CUSTOM DOOR

The Crane 2000 Series uses fully formed and welded construction on the enclosure and canopy, yet allows for clad wings in stainless steel or bronze over aluminum sub-frame for a sleek appearance.

The attachments are fully customizable and the door is available in a variety of sizes, finishes, and canopy designs.

With a clad construction and finishing process second to none, 2000 Series doors provide your building with a robust and reliable entrance that catches the eye.

Crane AL2000-A

CRANE 3000 SERIES CUSTOM DOOR

Crane 3000 Series doors combine premium construction with unmatched custom design, using materials such as mahogany or oak, stainless steel or bronze. Wooden doors are hand-crafted by skilled mill workers who meticulously design and sculpt the door panel to meet your specification.

The Crane 3000 Series is the only fully formed and welded revolving door in the industry with a 5-year standard warranty. For a smooth, beautiful appearance, the surface material is welded to a steel or stainless steel subframe, eliminating seams caused by cladding pre-finished materials to an aluminum subframe.

With optional automation, the Series 3000 door becomes even more versatile. The Crane Modular Drive System featuring an advanced microprocessor control makes automatic doors smart; it continually monitors the door and occupants to ensure safe operation.

Crane WD3000-M

CRANE 4000 SERIES ALL GLASS DOOR

The Crane 4000 Series is the original all glass revolving door. It provides a spectacular first impression with its elegant and sophisticated design. Rich styling and sleek lines reinforce the exclusive image desired more and more for exquisite high end store fronts and building entrances. The 4000 Series door is fully customizable, including push bars and attachment options to the store front, and the connection between the enclosure wall and exposed ceiling glass.

Crane SS4000-M

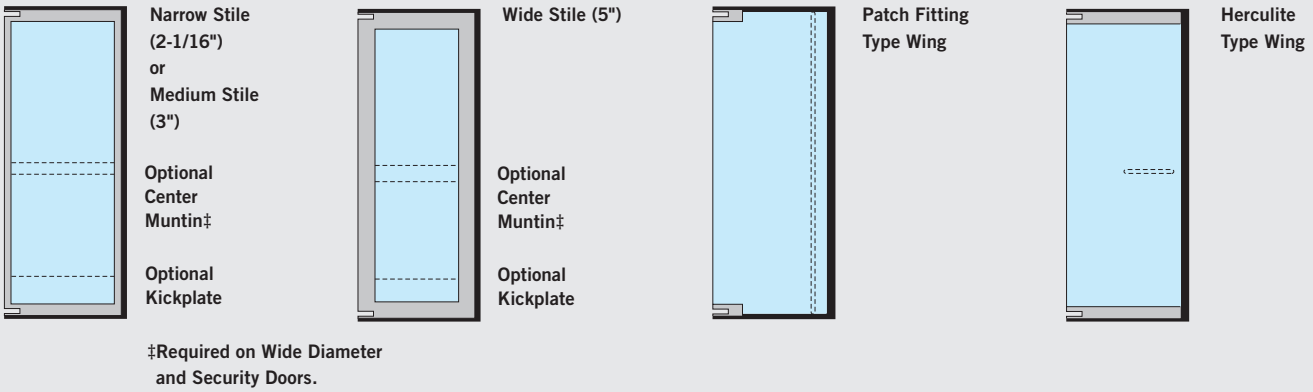
CONSTRUCTION

1000 Series
Crane produces 1000 Series revolving doors from aluminum extrusions and sheet material. Each piece is carefully cut and fitted. Connections are tightly bolted together with hairline joints. After fabrication, all exposed surfaces are mechanically finished to eliminate marks caused by rolling, forming, and welding. Anodized or painted finish is then applied. All standard colors, as well as most exotics and metallics can be applied.

2000 Series
In addition to fully formed and welded construction, Crane fabricates 2000 Series revolving door wings by cladding prefinished metal sheet over full 7 mil exterior grade anodized aluminum substructures. When value engineering is required, clad construction is an excellent alternative. Crane clad doors are available in prefinished brushed or mirror stainless steel and bronze.

3000 Series
Crane 3000 Series revolving doors are cut, formed, and precisely welded from heavy USS 16 gauge stainless steel or 14 B&S gauge bronze sheet and compatible bar stock to create the sturdiest structural elements possible. The exterior surface metal is fully welded to the interior reinforcing substructure. All four corners of the door wings are welded. The interior enclosure-post-to-base connections are welded as well. Canopy fascia are visually seamless and attached to the ceiling soffit with concealed welds. All exposed surfaces are ground and polished to eliminate blemishes from rolling, forming, and welding.

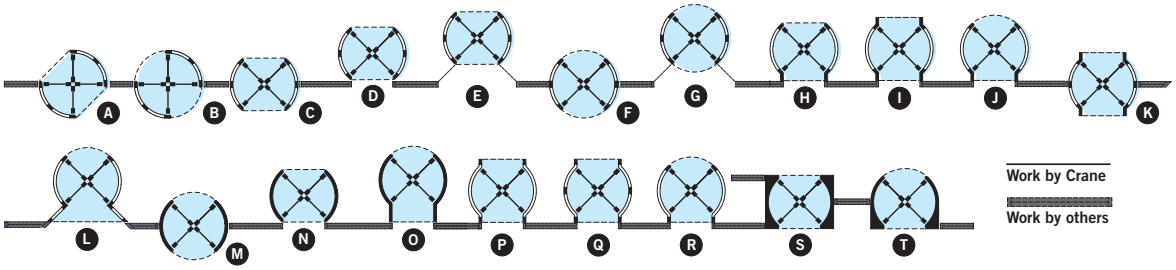
WING DESIGNS



‡Required on Wide Diameter and Security Doors.

ATTACHMENT PLANS

Typical Attachment Plans

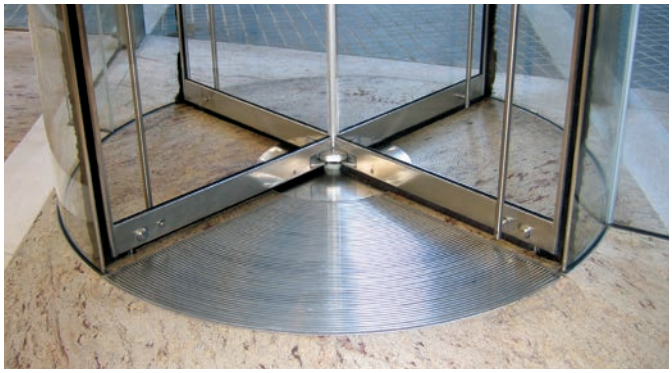


OPTIONS

- **Ceiling Lights**—Optional fixtures consisting of translucent lens and snap-in trim ring of the same material and finish as the door are mounted flush in the ceiling. Standard and custom fixtures available. Not available for glass ceiling installations.

- **Standard and Custom Push Bars**—Standard push bars are same material and finish as door. Formed from 1/2" x 1-1/2" rectangular bar or 1" diameter round bar. Mounted with through-bolts or concealed fasteners. Custom push bars are available with a 1-1/4" maximum projection from face of door stile.

- **Self-Positioning Closer**—Senses when the door comes to rest at any position other than closed, rotating the door to the closed position with all four door wing weathersweeps in contact with the enclosure wall. The door is then set in the most welcoming position for the next user while maintaining the maximum weather seal between the indoor and outdoor environments. The self closer's low-energy drive (15 pounds or less in compliance with ANSI A156.19[4.4]), fits into a 7" high canopy and plugs into a 110 volt outlet.



Welded Floor Grille

- **Welded Floor Grilles**—Curved floor grilles in pie shapes, quarter radians, or arcs are available. Custom fabricated from concentrically rolled bars of stainless steel and finished to match doors.

Crane SS4000-M
Walgreens, Chicago, IL

PRODUCT SELECTOR GUIDE

Model	Mtrl	Finishes	Op Mode	Attachment Plan‡	Diameter	Door Opening Ht	Enclosure Material	Enclosure Glass	Sightline†
AL1000	AL		All	A,B,C,D,F	6'-6", 7' (ID) 8", 9", 10', 12' (OD)	7' up to 9'	Glass	7/16" clear or tinted*	4"
AL2000	AL		All	A,B,C,D,F, H,I,J	6' (ID) to 12' (OD)	7' up to 9'	Glass or Aluminum Panels	7/16" clear or tinted*	4", 6", or Custom (up to 24")
AL3000	AL		All	All	6' (ID) to 12' (OD)	7' up to 10', Custom	Glass or Solid Metal	7/16" or 9/16" clear or tinted**	1" to 36"
AL4000	AL		All	All	6' (ID) to 8' (OD)	7' up to 10', Custom	Glass	9/16" clear or tinted*	0" to 36"
SS1000	AL/ SS		All	A,B,C,D,F	6'-6", 7' (ID) 8", 9", 10', 12' (OD)	7' up to 9'	Glass	7/16" clear or tinted*	4"
SS2000	AL/ SS		All	A,B,C,D,F, H,I,J	6' (ID) to 12' (OD)	7' up to 9'	Glass	7/16" clear or tinted*	4", 6", or Custom (up to 24")
SS3000	SS		All	All	6' (ID) to 12' (OD)	7' up to 10', Custom	Glass or Solid Metal	7/16" or 9/16" clear or tinted**	4", 6", or Custom (up to 24")
SS4000	SS		All	All	6' (ID) to 8' (OD)	7' up to 10', Custom	Glass	9/16" clear or tinted**	0" to 36"
BZ1000	AL/ BZ		All	A,B,C,D,F	6'-6", 7' (ID) 8", 9", 10', 12' (OD)	7' up to 9'	Glass	7/16" clear or tinted*	4"
BZ2000	AL/ BZ		All	A,B,C,D,F, H,I,J	6' (ID) to 12' (OD)	7' up to 9'	Glass	7/16" clear or tinted*	4", 6", or Custom (up to 12")
BZ3000	BZ		All	All	6' (ID) to 12' (OD)	7' up to 10", Custom	Glass or Solid Metal	7/16" or 9/16" clear or tinted**	1" to 36"
BZ4000	BZ		All	All	6' (ID) to 8' (OD)	7' up to 10', Custom	Glass	9/16" clear or tinted**	0" to 36"
WD3000	WD		M	All	6' (ID) to 8' (OD)	7' up to 9', Custom	Glass or Solid Wood	7/16" or 9/16" clear or tinted**	1" to 36"

‡See Attachment Plans, page 17 *Center post required **Center post optional †Enclosure base sightline

KEY:

Mtrl (Material)	
AL	Aluminum
SS	Stainless Steel #304, #316
BZ	Bronze #220, #280, Nickel Silver
WD	Mahogany, Oak

Finishes			
○	Clear Anodized	●	#7 Mirror
●	Dk BZ Anodized	●	#8 Mirror
●	Custom Anodized	●	Non-Directional
●	Painted	●	Bead Blast
●	#4 Satin	●	Custom
●	#6 Fine Satin	●	Stain

Op (Operational Mode)	
M	Manual
MS	Manual Security
A	Automatic
AS	Automatic Security

Please call the Crane Factory at 800-942-7263 for any questions or clarifications, or send email to cranesales@dorma-usa.com.

DORMA

7.14CT • 3M • USA • 07000462

DORMA USA, Inc.
Dorma Drive, Drawer AC
Reamstown, PA 17567
800-523-8483
www.dorma.com

CRANE REVOLVING DOORS

1000-A Series
Automatic Revolving Door

Crane SS1000-A
Greektown Hotel-Casino
Detroit, MI

- The Crane 1000 Series door sets the industry standard for revolving door design, construction, operation, and reliability.
- Every revolving door is designed, engineered, and fabricated by union craftsmen in our Chicago factory.
- The 1000-A Series Automatic Revolving Door features the torque-driven Crane Modular Drive System. The reliable advanced microprocessor control monitors the door and occupants to ensure safe operation.

The Crane 1000 provides the energy savings and traffic flow that you expect from a revolving door. Fabricated with rigid aluminum construction, the 1000 Series offers many options: different sizes, canopy designs, wing configurations, attachment plans, and finishes (anodized, painted, or clad in stainless steel or bronze). The Crane 1000 is an excellent choice for a budget conscious entrance or for a project that requires a fast lead time.

Standard 1000-A features include an advanced microprocessor control; a safety sensor system that monitors the door and its occupants; heavy-duty bookfold mechanism finished to match the door; a smooth-surface canopy without pie wedges or visible supports; and a rubber and felt weather sweep that provides a superior air seal.

CRANE
DORMA

DORMA is a national member of the
United States Green Building Council (USGBC).

CRANE REVOLVING DOORS

1000-A Series Automatic Revolving Door

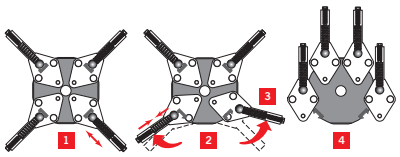
Servicing and maintaining your 1000-A Series door is vital to ensuring your entrance is fully functional and secure at all times. DORMA offers a variety of service plans to meet your needs. To find out more, visit: go.dorma.com/service

The Ideal Entrance — The 1000-A Series is a strong choice for your building's primary entrance. A range of available finishes allows for the door to be integrated into its surrounding décor and architecture, reinforcing the image you want to convey and guaranteeing a positive first impression. The superlative technical and safety features built into every Crane revolving door ensure safe and smooth traffic flow.

Automatic Drive System — The 1000-A Series door features the Crane Modular Drive System, which includes a reliable advanced microprocessor control and is torque driven for safety. The advanced control utilizes two redundant obstruction systems to ensure the ultimate in pedestrian safety.

Bookfold Mechanism — The heavy-duty Crane bookfold mechanism is constructed from a high grade chilled bronze casting. This heavy-duty hardware complies with all state and federal requirements for providing emergency egress. The pressure required to engage the bookfold mechanism is adjustable to meet local conditions, such as stack conditions, negative pressure, and wind conditions.

Crane Bookfold Mechanism



Energy Savings — Installing a 1000-A Series revolving door provides the most sustainable entrance possible. It allows continuous traffic flow while creating a barrier to prevent air infiltration. This barrier separates inside and outside environments, while enhancing the comfort of everyone inside and ensuring the owner's return on investment.

1000-A Series Options — The 1000-A Series door can be specified to meet any design. Standard options include standard diameter sizes, different canopies, wing configurations, finishes, and building attachments. Additional options include:

- **Welded Floor Grilles** — Floor grilles can be integrated into the revolving door design to ensure a working system and proper aesthetics. Fabricated from concentrically rolled bars of stainless steel, the grilles are curved to the radius of the revolving door, which allows the door to spin properly and minimizes damage to the bottom door sweep. The heavy-duty floor grilles are welded and formed from 304 or 316 solid stainless steel, 1/4" × 1" solid bars polished to a #4 satin finish. The recessed grille pan is welded from 12 gauge stainless steel and can have a drainage fitting added. The tolerances for the grilles aligning concentrically are to a 1/64" variance. Crane's proven floor grille design allows us to provide the industry's best 10 Year Wear Warranty.

- **Custom Push Bars** — Available upon request.

- **Ceiling Lights** — Crane offers three lighting options:
  - 8" Circline style with florescent bulb
  - 8" Circline style with LED light
  - LED spotlights

Safety is paramount — All Crane 1000-A Series revolving doors exceed the ANSI 156.27 standard for automatic revolving doors. The drive and safety sensor system continuously monitors the door and its occupants. Standard safety features include:

- Enclosure wall safety bumper (2 per door)
- Heel guards (1 per wing)
- Wing sensors (1 per wing)
- Breakout detection
- Torque-limited drive system
- Handicap door speed reduction switches (2)
- Emergency stop buttons (2)
- Activation
- Force detection

NOTE: See the **1000 Series Product Selector Guide** for product specification details. Contact us or visit our web site for information about other Crane products.

844-SPECNOW (844-773-2669)
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Reamstown, PA 17567
www.dorma.com

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CRANE REVOLVING DOORS

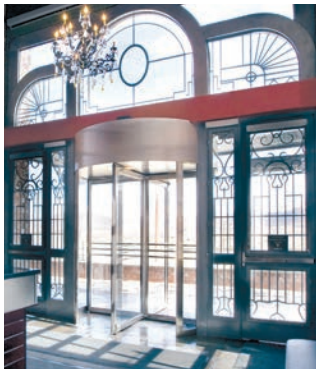
Enabling Better Buildings™

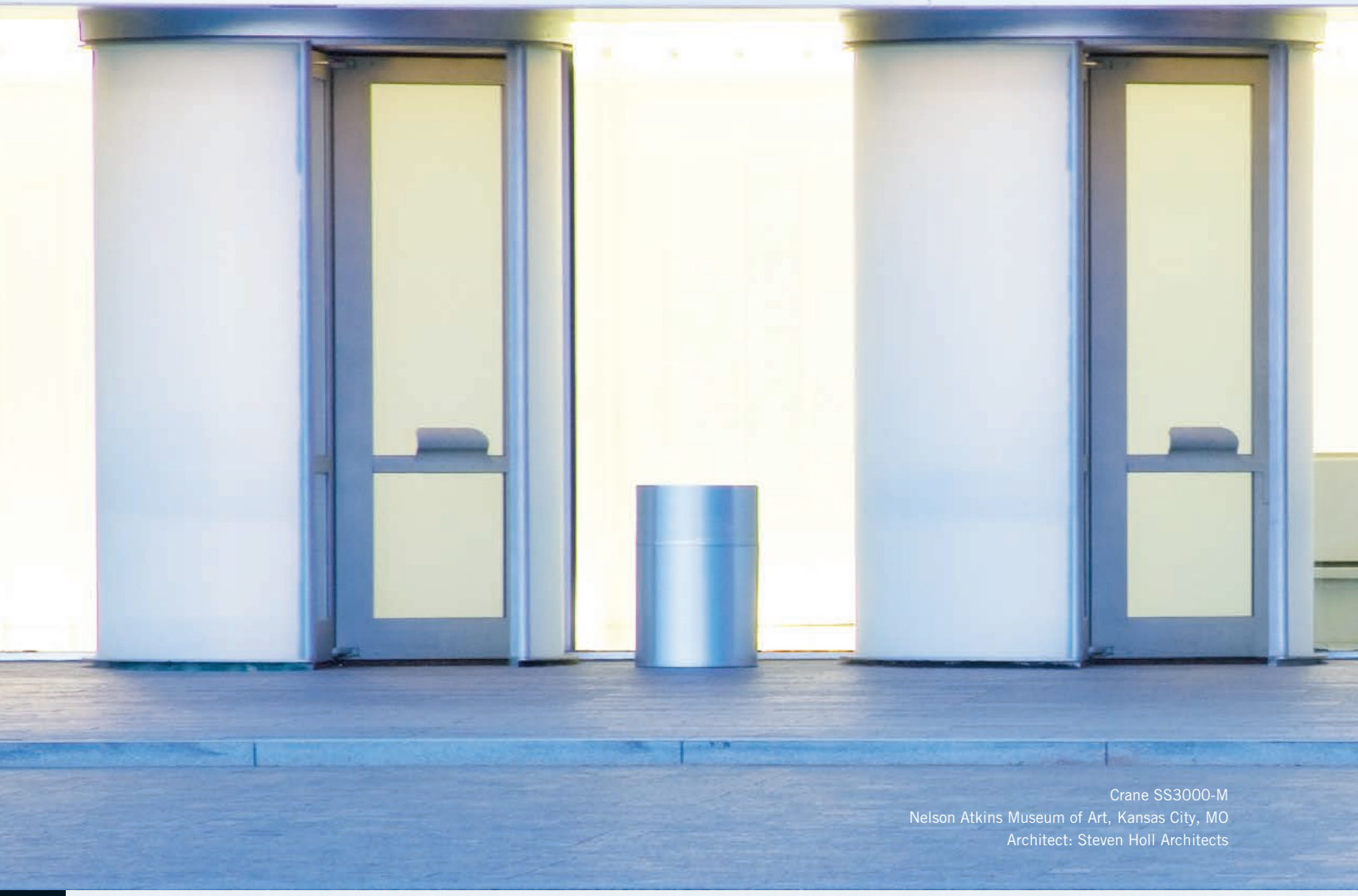
Crane SS3000-M
DTE Energy Headquarters, Detroit, MI
Architect: Neumann/Smith

DORMA is a national member of the the United States Green Building Council (USGBC). We understand the importance of LEED certification and welcome the challenge to build safe and sustainable buildings by aligning our products with standards set by the USGBC.

Cover:
Crane SS4000-M
500 North Lake Shore Drive, Chicago, IL
Architect: Solomon Cordwell Buenz
LEED Gold Certified

CRANE REVOLVING DOORS





Crane SS3000-M
Nelson Atkins Museum of Art, Kansas City, MO
Architect: Steven Holl Architects

CONFIGURED FOR THE MOST DEMANDING APPLICATION—YOURS

Crane Revolving Doors bring your vision to life—from an elegant all-glass door or a timeless classic mahogany wood door to multiple doors combined to create a complete entrance system. Premium construction and unmatched design create a door limited only by your imagination.

Crane is the premier global manufacturer of revolving doors. Our attention to detail is unsurpassed. Virtually every component of the door—push bars, canopies, glass panels, and more—can be customized to complement the building's exterior and interior design theme.

For over 70 years, highly skilled Crane engineers and dedicated craftsmen have created beautiful, state-of-the-art revolving doors for projects all around the world.

To ensure dependable operation, Crane engineers developed and perfected our own operating hardware, including our renowned bookfold system and a uniquely designed weather seal. Our weather seal maintains environmental separation while protecting the door from damaging scratches. With an inferior seal, dirt and debris collecting on the seal may cause metal and glass to be scratched.

On every Crane door is our bookfold mechanism that meets ANSI 156.27, NFPA 101 Life Safety, and International Building Codes. For protection against unintended bookfolding, the patented Crane bookfold lock mechanism offers an aesthetically subtle and code-compliant option. It is standard on security doors and recommended optional equipment for larger doors.

MANUAL REVOLVING DOORS

Crane SS3000-M (Complete Entrance)
800 North Michigan Avenue, Chicago, IL
Architect: Barteluce Architects and Associates

Premium construction and unmatched customization create the access solution you envision.

DORMA representatives and engineers will gladly review your design and specification requirements with the ultimate goal of transforming your vision into a safe and reliable entrance.

Designed to fulfill your vision

- From entry level to high end, Crane manual revolving doors are the most customizable revolving door on the market.
- Manual revolving doors allow for greater traffic volume and provide a quicker traffic flow compared to automatic or swing doors.
- Revolving doors are not just for new construction, but for retrofit projects as well.
- With a 6' to 10' diameter range and multiple attachment plans, Crane manual revolving doors can be fit into virtually any entrance.
- A wide range of finishes is available to meet your project needs, including mahogany and oak. Refer to the Product Selector Guide on page 19 for all options.

Crane SS4000-M
55 Allen Plaza, Atlanta, GA
Architect: Pickard Chilton

The Crane 4000 Series all-glass manual revolving door provides a spectacular first impression. Its rich styling and sleek lines complement any and all entrances and modern façades.

Crane SS2000-M
Cira Centre, Philadelphia, PA
Architects: Caesar Pelli and Associates, Bower Lewis Thrower

The Crane 2000 Series semi-custom revolving door with a glass roof combines traditional revolving door framing with an element of nearly all glass at a lower price point.

NOTE: DORMA offers automatic doors for ADA compliance. See www.dorma.com for information.

AUTOMATIC REVOLVING DOORS

Crane SS1000-A
Greektown Casino Hotel, Detroit, MI
Architect: Steelman Partners

Crane automatic revolving doors are designed to monitor the door itself and its occupants to ensure safe operation. The Crane Modular Drive System includes an advanced micro-processor control and is torque driven for safety.

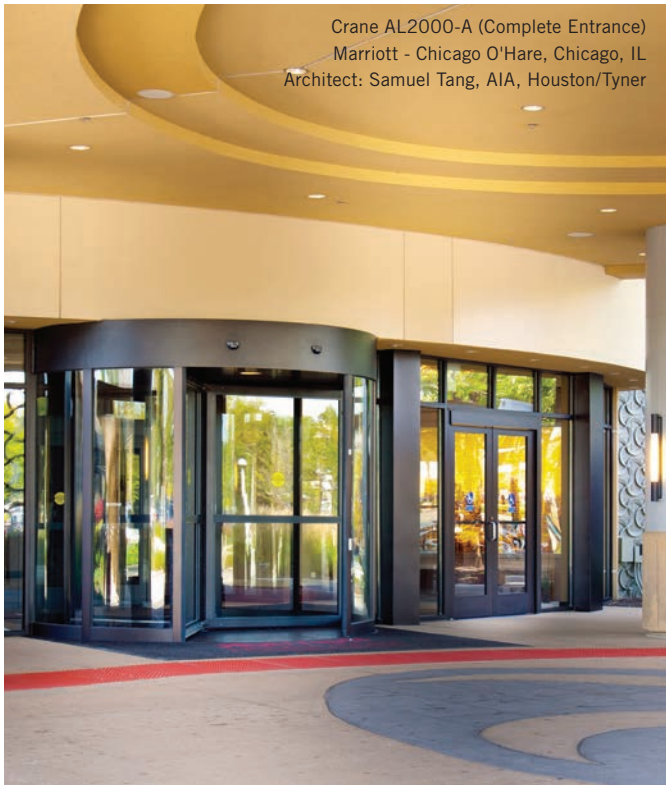
Designed without compromise

- Crane automatic revolving doors can be customized for most applications to provide automatic features while maintaining the entrance's design aesthetics.
- They are designed to meet or exceed all safety and code requirements.
- They can range in size from a minumum 8' outside diameter and up to 12'.
- Automatic doors are available as entry level 1000, semi-custom 2000, or custom 3000 or 4000 Series revolving doors. (See page 16 for descriptions of the four Series.)
- A wide range of finishes is also available to meet your project needs, with the exception of wood. Refer to the Product Selector Guide on page 19 for all options.

Below: A Crane 3000 Series revolving door fabricated with a customized canopy extending to the ceiling.

Crane SS3000-A (Complete Entrance)
Gaylord National Hotel and Convention Center
National Harbor, MD
Architect: Gensler

Crane BZ3000-A (Complete Entrance)
JW Marriott Chicago, Chicago, IL
Architect: Lucien Lagrange & Associates



Crane AL2000-A (Complete Entrance)
Marriott - Chicago O'Hare, Chicago, IL
Architect: Samuel Tang, AIA, Houston/Tyner

Given Crane's wide range of finish options, you can specify a revolving door that matches the look of the surrounding building structure. For example, the BZ3000-A revolving door shown above features a bronze finish that blends perfectly with the JW Marriott Chicago's entrance façade.

Crane automatic doors are custom designed to meet the needs of your specific application. The revolving door canopy houses the Modular Drive System, while maintaining the door's overall aesthetics.

NOTE: DORMA offers automatic doors for ADA compliance. See www.dorma.com for information.

COMPLETE ENTRANCES

Crane BZ3000-A (Complete Entrance), JW Marriott, Chicago, IL
Architect: Lucien Lagrange & Associates

Crane SS4000-M (Complete Entrance)
155 North Wacker Drive, Chicago, IL
Architect: Geottsch Partners
LEED Gold Certified

Designed to unify the entire entrance

- DORMA is a single source provider of complete, custom-fabricated entrance systems for both new construction and renovations. For a seamlessly elegant entrance façade, we are able to match finishes for different types of DORMA doors and hardware.
- Crane Complete Entrances provide more energy efficient solutions than entrances with swinging or sliding doors alone. Revolving doors increase energy savings and can contribute towards LEED certification for your building.
- DORMA offers consultation at the design phase to plan an entrance that matches your vision and your budget. Crane manual or automatic revolving doors, automatic sliding doors, and manual and/or automatic swinging doors from DORMA can all be integrated into the entrance.

Crane SS4000-M
(Complete Entrance)
333 West Wacker Drive
Chicago, IL
Architect: Perkins+Will
LEED Silver Certified

SECURITY REVOLVING DOORS

Designed to meet both your security AND design goals

Crane revolving doors can be built with features that maximize security without compromising aesthetics. The result is a revolving door that is both beautiful and secure. Power and security/safety components include the patented Crane book-fold lock and enclosure posts with safety edge sensor strips.

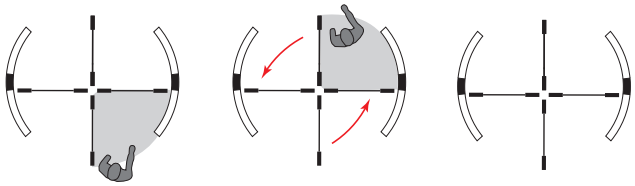
Beyond the basics, three security levels are available. Each security level can be one-way, two-way or exit-only. Various operating modes can also be combined or customized to meet your project specifications exactly.

Crane SS4000-S3

Crane SS2000-S2
Security Door

This custom SS4000-S3 all-glass door provides both beautiful aesthetics and high-end access control. It was constructed with S3 level integrated security systems featuring advanced anti-piggybacking.

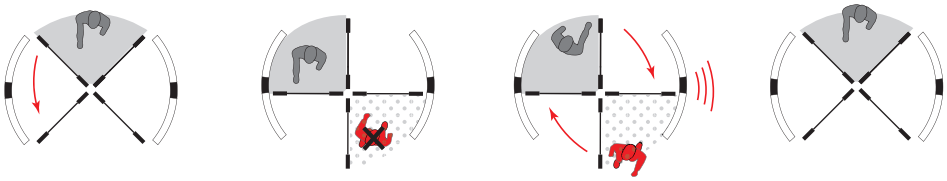
- **S1** – A manual revolving door that can be converted for increased security or access control.



1. **Authorized Person** swipes card and enters door compartment.
2. **Authorized Person** pushes manual door 90° and exits.
3. Revolving door locks and remains locked until the next **Authorized Person** swipes card.

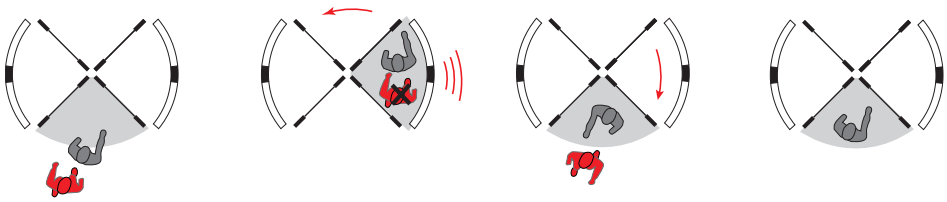
Crane AL1000-S2
Lucent Technology
Lisle, IL
Architect: Kevin Roche John Dinkeloo and Associates LLC

- **S2** – An automatic operated revolving door with anti-tailgating feature that prevents unauthorized access in the opposite direction or following compartment.



1. **Authorized Person** swipes card and enters door compartment.
2. **Intruder** enters opposite compartment.
3. Sensors detect objects in two compartments. The door stops, an intruder alert sounds, and the door reverses direction. Occupants then exit where they entered from.
4. **Authorized Person** swipes card again, re-enters door compartment, then exits.

- **S3** – An automatic operated revolving door with anti-piggybacking feature that restricts access to one person at a time.



1. **Authorized person** swipes card and enters door compartment. **Intruder** follows into same compartment.
2. Sensors detect two occupants in the same compartment. The door stops and an intruder alert sounds.
3. Door reverses direction to clear both occupants from the compartment.
4. **Authorized Person** swipes card again and re-enters door compartment.

LARGE DIAMETER REVOLVING DOORS

DORMA KTC Series

Eye-catching, functional and practical, DORMA KTC Series large diameter doors meet a wide range of applications and are perfect for hospitality and transportation venues where customers are accompanied by luggage, strollers, and large items. Summer configurations enable doors to open for unobstructed flow or passage of bulky items. Offered in outside diameters up to 18'—among the widest in North America—DORMA KTC doors are available in configurations of two, three, or four wings. Optional locked wings and night shields can be incorporated for increased security.

Model KTC-2/2 Large Diameter Revolving Door

DORMA SERVICE & MAINTENANCE

Nationwide coverage with DORMA Service

DORMA can service and maintain Crane revolving doors, as well as automatic and manual doors, operable partitions, and moveable glass walls.

Our nationwide coverage, available via a single toll-free number, offers a variety of service and account programs tailored to your requirements.

DORMA Service and Maintenance plans ensure your entrances function and look their best at all times.

Look to DORMA for:

- Nationwide provider network
- Independent DORMA distribution service
- AAADM-certified technicians
- Dedicated project/account managers
- Centralized dispatch service and trained dispatchers
- Variety of service plans to suit your needs
- Comprehensive service provided for most types of automatic and manual doors.

REVOLVING DOOR REHAB KIT

Make your old revolving door better than new

Crane offers Rehab Kits to replace the wings and hardware of an existing revolving door no matter who manufactured it originally. Made from aluminum, stainless steel, bronze, or wood, each kit is designed to match the original door as closely as possible or to bring fresh new style to an outdated entrance without replacing the entire door.

A Rehab Kit includes everything needed to properly mount and fit into the existing enclosure and canopy, such as:

- Speed control
- Center shaft with cover
- Bookfold mechanism
- Hanger discs
- Hangers
- Pivot bearing
- Pre-glazed wings with weathersweeps
- Push bars
- Bumpers
- Lock cases

ENERGY SAVINGS

Sealed barrier / Reduced infiltration rate

Revolving doors create a sealed barrier between inside and outside environments. In contrast, open swing or sliding doors provide no protection, creating hot or cold bursts on entry and exit, wasting valuable energy, and making HVAC systems work harder.

A study conducted by MIT* showed that opening a swing door causes, on average, 8x more air to be exchanged than a revolving door because open swing doors provide no barrier from the elements.

*Cullum, B.A. "Modifying Habits Towards Sustainability: A Study of Revolving Door Usage on the MIT Campus". MIT

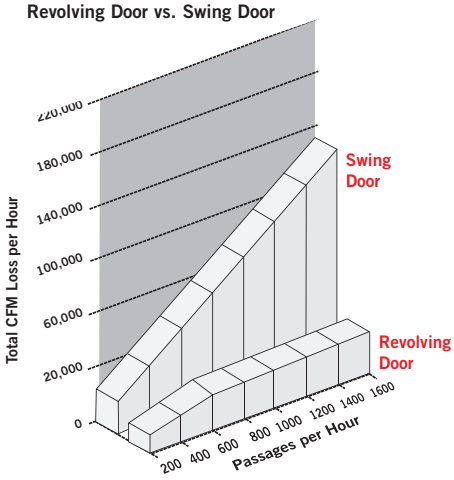
The clear indication is that a revolving door's sealed barrier can dramatically reduce the load on HVAC systems, saving energy in the process, and helping your building achieve LEED certification.

Reduced infiltration rate—Since traffic rate, building height, and outdoor temperatures are uncontrolled, entrance infiltration can be reduced by reducing the entrance pressure differential. This is done by sealing or tightening the building envelope, pressurizing with outdoor air, or sealing with proper doors.

Net outdoor air supply over exhaust reduces the entrance pressure differential, decreasing the infiltration rate. The use of outdoor air in excess of ventilation needs, merely to pressurize entire buildings and reduce infiltration problems, may add an economically unjustified heating load. Pressurizing only the ground floor requires much less outdoor air. But this may cause excessive pressure differentials across stair and elevator doors on the ground floor.

A revolving door mitigates stack effect by allowing traffic while sealing air flow. Infiltration through a revolving door (except for a small amount passing though the door seals) is virtually not affected by building height, indoor-outdoor pressure difference, and fan operation.

Air Infiltration:
Revolving Door vs. Swing Door



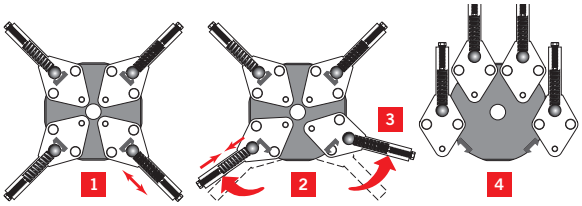
Infiltration rates through a swinging door are about 900 cubic feet (25.5 cubic meters) per person for a single-bank entrance, and 550 cubic feet (15.6 cubic meters) per person for a vestibule entrance. But it is only about 60 cubic feet (1.7 cubic meters) per person for a manually operated revolving door, and 32 cubic feet (0.9 cubic meters) per person for an automatic revolving door.

SAFETY

Dependable operation with little maintenance

Attention to detail goes beyond the aesthetics of a revolving door. To ensure dependable operation with minimum maintenance, we developed and perfected our own operating hardware. All operating hardware used in Crane revolving doors is manufactured by us or under our direct control. For example, our bookfold mechanism features machined cast bronze discs and hangers that are finished to match your door. Required by law on revolving doors in the United States, a bookfold mechanism provides emergency egress. The pressure to engage the bookfold mechanism is adjustable to meet local conditions—for example, stack conditions, negative pressure, and wind conditions. Likewise, our speed control has a precision-machined, cast-steel gear train mounted in the ceiling canopy or floor. The speed control is factory set to ensure that the revolving door does not exceed the revolutions per minute set by governing building codes.

BOOKFOLD MECHANISM



1. During normal operation, spring tension holds ball in socket maintaining proper wing configuration.
2. Panic pressure on wing compresses spring and releases ball.
3. Minimal pressure is required to continue bookfolding.
4. Wings bookfold either way, providing a clear passage on both sides. Release spring tension is adjustable.

Optional patented bookfold lock

- Standard on security doors
- Recommended for larger doors
- Aesthetically subtle and code-compliant

CRANE 1000 SERIES ENTRY-LEVEL DOOR

The Crane 1000 Series door provides the function, traffic flow advantage, and energy savings of a revolving door for budget conscious projects. Fabricated with rigid aluminum construction, the 1000 Series door offers options allowing you to match the door to your entrance requirements. Select from several size options, canopy designs, and custom painted, anodized, or clad finishes.

The 1000 Series includes our reliable Crane speed control; Crane bookfold mechanism; a smooth-surface ceiling without pie wedges or visible supports; and a superior rubber-and-felt weather seal.

Crane AL1000-M

CRANE 2000 SERIES SEMI-CUSTOM DOOR

The Crane 2000 Series uses fully formed and welded construction on the enclosure and canopy, yet allows for clad wings in stainless steel or bronze over aluminum sub-frame for a sleek appearance.

The attachments are fully customizable and the door is available in a variety of sizes, finishes, and canopy designs.

With a clad construction and finishing process second to none, 2000 Series doors provide your building with a robust and reliable entrance that catches the eye.

Crane AL2000-A

CRANE 3000 SERIES CUSTOM DOOR

Crane 3000 Series doors combine premium construction with unmatched custom design, using materials such as mahogany or oak, stainless steel or bronze. Wooden doors are hand-crafted by skilled mill workers who meticulously design and sculpt the door panel to meet your specification.

The Crane 3000 Series is the only fully formed and welded revolving door in the industry with a 5-year standard warranty. For a smooth, beautiful appearance, the surface material is welded to a steel or stainless steel subframe, eliminating seams caused by cladding pre-finished materials to an aluminum subframe.

With optional automation, the Series 3000 door becomes even more versatile. The Crane Modular Drive System featuring an advanced microprocessor control makes automatic doors smart; it continually monitors the door and occupants to ensure safe operation.

Crane WD3000-M

CRANE 4000 SERIES ALL GLASS DOOR

The Crane 4000 Series is the original all glass revolving door. It provides a spectacular first impression with its elegant and sophisticated design. Rich styling and sleek lines reinforce the exclusive image desired more and more for exquisite high end store fronts and building entrances. The 4000 Series door is fully customizable, including push bars and attachment options to the store front, and the connection between the enclosure wall and exposed ceiling glass.

Crane SS4000-M

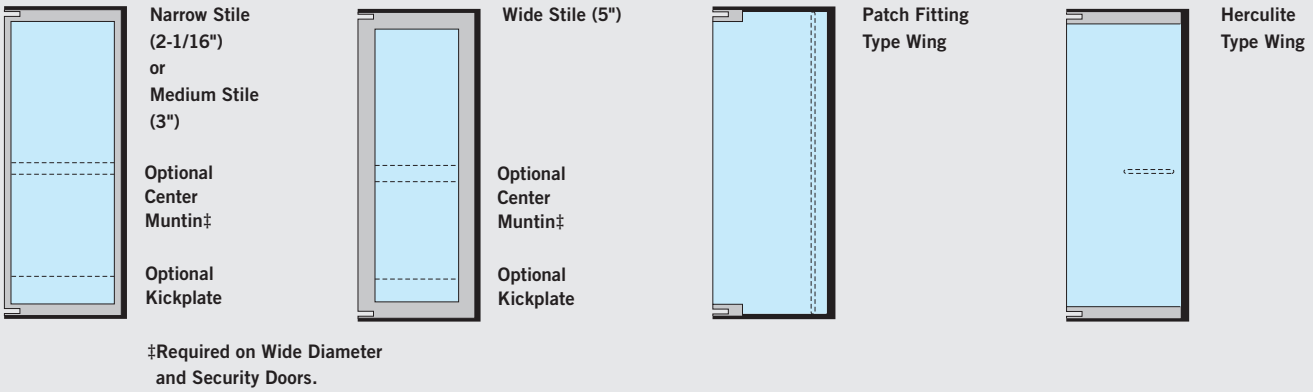
CONSTRUCTION

1000 Series
Crane produces 1000 Series revolving doors from aluminum extrusions and sheet material. Each piece is carefully cut and fitted. Connections are tightly bolted together with hairline joints. After fabrication, all exposed surfaces are mechanically finished to eliminate marks caused by rolling, forming, and welding. Anodized or painted finish is then applied. All standard colors, as well as most exotics and metallics can be applied.

2000 Series
In addition to fully formed and welded construction, Crane fabricates 2000 Series revolving door wings by cladding prefinished metal sheet over full 7 mil exterior grade anodized aluminum substructures. When value engineering is required, clad construction is an excellent alternative. Crane clad doors are available in prefinished brushed or mirror stainless steel and bronze.

3000 Series
Crane 3000 Series revolving doors are cut, formed, and precisely welded from heavy USS 16 gauge stainless steel or 14 B&S gauge bronze sheet and compatible bar stock to create the sturdiest structural elements possible. The exterior surface metal is fully welded to the interior reinforcing substructure. All four corners of the door wings are welded. The interior enclosure-post-to-base connections are welded as well. Canopy fascia are visually seamless and attached to the ceiling soffit with concealed welds. All exposed surfaces are ground and polished to eliminate blemishes from rolling, forming, and welding.

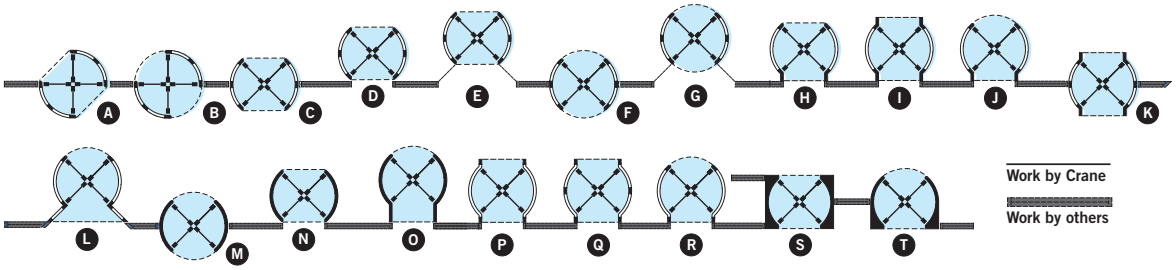
WING DESIGNS



‡Required on Wide Diameter and Security Doors.

ATTACHMENT PLANS

Typical Attachment Plans

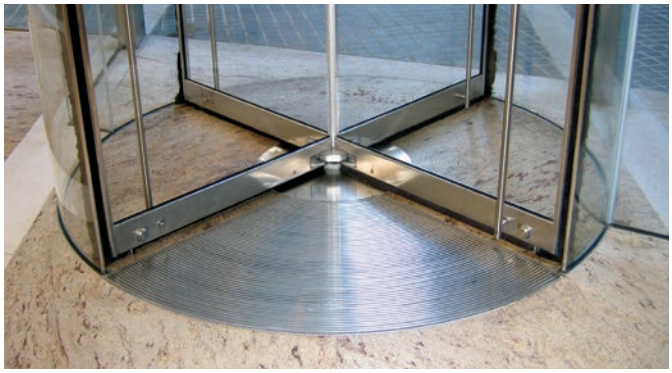


OPTIONS

- **Ceiling Lights**—Optional fixtures consisting of translucent lens and snap-in trim ring of the same material and finish as the door are mounted flush in the ceiling. Standard and custom fixtures available. Not available for glass ceiling installations.

- **Standard and Custom Push Bars**—Standard push bars are same material and finish as door. Formed from 1/2" x 1-1/2" rectangular bar or 1" diameter round bar. Mounted with through-bolts or concealed fasteners. Custom push bars are available with a 1-1/4" maximum projection from face of door stile.

- **Self-Positioning Closer**—Senses when the door comes to rest at any position other than closed, rotating the door to the closed position with all four door wing weathersweeps in contact with the enclosure wall. The door is then set in the most welcoming position for the next user while maintaining the maximum weather seal between the indoor and outdoor environments. The self closer's low-energy drive (15 pounds or less in compliance with ANSI A156.19[4.4]), fits into a 7" high canopy and plugs into a 110 volt outlet.



Welded Floor Grille

- **Welded Floor Grilles**—Curved floor grilles in pie shapes, quarter radians, or arcs are available. Custom fabricated from concentrically rolled bars of stainless steel and finished to match doors.

Crane SS4000-M
Walgreens, Chicago, IL

PRODUCT SELECTOR GUIDE

Model	Mtrl	Finishes	Op Mode	Attachment Plan‡	Diameter	Door Opening Ht	Enclosure Material	Enclosure Glass	Sightline†
AL1000	AL		All	A,B,C,D,F	6'-6", 7' (ID) 8", 9", 10', 12' (OD)	7' up to 9'	Glass	7/16" clear or tinted*	4"
AL2000	AL		All	A,B,C,D,F, H,I,J	6' (ID) to 12' (OD)	7' up to 9'	Glass or Aluminum Panels	7/16" clear or tinted*	4", 6", or Custom (up to 24")
AL3000	AL		All	All	6' (ID) to 12' (OD)	7' up to 10', Custom	Glass or Solid Metal	7/16" or 9/16" clear or tinted**	1" to 36"
AL4000	AL		All	All	6' (ID) to 8' (OD)	7' up to 10', Custom	Glass	9/16" clear or tinted*	0" to 36"
SS1000	AL/ SS		All	A,B,C,D,F	6'-6", 7' (ID) 8", 9", 10', 12' (OD)	7' up to 9'	Glass	7/16" clear or tinted*	4"
SS2000	AL/ SS		All	A,B,C,D,F, H,I,J	6' (ID) to 12' (OD)	7' up to 9'	Glass	7/16" clear or tinted*	4", 6", or Custom (up to 24")
SS3000	SS		All	All	6' (ID) to 12' (OD)	7' up to 10', Custom	Glass or Solid Metal	7/16" or 9/16" clear or tinted**	4", 6", or Custom (up to 24")
SS4000	SS		All	All	6' (ID) to 8' (OD)	7' up to 10', Custom	Glass	9/16" clear or tinted**	0" to 36"
BZ1000	AL/ BZ		All	A,B,C,D,F	6'-6", 7' (ID) 8", 9", 10', 12' (OD)	7' up to 9'	Glass	7/16" clear or tinted*	4"
BZ2000	AL/ BZ		All	A,B,C,D,F, H,I,J	6' (ID) to 12' (OD)	7' up to 9'	Glass	7/16" clear or tinted*	4", 6", or Custom (up to 12")
BZ3000	BZ		All	All	6' (ID) to 12' (OD)	7' up to 10", Custom	Glass or Solid Metal	7/16" or 9/16" clear or tinted**	1" to 36"
BZ4000	BZ		All	All	6' (ID) to 8' (OD)	7' up to 10', Custom	Glass	9/16" clear or tinted**	0" to 36"
WD3000	WD		M	All	6' (ID) to 8' (OD)	7' up to 9', Custom	Glass or Solid Wood	7/16" or 9/16" clear or tinted**	1" to 36"

‡See Attachment Plans, page 17 *Center post required **Center post optional †Enclosure base sightline

KEY:

Mtrl (Material)	
AL	Aluminum
SS	Stainless Steel #304, #316
BZ	Bronze #220, #280, Nickel Silver
WD	Mahogany, Oak

Finishes			
○	Clear Anodized	●	#7 Mirror
●	Dk BZ Anodized	●	#8 Mirror
●	Custom Anodized	●	Non-Directional
●	Painted	●	Bead Blast
●	#4 Satin	●	Custom
●	#6 Fine Satin	●	Stain

Op (Operational Mode)	
M	Manual
MS	Manual Security
A	Automatic
AS	Automatic Security

Please call the Crane Factory at 800-942-7263 for any questions or clarifications, or send email to cranesales@dorma-usa.com.

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CRANE REVOLVING DOORS

1000 Series Product Selector Guide

Crane 1000-M Series

Model	Material	Canopy Fascia Ht	Attachment Plans[1]	Diameter	Wing Style Option	Door Wings	Door Opening Ht	Enclosure Material	Enclosure Glass	Enclosure Base
AL1000	Aluminum	4", 8", or 12"	A,B,C,D,F	6'-6", 7' (ID) 8' (OD)	Narrow or Medium	3 or 4	7' up to 9'	Glass	7/16" clear or tinted[2]	4"
SS1000	Aluminum Clad, Stainless Steel (#304, #316)	4", 8", or 12"	A,B,C,D,F	6'-6", 7' (ID) 8' (OD)	Narrow or Medium	3 or 4	7' up to 9'	Glass	7/16" clear or tinted[2]	4"
BZ1000	Aluminum Clad, Bronze (#220, #280), Nickel Silver	4", 8", or 12"	A,B,C,D,F	6'-6", 7' (ID) 8' (OD)	Narrow or Medium	3 or 4	7' up to 9'	Glass	7/16" clear or tinted[2]	4"

Crane 1000-A Series

Model	Material	Canopy Fascia Ht	Attachment Plans[1]	Diameter	Wing Style Option	Door Wings	Door Opening Ht	Enclosure Material	Enclosure Glass	Enclosure Base
AL1000	Aluminum	8" or 12"	A,B,C,D,F	8', 9', 10', 12' (OD)	Medium or Wide	3 or 4	8'-6"	Glass	7/16" clear or tinted[2]	4"
SS1000	Aluminum Clad, Stainless Steel (#304, #316)	8" or 12"	A,B,C,D,F	8', 9', 10', 12' (OD)	Medium or Wide	3 or 4	8'-6"	Glass	7/16" clear or tinted[2]	4"
BZ1000	Aluminum Clad, Bronze (#220, #280), Nickel Silver	8" or 12"	A,B,C,D,F	8', 9', 10', 12' (OD)	Medium or Wide	3 or 4	8'-6"	Glass	7/16" clear or tinted[2]	4"

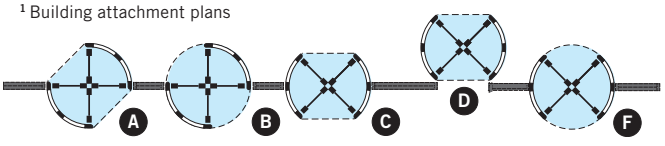
Crane 1000-S Series

Model	Material	Canopy Fascia Ht	Attachment Plans[1]	Diameter	Wing Style Option	Door Wings	Door Opening Ht	Enclosure Material	Enclosure Glass	Enclosure Base
AL1000	Aluminum	12"	A,B,C,D,F	6'-6", 7' (ID) 8' (OD)	Narrow or Medium	3 or 4	7' up to 8'-6"	Glass	7/16" clear or tinted[2]	4"
SS1000	Aluminum Clad, Stainless Steel (#304, #316)	12"	A,B,C,D,F	6'-6", 7' (ID) 8' (OD)	Narrow or Medium	3 or 4	7' up to 8'-6"	Glass	7/16" clear or tinted[2]	4"
BZ1000	Aluminum Clad, Bronze (#220, #280), Nickel Silver	12"	A,B,C,D,F	6'-6", 7' (ID) 8' (OD)	Narrow or Medium	3 or 4	7' up to 8'-6"	Glass	7/16" clear or tinted[2]	4"

Available Finishes

AL1000 Clad	SS1000 Clad	BZ1000 Clad
Clear Anodized	#4 Satin	#4 Satin
Dk BZ Anodized	#7 Mirror	#7 Mirror
Custom Anodized		Custom
Painted		

[1] Building attachment plans



[2] Center post required

NOTE: Contact us or visit our web site for information about other Crane products.

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