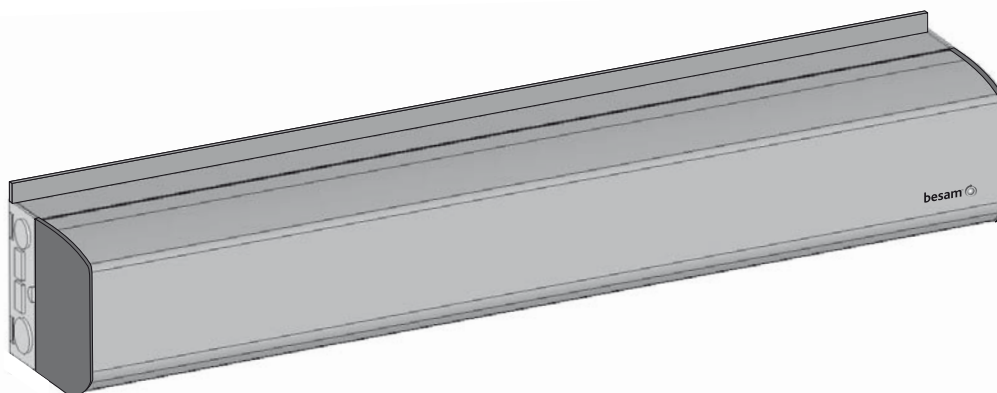
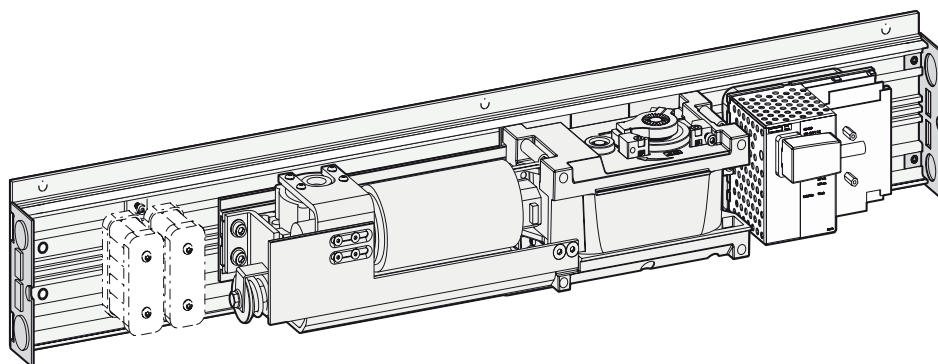


Besam Low Energy Swing Door Operator SW 100

Installation and Service Manual



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Following pages have been revised:

Page	Revision
–	This is the first version of Installation and Service Manual for Low Energy Swing Door Operator SW 100, No. 1003680-US-0.1, Issue 2006-12-14

2

Important information

2.1 Important notice!

To avoid bodily injury, material damage and malfunction of the product, the instructions contained in this manual must be strictly observed during installation, adjustment, repairs and service etc. Only Besam-trained experts should be allowed to carry out these operations.

2.2 Radio and television reception

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, it may cause interference to radio and television reception. It has been designed to comply with the emission limits in accordance with EN 61000-6-3 and EN 61000-6-2 (US market FCC 47 CFR Part 15B), which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient the receiving antenna.
- Relocate the receiver with respect to the equipment.
- Move the receiver away from the equipment.
- Plug the receiver into a different outlet so that equipment and receiver are on different branch circuits.
- Check that protective earth (PE) is connected.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.

2.3 Environment

This operator may be equipped with batteries containing materials which are hazardous to the environment. Remove the batteries from the operator before it is scrapped. The batteries must be disposed of safely.

This manual contains the necessary details and instructions for the installation, maintenance and service of the Low Energy Swing Door Operator SW 100, a universal electro-mechanical operator suitable for all low energy applications of swing doors.

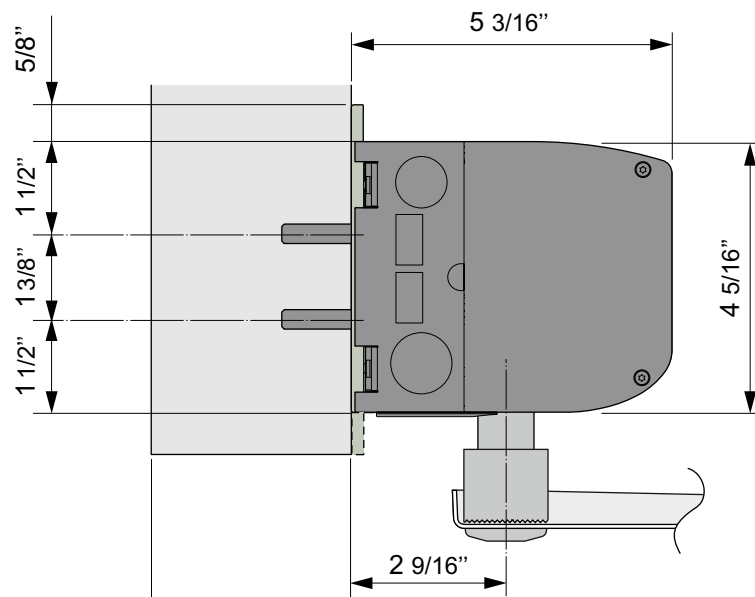
The SW 100 can be mounted on either side of the door header for pull or push action, and is suitable for single or double doors fitted with butt hinges, offset or center pivots.

The SW 100 ensures all-around safety. The operator can be combined with the full range of sensor products providing swing door safety, but meets also the requirements for a low energy operator without any sensors.

Power supply:	100-240 V AC +10/-15%, 50/60 Hz
Power consumption:	max. 75 W
Auxiliary voltage:	24 V DC, max. 400 mA
Internal control fuse:	2 x T 6.3 AH 250 V
Door width:	36-48" (914-1219 mm)
Door weight:	100-200 lb. (45-90 kg)
Door opening angle:	Push arm: 80° - 110°, with reveal 0 - 11 13/16" (0 - 300 mm)
	Pull arm: 80° - 110°, with reveal 0 - 5 1/8" (0 - 130 mm)
Opening time (0° - 80°):	variable between 3 - 6 seconds
Closing time (90° - 10°):	variable between 3 - 6 seconds
Hold open time:	1.5-30 seconds
Ambient temperature:	-4 °F to +113 °F (-20 °C to +45 °C)

This product is to be installed internally or externally with suitable weather protection.
Class of protection IP 20.

Complies with: IEC 335-1, ANSI/BHMA A156.19 and UL 325.



5

How the SW 100 works

The Low Energy Swing Door Operator SW 100 uses a DC motor and a gear-reduction system to drive an arm system, which opens the door. Closing power is provided by a motor and a clock spring. An electronic control unit uses a motor encoder and a microprocessor to control the door's movement.

5.1 Opening

When an opening signal is received by the control unit, the door is opened at the operator-adjusted opening speed. Before the door is fully open at back check, it slows automatically to low speed. The motor stops when the selected door opening angle has been reached. The open position is held by the motor.

If the door is obstructed while opening, it will either stall or stop which can be selected with a dip switch.

- When stalling - the door will continue to try to open during the hold open time.
- When stopping - the door will, even if hold open time has not expired, close after 2 seconds.

5.2 Closing

When the hold open time has elapsed, the operator will close the door automatically, using spring force and motor. The door will slow to low speed at latch check before it reaches the fully closed position. The door is kept closed by spring power or extended closing force by the motor.

5.3 Functions on the basic control unit CU-ESD (see also page 32)

5.3.1 Power failure

During power failure the operator acts as a door closer with controlled closing speed.

5.3.2 Spring force

The operator is delivered with spring pre-tension factory set to 210°. If necessary, the spring tension can be electronically adjusted with a potentiometer to required closing force.

5.3.3 Extended closing force/torque (CLTQ)

If the potentiometer CLTQ is set to 0°, the door will close with normal spring power. If the potentiometer is turned clockwise, the motor will extend the closing force/torque.

5.3.4 Power assist (POAS)

If the potentiometer POAS is set to 0°, the door gives no power assist. If the potentiometer is turned clockwise, the motor will give/increase power assist when the door is opened manually.

5.3.5 Push and go (PAG)

Dip switch to select “Push and go” or not. “Push and go” is available from any door position.

5.3.6 Overhead presence detector (OPD), frame mounted

Bodyguard III SMR

When an OPD sensor is mounted on the frame or operator header just above the swing side of the door, it will—when activated—either keep the door open or closed. The sensor is not active during opening and closing. Lock-out signal must be connected for proper function.

- a closed door will not open, if the OPD detects activity in the field
- an open door will not close, if the OPD detects activity in the field
- during opening, the door will continue to open, even if the OPD detects activity in the field
- during closing, the door will continue to close, even if the OPD detects activity in the field
- the OPD is not active in program mode OFF, manually opened door or during battery operation (Power Save Mode).

5.3.7 Mat

Mat safety means that:

- a closed door will not open, if someone steps on the mat
- an open door will not close, if someone steps on the mat
- during opening, the door will continue to open, even if someone steps on the mat
- during closing, the door will continue to close, even if someone steps on the mat
- opening impulses are prevented during closing, if someone steps on the mat
- the mat is not active in program mode OFF, manually opened door or during battery operation (Power Save Mode).

5.4 Functions on the extension unit EXU-SI (see also page 34)

5.4.1 Kill function

- Kill will, if circuit is closed, ignore all signals and close door(s) at normal speed.
- When kill is no longer active, operator will resume normal operation.
- If kill function must have manual reset, jumper must be removed and reset button connected.
- The lock will lock when kill is active regardless of program selector setting.
- The function of the lock can be changed during Kill (see page 42).

5.4.2 Function of locks

- The control has an available output of DC for external locks
- Dip switches to select 12 or 24 V DC, locked with or without power
- Dip switch for lock release and potentiometer for opening delay
- Dip switch for lock kick if door is not fully closed, to overbridge binding in the locking device during closing
- Input to unlock signal from lock

5.4.3 Program selector

- Input for OPEN, EXIT and OFF (if no program selector, AUTO is default).

5.4.4 Impulses

- Input for Outer impulse, Key impulse and Open/Close impulse
- The Open/Close function uses the door as indicator of door status. That is, an open door will close after an impulse on Open/Close, even if the door has been opened by another impulse. The Open/Close has as default a max. Hold Open Time of 15 min. This time can be changed to infinite (see page 42).

5.4.5 Power failure mode

- In case of power failure, normal operation can be carried out with impulses from the “Key switch”
- Two contacts are available for connection of 2 x 12 V batteries (NiMH)
- DIP-switch for monitoring of batteries is also available
- During “Power failure mode” the operator will finish the actual operating cycle and then switch off the battery supply. The battery powered operator can be awoken to achieve a new operating cycle by an impulse on the KEY input. The operating mode during battery power can be changed from “Power save” to “Convenience” (see page 42). During “Convenience mode” the operator will work as normal until the batteries are discharged. The batteries are rechargeable and will be charged by the control unit in the operator. New, fully charged, batteries can typically open and close a door 300 times.

5.5 Functions on the extension unit EXU-SA (see also page 35)

5.5.1 Presence impulse, door mounted

The presence impulse is active during fully open and closing. The sensor is mounted to the approach side of the door. Once the door is closed, the sensor is ignored and will not be active until the next impulse is received.

Note! When installed as a pair of doors, the presence impulse signal will re-open both doors. The sensor is not active in program mode OFF, manually opened door or during battery operation (Power Failure Mode).

5.5.2 Presence detection, door mounted

When a sensor that is mounted on the swing side of a door detects an object, it will send a command to the control unit to stop the door. If the control unit has received a short signal from the sensor and there is still hold open time left on the control unit, the door will continue on its way open if the object has cleared. The blanking potentiometer can be adjusted so that the sensor will avoid detecting a wall or object near the full open position. Presence detection has a higher priority than presence impulse.

Note! When installed as a pair of doors the presence detection signal will stop both doors, except for double egress doors. The behaviour for double egress doors can be changed (see page 42). The sensor is not active in program mode OFF, manually opened door or during battery operation.

5.5.3 Monitored safety sensors

Both presence impulse and presence detection can be monitored. If a sensor becomes defective, the operator will not accept any impulses and will then work as a manual door closer.

5.5.4 Open door indication

A relay output is used to indicate an opening cycle or a specific position of the door. The indication position is set by adjusting the blanking potentiometer.

5.5.5 Error indication

A potential free contact COM/NO/NC for external error indication (see page 48).

6

Models

Two main models of the Low Energy Swing Door Operator SW 100 are available:

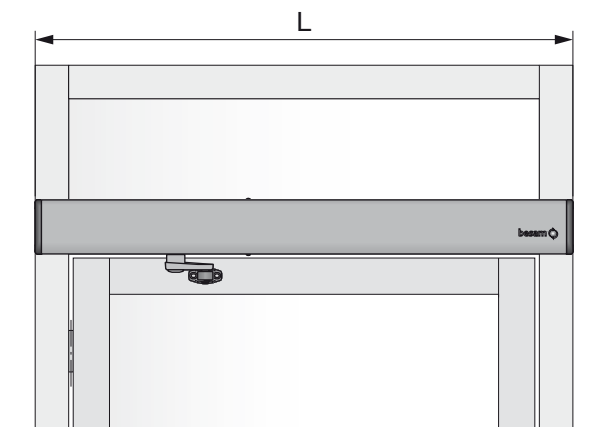
- Single operator
- Double operator

The operators are non-handed and not dependent on the hinges. The operators suit both pushing and pulling arm systems.

6.1 Single operator

The product is delivered complete with back plate, control unit, end plates and cover. Length incl. end plates, L = 39.5" (1003 mm) or 51" (1295 mm).

Pushing arm system shown.

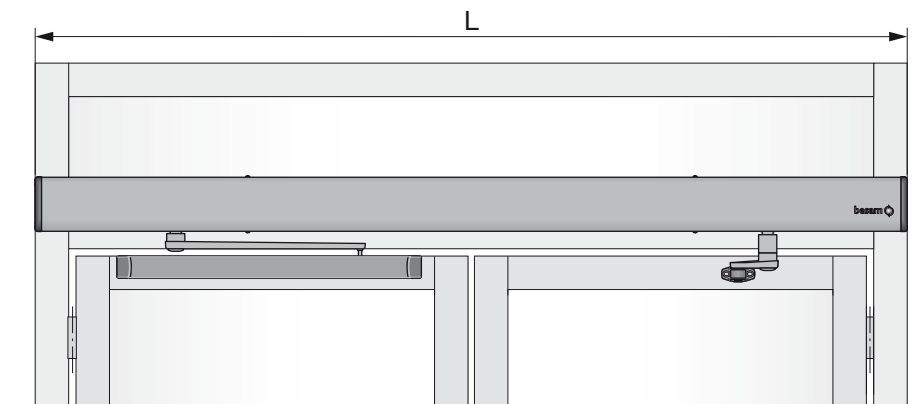


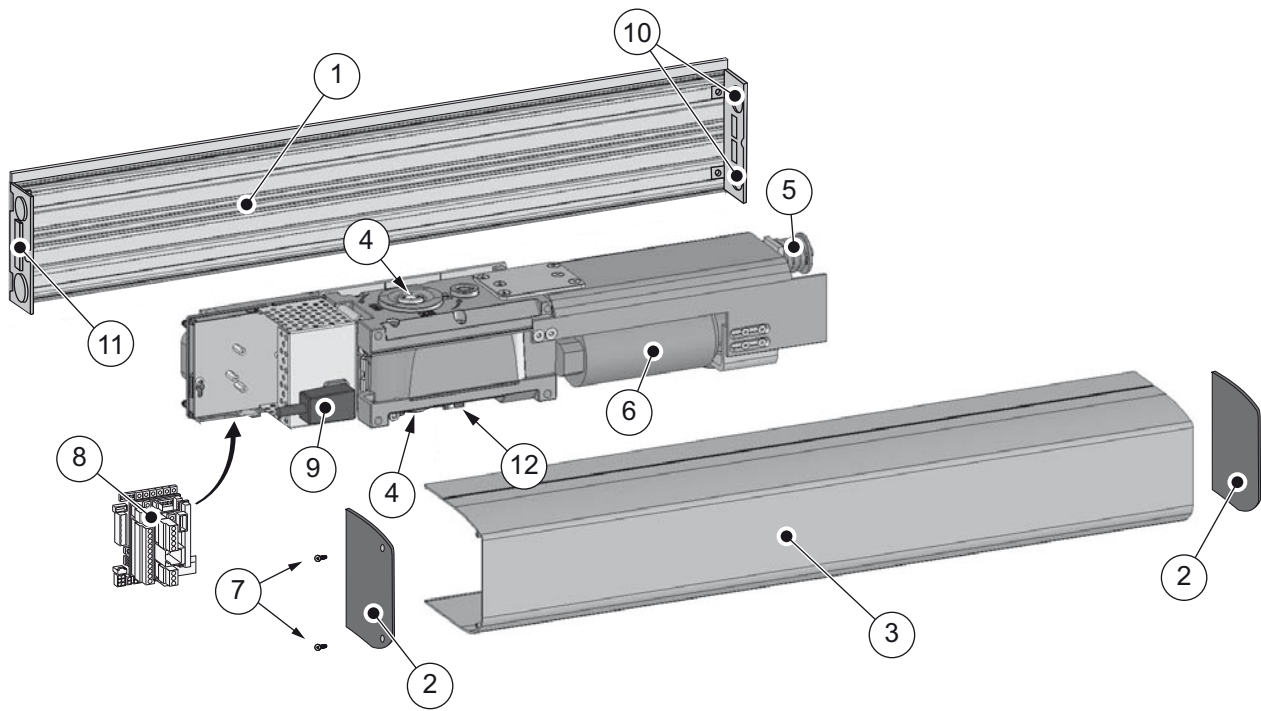
6.2 Double operator

The product is delivered complete with back plate, control unit, end plates and cover. Cover length L is optional.

Two operators can be mounted under the same cover to open one door each.

Pushing and pulling arm system shown (double egress).





- | | |
|--------------------------|--|
| 1. Back plate | 7. End plate fixing screws |
| 2. End plate | 8. Control and extension units |
| 3. Cover | 9. Mains contact |
| 4. Drive shaft | 10. Knockouts for cable inlet |
| 5. Belt tension device | 11. Knockouts for 2-position power switch ON/OFF (enclosed) and/or ON/OFF/Hold open switch |
| 6. Drive unit with motor | 12. Door stop |

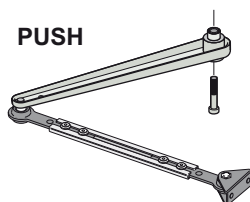
8

Options

8.1 Arm systems

8.1.1 Arm system, PUSH P/N: 1003576

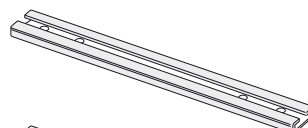
This arm system is delivered with drive arm, telescopic part and door fitting. It is used if the operator is installed on the wall on the opposite side of the door swing, and approved for fire door application.



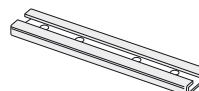
8.1.2 PUSH-arm extensions

Reveal = X	Extension
Up to 4-1/8" (0-105 mm)	None (standard arm)
4-1/8" to 8-11/16" (105-220 mm)	345 mm
8-11/16" to 11-13/16" (220-300 mm)	230 mm + Joint part

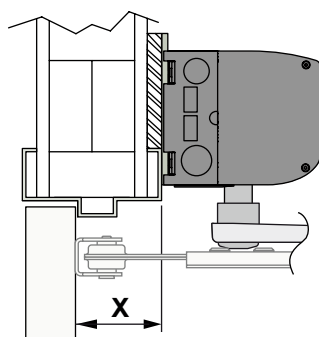
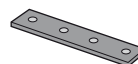
345 mm extension
P/N: 21-06-17305



230 mm extension
P/N: 21-06-17304

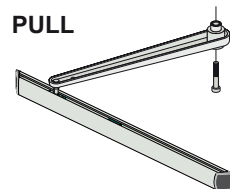


Joint part
P/N: 21-06-17319

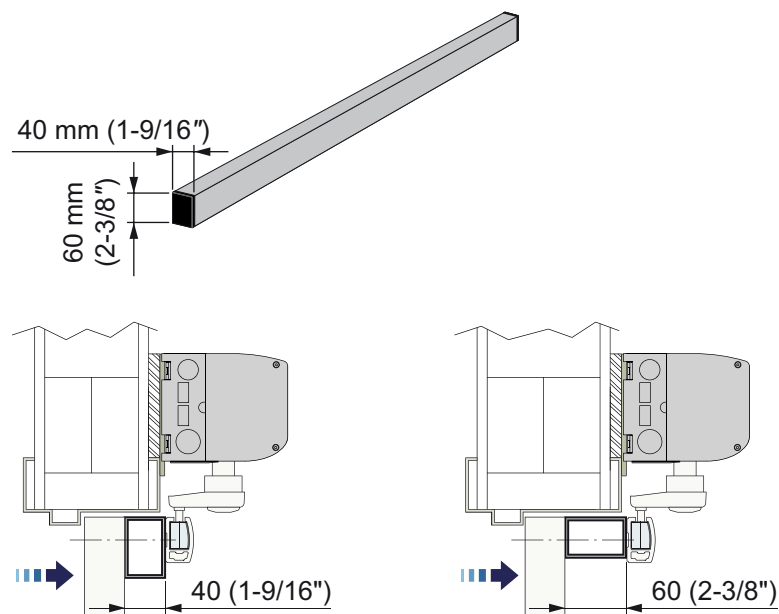


8.1.3 Arm system, PULL P/N: 1003559

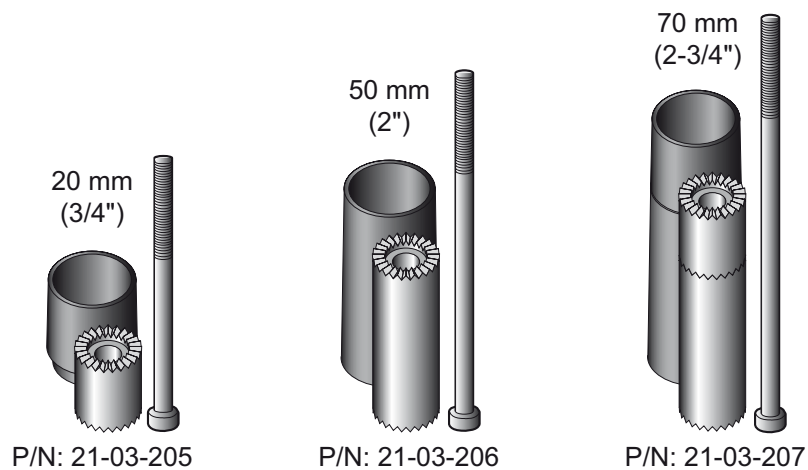
This arm system is delivered with drive arm, guide shoe and door fitting.



8.1.4 Reveal spacer, PULL P/N: 173804BK



8.1.5 Drive shaft extension kits



8.2 Push plates

For disable use, mount push plate 31" above floor level.

8.2.1 Push plates



P/N: 75-02-101



P/N: 75-02-102



P/N: 75-02-107



P/N: 75-02-108



P/N: 75-02-280

8.2.2 Remote transmitter push plates



P/N: 75-02-273



P/N: 75-02-272



P/N: 75-02-269



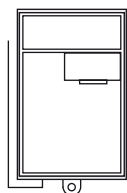
P/N: 75-02-270

8.2.3 Installation box for narrow plates



P/N: 75-21-002

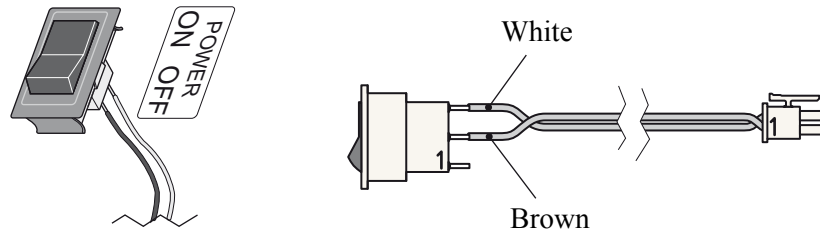
8.2.4 Remote receiver



P/N: 75-02-271

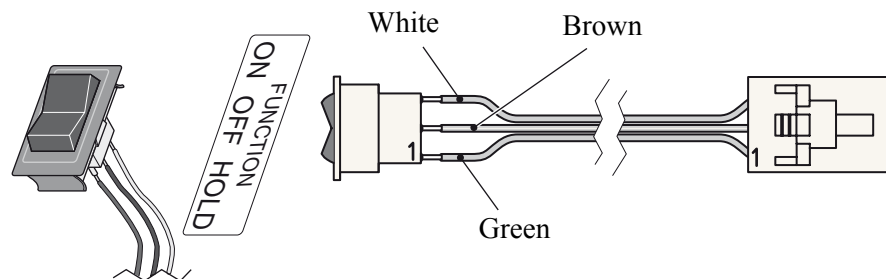
8.3 Position switches

8.3.1 2-position power switch (enclosed with the operator)



P/N: 1003581

8.3.2 3-position program switch



P/N: 1003582

Function	Program
ON	Impulses from activation units connected to XIMP are forwarded into inner impulse.
OFF	Impulses from activation units connected to XIMP are not forwarded into inner impulse. These units cannot open the door.
HOLD	The door is held permanently open.

8.4 Sync cable for double doors (synchronising of 2 operators)



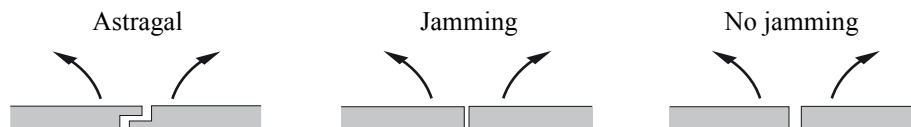
Note!

The connection/markings of the sync cable determines which of the operators is the master and slave.

P/N: 1003583

How to cut the strapping for double doors

Function		Door design		Cut the strapping with colour	
Opening	Closing	Astragal	Jamming	Master side	Slave side
Synchronous	Synchronous	No	No	No cutting	No cutting
Synchronous	Asynchronous	Yes	No	Cut black	No cutting
Asynchronous	Asynchronous	Yes	Yes	No cutting	Cut red
Double egress		—	—	Cut black	Cut red



Settings for double doors

Function	Settings on the	
	Master	Slave
Common		
Program selection	X	
Opening time	X	
Closing time	X	
Hold open time	X	
Close / Continue to open when the door is obstructed	X	
PAG On/Off	X	
Level of Power assist	X	(X)*
Extended closing force	X	(X)*
OPD Impulse or Mat Logic Impulse	X	
Selection of operating mode during operation on battery power	X	
Individual		
Lock/Unlock signal voltage	X	X
Locked without/with power	X	X
Lock release Enable/Disable	X	X
Open Delay Time	X	X
Lock kick Enable/Disable	X	X

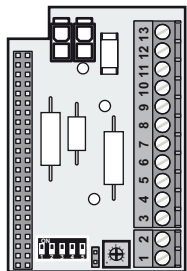
* For “Double egress doors”, these functions must be set separately for Master and Slave as the arm systems as well as the air pressure may be different.

Note! • Locks on the “Master” and “Slave” doors must be connected to the control unit (CU) on the corresponding operator.

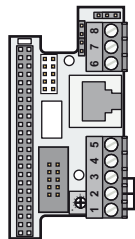
- Inner and outer impulses can be connected to either “Master” or “Slave” CU or both.
- The OPD is to be connected to the “Master” CU except for “Double egress”, where each OPD must be connected to corresponding CU.
- Door leaf mounted sensors must always be connected to corresponding CU.

8.5 Extension units (installation see page 33)

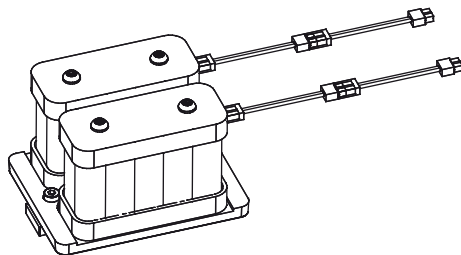
EXU-SI (kit)
P/N: 1003554



EXU-SA (kit)
P/N: 1003557



8.6 Battery backup unit



P/N: 1003567

8.7 Labels



P/N: 75-20-100
Dual Side “Automatic Door / Do Not Enter” – (Out)



P/N: 75-20-101
Dual Side “Automatic Door / Do Not Enter” – (In)



P/N: 75-20-102
Dual Side “Caution Automatic Door”



P/N: 1001695
Dual Side “Supervision of child”

9

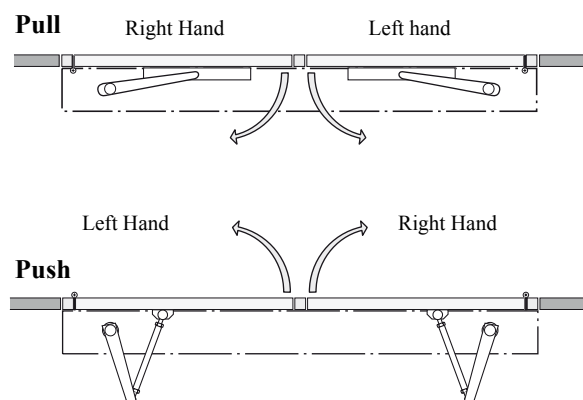
Pre-installation

9.1 General tips/Safety concerns

- For enhanced security and vandalism protection, always mount the operator access in the interior of a building.
- Make sure that the power is off before installing.
- Make sure that the door leaf and the wall are properly reinforced at the installation points.
- Inspect the door hinges before installation to ensure that they are in good repair.
- Unpack the operator and make sure that all parts are delivered in accordance with the packing note.

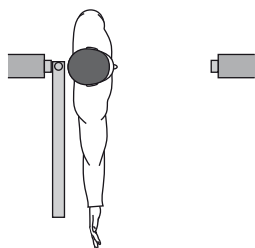
9.2 Door/Operator handing

9.2.1 Operator handing

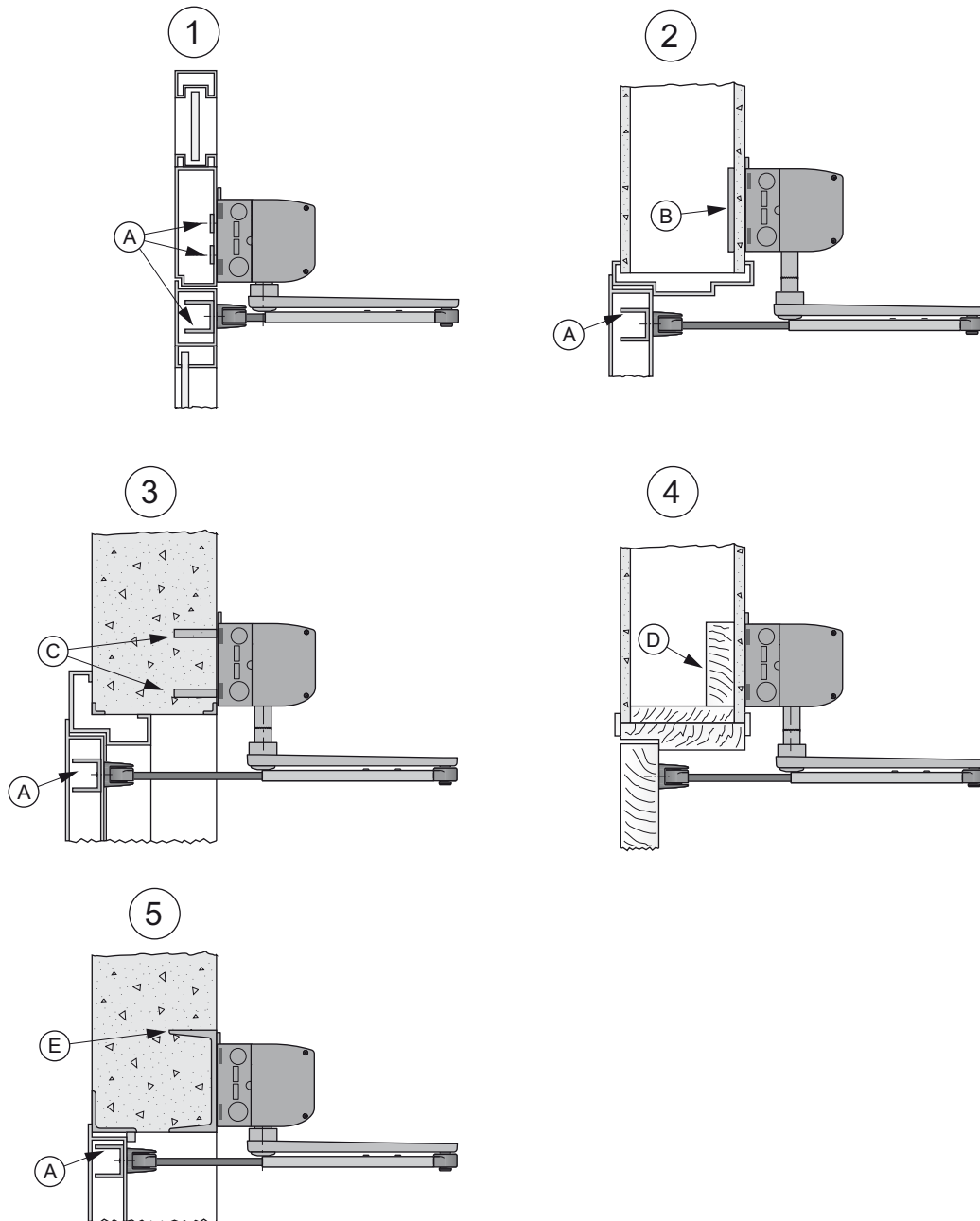


9.2.2 Door handing (Automatic Door Industry)

Door handing is determined by standing with your back to the hinges. The side to which the door normally opens (right or left) is the handing of the door. The diagram below shows a right-handed door.



9.3 Installation examples



1. Aluminum profile system
2. Plasterboard wall
3. Reinforced concrete wall and brick wall
4. Plasterboard wall
5. Reinforced concrete wall

- A Steel reinforcement or rivnut
 B Steel reinforcement
 C Expansion-shell bolt (for brick wall min. M6x85, UPAT PSEA B10/25)
 D Wood reinforcement
 E Steel beam

9.4 Fastening requirements

Base material	Minimum requirements of wall profile*
Steel	3/16" (5 mm)**
Aluminum	1/4" (6 mm)**
Reinforced concrete	min 2" (50 mm) from the underside
Wood	2" 50 mm
Brick wall	Expansion-shell bolt, min. M6x85, UPAT PSEA B10/25, min. 2" (50 mm) from the underside

* Besam minimum recommended requirements. Building Codes may give different specifications. Refer to AHJ (Authority Having Jurisdiction).

** Thinner wall profiles must be reinforced with rivnuts.

9.5 Tools required

- Torx T10
- Metric hexagonal key 2.5, 3, 4, and 6 mm
- Flatblade screwdriver (potentiometer and terminal size)
- Screwdriver (Philips size 2)
- Nut driver, 5 mm
- Wrench with metric Allen key 6 mm
- Carpenter's level
- Tape rule
- Power drill and set of drill bits
- Center punch
- Wire stripper
- Silicone sealant
- Installation and Service Manual 1003680-US (this manual)

9.6 Installation on double doors

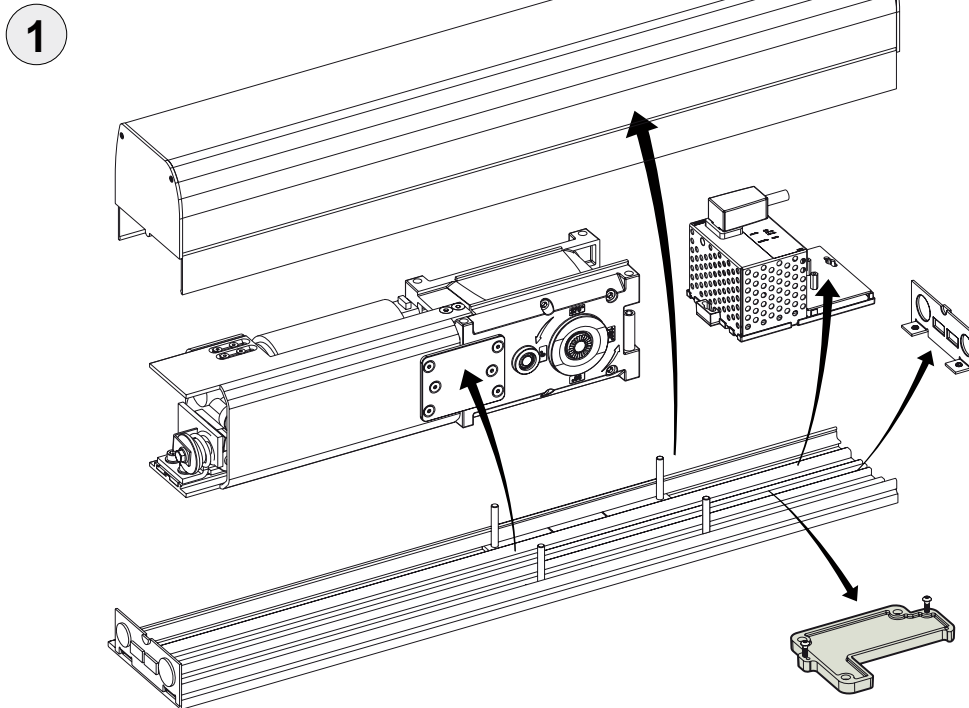
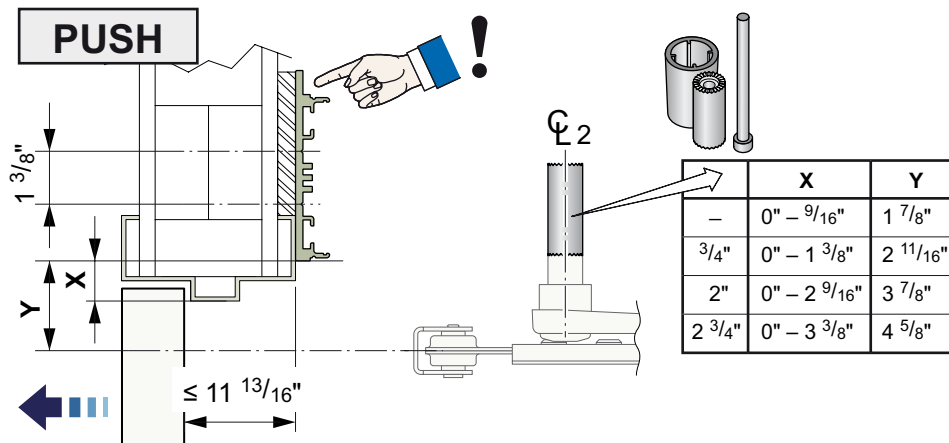
If the operators are to be mounted at the same height with pushing and pulling arm systems, the height is determined by the pulling arm system, PULL. The pushing arm system PUSH must always have a shaft extension, minimum 2" (50 mm), maximum 2 3/4" (70 mm) to match the mounting heights visually.

Example: if PULL/ST has a 3/4" (20 mm) extension, the PUSH must have a 2 3/4" (70 mm) extension. If PULL has 0 mm extension, the PUSH must have a 2" (50 mm) extension. See "Double operator" on page 13.

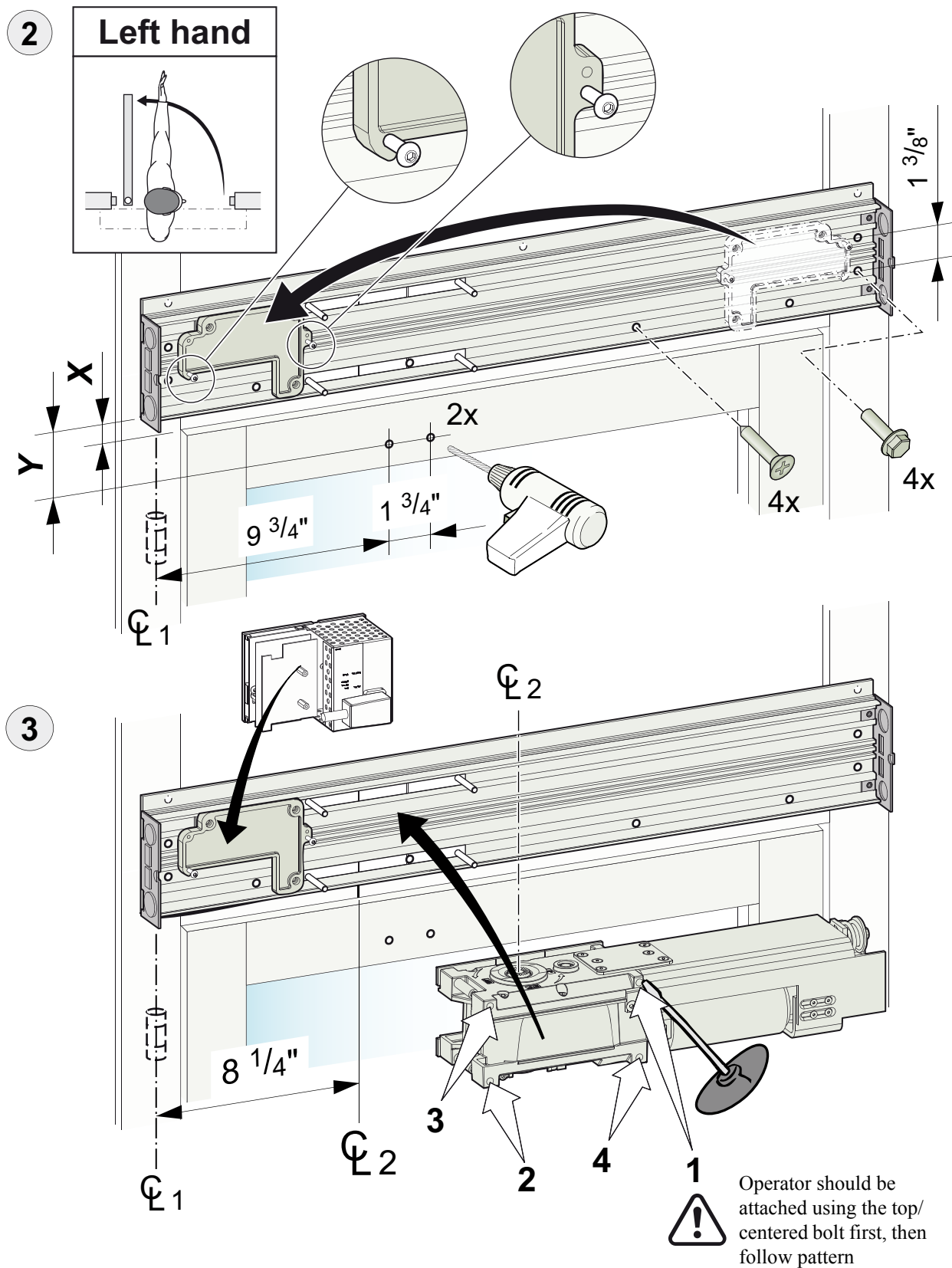
For installation, follow the instructions for the applicable arm system.

Note! Consider all power wire entry locations and signaling wires before preparing back plate.

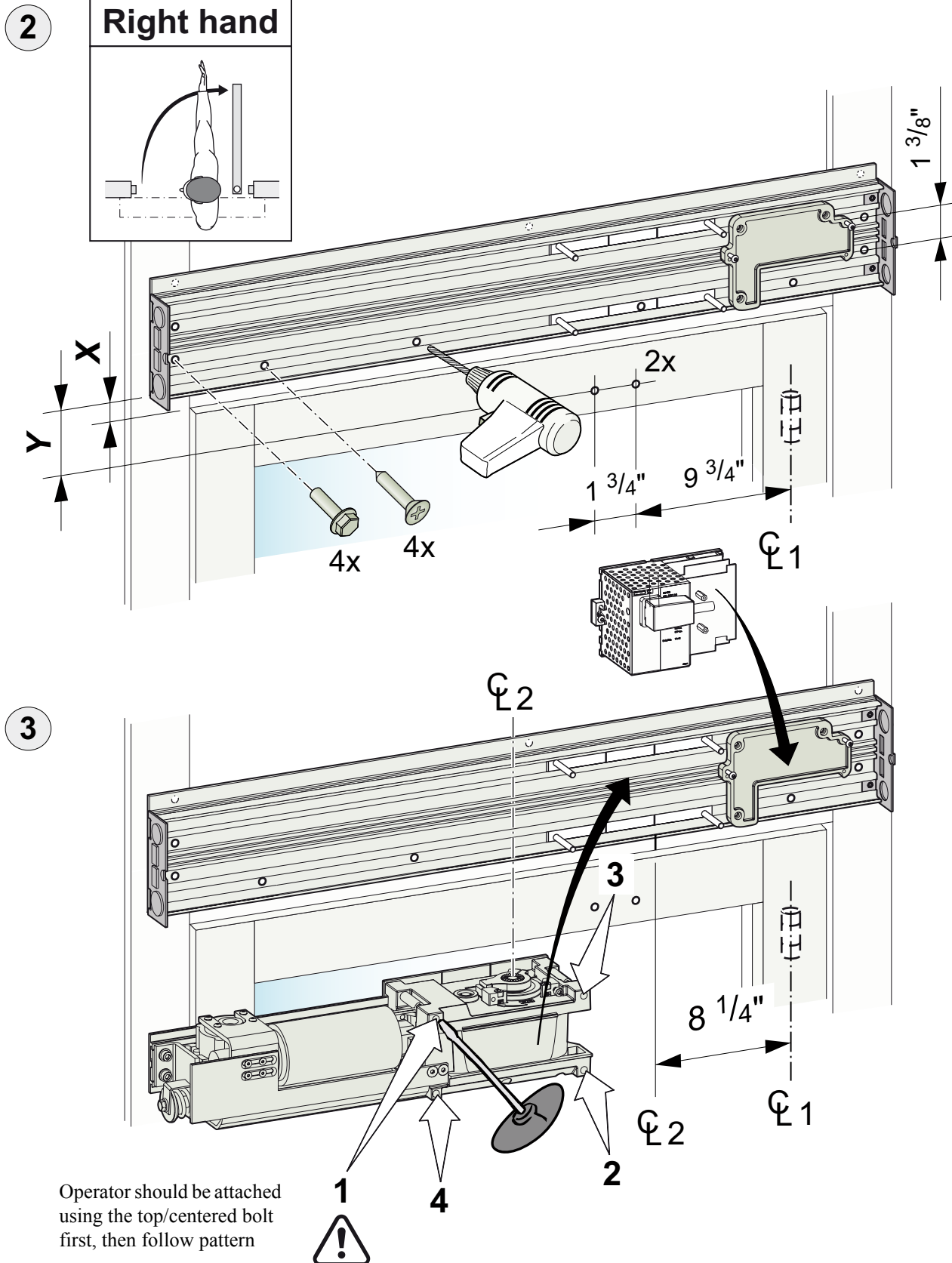
10.1 Operator with PUSH arm system



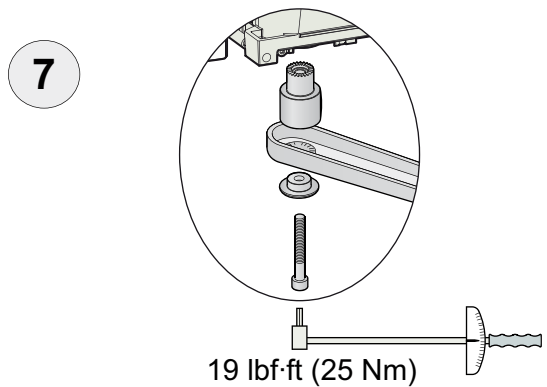
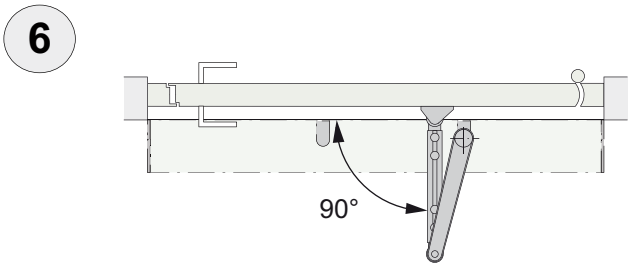
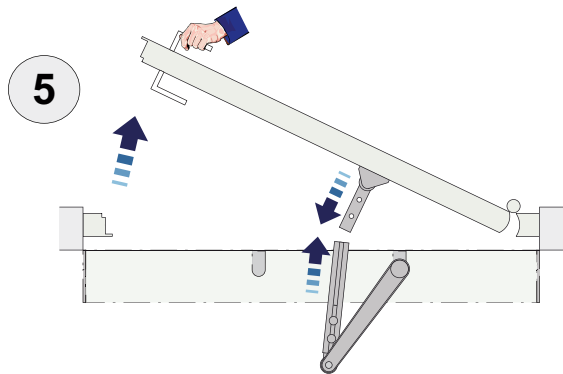
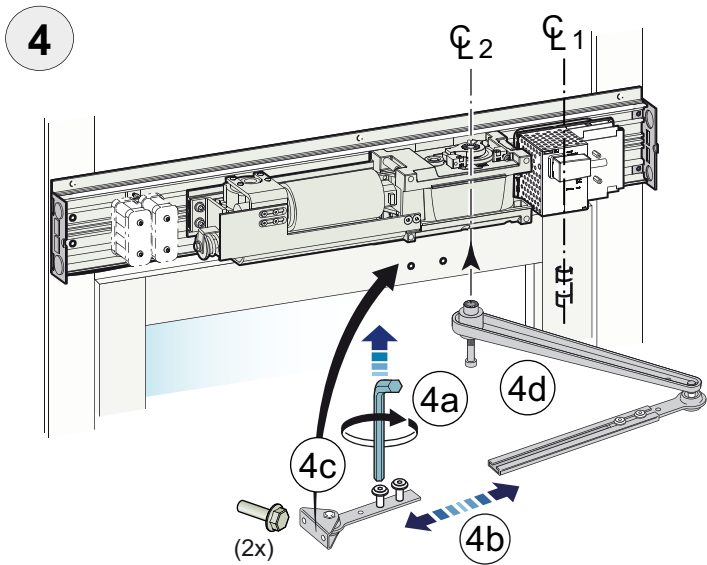
Cont. "Operator with PUSH arm system"



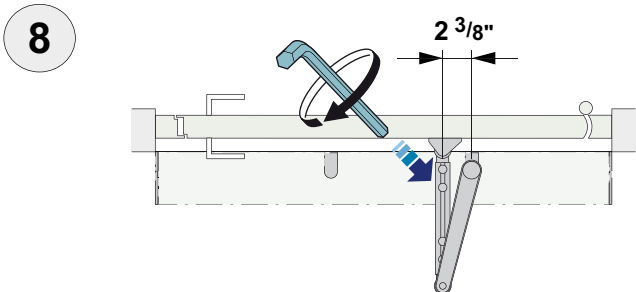
Cont."Operator with PUSH arm system"



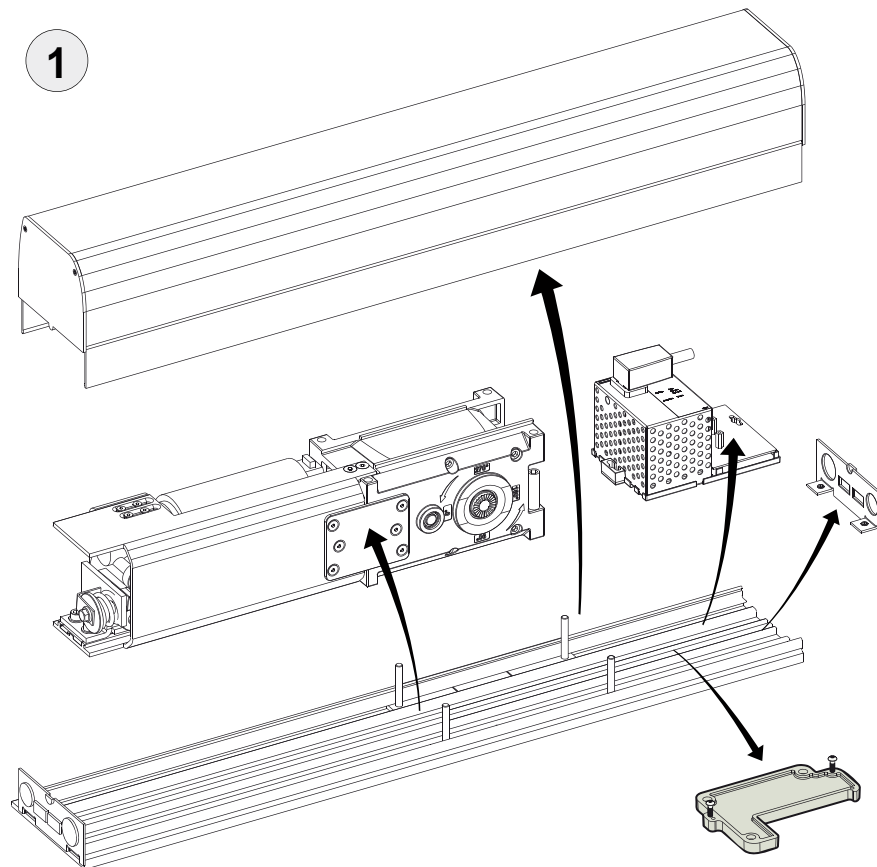
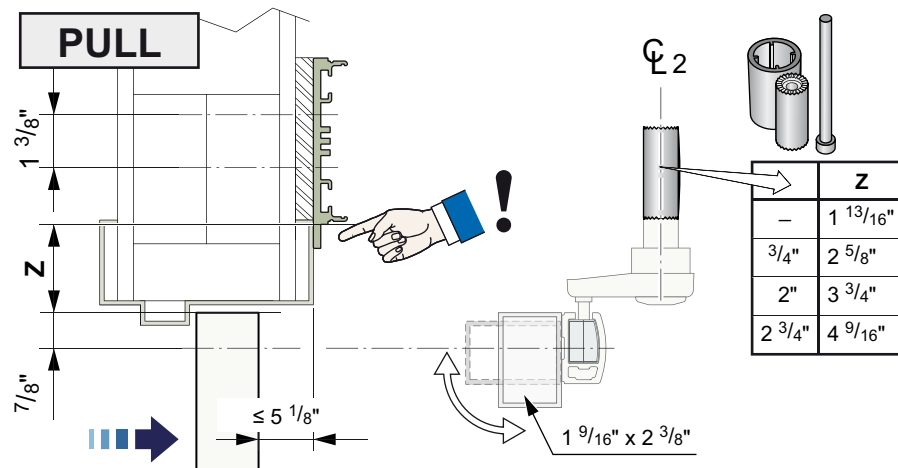
Cont.”Operator with PUSH arm system”



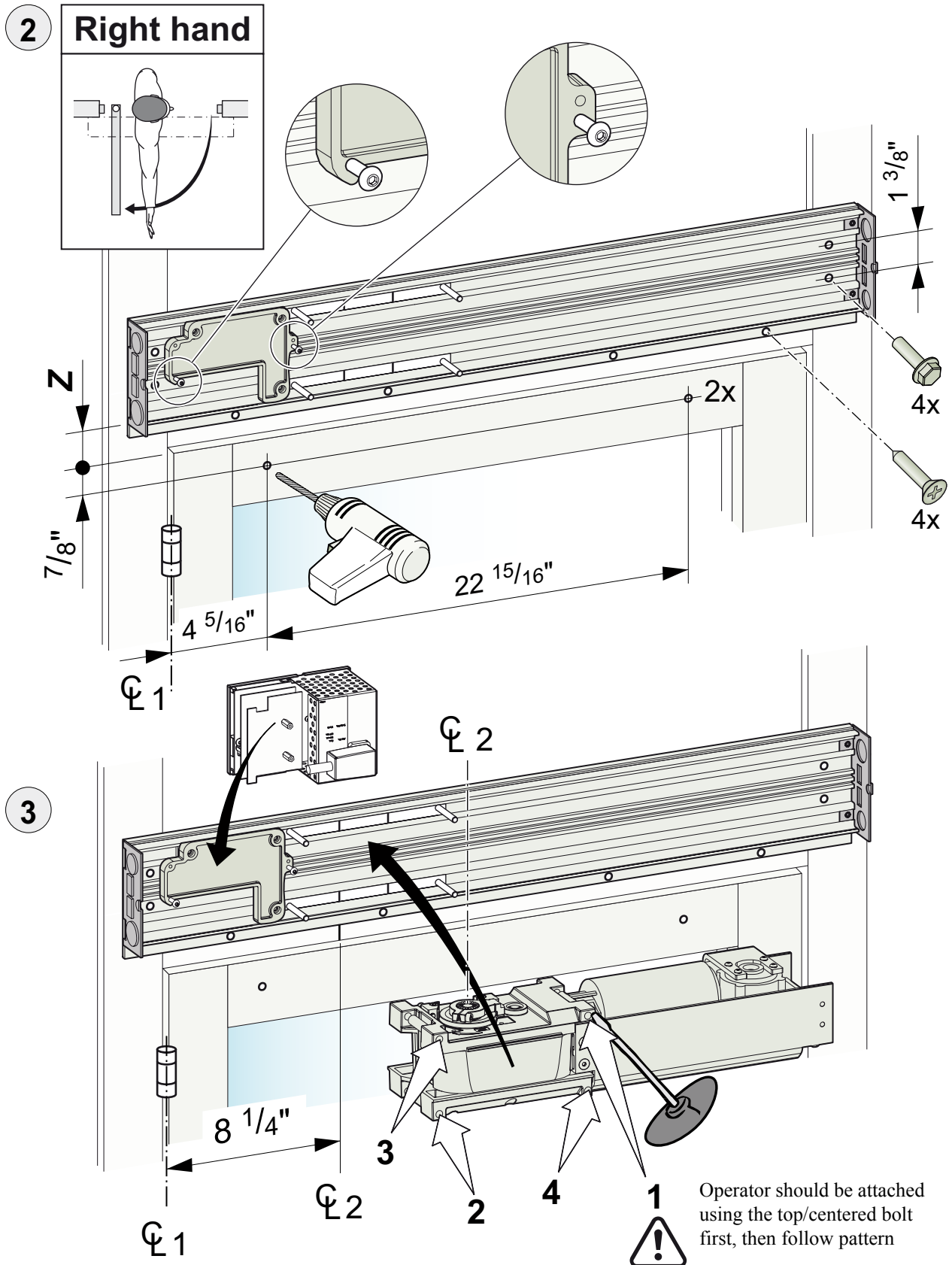
Note! Important measurement
for correct opening and
closing force



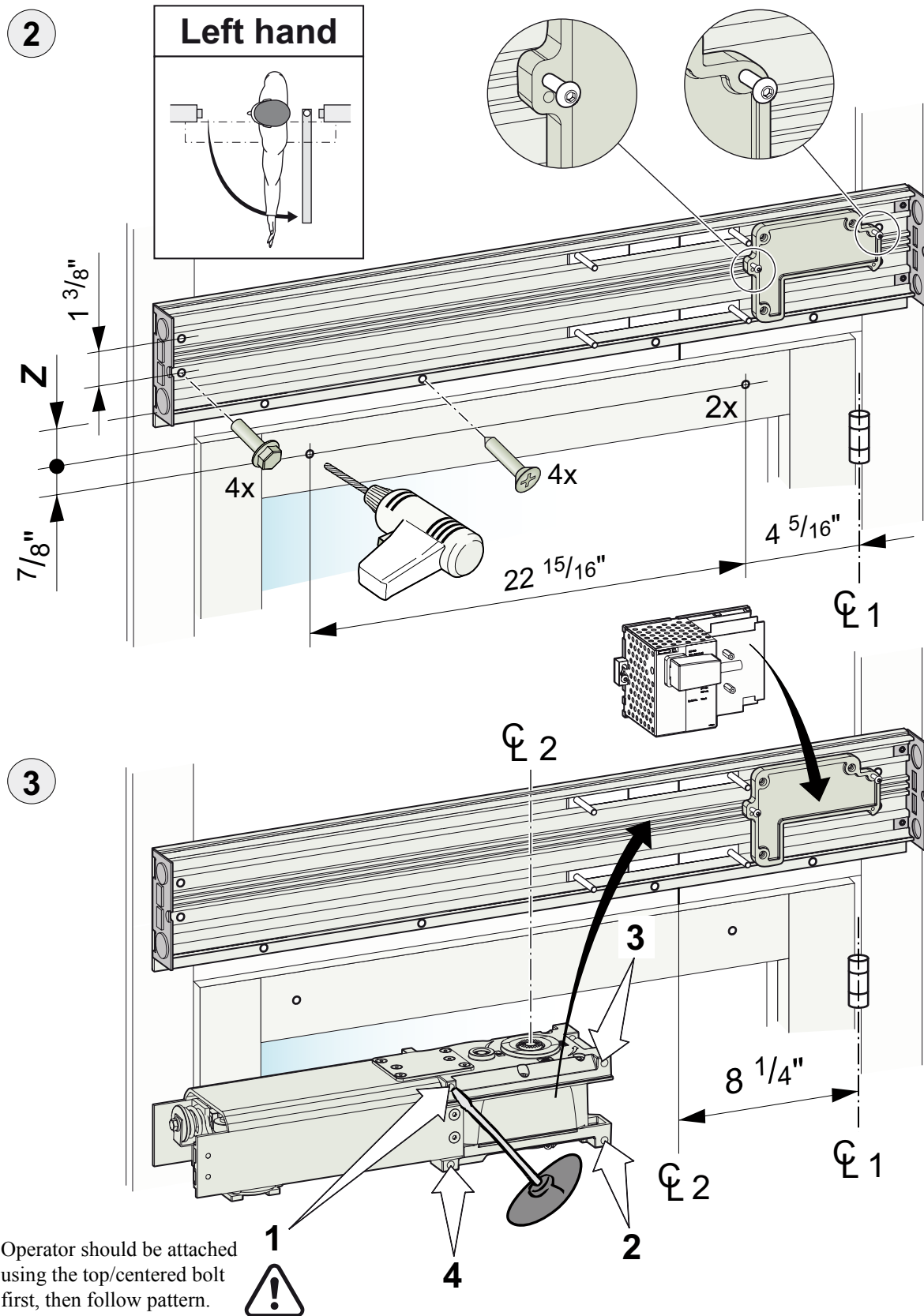
10.2 Operator with PULL arm system



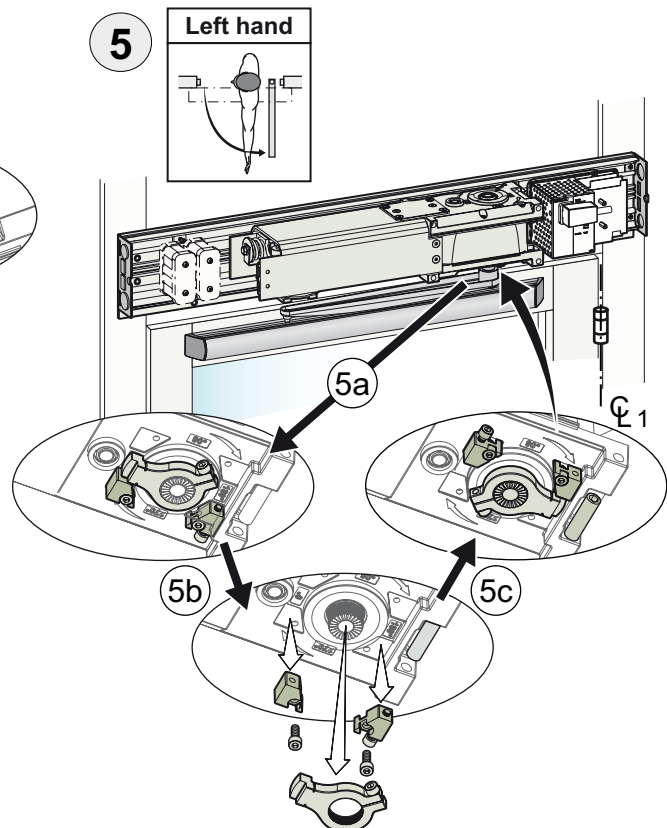
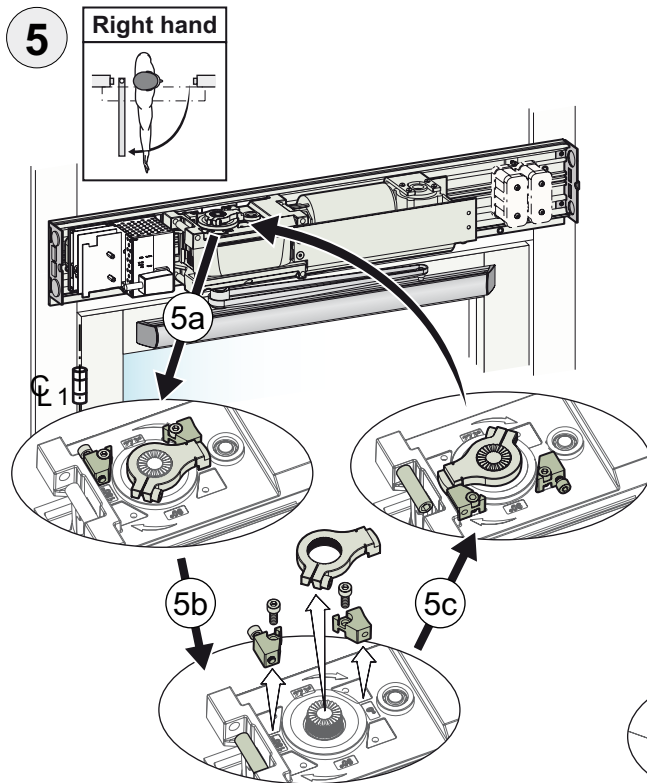
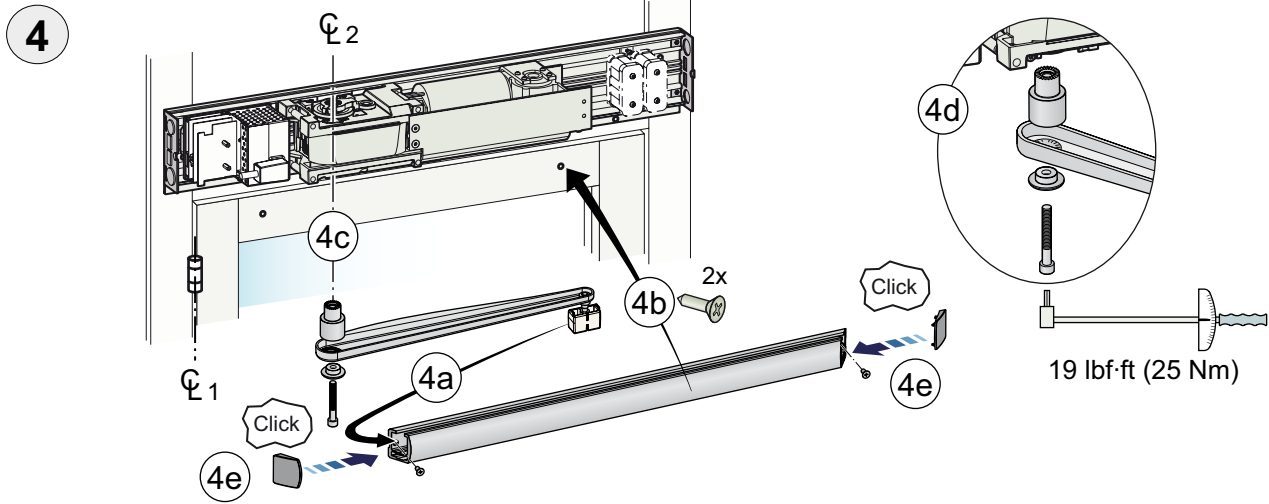
Cont. "Operator with PULL arm system"



Cont. “Operator with PULL arm system”



Cont. "Operator with PULL arm system"

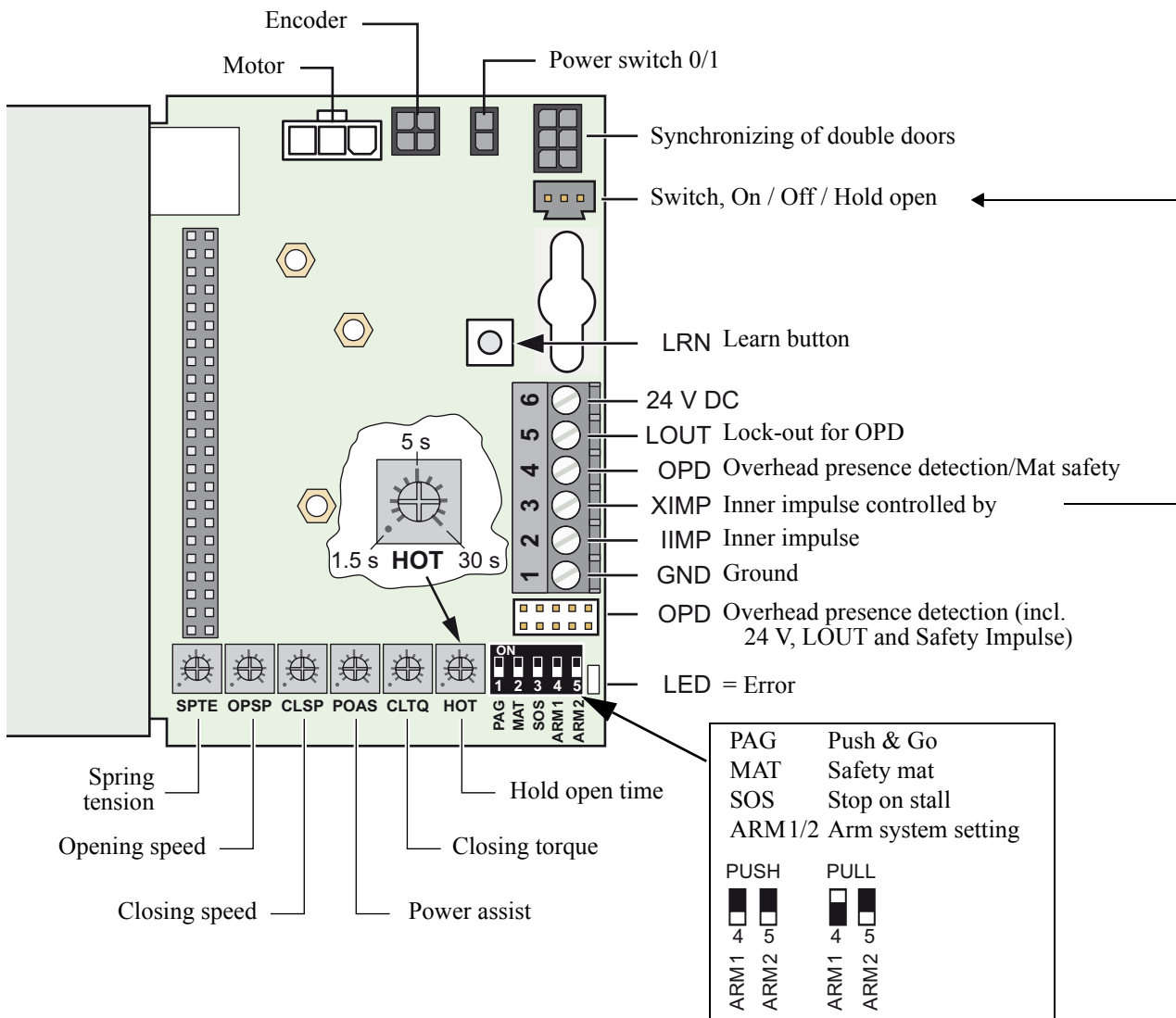


- During any work with the electrical connections the main power must be disconnected.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

11.1 Control units

11.1.1 CU-ESD

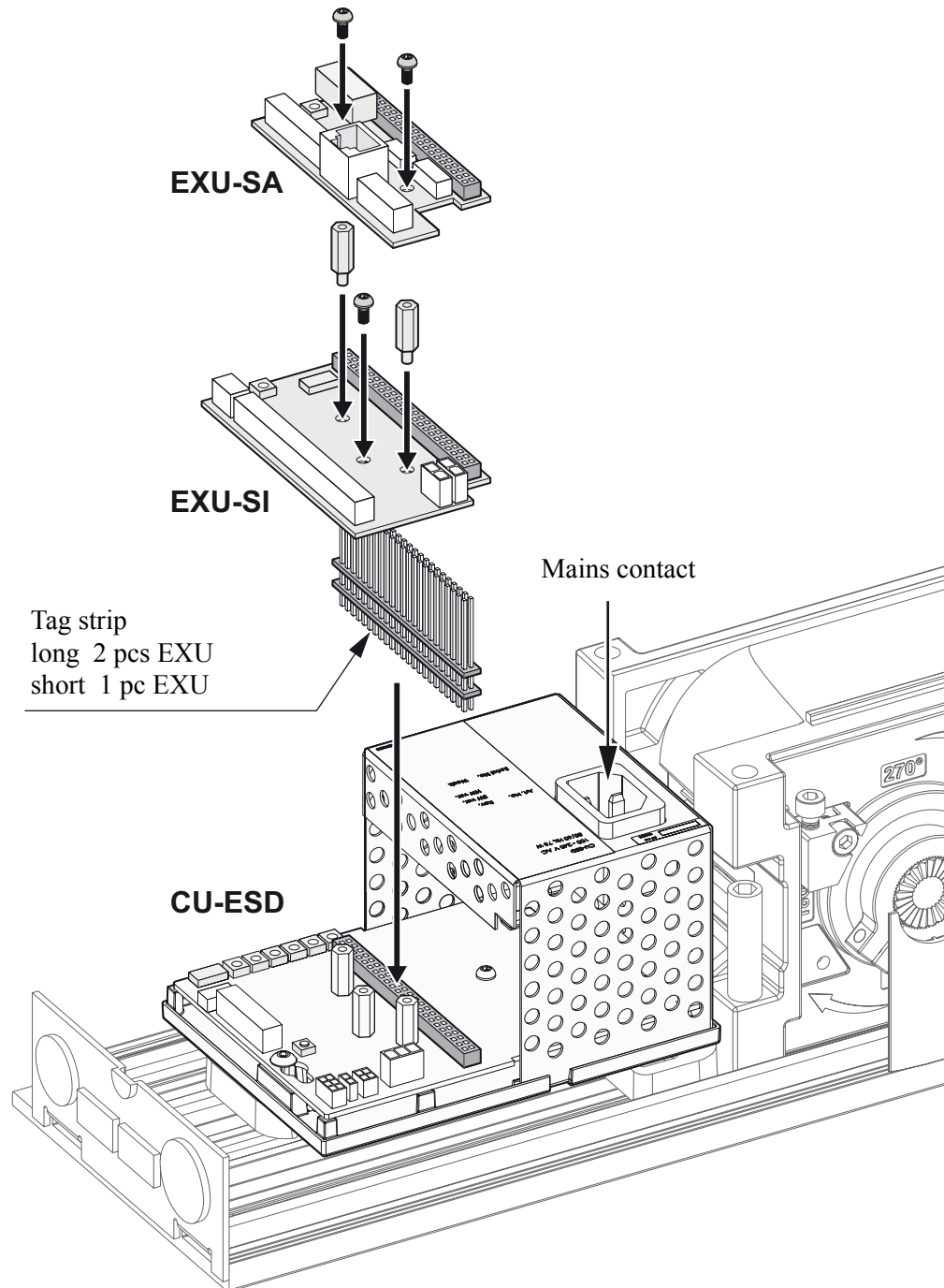
The CU-ESD can be equipped with extension units, EXU-SI and/or EXU-SA, depending on the functions required (see page 10).



11.1.2 Extension units EXU-SI / EXU-SA

Installation

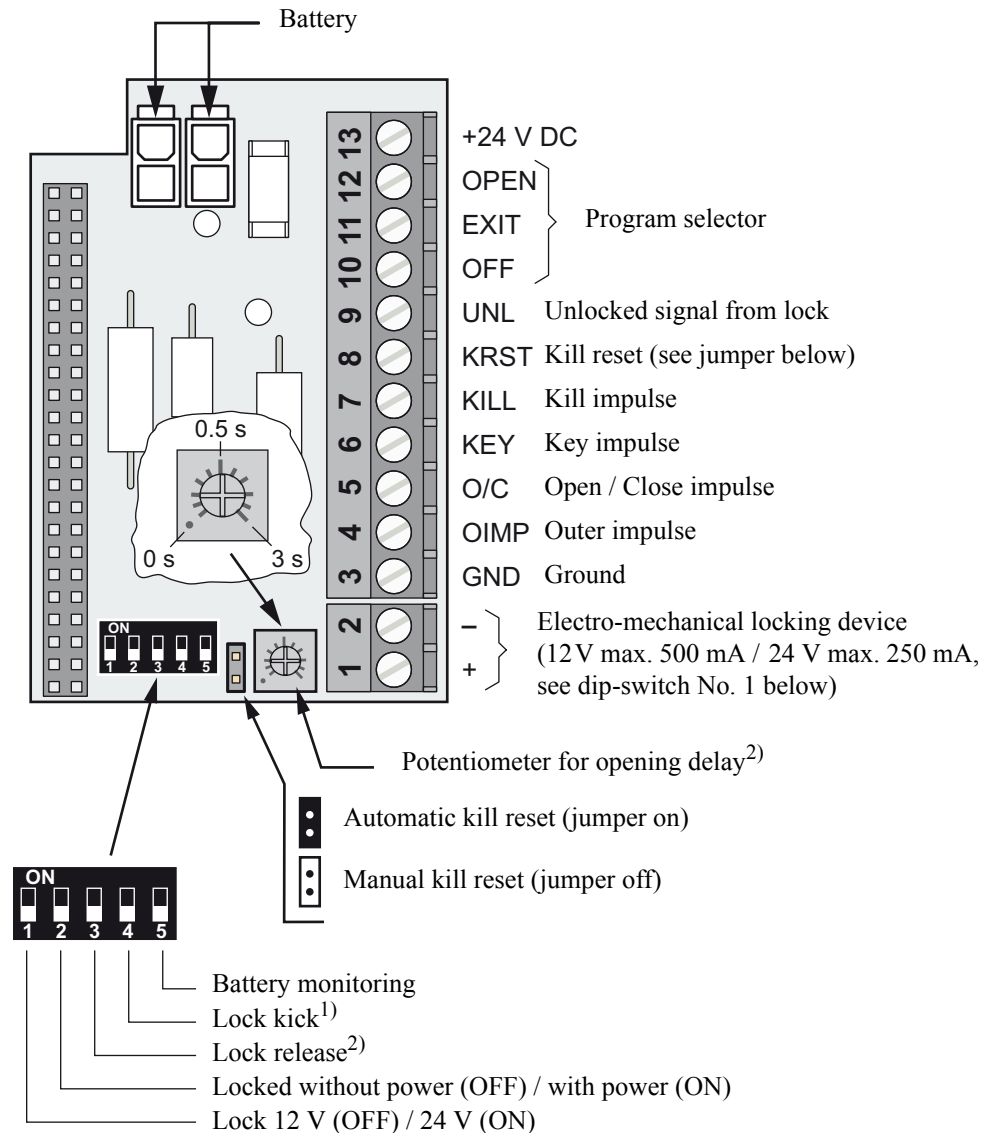
To extend the functions, the extension units can be mounted on top of the control unit CU-ESD, separately or combined.



11.1.3 Extension unit EXU-SI

Functions

This extension unit has inputs for electro-mechanical lock, program selector, batteries, kill function, open/close, key opening and outer impulse.



1) Independent of switch position (ON /OFF), the “latch check” complies with the ANSI 156.19 requirements.

Position OFF: Smooth closing, to be used on doors without lock.

Position ON: More powerful closing, to be used on doors with lock, to overbridge binding in the locking device.

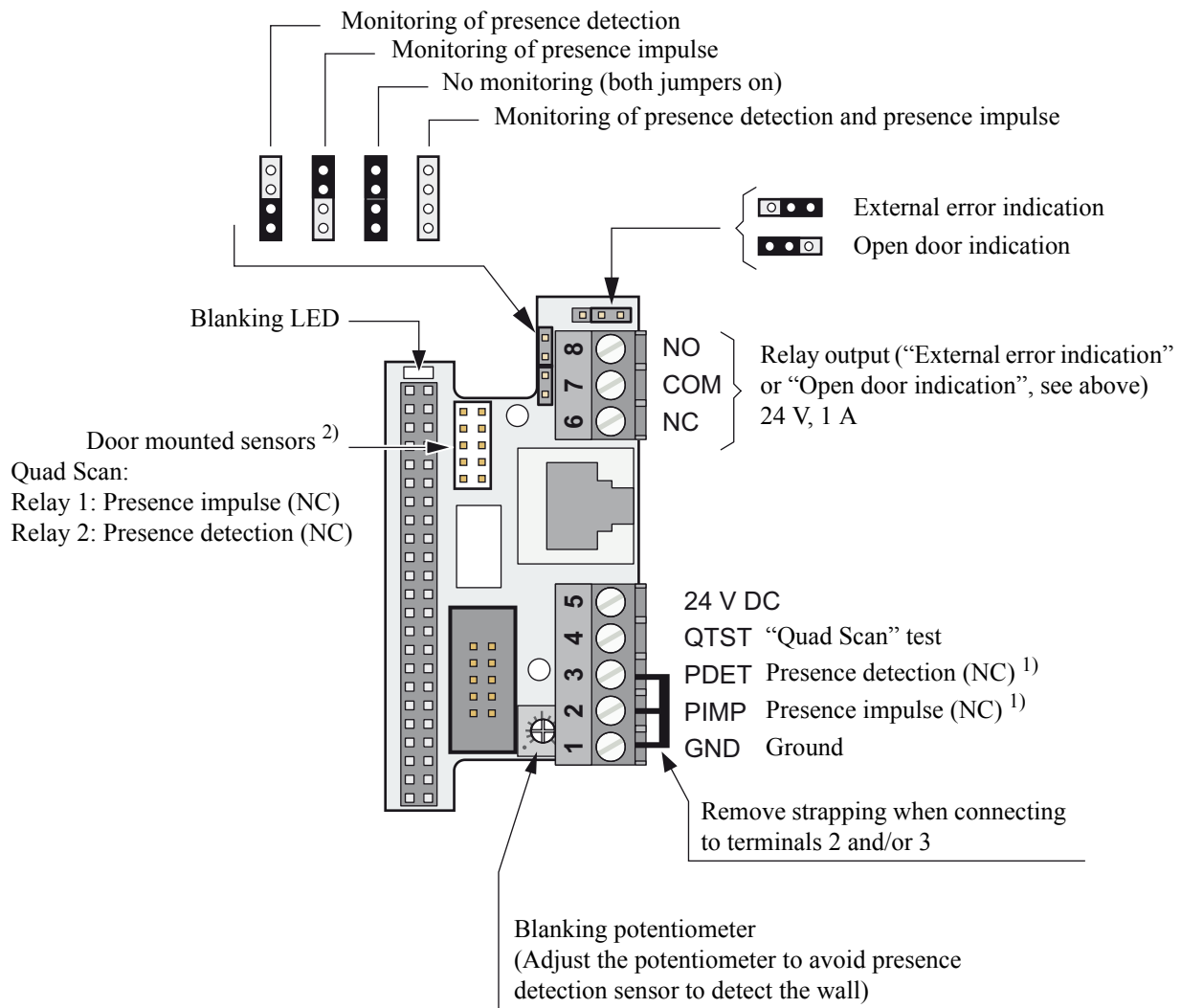
2) If the switch is set to ON, the “lock release” is active during the opening delay time set by the potentiometer.

For “pair of doors” installations, the “lock release” works in sequence: First the master then the slave.

11.1.4 Extension unit EXU-SA

This extension unit has inputs for door mounted sensors, which can give presence impulse and/or presence detection. Relay output for error indication or door indication is also integrated.

Functions



¹⁾ If not used strap to "Ground".

²⁾ Remove strapping from terminals 2 and/or 3.

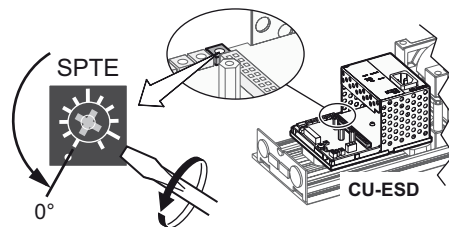
The spring pre-tension is **factory set to 210°** and is normally not necessary to adjust. If adjustment has to be carried out (see page 40).

12.1 Adjusting the door stop

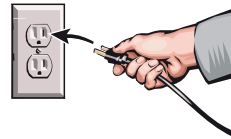
1. Close the door.



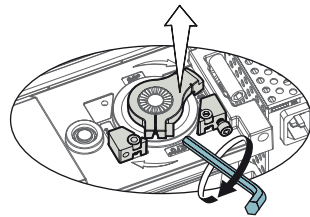
2. Turn the potentiometer SPTE to 0° (if not already on 0°).



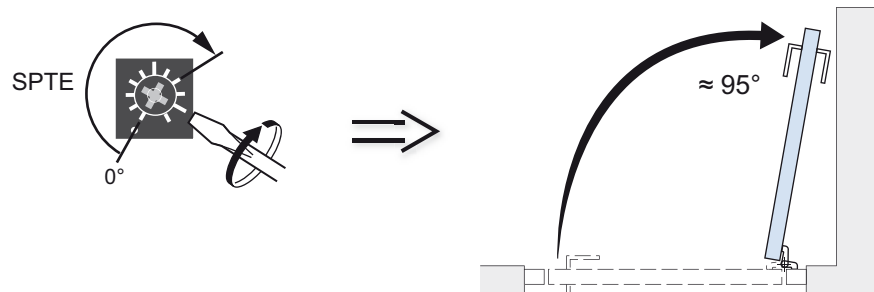
3. Connect the mains power (the operator will find its closed position).



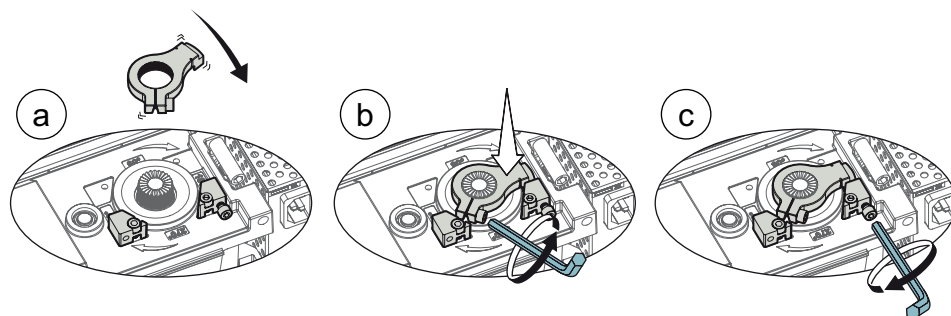
4. Loosen the door stop arm.



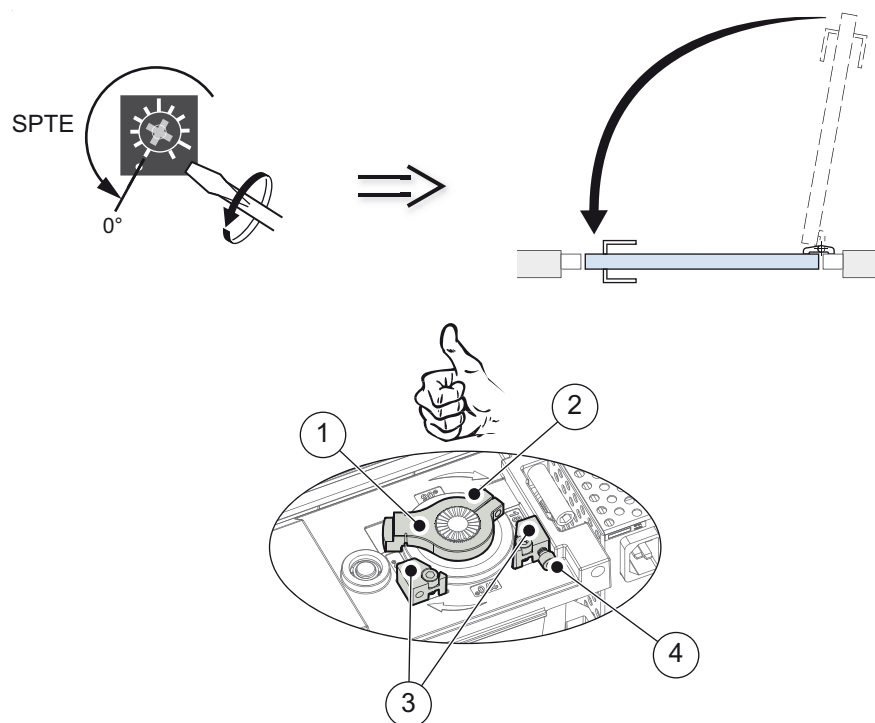
5. Open the door to required open position, plus approx. 15 mm (5/8"), by turning the potentiometer SPTE on the CU-ESD, clockwise.



6. Mount the door stop arm on the splines a), as close as possible to the stop block b). Fine-adjust if necessary with the screw on the stop block c).



7. Close the door by turning the potentiometer SPTE to 0° and let the door close.

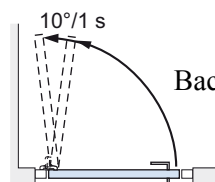


1. Door stop arm
2. Fixing screw
3. Stop block
4. Fine-adjustment screw

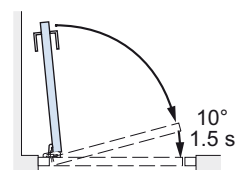
12.2 Learn with auto-setting of—back and latch-check—(recommended)

This learning is performed by pushing the Learn button (LRN).

- Note!
- Before the learning procedure starts, make sure that the door has been properly closed, i.e. not by force.
 - If any of the parameters “Spring pre-tension”, “Closing torque” (CLTQ) and “Lock release” (dip-switch No. 3 on EXU-SI) are changed after performed learning, a new learning must be carried out.
 - Learn can be carried out with activation units and locks connected.
 - The back-check will be automatically adjusted to 10° and 1 sec. before open position. The latch-check will be automatically adjusted to 10° and 1.5 sec. before closed position.



Back-check



Latch-check

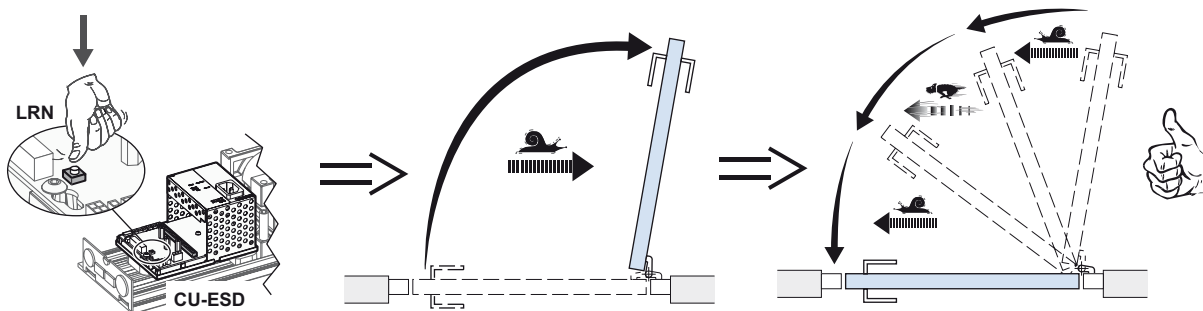
12.2.1 One push / two pushes on the Learn button (LRN)

One push (delayed opening)

Push the button once. The door will open after 2 sec. and adjust the back-check and latch-check automatically.

Two pushes (direct opening)

Push the button twice. As above, but the door starts to move directly.



12.2.2 Double doors

For double doors, the master door must be learned first and thereafter the slave door. When the slave door is learned, the master door will open up to fully open position during the learning phase of the slave door.

The doors can also be learned separately before connecting the sync cable. In case of astragal doors and separate learning, the master door must be held open before the slave door learn is carried out.

12.3 Learn with advanced setting of “back- and latch-check”

See the prerequisites for performing a “learn” under the heading “Learn with auto-setting of—back and latch-check—(recommended)” on page 38.

1. Push the button once or twice as for auto-setting.
2. Stop the door at required back-check.
3. The door reverts towards closed position.
4. Remove the stop.
5. Stop the door at required latch-check.
6. The door reverts to learn the fully open position.
7. Remove the stop.
8. The door reverts to closed position.

12.4 Revert to default values for “back- and latch-check”

1. Disconnect batteries if any.
2. Disconnect the mains contact.
3. Press the “Learn button” and keep it depressed.
4. Connect the mains contact.
5. Watch the “Error LED”.



6. Release the “Learn button” after 3 s flash.
7. The “Back check”, “Latch check” and “Open position” have now reverted to default values.
8. Disconnect the mains contact.
9. Next time the mains is connected, the operator will use the default values.

12.5 General adjustment

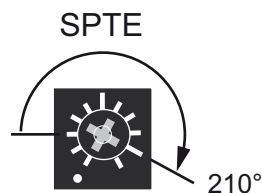
1. Set the hold open time with the potentiometer on the control unit.
2. Adjust the opening speed (OPSP) to comply with ANSI 156.19. Turning clockwise increases the speed (see “Table I” on page 45).
3. Adjust the closing speed (CLSP) to comply with ANSI 156.19. Turning counter-clockwise decreases the speed (see “Table I” on page 45).
4. Connect the required activation units.
5. Check that the installation complies with AHJ (Authority Having Jurisdiction).

12.6 Reducing / Increasing the “Spring pre-tension” (SPTE)

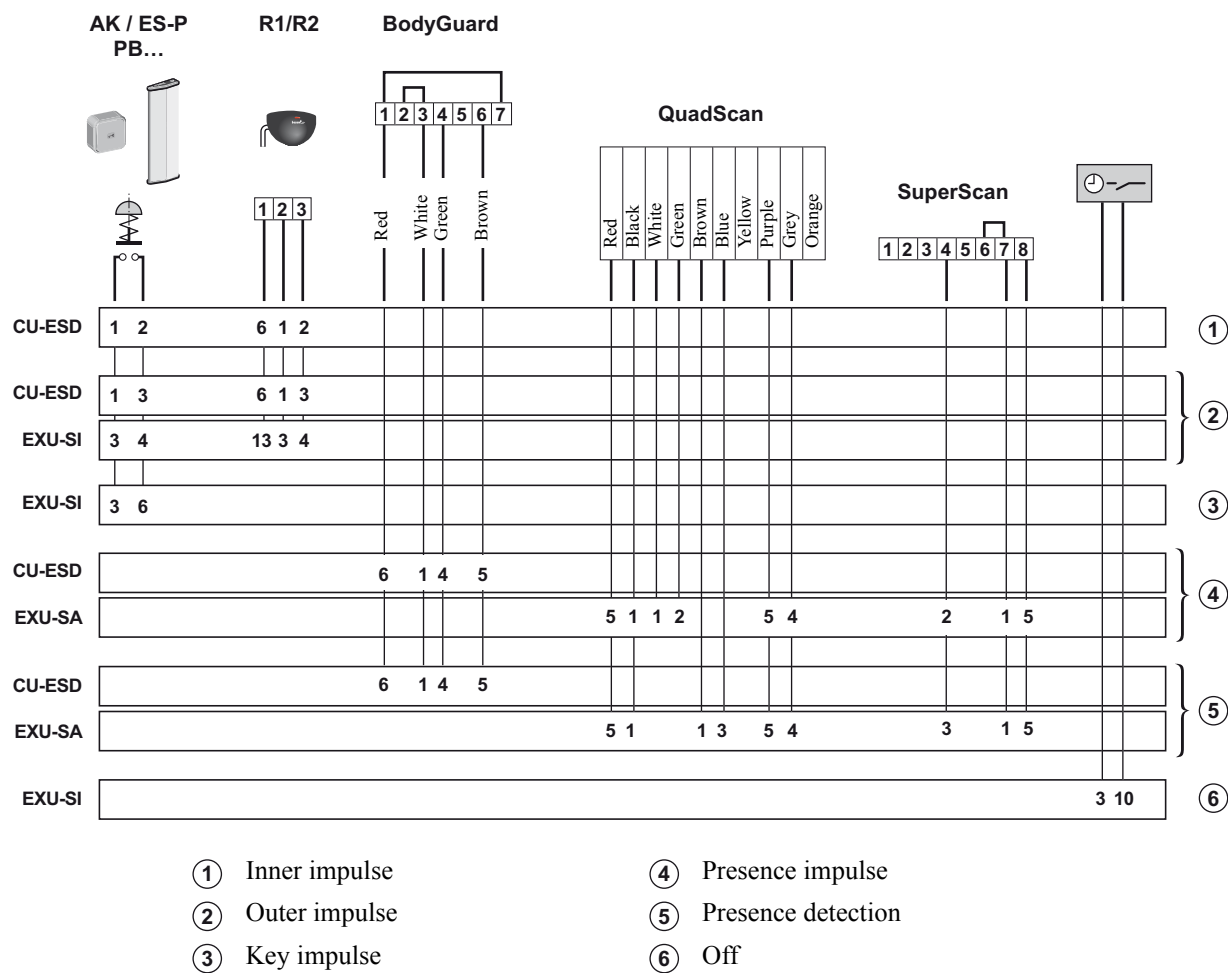
The spring pre-tension is **factory set to 210°** and is normally not necessary to adjust. If adjustment has to be carried out see below.

1. Loosen the door stop arm. Remove it, if it is fitted on the topside, slid down if fitted on the underside.
2. Turn the potentiometer for spring pre-tension (SPTE) clockwise until the door opens to 45°.
3. Loosen the drive arm fixing screw.
4. Moving the door **towards open position**, reduces the tension, or:
Moving the door **towards closed position**, increases the tension.
5. Tighten the drive arm.
6. Turn the potentiometer SPTE to 0°.
7. Open the door to required open position, plus approx. 15 mm (5/8"), by turning the potentiometer SPTE clockwise.
8. Mount the door stop arm as close as possible to the open door stop block, fine-adjust with the screw if necessary.
9. Turn the potentiometer SPTE to 0°.
10. Push the learn button.
11. Let the door do the learn cycle without touching it.

Note! Max. allowable spring pre-tension is 210°. Over-tension may damage the spring or overheat the motor.



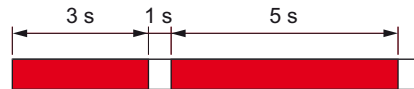
12.7 Connection of activation units and accessories



13

Changing group of parameters

1. Disconnect batteries if any.
2. Disconnect the mains contact.
3. Press the “Learn button (LRN)” and keep it depressed.
4. Connect the mains contact.
5. Watch the “Error LED”.



6. Release the “Learn Button” after the 5 s flash.
The “Error LED” flashes a number of short flashes that corresponds to the parameter group number (see table). After a short pause the LED will repeat the group number, and so on.
7. Pushing the “Learn button” once, increases the parameter group number. When the highest parameter group number is reached it will start with number 1 (default) again.
8. Push the button until you get the requested parameter group.
9. Disconnect the mains contact.
10. Next time the mains is connected, the operator will use the new group of parameters.

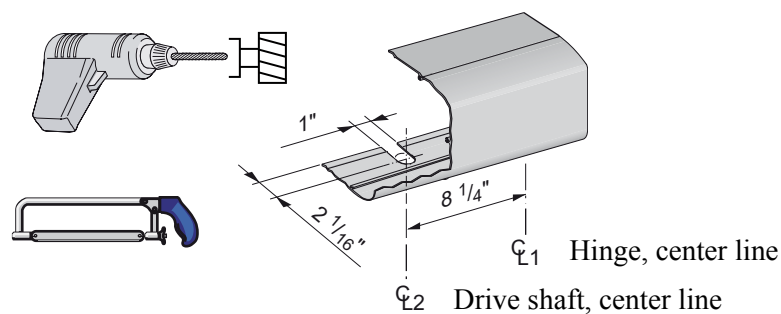
Parameter/ Group	1 (default)	2	3	4	5	6	7
Open/Close Hold Open Time	15 min.	Infinite	15 min.	15 min.	15 min.	15 min.	15 min.
Battery mode	Power save	Power save	Convenience	Power save	Power save	Power save	Power save
Kill mode	Locked during kill	Locked during kill	Locked during kill	Lock follows program selector during kill	Locked during kill	Locked during kill	Locked during kill
Obstruction mode¹⁾	Door closer	Door closer	Door closer	Door closer	Reverses when obstructed	Door closer	Door closer
Double egress mode	Separate presence detection	Separate presence detection	Separate presence detection	Separate presence detection	Separate presence detection	Common presence detection	Separate presence detection
Lock retry	On	On	On	On	On	On	Off

¹⁾ If set to “Reverses when obstructed”, the operator re-opens when obstructed, similar to a presence impulse. As default the operator tries to close two times extra in automatic operation, Off or Exit mode and one time in manual operation, Off or Exit mode if there is a problem with binding striking plates. This function can be switched off (see “Lock retry” above).

The cover and back plate are manufactured in clear anodized aluminum. The end plates are made of black painted steel sheet.

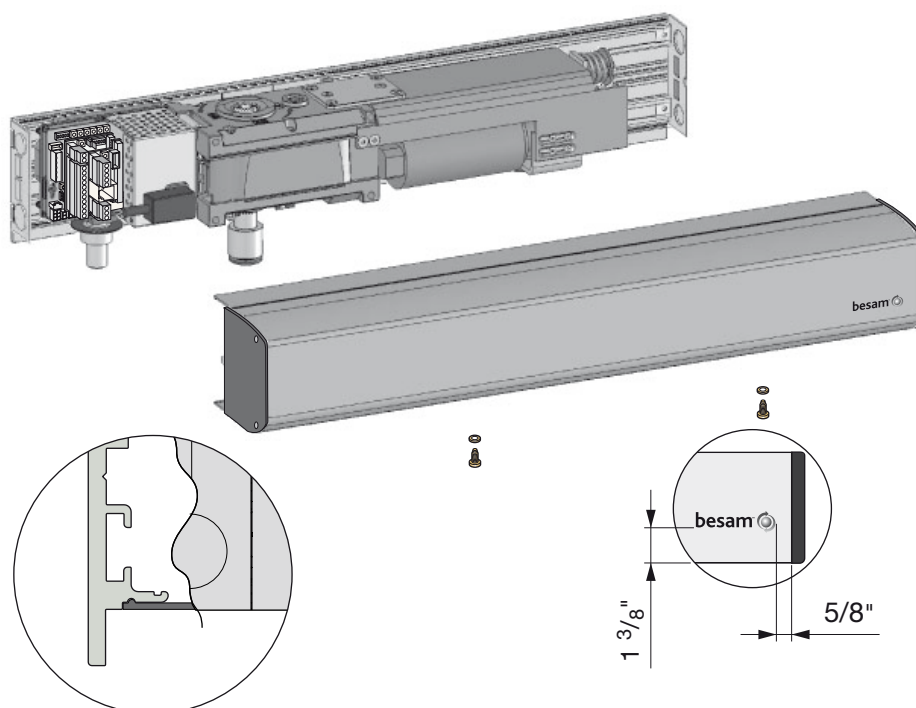
14.1 Creating slot in the cover for the drive shaft

1. Use a 25 mm (1") hole saw to cut the round hole for the output shaft.
2. Use a sabre saw to make two straight cuts.



14.2 Fitting and removing the cover

The cover is slid over flanges in the back plate so that the ridges fit in the grooves. Stick the Besam logotype to the cover – see below.



REQUIREMENTS FOR LOW ENERGY POWER OPERATED DOORS

The following texts are excerpts from American National Standard for low energy power-operated doors. Please refer to the full standard if necessary.

1. Activation

The operator shall be activated by a knowing act.

2. Opening

Doors shall open from closed to back check, or 80 degrees which ever occurs first, in 3 seconds or longer as required in Table I. Backcheck shall not occur before 60 degrees opening.

Total opening time to 90 degrees shall be as in Table II. If the door opens more than 90 degrees, it shall continue at the same rate as backcheck speed.

When powered open, the door shall remain at the open position for not less than 5 seconds.

3. Closing

Doors shall close from 90 degrees to 10 degrees in 3 seconds or longer as required in Table I.

Doors shall close from 10 degrees to fully closed in not less than 1.5 seconds.

4. Force and Kinetic Energy

The force required to prevent a stopped door from opening or closing shall not exceed 15 lbf (67 N) measured 1 in (25 mm) from the latch edge of the door at any point during opening or closing.

The kinetic energy of a door in motion shall not exceed 1.25 lbf-ft (1.69 Nm). Table I provides minimum times for various widths and weights of doors for obtaining results complying with this kinetic energy.

Doors shall open with a manual force not to exceed 15 lbf (67 N) to release a latch, if equipped with a latch, 30 lbf (133 N) to set the door in motion, and 15 lbf (67 N) to fully open the door. The forces shall be applied at 1" (25 mm) from the latch edge of the door.

Table I

Minimum Opening Time to Back Check or 80 degrees, which ever occurs first, and the Minimum Closing Time from 90 degrees to Latch Check or 10 degrees.

“D” Door Leaf Width - Inches (mm)	“W” Door Weight in Pounds (kg)				
	100 (45.4)	125 (56.7)	150 (68.0)	175 (79.4)	200 (90.7)
*30 (762)	3.0	3.0	3.0	3.0	3.5
36 (914)	3.0	3.5	3.5	4.0	4.0
42 (1067)	3.5	4.0	4.0	4.5	4.5
48 (1219)	4.0	4.5	4.5	5.0	5.5

* Check applicable Building Codes for clear width requirements in Means of Egress.

Table II

Total Opening Time to 90 Degrees

Backcheck at 60 degrees	Backcheck at 70 degrees	Backcheck at 80 degrees
Table I plus 2 seconds	Table I plus 1.5 seconds	Table I plus 1second
If the door opens more than 90 degrees, it shall continue at the same rate as backcheck speed.		

Note: To determine maximum times from close to full open, the operator shall be adjusted as shown in the chart. Back check occurring at a point between positions in Table II shall use the lowest setting. For example, if the backcheck occurs at 75 degrees, the full open shall be the time shown in Table I plus 1.5 seconds.

6. Signage

- 6.1 Doors shall be equipped with signage visible from either side, instructing the user as to the operation and function of the door. The signs shall be mounted 50" +/- 12" (1270mm +/- 305mm) from the floor to the center line of the sign. The letters shall be 5/8 inch (16 mm) high minimum.
- 6.2 **Low Energy Doors** All low energy doors shall be marked with signage visible from both sides of the door, with the words "AUTOMATIC CAUTION DOOR" (See Figure 1.). The sign shall be a minimum of 6 inches (152 mm) in diameter with black lettering on a yellow background. Additional information may be included.



Figure 1

Additionally one of the following knowing act signs shall be applied:

- 6.2.1 When a **Knowing Act Switch** is used to initiate the operation of the door operator, the doors shall be provided with signs on both sides of the door with the message "ACTIVATE SWITCH TO OPERATE". The lettering shall be white and the background shall be blue.
- 6.2.2 When push/pull is used to initiate the operation of the door operator, the doors shall be provided with the message "PUSH TO OPERATE" on the push side of the door and "PULL TO OPERATE" on the pull side of the door. The lettering shall be white and the background shall be blue.

Fault	Possible reasons why	Remedies/Explanations
The door does not open - The motor does not start	Position switch is set to OFF	Change the setting of the position switch
	Mains power is missing	Check the mains switch
	Activation unit does not function	Strap impulse inputs
	Presence detection is activated	Check that there are no objects in the detection zone
	Kill activated	Deactivate Kill
- The motor starts	Mechanical lock is locked	Unlock the lock
	Something jammed beneath the door	Remove object
	Electric striking plate is binding	Select lock release
		Adjust striking
The door does not close	Arm system has come loose	Turn potentiometer SPTE until the door-stop hits the stop-block. Put the door in required open position. Tighten the arm system. Turn SPTE to 0°
	Position switch is set to HOLD	Change the setting of the position switch
	Presence impulse is activated	Remove objects in the detection zone
	Something jammed beneath the door	Remove object

16.1 Error indication

- During normal operation the “Error LED” on the control unit is illuminated.
- An extinguished LED indicates that there is no mains power.
- A flashing light on the LED indicates that the operator is out of function (see table below).

LED flash frequency	Reason	Remedy
One 0.3 s flash, pause etc.	+ 24 V DC external error or sensor monitoring error	Check for short circuit or broken monitored sensor
Two 0.3 s flashes, pause etc.	Battery defective	Replace battery (normal operation with mains power)
Three 0.3 s flashes, pause etc.	Control unit defective	Replace control unit
Four 0.3 s flashes, pause etc.	Encoder error	Check the encoder cable. Open and close the door manually and thereafter check the automatic function. If the operator is still out of function replace the drive unit.
Five 0.3 s flashes, pause etc.	Locking device defective	Check for e.g. short circuit in the locking device Replace locking device
	EXU-SI board defective	Replace EXU-SI board
Six 0.3 s flashes, pause etc.	Sync cable not connected or defective (double door only)	Connect the sync cable
		Replace the sync cable
Seven 0.3 s flashes, pause etc.	Slave control unit defective (double door only)	Check the flash frequency on the Slave LED and take necessary measures in accordance with this table.
Eight 0.3 s flashes, pause etc.	Motor overheated	Wait for the motor to cool down
Nine 0.3 s flashes, pause etc.	Blocked door and constant impulse	Toggle impulse

- Measure / Adjust Speeds – Measure to ANSI/BHMA A156.19 and local codes; adjust if necessary.
- Measure / Adjust Forces – Measure to ANSI/BHMA A156.19 and local codes; adjust if necessary.
- Measure / Adjust Time Delays – Measure to ANSI/BHMA A156.19 and adjust if necessary.
- Check Functioning – Mats, Sensors, Operator/Control, and Push Plates per device checklist and AAADM.
- Check Signage – Are all signs in place, readable, and in good condition?
- Check Door Hinging / Mechanical Soundness – all attachments, covers, arms, crash bars, etc.
- Check Finger Guards, Glass and Glass Stops, Trip Hazards, Rails and Sharp Edges.
- Check Emergency Egress (if so equipped).
- Check all wiring for good connections, proper insulation and clearance from moving parts.
- Check Battery Backup if equipped.
- Go through Daily Safety Checklist with facility manager.



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