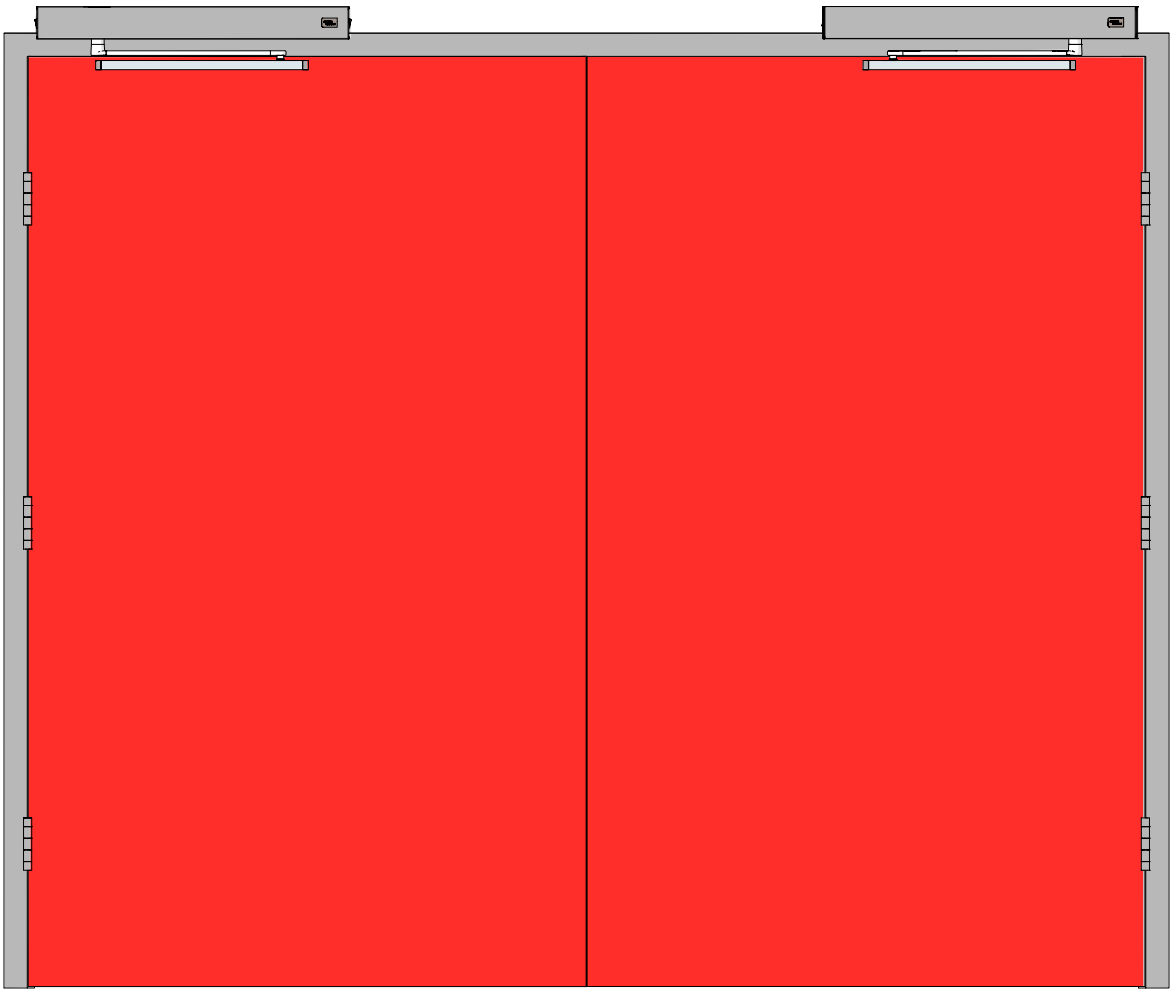


ED900

Low Energy Swing Door Operator (Fine cover) Double doors

Installation Instructions

08125320 – 02-2020

| EN |

dormakaba

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1 General information

1.1 General information

1.1.1 Installation Instructions

This manual provides installation instructions for ED900 low energy swing door operators used in double door installations.

1.1.2 Manual storage

This document must be kept in a secure place, and accessible for reference as required.
If the door system should be transferred to another facility, insure that this document is transferred as well.

1.1.3 dormakaba.com website

Manuals are available for review, download, and printing on the dormakaba.com/us website.

1.1.4 Dimensions

Unless otherwise specified, all dimensions are given in inches (") and [mm].

1.1.5 Building codes and standards

ED900 installation: observe applicable national and local building codes.

1.1.6 Symbols used in these instructions.

WARNING

This symbol warns of hazards which could result in personal injury or threat to health.

CAUTION

This symbol warns of a potentially unsafe procedure or situation.

NOTICE

Draws attention to important information presented in this document.

TIPS AND RECOMMENDATIONS

Clarifies instructions or other information presented in this document.

1.2 ED900 Arm configurations

1.2.1 Arm configurations.

ED900 is suitable for installation using the following arm configurations:

- **J8** – Standard push arm, 0 - 8" reveal
- **J12** – Deep reveal push arm, 8" - 12" reveal
- **T** – Arm and track, 0 - 1" reveal
- **T275** – Deep reveal arm and track, 1" - 2 3/4" reveal

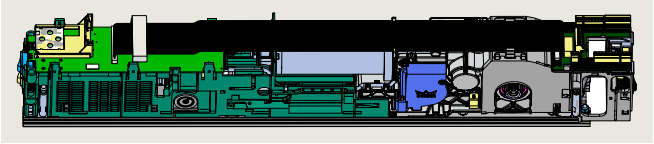
2 Product description

2.1 Product description

2.1.1 Intended use.

The ED900 is a low energy electromechanical operator used exclusively for opening and closing interior swing doors.
The ED900 operator must be installed on an interior building surface.

Fig. 2.1.1 ED900 operator



2.1.2 Low energy operator.

ED900 is supplied only as a low energy operator.

- The operator is supplied with a reduced power motor and a brake (Para. 4.4 - component view).
- The brake is used during door hold open time.

WARNING

To reduce risk of injury to persons, use this ED900 operator only with a swing door for which the ED900 is designed for.

- Reference Chapter 6, Technical data.

TIPS AND RECOMMENDATIONS

Insure operator door configuration is qualified for use on the respective smoke or fire rated door.

2.1.3 ED900 maximum door specifications.

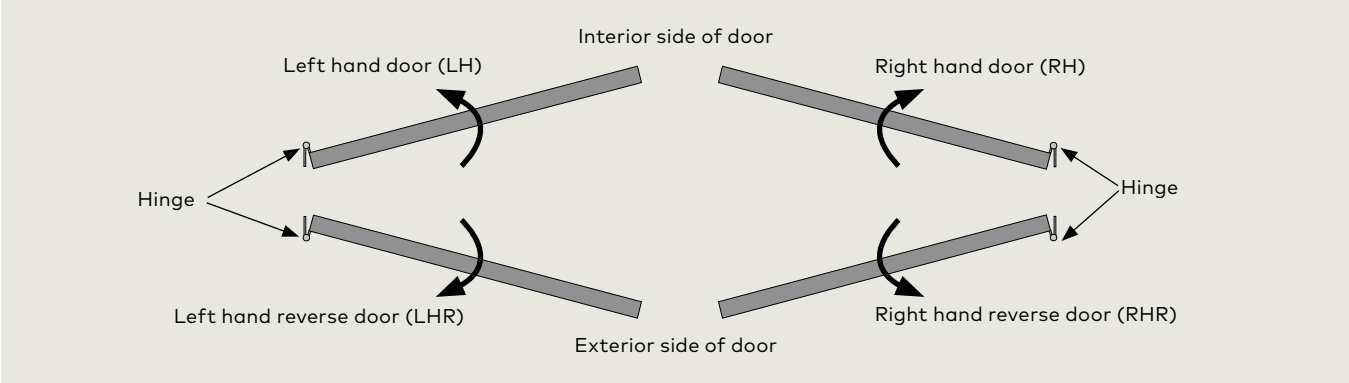
Reference Para. 6.2, Operating specifications.

2.1.4 ED900 hardware – double swing doors.

Reference Chapter 5 for ED900 hardware overview.

2.2 Handing of door

2.2.1 Handing of door.

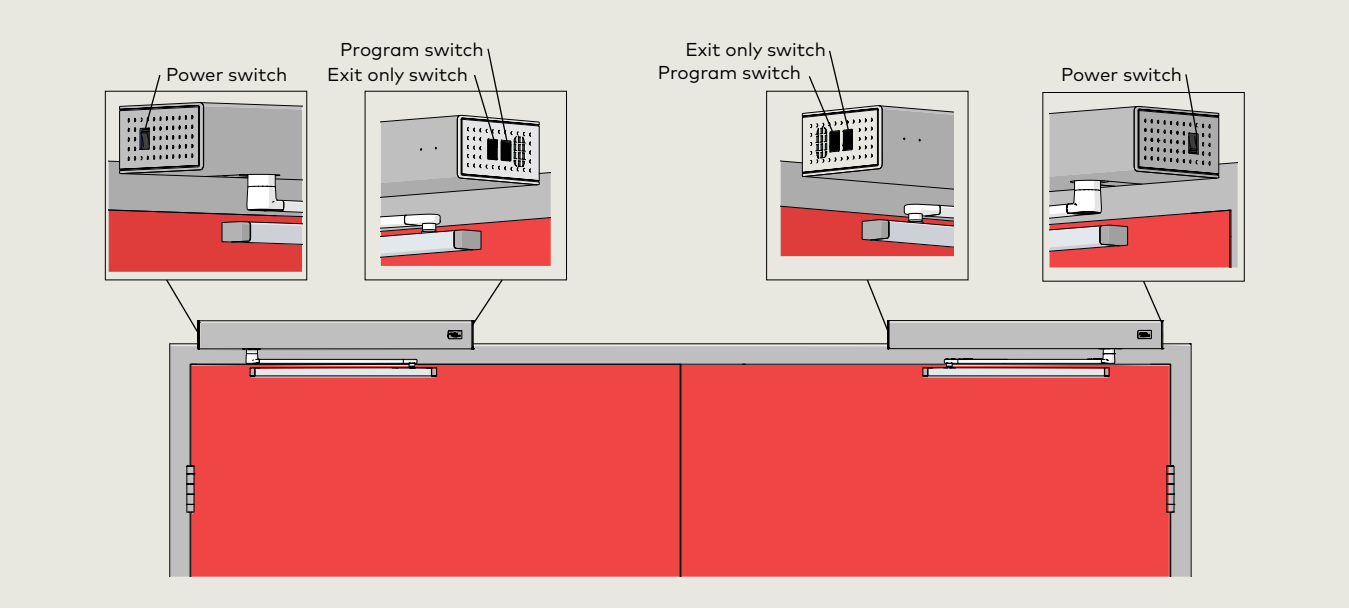


2.3 Double door installation configurations

2.3.1 Standard ED900 cover installation.

1. Each ED900 controlled by its own power switch and program switches.

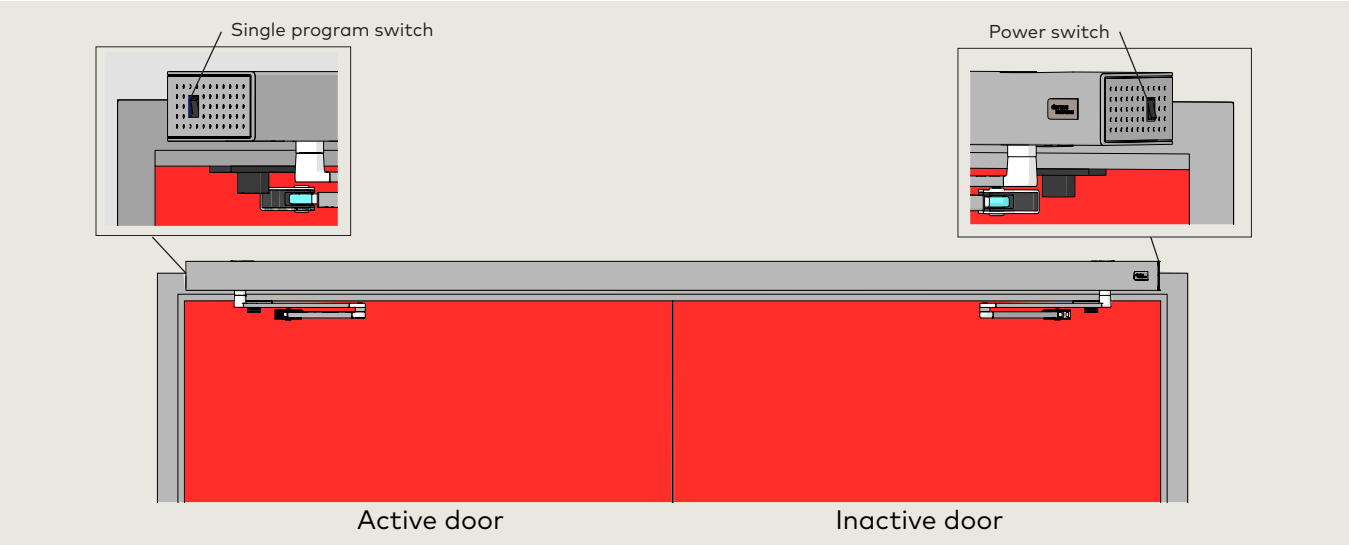
Fig. 2.3.1 ED900 installation – separate covers



2.3.2 Full width cover (option) installation.

1. ED900 power switch located on inactive door controls power to both ED900 operators.
2. ED900 single program switch located on active door controls both ED900 operators.

Fig. 2.3.2 ED900 installation – full width cover (option) installation example



3 Safety information

3.1 Safety instructions.

This document contains important instructions for installation of the ED900 swing door operators. Review these instructions thoroughly prior to installation, and follow them carefully during installation, commissioning, troubleshooting and maintenance.

3.2 Door signage requirements.

Proper signs and labels, per ANSI/BHMA A156.19 Standard for Power Assist and Low Energy Power Operated Doors, shall be applied and maintained on the door controlled by the ED900 swing door operators.

- Reference Chapter 10, ED900 Door Signage.

3.3 Safety warnings.

WARNING

An incorrect installation may result in damage to equipment or incorrect equipment operation.

WARNING

Hazard to mechanical processes by use of control settings, elements, or procedures not documented in this manual!

WARNING

Electric shock hazard!
By use of control elements, settings, or procedures not documented in this manual!

WARNING

Work on electrical equipment and 115 Vac wiring installation must be only be performed by qualified personnel!

WARNING

Metallic doors must be grounded per national and local codes!

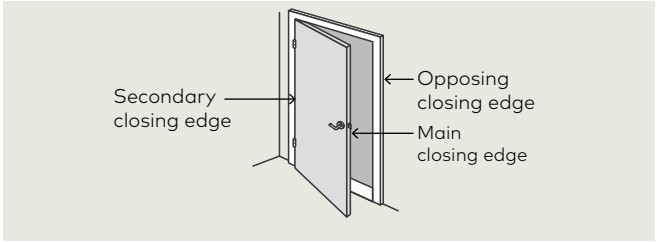
WARNING

Hand pinch point and crushing hazards at door closing edges!

WARNING

Crushing hazards at door closing edges!

Fig. 3.1 Door closing edges



3.4 Residual hazards.

WARNING

After installation, hazards such as minor crushing, impact with limited force, and risk to unsupervised children may exist depending on structural design of door area, type of door, and any safeguards that have been implemented.

WARNING

Hand pinch point and crushing hazards at push arm and arm and track!

Fig. 3.2 Push arm

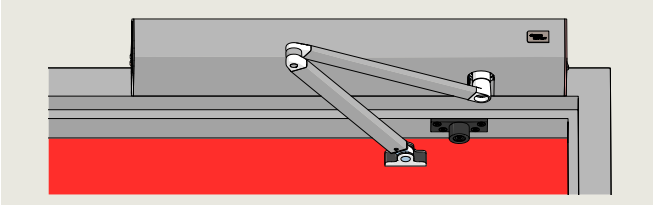
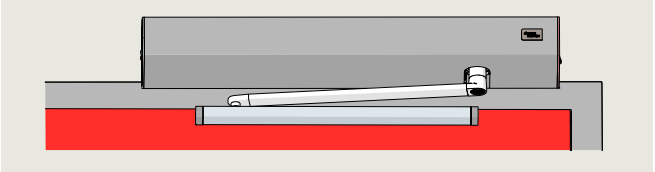


Fig. 3.3 Arm and track

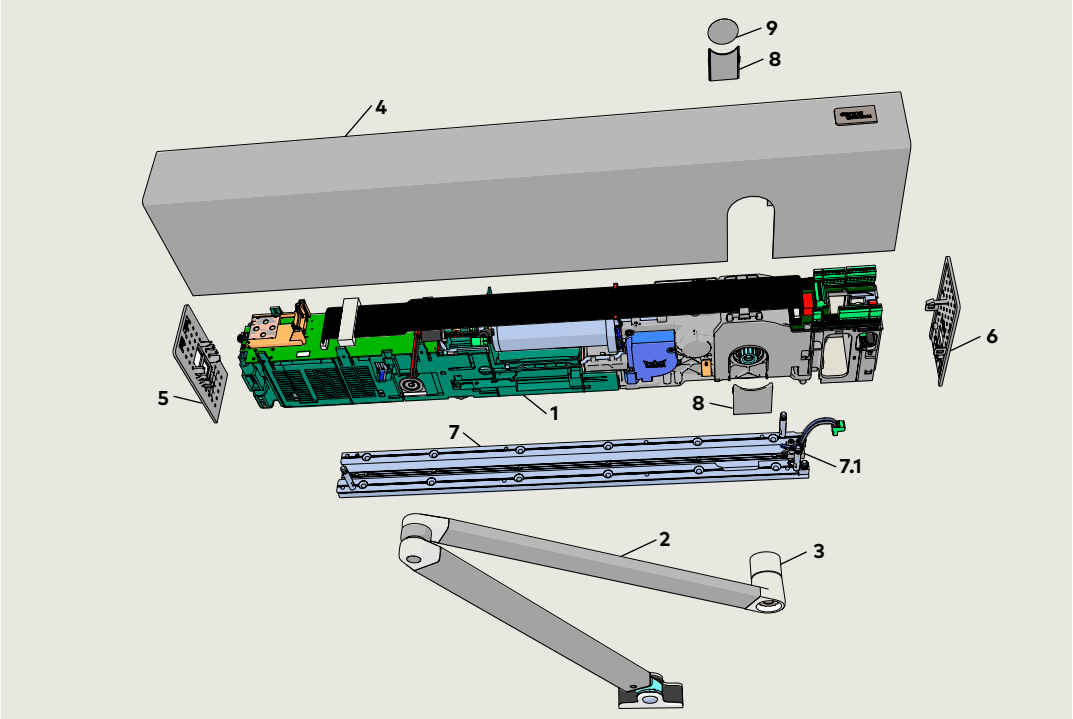


4 ED900 Product overview

4.1 ED900 push arm system

1 ED900 operator
2 J/pull arm assembly
3 Axle extension
4 Standard cover
5 End cap, program switch
6 End cap, power switch
7 Mounting plate
7.1 115 Vac terminal block
8 Spindle cap
9 Spindle cap

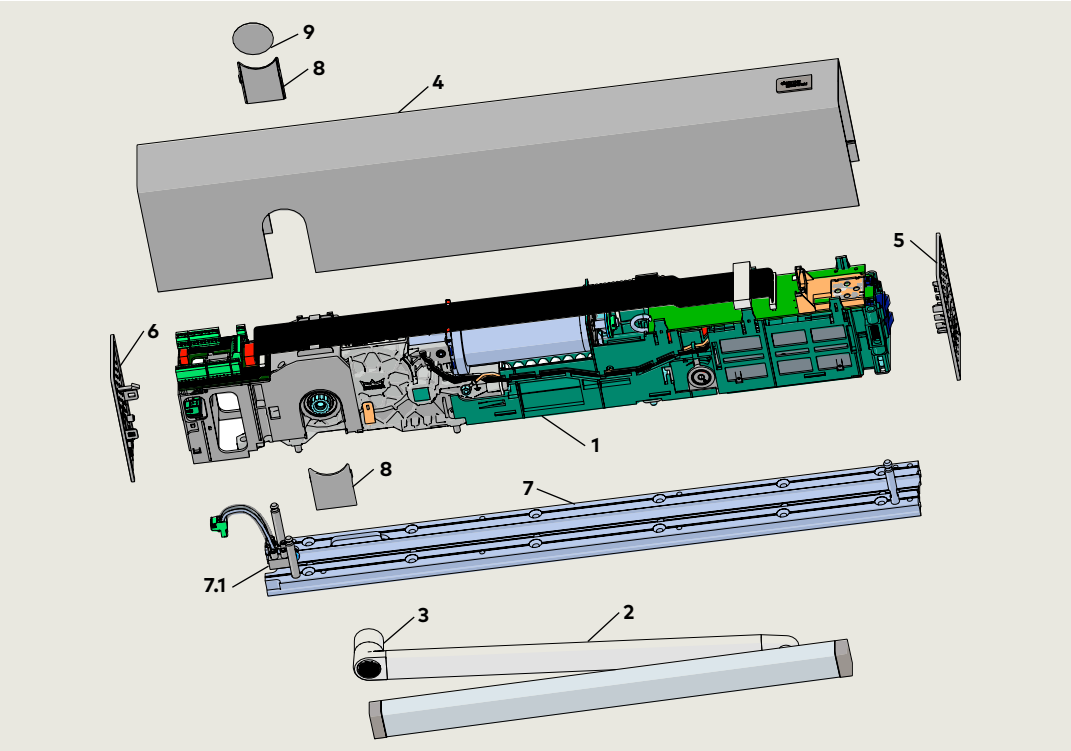
Fig. 4.1.1 ED900 RH push arm system example



4.2 ED900 pull arm system

1 ED900 operator
2 T/track/arm assembly
3 Axle extension
4 Standard cover
5 End cap, program switch
6 End cap, power switch
7 Mounting plate
7.1 115 Vac terminal block
8 Spindle cap
9 Spindle cap

Fig. 4.2.1 ED900 RH pull arm system example



4.3 ED900 – double door configurations

Fig. 4.3.1 ED900 J8 – Top jamb installation – Push

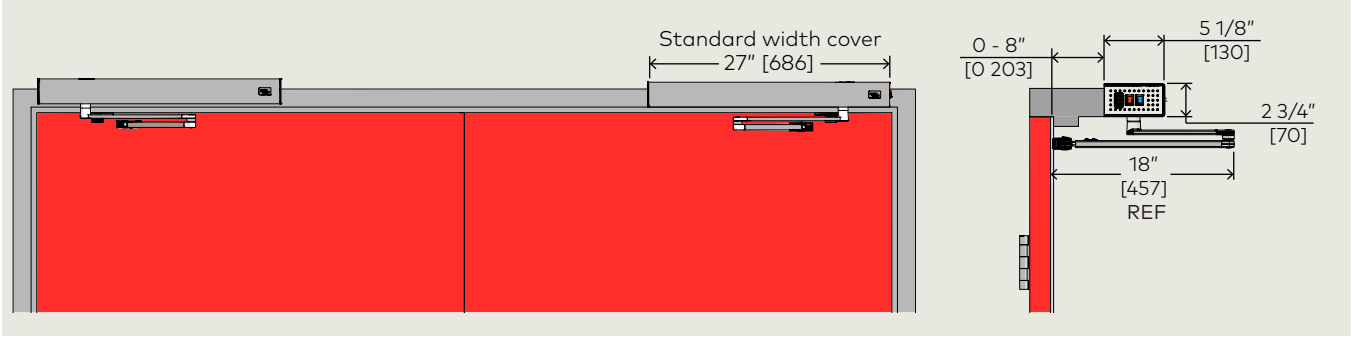


Fig. 4.3.2 ED900 T – Pull - Track mount installation

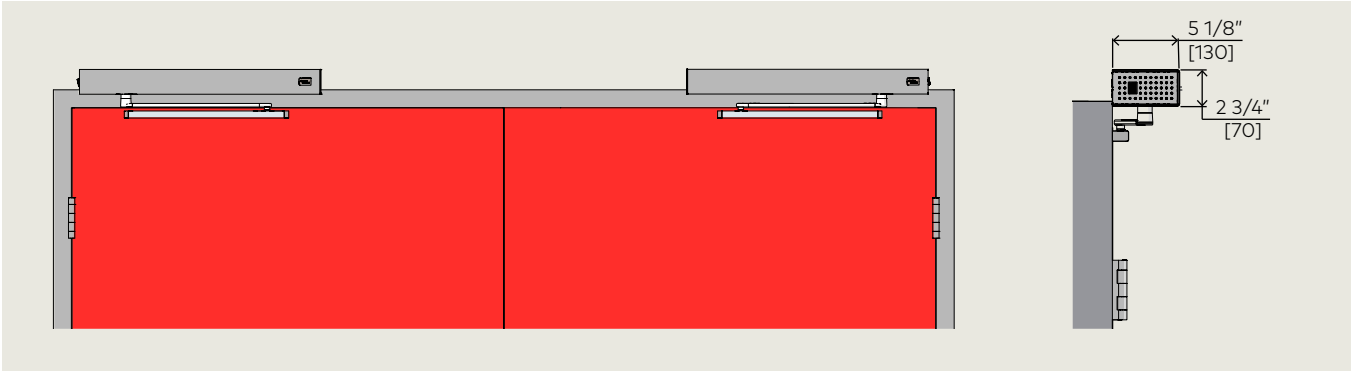


Fig. 4.3.3 ED900 J12 – Push - deep reveal installation

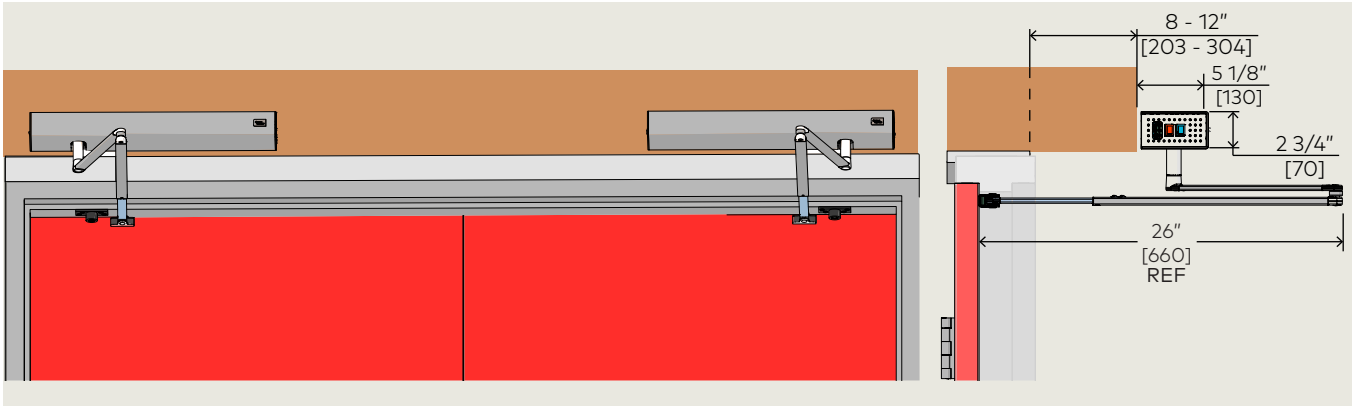


Fig. 4.3.4 ED900 T275 – Pull -track mount deep reveal installation

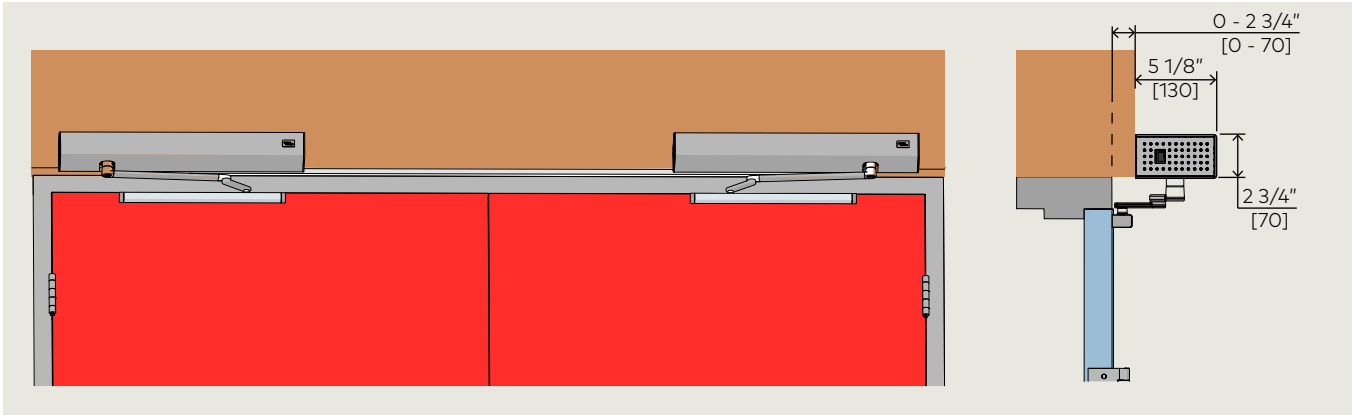


Fig. 4.3.5 – Track mount pull as push configuration – next page.

Fig. 4.3.5 ED900 T275 – Pull as push – track mount installation

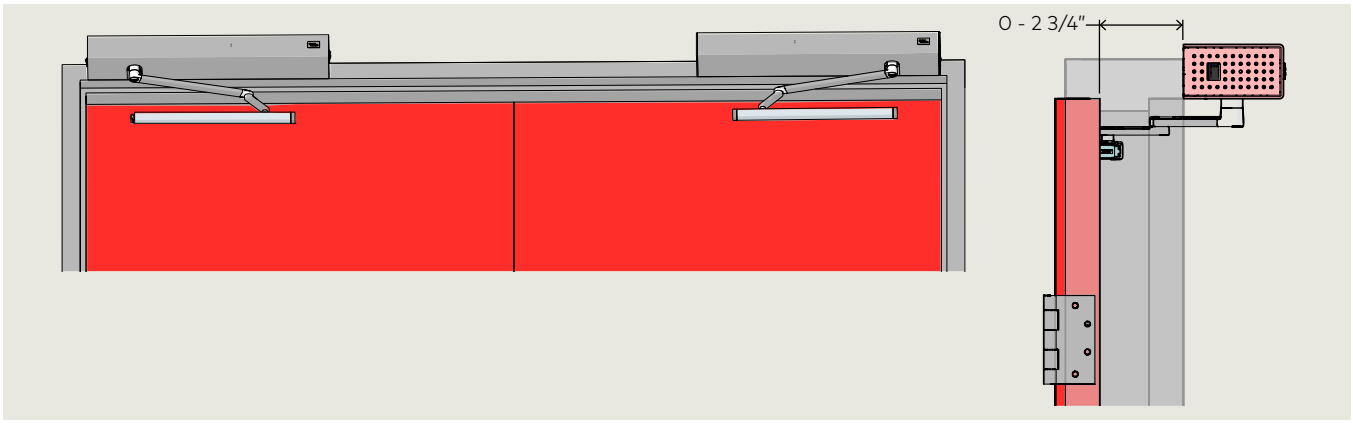


Fig. 4.3.6 ED900 – T/Pair pull – track mount installation – full length cover option

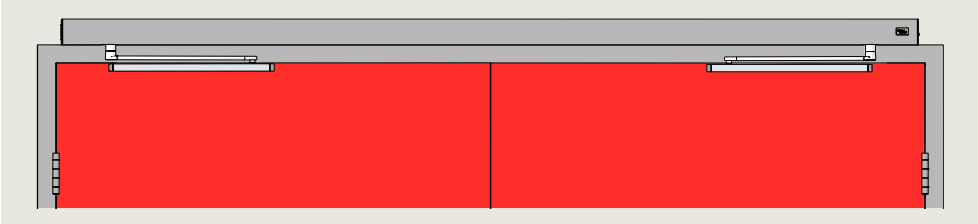


Fig. 4.3.7 ED900 – T275/Pair deep pull – full length cover option

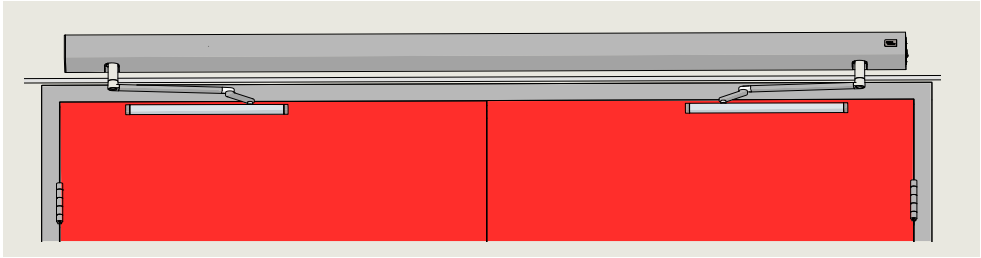


Fig. 4.3.8 ED900 –J/Pair push – full length cover option



Fig. 4.3.9 ED900– J8/Pair deep push – full length cover option

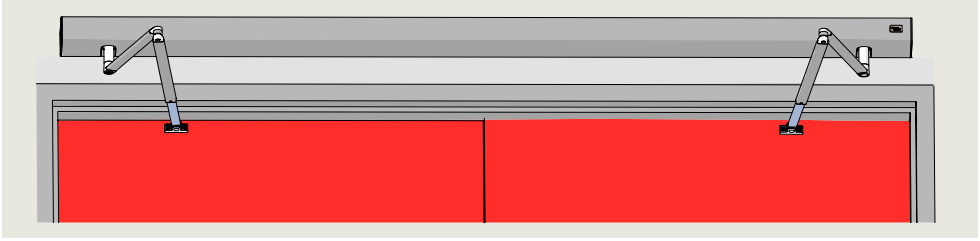
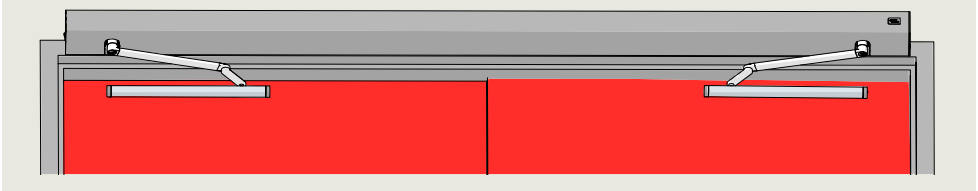


Fig. 4.3.10 ED900 – T275/Pair door pull as push – full length cover option



4.4 ED900 operator component views

1 Power switch
2 120 Vac cable
4 Splined shaft spindle
5 Operator (motor, gear, spring)
6 Spring tension adjustment, closing force
7 Program switches
8 4 button user interface
9 Information display
11 Potentiometer, power fail closing speed adjustment
12 Terminal jumper socket, push or pull mounting
15 RJ45 socket, double door operator synchronization
16 Com 1 service connector
17 Accessories terminal board
18 Mounting plate
19 Customer ground terminal
20 Guide pin
21 Ribbon cable
22 Ribbon cable socket
23 Upgrade card socket
24 Motor
25 Encoder socket and cable
26 Motor socket and cable
27 Control board
28 Motor brake

Fig. 4.4.1 ED900 component view 1

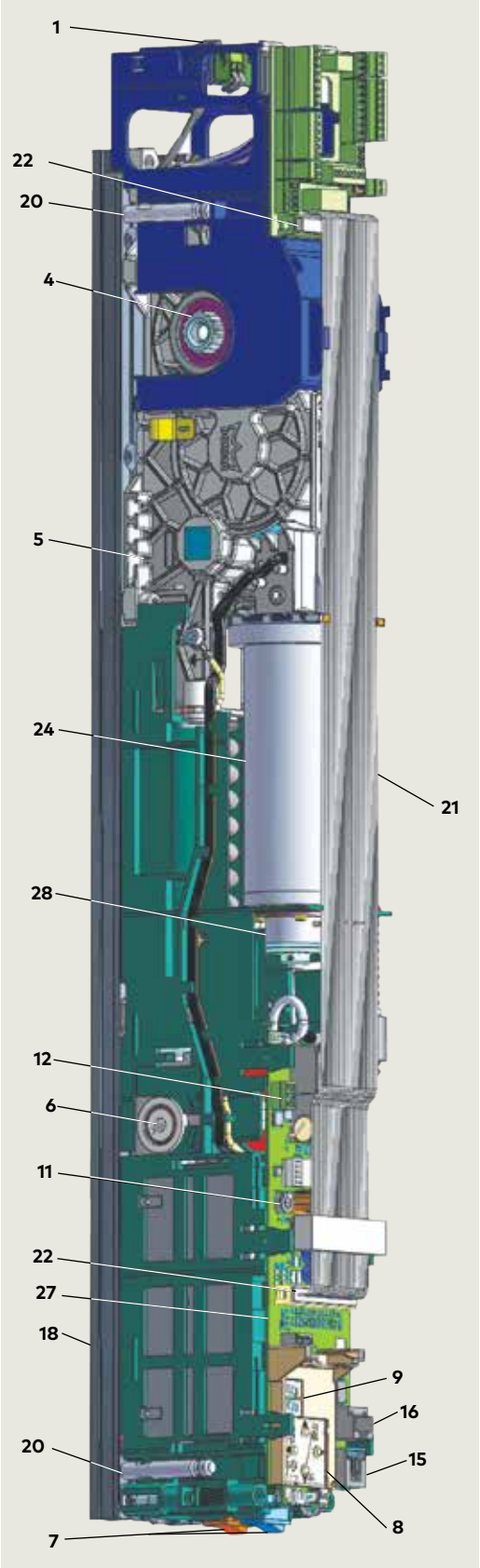
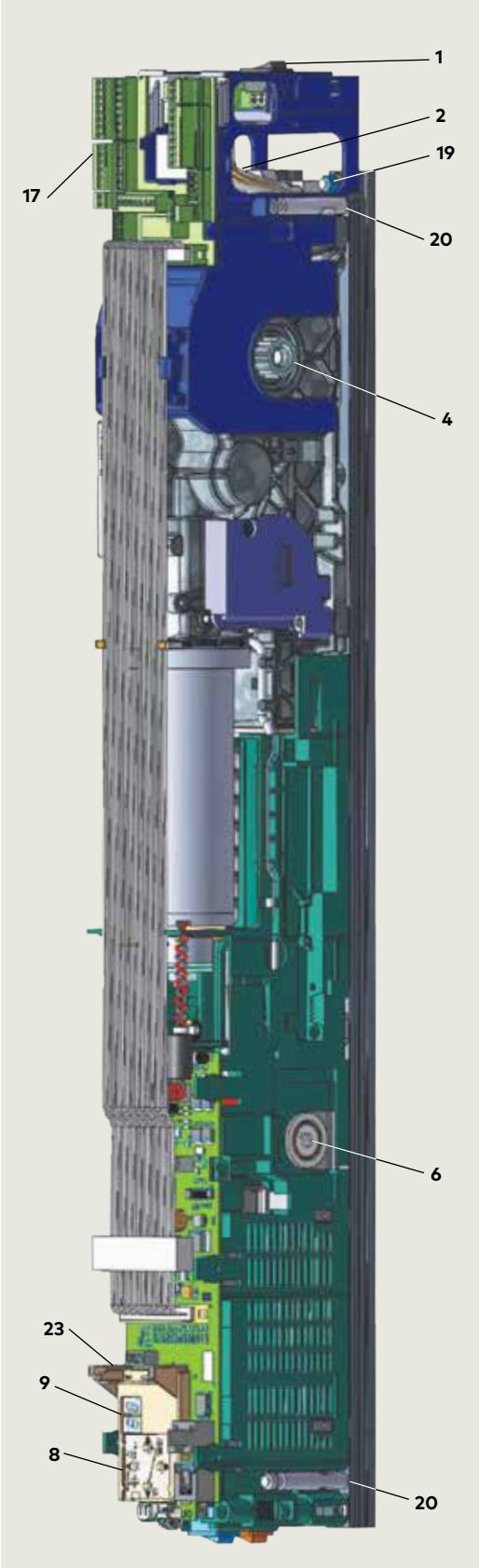


Fig. 4.4.2 ED900 component view 2



5 ED900 hardware – double door

5.1 ED900 operator and mounting plate

Fig. 5.1.1 Two - ED900 operator and mounting plate

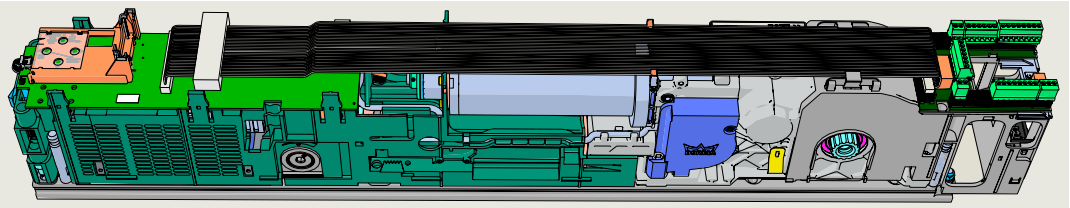


Fig. 5.1.2 Two- Accessory terminals

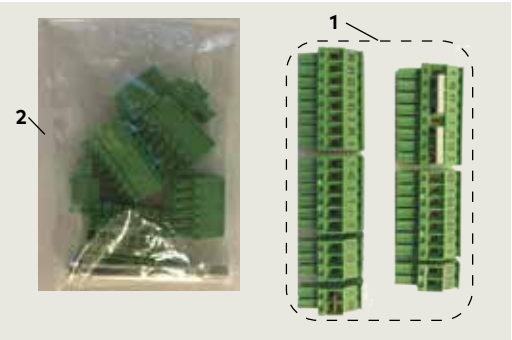
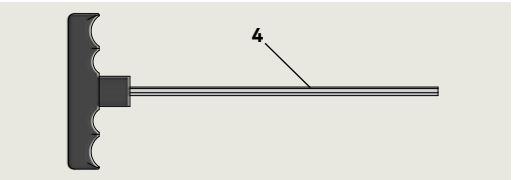


Fig. 5.1.3 5 mm T-handle hex key

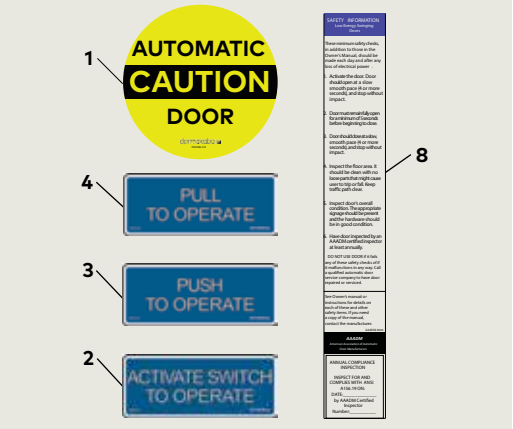


1 Terminals for accessory wiring
2 Bag containing terminals and third guide pin*
3 Guide pin
4 5 mm T-handle hex key 08120720

* Included with operator

5.2 Door decal kit, low energy

Fig. 5.2.1 Two - Decal kit, low energy 08087770



1 Decal, Automatic Caution door (both sides)
2 Decal, Activate Switch to Operate
3 Decal, Push to Operate
4 Decal, Pull to Operate
5 Decal, AAADM safety Information label, low energy

5.3 Double door communication cable

Fig. 5.3.1 Communication cable



1 Communication cable assembly 08125243
2 RJ45 connector
5 Ferrite bead

5.4 Arm assemblies

1 Drive arm
2.1 Adjustment shaft tube, 225 mm
2.2 Adjustment shaft, 225 mm
3 Shoe
4 Axle extension
5.1 Adjustment shaft tube, 450 mm
5.2 Adjustment shaft, 450 mm

Fig. 5.4.1 J8 – Splined push arm assembly, 225 mm, 0 - 8" reveal

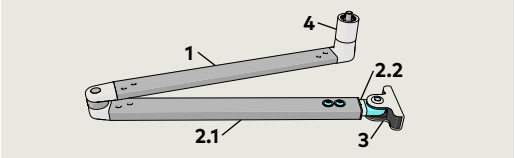
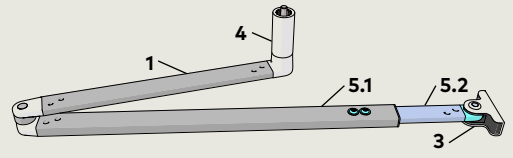


Fig. 5.4.2 J12 – Splined push arm assembly, 500 mm, 8" - 12" reveal



1 Drive arm
2 CPD lever
3 Track

Fig. 5.4.3 T275 – Splined pull arm assembly, LH, 1 - 2 3/4" reveal

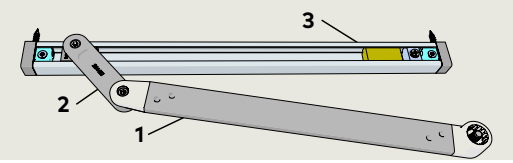
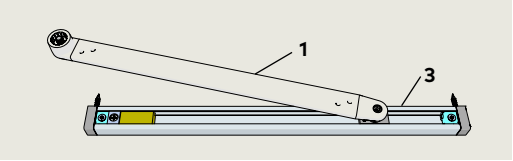
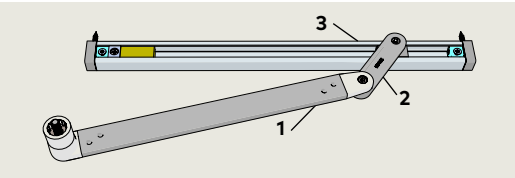


Fig. 5.4.5 T – Splined pull arm assembly, 0 - 1" reveal



1 Drive arm
2 CPD lever
3 Track

Fig. 5.4.4 T275 – Splined pull arm assembly, RH, 1 - 2 3/4" reveal



5.5 Axle extension sleeves and extensions

1 20 mm axle extension sleeve
1.1 20 mm axle extension
2 M8 -1.25 x 40 SHCS
3 30 mm axle extension sleeve
3.1 30 mm axle extension
4 M8 -1.25 x 50 SHCS
5 60 mm axle extension sleeve
5.1 60 mm axle extension sleeve
6 M8 -1.25 x 80 SHCS

Fig. 5.5.1 [20 mm] 08125201

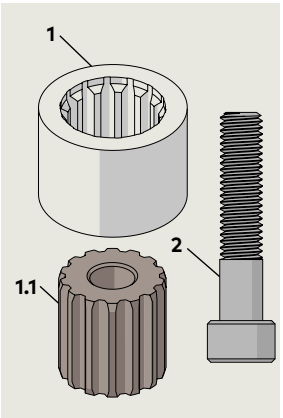


Fig. 5.5.2 [30 mm] 08125202

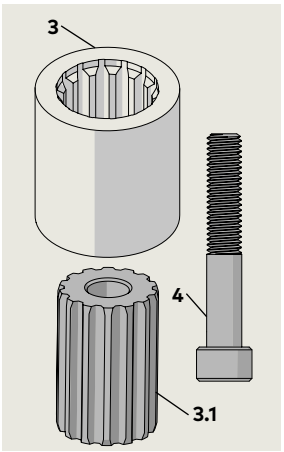
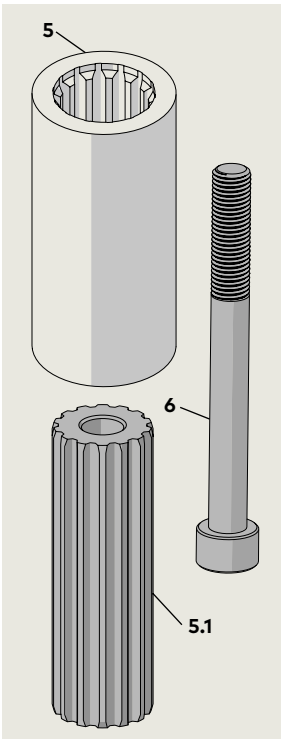


Fig. 5.5.3 [60 mm] 08125203



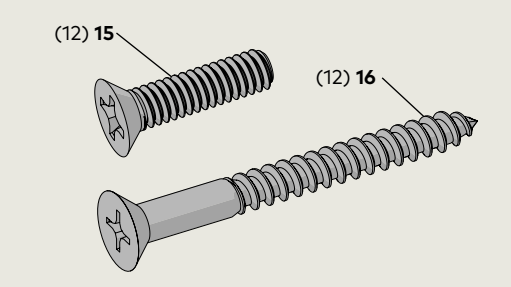
5.6 ED900 mounting plate screw kit

15,16 Mounting plate fastener kit
08120570

15 1/4-20 x 1" FH machine screw

16 No. 14 x 1 "FH wood screw

Fig. 5.6.1 Two sets - Mounting plate fasteners



5.7 ED900 arm mounting screw kits

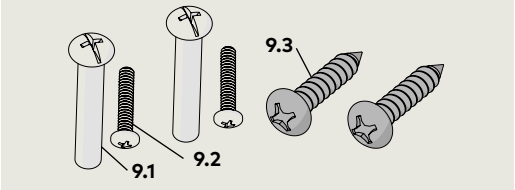
9 Push arm screw kit
08120550

9.1 10-24 x 1 1/2" barrel nut

9.2 10-24 x 1" PPHMS

9.3 #14 x 1 1/4" pan head wood screw

Fig. 5.7.1 Two sets -Push arm screw kit



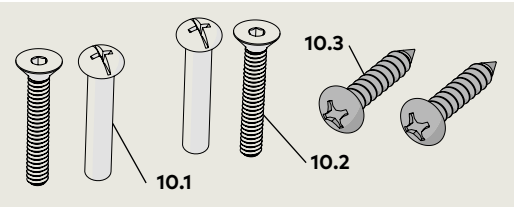
10 Pull arm screw kit
08122740

10.1 10-24 x 1 1/2" barrel nut

10.2 10-24 x 1 1/4" FHSCS (flat head socket screw

10.3 #14 x 1 1/4" pan head wood screw

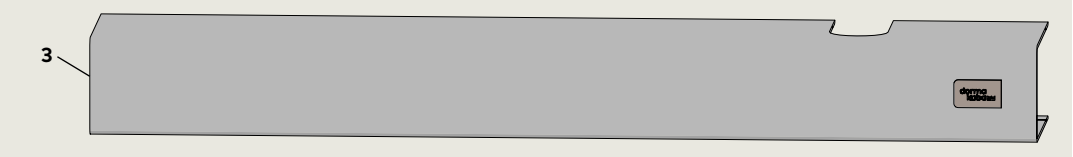
Fig. 5.7.2 Two sets -Pull arm screw kit



5.8 ED900 standard cover kit

3 Standard width cover

Fig. 5.8.1 ED900 standard width 27" cover



2 End cap, program switches

3 End cap, power switch

4 Spindle cap

5 Spindle cap

Fig. 5.8.2 ED900 operator end caps

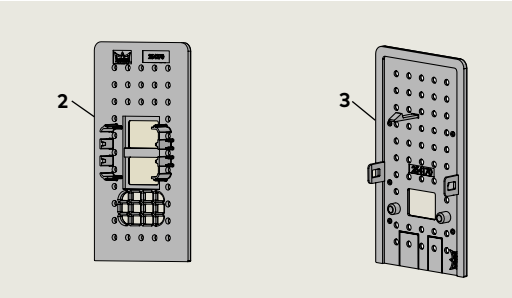
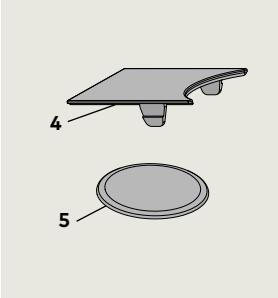
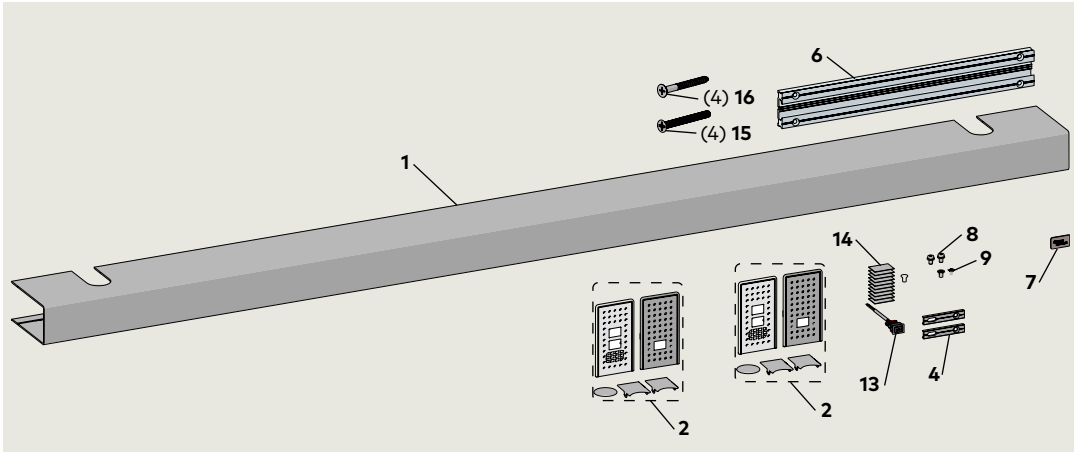


Fig. 5.8.3 Spindle cops



5.9 ED900 full width cover, mounting plate extension, and cables – option

Fig. 5.9.1 Full width cover kit 08125264



1 Fine cover double 08120370
2 End and spindle cap set 08121260
4 Mounting plate connectors 08125217
6 Front cover extension 08121870
7 dormakaba logo plate 08125241
8 M6 x 10 mm SHS with washer
9 M6 x 10 mm PFHS
13 Program switch with cable 08122770
14 Wire retainer 08125242
15 1/4-20 x 1" FH machine screw
16 No. 14 x 1 "FH wood screw

Fig. 5.9.2 115 Vac power cable



1 3 conductor cable
3 Ring lug
5 Connector

5.9.2 Power cable

- 1750 mm, 68 7/8" 08125246
- 2400 mm, 94 1/2" 08125247
- 3400 mm, 133 7/8" 08125248

Fig. 5.9.3 Single program switch



1 3 position program switch
2 3 conductor cable

5.9.3 Single program switch and cable.

- 3340 mm, 131 1/2" 08122770

5.10 Key switch panels – option

2 Key switch panel, with RJ45
3 Key switch panel
4 Communication cable for program switch panel comm port, 11 ft. [3340 mm] 08122770

Fig. 5.10.1 Key switch panels

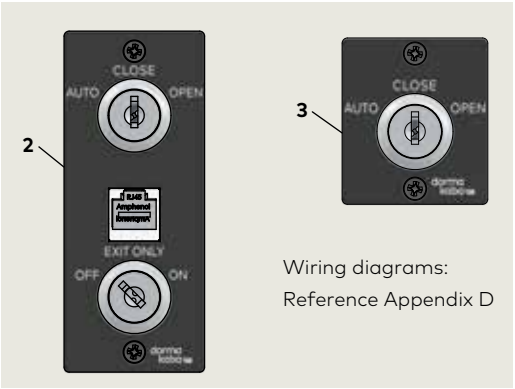
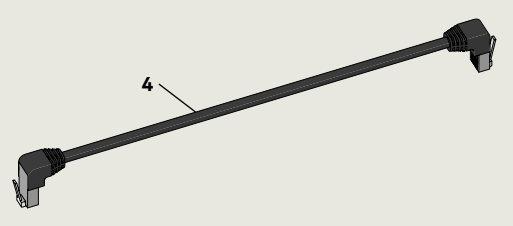


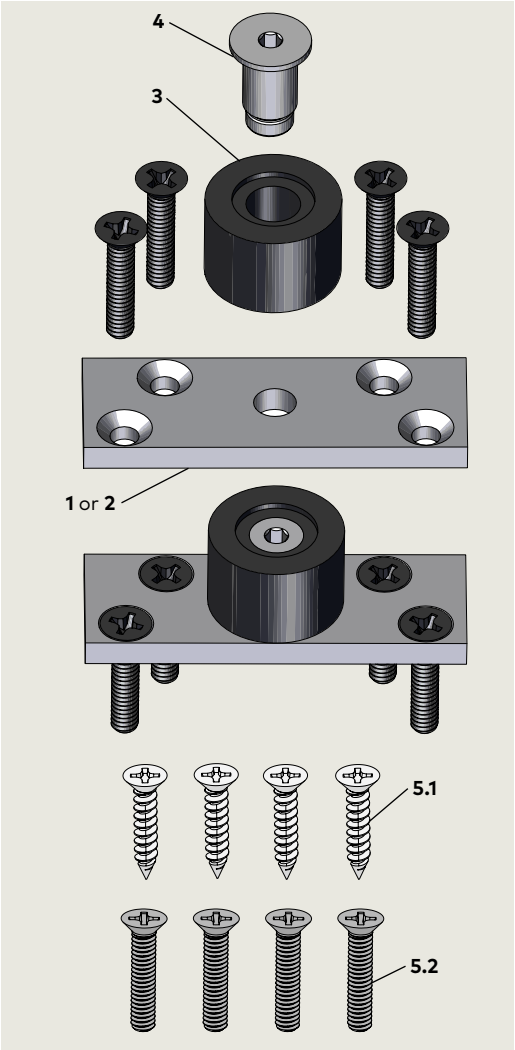
Fig. 5.10.2 Communication cable



5.11 Push arm door stop - option

Door stop assembly 1/4" thick plate
08121320
Door stop assembly 1/2" thick plate
08121330
1 Plate, bumper mounting, 1/4" thick 08120774
2 Plate, bumper mounting, 1/2" thick 08120770
3 Rubber bumper 08120750
4 Shoulder bolt 08104231
5.1 1/4-20 x 1 1/4" Phillips FHS, black oxide, SS
5.2 No. 14 x 1 1/4" Phillips FHMS for sheet metal, zinc plated steel

Fig. 5.11.1 Door stop assembly



5.12 Conduit box and wiring kit – options

4 Conduit box
08120730

Fig. 5.12.1 Conduit box

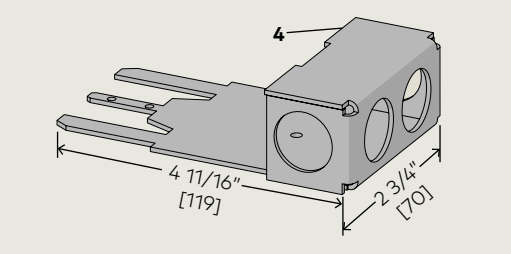
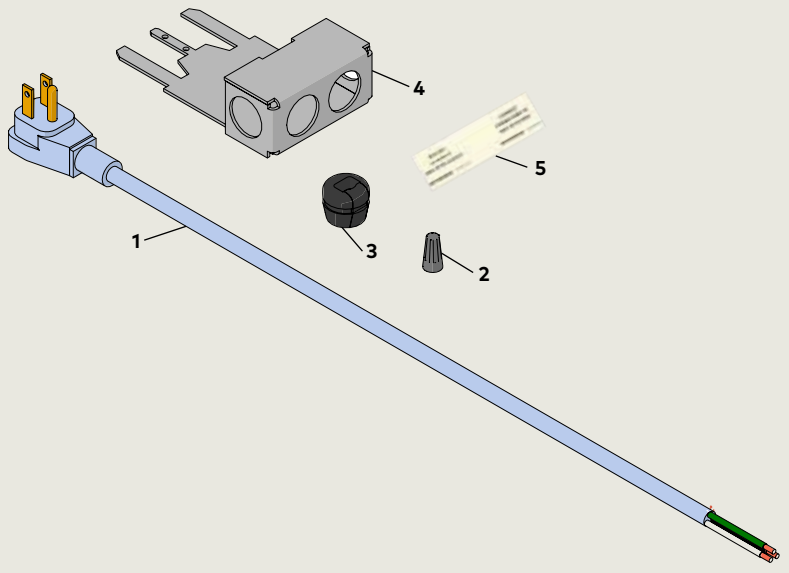


Fig. 5.12.2 Power cord wiring kit 08121110



1 Power cord
08075390

2 Wire nut

3 Cord grip
08121130

4 Conduit box
08120730

5 120 Vac label

6 Technical data

6.1 ED900 Technical data

6.1.1 Required operating conditions.

Ambient temperature	5 to 122 °F
Suitable for dry rooms only	Relative air humidity: 93% maximum, non-condensing
Power supply	115 Vac ±10%, 50/60 Hz 6.6 A maximum
Branch circuit protection (provided by others)	15 A maximum, dedicated branch circuit
Protection class	NEMA 1
Power wiring: black, white, bare copper (ground)	12 AWG maximum
Operating noise	Maximum 50 db(A)

6.1.2 General specifications.

Operator dimensions (W x H x D)	27" standard cover 27" x 2 3/4 x 5 1/8", [685 x 70 x 130 mm]
Operator weight	26.5 lb [12 kg]
Maximum door opening angle	95 to 110° depending on installation type

6.1.3 Inputs

Maximum wire size Connector plug screw size		16 AWG 1/16"	
Activation inputs	**X4***	Interior, exterior	N. O. contact
Safety sensors	**X5**	Swing, approach sides	
Night-bank (intercom system)	**X10** 57, 57a	8-24 Vdc/Vac +5%	
Night-bank (key switch)	**X1** 35, 3	**d2** parameter	Configure for N.O. or N.C. contact
Deactivation of drive function	**X6** 4, 4a	**d1** parameter	Configure for N.O. or N.C. contact

TIPS AND RECOMMENDATIONS

- ***X4**: terminal board numbers, reference Chapter 9, System accessories.
- Parameters, reference Chapter 22.

6.1.4 Outputs

Maximum wire size Connector plug screw size		16 AWG 1/16"	
Door status	**X7** 97,98,99	**Sr** parameter Door closed Door open Door closed, locked	Com, N.O., N.C. contacts

6.1.5 Integrated functions.

Hold open time:		
Automatic opening	**dd** parameter	0 to 30 s
NIght / bank	**dn** parameter	0 to 30 s
Manual opening	**do** parameter	0 to 30 s
Door blocking behavior	**hd** parameter	Automatic, manual door modes
Electric strike delayed opening for locking mechanism	**Ud** parameter	0 to 4 s
Locking device feedback **X3** 43, 3	Motor lock	
Wind load control, maximum	**Fo, Fc** parameters	33.7 lb f 150 N
Voltage independent braking circuit	Chapter 21	Adjustable with potentiometer
LED status indicators Chapter 8	Green Red Yellow	24 Vdc power Error codes Service interval
Program and Exit Only switches	Chapter 8	Auto, Close, Open Exit only; Off, On
User interface	Chapter 8	4 button keypad, 2 digit display
Firmware update	Appendix C	Firmware update
TMP, temperature management program	Overload protection	
IDC, initial drive control	Driving phase optimization	
Cycle counter	**CC** parameter	0 to 1,000,000
Power assist function	**hA, hF, hS** parameters	Drive support for manual opening of door
Push & go function	**PG** parameter	Auto opening of door at 4° open

6.2 Operating specifications

6.2.1 ED900

Maximum power consumption	120 watt	
Opening force N (lbf) **Fo** parameter	Minimum 20 (4.5)	Maximum 60 (13.5.5)
Manual closing force N (lbf) **Fc** parameter	Minimum 20 (4.5)	Maximum 60 (13.5)
Maximum door weight, pounds	220 at 48" door width	Depending on door width and application
Door width	Minimum 28"	Maximum 48"
Maximum opening speed, °/s	27	May be limited by door weight after learning cycle.
Maximum closing speed, °/s	27	

Axle extensions, [mm] inches	[20] 13/16" [30] 1 3/16" [60] 2 3/8"
Reveal depth for pull arm	1 3/16"
Reveal depth for pull arm and CPD lever	2 1/4"
Reveal depth for standard push arm	0 to 8 3/4"
Reveal depth for deep push arm	8" minimum to 11 13/16"

7 Operational mode overview

7.1 ED900 door closer modes

7.1.1 Automatic mode.
Door closer mode parameter **hd**=0.
Door opens automatically following pulse generation by a knowing act device or by push/pull.

7.1.2 Manual mode.
Door closer mode parameter **hd**=1.
Designed for doors primarily accessed manually.

TIPS AND RECOMMENDATIONS

Parameter descriptions can be found in Chapter 22; Parameters.

7.1.3 Power assist.
- Available only in door closer mode (**hd**=1), manual opening drive support is automatically adjusted to operator size.
- Parameter **hA** sets door activation angle for power assist function. Once angle reached, drive support provides easier manual opening of the door.
- Parameter **hF,** power assist function. Parameter values greater than 0 provides additional opening force.
- Parameter **hS**, power assist function support for door in closed position.

7.2 Low energy product

7.2.1 ANSI/BHMA 156.19.
ED900 operator is configured to meet requirements of a low energy application per ANSI/BHMA A156.19, U.S. Standard for Power Assist and Low Energy Power Operated Doors.

7.2.2 Low energy power operated door.
A manual door with a power mechanism that opens the door upon receipt of a knowing act activating signal, does not generate more kinetic energy than specified in ANSI 156.19, and is closed by a power mechanism or by other means.

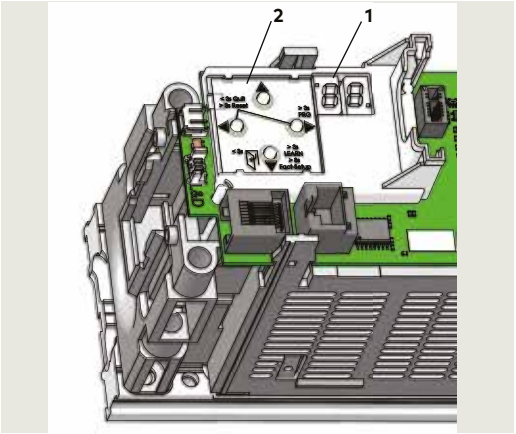
Required system safety, as a low energy application, is achieved utilizing the following design factors:
- Reduced dynamic door panel contact forces
- Reduced static door panel contact forces
- Low driving speeds
- Force limitation

8 User interface

8.1 Overview

1 2 digit display
2 4 button keypad

Fig. 8.1.1 Operator keypad and display



8.1.1 Operator user interfaces.

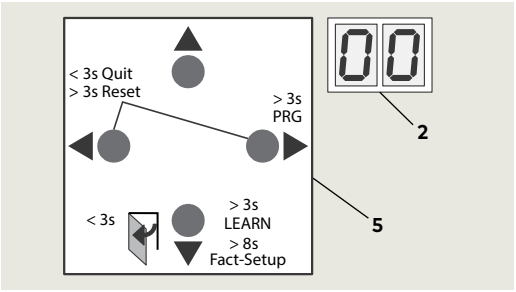
1. 4 button keypad and 2 digit display.

- 4 button keypad; to select, input and adjust door parameter values.
- 2 digit display; parameter values, error and information codes.

8.2 4 button keypad and display

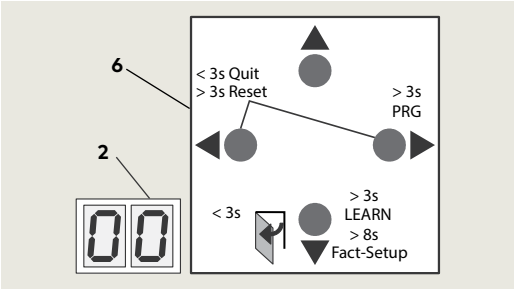
2 2 digit display
5 Button legend

Fig. 8.2.1 Door hinge side on right



2 2 digit display
6 Button legend rotated 180°

Fig. 8.2.2 Door hinge side on left



TIPS AND RECOMMENDATIONS

Symbols

- "<", Less than
- ">", Greater than

8.2.1 4 button keypad.

4 button legend is orientated so buttons have same function and position regardless of operator orientation. Button legend can be removed and rotated.

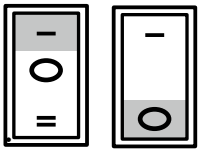
8.2.2 4 button keypad functions.

▶	Right button	1. Access parameter menu, press button > 3 seconds. 2. Edit selected parameter. 3. Save changed value.
◀	Left button	1. Reset, > 3s 2. Quit process, < 3 s.
◀▶	Both buttons together	1. Acknowledge errors, press both buttons < 3 s. 2. Reset, press both buttons > 3 s.
▲	Up button	1. Scroll through parameters and error messages. 2. Increase parameter value.
▼	Down button	1. Scroll through parameters and error messages. 2. Reduce parameter value. 3. Opening pulse, press button < 3 s. 4. Learning cycle, press button > 3 s. 5. Reset with factory setting, press button > 8 s (program switches off). 6. Identify operator orientation for display

8.3 Program and Exit Only switches

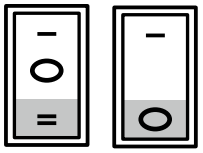
8.3.1 Program switch control modes.

- **Auto**, door opens following pulse generation by a knowing act device or push/pull.
- Door will close after hold open time (adjustable) has expired.
- Knowing act device (Para. 3.2). Door will remain at full open position for not less than five seconds.
- Push/pull actuation of door, Chapter 10. Door will remain at full open position for not less than three seconds.



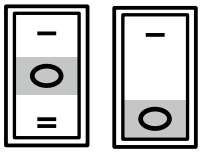
Auto

- **Open**, door opens automatically and remains open.



Open

- **Close**, door closes automatically, or remains closed.



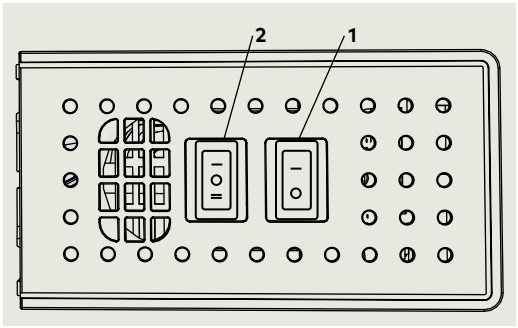
Close

8.3.2 Exit only switch.

- Disables exterior switch only.

Fig. 8.3.1 Program and Exit Only switches

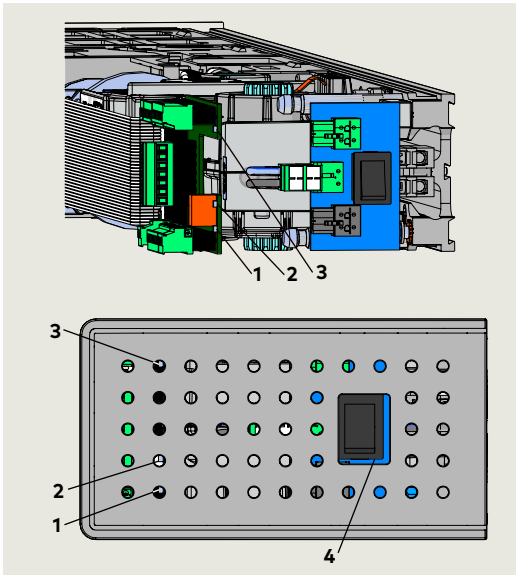
1 Exit Only switch, 2 position
2 Program switch, 3 position



8.4 Operator status LEDs

Fig. 8.4.1 Operator status LEDs

1 Red LED
2 Yellow LED
3 Green LED
4 Power switch



8.4.1 Operator status LEDs.

1. Red LED
   Blinking codes are used to indicate "In__" information (system status or operating conditions) or certain error codes "E__".
2. Yellow LED
   Maintenance interval indicator. When illuminated, an indication the operator system has to be serviced.
3. Green LED

- On, internal 24 Vdc power is On.
- Off, internal 24 Vdc power is Off.

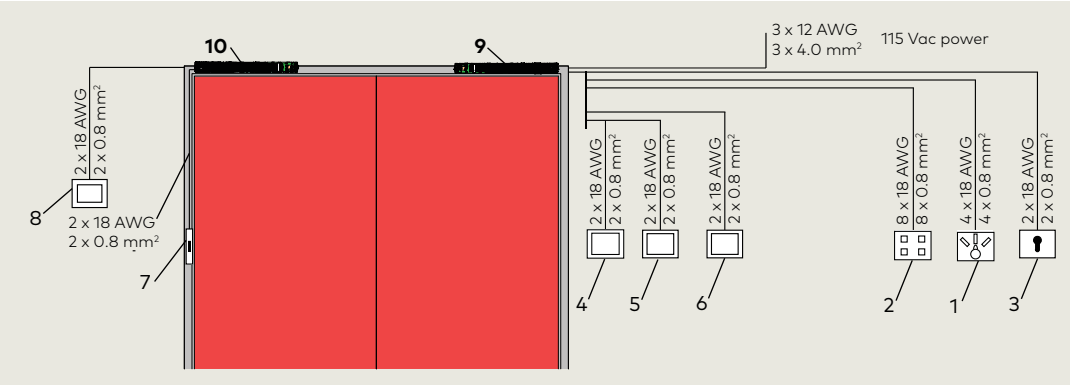
TIPS AND RECOMMENDATIONS

Information on LED status codes and maintenance intervals can be found in Appendix B, Troubleshooting.

9 System accessories

9.1 System accessory electrical connections

Fig. 9.1.1 Electrical connections, double door



1 External program switch, mechanical
2 External program switch, electronic
3 Key switch
4 Pushbutton, night / bank
5 Pushbutton, interior
6 Pushbutton, exterior
7 Door locking device
8 Manual release switch
9 ED900, active door
10 ED900, inactive door

9.2 System accessories

9.2.1 Overview

ED900 operators are normally used with system accessories available from dormakabaUSA, Inc. or other manufacturers.

9.2.2 Accessory electrical installation.

Electrical interfaces from system accessories used with operator must be planned for. This includes routing of wiring from accessories to operator.

9.2.3 System accessories, other manufacturers.

dormakaba USA, Inc. cannot guarantee compatibility for other manufacturer's accessories. If any of these accessories are used despite this caution, the operator's full range of functions may be unavailable, or the accessories may not work properly.

WARNING

Damage to operator or to connected device is also possible!

9.2.4 Power for accessories. External DC power supply is required for external consumers

(Para 9.2.6, 9.2.7).

9.2.5 Miscellaneous accessories.

1. Door status display, red, green

9.2.6 Activators

Typical activators:

1. Pushbuttons, key switches
2. Access control systems
3. Telephone systems
4. Intercoms

TIPS AND RECOMMENDATIONS

Refer to Chapter 6, Technical data for electrical interface requirements.

9.2.7 Locking devices

Typical locking devices:

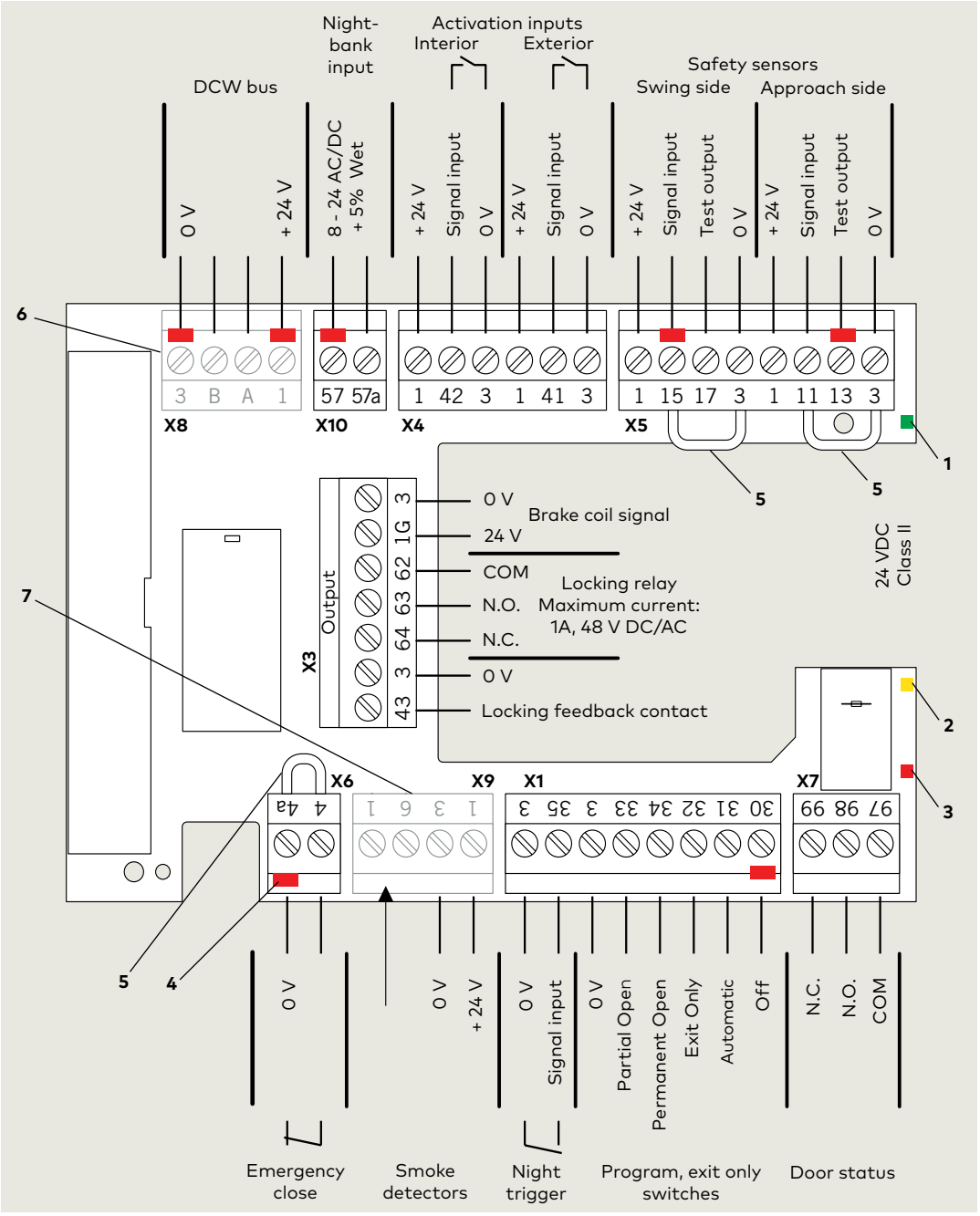
1. Electric strike plates
2. Electromagnetic locks
3. Electric locks

To insure that operator and locking device work safely when connected together, locking device mus comply with following:

1. Operating voltage, external power supply, 48 Vdc/Vac maximum.
2. Locking device relay contact, maximum load, 1 A.
3. Electric strike plate duty factor, 30% minimum.
4. Motor lock duty factor, 100%.

9.3 ED900 terminal board interfaces

Fig. 9.3.1 Terminal board electrical connections



1 Green LED (Para. 8.4)
2 Yellow LED (Para. 8.4)
3 Red LED (Para. 8.4)
4 Key (red insert) location in socket. Assigned plug has tab in same location broken off.
5 Jumpers, factory installed at following terminals:
- 4 and 4a
- 15 and 3*
- 11 and 3*

* Remove jumpers if safety sensors installed.
6 DCW® upgrade card plug (n/a)
7 Fire protection upgrade card plug

TIPS AND RECOMMENDATIONS

Do not connect system accessories to board until operator has been commissioned and learning cycle performed. Reference Chapter 25.

10 ED900 door signage

10.1 Low energy operator

10.1.1 Overview

Signage and warnings are specified in ANSI /BHMA A156.19, American National Standard for power assist and low energy power operated doors.

10.1.2 All low energy doors.

1. AUTOMATIC CAUTION DOOR decal.

- All low energy doors shall be marked with signage visible from both side of door with the words "AUTOMATIC CAUTION DOOR".
- Signs shall be mounted 50" ± 12" from floor to centerline of sign.

10.1.3 Knowing act switch used to initiate door operation.

1. ACTIVATE SWITCH TO OPERATE decal.

- When a knowing act device is used to initiate operation of door operator, door shall be provided with sign on each side of door where switch is operated with message "ACTIVATE SWITCH TO OPERATE".

10.1.4 Push/Pull used to initiate door operation.

1. PUSH TO OPERATE, PULL TO OPERATE decals.

- When push/pull is used to initiate operation of door operator, doors shall be provided with the message "PUSH TO OPERATE" on push side of door and "PULL TO OPERATE" on pull side of door.

10.1.5 Knowing act: ANSI/BHMA standard A159.19 definition.

Any conscious action with the expected result of opening a door. This includes but is not limited to::

- Wall or jamb mounted contact or non contact switches such as push plates.
- The action of manually opening (pushing or pulling) a door.
- Controlled access devices such as keypads, card readers, and key switches.

Fig. 10.1.1 AUTOMATIC CAUTION DOOR decal

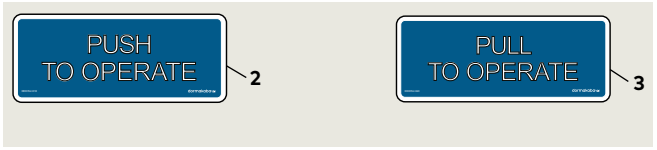


Fig. 10.1.2 ACTIVATE SWITCH TO OPERATE decal



1 Activate Switch to Operate

Fig. 10.1.3 PUSH TO OPERATE, PULL TO OPERATE decals



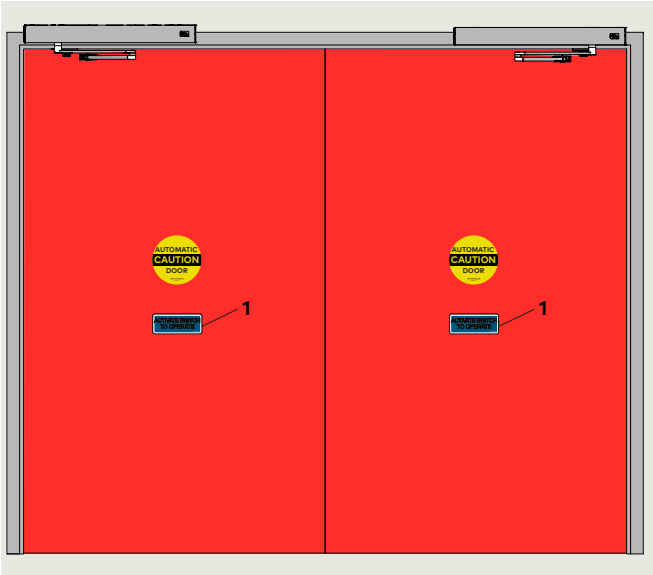
2 Push to Operate

3 Pull to Operate

10.2 Door signage, low energy double swing door

10.2.1 Knowing act switch used to initiate door operation.

Fig. 10.2.1 Door push side



1 Activate Switch to Operate

Fig. 10.2.2 Door swing side



1 Activate Switch to Operate

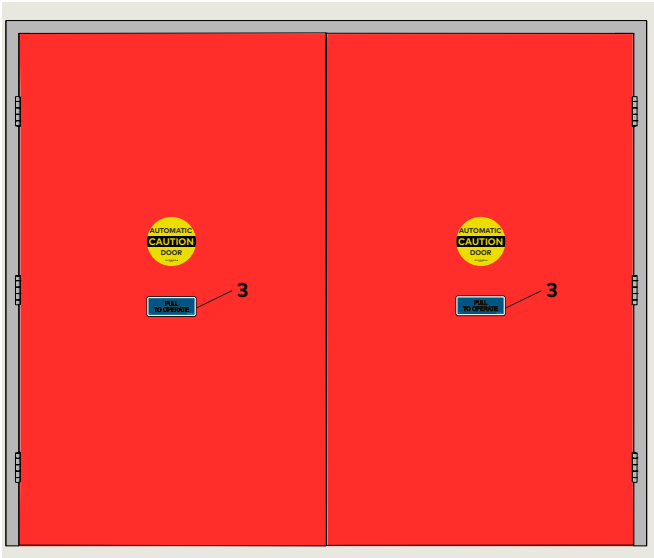
10.2.2 Push/Pull used to initiate door operation.

Fig. 10.2.3 Door push side



2 Push to Operate

Fig. 10.2.4 Door swing side



3 Pull to Operate

10.3 Safety Information label, low energy swing doors

10.3.1 Low energy swinging door safety information label.

This AAADM label outlines safety checks that should be performed daily on a swinging door controlled by an ED900 low energy operator.

10.3.2 Safety information label location.

Place label in a protected, visible location on door frame, near program switch plate if possible.

10.3.3 Annual compliance section of label.

This section of label is only completed on low energy swing doors that comply with ANSI/BHMA A156.19 standard and pass inspection by a AAADM certified dormakaba USA, Inc. technician.

10.3.4 Additional annual compliance inspection labels.

Place additional labels over annual compliance inspection section of safety information label.

Fig. 10.3.1 Safety information label

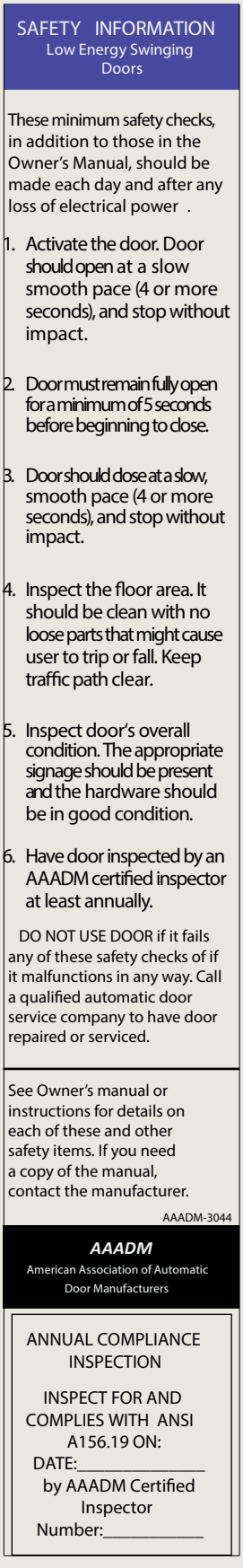
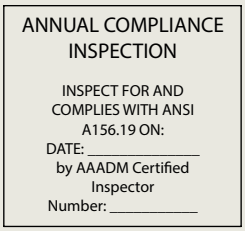


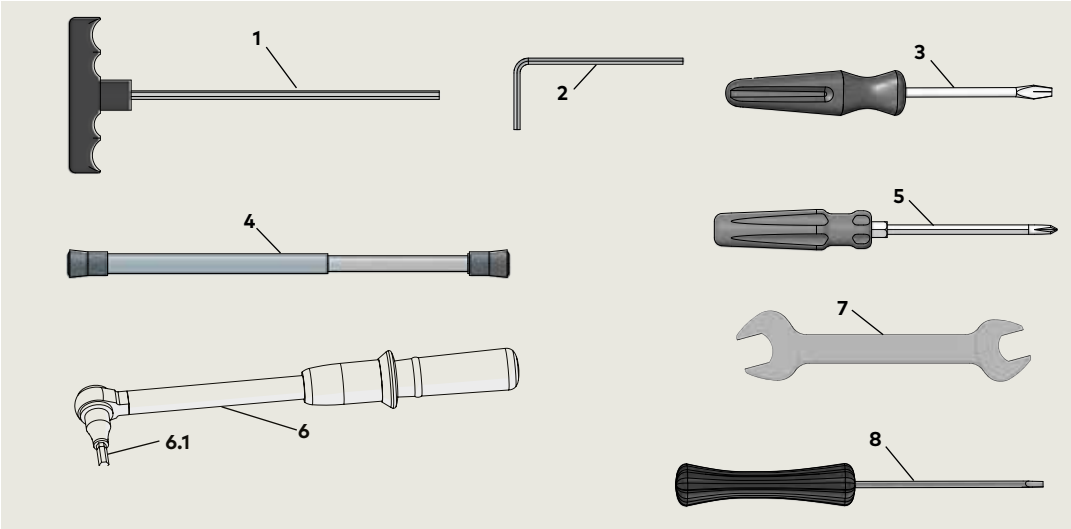
Fig. 10.3.2 Annual compliance inspection label



11 Recommended tools and torque chart

11.1 Recommended tools

Fig. 11.1.1 Recommended tools



1 T-handle hex key, 5 mm Supplied with ED900
2 Hex keys, 2.5 mm, 3 mm, 6 mm
3 Screwdriver, flat blade
4 Door pressure gauge, 0 to 35 ft - lbf
5 Screwdriver, Phillips, #2, #3
6 Torque wrench, 3 to 50 ft lb min.
6.1 Metric hex key sockets
7 Open end wrench, 13 mm
8 Screwdriver, flat blade, M2 (1/16 to 3/32")

11.2 Standard tightening torque

11.2.1 Standard tightening torque

Fastener size	ft lb
M5	3.7
M6	7
M8	17
M10	34
M12	58

11.3 Drill bits

11.3.1 Drill bit sizes for fasteners

Fastener	Drill bit size	
#10 wood screw	Hardwood 9/64"	Softwood 1/8"
#12 wood screw	Hardwood 5/32"	Softwood 9/64"
#14 wood screw	Hardwood 11/64"	Softwood 5/32"
1/4 -20 metal self tapping screw	7/32"	
10-24 barrel nut	5/32"	

Fig. 11.3.1 Drill bit



12 ED900 installation overview

12.1 Installation preparation

NOTICE

Installation steps listed in Chapter 14 through 17 are a recommendation. Structural, local conditions, available tools, or other factors or circumstances may require modification to these steps.

WARNING

Review safety information in Chapter 3!

WARNING

ED900 system should be installed by trained and knowledgeable installers experienced in installation and commissioning of swing door operators.
The installer should be familiar with all applicable local and national building code requirements, and with requirements of current ANSI/BHMA standard A156.19, Power Assist and Low Energy Power Operated Doors.

12.1.1 dormakaba USA, Inc. ED900 hardware.

1. Locate shipping boxes for ED900 operator and hardware.

12.1.2 Door frame and door.

CAUTION

Insure area around door frame, adjacent walls and door is readily accessible and free of objects and debris.

12.1.3 Accessories

1. Verify accessories planned for or in place for the door. Chapter 9, system accessories, list typical accessory types for ED900 operators.

TIPS AND RECOMMENDATIONS

Accessory wiring to ED900 operator should be planned for prior to operator installation.

12.1.4 ED900 mounting plate installation preparation.

CAUTION

Using applicable ED900 installation template (Chapter 13), holes for mounting plate fasteners must be located and drilled into door frame, wall or substructure prior to mounting plate installation.

CAUTION

Mounting plate installation must be orientated with 115 Vac connection towards door hinge side.

12.1.5 ED900 mounting plate extension used with optional full door width cover.

TIPS AND RECOMMENDATIONS

Mounting plate extension is included for full width cover installation.

- Reference Para. 14.4.

12.1.6 ED900 115 Vac electrical installation.

WARNING

Work on electrical equipment and 115 Vac wiring installation must be performed only by qualified personnel!

WARNING

Electrical shock hazard! 115 Vac branch circuit disconnect for ED900 must be Off prior to start of electrical installation.

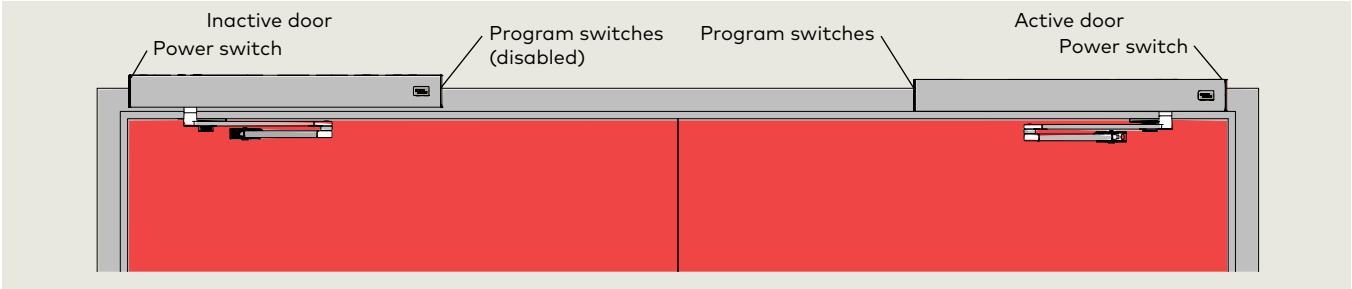
WARNING

115 Vac wiring to ED900 operator must conform to local and national electrical codes.

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12.2 ED900 operator installation with standard covers

Fig. 12.2.1 ED900 standard cover installation for double door operation



12.3 ED900 operator installation with full width cover (option)

Fig. 12.3.1 ED900 full width cover installation for double door operation



12.4 ED900 operators – assign active door and inactive door type

Table 12.4.1 Door-type parameter dL.

dL	**Door type**
Parameter value	Parameter description
0*	Single door
1	Double door with astragal. • Active door operator – door opens first.
2	Double door with astragal. • Inactive door operator.
3	Double door, without astragal. • Active door operator. Both doors open simultaneously.
4	Double door, without astragal. • Inactive door operator. Both doors open simultaneously.
*	Factory setting

12.4.1 ED900 active and inactive door assignments.

1. Position ED900 operators on a flat surface orientated as shown in Fig. 12.5.1.
2. Determine ED900 active and inactive door assignments.

TIPS AND RECOMMENDATIONS

Active and inactive door assignments.
Fig. 12.1.1 shows example of active and inactive door assignments.
Door assignments may be reversed.

- Use **dL** door type parameter to assist in determining ED900 active and inactive door assignments

TIPS AND RECOMMENDATIONS

dL door type parameter.
dL parameter is set during double door commissioning – Reference Chapter 24.

12.4 ED900 operators – 115 Vac customer wiring

12.4.1 ED900 installation with standard covers (Fig. 12.2.1)

1. 115 Vac customer power is wired to each ED900 operator. Reference Para.14.2.

- Power to each operator is controlled by its power switch.

12.4.2 ED900 installation with full width cover option. (Fig. 12.3.1)

1. 115 Vac customer power is wired to active door ED900. Reference Para.14.2.

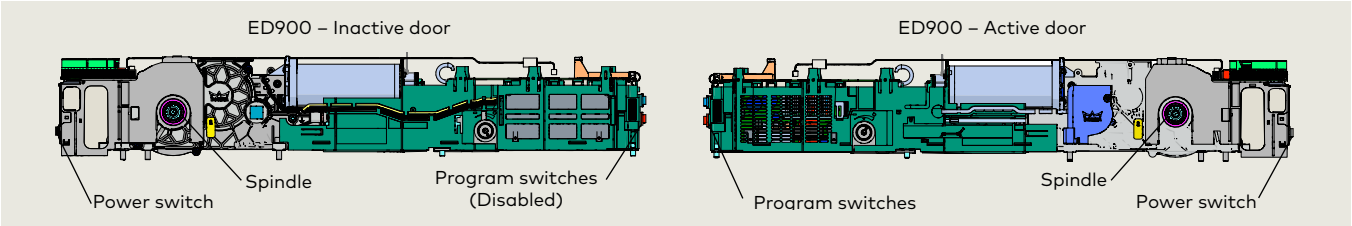
- Power to both operators is controlled by the active door operator's power switch.

12.5 ED900 operators – program switch operation

12.5.1 ED900 installation with standard covers (Fig. 12.5.1)

- Inactive door program switches are disabled in double door operation.
- Active door ED900 program switches control operation of both ED900 controllers.

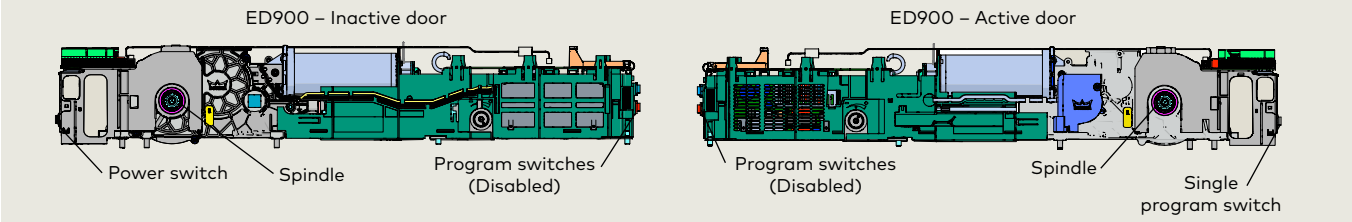
Fig. 12.5.1 ED900 installation with standard covers



12.5.2 ED900 installation with optional full width covers (Fig. 12.5.2)

- Single program switch installed on active door ED900 controls operation of both ED900 controllers.
- Standard program switches are disabled in double door operation.
- Reference Para.15.8 for single program switch installation.

Fig. 12.5.2 ED900 installation with optional full width cover



12.6 Interconnecting cables

12.6.1 ED900 installation with standard covers.

1. Communication cable Para. 5.3.

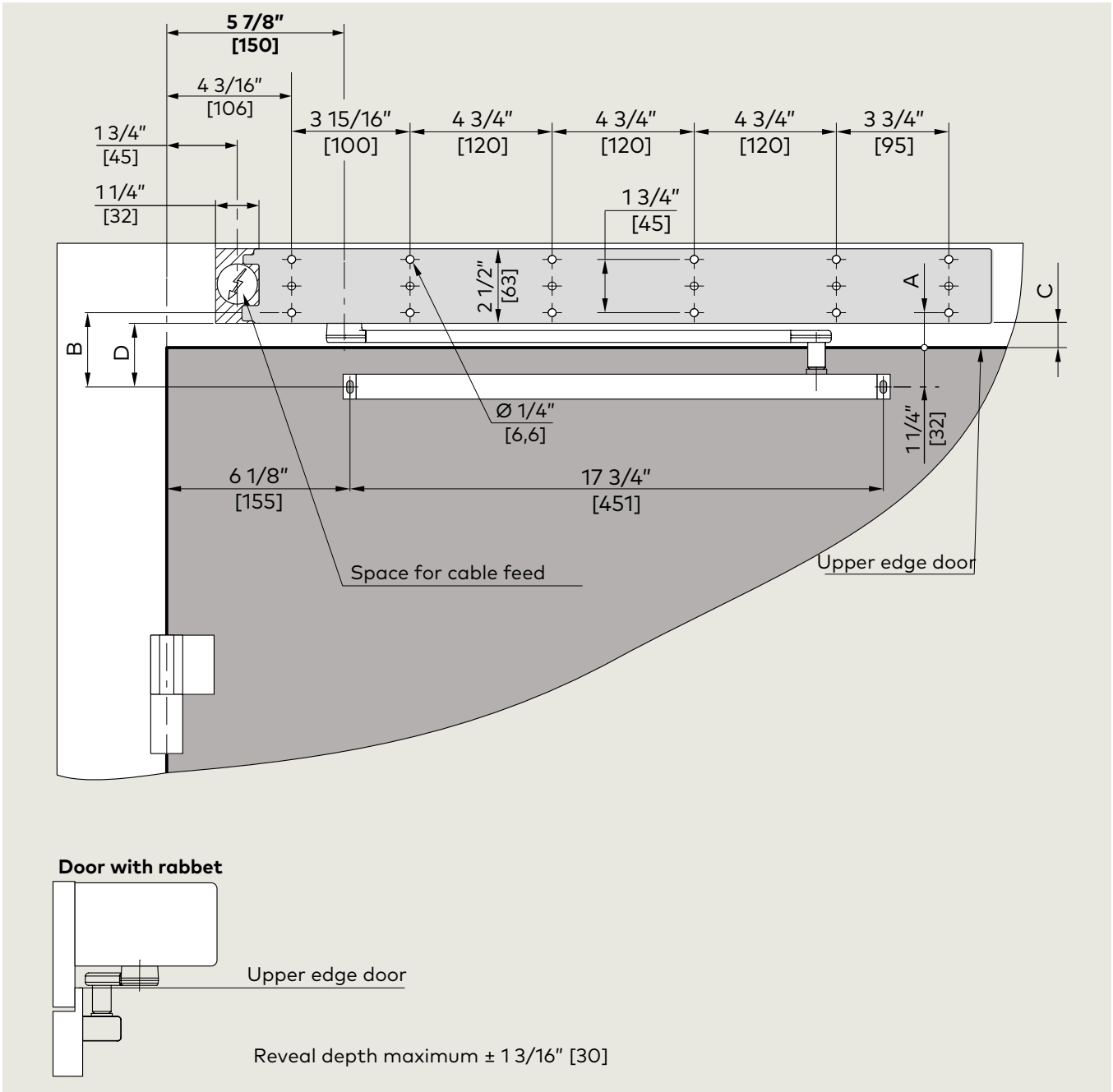
12.6.2 ED900 installation with full width cover option.

1. Communication cable Para. 5.3.
2. 115 Vac power cable, Para. 5.9
3. Single program switch and cable, Para. 5.9.

13 ED900 installation templates

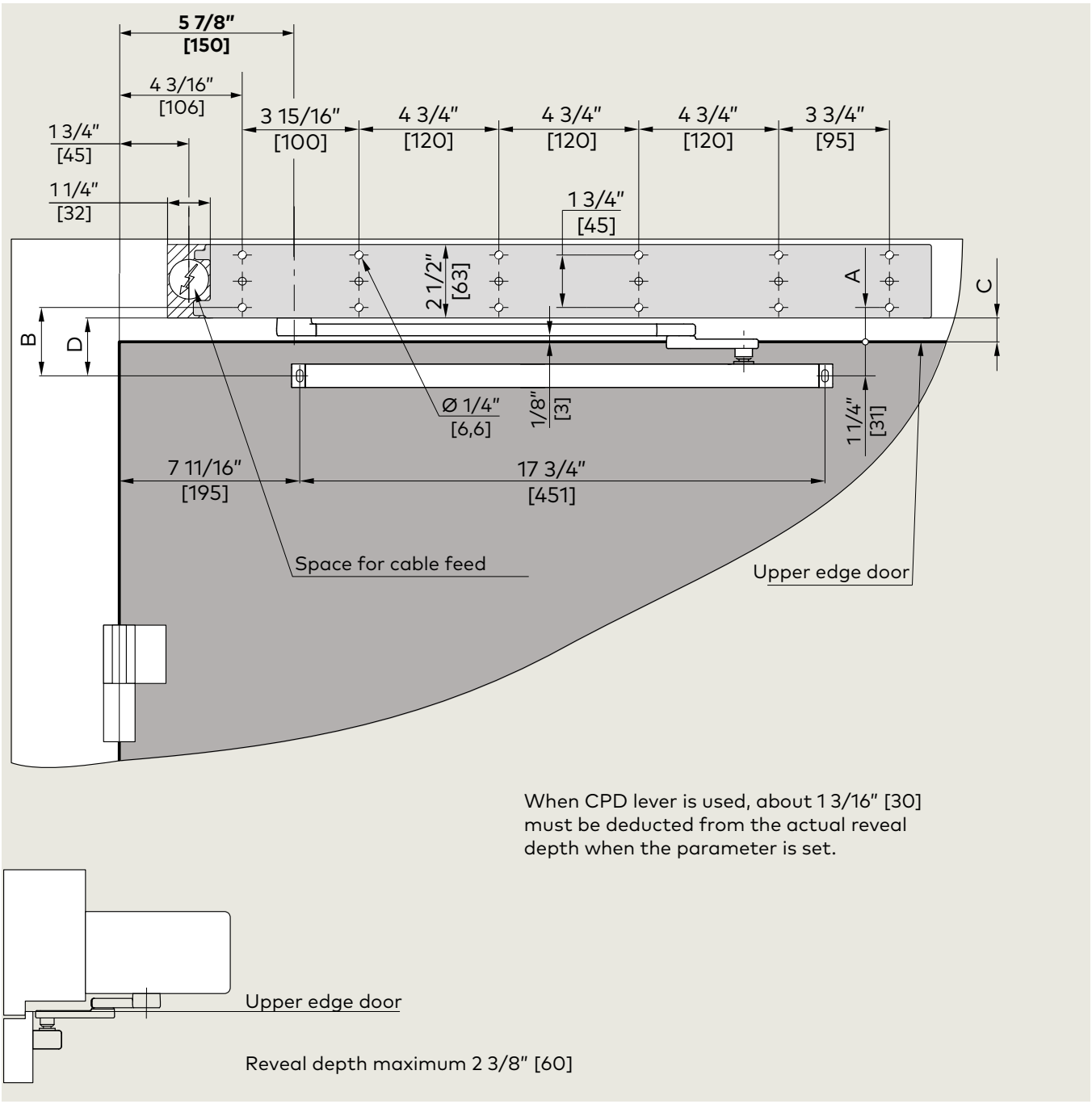
13.2 Installation templates – pull arm

Fig. 13.2.1 Assembly on hinge side, pull version with slide channel and long pivot pin



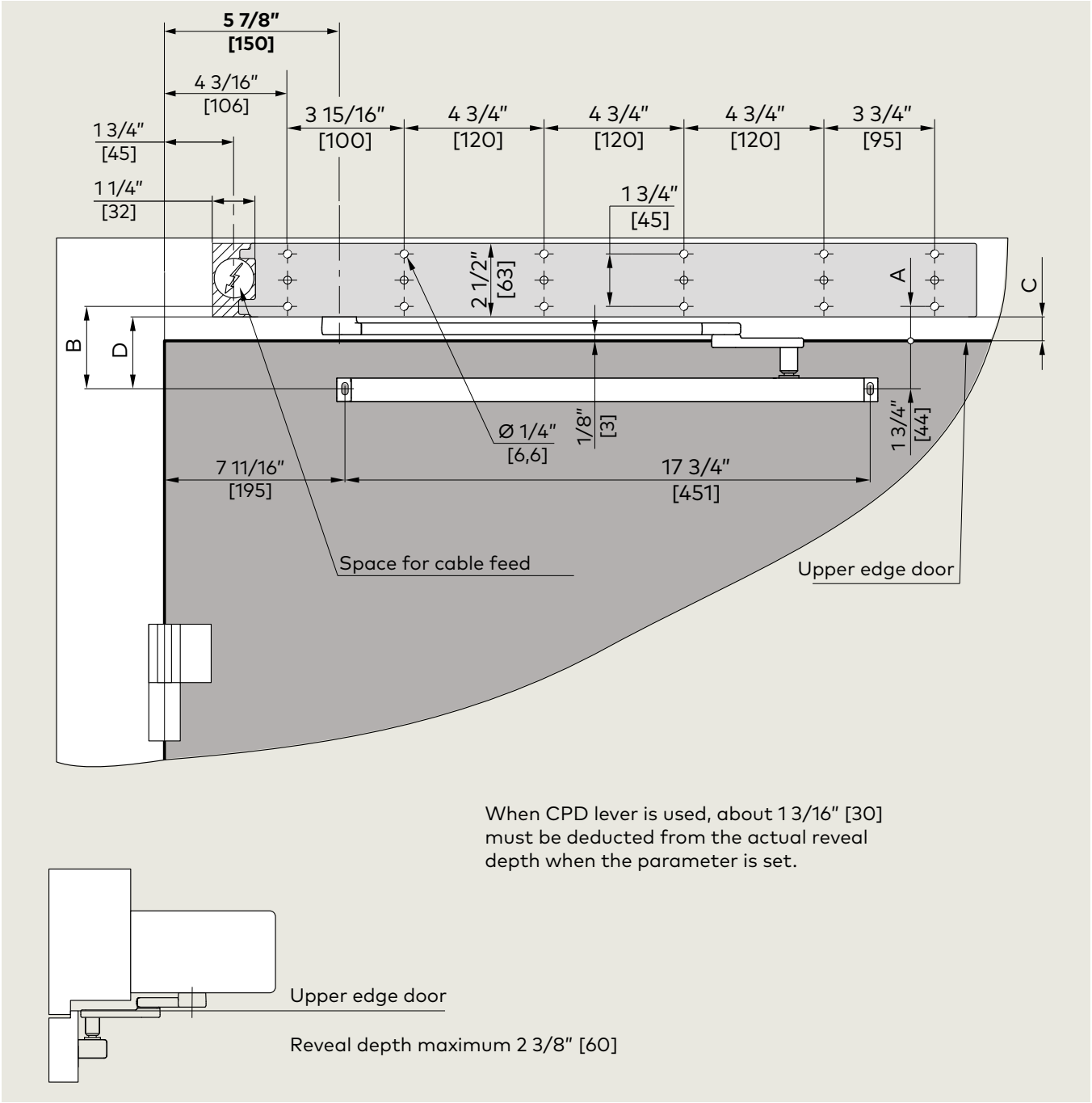
Axle extension		ED900	A		B		C		D	
			Inches	mm	Inches	mm	Inches	mm	Inches	mm
Standard		●	1 7/32	31	2 1/2	63	7/8	22	2 1/8	54
3/4"	[20]	●	2	51	3 1/4	83	1 21/32	42	2 29/32	74
1 3/16"	[30]	●	2 13/32	61	3 21/32	93	2 1/16	52	3 5/16	84
2 3/8"	[60]	●	3 9/16	91	4 27/32	123	3 7/32	82	4 1/2	114

Fig. 13.2.2 Assembly on hinge side, pull version with slide channel CPD and short pivot pin



Axle extension	ED900	A		B		C		D	
		Inches	mm	Inches	mm	Inches	mm	Inches	mm
Standard	●	1 7/32	31	2 7/16	62	7/8	22	2 3/32	53
3/4" [20]	●	2	51	3 7/32	82	1 21/32	42	2 7/8	73
1 3/16" [30]	●	2 13/32	61	3 5/8	92	2 1/16	52	3 1/4	83
2 3/8" [60]	●	3 9/16	91	4 13/16	122	3 7/32	82	4 7/16	113

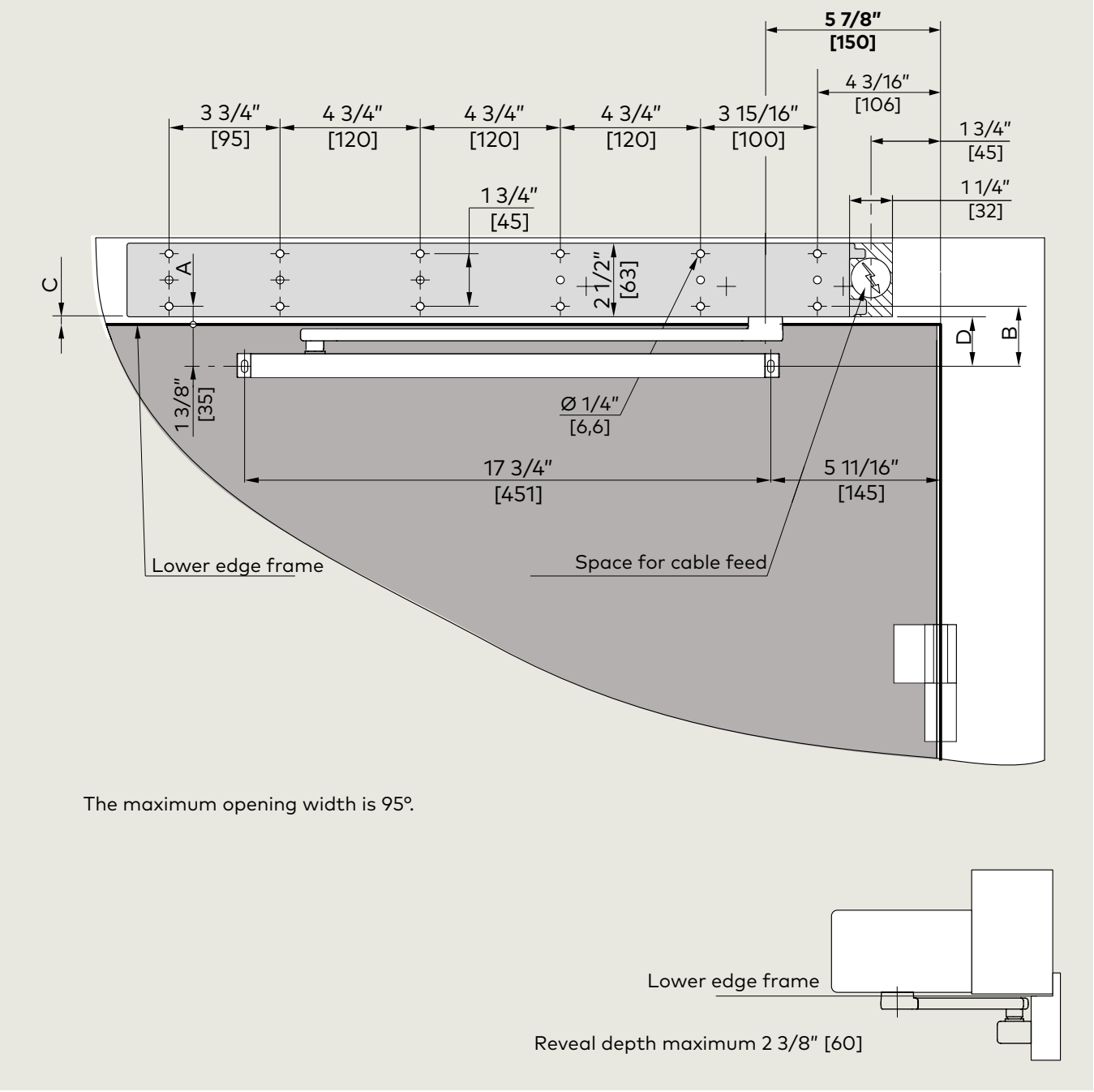
Fig. 13.2.3 Assembly on hinge side, pull version with slide channel CPD and long pivot pin



Axle extension		ED900	A		B		C		D	
			Inches	mm	Inches	mm	Inches	mm	Inches	mm
Standard		●	1 7/32	31	2 15/16	75	7/8	22	2 19/32	66
3/4"	[20]	●	2	51	3 3/4	95	1 21/32	42	3 3/8	86
1 3/16"	[30]	●	2 13/32	61	4 1/8	105	2 1/16	52	3 25/32	96
2 3/8"	[60]	●	3 9/16	91	5 5/16	135	3 7/32	82	4 31/32	126

13.3 Installation templates – pull as push

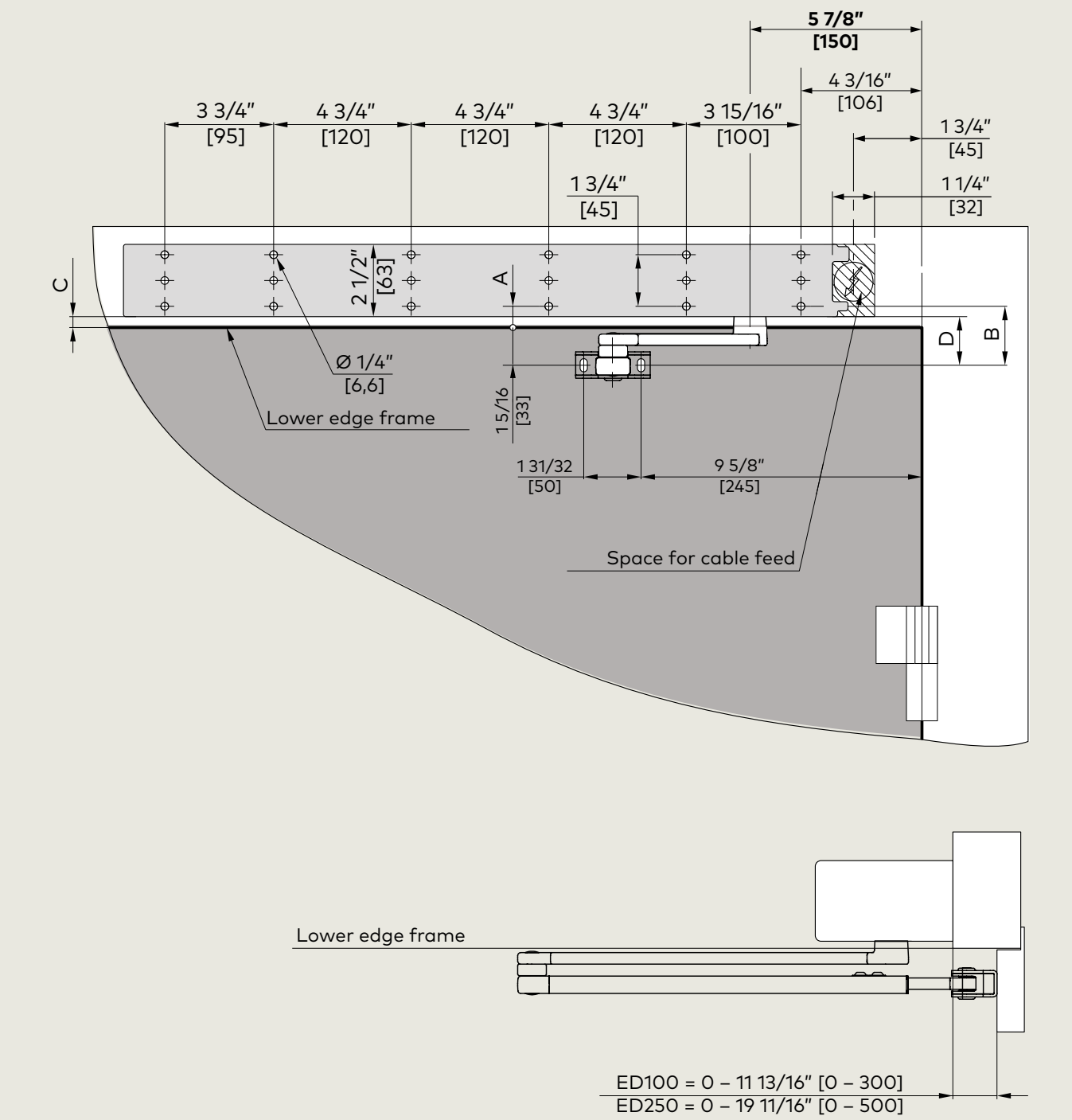
Fig. 13.3.1 Assembly on opposite hinge side, push version with slide channel and short pivot pin



Axle extension		ED900	A		B		C		D	
			Inches	mm	Inches	mm	Inches	mm	Inches	mm
Standard		●	9/16	14	1 15/16	49	3/16	5	1 9/16	40
3/4"	[20]	●	1 11/32	34	2 23/32	69	1	25	2 3/8	60
1 3/16"	[30]	●	1 3/4	44	3 1/8	79	1 3/8	35	2 3/4	70
2 3/8"	[60]	●	2 29/32	74	4 5/16	109	2 9/16	65	3 15/16	100

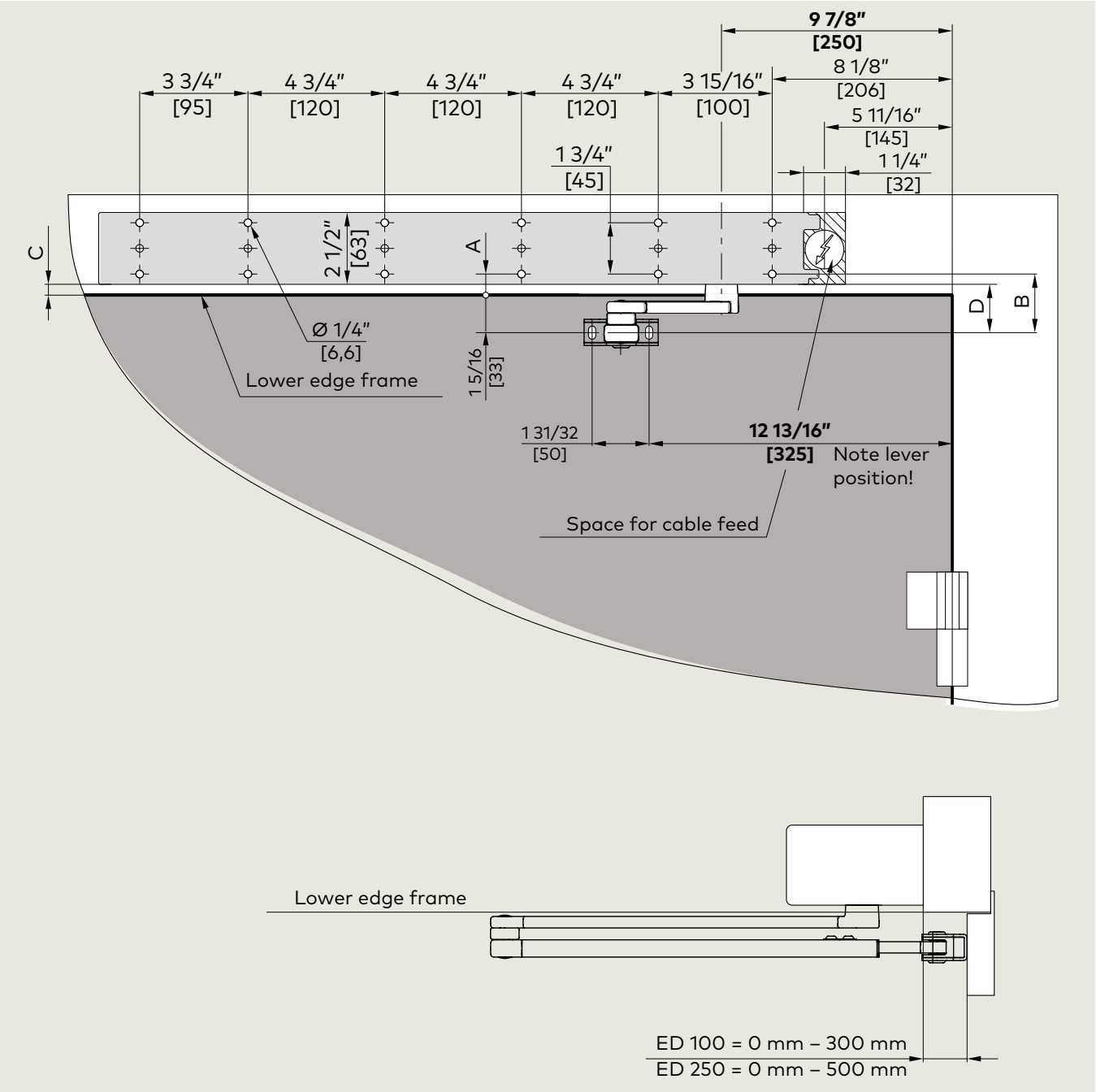
13.4 Installation templates – push arm

Fig. 12.4.1 Assembly on opposite hinge side, push version with J/arm assembly



Axle extension		ED900	A		B		C		D	
			Inches	mm	Inches	mm	Inches	mm	Inches	mm
Standard		●	11/16	18	2	51	11/32	9	1 21/32	42
3/4"	[20]	●	1 1/2	38	2 13/16	71	1 1/8	29	2 7/16	62
1 3/16"	[30]	●	1 7/8	48	3 3/16	81	1 13/32	39	2 13/16	72
2 3/8"	[60]	●	3 1/16	78	4 3/8	111	2 23/32	69	4	102

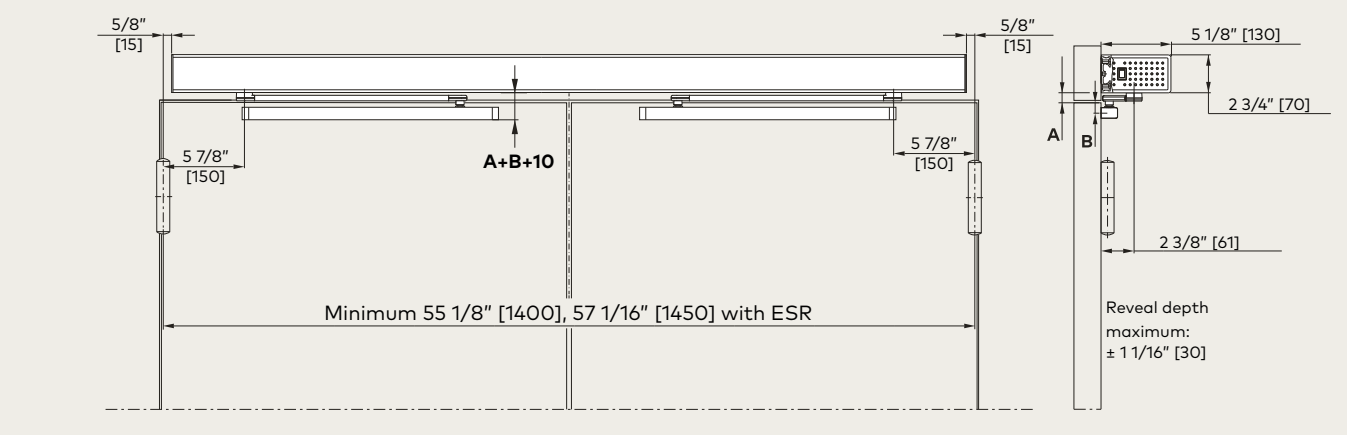
Fig. 13.4.2 Assembly on opposite hinge side, push version with J8/arm assembly



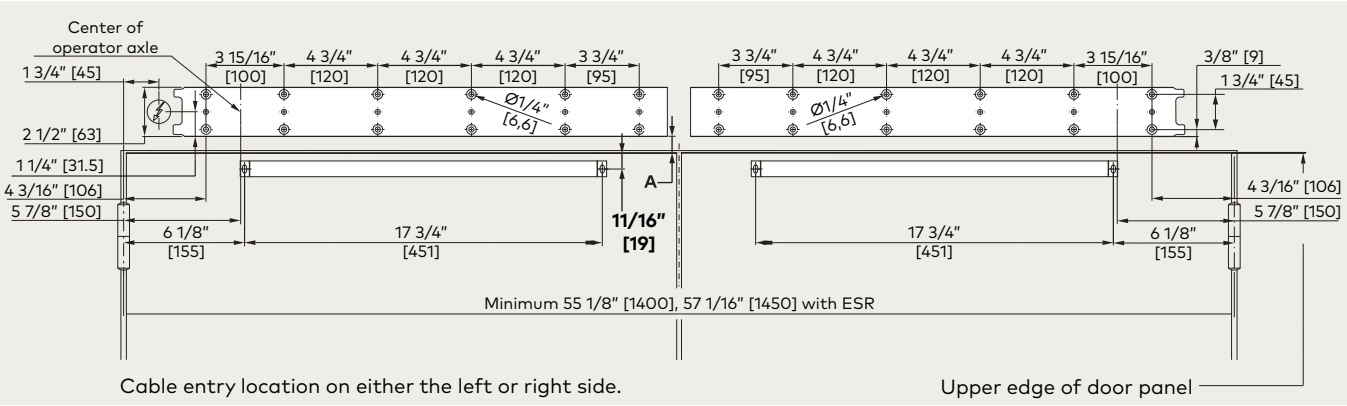
Axle extension		ED900	A		B		C		D	
			Inches	mm	Inches	mm	Inches	mm	Inches	mm
Standard		●	11/16	18	2	51	11/32	9	1 21/32	42
3/4"	[20]	●	1 1/2	38	2 13/16	71	1 1/8	29	2 7/16	62
1 3/16"	[30]	●	1 7/8	48	3 3/16	81	1 13/32	39	2 13/16	72
2 3/8"	[60]	●	3 1/16	78	4 3/8	111	2 23/32	69	4	102

13.3 Installation templates, double doors

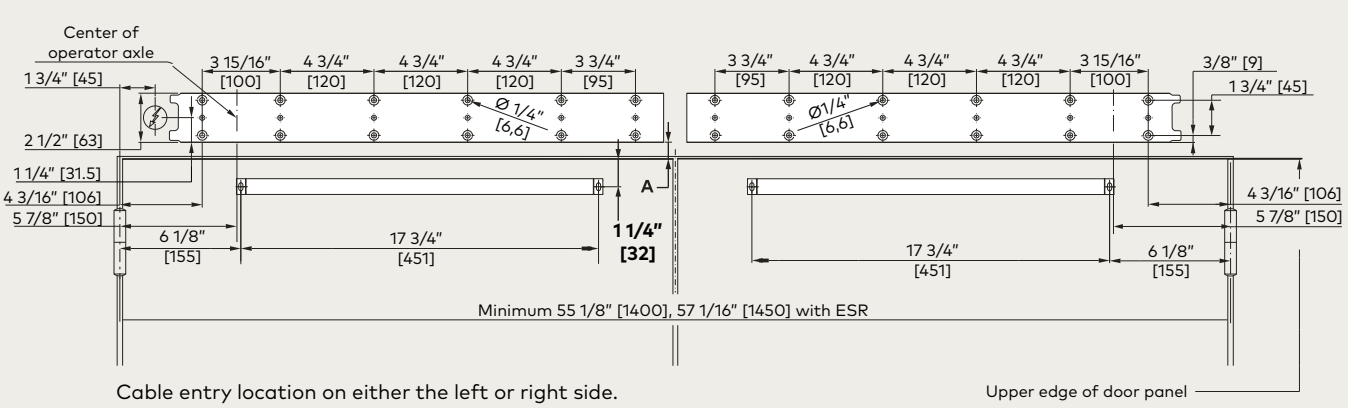
Fig. 13.3.1 Pull version, mounting on hinge side, Professional cover, standard axle extension



Drilling template: short pivot pin 1/2" [12.5]



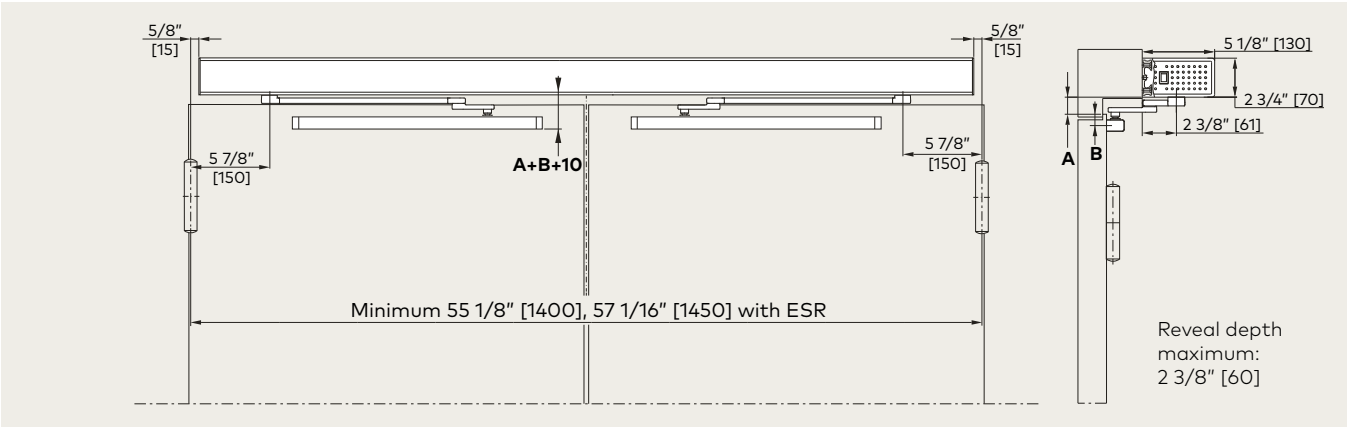
Drilling template: long pivot pin 1" [25]



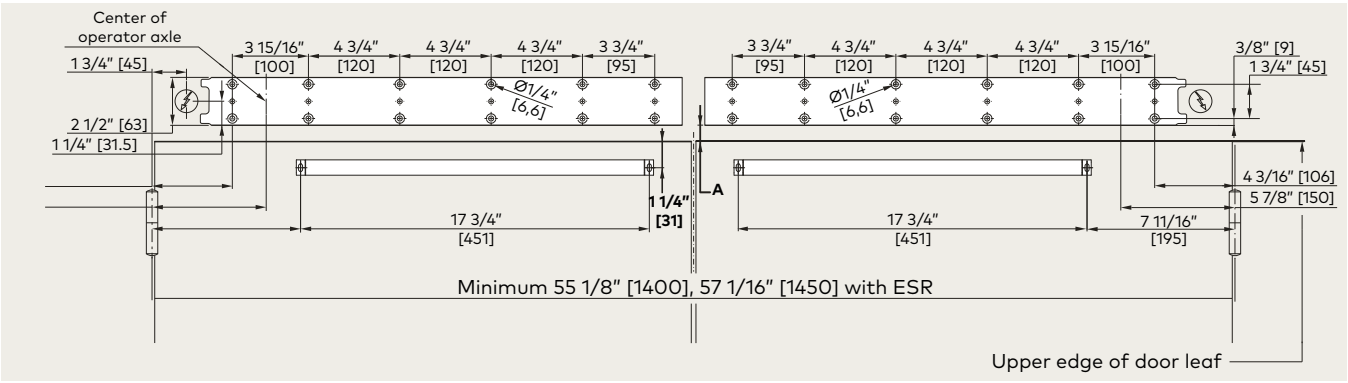
	Inches	mm	Inches	mm	Inches	mm	Inches	mm
Axle extension	Standard		3/4	**20**	1 3/16	**30**	2 3/8	**60**
A	7/8	22	1 5/8	42	2	52	3 1/4	82

	Inches	mm	Inches	mm
Pivot pin	1/2	**12.5**	1	**25**
B	3/4	19	1 1/4	32

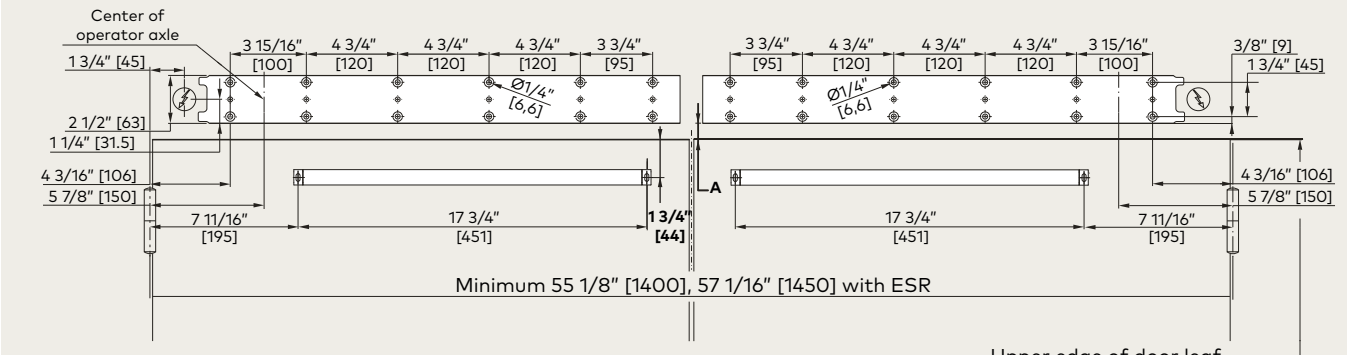
Fig. 13.3.2 Pull version with CPD lever, mounting on hinge side, Professional cover, standard axle extension



Drilling template: pivot pin short 12.5 mm



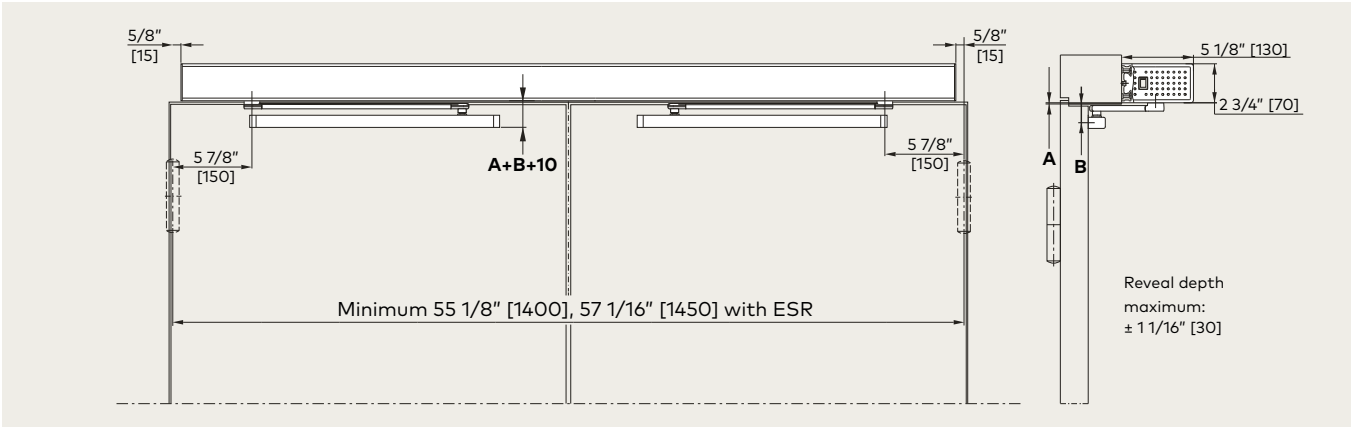
Drilling template: pivot pin long 25 mm



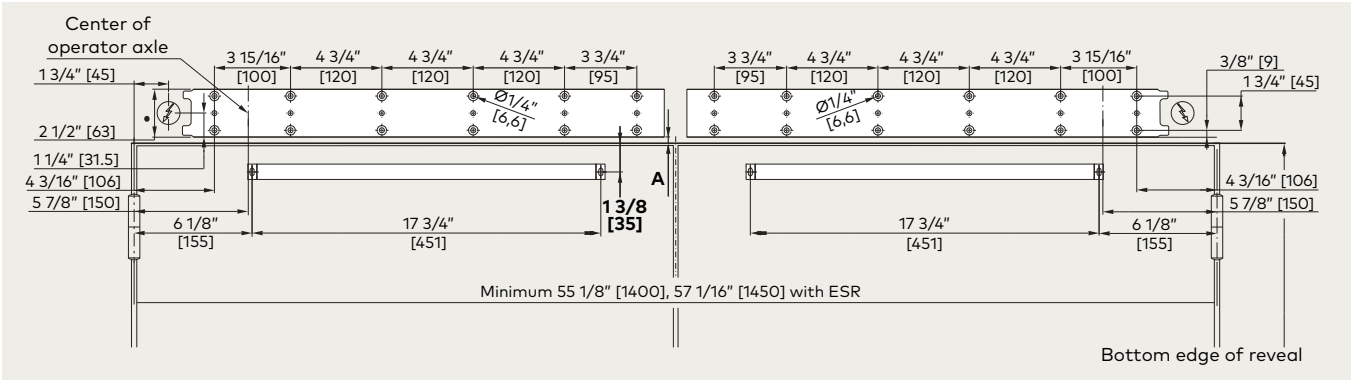
	Inches	mm	Inches	mm	Inches	mm	Inches	mm
Axle extension	Standard		3/4	**20**	1 3/16	**30**	2 3/8	**60**
A	7/8	22	1 5/8	42	2	52	3 1/4	82

	Inches	mm	Inches	mm
Pivot pin	1/2	**12.5**	1	**25**
B	1 7/32	31	1 3/4	44

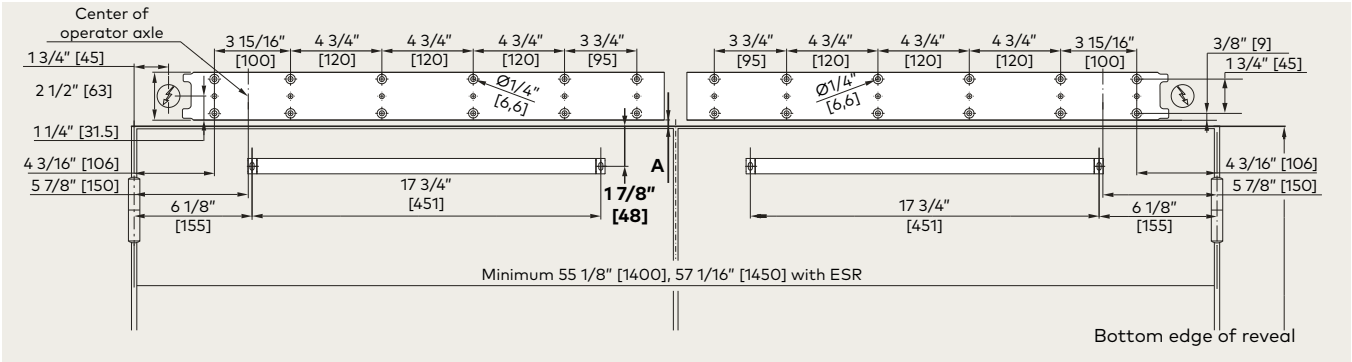
Fig. 13.3.3 Push version with track, mounting on opposite hinge side, Professional cover, standard axle extension



Drilling template: pivot pin short 12.5 mm



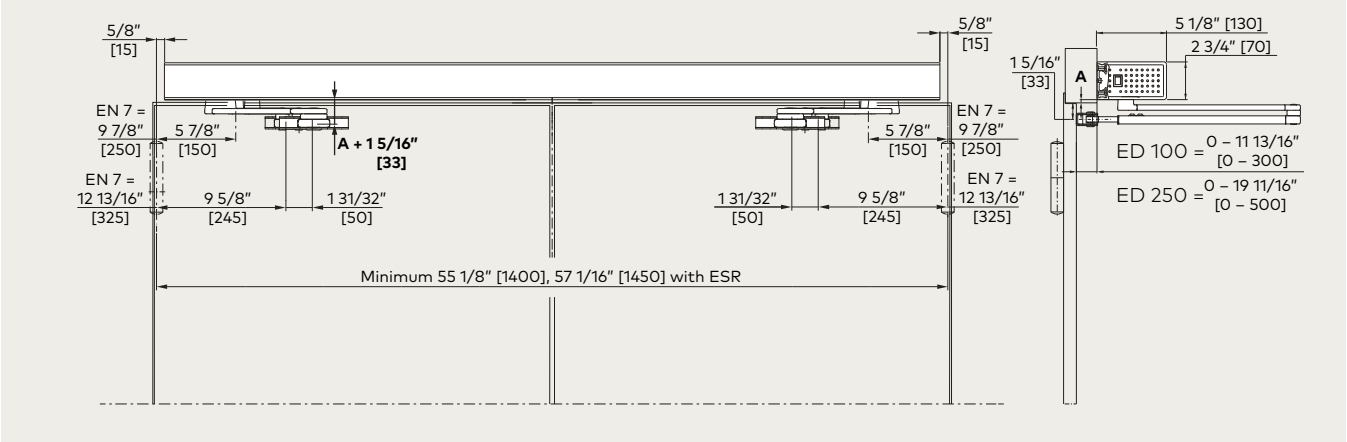
Drilling template: pivot pin long 25 mm



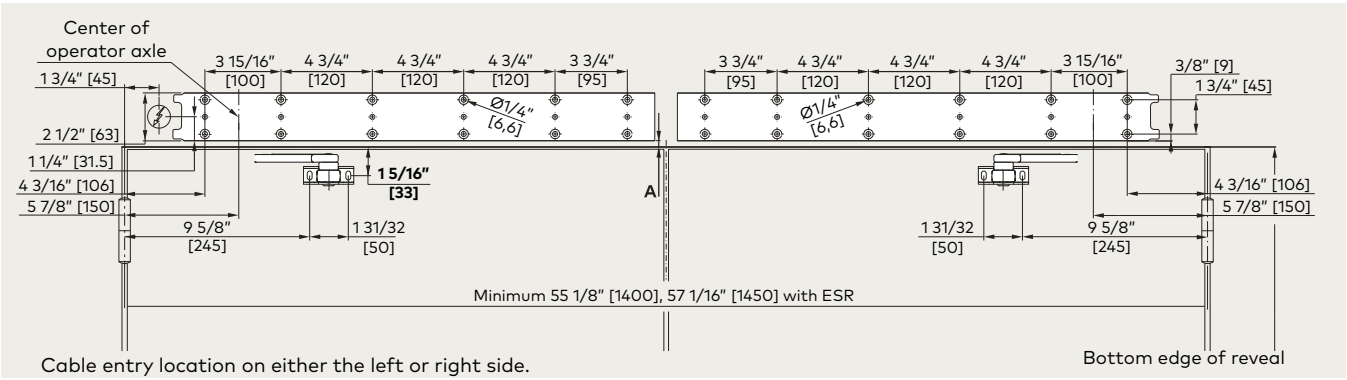
	Inches	mm	Inches	mm	Inches	mm	Inches	mm
Axle extension	**Standard**		3/4	**20**	1 3/16	**30**	2 3/8	**60**
A	3/16	5	1	25	1 3/8	35	2 9/16	65

	Inches	mm	Inches	mm
Pivot pin	1/2	**12.5**	1	**25**
B	1 3/8	35	1 7/8	48

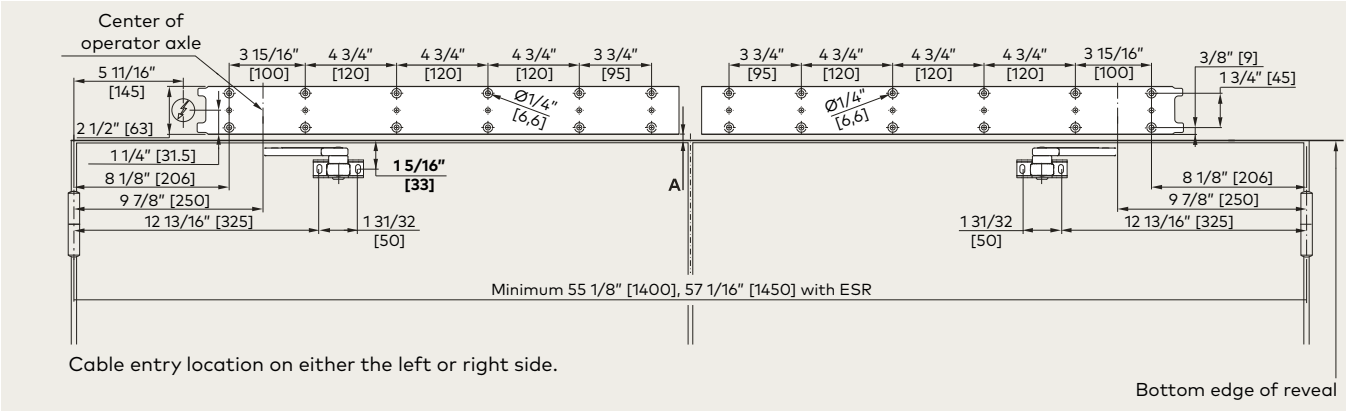
Fig. 13.3.4 Push version with arm, mounting on opposite hinge side, Professional cover, standard axle extension



Drilling template: arm EN 3-6



Drilling template: arm EN 7



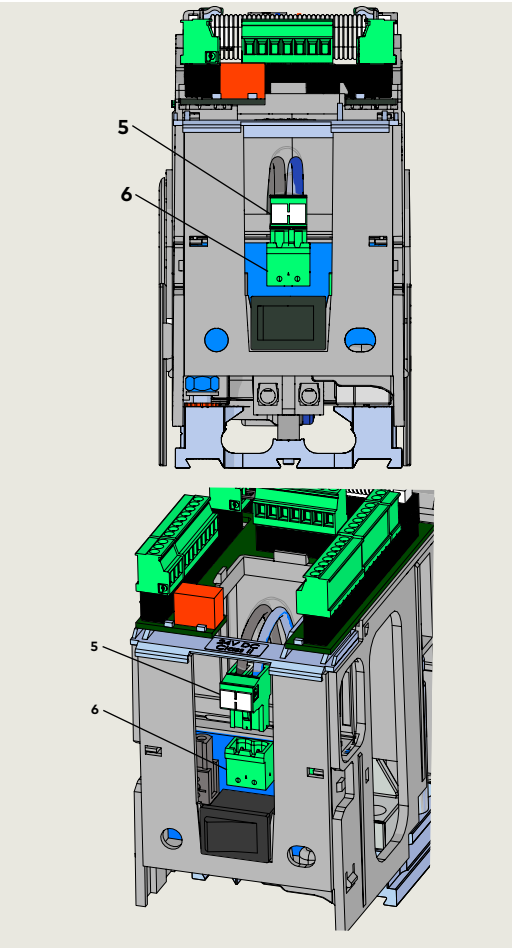
	Inches	mm	Inches	mm	Inches	mm	Inches	mm
Axle extension	**Standard**		3/4	**20**	1 3/16	**30**	2 3/8	**60**
A	3/8	9	1 1/8	29	1 17/32	39	2 23/32	69

14 ED900 operator and mounting plate preparation

14.1 Remove mounting plate from each ED900 operator

5 115 Vac plug
6 115 Vac socket

Fig. 14.1.1 115 Vac plug removal



14.1.1 Remove 115 Vac plug from receptacle.

1. Remove 115 Vac plug (**5**) from its receptacle (**6**).

14.1.2 Remove mounting plate from ED900 operator.

1. Loosen all eight captive ED900 M6 socket head cap screws (SHCS) using a 5 mm hex T-handle.

TIPS AND RECOMMENDATIONS

Insure all eight fasteners are free of the mounting plate.

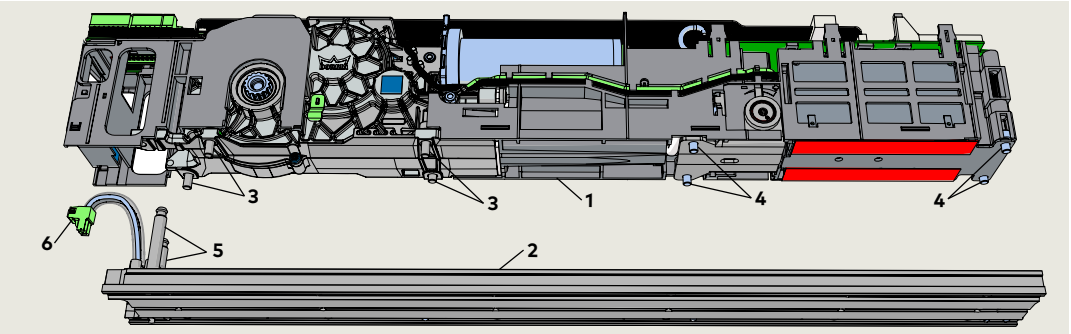
2. Remove operator from mounting plate.

TIPS AND RECOMMENDATIONS

Guide pin resistance may require screwdriver to start operator removal from end of mounting plate (Fig. 14.1.3).

1 ED900 operator
2 Mounting base
3 M6 x 20 SHCS
4 M6 x 10 SHCS
5 Guide pin
6 115 Vac plug

Fig. 14.1.2 Mounting plate removed from ED900 operator



4 Guide pin

Fig. 14.1.3 Mounting plate removal

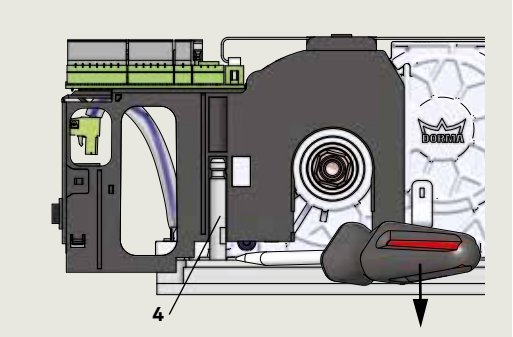
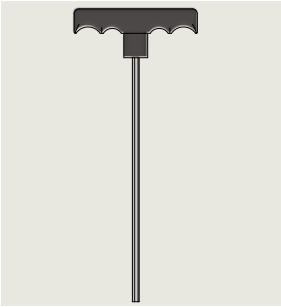


Fig. 14.1.4 5 mm T-handle hex key

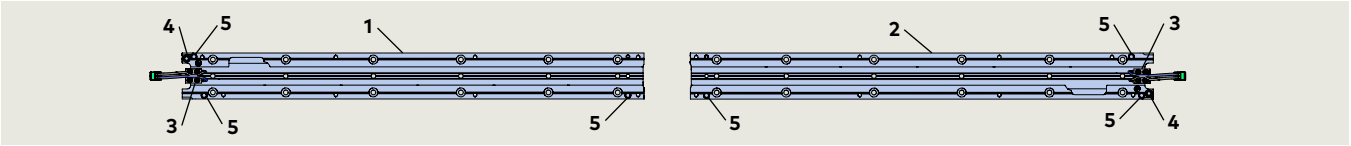


14.2 Mounting plate 115 Vac terminal blocks

14.2.1 ED900 installation with standard covers (Fig. 14.2.1)

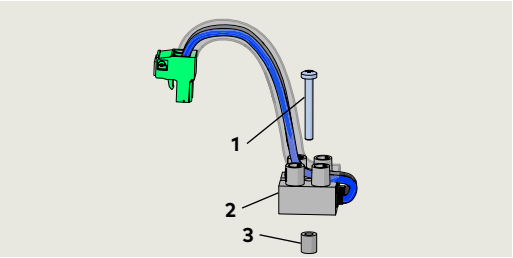
1. Customer 115 Vac is connected to terminal block and ground stud on each ED900 mounting plate.

Fig. 14.2.1 ED900 mounting plates – installation with standard covers



1 Inactive door mounting plate
2 Active door mounting plate
3 115 VAC terminal block
4 Ground terminal
5 Guide pin

Fig. 14.2.2 115 Vac terminal block assembly



1 M3 x 5 screw
2 115 Vac terminal block
3 Spacer

14.2.2 ED900 installation with full width cover option (Fig. 14.2.2)

1. Customer 115 Vac is connected to inactive door terminal block and ground stud.

14.2.2 Remove 115 Vac terminal block on inactive door mounting plate.

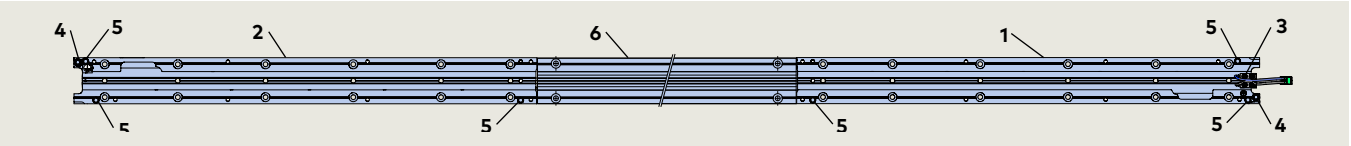
1. Remove M3 x 5 screw securing 115 Vac terminal block assembly to mounting plate.
2. Remove 115 Vac terminal block assembly.

TIPS AND RECOMMENDATIONS

Removing 115 Vac terminal block on inactive door mounting plate is optional.

- Wiring between mounting plates is facilitated by removing terminal block.

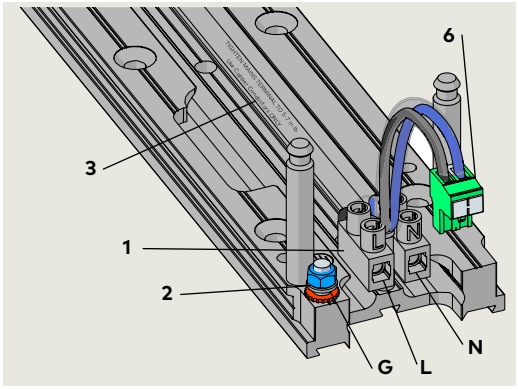
Fig. 14.2.3 ED900 mounting plates – installation with optional full width cover example



1 Inactive door mounting plate
2 Active door mounting plate
3 115 VAC terminal block
4 Ground terminal
5 Guide pin
6 Mounting plate extension

14.3 Options – Customer 115 Vac connection to terminal blocks

Fig. 14.3.1 115 Vac terminal block



1 115 VAC terminal block
2 Ground terminal
3 Mains terminal torque and wire label
5 M3.5 screw
6 115 Vac plug to operator
L 115 Vac
N Neutral
G Ground

Fig. 14.3.2 Mains terminal torque and wire label

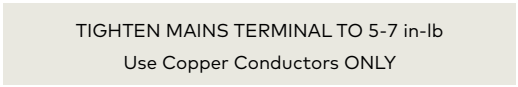
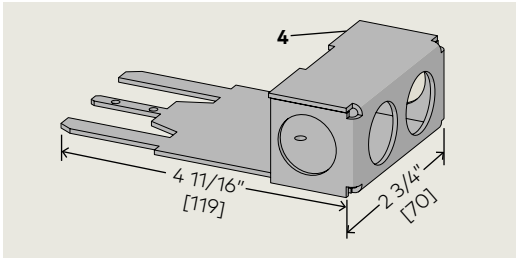
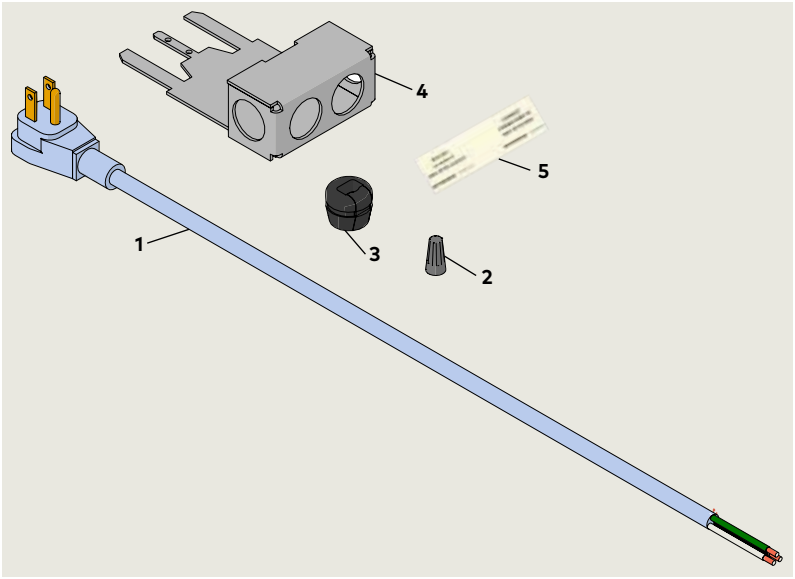


Fig. 14.3.3 Conduit box 08120730



4 Conduit box

Fig. 14.3.4 Power cord wiring kit 08121110



1 Power cord
2 Wire nut
3 Cord grip
4 Conduit box
5 120 Vac label

WARNING

Work on electrical equipment and 115 Vac wiring installation must be performed only by qualified personnel!

14.3.1 Conduit box.

1. Conduit box (Fig. 14.3.3).

- U/L approved conduit box accessory; provides 115 Vac surface wiring to ED900.
- Reference Para. 14.3.6 for conduit box installation.

14.3.2 Power cord wiring kit.

1. Power cord wiring kit (Fig. 14.3.4).

- Eliminates need for hard wiring. Permits ED900 to plug directly into 115 Vac receptacle.
- Power cord length: 15" from end of conduit box to center of plug.

CAUTION

Insure power cord installation conforms to local and national electrical codes.

Fig. 14.3.5 115 Vac terminal block mounting

1 115 VAC terminal block
2 Ground terminal
5 M3.5 screw
6 115 Vac plug to operator
L 115 Vac
N Neutral
G Ground

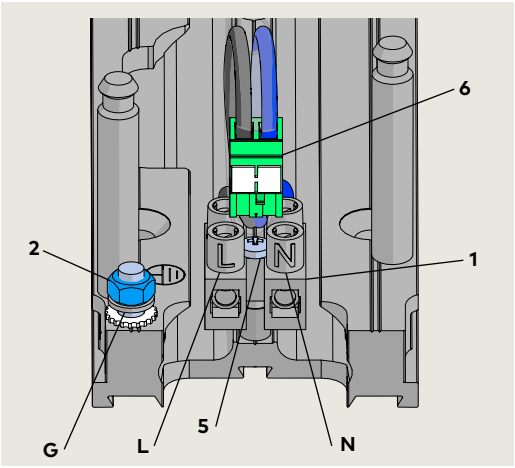
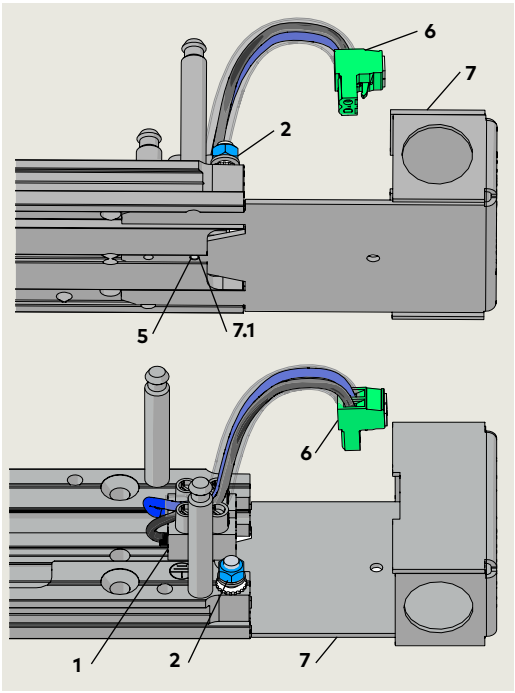


Fig. 14.3.6 Conduit box installed on mounting plate

1 115 VAC terminal block
2 Ground terminal
5 M3.5 screw
6 115 Vac plug to operator
7 Conduit box
7.1 Conduit box mounting hole



14.3.3 Install conduit box (option).

TIPS AND RECOMMENDATIONS

115 Vac terminal block is secured to mounting plate by M3 x 25 Phillips head screw.

- Screw must be loosened to allow conduit box tabs to slide into mounting plate slots.
- Screw is then threaded into conduit box mounting hole and tightened.

1. Loosen M3 x 25 Phillips head screw.
2. Slide conduit box tabs into slots in bottom of mounting plate until hole in conduit box lines up with hole in mounting plate.
3. Thread M3 Phillips head screw into conduit box mounting hole and tighten screw.

CAUTION

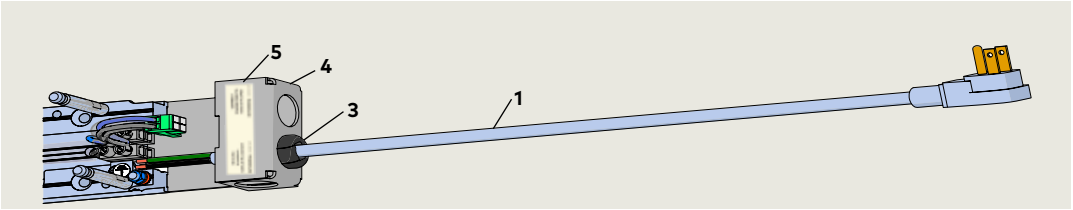
Terminal block M3 screw torque. Tighten M3 screw to a torque of 5 - 7 in-lb.

- Insure screw is threaded into conduit box mounting hole.

4. Mounting plate assembly is ready for installation.

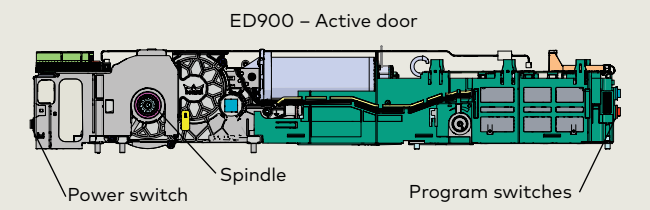
Fig. 14.3.7 Power cord wiring kit assembly (option)

1 Power cord
3 Cord grip
4 Conduit box
5 120 Vac label



14.4 Full width cover option – ED900 operator preparation and mounting plate assembly

Fig. 14.4.1 ED900 active door operator



TIPS AND RECOMMENDATIONS

Reference Chapter 12 for active /inactive door assignments.

TIPS AND RECOMMENDATIONS

Power switch on active door operator will be replaced with single program switch (Para. 15.8).

14.4.1 Remove terminal board from active door ED900.

1. Press in 3 tabs (**2**) that secure terminal board (**1**) to ED900, lift up terminal board and swing away from end of housing.

14.4.2 Remove ED900 115 Vac plug.

1. Swing open upper bracket (**3**).
2. Remove ED900 115 Vac plug (**5**) from power supply circuit board socket (**6**).

14.4.3 Remove power supply circuit board.

1. Remove power supply circuit board (**4**) from its slot in ED900.

Fig. 14.4.2 ED900 active door power switch removal

1 Terminal board
2 Tabs
3 Upper bracket
4 Power supply circuit board
5 ED900 115 Vac plug

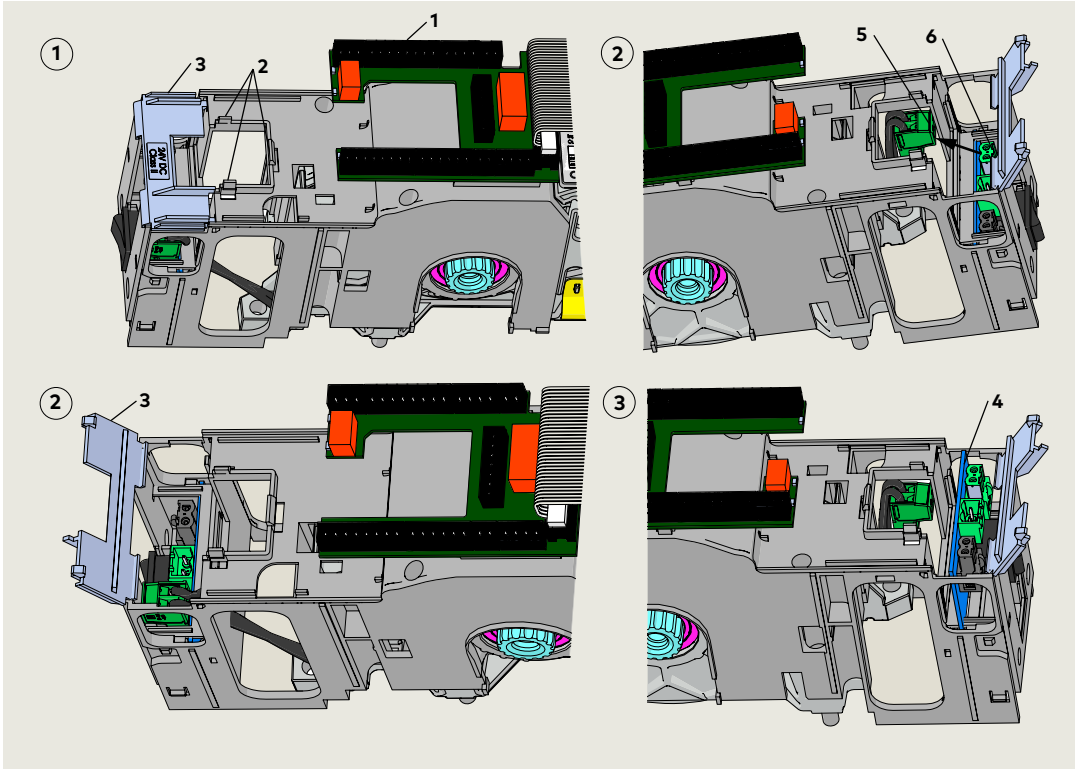
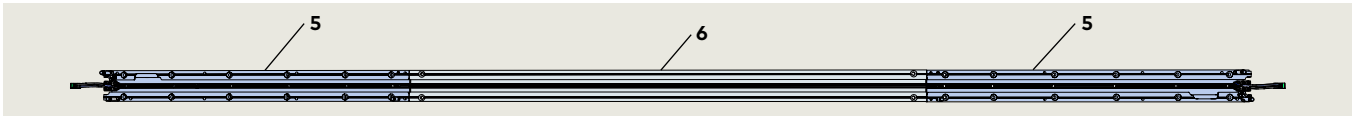


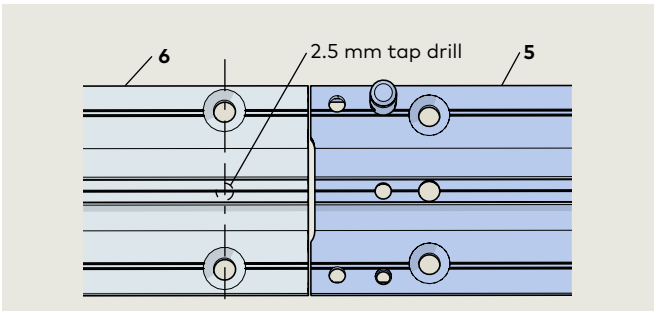
Fig. 14.4.4 Mounting plate assembly



5 Mounting plate, operator

6 Mounting plate, pair

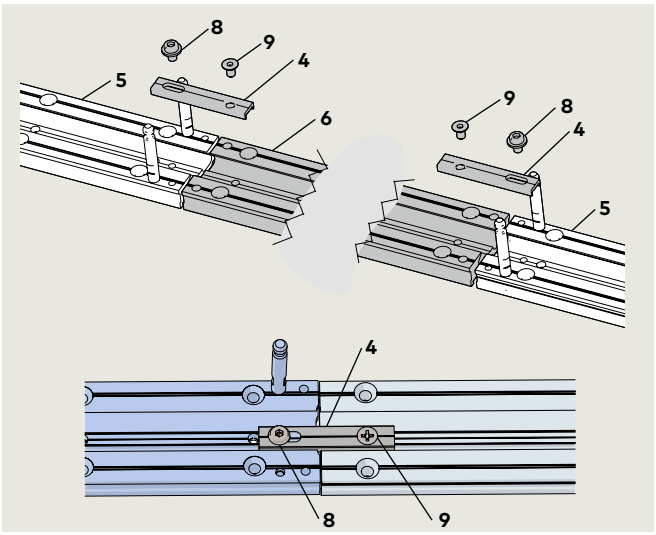
Fig. 14.4.5 Pair mounting plate hole for M6 fastener



5 Mounting plate, operator

6 Mounting plate, pair

Fig. 14.4.6 Mounting plate connectors and fasteners



4 Mounting plate connectors

8 M6 x 10 mm SHS with washer

6 Front cover extension 08121870

9 M6 x 10 mm PFHS

7 dormakaba logo plate 08125241

14.4.5 Drill two holes in pair mounting plate for M6 fastener.

1. Drill hole in each end of pair mounting plate for M6 x 10 mm PFHS (Fig. 14.4.5).

14.4.6 Assemble mounting plates.

1. Place the three mounting plates on a flat surface (Fig. 14.4.4).

CAUTION

Verify mounting plate assembly dimensions with installation template (Chapter 13).

2. Secure the operator mounting plates to the front cover extension (**6**) using:

- (2) mounting plate connectors (**4**)
- (2) M6 x 10 mm SHS with washer (**8**)
- (2) M6 x 10 mm PFHS (**9**)

Do not tighten screws.

14.4.7 Check cover fit over ED operators.

1. Place the ED operators onto their mounting plates.
2. Place end caps (2) at end of each operator.
3. Place cover over end caps and ED operator.
4. Adjust mounting plates as necessary for cover fit over end caps.
5. Remove end caps and operators.
6. Tighten mounting plate connector fasteners.

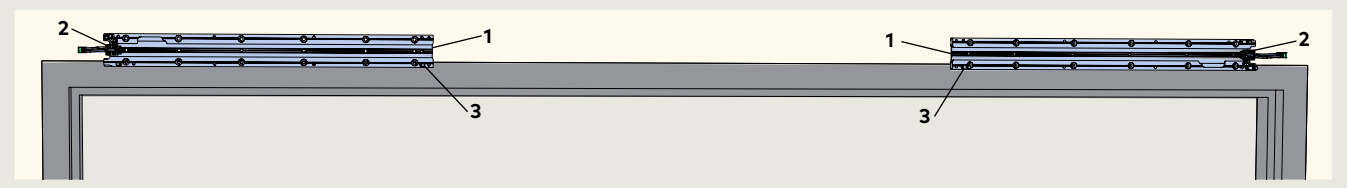
14.4.8 Mounting plate installation.

1. Reference Chapter 15.

15 ED900 mounting plate and operator installation

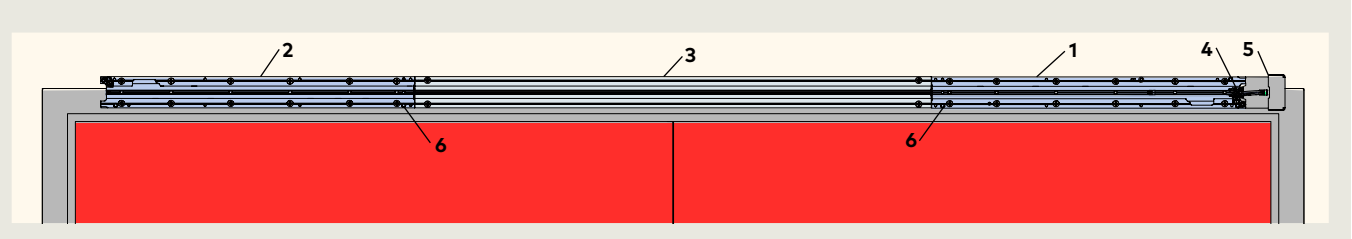
15.1 ED900 mounting plate attachment to jamb and/or wall examples

Fig. 15.1.1 Double door mounting plate installation – standard covers example



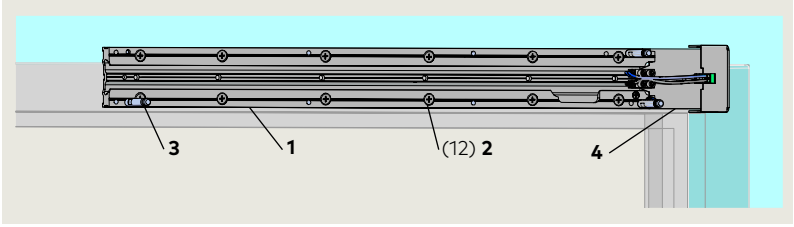
1 ED900 mounting plate
2 115 Vac terminal block
3 Third guide pin

Fig. 15.1.2 Double door mounting plate installation – optional full width cover example



1 ED900 mounting plate - inactive door
2 ED900 mounting plate - active door
3 Mounting plate extension
4 115 Vac terminal block
5 Conduit box (option)
6 Third guide pin

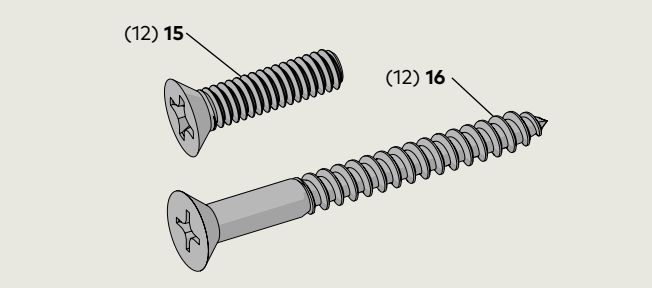
Fig. 15.1.3 Mounting plate installation with conduit box



1 ED900 mounting plate
2 Mounting hole
3 Guide pin
4 Conduit box (option)

15.2 Install ED900 mounting plate to jamb and/or wall

Fig. 15.2.1 Mounting plate fasteners

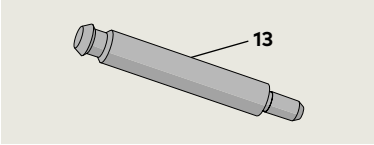


15 1/4-20 x 1" FH machine screw

16 No. 14 x 1 "FH wood screw

Fig. 15.2.2 Guide pin

13 Guide pin



CAUTION

Select fasteners based on door frame and wall material.

CAUTION

Use fasteners provided with ED900 (Fig. 15.2.1).

15.2.1 Select installation template.

1. Select applicable installation template.

NOTICE

Installation templates: Reference Chapter 13.

15.2.2 Fasten mounting plates to jamb and/or wall.

CAUTION

Install shims between mounting plates and wall as required.

CAUTION

ED900 conduit box (if used):

- Insure ED900 conduit box (Para. 14.3) is prepared with applicable conduit fitting or cord grip.
- Insure jamb or wall is prepared for wiring to each ED900 conduit fitting or cord grip.

1. Using template as a guide, prepare twelve mounting holes at first mounting plate location for mounting plate fasteners (Fig. 15.2.1).
2. Install first plate.
3. Full width cover option: Using mounting plate extension as a guide, mark four mounting holes for extension.
4. Using template as a guide, prepare twelve mounting holes at second mounting plate location for mounting plate fasteners (Fig. 15.2.1).
5. Install second mounting plate.
6. Full width cover option: Install mounting plate extension.

15.2.4 Mounting plate installation checks.

CAUTION

- Check level.
- Check spindle to hinge centerline distance.
- Check mounting plate alignment.

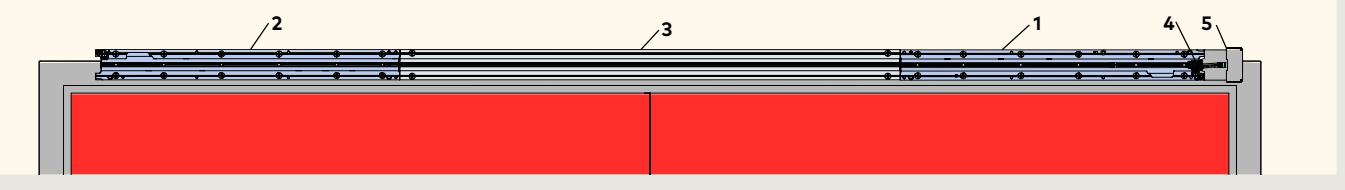
15.2.5 Install third guide pin.

1. Install third guide pin (Fig. 15.2.2) in each mounting plate (Fig. 15.1.1).

- Use 3 mm hex T-handle or hex key.

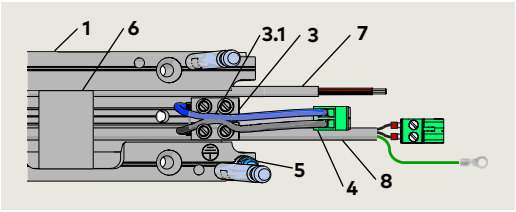
15.3 Full width cover option – Install cables between mounting plates

Fig. 15.3.1 Double door mounting plate installation – optional full width cover



1 Mounting plate, inactive door
2 Mounting plate, active door
3 Mounting plate extension
4 115 Vac terminal block
5 Conduit box (option)

Fig. 15.3.2 ED900 cables at inactive door



1 Mounting plate, active door
2 Mounting plate, inactive door
3 115 Vac terminal block
3.1 M3 x 5 screw
4 115 Vac plug
5 Ground stud
6 Wire retainer
7 Program switch and cable
8 115 Vac power cable

Fig. 15.3.3 ED900 cables at active door

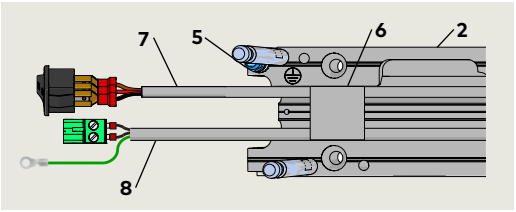
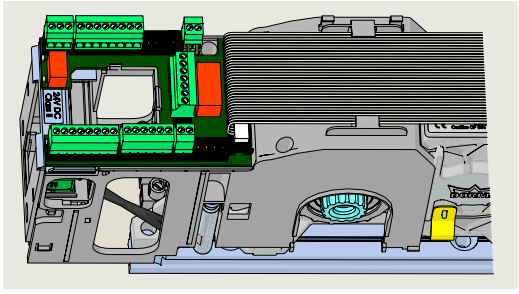


Fig. 15.3.4 ED900 housing and terminals, active door



TIPS AND RECOMMENDATIONS

Active/inactive door orientation.
May be reversed from Fig. 15.3.1 orientation.

NOTICE

Installer responsibilities.
Installer responsible for routing and securing all wiring between ED900 operators.

TIPS AND RECOMMENDATIONS

Cable length options.
Reference Para. 4.12 for cable length options for:

- Program switch cable
- 115 Vac power cable

15.3.1 Install program switch cable.

1. Locate single program switch (Fig. 15.3.5) at end of active door mounting plate (Fig.15.3.3).
2. Route program switch cable to active door 115 Vac terminal block end of mounting plate (Fig. 15.3.4).

15.3.2 Install 115 Vac power cable in mounting plate channels.

1. Route 115 Vac power cable (Fig. 15.3.6) between mounting plates using mounting plate channels.

15.3.3 Install wire retainers to secure cables.

1. Install wire retainers (Fig. 15.3.7) to secure cables.

Fig. 15.3.5 Single program switch

1 3 position program switch
2 3 conductor cable



Fig. 15.3.6 115 Vac power cable

1 3 conductor cable
3 Ring lug
5 Connector



Fig. 15.3.7 Wire retainer

3 Wire retainer

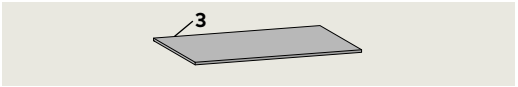


Fig. 15.3.8 Inactive door – 115 Vac cable ground wire

1 Active door mounting plate
5 Ground stud
8 115 Vac power cable
8.1 Ground wire

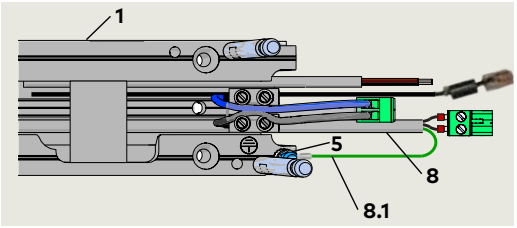


Fig. 15.3.9 Active door – 115 Vac cable ground wire

2 Inactive door mounting plate
5 Ground stud
8 115 Vac power cable DX3484
8.1 Ground wire

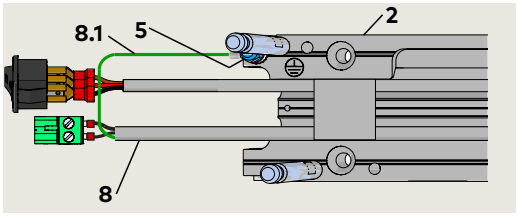
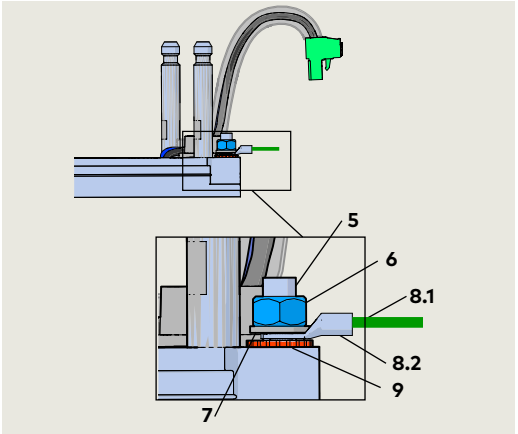


Fig. 15.3.10 Ground stud wiring

5 Ground stud
6 M5 nut
7 Flat washer
8.1 115 Vac power cable ground wire
8.2 Ground wire ring lug
9 External tooth lock washer



15.3.4 Fasten 115 Vac cable ground wires to mounting plate ground studs.

1. Inactive door mounting plate – fasten ground wire ring lug to mounting plate ground stud (Fig. 15.3.8).
2. Active door mounting plate – fasten ground wire ring lug to mounting plate ground stud (Fig. 15.3.9).

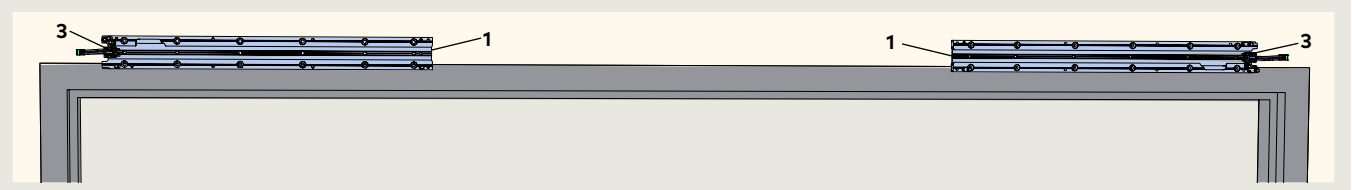
TIPS AND RECOMMENDATIONS

Reference Fig. 15.3.10 for ground stud wiring detail.

- Ground wire ring lug placed between external tooth lockwasher and flat washer.

15.4 Connect customer 115 Vac to ED900 mounting plate terminal block

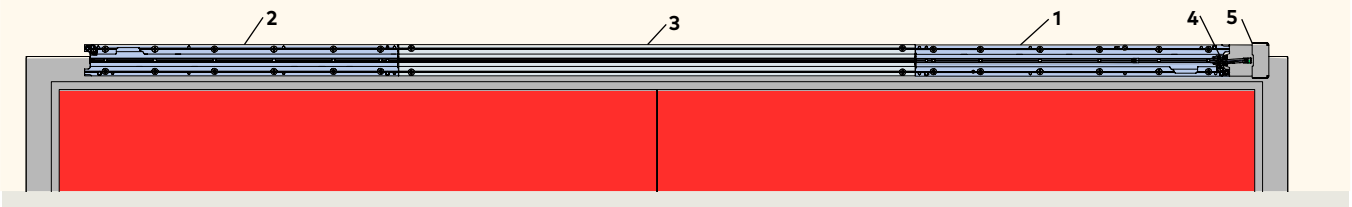
Fig. 15.4.1 Double door mounting plate installation with standard covers



1 ED900 mounting plate

3 115 Vac terminal block

Fig. 15.4.2 Double door mounting plate installation – optional full width cover



1 ED900 mounting plate, inactive door

2 ED900 mounting plate, aactive door

3 ED900 mounting plate extension

4 115 Vac terminal block

5 Conduit box (option)

15.4.1 ED900 115 Vac electrical installation.

WARNING

Work on electrical equipment and 115 Vac wiring installation must be performed only by qualified personnel!

WARNING

Electrical shock hazard! 115 Vac branch circuit disconnect for ED900's must be Off prior to start of electrical installation.

WARNING

115 Vac wiring to ED900 operators must conform to local and national electrical codes.

15.4.2 ED900 installation with standard covers.

- Customer 115 Vac power wiring required to terminal block (3) on each mounting plate (Fig. 15.4.1).

15.4.3 ED900 installation with full width cover option.

- Customer 115 Vac power wiring required at terminal block (3) on inactive door mounting plate (Fig. 15.4.2).
- Active and inactive door assignments may be reversed from Fig. 15.4.2).

4 115 Vac terminal block
5 Ground post

Fig. 15.4.3 115 Vac wiring example

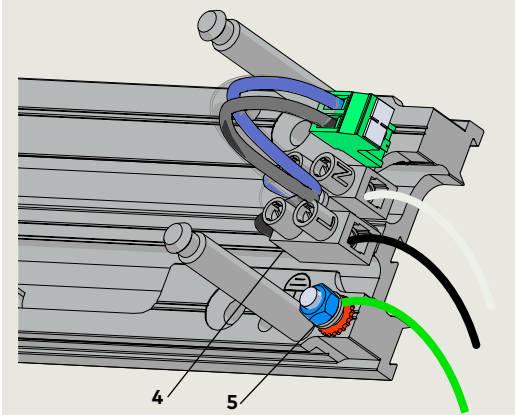


Fig. 15.4.4 Conduit box installation

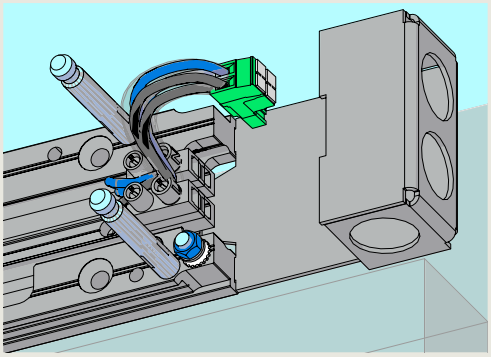
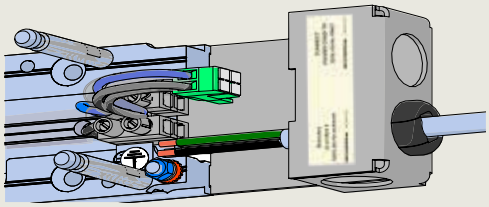


Fig. 15.4.5 PC power cord, conduit box installation



15.4.4 Connect customer 115 Vac wiring.

WARNING

Routing and connection of 115 Vac wiring to ED900 must be performed by a qualified person!

WARNING

115 Vac branch circuit disconnect or circuit breaker must be OFF!

1. Route customer wiring to mounting plate 115 Vac terminal block.

- Standard cover installation; two 115 Vac connections required.
- Full width cover installation (optional); one 115 Vac connection required.

CAUTION

115 Vac wiring.
Use copper conductors only!

1. Connect 115 Vac wiring to each terminal block.

- Terminal block screw tightening torque.

TIGHTEN MAINS TERMINAL TO 5-7 in-lb
Use Copper Conductors ONLY

2. Connect earth ground to mounting plate ground post (s).

15.5 Route accessory wiring to active door mounting plate

15.5.1 Route accessory wiring (Chapter 9) to active door mounting plate.

1. Route wiring to active door 115 Vac terminal block side of mounting plate (Fig. 14.2.1).

TIPS AND RECOMMENDATIONS

Active/inactive door assignments.
Reference Chapter 12, Para. 12.1 for active/inactive door assignments.

Fig. 15.5.1 Mounting plate slots for accessory wiring



2. Accessory wiring, inactive door hinge side: route wiring to active door 115 Vac terminal block side of mounting plate.

TIPS AND RECOMMENDATIONS

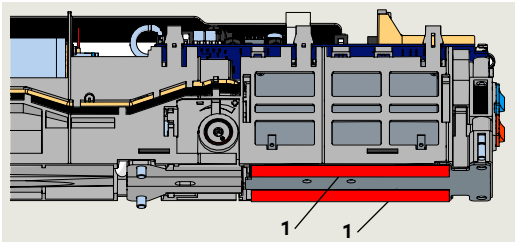
Accessory wiring will terminate at ED900 terminal board (Chapter 9).

NOTICE

Installer responsibilities.
Installer responsible for routing and securing all wiring between ED900 operators.

15.6 Remove protective film strips from each ED900 operator

Fig. 15.6.1 Operator protective film strips



1 Heat conductive pads

15.6.1 Remove protective film strips.

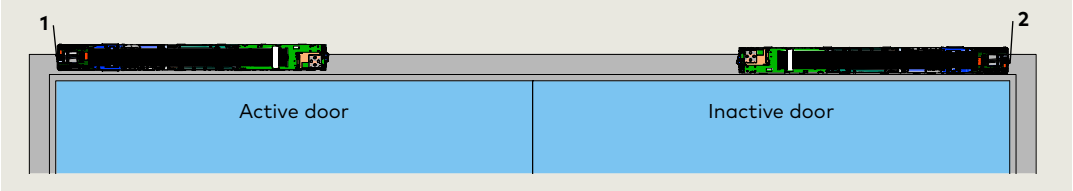
1. Remove two protective film strips from each operator's heat conductive pads.

CAUTION

Heat conductive pads.
Heat conductive pads must remain clean once protective film strips are removed!

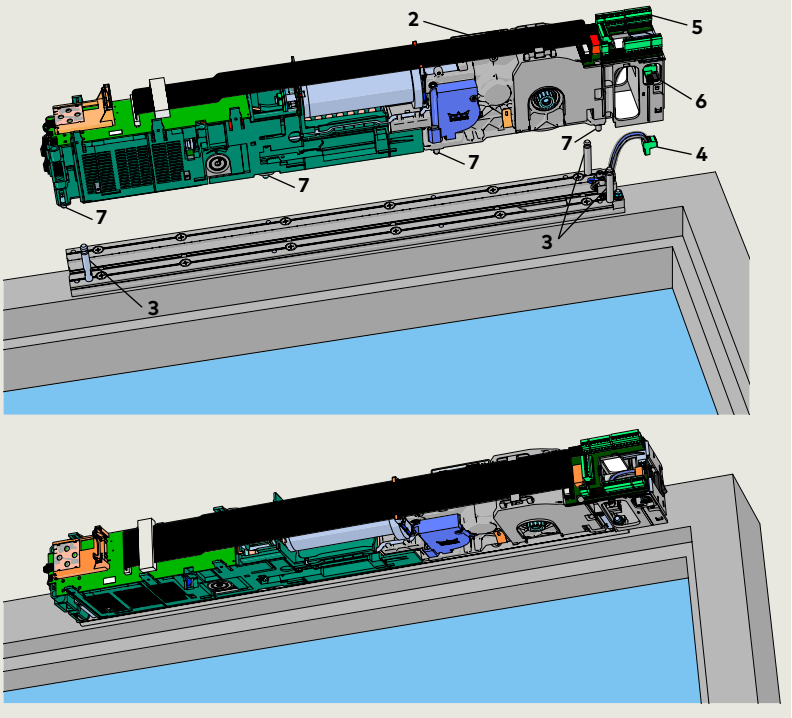
15.7 Install each ED900 operator onto its mounting plate

Fig. 15.7.1 ED900 installation



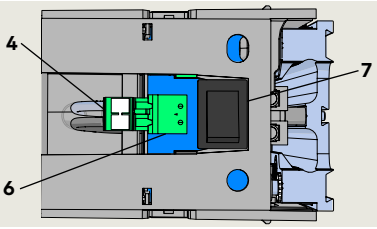
1 Single program switch
2 Power switch

Fig. 15.7.2 Installation of ED900 on mounting plate



1 ED900 mounting plate
2 ED900 operator
3 Guide pin
4 115 Vac plug
5 Accessory wiring terminal connectors
6 115 Vac socket
7 M6 x 10 SHCS

Fig. 15.7.3 ED900 115Vac plug and socket



4 115 Vac plug
6 115 Vac socket
7 Power off/on switch

15.7.1 Active door – Install ED900 operator onto its mounting plate.

CAUTION

Protective film strip removal.
Insure two protective film strips have been removed from operator heat conductive pads (Para. 15.6).

1. Slide ED900 operator over the three mounting plate guide pins and onto mounting plate.
   - Guide 115 Vac plug (4) into ED900 housing adjacent to socket (6).
2. Thread the eight captive ED900 M6 SHCS (7) into their mounting plate holes using 5 mm hex T-handle.
3. Tighten the eight M5 SHCS.

15.7.2 Insert 115 Vac plug into socket.

1. Insert 115 Vac plug from mounting plate 115 Vac terminal block into ED900 socket (Fig. 15.7.2).

15.7.3 Inactive door.

1. Repeat steps in 15.7.1 and 15.7.2.

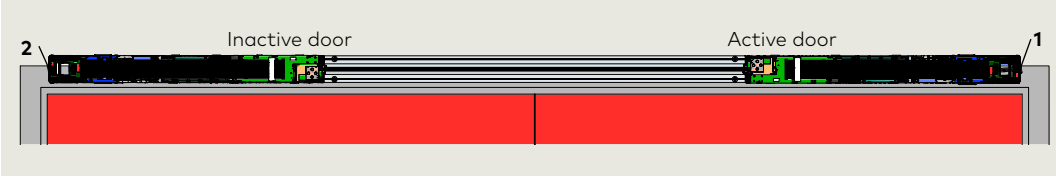
CAUTION

Full width cover option, single program switch and cable.
As ED900 operator is lowered onto mounting plate, route program switch and cable into ED900 housing.
Reference Para. 15.8.

15.8 Full width cover option – Install program switch, active door ED900

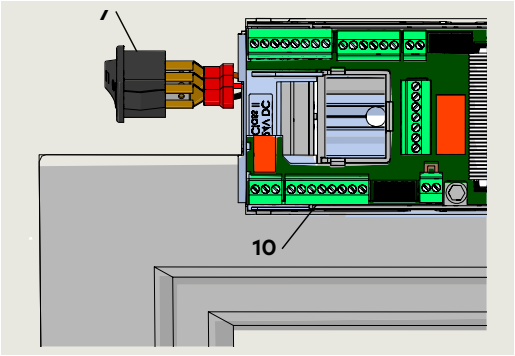
1 Single program switch
2 Power switch

Fig. 15.8.1 Program switch installation on active door



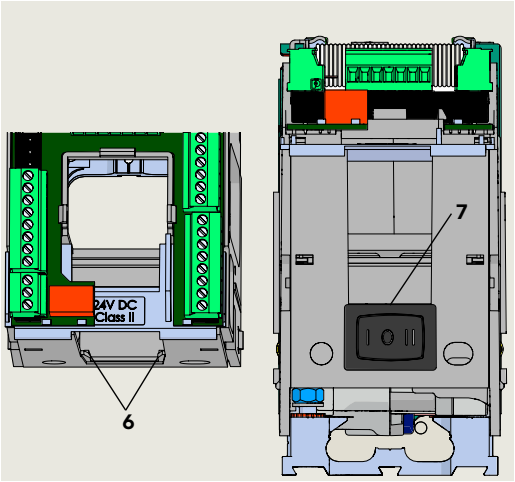
7 Program switch and cable
10 Program switch terminals

Fig. 15.8.2 Program switch and cable



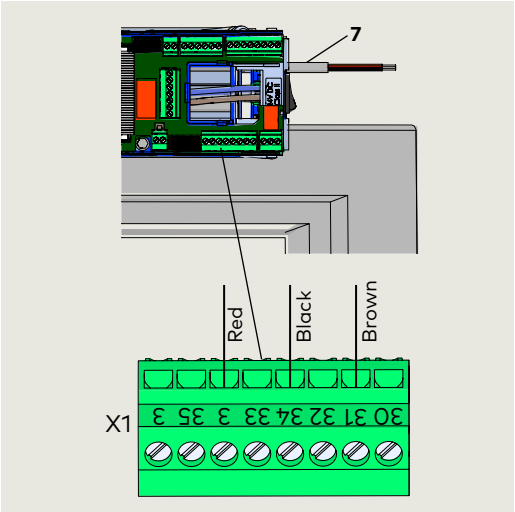
6 Slots for switch
7 Program switch and cable

Fig. 15.8.3 Program switch installation



7 Program switch cable

Fig. 15.8.4 Program switch cable installation, active door ED900



TIPS AND RECOMMENDATIONS

Active/inactive door orientation. May be reversed from Fig. 15.8.1 orientation.

14.8.1 Install program switch.

1. Route program switch and cable into active door ED900 housing.
2. Slide switch into slots in ED900 housing.

- Note orientation of switch in housing (Fig. 15.8.3).

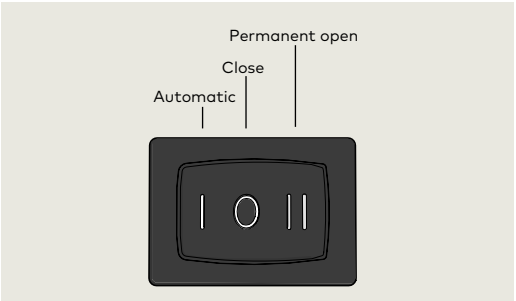
15.8.2 Connect program switch cable wires to active door ED900 operator.

1. Connect program switch cable wires to X1 terminal connector (Fig. 14.7.4)

15.8.3 Program switch wiring.

Terminal	Wire color	Function
31	Brown	Automatic
34	Black	Permanent open
3	Red	0V

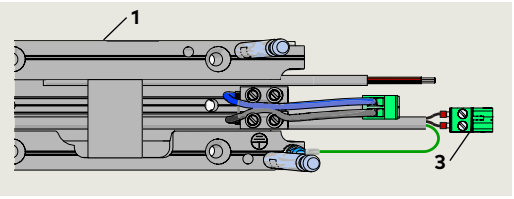
Fig. 15.8.5 Program switch functions



15.9 Full width cover option – 115 Vac pair power cable connections

3 115 Vac interconnect cable plug, male connection

Fig. 15.9.1 Inactive door cables

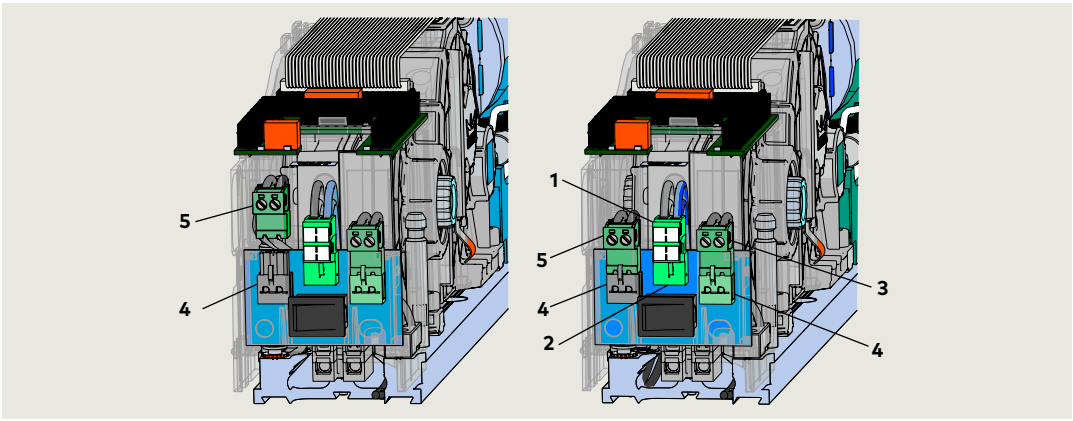


15.9.1 Inactive door

1. Insert 115 Vac interconnecting cable plug (**5**) into ED900 power supply circuit board socket (**4**) (Fig.15.9.2).

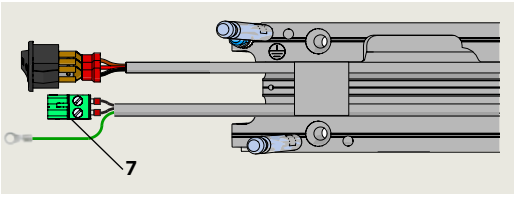
Fig. 15.9.2 ED900 115 Vac pair power cable – inactive door

1 ED900 115 Vac plug from 115 Vac socket, female connection
2 ED900 power supply circuit board socket, male connection
3 ED900 power supply 115 Vac plug, male connection
4 ED900 power printed circuit board socket, female connection.
5 115 Vac pair power cable plug, male connection



7 115 Vac pair power cable plug, female connection

Fig. 15.9.3 Active door cables

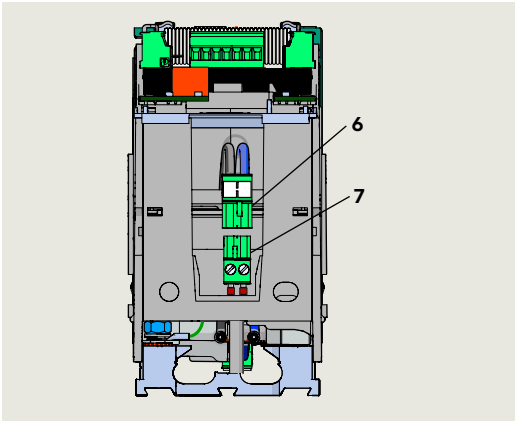


15.9.2 Active door.

1. Insert 115 Vac interconnecting cable plug (**7**) into ED900 power cord socket **(6)** (Fig.15.9.4).

Fig. 15.9.4 ED900 115Vac pair power cable – active door

6 ED900 power cord, male connection
7 115 Vac pair power cable plug, female connection



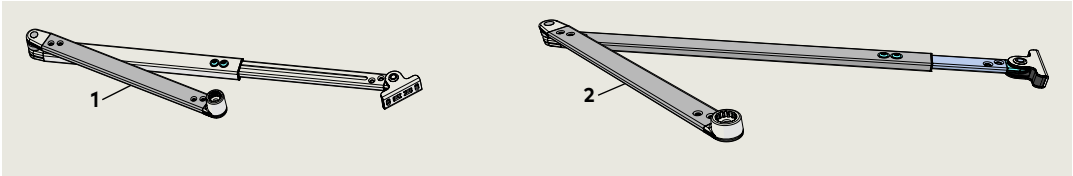
16 J/Push arm installation

16.1 Push arm installation templates

NOTICE

Reference Chapter 13 for push arm installation templates.

Fig. 16.1.1 Push arm assemblies

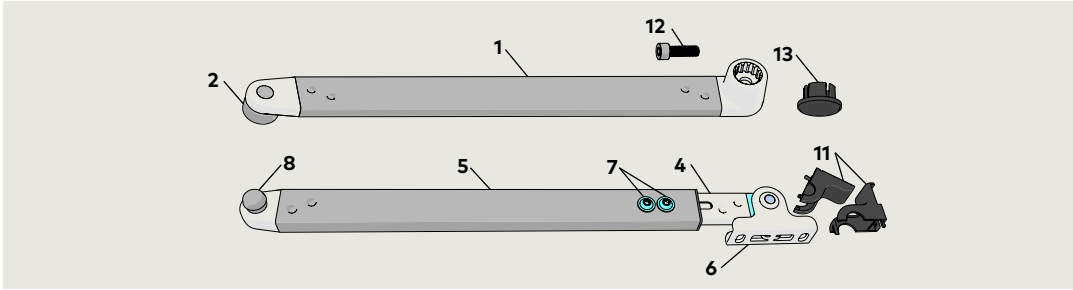


1 J8/Standard push arm, reveal depths 0 - 8" maximum

2 J12/Deep push arm reveal depths 8 - 12" maximum

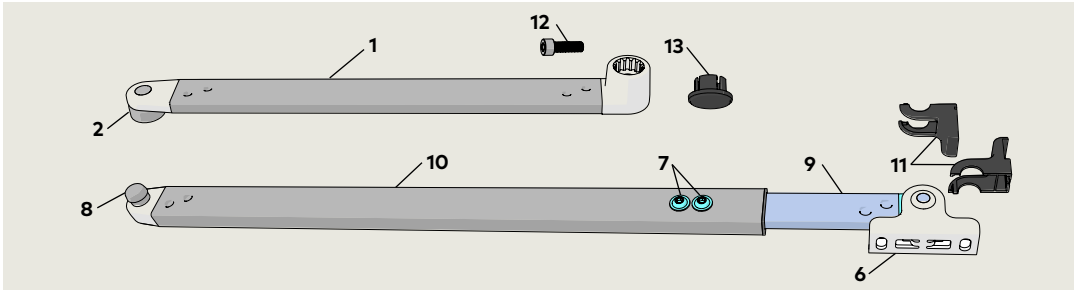
16.2 Push arm installation

Fig. 16.2.1 J8/Splined push arm assembly, 8 7/8" [225]



1 Splined drive arm
2 Socket
4 Adjustment arm 11 1/4"[285]
5 Adjustment arm tube 12 1/4" [311]
6 Shoe
7 M6 x 10 mm flanged button head screw
8 Ball head
11 Shoe screw cover
12 M8 x ___ SHCS
13 Cap

Fig. 16.2.2 J12/Splined push arm assembly, 19 11/16" [500]



1 Splined drive arm
2 Socket
6 Shoe
7 M6 x 10 mm flanged button head screw
8 Ball head
9 Adjustment arm, 17 3/4" [450]
10 Adjustment arm tube, 17 3/4" [450]
11 Shoe screw cover
12 M8 x ___ SHCS
13 Cap

Fig. 16.2.3 Drive arm

1 Drive arm
2 Socket
3 Arm axle sleeve

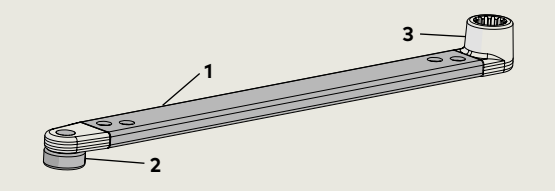
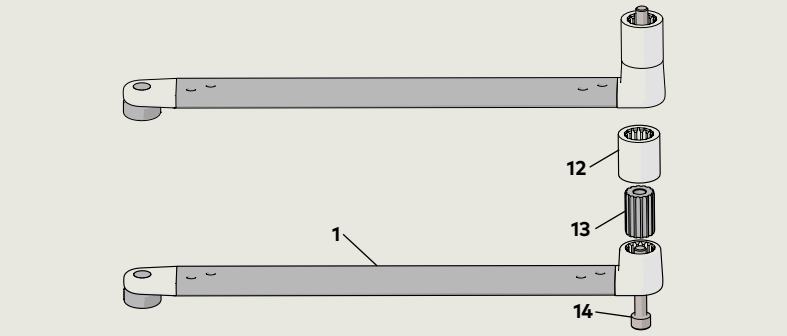
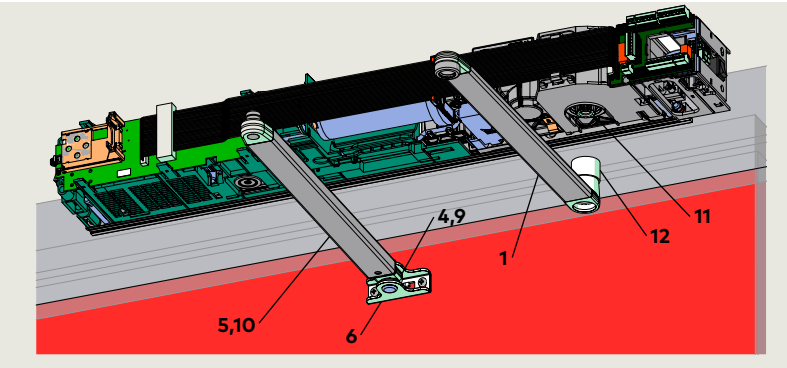


Fig. 16.2.4 Drive arm axle extension installation



1 Drive arm
12 Axle extension sleeve
13 Axle extension
14 M8 x ___ SHCS

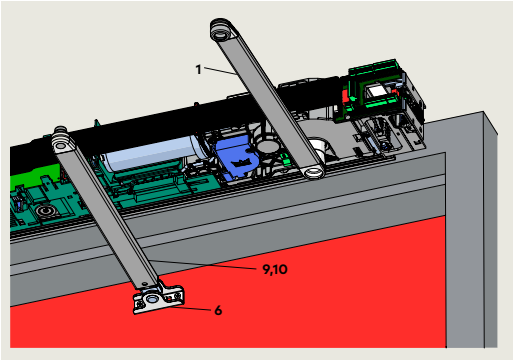
Fig. 16.2.5 Push arm assemblies for installation



1 Drive arm
4 Adjustment arm 11 1/4"[285]
5 Adjustment arm tube 12 1/4" [311]
6 Shoe
7 M6 x 10 mm flanged button head screw
8 Ball head
9 Adjustment arm, 17 3/4" [450]
10 Adjustment arm tube, 17 3/4" [450]
11 ED900 spindle
12 Axle extension sleeve

Fig. 16.2.6 Arm assemblies attached to door and ED900

1 Drive arm
6 Shoe
9 Adjustment arm, 17 3/4" [450]
10 Adjustment arm tube, 17 3/4" [450]



16.2.2 Attach drive arm to operator.

CAUTION

Door must be fully closed!

WARNING

Use caution when working in proximity of door and push arm!.

CAUTION

ED operator axle zero position.
In order to mount the drive arm in the correct position, the axle must be brought to the zero position.

1. Set ED operator spring preload to approximately ten clockwise rotations.
• Axle rotates to the zero position.

TIPS AND RECOMMENDATIONS

Reference Chapter 19, Operator spring tension.

2. Insert axle extension into drive arm.
3. Move arm to ED900, inserting arm into operator spindle at a 90º angle (Fig. 16.2.5).
4. Insert M8 SHCS through drive arm and axle extension. Thread SHCS into ED900 spindle and tighten.

CAUTION

Use torque wrench with hex key socket to tighten SHCS to 17 ft-lb [23 Nm]

16.2.3 Drill two holes in door for adjustment arm shoe.

Installation templates (Chapter 13) document location of shoe on door.

1. Drill two holes in door for adjustment arm shoe.
• Fastener type based on door material.

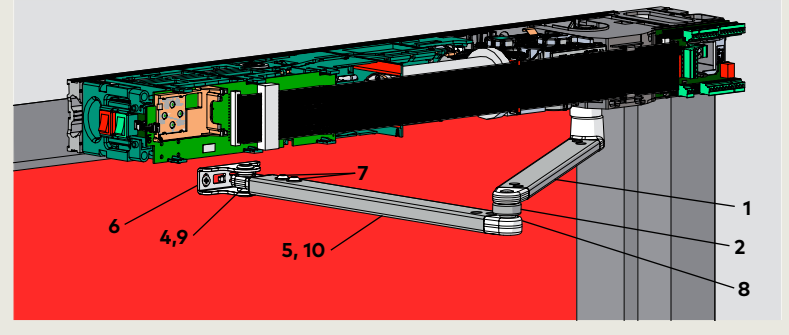
TIPS AND RECOMMENDATIONS

Reference Chapter 5, Accessory kits, for arm fasteners.

16.2.4 Secure adjustment arm assembly to door.

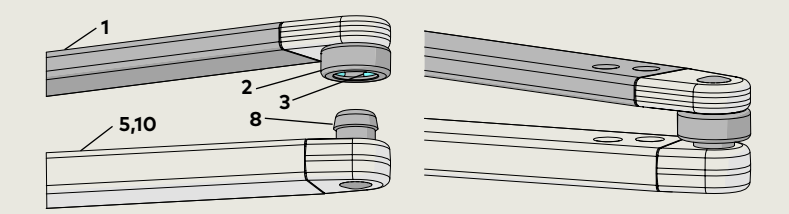
1. Fasten adjustment arm assembly to door (Fig. 16.2.6).

Fig. 16.2.7 Arm assemblies attached to door and ED900



1 Drive Arm
2 Socket
4 Adjustment arm 11 1/4"[285]
5 Adjustment arm tube 12 1/4" [311]
6 Shoe
7 M6 x 10 mm flanged button head screw
8 Ball head
9 Adjustment arm, 17 3/4" [450]

Fig. 16.2.8 Drive arm, adjustment arm connection



1 Drive arm
2 Socket
3 Spring
5 Adjustment arm tube 12 1/4" [311]
7 M6 x 10 mm flanged button head screw
8 Ball head
10 Adjustment arm tube, 17 3/4" [450]

Fig. 16.2.9 Adjustment arm M6 x 10 screws

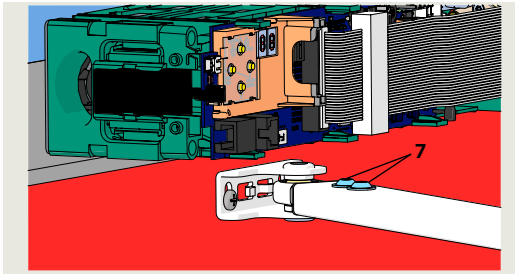
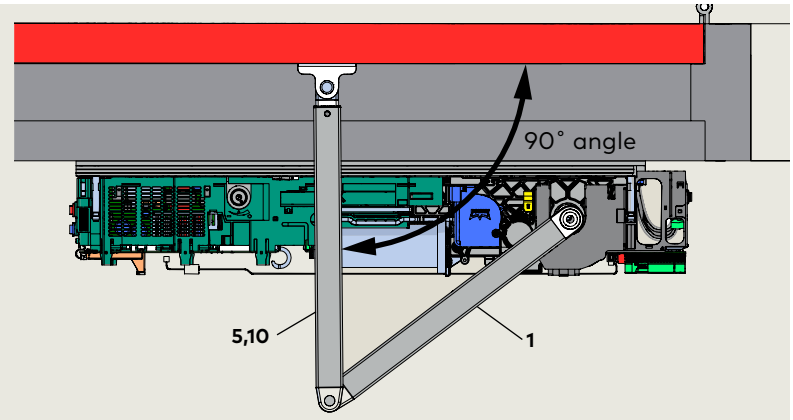


Fig. 16.2.10 Adjustment arm at 90° angle to door



1 Drive Arm
5 Adjustment arm tube 12 1/4" [311]
10 Adjustment arm tube, 17 3/4" [450]

16.2.5 Connect adjustment arm to drive arm.

1. Loosen the two adjustment M6 x 10 mm flanged button head screws (Fig. 16.2.9).

1. Using square, position adjustment arm assembly at 90° angle to door (Fig. 16.2.10).

2. Rotate drive arm and adjust length of adjustment arm until drive arm ball head (8) is aligned with adjustment arm socket (2).

CAUTION

Maintain adjustment arm assembly at a 90° angle to door.

3. Insert adjustment arm ball head (8) into drive arm socket (2).
- Spring in socket will retain ball head in socket.

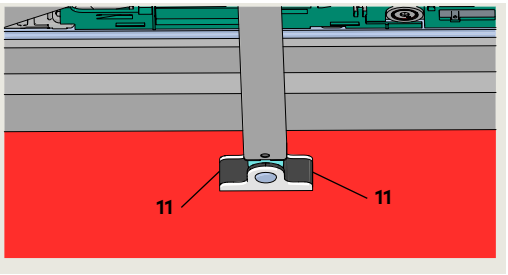
4. Secure adjustment arm position by tightening the two M6 x 10 mm flanged button head screws.

CAUTION

Recheck that adjustment arm is at 90° angle to door.

5. Install shoe screw covers.

Fig. 16.2.11 Shoe screw covers



11 Shoe screw covers

17 Arm with track mount installation

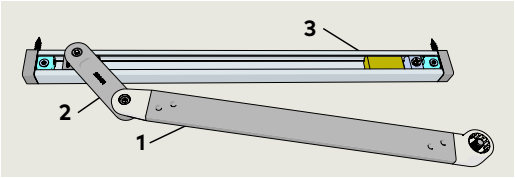
17.1 Arm with track installation

NOTICE

Reference Chapter 13 for pull arm and pull arm as push installation templates.

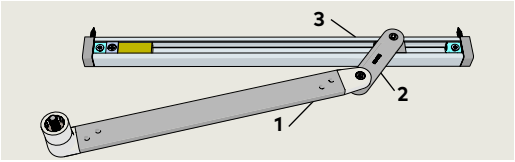
17.2 Splined arm and track assemblies

Fig. 17.2.1 T275/Splined arm with CPD lever and track assembly, LH



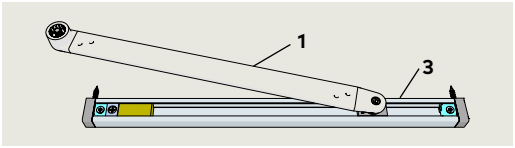
1 Drive arm
2 CPD
3 Track

Fig. 17.2.2 T275/Splined arm with CPD lever and track assembly, RH



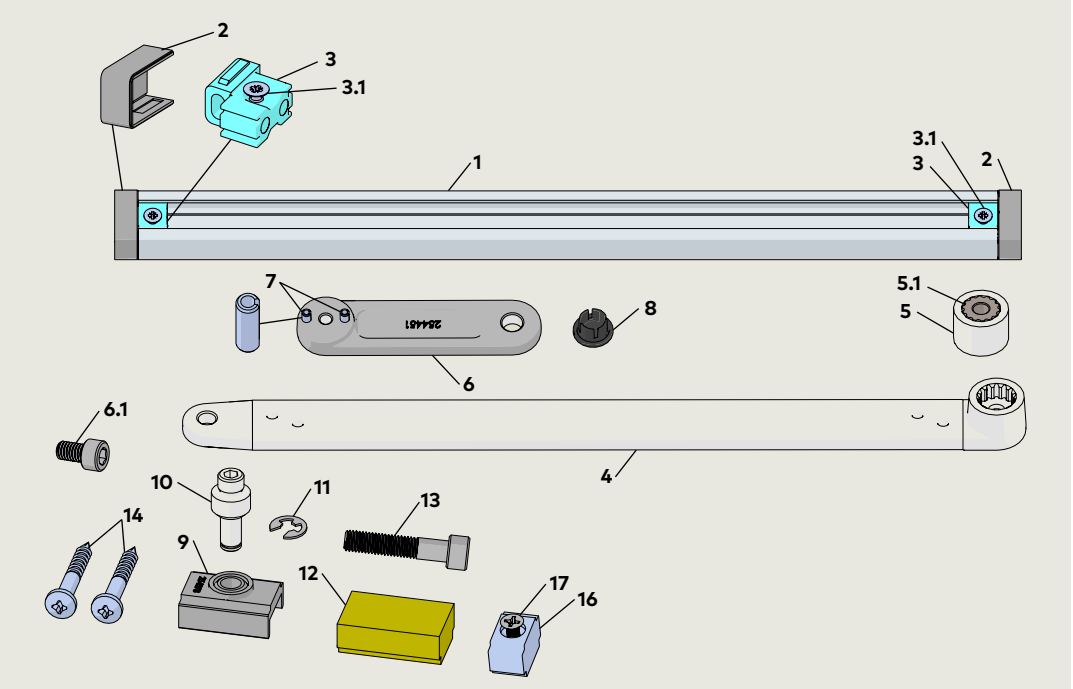
1 Drive arm
2 CPD
3 Track

Fig. 17.2.3 T/Splined arm and track assembly



17.3 Splined arm and track hardware

Fig. 17.3.1 Track assembly

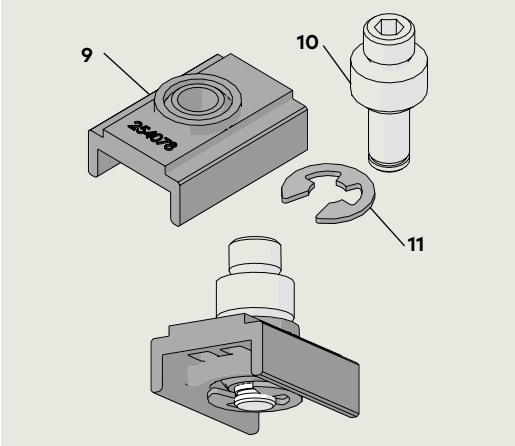


1 Track
2 End cap
3 Fixing piece
3.1 M5 x 15 Phillips FHS
4 Pull arm
5 20 mm axle extension
5.1 Splined sleeve
6 CPD lever
6.1 M6 x 10 SHCS
7 Slotted spring pin
8 Pull arm cap
9 Slide shoe
10 Pivot pin
11 Retaining ring
12 Bumper
13 M8 x 1.25 x 40 SHCS
14 Wood screws
15 Machine screws
16 Bumper stop
17 M5 x 13 FHMS cross recessed

17.4 Slide shoe assembly

9 Slide shoe
10 Pivot pin
11 Retaining ring

Fig. 17.4.1 Slide shoe and pivot pin

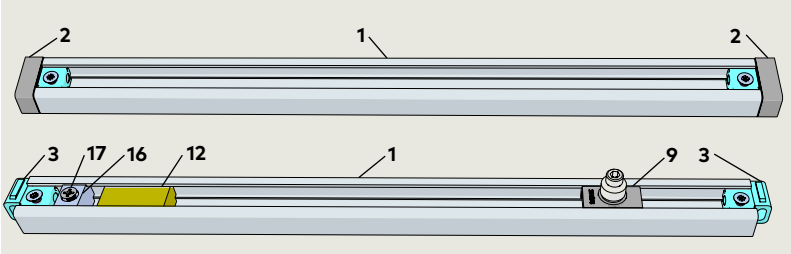


17.4.1 Install pivot pin into slide shoe.

1. Insert pivot pin into slide shoe.
2. Install spring clip into pivot pin slot.

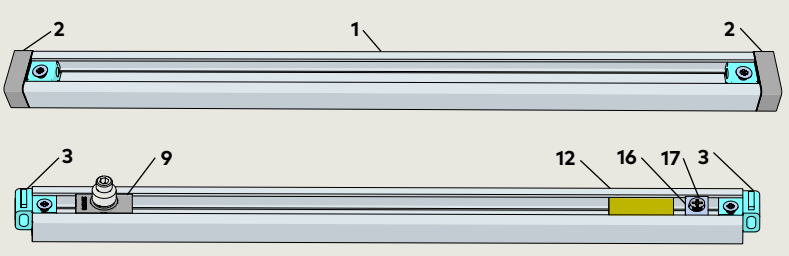
17.5 Install hardware into track

Fig. 17.5.1 RH track assembly



1 Track
3 Fixing piece
9 Slide shoe
12 Bumper
16 Bumper stop
17 M5 x 13 FHMS cross recessed

Fig. 17.5.2 LH track assembly



1 Track
3 Fixing piece
9 Slide shoe
12 Bumper
16 Bumper stop
17 M5 x 13 FHMS cross recessed

17.5.1 Track assembly.

CAUTION

Assemble track hardware based on RH or LH installation.

1. Remove both end caps (2) and one fixing piece (3) from track.

1. Slide bumper stop (16), bumper (12) and slide shoe assembly (9) into track.

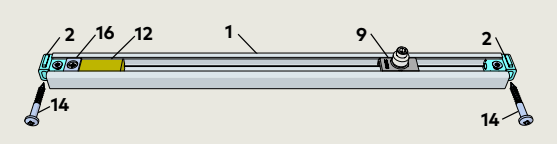
- Do not tighten bumper stop M5 screw (17).

2. Secure fixing piece to end of track with M5 x 15 screw (3.1).

- Use No. 2 Phillips, do not over-tighten.

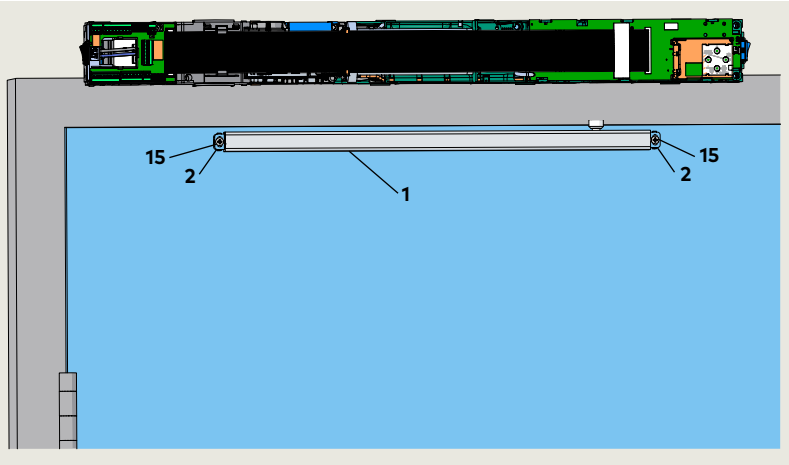
17.6 Fasten track assembly to door

Fig. 17.6.1 Track assembly



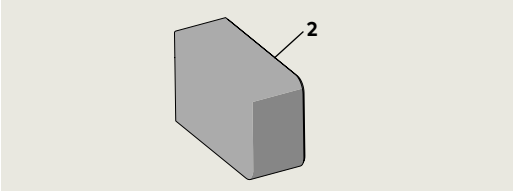
1 Track
2 Fixing piece
9 Slide shoe
12 Bumper
14 Wood screw

Fig. 17.6.2 Track installation



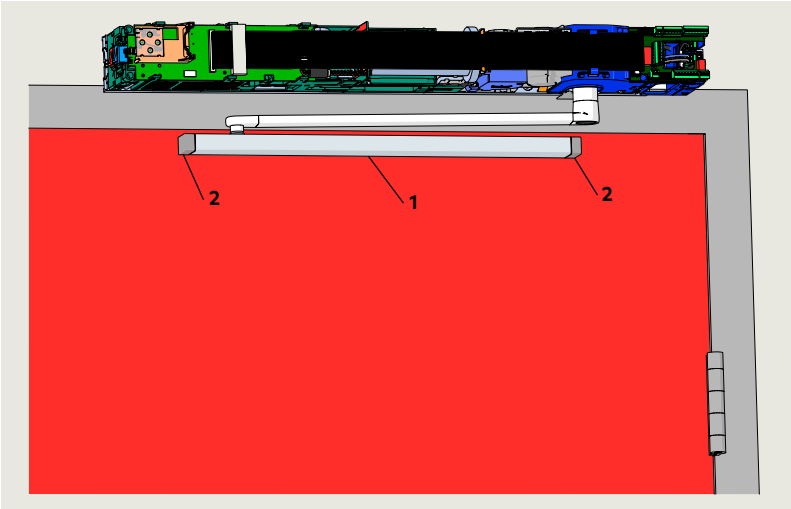
2 Fixing piece
3 Track
15 Fastener

Fig. 17.6.3 End cap



2 End cap

Fig. 17.6.4 End cap installation



1 Track
2 End cap

17.6.1 Mount track assembly on door.

CAUTION

Insure track hardware is assembled for hand of door.

1. Use applicable template (Chapter 13) to locate two track mounting holes on door.

CAUTION

Fastener type:
Fig. 17.6.1 shows wood screws.
- Select fastener based on door material.

2. Drill holes in door, hole size based on selected screw or fastener (Ref. Chapter 5, Accessory kits).
3. Mount track to door; thread fasteners through fixing pieces (2) into door and tighten.

CAUTION

Check track for level when tightening fasteners.

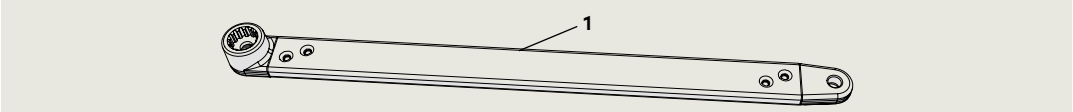
17.6.2 Install track end caps.

1. Install track end caps over fixing pieces.

17.7 Arm assembly

1 Arm

Fig. 17.7.1 Arm assembly



17.8 Arm assembly with CPD lever

6.1 M6 x 10 SHCS
11 Slotted spring pin

Fig. 17.8.1 Slotted spring pin

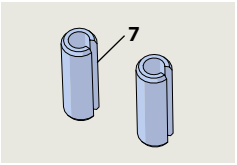
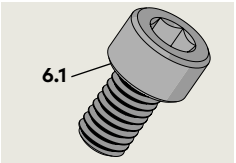
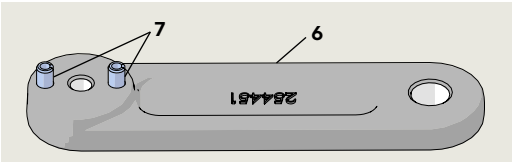


Fig. 17.8.2 M6 x 10 SHCS for CPD



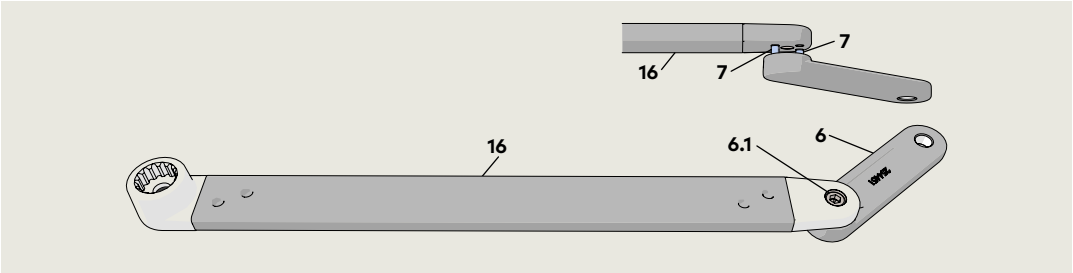
6 CPD lever
7 Slotted spring pin

Fig. 17.8.3 CPD lever and slotted spring pins



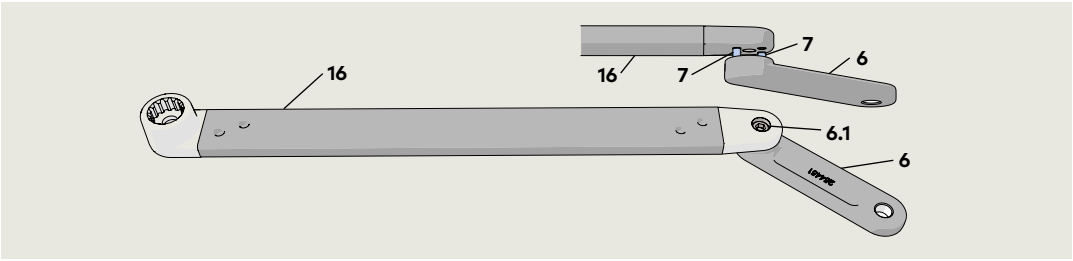
6 CPD lever
6.1 M6 x 10 SHCS
7 Slotted spring pin
16 Arm

Fig. 17.8.4 Arm assembly, RH pull, LH push



6 CPD lever
6.1 M6 x 10 SHCS
7 Slotted spring pin
16 Arm

Fig. 17.8.5 Arm assembly, LH pull, RH push



17.8.1 Arm with CPD lever assembly.

CAUTION

Assemble arm and CPD lever based on RH or LH pull or push.

1. Press CPD lever slotted spring pins into corresponding holes in arm.
2. Secure CPD lever to arm with M6 x 10 SHCS.

17.9 Fasten arm to ED900 operator

Fig. 17.9.1 Mount drive arm to operator at 12 degrees

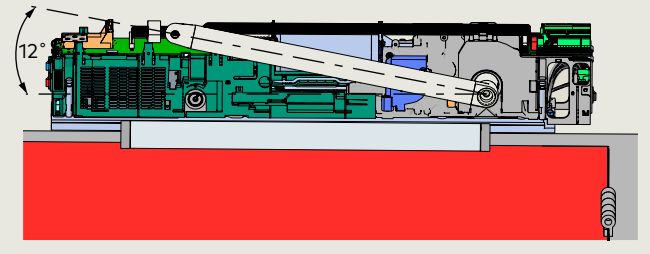


Fig. 17.9.2 Rotate drive arm 10 degrees in door opening direction

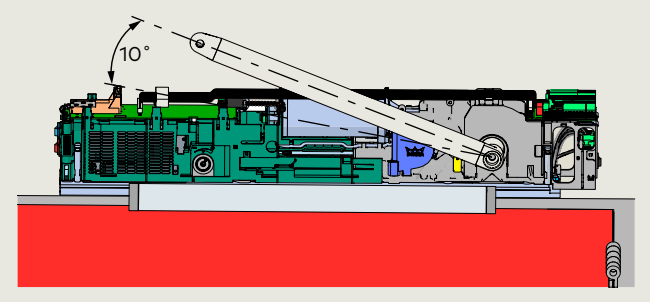


Fig. 17.9.3 Remove drive arm

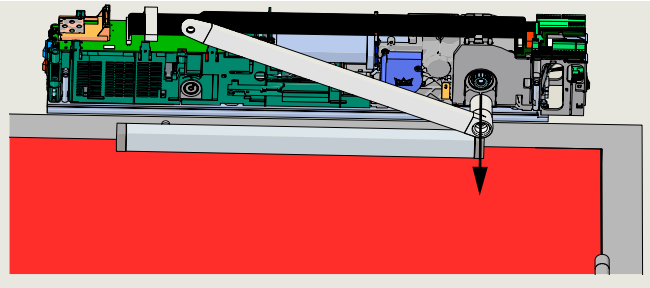


Fig. 17.9.4 Install drive arm and axle extension

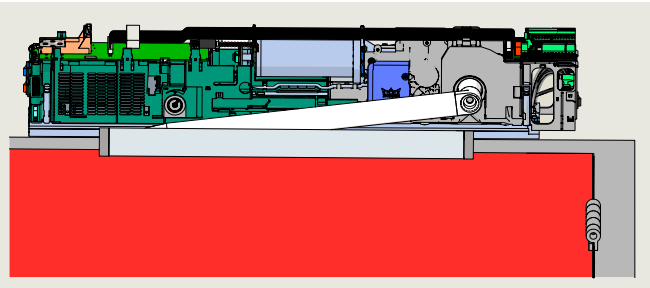
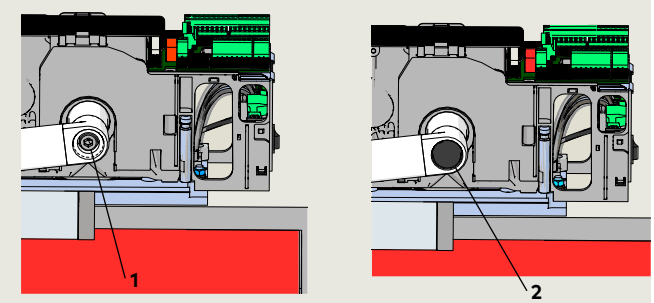


Fig. 17.9.5 InstallM8 x __ mm SHCS into spindle



1 M8 x __ SHCS **2** Cap

17.9.1 Mount drive arm to operator.

WARNING

Use caution when working in proximity of door and pull arm!.

CAUTION

ED operator axle zero position.
In order to mount the drive arm in the correct position, the spindle must be brought to the zero position.

1. Set ED operator spring preload to approximately ten clockwise rotations.

- Axle rotates to the zero position.

TIPS AND RECOMMENDATIONS

Reference Chapter 19, Operator spring tension.

2. Turn the spring preload back to zero rotations (fully CCW).
3. Push the drive arm onto the spindle at an angle of approximately 12º to the ED operator (Fig. 17.9.1).
4. Rotate the drive arm/spindle approximately 10º in the door's opening direction (Fig. 17.9.2).
5. Remove the drive arm from the spindle (Fig. 17.9.3).
6. Position the drive arm one tooth in the door's closing direction (Fig. 17.9.4).
7. Push the drive arm / axle extension onto the spindle (Fig. 17.9.4).
8. Thread the M8 x ___ mm SHCS (length determined by axle extension) into the spindle and tighten SHCS (Fig. 17.9.5).

CAUTION

Use torque wrench with hex key socket to tighten M8 screw to 17 ft-lb [23 Nm].

9. Install cap over M8 SHCS (Fig. 17.9.5).

Fig. 17.9.6 Torque wrench, 5 mm hex key

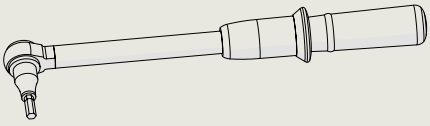


Fig. 17.9.7 Fastening drive arm to pivot pin

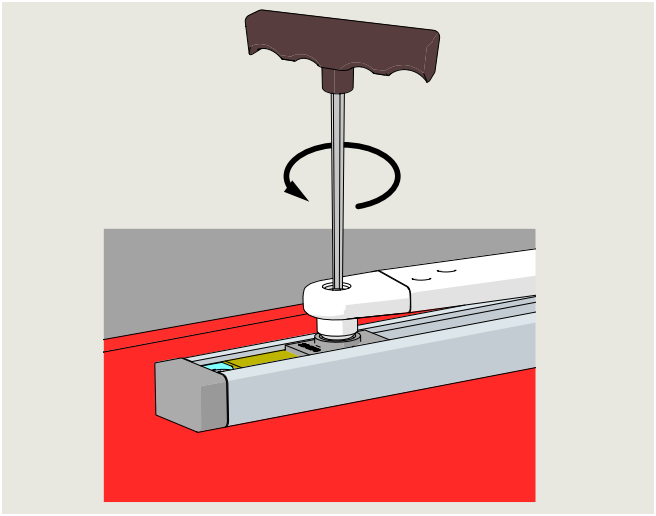


Fig. 17.9.8 Fastening drive arm with CPD to pivot pin

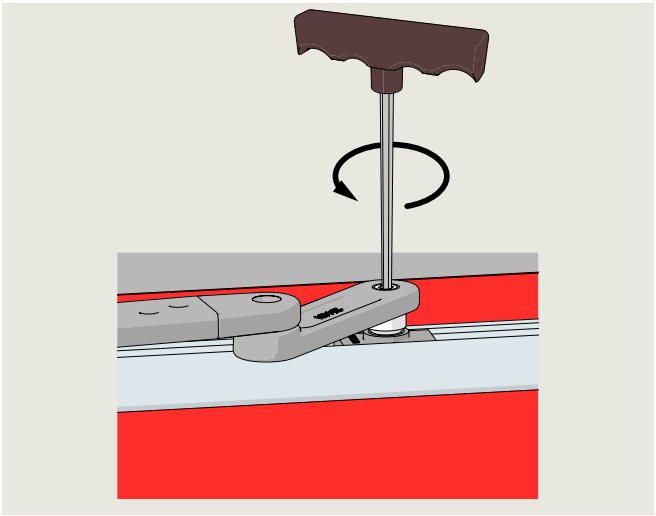
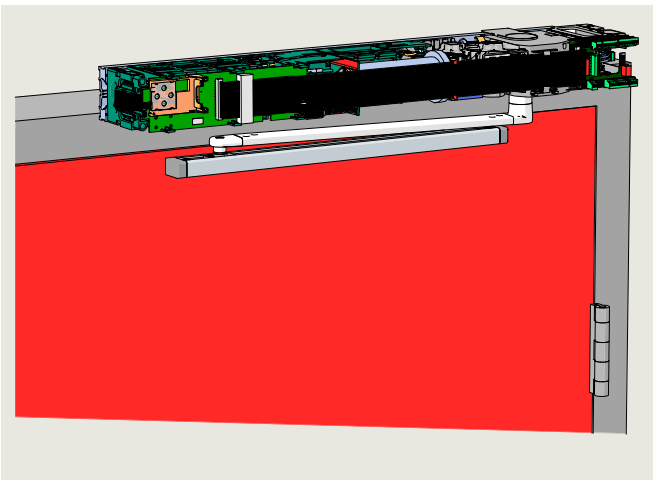


Fig. 17.9.9 Drive arm fastened to track



17.9.2 Attach drive arm to pivot pin.

1. Open door as required to access pivot pin M8 socket head.
2. Use 6 mm T handle hex key to rotate pivot pin M8 socket head into drive arm and tighten.

CAUTION

Use torque wrench with hex key socket to tighten M8 screw to 5.9 - 7.4 ft-lb [8 - 10 Nm].

17.9.3 Set operator spring tension.

CAUTION

A minimum of ten spring tension revolutions are required to operate system.

- Reference Chapter 19 for spring tension adjustment procedure.

18 Measure door width, reveal depth

18.1 Door width parameter Tb

Parameter			Description	Reference paragraph, parameters
2	Tb	rb	Door width	Para. 18.1.8

18.1.1 Door width parameter

Door width is set in increments of 100 mm (4").
Example:
Measured width of 40" [1016] = **Tb** value of "10".

18.2 Record door width measurement, Tb value

Parameter Tb value	Door width measurement

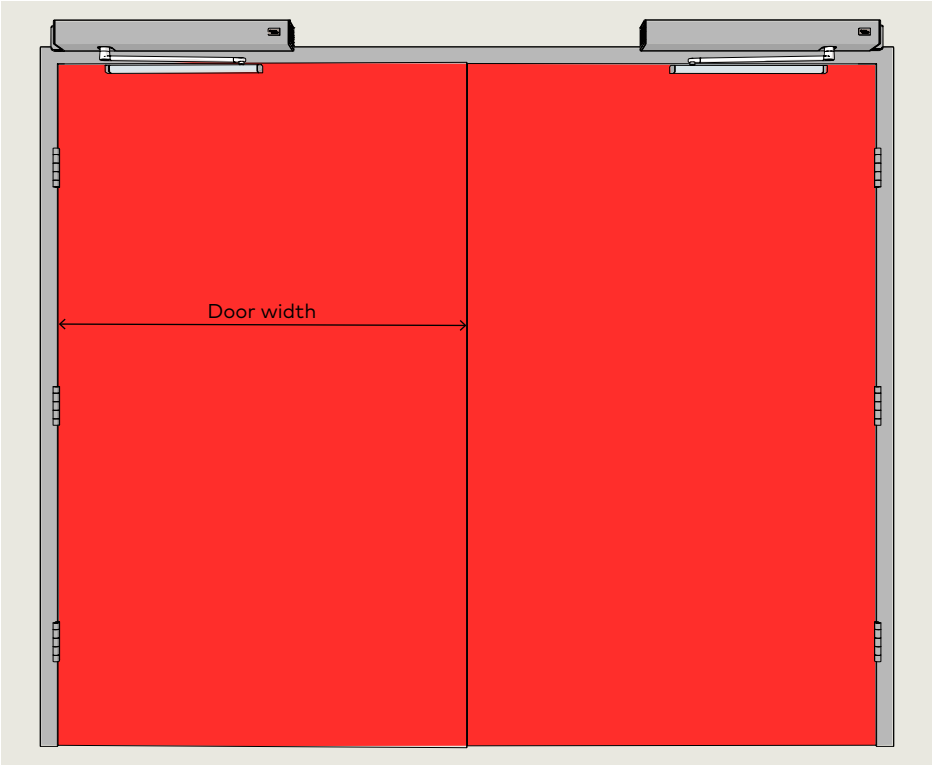
18.3 Tb parameter values

15.3.1 ED900 door width

Door width measurement			
Inches	[mm]	**Tb**	Width Inches [mm]
28 - 31 15/16	[711] - [811]	7	28 [711]
32 - 35 15/16	[813] - [912]	8	32 [813]
36 - 39 15/16	[914] - [1014]	9	36 [914]
40 - 43 15/16"	[1016] - [1116]	**10***	40 [1016]
44 - 47 15/16	[1118] - [1218]	11	44 [1118]
48 - 51 15/16	[1219] - [1319]	12	48 [1219]

*Factory setting

Fig. 18.2.1 Measure door width



18.3 Reveal depth parameter rd

Parameter			Description	Reference paragraph
2	rd	rd	Reveal depth	

18.3.1 Reveal depth parameter.

1. Reveal depth is set in increments of 10 mm (approximately 3/8").

Example: Measured reveal depth of 30 mm (approximately 1 3/16") equals rd parameter value of 3.

18.4 Measure and record reveal depth

18.4.1 Measure reveal depth parameter.
Reveal depth measurement required for each ED900 operator.

Parameter rd value	Reveal measurement

18.4.2 Use of T275 track and pull arm (Fig. 18.4.1).
Value of parameter **rd** must be reduced by 3/16" [30].

- Example: ED900 with T275 track in pull installation with reveal of 30 mm (1 1/8").
  Parameter rd setting = 0. (Reveal of 30 mm - 30 mm).

Fig. 18.4.1 T275 track and pull arm

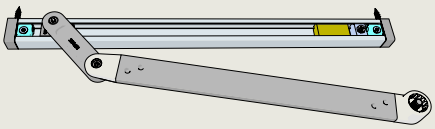


Fig. 18.3.1 Positive reveal

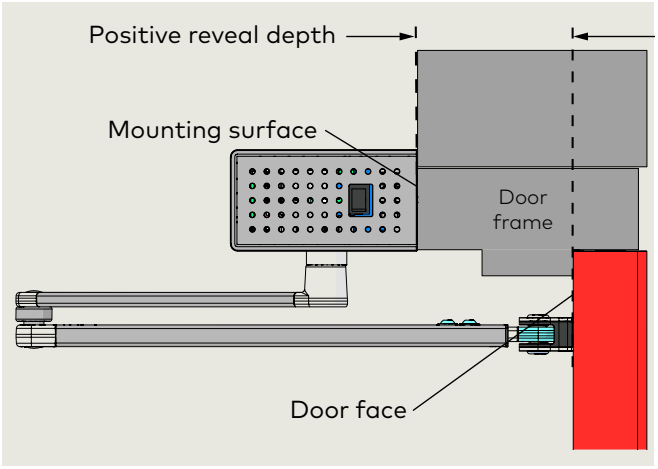
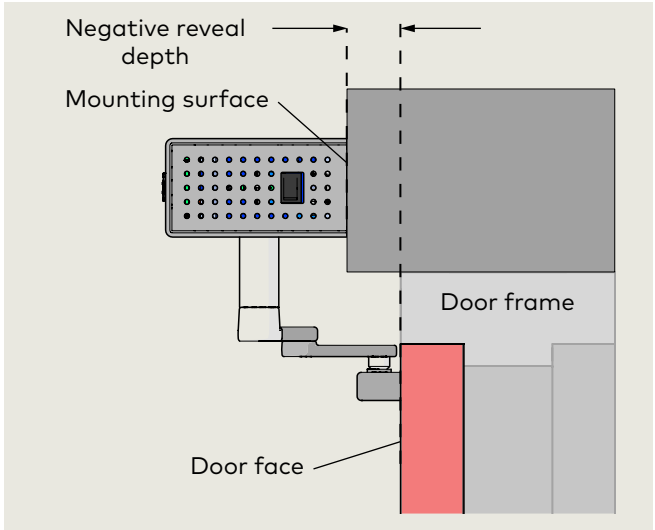


Fig. 18.3.2 Negative reveal



18.5 rd parameter values

18.5.1 ED900 reveal depths, rd parameter

Reveal measurement		
Inches	[mm]	**rd**
-2 3/8"	-60	-6
-1 3/16	-30	-3
-3/4	-20	-2
-3/8	-10	-1
0	**0***	0
3/8	10	1
3/4	20	2
1 1/8	30	3
1 9/16	40	4

Reveal measurement		
Inches	[mm]	**rd**
1 15/16	50	5
2 3/8	60	6
2 3/4	70	7
3 1/8	80	8
3 1/2	90	9
3 15/16	100	10
4 5/16	110	11
4 3/4	120	12
5 1/8	130	13

Reveal measurement		
Inches	[mm]	**rd**
5 1/2	140	14
5 7/8	150	15
6 5/16	160	16
6 11/16	170	17
7	180	18
7 1/2	190	19
7 7/8	200	20
8 1/4	210	21
8 5/8	220	22

Reveal measurement		
Inches	[mm]	**rd**
9	230	23
9 7/16	240	24
9 13/16	250	25
10 1/4	260	26
10 5/8	270	27
11	280	28
11 7/16	290	29

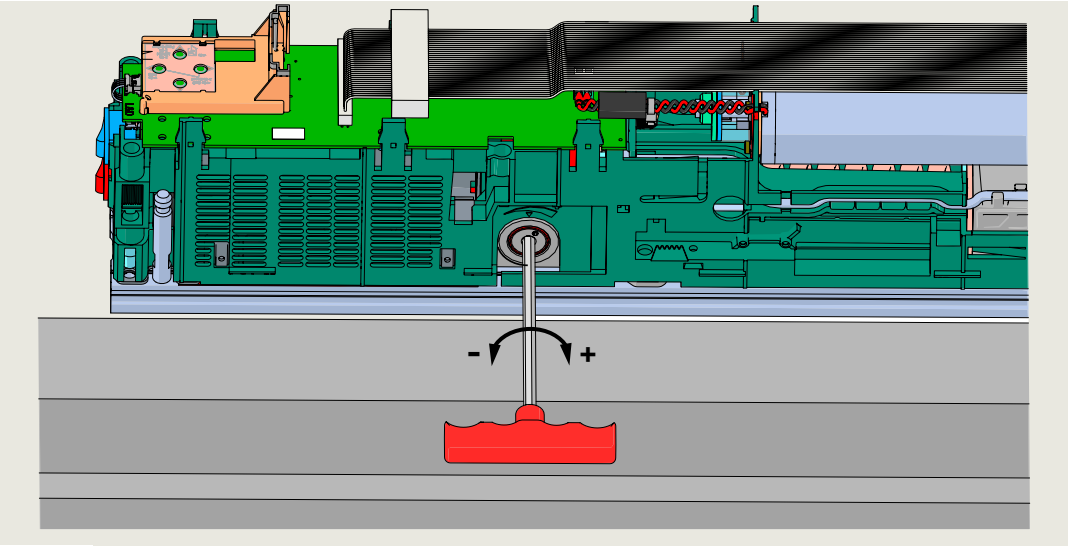
*Factory setting

19 Operator spring tension

19.1 Set ED900 operator spring tension

1 Spring tension adjustment

Fig. 19.1.1 Spring tension adjustment



19.1.1 Spring tension setting revolutions.

Door width				
Inches	32	36	42	48
mm	813	914	1067	1219
Spring setting revolutions				
ED900	10	14	16	18

TIPS AND RECOMMENDATIONS

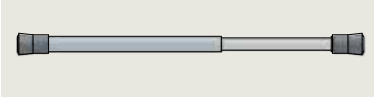
System checks spring tension during learning cycle (Chapter 23).
Learning cycle will be canceled if spring is insufficiently tensioned; door will stop and display will show a rotating "0" and an "F".



Fig. 19.1.2 5 mm T-handle hex key



Fig. 19.1.3 Door pressure gauge



19.1.2 Operator spring tension function.

1. Spring tension sets closing force on door.
2. Required spring tension is based on door width.

19.1.3 Spring tension adjustment.

Spring tension adjustment required for both ED900 operators.

1. Spring tension adjustment is factory set fully CCW, no spring tension.
2. Spring must be pretensioned per Para. 19.1.1.

- Use 5 mm T-handle hex key (Fig. 19.1.2).

Clockwise - increases spring tension.
Counterclockwise - decreases spring tension.

CAUTION

A minimum of ten spring tension revolutions are required to operate system.

CAUTION

Any change to spring tension setting requires a new learning cycle (Chapter 23)!

19.1.4 Check door closing force.

1. Para. 19.1.1 lists approximate spring tension settings.
2. Use pressure gauge to check door closing force at 2° and adjust tension setting if necessary.

TIPS AND RECOMMENDATIONS

Reference Chapter 30, ANSI/BHMA standards for door closing forces.

20 Braking circuit plug

20.1 Braking circuit plug position

Fig. 20.1.1 Braking circuit socket and plug; plug factory installed in pull arm location

1 Braking circuit plug
2 Braking circuit 3 pin socket
3 User interface

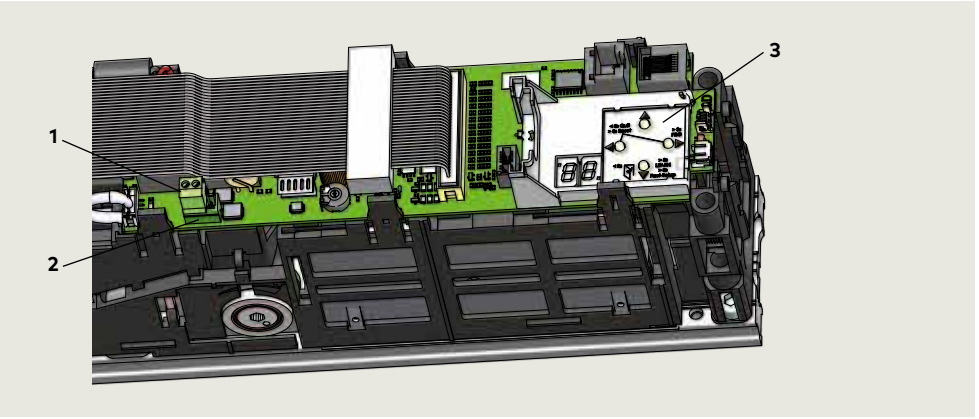


Fig. 20.1.2 Plug position, pull arm

1 Braking circuit plug
2 Braking circuit 3 pin socket

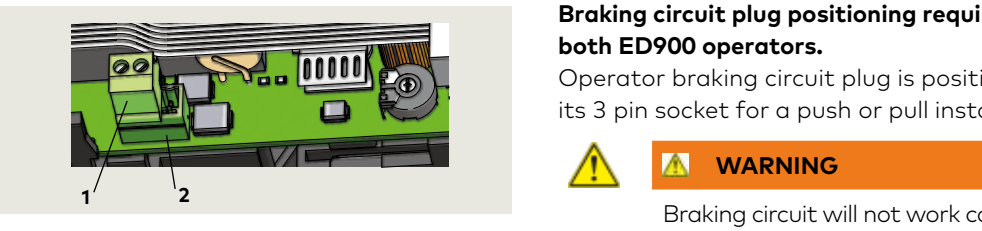


Fig. 20.1.3 Power switch

4 Power switch (shown ON)

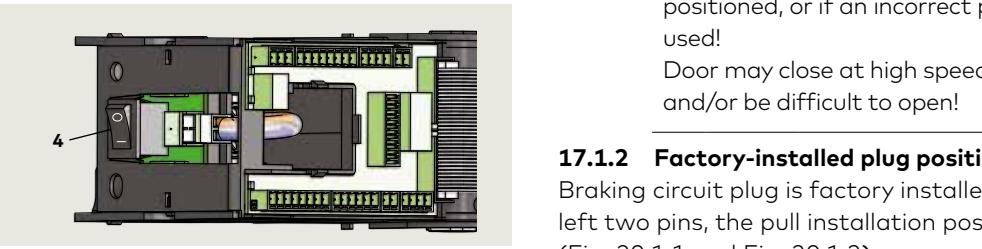


Fig. 20.1.4 Plug position, push arm

1 Braking circuit plug
2 Braking circuit 3 pin socket

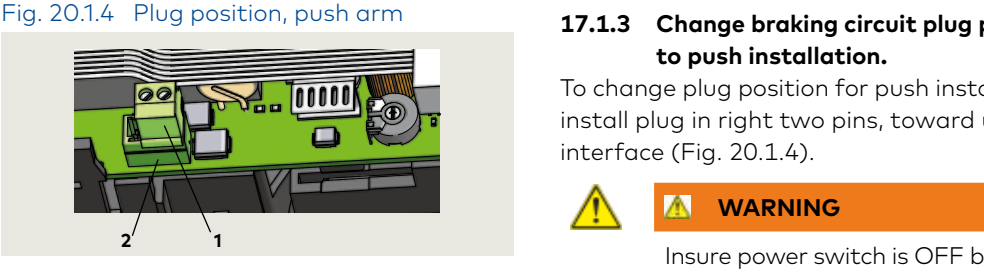
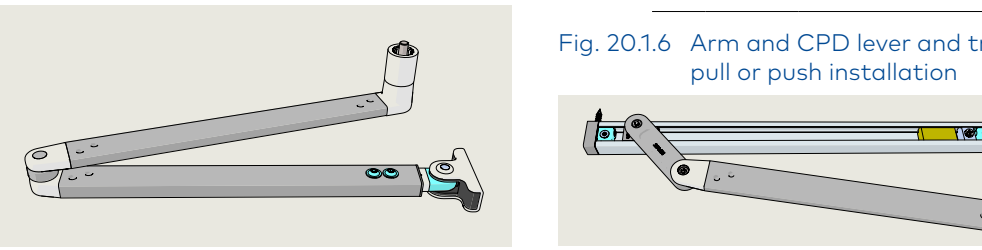


Fig. 20.1.5 Standard push arm



20.1.1 Braking circuit plug.
Braking circuit plug positioning required for both ED900 operators.
Operator braking circuit plug is positioned in its 3 pin socket for a push or pull installation.

WARNING

Braking circuit will not work correctly if braking circuit plug is improperly positioned, or if an incorrect plug is used!
Door may close at high speed and/or be difficult to open!

17.1.2 Factory-installed plug position.
Braking circuit plug is factory installed in the left two pins, the pull installation position (Fig. 20.1.1 and Fig. 20.1.2).

17.1.3 Change braking circuit plug position to push installation.
To change plug position for push installation, install plug in right two pins, toward user interface (Fig. 20.1.4).

WARNING

Insure power switch is OFF before changing plug position!

Fig. 20.1.6 Arm and CPD lever and track, pull or push installation

21 Power fail closing speed

21.1 Set power fail closing speed

Fig. 21.1.1 Power fail closing speed potentiometer

1 Power fail closing speed potentiometer
2 Control board

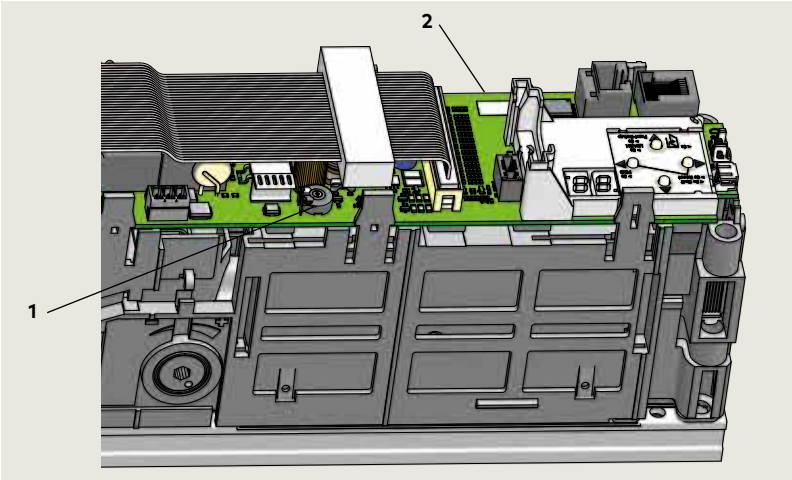
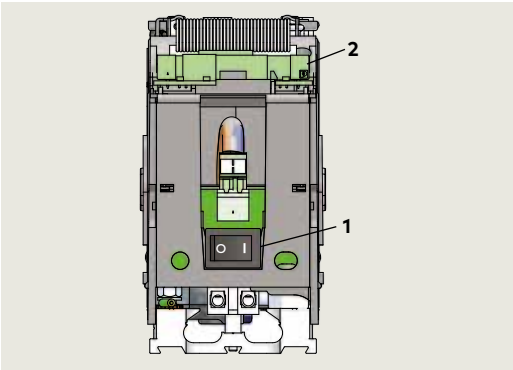


Fig. 21.1.2 Power on switch

1 Power on switch
2 Terminal board



NOTICE

Error message E73:
If door closes in less than three seconds, error message **E 73** (System error 3, braking circuit) will be displayed.
Reference: Appendix B, Troubleshooting.

21.1.1 Power fail closing speed potentiometer.

- Single turn
- Factory setting: fully CCW
- CCW increases closing speed.
- CW decreases closing speed.
- 3/32" [2-3 mm] flat blade screwdriver required for adjustment.

21.1.2 Setting door closing speed upon power failure.

1. Turn ED900 power switch OFF.
2. Manually open door to 90° angle and let it close.
3. If door closes in less than 5 seconds, turn potentiometer 1/4 turn CW and retry test.
4. Continue retrying test after potentiometer adjustment until the door closing time is a minimum of 5 seconds.

21.1.3 Repeat setting closing speed for second door.

TIPS AND RECOMMENDATIONS

Minimum 5 second closing time is required to meet requirements of:
- A117.1, Accessible and Usable Buildings and Facilities, Section 404.2.7.
- 2010 ADA Standards for Accessible Design, Section 404.2.8.

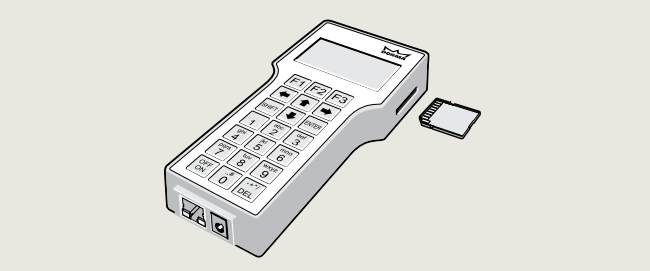
22 Parameters

22.1 Parameters

22.1.1 Firmware version and updates.

- Operator firmware version is displayed during first commissioning. Reference Chapter 23.
- dormakaba handheld can be used to check operator firmware version and to perform firmware updates. Reference Appendix C, dormakaba handheld, or dormakaba handheld manual.

Fig. 22.1.1 dormakaba handheld terminal



22.1.2 Configuration parameters.

Configuration parameters (Para. 22.1.5) are set during first commissioning (Chapter 23).

- Reference Para. 22.1.7 for configuration parameter detail.

22.1.3 Driving parameters.

Driving parameters can be set once first commissioning has been completed.

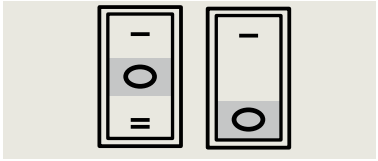
- Reference Para. 22.1.6 for a list of driving parameters.
- Reference Appendix A for driving parameter detail.

22.1.4 Changing parameter values.

1. Set program switches to the CLOSE position

1 Program switch,es, close position

Fig. 22.1.2 Program switches

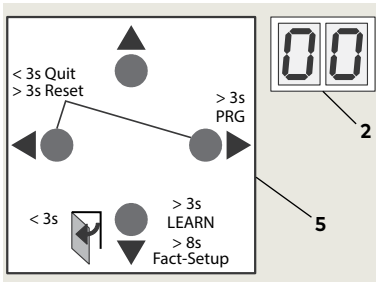


2. Use 4 button keypad as outlined in Steps 1 through 8 to view or change parameter values.

Fig. 22.1.3 4 button keypad, 2 digit display

2 2 digit display

5 4 button keypad



Step 1 ▶	Press right button greater than 3 s to enter program mode.
Step 2 ▲▼	Press up or down button to scroll through parameters until desired parameter is displayed.
Step 3 ▶	Press right button to display current parameter value.
Step 4 ▶	Press right button again to enable editing of value, display will start flashing.
Step 4 ▲▼	Press up or down button to select desired parameter value.
Step 5 ▶	Press right button to save selected value. Display stops flashing.
Step 6 ◀	Press left button to return to selected parameter.
Step 7 ▲▼	Press up or down button to scroll through parameters until next desired parameter is displayed.
Step 8 ◀	Press left button for a minimum of 3 s to exit program mode.

22.1.5 Configuration parameters

Parameter			Description
1	AS		Installation type
2	rd		Reveal depth
3	Tb		Door width
4	dL		Door type

22.1.6 Driving parameters

Driving parameter			Description
5	So		Opening speed, automatic mode
6	Sc		Closing speed, automatic mode
7	dd		Hold open time, automatic mode
8	dn		Hold open time, night/bank
9	do		Hold open time, manual opening of door
10	Sb		Wall masking on door swing (hinge) side
11	ST		Safety sensor test
12	SA		Activation by safety sensor on approach (opposite hinge) side
13	SP		Suppression of safety sensor on swing hinge) side during initial movement
14	Ud		Locking mechanism delayed opening time
15	Pu		Door preload prior to unlocking
16	TS		PR (Power reserve) module test
17	Fo		Static force on door closing edge in opening direction (wind load control)
18	Fc		Static force on door closing edge in closing direction (wind load control)
19	EP		Motor driven latching action, automatic mode
20	EA		Door opening angle at which motor driven latching action is activated
21			Left intentionally blank
22	PG		Push and Go
23	PS		Program switch type
24	S1		DCW EPS, electronic program switch behavior following a power reset
25	S2		Internal program switch; switch function on delay
26	du		Door unlocking during business hours
27	Sr		Status relay function, terminal block X7

TIPS AND RECOMMENDATIONS

Driving parameter details can be found in Appendix A.

Driving parameter			Description
28	bE		**I**nput 4/4a and X3, 1G 24V locking device output configuration
29	CC		Cycle counter, number displayed * 10000
30	EC		Delete error log
31	CS		Reset service interval display (yellow LED)
32	SL		Factory setting level (Fact Setup button)
33	OA		Opening angle, set during learning cycle
34	hd		Door closer mode, automatic or manual
35	hA		Power assist function activation angle
36	hF		Power assist function force adjustment
37	hS		Power assist function support for manual mode in door closed position
38	F1		Upgrade card, fire protection
39	F2		Not used
40	F3		Not used
41	F4		Not used
42	F5		Not used
43	F7		Upgrade card, barrier free toilet
44	F8		Not used
45	C1		Configuration of COM 1 interface
46	bc		Back check angle when door opened manually
47	Td		Door thickness (mm)
48	d1		Deactivation of drive, emergency pushbutton at X4, 4 and 4a, trigger type
49	d2		Night/bank function, trigger type
50	FC		Hold open system release by manually closing door, trigger type
51	Ad		Active door with astragal, caster angle; angle door must reach before passive door starts to open
52	HS		Hinge clearance

22.1.7 Configuration parameters, detail.

Parameter and value range, factory setting = **bold**.			Parameter description
1	AS	0 - 2 **0**	**Installation type** **0** **Pull** • Arm with track (Fig. 22.1.4). • Arm and CPD lever with track (Fig. 22.1.5). Wall mounting on swing (hinge) side. 1 **Push** • Standard push arm (Fig. 22.1.6) Wall mounting on approach (non-hinge) side. 2 **Push** • Arm with track (Fig. 22.1.4). • Arm and CPD lever with track (Fig. 22.1.5). Wall mounting on approach (non-hinge) side.
2	rd	ED900 -3 to 29 **0**	**Reveal depth** **0** Reveal is set in increments of 10 mm (3/8"), "3" = 30 mm (1 1/8") • ED900: [-30 to 290 mm] -1 3/16" to 11 13/32" If using arm with CPD lever (Fig. 22.1.5), approximately 1 3/16" [30 mm] must be deducted from actual reveal.
3	rb Tb	ED900 7 to 12 **12**	**Door width** **10** Door width is set in increments of 100 mm (4"),„"9" = 900 mm (35.4"). • ED900: [700 - 1219] 28" - 48"
4	dL	0 to 4 **0**	**Door type** **0** Single door 1 Double door • Overlapping door (with astragal) • Active door operator. 2 Double door • Overlapping door (with astragal) • Passive door operator. 3 Double door • Edgeless door (no astragal) • Active door operator. 4 Double door • Edgeless door (no astragal) • Passive door operator.

22.1.8 CPD arm and lever; rd parameter adjustment.

- Value of parameter **rd** must be reduced by 3/16" [30] when using the arm with CPD lever in a pull installation.
- Example: ED900 with arm and CPD lever in pull installation with reveal of 30 mm (1 1/8"). Parameter rd setting = 0 (Reveal of 30 mm - 30 mm).

22.1.9 Arm with track – push installation [Application specific].

1. For doors without fire or smoke detection requirements.
2. Maximum reveal depth of 2 3/8" [60].
3. Maximum opening width at a reveal depth of 2 3/8"[60] is reduced to 95 degrees.

Fig. 22.1.4 T/Arm with track

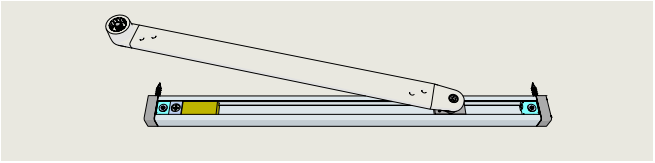


Fig. 22.1.5 T275/Arm with CPD lever and track

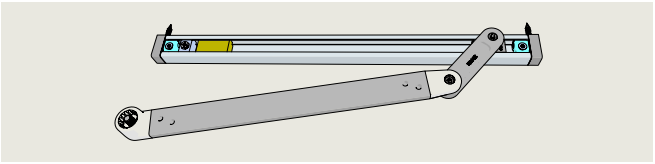


Fig. 22.1.6 J/Push arm

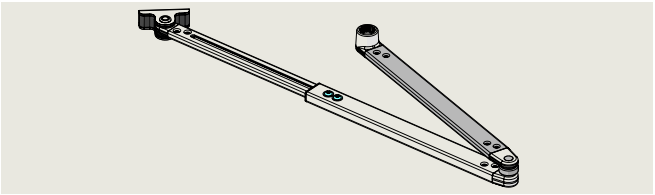
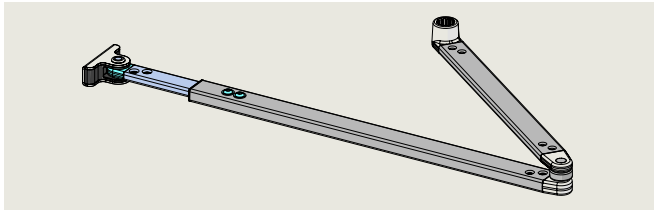


Fig. 22.1.7 J8/Deep reveal push arm



23 Single door first commissioning

23.1 First commissioning

Conditions prior to commissioning.

1. ED900 operators are installed.
2. Standard push arms or arm with tracks are installed.
3. 115 Vac branch circuit to operators is energized.
4. Operator motors are cold.

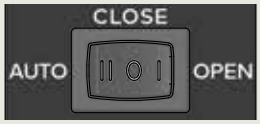
CAUTION

Motors must be cold for commissioning!

TIPS AND RECOMMENDATIONS

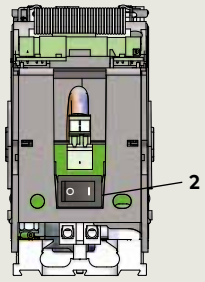
Accessory wiring.
Termination of accessory wiring to the ED900 active door operator should be done only after operator commissioning is completed and learning cycle is performed for each door. Reference Chapter 25 for accessory wiring.

Fig. 23.1.1 Program switch



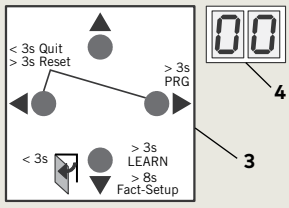
1 Program switch, 3 position

Fig. 23.1.2 Power switch



2 Power switch

Fig. 23.1.3 4 button keypad, 2 digit display



3 Four button keypad

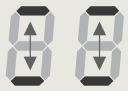
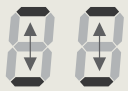
4 Two digit display

TIPS AND RECOMMENDATIONS

If pressing down button (Step 3) does not result in desired display orientation, return to Step 2, turn power button off, then on to repeat commissioning steps.

23.1.1 First commissioning.

Steps in Para. 23.1 through Para. 23.4 must be completed for each ED900 operator.

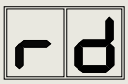
Step 1	Program switch to CLOSE position.
Step 2	Power switch to ON position.
	System check. • Series of letters and numbers rapidly displayed.
	Control unit self check. • Two segments jumping back and forth.
	Horizontal dashes move up and down.
Step 3	Press 4 button keypad down button ▼.
	While 2 digit display segments move up and down, letters and numbers will change if required to display correct orientation.
	Display scrolls: • Device ID (Ed 900) • Firmware version (format F x x x x)
	Program mode display. Program mode will be displayed indicating system requires further parameter settings.

23.2 Set configuration parameters

23.2.1 Set parameter AS, installation type.

Step 1 Press ▶		Press **PRG** greater than 3 s to enter program mode, AS parameter displayed. If no change required, go to step 7.
Step 2 Press ▶		Displays "00" , factory setting.
Step 3 Press ▶		"00" starts flashing.
Step 4 Press ▲▼		Scroll to select parameter value. "1" shown as example.
Step 5 Press ▶		Saves value entered. Display stops flashing.
Step 6 Press ◀		Returns to Installation type parameter.

23.2.2 Set parameter rd, reveal depth.

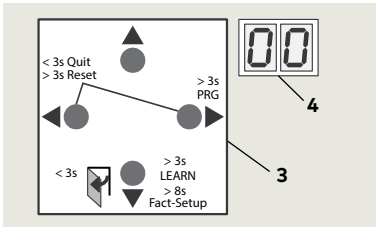
Step 7 Press ▼		Scroll to **rd** parameter.
Step 8 Press ▶		Displays "00" , factory setting.
Step 9 Press ▶		"00" starts flashing.
Step 10 Press ▲▼		Scroll to select parameter value. "6" shown as example.
Step 11 Press ▶		Saves value entered. Display stops flashing.
Step 12 Press ◀		Returns to reveal depth parameter.

Configuration parameter settings continue on next page.

Fig. 23.2.1 4 button keypad, 2 digit display

3 Four button keypad

4 Two digit display

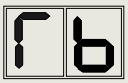
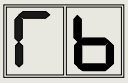


AS	**Installation type**
Parameter value	Parameter description
0*	Pull arm with track, wall mounting on swing (hinge) side.
1	Push arm, wall mounting on approach (opposite hinge) side.
2	Push arm with track, wall mounting on approach (opposite hinge) side.[Application specific]
*	Factory setting

TIPS AND RECOMMENDATIONS

Reference Chapter 18 for reveal depth parameter values.

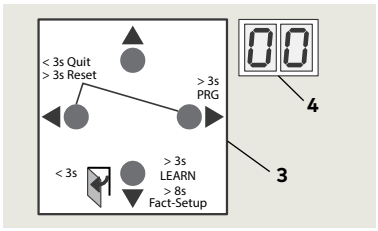
23.2.3 Set parameter Tb, door width.

Step 13 Press ▼		Scroll to **Tb** parameter.
Step 14 Press ▶		Displays "10" , factory setting.
Step 15 Press ▶		"10" starts flashing.
Step 16 Press ▲▼		Scroll to select parameter value. "7" is example, for door widths of 28" to 31 15/16"
Step 17 Press ▶		Saves value entered. Display stops flashing.
Step 18 Press ◀		Returns to door width parameter. If single door, exit program mode (Step 19).
Step 19 Press ◀		Exits program mode. Display indicates "ready for learning cycle".

3 Four button keypad

4 Two digit display

Fig. 23.2.2 4 button keypad, 2 digit display



TIPS AND RECOMMENDATIONS

Reference Chapter 18 for door width parameter values.

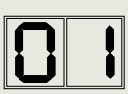
20.2.4 Parameter dL, door type.

TIPS AND RECOMMENDATIONS

Parameter **dL** factory setting is 0, single door.

23.3 Set parameter PS, program switch type

23.3.1 Full width cover or Key switch panel option – set parameter PS to 1.

Step 1 Press ▶		Press and hold PRG > 3 s to enter program mode, AS parameter displayed.
Step 2 Press ▼		Scroll to **PS** (Program switch type) parameter.
Step 3 Press ▶		Displays "00" , factory setting.
Step 4 Press ▶		"00" starts flashing.
Step 5 Press ▲▼		Scroll to select parameter value "1", External mechanical program switch connected to operator terminal board.

CAUTION

Key switch panel options – program switch wired to ED900 terminal board. Reference Appendix D.
Parameter **PS** (Program switch type) must be set to 1.

Step 6 Press ▶		Saves value entered. Display stops flashing.
Step 7 Press ◀		Returns to program switch parameter.
Step 8 Press ◀		Exits program mode.

23.4 Perform learning cycle

CAUTION

Learning cycle must be performed while motor is cold!

CAUTION

Door must not be manually moved or held in position during the learning cycle!

CAUTION

Verify that the following parameters have been set (Para. 23.2):

- **AS**, Installation type
- **rd**, Reveal depth
- **Tb**, Door width

Full width cover option or Key switch panel option, set PS parameter to 1.

- **PS**, Program switch type (Para. 23.3).

TIPS AND RECOMMENDATIONS

During learning cycle:

- Operator functions are deactivated.

WARNING

No personnel or objects must be in range of door motion during learn cycle!

Fig. 23.4.1 Program switches, CLOSE position

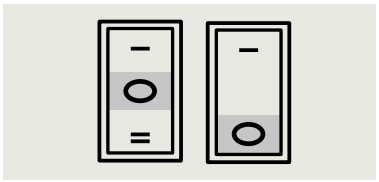
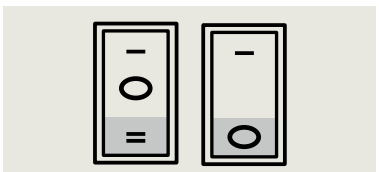
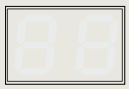
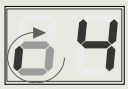


Fig. 23.4.2 Program switches, Auto position



Step 1		Secure motion range of door.
Step 2		Set program switch to CLOSE position, Fig. 20.4.1.
		Rotating "o" and a "0" indicates operator learning cycle is required.
Step 3 Press ▼		Press and hold down button until display changes. • Door performs several movements and display shows a sequence of symbols. • Movements of door must not be interrupted!
		Display indicates door is at 70° position and is waiting for door opening angle to be set.
Step 4		• Manually move door to desired opening angle. Maximum door angle is 110°.
Step 5 Press ▼		Momentarily press down button to continue learning cycle. • Door performs several movements and display shows a sequence of symbols. • Movements of door must not be interrupted!
		**Operator spring tension too low.** • Display with small rotating "o" and an "F" during learn cycle indicates spring tension is too low. • Door will close. 1. Increase spring tension (Chapter 19). 2. Restart learning cycle (Step 3).
		Door completes learning cycle. • Display with two horizontal bars indicate operator is ready for operation.
Step 6 Press ▼		Momentarily press down button to cycle door.
Step 7		Following automatic learning cycle, actual forces on door, and door opening and closing times must be measured and changed if necessary to insure compliance with ANSI/BHMA standards, reference Chapter 30.
Step 9		Set program switch to Auto, Fig. 23.4.2.

24 Double door first commissioning

24.1 Separately commission active and inactive doors

24.1.1 Commission active door first.

1. Refer to Chapter 23 and commission active door.

24.1.2 Commission inactive door.

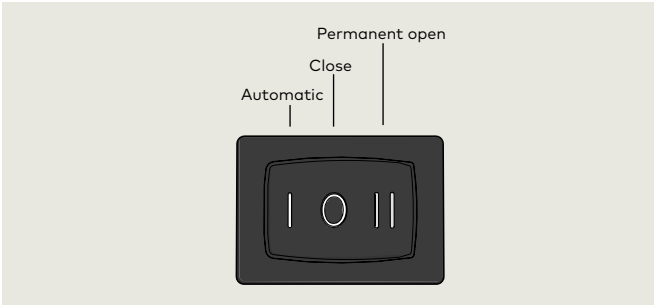
1. Refer to Chapter 23 and commission inactive door.

24.2 Set operator parameters for double door operation

24.2.1 Full width cover option – Active door, set parameter PS to 1.

1. Set program switch to CLOSE4

Fig. 24.2.1 Single program switch located on active door.



CAUTION

Full width cover option – single program switch.
Parameter **PS** on active door must be set to 1. Reference Para. 23.2.1.

Step 1 Press ▶	AS	Press and hold PRG > 3 s to enter program mode, AS parameter displayed.
Step 2 Press ▼	PS	Scroll to **PS** (Program switch type) parameter.
Step 3 Press ▶	00	Displays "00" , factory setting.
Step 4 Press ▶	00	"00" starts flashing.
Step 5 Press ▲▼	01	Scroll to select parameter value "1", External mechanical program switch connected to operator terminal board.

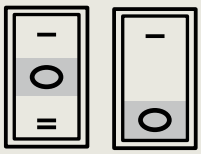
Step 6 Press ▶	01	Saves value entered. Display stops flashing.
Step 7 Press ◀	PS	Returns to program switch parameter.
Step 8 Press ◀		Exits program mode.

24.2.2 Active door, set parameters dL and Ad.

1. Set active door program switches to CLOSE.
2. Set parameters dL (door type) and Ad (caster angle) for active door.

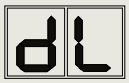
- Castor angle sets opening angle of active door before inactive door starts to open. Factory setting is 30°.

Fig. 24.2.2 Program switches in CLOSE position



CAUTION

Full width cover option.
Single program switch located on active door.

Step 1 Press ▶		Press and hold PRG > 3 s to enter program mode, AS parameter displayed.
Step 2 Press ▼		Scroll to **dL** parameter.
Step 3 Press ▶		Displays "00" , factory setting.
Step 4 Press ▶		"00" starts flashing.
Step 5 Press ▲▼		Scroll to select parameter value ("1" as an example).
Step 6 Press ▶		Saves value entered. Display stops flashing.
Step 7 Press ◀		Returns to door type parameter.

	**Door type**
Parameter value	Parameter description
0*	Single door
1	Double door, with astragal. Active door operator, door opens first.
2	Double door, with astragal. Inactive door operator.
3	Double door, without astragal. Active door operator. Both doors open simultaneously.
4	Double door, without astragal. Inactive door operator. Both doors open simultaneously.
*	Factory setting

Step 8 Press ▼		Scroll to Ad parameter.
Step 9 Press ▶		Displays "30", factory setting.
Step 10 Press ▲▼		Scroll to select parameter value (10° as an example).
Step 11 Press ▶		Saves value entered. Display stops flashing.
Step 12 Press ◀		Returns to caster angle parameter.
Step 13 Press ◀		Exits program mode. Operator is ready for operation.

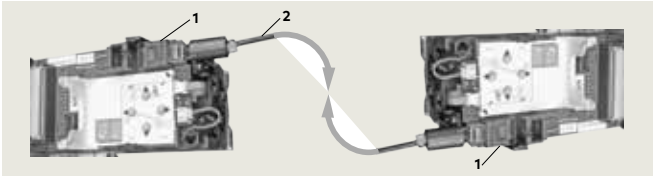
24.2.3 Inactive door, set parameter dL.

1. Set program switch to CLOSE.
2. Set parameter dL (door type) for inactive door.

Step 1 Press ▶		Press and hold PRG > 3 s to enter program mode, AS parameter displayed.
Step 2 Press ▼		Scroll to **dL** parameter.
Step 3 Press ▶		Displays "00" , factory setting.
Step 4 Press ▶		"00" starts flashing.
Step 5 Press ▲▼		Scroll to select parameter value ("3" as an example).
Step 6 Press ▶		Saves value entered. Display stops flashing.
Step 7 Press ◀		Returns to door type parameter.
Step 25 Press ◀		Exits program mode. Operator is ready for operation.

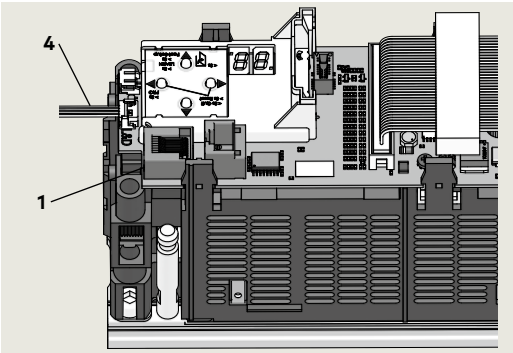
24.3 Connect communication cable between operators

Fig. 24.3.1 Double door operators, communication cable



1 RJ45 jack (horizontal) for communication cable
2 Communication cable

Fig. 24.3.2 RJ45 jack



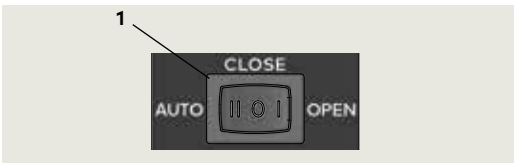
1 RJ45 jack
4 Program switch cable

Fig. 24.3.3 Communication cable



2 Communication cable 08125243

Fig. 24.3.4 Program switch



1 Program switch, 3 position

24.3.2 Install communication cable.

1. Set program switch to CLOSE.
2. Connect communication cable to active and inactive operator RJ45 jacks.
3. Secure cable to header

23.3.3 Test door operation

1. Set program switch to AUTO.
2. Test double door operation.

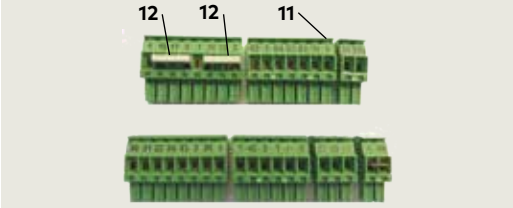
- Use knowing act device

25 Connect accessory wiring and test

25.1 Install accessory wiring

11 Connectors
12 Jumpers

Fig. 25.1.1 ED900 terminal connectors



TIPS AND RECOMMENDATIONS

ED900 115 Vac branch circuit disconnect should be Off while making accessory connections!

25.1.1 Connect accessory wiring.

- All accessory wiring terminates at active door ED900 terminals.

Reference Chapter 9, System Accessories.

1. Use applicable terminal connectors (Fig. 25.1.1) to terminate accessory wiring.

TIPS AND RECOMMENDATIONS

- Use documentation provided with each device for electrical installation.
- Do not connect system accessories to board until operator has been commissioned and learning cycle performed (Chapter 23, 24).

2. Use diagram in Chapter 9 to locate connector to its socket.

CAUTION

Terminal jumpers.
Jumpers (Fig. 25.1.1/12) must be in place on monitoring circuits.

25.2 Test all accessories

25.2.1 Test all accessories.

1. Test functions of all accessories.

26 Set track bumper stop

26.1 Set track bumper stop position

Fig. 26.1.1 Program switch OPEN position

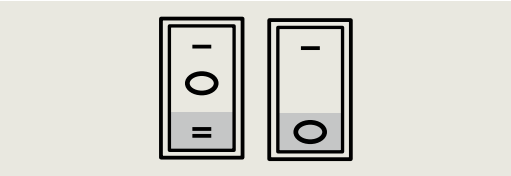


Fig. 26.1.2 Door at set opening angle

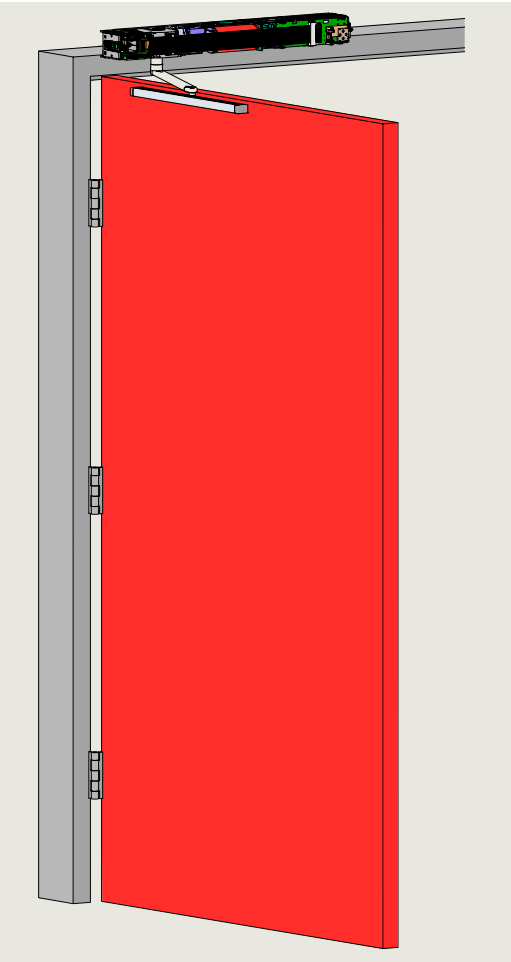
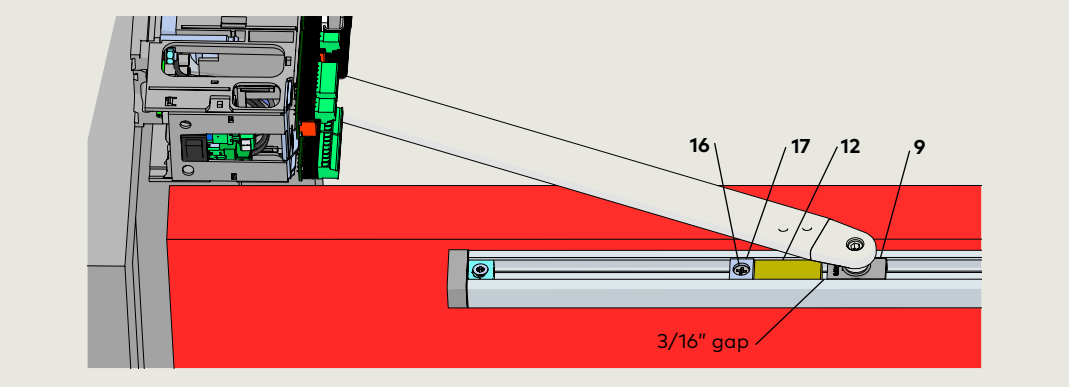


Fig. 26.1.3 Setting bumper stop location



9 Slide shoe
12 Bumper
17 Bumper stop
13 MM5 x 13 FHMS cross recessed

26.1.1 Set bumper stop position.

1. Set program switch to OPEN.
2. Door moves to set opening angle.

WARNING

Use caution when working in proximity of door and track.

3. Slide bumper and bumper stop toward slide shoe until bumper is 3/16" from edge of slide shoe (Fig. 26.1.3).
4. Tighten bumper stop M5 screw. Do not overtighten.

CAUTION

Using program switch, close then open door to verify gap between bumper and slide shoe with door at full open position.

27 Install push arm door stop

27.1 Install push arm door stop (optional assembly)

Door stop assembly 1/4" thick plate
08121320
Door stop assembly 1/2" thick plate
08121330

1 Plate, bumper mounting, 1/4" thick
08120774

2 Plate, bumper mounting, 1/2" thick
08120770

3 Rubber bumper
08120750

4 Shoulder bolt
08104231

5.1 1/4-20 x 1 1/4" Phillips FHS, black oxide, SS

5.2 No. 14 x 1 1/4" Phillips FHMS for sheet metal, zinc plated steel

Fig. 27.1.1 Door stop assembly

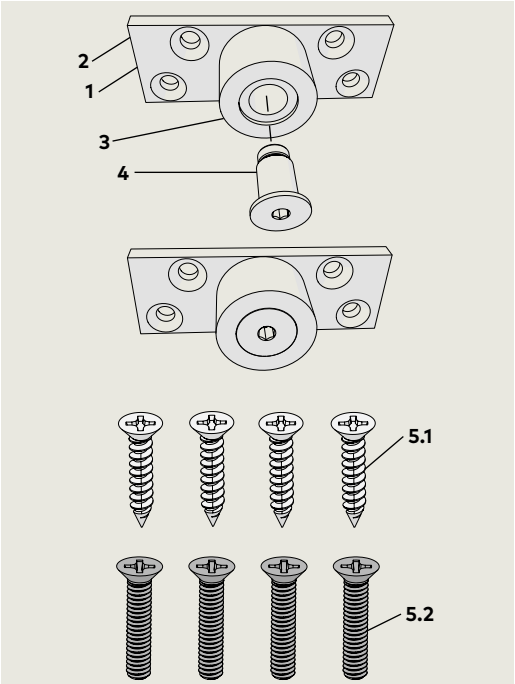


Fig. 27.1.2 Program switch, OPEN position

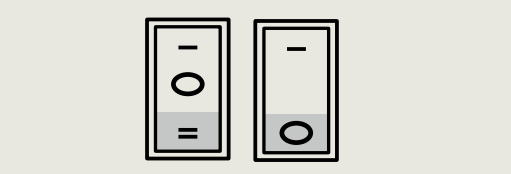
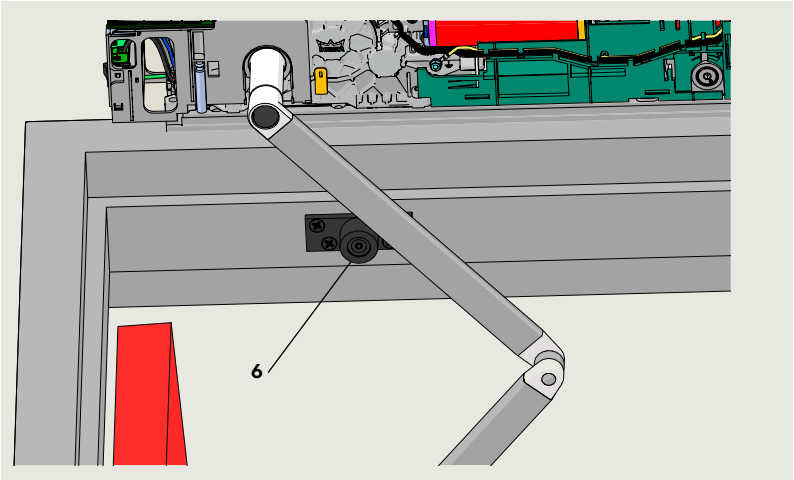


Fig. 27.1.4 Door stop installation



4 Bumper stop assembly

27.1.1 Assemble bumper stop.

1. Attach bumper to bumper mounting plate with 1/2" shoulder screw.
- Use 5 mm hex key.

27.1.2 Open door.

1. Set program switch to OPEN position.
2. Door moves to set opening angle.

WARNING

Use caution when working in proximity of door and push arm!.

27.1.3 Bumper stop installation.

1. With door at its full open position locate door stop assembly bumper on door frame 1/8" beyond arm.
2. Mark mounting plate hole locations on frame.
- Plate hole diameter is 1/4".
3. Select fasteners based on door frame material.
4. Attach door stop assembly to frame.

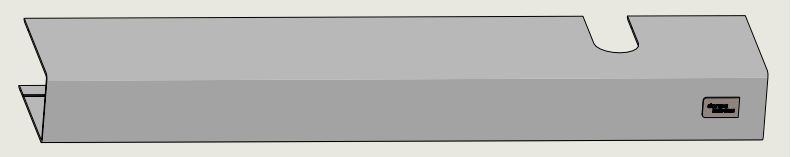
CAUTION

Using program switch, close then open door to verify arm does not contact door stop with door at full open position.

28 Install ED900 cover, end caps and spindle caps

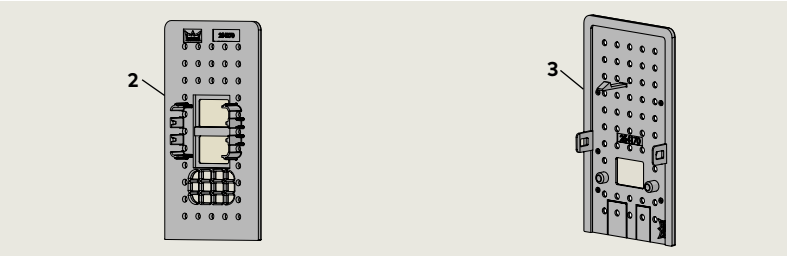
28.1 Install cover and end caps

Fig. 28.1.1 ED900 standard cover



1 Standard cover

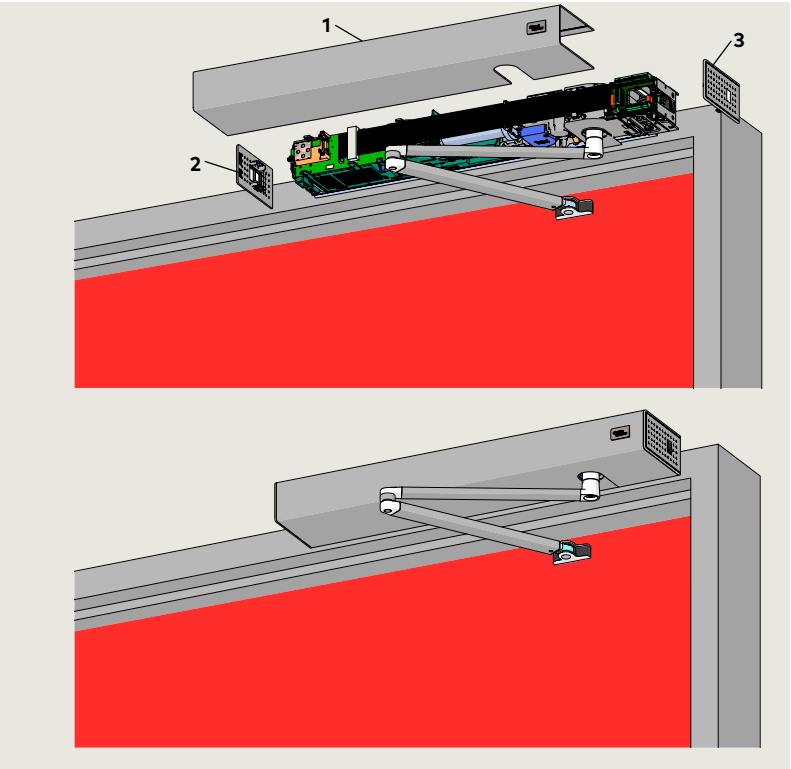
Fig. 28.1.2 ED900 operator end caps



2 End cap, program switches

3 End cap, power switch

Fig. 28.1.3 Cover and end cap installation



1 ED900 standard cover

2 End cap, program switches

3 End cap, power switch

28.1.1 Install covers.

1. Align cover with operator, press inward until cover snaps into place.

CAUTION

Insure that all cables are in place and secured as necessary.

TIPS AND RECOMMENDATIONS

Optional full width cover.

28.1.2 Install end caps.

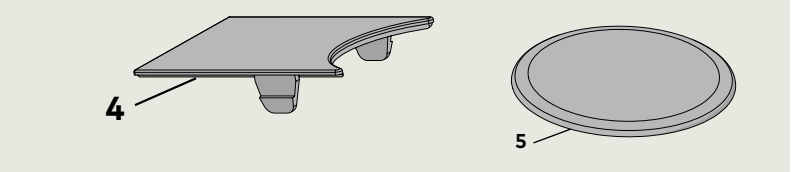
1. Install ED900 operator end caps.

TIPS AND RECOMMENDATIONS

Program switch end cap; insertion depth is adjustable to compensate for minor tolerances is length of operator cover.

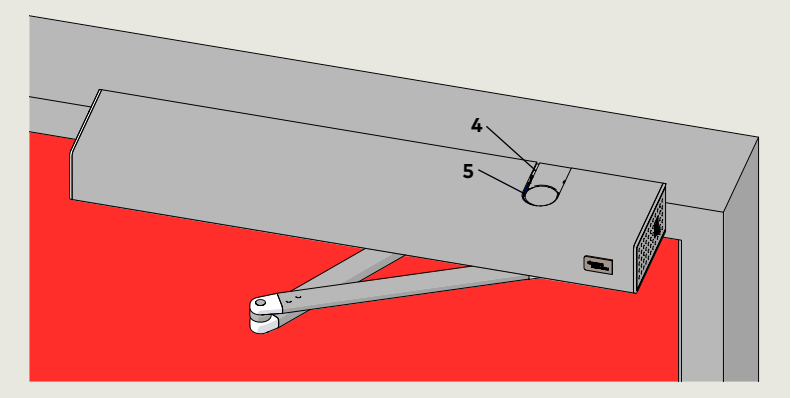
28.2 Install spindle caps

Fig. 28.2.1 Spindle caps



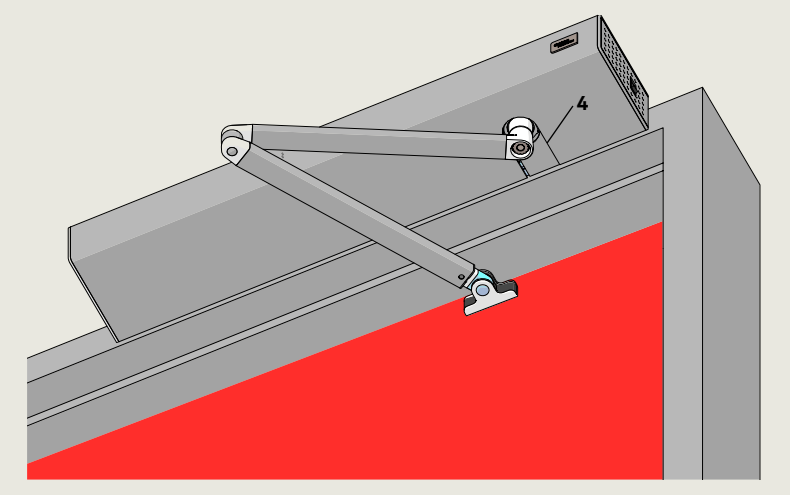
4 Spindle cap
5 Spindle cap

Fig. 28.2.2 Spindle cap installation, ED900 cover top



4 Spindle cap **5** Spindle cap

Fig. 28.2.3 Spindle cap installation, ED900 cover bottom



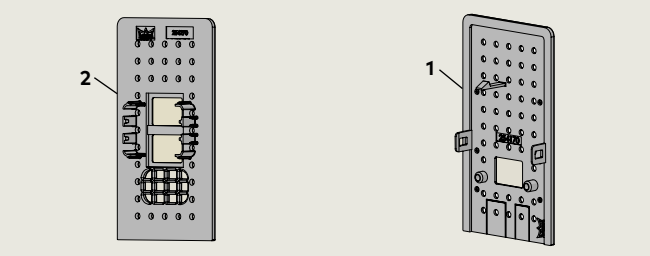
4 Spindle cap

28.2.1 Install spindle caps.

1. Install spindle caps on ED900 cover.

28.3 Full width cover option – Install cover and end caps

Fig. 28.3.1 ED900 end caps



2 End cap, program switches

1 End cap, power switch

28.3.1 Install end caps.

1. Install power switch and program switch end caps.

TIPS AND RECOMMENDATIONS

Active door and inactive door may be reversed from Fig. 28.3.3 orientation.

28.3.2 Install full length cover.

Fig. 28.3.2 ED900 full width cover option

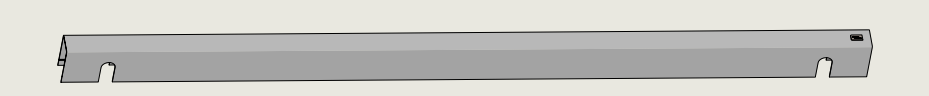


Fig. 28.3.3 End cap installation

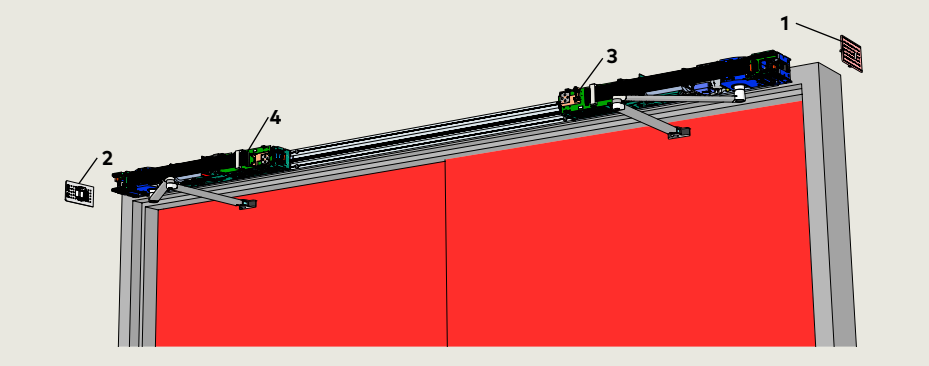
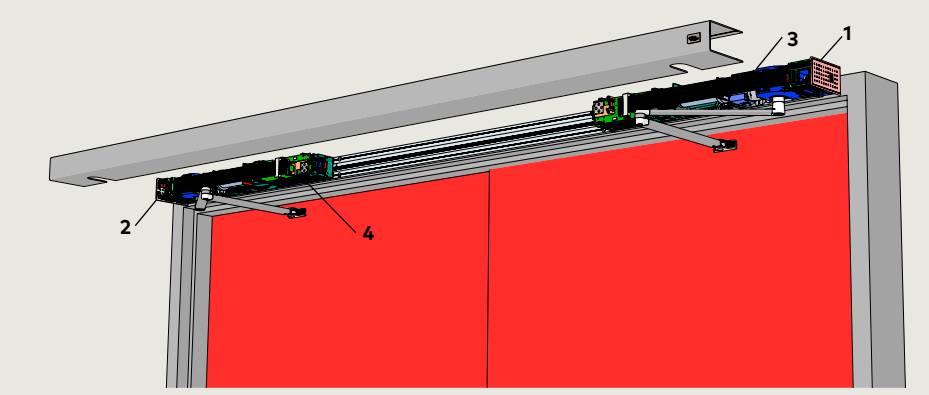


Fig. 27.3.4 Full cover installation



29 Install door signage

29.1 Install door signage

29.1.1 Install door signage based on type of door operation.

Install applicable door signage as outlined in Chapter 10, ED900 door signage.

30 ANSI/BHMA standards

30.1 A156.19 Low energy power operated doors

The following table references portions of content from ANSI/BHMA A156.19. Refer to the standard, available through ANSI or BHMA for additional information. Standard material reprinted with BHMA permission.

30.1.1 Door measurements, low energy power operated door

ED900 Parameter					A156.19 standard	
Parameter		Function	Factory setting	Adjustment range	Para.	Requirement
So	Opening speed	Swing door opening speed.	17⅞ Note 1	8⅞ - 27⅞ 27⅞ max. L.E. mode	4.2	Opening Doors shall open from closed to back check or 80°, whichever occurs first, in 3 seconds or longer as required in Table I. Total opening time to 90° shall be as in Table II. If door opens at more than 90°, iit shall continue at the same rate as back check speed.
bc	Back check	Checking or slowing down of door speed before door being fully opened.	10°	5° - 40°	4.2	Back check shall not occur before 60° opening.
Sc	Closing speed	Swing door closing speed, automatic mode.	17⅞ Note 1	8⅞ - 27⅞ 27⅞ max. L.E. mode	4.4	Closing: Doors shall close from 90° to 10° in 3 seconds or longer as required in Table I. Doors shall close from 10° to fully closed in not less than 1.5 seconds.
dd	Hold open time	Hold open time.	5 s	5 s - 30 s	4.3	Time delay: When powered open, the door shall remain open at the fully opened position for not less than 5 seconds. Exception: when push-pull activation is used, the door shall remain at the fully opened position for not less than 3 seconds.
hS	Reference Appendix A for parameter detail.	Support for manual mode in door closed position.			4.5	Doors shall open with a manual force: • Not to exceed 15 lbf [67 N]to release a latch if equipped with a latch. • To set a door in motion 30 lbf [133 N]. • To fully open the door 15 lbf [67 N]. Forces shall be measured 1" [25.5] from latch edge of door.
hA		Adjustment, door activation angle.				
hF		Power assist function.				
Fo	Static force in opening direction	Static force on door closing edge in opening direction.	13.5 lb f [60 N]	4.5 lb f [20 N] - 15 lb f [67 N]	4.5	Force required to prevent a stopped door from opening or closing shall not exceed 15 lb f [67 N] measured 1" [25.4] from latch edge of door at any point during opening or closing.
Fc	Static force in closing direction	Static force on door closing edge in closing direction.	13.5 lb f [60 N]	4.5 lb f [20 N] - 15 lb f [67 N]	4.5	

Note 1: Speed may be slower after learning cycle completed.

30.1.2 A156.19, Table I: Minimum opening and closing times.

"D" door width, inches [mm]	"W" door weight, pounds [kg]				
	100 [45.4]	125 [56.7]	150 [68]	175 [79.4]	200 [90.7]
30 [762]	3.0	3.0	3.0	3.0	3.5
36 [914]	3.0 s	3.5 s	3.5 s	3.0 s	3.0 s
Minimum opening time to back check or 80 degrees (whichever occurs first). Minimum closing time from 90 degrees to latch check or 10 degrees (whichever occurs first).					

30.1.3 A156.19, Table II: Total opening time to 90 degrees.

Back check at 60°	Back check at 70°	Back check at 80°
Table I plus 2 s	Table I plus 1.5 s	Table I plus 1 s
If door opens more than 90°, it shall continue at the same rate as backcheck speed.		
Back check occurring at a point between positions shall use lowest setting.		

30.1.4 Other door weights and widths

Closing time T = (D $\sqrt{W}$)/188
D = Width of door in inches.
W = Weight of door in pounds.
T = Closing time to latch check in seconds.

SI (metric) units
Closing time T = (D $\sqrt{W}$)/2260
D = Width of door in mm.
W = Weight of door in kg.
T = Closing time to latch check in seconds.

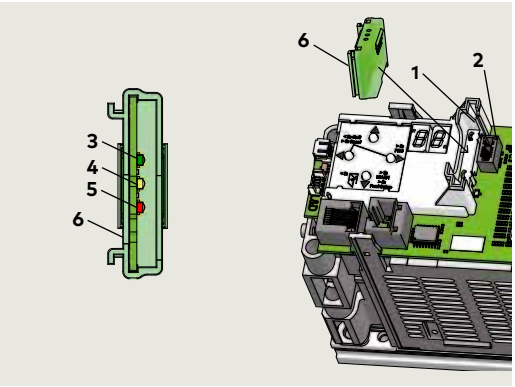
31 Upgrade cards

31.1 Upgrade cards

31.1.1 Upgrade card installation.

dormakaba upgrade cards can be used to expand the range of functions of ED900 operators.
When upgrade cards are installed, information is exchanged between and permanently allocated to both the operator control unit and the upgrade card.

Fig. 31.1.1 Upgrade card slot



1 Upgrade card slot
2 Upgrade card socket
Status LEDs
3 Green LED
4 Yellow LED
5 Red LED
6 Upgrade card

31.1.2 Upgrade cards

Upgrade card	Upgrade card color	Parameter
Fire protection	Red	F1
Barrier free toilet		F7

31.2 Container module

31.2.1 Container module

- The first upgrade card installed becomes the container module.
- Every operator control unit has only one container module.
- Functions of upgrade cards installed after the first upgrade card are saved in the container module.

31.2.2 Container module removal.

- If the container module is removed, all previously enabled functions will be deactivated **after a certain time.**

31.2.3 Operator control unit replacement.

- If the control unit is replaced, the container module is removed from the old control unit and inserted into the new control unit.
- The new control unit synchronizes with the container module and all upgrade card functions are available.

31.2.4 Inserting an upgrade card that has already been activated.

- Rapidly flashing yellow LED on upgrade card indicates card is rejected.
- Card's functions in operator control unit are still valid.

31.2.5 Inserted a container module from third party control unit.

- Rapidly flashing yellow and green LEDs on container module indicates module is rejected.
- Container module can only be synchronized with one control unit.

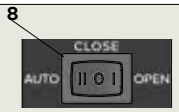
31.2.6 Container module defective.

- Upgrade cards that were installed after the container module must be reinstalled.

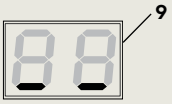
31.3 Installing upgrade cards

31.3.1 Set program switch to CLOSE.

1 Upgrade card slot
6 Next upgrade card
7 Container module
8 Program switch
9 2 digit display with horizontal bars



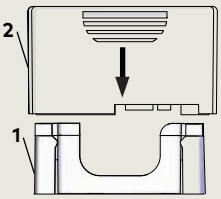
Set program switch to Close.



Horizontal bars indicate controller in stand by mode.

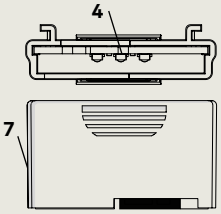
31.3.2 Installing first upgrade card.

1 Upgrade card slot
2 First upgrade card



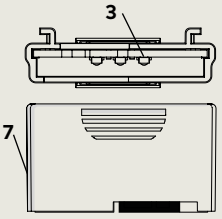
1. Insert first upgrade card into upgrade card slot.
2. This card will become container module.

4 Yellow LED
7 Container module



3. Yellow LED flashes on and off once during card insertion.

1 Upgrade card slot
3 Green LED
7 Container module



4. Green LED slowly flashes on and off indicating communication between card and control module.
5. Upgrade card becomes container module, green LED continues to slowly flash on and off.

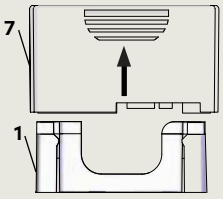
- Upgrade card function is now available.

3 Green LED
7 Container module

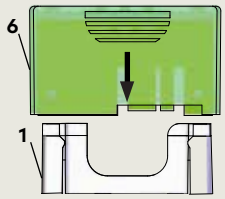
TIPS AND RECOMMENDATIONS

Container module can be configured using applicable parameter (F1 - F8) for card. Reference Chapter 22, Parameters.

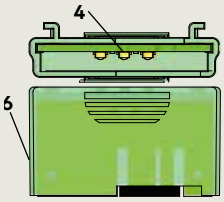
31.3.3 Installing additional upgrade cards.



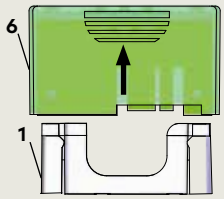
1. Remove container module from upgrade card slot.



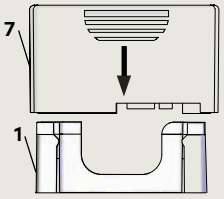
2. Insert next upgrade card into upgrade card slot.



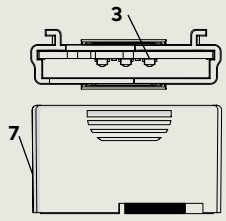
- Card function is copied to control module; upgrade card is then invalidated.
- Yellow LED indicates procedure is complete.



3. Remove upgrade card from upgrade card slot.



4. Reinsert container module into upgrade card slot.



- Control unit recognizes container module; container module stores new functions.
- Green LED slowly flashes on and off indicating successful operation.
- New card functions are now available.

TIPS AND RECOMMENDATIONS

New upgrade card can be configured using applicable parameter (F1 - F8) for card. Reference Chapter 22, Parameters.

32 Maintenance

32.1 Safety label, low energy swing doors

32.1.1 Low energy swinging door safety information label

This AAADM label outlines safety checks that should be performed daily on low energy swinging door controlled by an ED900 operator.

32.1.2 Safety information label location

Place label in a protected, visible location on door frame, near program switch panel if possible.

32.1.3 Annual compliance section of label

This section of label is only completed on low energy swing doors that comply with ANSI/BHMA A156.19 standard and pass inspection by an AAADM certified dormakaba USA, Inc. technician.

32.1.4 Additional annual compliance inspection labels

Place additional labels over annual compliance inspection section of safety information label.

Fig. 32.1.1 Safety information label

SAFETY INFORMATION
Low Energy Swinging Doors

These minimum safety checks, in addition to those in the Owner's Manual, should be made each day and after any loss of electrical power.

1. Activate the door. Door should open at a slow smooth pace (4 or more seconds), and stop without impact.
2. Door must remain fully open for a minimum of 5 seconds before beginning to close.
3. Door should close at a slow, smooth pace (4 or more seconds), and stop without impact.
4. Inspect the floor area. It should be clean with no loose parts that might cause user to trip or fall. Keep traffic path clear.
5. Inspect door's overall condition. The appropriate signage should be present and the hardware should be in good condition.
6. Have door inspected by an AAADM certified inspector at least annually.

DO NOT USE DOOR if it fails any of these safety checks of if it malfunctions in any way. Call a qualified automatic door service company to have door repaired or serviced.

See Owner's manual or instructions for details on each of these and other safety items. If you need a copy of the manual, contact the manufacturer.

AAADM-3044

AAADM
American Association of Automatic Door Manufacturers

ANNUAL COMPLIANCE INSPECTION

INSPECT FOR AND COMPLIES WITH ANSI A156.19 ON:
DATE:_____
by AAADM Certified Inspector
Number:_____

Fig. 32.1.2 Annual compliance inspection label

ANNUAL COMPLIANCE INSPECTION

INSPECT FOR AND COMPLIES WITH ANSI A156.19 ON:
DATE: _____
by AAADM Certified Inspector
Number: _____

32.2 ED900 environment and cleaning

Table 32.2.1 Operator environmental requirements.

Ambient temperature	5 to 122 °F	[-15 to 50° C]

Fig. 32.2.1 ED900 low energy installation



32.2.1 ED900 environmental requirements.

ED900 assembly is designed to operate on an interior application only under the specifications shown in Table 32.2.1.

32.2.2 Areas around door(s) and door swing radius.

Areas around doors and door swing radius must be kept clear of all obstacles.

32.2.3 Cleaning

WARNING

Cleaning of ED900 cover surfaces should be done with program switches in Close position!

ED900 cover can be cleaned with a damp cloth and commercial cleaning agents.

TIPS AND RECOMMENDATIONS

Abrasive (scouring) agents should not be used as they may damage cover surface.

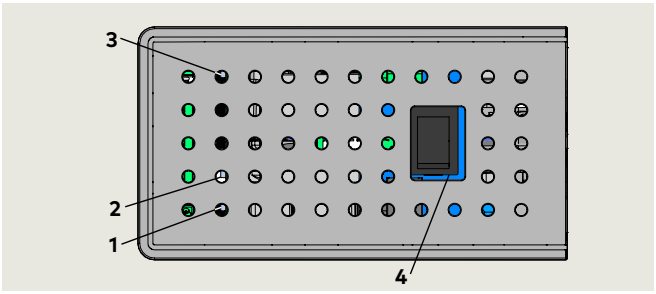
32.2.4 Water and other liquids.

WARNING

No water or other liquids must be sprayed or spilled on ED900!

32.3 Yellow LED, service level

Fig. 27.3.1 Service level indicator



1	Red LED	**3**	Green LED
2	Yellow LED	**4**	Power switch

32.3.1 Service level indicator

Yellow LED on operator power switch side is service level indicator. Operator system should be scheduled for service when yellow LED is first illuminated, or annually, whichever comes first.

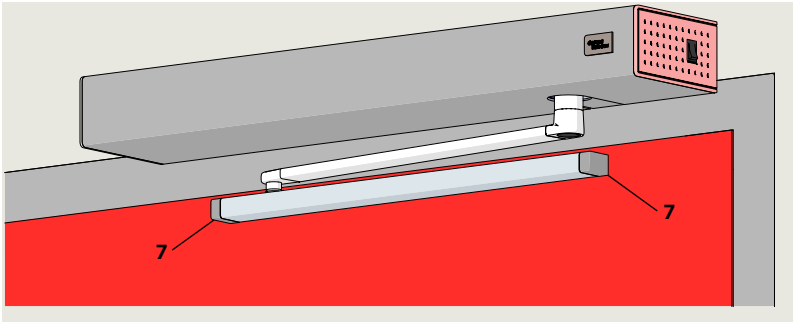
TIPS AND RECOMMENDATIONS

Reference Appendix A, Parameter detail, for information on:

- Parameter CS, reset service interval display.
- Parameter CC, cycle counter.

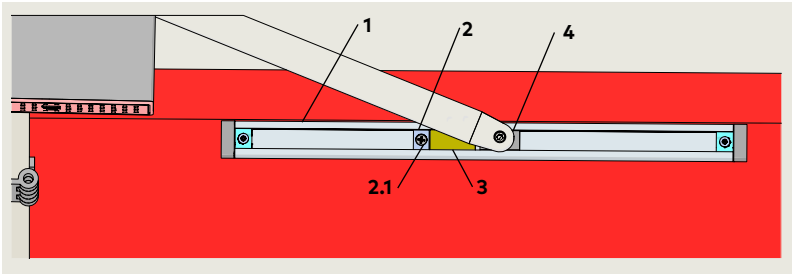
32.4 Pull arm maintenance

Fig. 32.4.1 Arm and track assembly



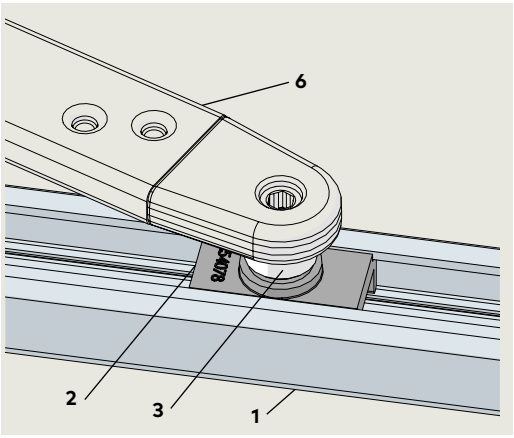
7 End cap

Fig. 32.4.2 Arm and track assembly



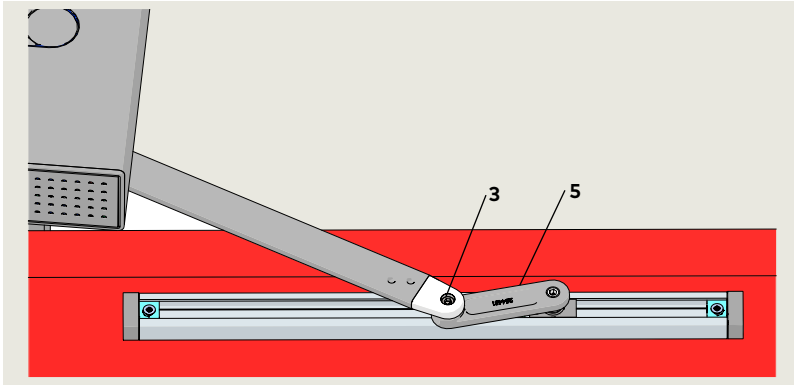
1 Track
2 Bumper stop
2.1 M6 FHMS
3 Bumper
4 Slide shoe, pivot pin

Fig. 32.4.3 Track, slide shoe, pivot pin



1 Track
2 Slide shoe
3 Pivot pin
6 Arm

Fig. 32.4.4 CPD lever M6 socket head screw



3 M6 socket head cap screw
5 CPD lever

Fig. 32.4.5 Program switch



32.4.1 Track mounting screws.

1. Set program switch to CLOSE.
2. Remove track end caps
3. Check tightness of track mounting screws.
4. Replace end caps.

32.4.2 Track maintenance.

1. Set program switch to OPEN.
2. Track.
   - Check for wear or damage.
3. Slide shoe and pivot pin.
   - Check for wear or damage.
4. Bumper stop M6 screw.
   - Check bumper stop position (bumper location approximately 1/8" from slide shoe)
   - Check tightness of screw.

32.4.3 CPD lever.

1. Check tightness of M6 SHCS.

32.5 Arm fasteners – torque requirements

Fig. 32.5.1 Arm M8 SHCS cap

8 Cap

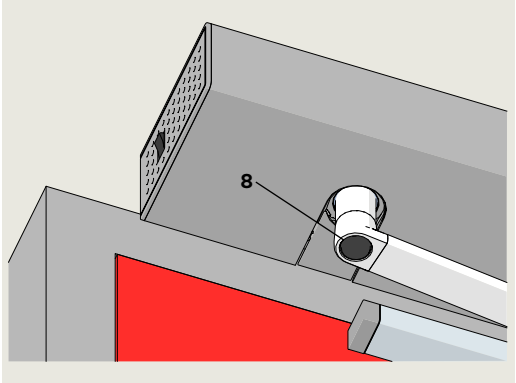


Fig. 32.5.2 M8 SHCS

5 M8 x __ SHCS

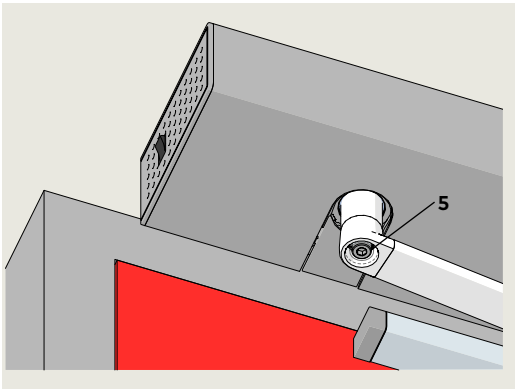
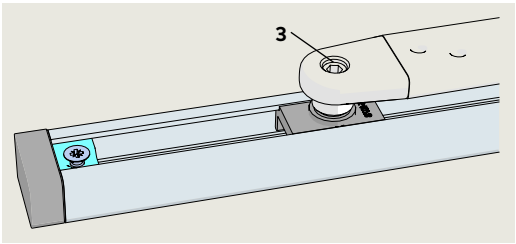


Fig. 32.5.3 Pivot pin M8 socket head

3 Pivot pin M8 socket head



32.5.1 Check drive arm M8 SHCS torque.

1. Set program switch to CLOSE.
2. Remove cap over M8 SHCS.
3. Check torque.
4. Replace cap.

CAUTION

Using torque wrench with 5 mm hex key socket, check M8 SHCS torque.17 ft-lb [23 Nm].

32.5.2 Check pivot pin M8 socket head torque.

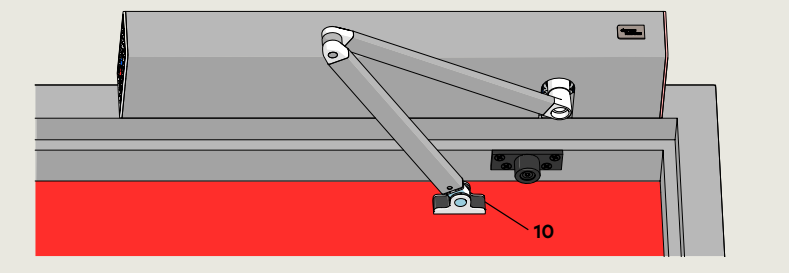
1. Check torque.

CAUTION

Use torque wrench with hex key socket. M8 screw torque: 5.9 - 7.4 ft-lb [8 - 10 Nm].

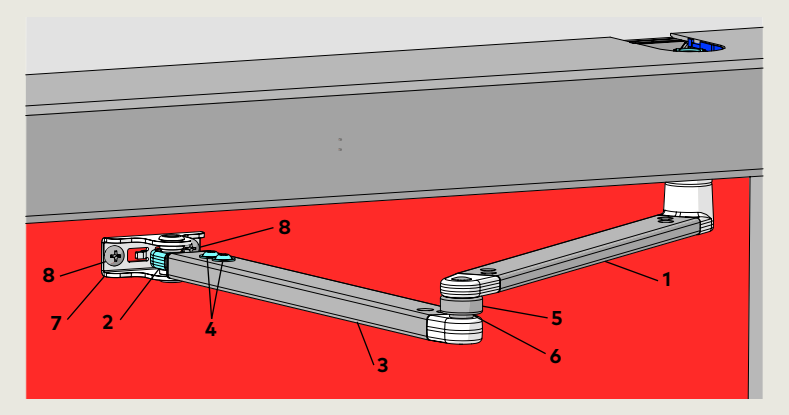
32.6 Push arm maintenance

Fig. 32.6.1 Push arm assembly



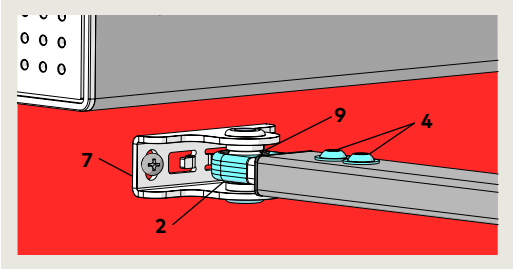
10 Screw cover caps

Fig. 32.6.2 Push arm assembly hardware



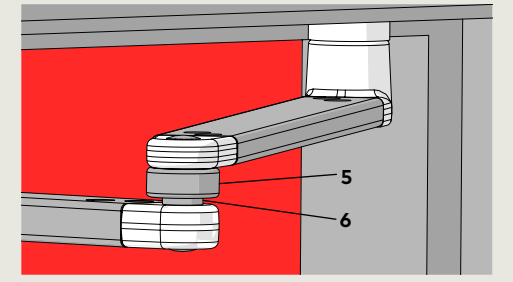
1 Drive arm
2 Adjustment arm
3 Adjustment arm tube
4 M6 x 10 button head screws
5 Drive arm socket
6 Adjustment arm ball head
7 Shoe
8 Shoe mounting screws (2)

Fig. 32.6.3 Shoe bearing



2 Adjustment arm
3 Adjustment arm tube
4 M6 x 10 mm flanged button head screw
7 Shoe
9 Articulated bearing
11 M8 SHCS

Fig. 32.6.4 Arm socket and ball head



5 Socket
6 Ball head

32.6.1 Push arm maintenance.

WARNING

Set program switch to CLOSE before performing maintenance!

1. Adjustment arm.
- Check for wear or damage.
- Check tightness of M6 x 10 flanged button head screws (Fig. 32.6.2).

2. Shoe and adjustment arm assembly:
- Check for wear or damage at shoe bearing (Fig. 32.6.3).

3. Adjustment arm socket and ball head (Fig. 32.6.4).
- Check for wear or damage.

27.6.2 Shoe door mounting screws .

1. Remove screw cover caps (Fig. 32.6.1).
2. Check for tightness of mounting screws (Fig. 32.6.3).
3. Replace screw cover caps.

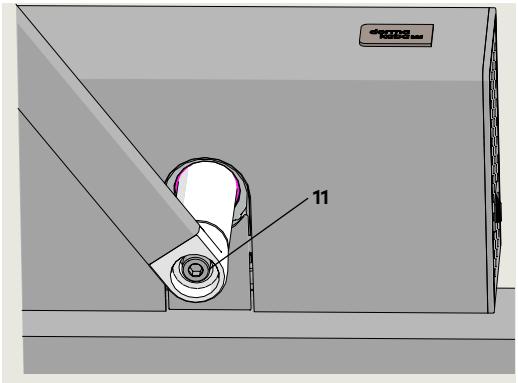
27.6.3 Drive arm to ED50 spindle.

1. Remove spindle cap.
2. Check tightness of M8 SHCS.

CAUTION

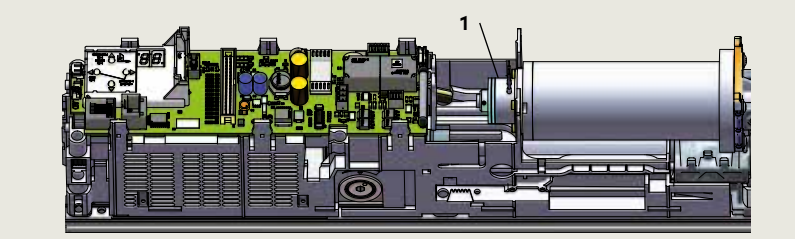
Using torque wrench with 5 mm hex key socket, torque M8 SHCS to 17 ft-lb [23 Nm].

Fig. 32.6.5 Spindle M8 SHCS



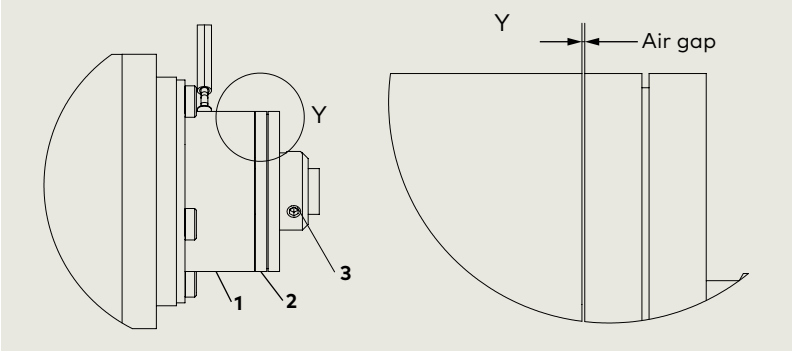
32.7 ED900 brake maintenance

Fig. 32.7.1 ED900 operator



1 Brake assembly

Fig. 32.7.2 Brake to brake disc air gap



1 Brake assembly
2 Brake disc assembly
3 M3 x 3 SHCS

1 Brake assembly
2 Brake disc assembly
3 M3 x 3 set screw
4 Brake motor flange
6 M3 x 5 SHCS

Fig. 32.7.3 Brake assembly

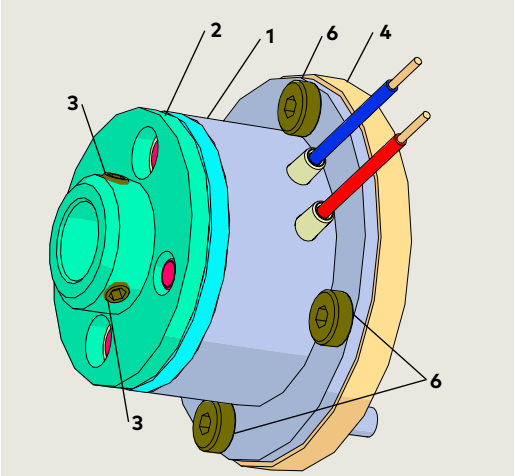


Fig. 32.7.4 Feeler gauge set



32.7.1 Adjustment of air gap: brake to brake disc (Fig. 32.7.2).

TIPS AND RECOMMENDATIONS

Reference drawing:
254197-01-50

⚠ WARNING

Set program switch to CLOSE before performing maintenance!

CAUTION

Air gap setting between brake and brake disc:
0.1 mm to 0.3 mm
(0.004" to 0.012")

1. Using 2.5 mm hex key, loosen three M3 x 3 set screws securing brake disc to motor shaft.
2. Insert feeler gauge [air gap setting for sizing] between brake disc and brake.
3. Move brake disc against shim(s).
4. Screw M3 x 3 set screws against motor shaft but do not tighten.
5. Remove feeler gauge.
6. Tighten M3 x 3 set screws.

CAUTION

M3 x3 SHCS torque setting:
5.3 in-lb + 0.9 in-lb [0.6 Nm +0.1 Nm].

TIPS AND RECOMMENDATIONS

Paper stock thickness:
approximately 0.003"

Fig. 32.7.5 M3 x 5 SHCS

1 Brake assembly
2 Brake disc assembly
6 M3 x 5 SHCS

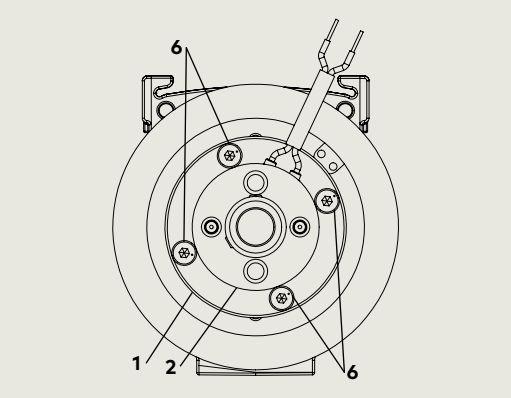


Fig. 32.7.6 Brake disc assembly removed from brake

1 Brake assembly
2 Brake disc assembly
5 Motor shaft

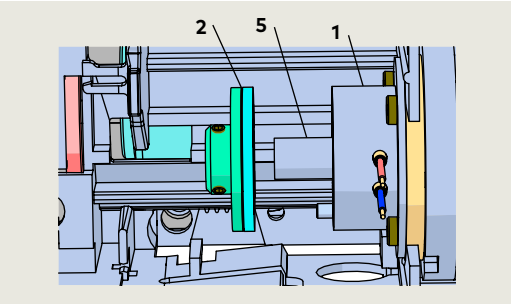


Fig. 32.7.7 Brake and brake disc assemblies

1 Brake assembly
2 Brake disc assembly
6 M3 x 5 SHCS

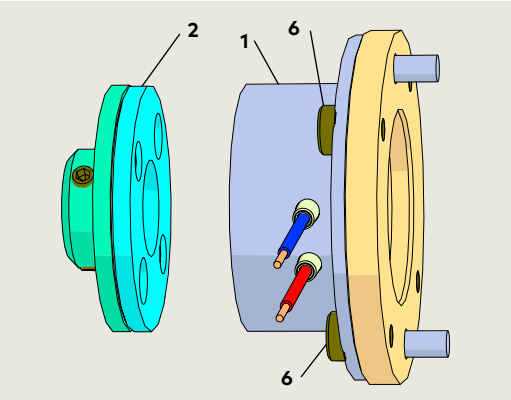
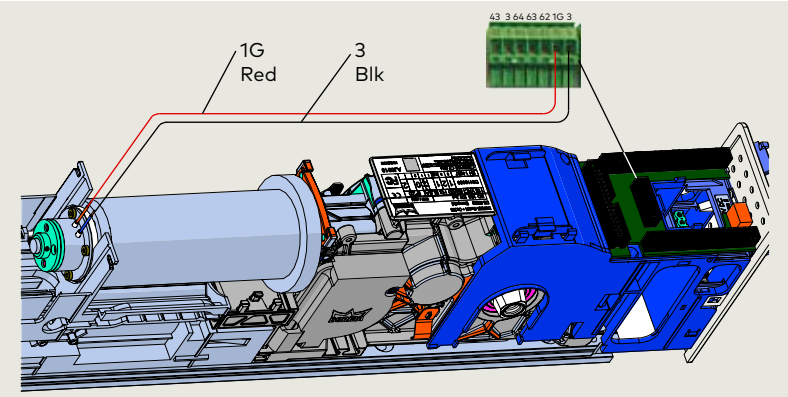


Fig. 32.7.8 Brake coil wiring



32.7.2 Torque setting of M3 x 5 SHCS.

- 5.3 in-lb + 0.9 in-lb [0.6 Nm +0.1 Nm]

Appendix A – Driving parameters – detail

A.1 Driving parameters detail

A.1.1 Driving parameters detail.

Parameter	Value range	Units	Factory setting	Description
Opening speed, automatic mode				1. Opening speed refers to automatic mode. Speed can be adjusted using this parameter. 2. Internal monitoring system checks if parameter setting is admissible If setting exceeds value, the setting is alternately displayed with the permissible value. 3. After parameter set, verify setting meets ANSI/BHMA standard A156.19 (low energy) See Chapter 30.
5 	ED900 8 - 27 °/s		**25**	
Closing speed, automatic mode				1. Closing speed refers to automatic mode. Speed can be adjusted using this parameter. 2. Internal monitoring system checks if parameter setting is admissible. If setting exceeds admissible value, the setting is alternately displayed with the permissible value. 3. After parameter set, verify setting meets ANSI/BHMA standard A156.19 (low energy) See Chapter 30. *ED900: maximum closing speed 27°/s in low energy mode.
6 	ED900 2 - 27* °/s		**25**	
Hold open time, automatic mode				1. Hold open time starts once all internal, external, safety and push and go inputs have been opened or dropped, and door is in an open position. 2. Hold open time values from 5 to 30 s are set in increments of 1 second. 3. In low energy mode, a minimum hold open time of 5 seconds is required. 4. Hold open time can be re-triggered.
7 	0 - 30	s	**5**	
Night-bank hold open time				1. Night-bank (key switch) hold open time is set using this parameter. 2. Night-bank Hold open time starts once contact on night-bank activator input is opened and door is in an open position. 3. Night-bank hold open time can be re-triggered.
8 	0 - 30	s	**10**	
Hold open time, manual opening				1. Default hold open time of 1 second that follows every manual opening of door can be adjusted using parameter **do**. 2. Hold open time starts when door is released.
9 	0 - 30	s	**1**	
Wall masking on door hinge side				1. Wall masking required if door opens against an obstacle. 2. When door reaches set wall masking angle, system will ignore signal from safety sensor on door swing (hinge) side. 3. The wider the detection range of safety sensor used, the greater the area must be in which system has to ignore sensor's emitted signal. To insure personnel safety, it is advised to keep this range as small as possible. 4. If set wall masking angle is exceeded when door is being opened, a rapidly flashing dot appears in top left hand corner of 2 digit display. 5. Rapidly flashing dot disappears when door angle drops below set wall masking angle.
10  	60 - 99	°	**80**	

A.1.1 Driving parameters detail.

Parameter	Value range	Units	Factory setting	Description	
Safety sensor test					
11 SI ST	0 - 8		**0**		Safety sensor parameter **ST** must be set to sensors used and if they are active-high or active-low. See E 04 safety sensor test error, Appendix B.
				0	Sensor test off.
				1	Sensor test on swing (hinge) side. Active-high
				2	Sensor test on swing and approach sides. Active-high
				3	Sensor test on swing and approach sides. Active-high
				4	Sensor test on swing side. Active-low
				5	Sensor test on approach side. Active-low
				6	Sensor test on swing and approach sides. Active-low
				7	Wall mounted sensor with data line. Lock monitoring not available.
				8	Sensor test overhead sensor type Bodyguard III or Premier T with monitoring input.
Activation by safety sensor on approach (opposite hinge) side					
12 SA	0 - 1		**0**	0	Safety sensor's input is disregarded as soon as door is closed.
				1	Safety sensor can trigger an opening pulse while door is closed.
Suppression of safety sensor on swing (hinge) side during initialization drive					
13 SP	0 - 1		**0**	0	Safety sensor on swing side is active during an initialization drive after a power on reset.
				1	1. With SP set to 1, operator will disregard swing side safety sensor during initialization drive. After a power on reset, operator starts an initialization drive at slow speed. The initialization drive cannot be completed if safety sensor on hinge side is, or has been triggered.
Delayed opening time for locking mechanism				1. Delayed opening time delay starts as soon as door opening pulse has been generated. 2. Door opens on expiration of time delay. 3. If parameter is set to "0" and input for locking feedback contact is closed, door will not perform a preload **Pu** before door unlocks. 4. Since various motor locks do not have feedback contacts, a delay of up to 4 seconds is possible	
14 Ud	0 - 40 * 100	ms	**3** *100		

A.1.1 Driving parameters detail.

Parameter	Value range	Units	Factory setting	Description
Door preload prior to unlocking				1. Door preload prior to unlocking; force with which door is pushed in the "closed" direction before door is opened. 2. The door may need to be pushed in closing direction (preload) in order to release electric strike to insure door opens. 3. Preload time is set by parameter **Ud,** delayed opening time for locking mechanism. 4. To maintain long service life, set preload force only as high as necessary.
15 Pu	0 - 9		**0**	
Power reserve module SVP-PR 12 test				
16 rS / TS	0 - 1		**0**	0 Test off 1 1. SVP-PR 12 power reserve module test is performed once every 24 hours, or 10 minutes after AC power has been turned on. In event of an error: • Unlocking is not performed and no automatic door movements are initiated. • Error code **E 25** is displayed, Appendix B, troubleshooting error codes. 2. SVP-PR 12 power reserve module can be used but must be tested on a regular basis if using: • SVP-2000 DCW® emergency escape motor lock with automatic latching action. • M-SVP 2000 DCW® emergency escape lock. 3. Test is automatically activated if a fire protection module is recognized in conjunction with SVP-2000 DCW® or M-SVP 2000 DCW® locks.
Static force in opening direction				1. Static force in opening direction (basic parameter for wind load control). Static force on door closing edge can be changed using this parameter. 2. Internal monitoring system checks if parameter setting is admissible. If setting exceeds admissible value, the setting is alternately displayed with the permissible value. 3. After parameter set, verify setting meets ANSI/BHMA standard A156.19 (low energy). See Chapter 30. 4. ED900 low energy operator: static force range is reduced.
17 Fo	2- 15 *10	N	**6** *10	
	.45- 3.4 *10	lbf	1.35 *10	
Static force in closing direction				1. Static force in closing direction (basic parameter for wind load control). Static force on door closing edge can be changed using this parameter. 2. Internal monitoring system checks if parameter setting is admissible. If setting exceeds admissible value, the setting is alternately displayed with the permissible value. 3. After parameter set, verify setting meets ANSI/BHMA standard A156.19 (low energy). See Chapter 30. 4. ED900 low energy operator: static force range is reduced.
18 Fc	2- 15 *10	N	**6** *10	
	.45- 3.4 *10	lbf	1.35 *10	
Motor driven latching action, automatic mode				1. System offers a motor driven latching action in automatic mode in addition to mechanical latching action. 2. The **EP** parameter setting is designed to increase static force on door to insure proper closing despite resistance caused by door seals or locking devices. 3. Setting should be increased step by step from a low setting so as to avoid damage to the system. Use the lowest possible setting. 4. Ensure that both the door itself and the arm or track installation are suitable for the additional, permanent forces.
19 EP	0 - 9		**0**	

A.1.1 Driving parameters detail.

Parameter	Value range	Units	Factory setting	Description
Motor driven latching action angle				Door opening angle at which motor driven latching action **EP** is activated. • Starting angle of the latching angle adjustable from 10°.
20 EA	2 -10	°	**3**	
Keep closed force				
21 FH	0 - 9		**0**	0 Off 1 to 9: 1. Keep closed force is: • Permanently applied following motor drive latching action. • Designed to keep door in closed position even if wind acts on door. 2. Keep closed force can be set from 0 (off) to 9, maximum force.
Push & Go				
22 PG	0 - 1		**0**	0 Off 1: 1. Parameter is activated. 2. Automatic opening of door is started when door is manually moved 4° out of the closed position. 3. Door close mode parameter **hd** must be set to "0" (manual) to enable this function.
Program switch type				
23 PS	0 - 4		**0**	0 Internal, operator mounted program switches are active. 1 External mechanical program switch with contacts is connected to operator terminal board. Internal program switch connector must be removed. 2 External DCW® electronic program switch (EPS) is connected to operator terminal board. Internal program switch connector must be removed. 3 Program switch control by TMS Soft control software. 4: 1. DCW® electronic program switch (EPS) is installed, and operator is also connected by the building management system to TMS Soft control software. 2. When **PS** is set to 4, the program switch functions can be changed from DCW® (EPS) to TMS Soft..
DCW® Electronic program switch (EPS) behavior following power reset				
24 S1	0 - 1		**0**	0: 1. In event of power failure, or if operator is deliberately switched off, EPS will automatically switch to last known position when power returns. **2. Important:** The time at which power returns might not be during business hours and may affect insurance-compliant door locking requirements. 1: 1. In event of power failure, or if operator is deliberately switched off, EPS will automatically switched to OFF position when power returns. 2. This function should be used iif insurance compliant locking if required.
Internal program switches, switch on delay				
25 S2	0 - 1		**0**	0 Operator will perform function of new switch setting as soon as internal program switch is moved. 1: 1. Operator will perform function of new switch setting after a delay of 10 seconds from when internal program switch is moved. 2. This function is useful if user has to pass through door and its connected detectors and sensors after program switch is set to new function.

A.1.1 Driving parameters detail.

Parameter	Value range	Units	Factory setting	Description	
Unlocking during business hours					
26 	0 - 1		**0**	0	Door is always locked when it reaches closed position.
				1	1. In automatic mode, door will not lock when it reaches closed position. This achieves faster door opening when system is equipped with motor driven locks. 2. If an electric strike opener is used, it must be suitable for 100% continuous duty factor to avoid possibility of damage.
Status relay function, X7 terminals				0	Status relay is deactivated.
27 	0 - 6		**1**	1	Status relay activated as soon as door reaches door "closed" position.
				2	Status relay activated as soon as door reaches door "open" position.
				3	Status relay activated when error codes are displayed on 2 digit operator display.
				4	"Door closed and locked" activates status relay.
				5	Status relay activated when information or error codes are displayed on 2 digit operator display.
				6	1. Status relay activated when door is opened further than opening angle parameter **OA**, set during learning cycle. 2. Parameter **OA** value can only be changed using dormakaba handheld or by performing another learning cycle.
Locking device output configuration; output X3, 1G (24V) and input X6, 4/4a				Reference Chapter 7	
28 	0 - 1		**0**	0	Locking device output terminal X3, 1G (24V) is independent of Input X6, 4/4a.
				1	1. Locking device output terminal X3, 1G (24V) is turned on as soon as contact at X6, 4/4a is opened.. 2. Terminal X3, 1G 24V output is on for as long as contact at X6, 4/4a is open, motor lock with a 100% duty factor is required. 3. This function is not available for DCW motor locks.
Cycle counter				1. Total number of opening and closing cycles displayed is shown in increments of 10000. • Display value, "4", 40,000 cycles. • Display value, "53", 530,000 cycles. 2. Total number of cycles can be displayed on dormakaba handheld. 3. A display value of "99" means 990,000 cycles or greater.	
29 	0 - 99 * 10000	cycles			
Delete error log					
30 	0 - 1		**0**	0	No function.
				1	1. When "1" entered, Error log is deleted. 2. Parameter is then automatically reset to "0".

A.1.1 Driving parameters detail.

Parameter	Value range	Units	Factory setting	Description
Reset service interval display, operator yellow LED				
31 	0 - 1		**0**	0 No function. 1 1. When "1" entered: • Service cycle counter is reset to 200,000. • Service interval is reset to 12 months. • Yellow LED not illuminated. 2. Parameter is then automatically reset to "0". 3. Values other than default values must be set using dormakaba USA, Inc. handheld: • Maintenance interval • Maintenance cycles
Factory setting level				
32 	1 - 2		**1**	Parameter **SL** is used to determine what data will be reset during factory setting process. 1 Standard factory settings • Program switches CLOSE. • Door closed. • Press 4 button keypad down button ▼ for greater than 8 s. 1. All parameters reset to factory settings. 2. Procedure completed when "8" on 2 digit displays blinks twice. 3. Installed upgrade cards remain valid and do not require reinstallation. 4. Learning cycle required. 2 Extended factory settings • Program switches CLOSE. • Door closed. • Press 4 button keypad down button ▼ for greater than 8 s. 1. All parameters reset to factory settings. 2. Procedure completed when "8" on 2 digit displays blinks twice. 3. Installed upgrade cards deleted from operator memory. 4. Parameter **SL** automatically reset to 1. 5. Control unit and upgrade cards can be used independently (delivery status). 6. Learning cycle required..
Opening angle				1. Door opening angle set during learning cycle is displayed. 2. Opening angle can only be changed during learning cycle. 3. Due to installation and parameter tolerances, display value may not match actual door position.
33 	0 - 110	°		

A.1.1 Driving parameters detail.

Parameter	Value range	Units	Factory setting	Description
Door closer mode				
34 hd	0 - 1		**1**	0: 1. Automatic mode. This mode is applicable whenever door is mainly opened automatically and where motion detectors are installed. 2. Mode is optimized for high frequency use. 3. Full energy upgrade card provides for higher door opening and closing speeds. 4. In case door is blocked during a closing cycle, operator reverses automatically. 5. Driving phase is optimized to provide reliable closing cycles. 6. Keep closed force (wind load control) parameter **FH** and Push & Go function parameter **PG** are only available in automatic mode.
				1: 1. Manual mode. This mode is applicable whenever door is mainly used manually and only rarely automatically. 2. In case door is blocked during a closing cycle, door will stop at its current position. 3. Driving phase optimized for manual opening cycles. 4. Power assist function parameter **hf** is only available in manual mode.
Power assist activation angle				1. Setting of door activation angle for Power assist function (**hF**). 2. Higher settings of **hA** result in better spring force compensation for easier manual opening. 3. Power assist function is more sensitive the smaller the activation angle.
35 hA	1 - 5	°	**3**	
Power assist function				1. Force setting for Power assist function. 2. Power assist function only available with **hd** parameter = 1, manual mode. 3. "0"; power assist function OFF; power assist function enabled for available values greater than 0. 4. Power assist function enabled when power assist activation angle **hA** reached. 5. The greater the value of **hF**, the easier the door can be manually opened from power assist activation angle **hA**. 6. If power assist set too high, door can open automatically. 7. Power assist function is not available • If operator is switched off • A smoke detector or emergency button has been triggered.
36 hF	0 - 10		**0**	
Power assist function support for manual mode in door closed position				1. Setting for power assist function support with door in **closed** position. 2. Power assist function only available with **hd** parameter = 1, manual mode. 3. The greater the value of **hS**, the easier the door can be manually opened from the **closed** position.
37 hS / hS	0 - 10		**0**	
Upgrade card units codes				
	0 - 3		**0**	0: Upgrade card not installed, function not available.
				1: Upgrade card installed, function not activated.
				2: Upgrade card installed, function activated.
				3: Upgrade card has been removed, function no longer available.
Upgrade card, fire protection				1. Once upgrade card installed, parameter value will automatically change to 2. 2. Following activation, drive may be used as a electrically controlled hold-open system according to EN 14637, Building hardware-Electrically controlled hold-open systems for fire/smoke door assemblies, or similar standards. 3. Full energy function is automatically activated. 4. Plug for terminal board X9 socket included with upgrade card.
38 F1	0, 2, 3		**0**	

A.1.1 Driving parameters detail.

Parameter	Value range	Units	Factory setting	Description
39 F2				Not used.
Upgrade card professional, impulse relay Not available				1. Once upgrade card installed, parameter value will automatically change to 1. 2. Function must be activated by changing parameter **F3** to 2. 3. Door can be controlled with a pushbutton connected to Night-bank input without a door hold open time: • Door opens with first pulse and remains open. The hold open time is not limited. • Door closes only with second pulse of pushbutton. 4. Pushbutton in 3. must be connected to terminal board Night-bank input: • X1, 3 and 35 (dry) • X10, 57 and 57a (wet) 5. Standard hold-open time **dd** is available when door is opened using other internal and external detectors.
40 F3	0, 1, 2, 3		**0**	
Upgrade card professional, extended hold-open time Not available				1. Once upgrade card installed, parameter value will automatically change to 2. 2. Setting range of **dd**, hold -open time is extended from 0 - 30 s to 0 - 180 s.
41 F4	0, 2, 3		**0**	
Upgrade card professional, nurse - bed function (double doors only) Not available				1. Once upgrade card installed, parameter value will automatically change to 1. 2. Function must be activated by changing parameter **F5** to 2. 3. For double doors, this function enables: • Separate door opening (only active door, nurse) • Both doors open (active, inactive doors, bed) 4. The activator connected to the external detector (terminal board X4, 41 and 3) controls the active door (nurse function). Only the active door will open. 5. The activator connected to the internal detector (terminal board X4, 42 and 1) controls the both active and inactive doors (bed function), both doors will open. 6. If Push & Go function **PG** is activated, only the active door will open in the event of a manual opening. 7. Night-bank inputs will only cause the active door to open. 8. Exit only program switch function is not available with **F5** activated.
42 F5	0, 1, 2, 3		**0**	
Upgrade card barrier free toilet				1. Once upgrade card installed, parameter value will automatically change to 1. 2. Function must be activated by changing parameter **F7** to 2. 3. Operator power reset is required; turn power switch off, wait 10 s and turn power back on. 4. Upgrade card assigns inputs and outputs of the control unit with functions which are required for this application.
43 F7	0, 1, 2, 3		**0**	
Upgrade card DCW®				Not used.
44 F8	0, 2, 3		**0**	
COM 1 configuration interface				
45 C1	0 - 1		**0**	0 Interface programmed for communication with dormakaba handheld. 1 Interface programmed for use with Dorma USA, Inc. TMS Soft control software.

A.1.1 Driving parameters detail.

Parameter		Value range	Units	Factory setting	Description
Backcheck when door opened manually					1. Angle after which door is braked when manually opened. 2. Back check level is automatically optimized during manual door opening cycles. This function improves door braking behavior in end position so door does not move beyond set opening angle **OA** Entered value is subtracted from set opening angle **OA**. 3. Example • Opening angle, 90° • Parameter **bc**, 12° • Door back check starts at 78°.
46	bc	5 - 40 (v1.9)	°	**10**	
Door thickness					1. Parameter is entered in mm. 2. Door thickness affects measured door opening angle. 3. Parameter **Td** enables a more accurate door width to be entered, if required.
47	rd	0 - 99	mm	**35**	
	Td	0 - 3 7/8"		1 3/8"	
Deactivation of drive; X6, 4 and 4a, trigger type					
48	d1	0 - 1		**0**	0 NC contact, drive function is deactivated when NC contact is open. 1 NO contact, drive function is deactivated when NO contact is closed.
Night-bank contact X1; 3 and 35, trigger type					
49	d2	0 - 1		**0**	0: 1. NO contact, night-bank function is triggered when NO contact is closed. 2. Typically used when using a key switch or an access control system. 1: 1. NC contact, night-bank function is triggered when NC contact is opened. 2. Typically used when connected to building management system to trigger doors (signal normally present).
Release of hold-open system					
50	FC	0 - 1		**1**	1: 1. Upgrade care Fire Protection installed, users may release hold-open by manually moving door in closed direction. 2. A manual release button is not required. 0: 1. Hold-open release by manually moving door in closed direction is deactivated. 2. A manual release button is required.
Castor angle for double doors					Primary door with astragal, angle active door must open before secondary door opens.
51	Ad	0 - 30	°	**30**	
Hinge clearance					1. Clearance between hinges is critical for the calculated door angle. 2. It may only have a small effect but the clearance can be adjusted in extreme cases to improve accuracy. 3. Factory setting is 3 * 10, 30 mm, 1 3/16". 4. With CPD doors, setting must be changed to a negative value. A learning cycle is then required as system creates an angle table as a function of the set parameters.
52	HS	± 5 *10	mm	**3** *10	
		±3/16 *10	inches		

Appendix B – Troubleshooting

B.1 Information and error codes

Fig. B.1.1 User interface

1 4 button keypad
2 2 digit display

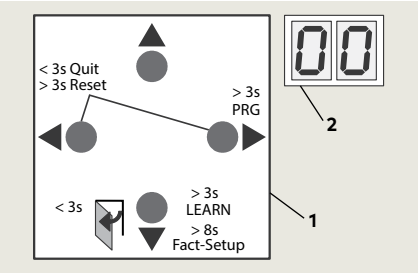


Fig. B.1.2 Operator LEDs

3 Power switch
4 Red LED
5 Yellow LED
6 Green LED

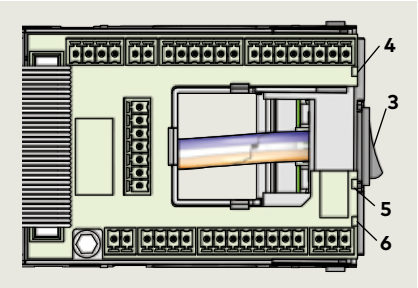
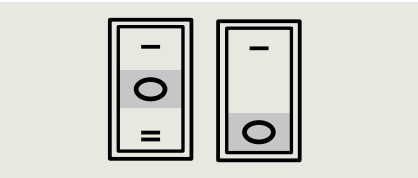


Fig. B.1.3 Program switches

7 Program switch,es Close position



TIPS AND RECOMMENDATIONS

Para. B.3, Information codes
Para. B.4, Error codes

B.1.1 Overview

Operator monitors internal circuits and external safety circuits managed by the operator.

B.1.2 Error and information messages.

1. With operator in use, certain conditions may develop resulting in error or information messages.
2. Operator attempts to identify the cause and respond accordingly.
3. Response depends on the severity of the error:

- Information message (**In**)
- Error message (**E**)
- Deactivating the operator's automatic function; operator will switch to emergency mode. Users can then access door manually.

B.1.3 User information display.

User interface display, or or dormakaba handheld displays:

- Information **In** codes
- Error message **E** codes

B.1.4 Viewing error messages.

To access and view error messages, briefly press the right ▶ button on the 4 button keypad.

B.1.5 Red LED on operator .

Red LED adjacent to operator power switch displays blinking codes for:

- Certain **In** information
- **E** error codes (Para. B.2)

B.1.6 Resetting error codes.

Options for resetting error codes:

1. Set program switch in Close (off) position.
2. User interface Reset buttons:

- Press both left ◀ and right ▶ buttons >3s to reset system.
- Header cover must be opened to access user interface.

3. Power reset:

- Turn power switch OFF.
- Turn power switch back on after 10 seconds.

CAUTION

Always analyze and remove cause for error before resetting error message!
Troubleshooting charts (Para. B.3,.4) are intended as a guide for diagnosing errors.

B.1.7 Error message memory.

1. There are ten error message memory locations; E 0 through E 9.
2. The latest error message is always stored in error memory location E 0:

- As soon as another error occurs, the existing error stored in E 0 will be moved to E 1 and the latest error will be stored in E 0.

3. A maximum of 9 errors can be stored in memory locations E1 through E9.
4. Identical error messages occurring one after another are not stored again.

B.2 Red LED status codes

B.2.1 Red LED status codes

Red LED status	Display	Description
Steady flashing		Control unit has detected error, emergency mode activated.
On steady	In 11	Hold-open device triggered.
Flashing 2 times	E 02	Locking device error.
Flashing 4 times	E 04	Safety sensor test error.
Flashing 5 times	E 25	SVP PR DCW module test negative.
Flashing 5 times	E 51 E 52 E 53	Incremental encoder error.
Flashing 6 times	E 62	Double door operation, 2nd system has incompatible firmware version.
Flashing 6 times	E 63	Double door operation, 2nd system has incompatible fire protection setting.
Flashing 7 times	E 71	System error 1 (test), second shutdown option.
Flashing 7 times	E 72	System error 2 (test), current measuring circuit.
Flashing 7 times	E 73	System error 3 (test), braking circuit
Flashing 12 times	E 12	EEPROM error
Flashing 13 times	E 13	Motor overcurrent
Flashing 15 times	E 15	Faulty learning cycle

B.3 Troubleshooting chart, "In" codes

B.3.1 Troubleshooting chart, information messages.

No.	Display	Red LED	Description	Troubleshooting information messages
	In 01	Off	**Obstruction** Door obstructed by an obstacle or person; door movement stopped by operator.	Sustained operation on a door with an obstruction can result in damage to drive. 1. Object or person obstructing door movement. • Check door movement while system is deenergized. • Remove cause of anything obstructing door movement. 2. Sensor detection range too small. • Obstructions are often caused by people using door due to sensor's detection range not matching operator's opening speed. Door is unavoidably contacted by person using door. • Sensors detection range should be increased and/or operator's opening speed should be increased. 3. Test system operation after cause of obstruction found.
2	In 08	Off	**Deactivation of drive function** • Contact at X6, 4 and 4a is opened. • Operator switched to emergency mode, door can only be used manually.	An emergency close switch, lock switch, or other system safety device may be connected to the X6 input. 1. One of the activators connected to X6 may have opened, or a defect is present. 2. Reset the applicable activator. Operator should start operation automatically. 3. If In 08 still present, check activators or system wiring.
3	In 09	Off	**Upgrade card error** • Installed upgrade card has been removed. • If two upgrade cards were installed, the upgrade card installed first (container module) has not been reinstalled or is defective.	1. Installed upgrade card cannot be removed from ED900. 2. If more than one upgrade card is installed, the first card installed becomes the container module. • Reference Chapter 25, for Upgrade cards installation. • The container module must be installed last, after all other Upgrade cards are installed. 3. If container module is defective, first upgrade card (container module) must be replaced and all other upgrade cards must be reinstalled.
4	In 11	On	**Hold-open system triggered.**	1. Hold-open system can be triggered: • Automatically by smoke detector or building interface system. • Manually by a manual release button. • Manually moving door. 2. The system must be reactivated by a deliberate action. 3. Depending on system's configuration, reactivation can be done by: • Manually moving door to taught opening angle. • Switching program switch to Close (off). • Pressing both 4 button keypad left ◀ and right ▶ buttons greater than 3s. 4. It must be ensured that a smoke detector or building interface has not been triggered. 5. If reactivation is unsuccessful, there may be a defect in the smoke detector or building interface system or its connections.
5	In 23	Off	**Locking alarm** • Door is blocked while in the closed position.	1. Most common cause of this error is the drive unit attempting to open a locked door. 2. To eliminate the occurrence of this error, install a lock status switch. • Lock switch detects the lock pin's switching status and switches the drive unit off if necessary. 3. It is recommended to use a lock status switch, as repeated attempts to open a locked door may damage the drive unit or the door.

B.3.1 Troubleshooting chart, information messages.

No.	Display	Red LED	Description	Troubleshooting information messages
6	In 61	Off	**Communication error, double door system** • No communication between the two operators.	Reference ED900 double door installation manual. 1. Check communication cable connection at the two operators. • Cable connects to the horizontal RJ 45 connector next to the user interface. Check communication cable.
7	In 72	Off	**Current measuring circuit** • System could not successfully perform internal current measuring test , performed once every 24 hours.	1. The initial current measuring test my not always be successfully completed due to system tolerances and environmental conditions. 2. The test may also fail, as an example, if someone uses the door while the test is in progress.
8	In 73	Off	**Braking circuit test** • System could not successfully perform internal braking circuit test , performed once every 24 hours.	1. The initial braking circuit test my not always be successfully completed due to system tolerances and environmental conditions. 2. The test also may fail, as an example, if someone uses the door manually while the test is in progress. 3. If the cyclical test fails ten times in a row, error message **In 73** will be displayed.
9	In 91	Off	**DCW® communication** • At least one registered DCW device is missing.	1. Reconnect the corresponding DCW® device. 2. If this is not possible, reactivate the drive. Reactivation can be done by: • Switching program switch to Close (off). • Pressing both 4 button keypad left ◀ and right ▶ buttons greater than 3s.

B.4 Troubleshooting chart, "E" codes

B.4.1 Troubleshooting chart, "E" codes.

No.	Display	Red LED	• Description	Troubleshooting error codes
1	E 02	Flashing 2 x	**Locking device error** • Operator is attempting to open or close a locking device with feedback, or a DCW® locking device. An error has occurred during this process.	1. Probable causes are a defective locking device or wiring defect. • Check the locking device and feedback system.
2	E 03	Flashing 3 x	**DCW® program switch is missing.**	1. Check the DCW® program switch and its connections.
3	E 04	Flashing 4 x	**Safety sensor test error** • Test of moving safety sensors was unsuccessful.	1. Factory setting level of "safety sensor test" parameter **ST** is 0, test off (Appendix A, Parameter detail). 2. When **ST** is configured to installed safety sensors, a test signal is sent to the sensors before each door opening or closing cycle. Operator waits for a response within a certain time window. 3. Check whether parameter **ST** has been configured to the installed safety sensors and their active-high or active-low signal level. 4. Check for activation of the test at the safety sensors.
4	E 12	Flashing 12 x	**EEPROM error** • Internal memory check could not be completed. • Drive unit works in door closer mode.	1. Using dormakaba handheld, reload current firmware to reinitialize system. 2. If the error is still present, the control unit must be replaced.

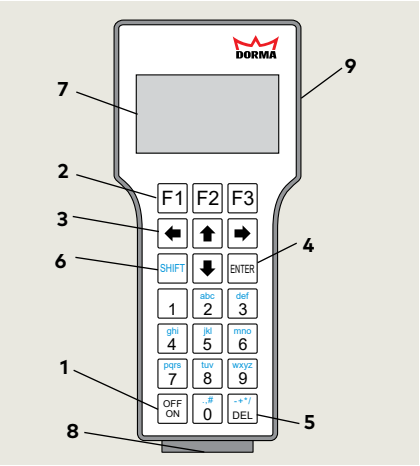
B.4.1 Troubleshooting chart, "E" codes.

No.	Display	Red LED	• Description	Troubleshooting error codes
5	E 13	Flashing 13 x	**Overcurrent detection** • Motor is consuming more current than drive unit can provide.	1. Motor is consuming too much power, check for any external causes. 2. Drive unit or control unit is defective. 3. If error repeats, operator must be replaced.
6	E 15	Flashing 15 x	**Faulty learning cycle.** • Learning cycle could not be completed (Chapter 19).	1. Error may occur if learning cycle has been interrupted, for example if door movement has been interrupted during the learning cycle. 2. Learning cycle must be repeated.
7	E 25	Flashing 5 x	**SVP-PR 12 power reserve module test negative**	1. See Appendix A, parameter **TS**, Power reserve module test. 2. Check power reserve module and its wiring.
8	E 51 E 52 E 53	Flashing 5 x	**Incremental encoder error** • Motor gear unit encoder monitoring detected a faulty state.	1. Check encoder plug connection at operator. • Secure connection. • Wiring terminations • Short circuits. 2. Check locking device for short circuits. 3. Error can be caused by defective motor or short circuit in locking device. 4. Motor gear unit must be replaced in event of defective motor.
9	E 62	Flashing 6 x	**Incompatible firmware version,** double door system, second system.	1. Equip both operators with same firmware version.
10	E 63	Flashing 6 x	**Incompatible fire protection setting**, double door system.	1. For double door systems, the Upgrade card fire protection must be installed in both control units.
11	E 71	Flashing 7 x	**System error 1, 2nd shutdown option**	1. In order to reliably switch off the drive unit, several switching elements are used and their functions are tested periodically. 2. If the function test always results in the error code, the control unit must be replaced.
12	E 72	Flashing 7 x	**System error 2, current measurement circuit**	1. The current measurement circuit is part of the safety mechanisms and its function is tested periodically. 2. If the function test always results in the error code, the control unit must be replaced.
13	E 73	Flashing 7 x	**System error 2, current measurement circuit**	1. The braking circuit is a safety element in the closer mode and will be tested every 24 hours. • During the test the motor is shut down during door closing and the door closes at a set angle in emergency mode. • Test can be noticed as a short jerk on the door and is normal. 2. Error can be due to door closing in the deenergized state too fast (under 3 seconds). See Chapter 21, Power fail closing speed. 3. Check the closing speed and reduce if necessary.
14			**Energy management** • Motor is too hot (for example, too high an ambient temperature) • System responds automatically.	1. Movement dynamics in the closed direction will be reduced. 2 Movement dynamics in both the open and closed directions will be reduced. 3 System shuts down for 3 minutes (door closer mode). 4 Hold-open time will be extended.

Appendix C – dormakaba handheld

C.1 dormakaba handheld terminal

Fig. C.1.1 dormakaba handheld



1 Off/On key
2 Function keys
3 Arrow keys
4 ENTER key
5 DEL key
6 SHIFT key
7 Alpha numeric keyboard
8 LED, recharging battery status (Off when batteries fully charged)
9 SD card slot

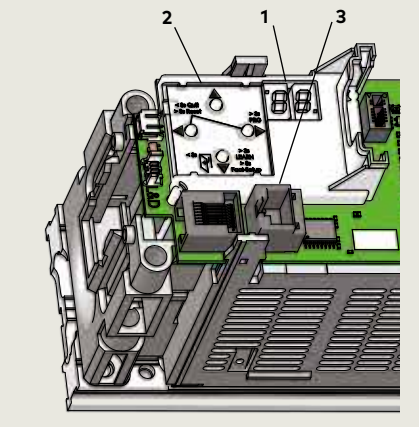
C.1.1 Interface cable

Use dormakaba interface cable (Article No. 16596101170) to connect dormakaba handheld to operator Com 1 interface.

CAUTION

Never use conventional network cable with RJ45 plug! Using conventional cable may result in permanent damage to operator!

Fig. C.1.2 Com 1 interface



1 2 digit display
2 4 button keypad
3 Com 1 interface
.

C.1.2 Handheld key functions.

1. OFF ON, switches Handheld on or off.
2. Function keys F1 - F3, trigger functions shown in bottom line of display (e.g., "RPT" for repeat, "UP" and "DOWN" to switch lines, "UpDoLd" for file up and download, "CHANGE" to change values, "OPEN" to trigger opening pulses.
3. Arrow keys, allow navigation within the display. Use left arrow to get back to previous screen.
4. ENTER, selects individual menu items and confirms changes of values and settings.
5. DEL, deletes figures or letters.
6. SHIFT, switch between figures and letters or small and capital letters. Current function is indicated on display (n: numeral, A: capital letters, a: small letters).
7. Alpha numeric keyboard, allows entering values and fie names in small and capital letters. There are several special characters (dot, comma, hash key, plus, minus, asterisk and diagonal slashC

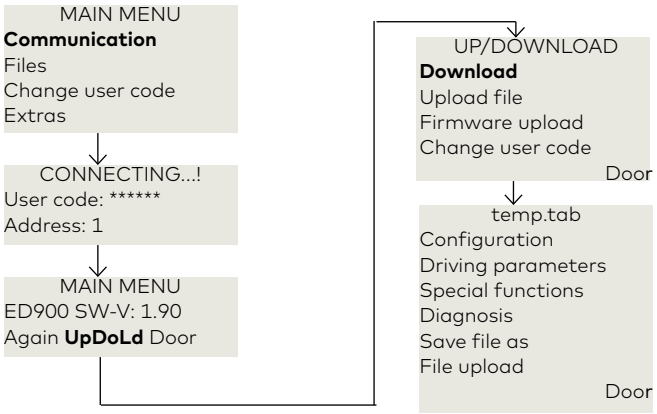
C.1.3 Handheld startup.

1. Press OFF ON to turn on Handheld terminal.
2. Screen displays Current version, creation date and name of data base. Handheld is ready for operation.
3. Select "COMMUNICATION" and enter user code (dormakaba original setting: 123456).
4. Handheld displays current software version of the connected operator (e.g., Ed900 SW- V1.40).

C.1.4 Downloading current parameters.

1. Press function key F2 "UpDoLd" to access menu "UP/DOWNLOAD".
2. Select "Download" to download current adjustments and parameters. System stores this data as temporary file under file name "temp.tab".
3. Every change in configuration, parameter setting or special functions confirmed with the "ENTER" key automatically uploads to the operator.
4. The Handheld does **not** automatically save the changes. The Handheld will prompt you to save the changes when quitting the menu.

C.1.5 Menu structure



NOTICE

Parameters and detail may change depending on firmware version.

C.2 dormakaba handheld; configuration parameters

"#" refers to reference numbers in Parameter list, Chapter 22.

C.2.1 Configuration parameters.

#	Parameter and default		Description / Selections		
1	Installation	*	Pull arm		
			Push arm		
			Gleit BGS (Track w push arm)		
				cm	Inches
2	Reveal depth	**0**	ED900	(-3)- 30	-1 3/16 ... 11 13/16
3	Door width (steps of 4")	**100**	ED900	71 - 122	28 -48
4	Door type	*	single*		
			1. leaf		
			2. leaf		
			Master		
			Slave		
11	Sensor test	**0**	0	Off	
			1	Pull side high active	
			2	Push side high active	
			3	Both sides high active	
			4	Pull side low active	
			5	Push side low active	
			6	Both sides low active	
			7	Bodyguard	
			8	Bodyguard III or Premier T with monitoring	

#	Parameter and default		Description / Selections		
12	Start safety push side	*	Off*	Signal ignored once door closed	
			On	Sensor can trigger pulse with door closed	
14	Lock delay	**3**	Delayed opening time for locking mechanism		(0 ... 3) *100 msec
15	Unlock force	**0**	Preload prior to unlocking		0 ... 9
12	Test PR module	*	0*	Test off	
			1*	Test once every 24 hrs.	
23	Program switch	*	Internal*		
			External		
			DCW		
24	PGS power up (DCW)	*	Last*		
			Off		
25	PGS delay	*	Off*		
			On		
26	Daytime unlock	*	Off*		
			On	Locking device remains permanently unlocked while door is in closed position.	
27	Door status (Status relay function, X7 terminals)	*	1 Off	Relay off	
			2 Open*	door reaches closed position	
			3 Close	door reaches open position	
			4 Error	any error message	
				door closed and locked	
			5	Information or error codes displayed	
			6	Door opened further than opening angle	

C.2.1 Configuration parameters.

#	Parameter and default		Description / Selections	
34	Manual mode	**On**	On*	Manual mode on.
			Off	Manual mode disabled.
35	Power assist winkel (angle)	**3**	Activation angle for power assist function (0 ... 5)	
36	Power assist kraft (force)	**0**	Force adjustment for power assist.	0 ... 10
21	Keep closed force	**0**	Force activated after latching action	0 ... 9
50	Manual release	**On**	Off; function deactivated. Manual release button required to deactivate hold open function.	
			On; function activated. Moving door manually in closing direction from hold open position deactivates hold open function.	
48	Input enable operator	*	Normal*	NC contact, operator deactivated when contact is open
			Inverse	NO contact, operator deactivated when contact is closed
49	Input Night-bank		Normal*	NO contact; night-bank function triggered while contact closed.
			Inverse	NC contact; Night-bank function triggered while contact open.
47	Door depth	**35**	0 ... 99 mm	0 ... 7/8"
52	Hinge clearance	**3**	-5 ... +5 mm	-3/16 ... +3/16"
	I04 Out 1			
	I04 Out 1			
	I04 Out 1			
	I04 Out 1			

C.3 dormakaba handheld; driving parameters

C.3.1 Driving parameters.

#	Parameter and default		Description / Selections		
				°/s	°/s
5	Speed open	**25**	ED900	8 ... 27	27 max. L.E.mode
6	Speed close	**25**	ED900	8 ... 27	27 max. L.E.mode
17	Limit force open	**60**	Static force in opening direction (wind load control)		(20 ...67) N L.E. mode
18	Limit force close	**60**	Static force in closing direction (wind load control)		(20 ...67) N L.E. mode
7	Hold-open time	**5**	Hold-open time automatic mode		(0 ... 30) s
8	Nurse bed function	**10**	Hold-open time nurse bed function		(0 ... 30) s
5	Offenhaltez man.	**1**	Hold-open time manual mode		(0 ... 30 s
10	Wall blanking	**80**	Angle when system ignores safety sensor on hinge side		(60 ... 99)°
19	Latching action	**0**	Motor-driven latching action, automatic mode		(0 ... 9)
20	Latching angle	**3**	Opening angle, motor-driven latching angle activated.		(2 ... 10)°
46	Backcheck angle	**10**	Backcheck angle for manual opening cycles.		(5 ... 40)°
51	Coord. offset angle	**30**	Starting angle for second door of two door system.		(0 ... 30)°

C.4 dormakaba handheld; special functions (Upgrade cards) ED900

C.4.1 Special functions (upgrade cards).

#	Parameter and default	Description / Selection	
	Upgrade card status codes	• locked: not available • unlocked: available, not active • activ or active: activated • fehlt: upgrade card missing	
40	Flip-flop func.	locked	Upgrade card professional Not used
		unlocked	
		active	
		fehlt	
41	extend HOT (extended hold-open time) r/o	locked	Upgrade card professional Not used
		unlocked	
		active	
		fehlt	
42	Nurse-Bed func.	locked	Upgrade card professional Not used
		unlocked	
		active	
		fehlt	
38	Fire protection r/o	locked	Upgrade card fire protection
		unlocked	
		active	
		fehlt	

#	Parameter and default	Description / Selection	
39	Full energy r/o	locked	Upgrade card full energy Not used
		unlocked	
		active	
		fehlt	
44	DCW r/o	locked	Upgrade card DCW® Not used
		unlocked	
		active	
		fehlt	
43	Disabled restr r/o	locked	Upgrade card Barrier-free toilet
		unlocked	
		active	
		fehlt	

22	Push & Go *	Off*	
		On	Door opens automatically when moved manually by 4° from closed position. Only available when "manual operation" is turned "off".

C.5 dormakaba handheld; diagnostics

C.5.1 Diagnostics

Parameter name	Description	Setting
FW vers BM r/o	Displays firmware (FW) version of basic module	x.x y y (e.g.,0190 v 1.9.0)
Rev FW version r/o		0 ... zzz
FW version SK r/o	Displays firmware version of Service Key	x x.y y (e.g., 01.00 = v 1.0.0)
FW bootloader		x x y y
Current error r/o	Displays current error	(...)
Error log 1		(...)
Error log 2		(...)
Error log 3		(...)
Error log 4		(...)
Error log 5		(...)
Error log 6		(...)
Error log 7		(...)
Error log 8		(...)
Error log 9		(...)
Current information	Displays current error	(...)
Delete errors	Press "ENTER" to delete error log.	Cmd ->
Installation dat r/o	Displays date of installation (month / yr)	mmyy (e.g., 1110 November 2010)
Hours counter r/o	Displays number of operating hours	(..) h
Service time interval	Enter maintenance interval	(6 .. 24) months **12**
Service cycle interval	Enter number of opening and closing cycles until next maintenance	(200 .. 1000)* 1000 **200**

Parameter name	Description	Setting
Wartungs datum	Maintenance data	x x y y (month, year)
Cycles total r/o	Displays total opening and closing cycles	(..)
Zyklen max h r/o	Displays maximum number of cycles in one hour	(..) h
Zyklen / h r/o	Displays number of cycles in previous hour	(..) h
Zyklen / h akt.	Displays number of cycles in current hour	(..) h
Learning cycle	Press "ENTER" to start learning cycle.	Cmd->
Learn cycle stat. r/o	Indicates status of learning cycle	(..)
Factory reset	Press "ENTER" to reset system to original settings	Cmd ->
Latching action p/u		(...) kg
Setup level (Ref. parameter SL, no. 28)	- Level 1, standard original settings. - Level 2, extended original settings	- Level 1 - Level 2
DCW list r/o	Displays DCW list	List ->
DCW reset		Cmd ->
Function mode r/o	Displays program switch setting	(..)

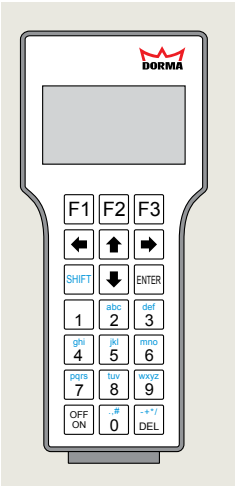
C.5.1 Diagnostics

Parameter name	Description	Setting
Setting code		0, low active (function on) 1, function off
Inp. Night - bank r/o	Status of Night -bank input X9, 6 and 1	0 1
Inp. OPEN r/o	Status of program switch permanent OPEN input X1, 34	0 1
Inp. PART OPEN r/o	Status of program switch PARTIAL OPEN input X1, 33	0 1
Inp. EXIT ONLY r/o	Status of program switch EXIT ONLY input X1, 32	0 1
Inp. AUTO r/o	Status of program switch AUTO input X1, 31	0 1
Inp. OFF r/o	Status of program switch OFF input X1, 30	0 1
Inp. Sfty pull side r/o	Status of safety sensor, hinge side input X5, 15	0 1
Inp. Sfty push side r/o	Status of safety sensor, opposite hinge side X5, 11	0 1
Inp. Activ extern r/o	Status of external activation sensor X6, 41	0 1
Inp. Activ intern r/o	Status of internal activation sensor X6, 42	0 1
Inp enable operator r/o	Status of Emergency close input X6, 4 and 4a	0 1
Inp. smoke detector r/o	Status of smoke detector input X9, 3 and 1	0 1
Inp. lock status r/o	Status of locking device input X3, 43 and 3	0 1
Locking status		locked

Parameter name	Description	Setting
Klemme 1G	Clamp X3, 1G and 3, 24 V out	
Opening width r/o	Displays opening angle	(..) °
Cur. door position r/o	Displays current door angle	(..) °
Amb. temp. r/o	Displays ambient temperature	(..) °C
Amb. max r/o	Displays maximum ambient temperature	(..) °C
Motor temp. r/o	Displays motor temperature	(..) °C
Motor temp max. r/o	Displays maximum motor temperature	(..) °C
Com 1 r/o	Com 1 connection	(..)

C.6 New dormakaba handheld; language change to English

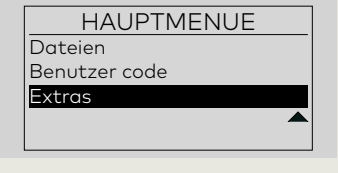
Fig. C.6.1
dormakaba handheld



C.6.1 New dormakaba handheld; language change.

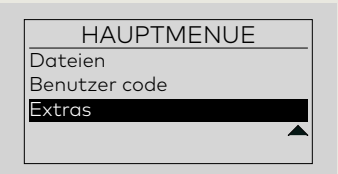
If German language is displayed on screen when handheld is first turned on (Fig. 25.6.2, handheld power on sequence), use following steps to change to English.

Fig.C.6.2 HAUPTMENUE (main menu)



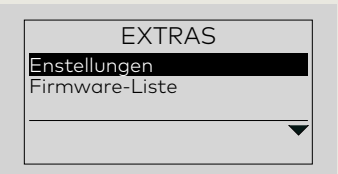
1. Scroll down Main Menu to EXTRAS:
   - Press ↓ 3 times to highlight EXTRA.

Fig. C.6.3 Main Menu; EXTRAS highlighted.



2. Press ENTER to select EXTRAS menu.

Fig. C.6.4 EXTRAS menu



3. Press ENTER to select EINSTELLUNGEN (Settings) menu.

Fig. C.6.5 EINSTELLUNGEN menu



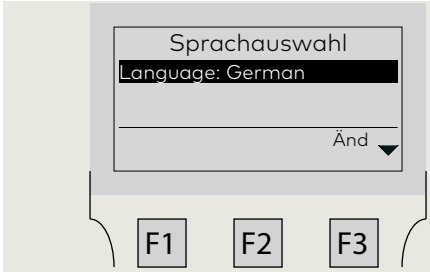
4. Scroll down EINSTELLUNGEN Menu to Sprachen (Languages):
   - Press ↓ twice to highlight Sprachen.

Fig. C.6.6 Sprachen highlighted



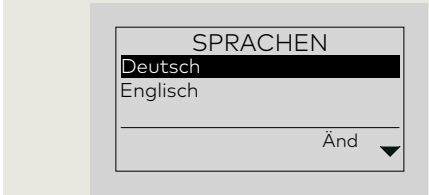
5. Press ENTER to select Sprachen (Fig. 26.6.6).

Fig. C.6.7 Sprachauswahl (Language Selection) menu



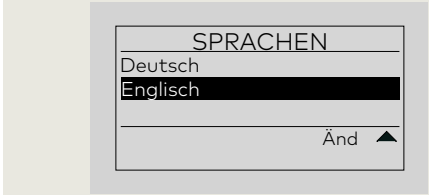
6. Press F3 to select Änd (Amendments).

Fig. C.6.8 SPRACHEN menu



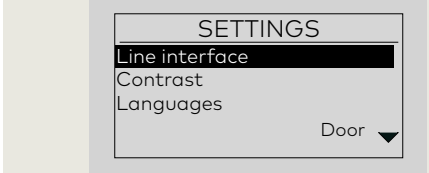
7. Scroll down SPRACHEN menu to Englisch:
   Press ↓ once to highlight "Englisch"

Fig. C.6.9 Englisch highlighted



8. Press ENTER to select Englisch.

Fig. C.6.10 SETTINGS menu



TIPS AND RECOMMENDATIONS

Handheld programmer will retain English setting when unit is turned off. Change to English only required the first time the programmer is turned on "out of the box".

C.7 dormakaba handheld; firmware update

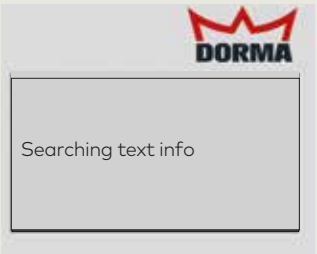
C.7.1 Firmware update procedure

CAUTION

For all firmware changes, set program switch to CLOSE and allow door to close completely before any updates are made!

Fig. C.7.1 Handheld power on sequence





1. Connect Handheld to COM 1 port (Para. C.1) and power on.
- Handheld will boot up and display main menu.

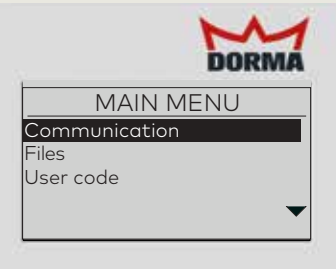
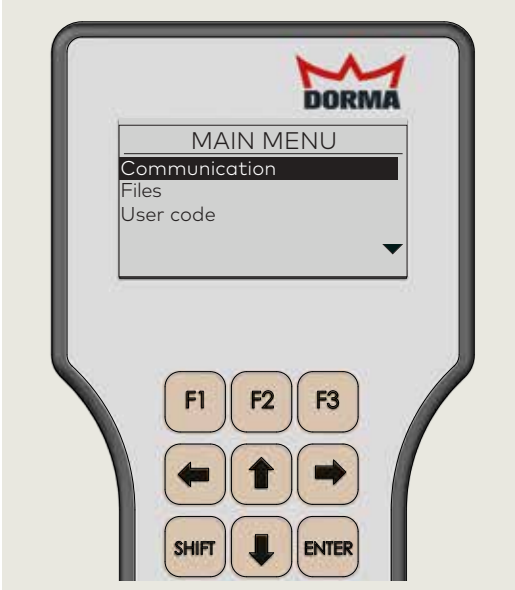


Fig. C.7.2 Select communication menu

Fig. C.7.3 Enter Handheld user code

1 ENTER button



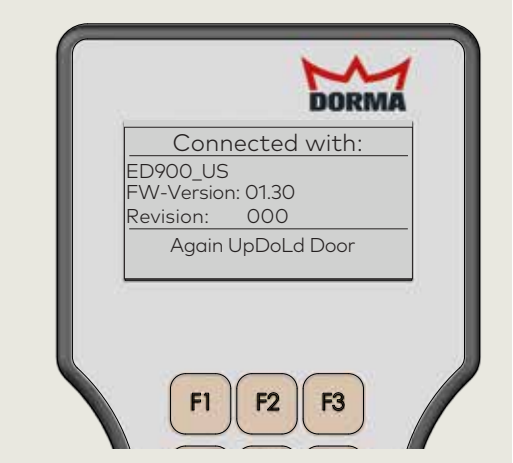
2. With Communication highlighted, press ENTER.



3. Enter handheld user code and press ENTER.

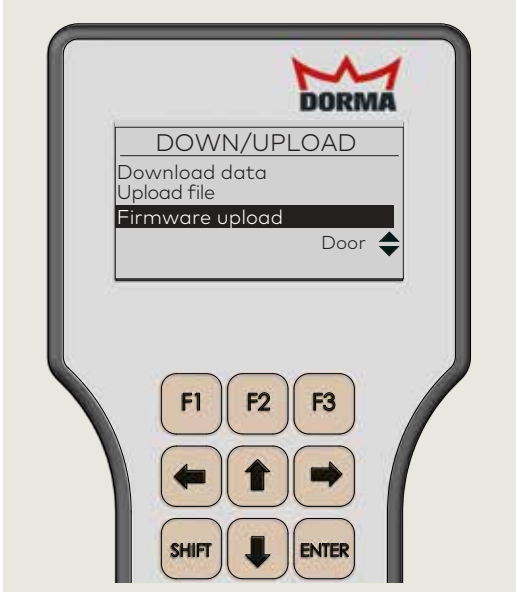
1 ENTER button
2 F2 button
3 Up/down arrows

Fig. C.7.4 Select UpDoLd



4. Press F2 to select UpDoLd.

Fig. C.7.5 Select Firmware upload



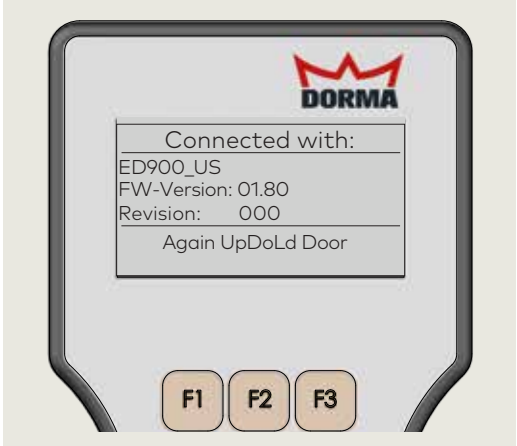
5. Use Up and Down arrows to select Firmware upload and press ENTER.

Fig. C.7.6 Select Firmware version



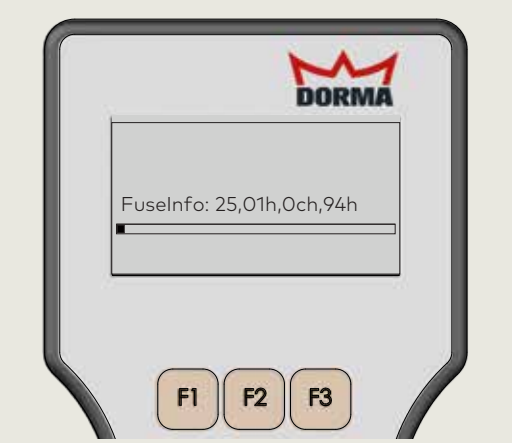
6. Use Up and Down arrows to select firmware version and press ENTER.

Fig. C.7.7 Start transmission



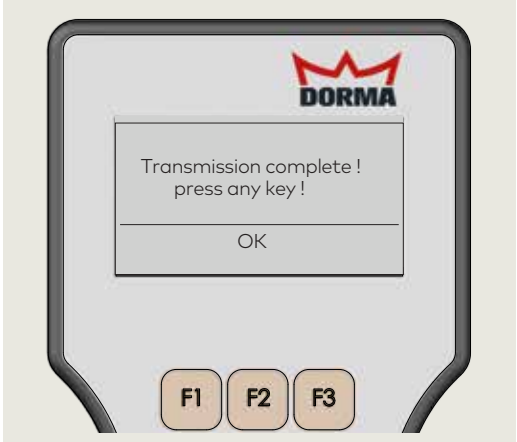
7. Press any key to start firmware transmission.

Fig. C.7.8 Firmware uploading



8. Firmware uploading to controller. Wait time of 3 to 5 minutes to upload.

Fig. C.7.9 Complete firmware update



9. Press any key to complete firmware update.

Appendix D - Wiring diagrams

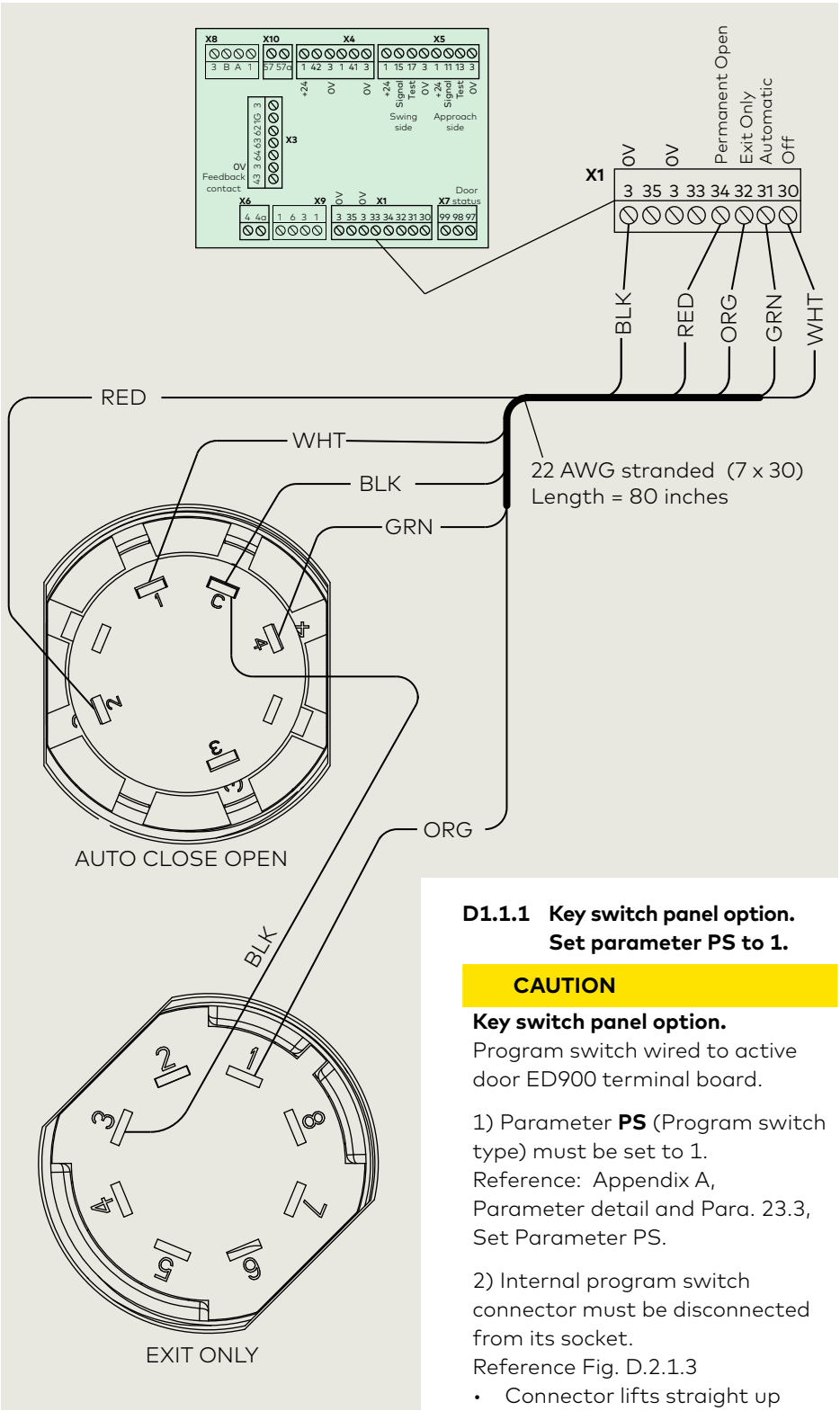
D1.1 Key Switch Panel with RJ45 connector

Fig. D1.1.1 Key switch panel



Reference Appendix C.1 for RJ45 comm cable connection.

Fig. D1.1.2 Key switch panel wiring diagram, active door



D1.1.1 Key switch panel option. Set parameter PS to 1.

CAUTION

Key switch panel option.
Program switch wired to active door ED900 terminal board.

1) Parameter **PS** (Program switch type) must be set to 1.
Reference: Appendix A, Parameter detail and Para. 23.3, Set Parameter PS.

2) Internal program switch connector must be disconnected from its socket.
Reference Fig. D.2.1.3

- Connector lifts straight up from its socket.

D2.1 Key Switch Panel

Fig. D2.1.1 Key switch panel

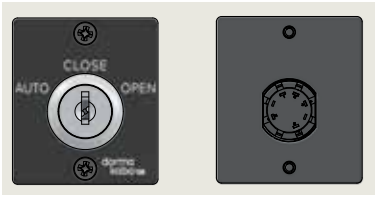


Fig. D2.1.2 Key switch panel wiring diagram, active door

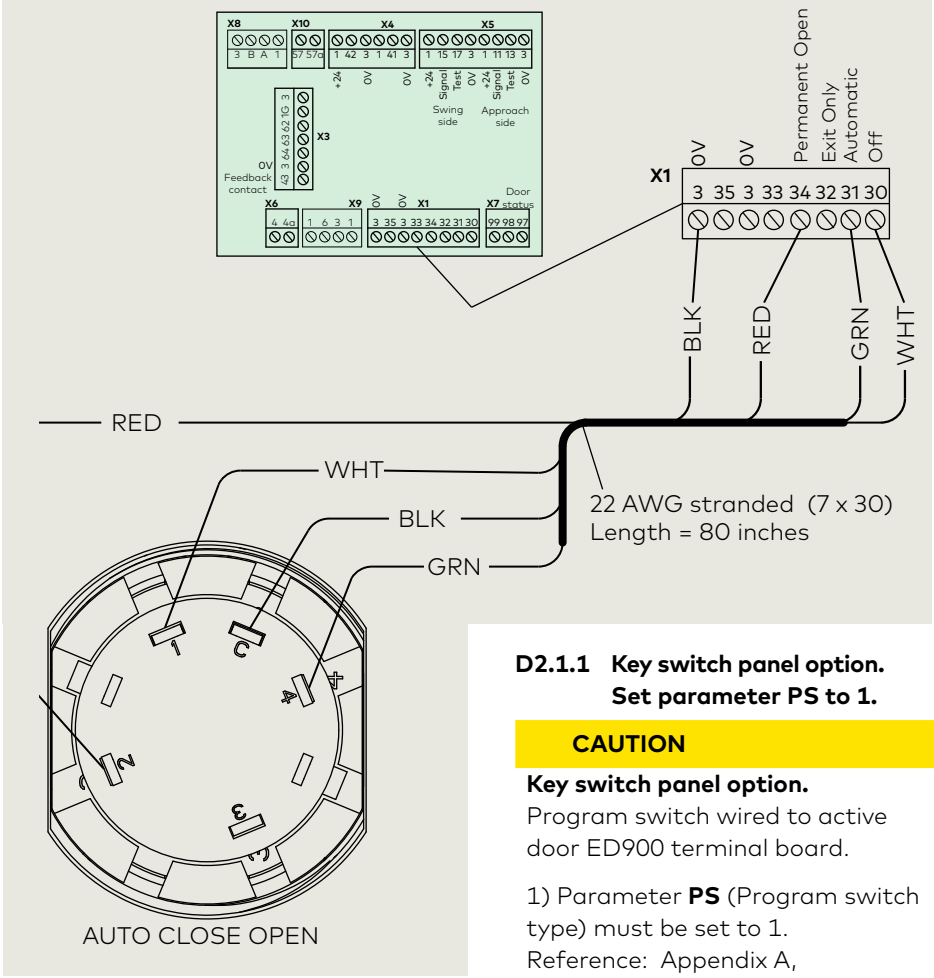
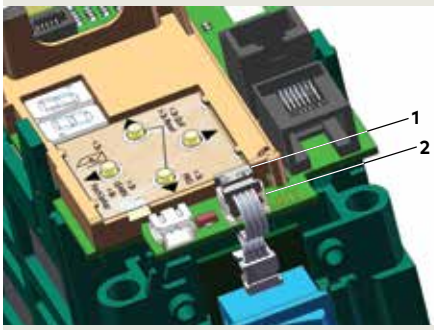


Fig. D.2.1.3 Program switch connector and socket



1 Program switch cable connector

2 Program switch socket

D2.1.1 Key switch panel option. Set parameter PS to 1.

CAUTION

Key switch panel option.
Program switch wired to active door ED900 terminal board.

1) Parameter **PS** (Program switch type) must be set to 1.
Reference: Appendix A, Parameter detail and Para. 23.3, Set Parameter PS.

2) Internal program switch connector must be disconnected from its socket.
Reference Fig. D.2.1.3

- Connector lifts straight up from its socket.

dormakaba USA, Inc.
1 Dorma Drive, Drawer AC
Reamstown, PA 17567
USA
T: 717-336-3881
F: 717-336-2106