Installation and Service Manual

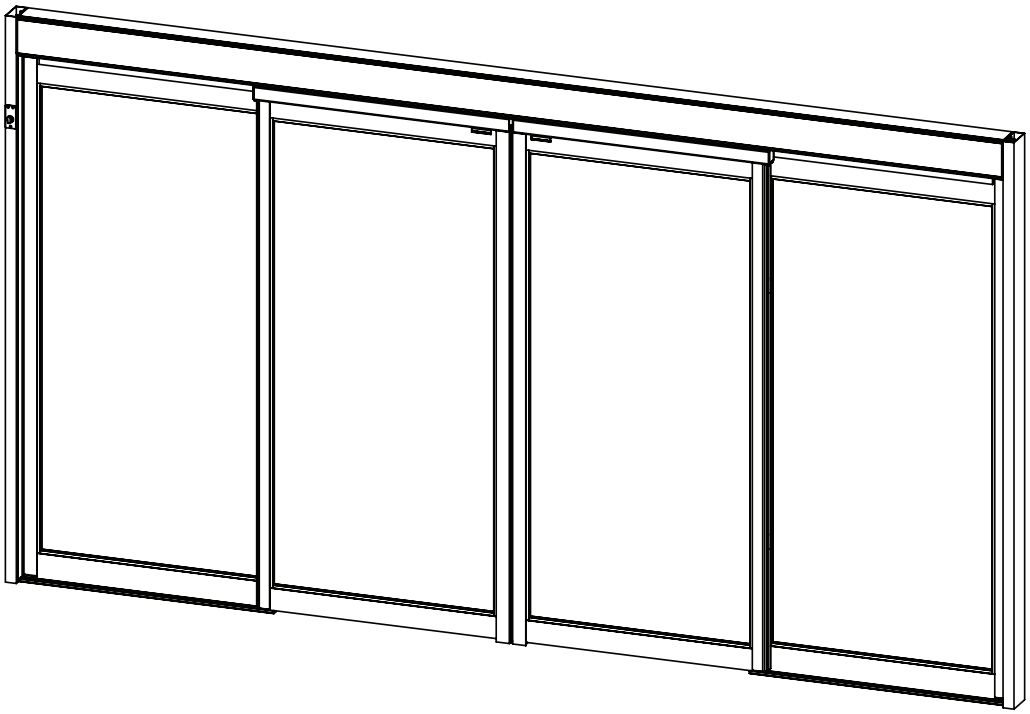
Sliding Door Operator

Besam SL500

ASSA ABLOY

ASSA ABLOY Entrance Systems

The global leader in door opening solutions



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CONTENTS - Original instructions

1 Revision

Following pages have been revised:

Page	Revision 3.0 → 4.0
9	Ambient temperature was 122°F and is now 130°F.
13	Changed and added part numbers for Active Leaf Panic Break-Out System.
54	Added chapter Break Out/Safety – Hold Beam Connection Diagram.
80	Added section Accessory board.
82	Changed illustration to show new Accessory board.
83	Changed illustration to show new Accessory board.

2 Instructions for safe operation

- Failure to observe the information in this manual may result in personal injury or damage to equipment.
- To reduce the risk of injury of persons - use this operator only with pedestrian doors.
- Do not use the equipment if repair or adjustment is necessary.
- Disconnect supply when cleaning or other maintenance is to be carried out.
- The operator can be used by children age 8 and above, and persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, if they have been given supervision or instruction by a person responsible for their safety concerning safe operator use and the possible hazards involved.
  This does not however prevent those persons to use the door where the operator is installed.
- Cleaning and user maintenance shall not be made by children without supervision.
- Do not let children climb on or play with the door or the fixed/remote controls.
- Make sure that the wall is properly reinforced at the installation points.
- Make sure that the power is off before installing.
- Ensure that the surface is even, particularly when attaching to block or concrete surfaces - level and shim as necessary. (Failure to provide and even surface results in warping the profile making it impossible to snap the filler tube together.)
- Use care that all holes are deburred to prevent electrical shorts.
- Potential hazard of shattering magnets if not handled correctly, use hand and eye protection at all times when working with magnetic catch.
- In all instances, where work is being done, the area is to be secured from pedestrian traffic, and the power removed to prevent injury.

- Installer must properly ground door package! Improper grounding can lead to risk of personal injury.
- The mains connection must remain isolated until the wiring is completed. Then connect to the supply unit.
- The doorset can be operated automatically by sensors or manually by activators.

3 Important information

3.1 Intended use

The Besam SL500 is designed for an overhead-concealed installation between two vertical jambs or surface applied. The header holds the drive and control units and supports the sliding doors, Sidelites and transom above the operator, if required.

A Besam SL500 operator ensures all-around safety. It can be combined with the full range of ASSA ABLOY Entrance Systems safety units, such as presence and motion sensors.

It is easy to install for both new construction and retrofit application and can be adapted to a wide range of overhead concealed or surface applied installations.

For use see Owners Manual 1008210.

3.2 Safety precautions

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. Factory authorized training is required to carry out these tasks safely. Only ASSA ABLOY Entrance Systems-trained technicians should be allowed to carry out these operations.

3.3 Electronic equipment reception interference

The equipment complies with the European EMC directive (US market FCC Part 15), provided installed according to Installation and Service manual.

The equipment may generate and use radio frequency energy and if not installed and used properly, it may cause interference to radio, television reception or other radio frequency type systems.

If other equipment does not fully comply with immunity requirements interference may occur.

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 electronics technician for additional suggestions.

3.4 Environmental requirements

ASSA ABLOY Entrance Systems products are equipped with electronics and may also be equipped with batteries containing materials which are hazardous to the environment. Disconnect power before removing electronics and battery and make sure it is disposed of properly according to local regulations (how and where) as was done with the packaging material.

3.5 Glazing materials

The glazing material for sliding doors shall comply with ANSI Z97.1.

4 Technical specification

Manufacturer:	ASSA ABLOY Entrance Systems Inc.
Address:	1900 Airport Road, Monroe, NC 28110, US
Type:	Besam SL500
Mains power supply:	100 V AC -10% to 240 V AC +10%, 50/60 Hz, fuse 10 AT (building installation) **Note:** The mains power supply shall be installed with protection and an all-pole mains switch with isolating capability of Category III, at least 1/8" (3 mm) between contacts, shall be installed according to local regulations. These articles are not provided with the door.
Power consumption:	Max. 250 W
Degree of protection:	IP20
Degree of protection, control actuators:	IP54
Auxiliary voltage:	24 V DC, 1 A
Recommended max. door weight:	Bi-parting Non-panic: Besam SL500-2 440 lb./leaf (200 kg/leaf) Bi-parting with panic: Besam SL500-2: 220 lb/leaf (100 kg/leaf) Single Slide Non-panic: Besam SL500-R/L 530 lb./leaf (240 kg) Single Slide with panic: Besam SL500-R/L: 220 lb/leaf (100 kg/leaf)
Clear opening:	Bi-parting: Besam SL500-2: $35^{7/16}$" – 118" (900 – 3000 mm) Single Slide: Besam SL500-R/L: $35^{7/16}$"– $84^{7/16}$"(900 – 3000 mm)
Opening and closing speed:	Variable up to approx. 4.5 ft/sec. (1.4m/s) (Besam SL500-2) To be adjusted to comply with ANSI/BHMA A156.10. Note that local codes may vary.
Hold open time:	0-60 s To be adjusted to comply with ANSI/BHMA A156.10. Note that local codes may vary.
Ambient temperature:	-4°F to 130°F (-20 °C to +55 °C)
Relative humidity (non-condensing):	Max. 85%
The Besam SL500 complies with: ANSI/BHMA A156.10, UL 325, UL 60730, NFPA 79	
For indoor use only	

Note: The glazing material of all doors shall comply with the requirements in the American National Standard Performance Specification and Methods of Test for Safety Glazing Material Used in Buildings, Z97.1-1975.

5 Design and function description

Design

The sliding door operator Besam SL500 works electromechanically. The motor, control unit, transmission – and optional emergency unit and electromechanical locking device – are all assembled in a support beam with an integrated cover. The motor and gear box transmit movement to the door leaves by means of a tooth belt. The door leaf is fitted to a door adapter/carriage wheel fitting and hangs on a sliding track. The guiding at the bottom is carried out by means of floor guides (Full Break-Out) or Side Panel Guides (Fixed Sidelites).

Safety functions integrated in the operator

To permit safe passage between closing doors, the doors immediately reverse to the open position if an obstruction is detected, then resume their interrupted movement at low speed to check whether the obstruction has disappeared. If an obstruction is detected between opening doors and surrounding walls or interior fittings, the doors immediately stop and then close after a time delay.

5.1 Function

Opening
When an OPENING IMPULSE is received by the control unit the motor starts and transmits movement to the door leaves, which move to the open position.

Closing
The closing starts when no OPENING IMPULSE is received and the HOLD OPEN TIME has run out.

5.2 Microprocessor for precise control

The microprocessor has a routine for self-monitoring, which detects any interference or faulty signals in door operation. If an input signal does not correspond to the preprogramming, the microprocessor automatically takes necessary actions to ensure safe door operation.

5.3 Emergency escape

The Besam SL500 can be combined with an emergency unit that automatically opens or closes the doors in the event of a power failure and can also be interfaced with the fire alarm or smoke detector. Safety can be further reinforced by incorporating a break-out fitting. This enables the doors and sidelites to swing outwards in an emergency situation by applying a defined pressure at the front edge.

Doors used for emergency escape in buildings such as hospitals and homes for elderly people may not be locked or put in programme selection OFF.

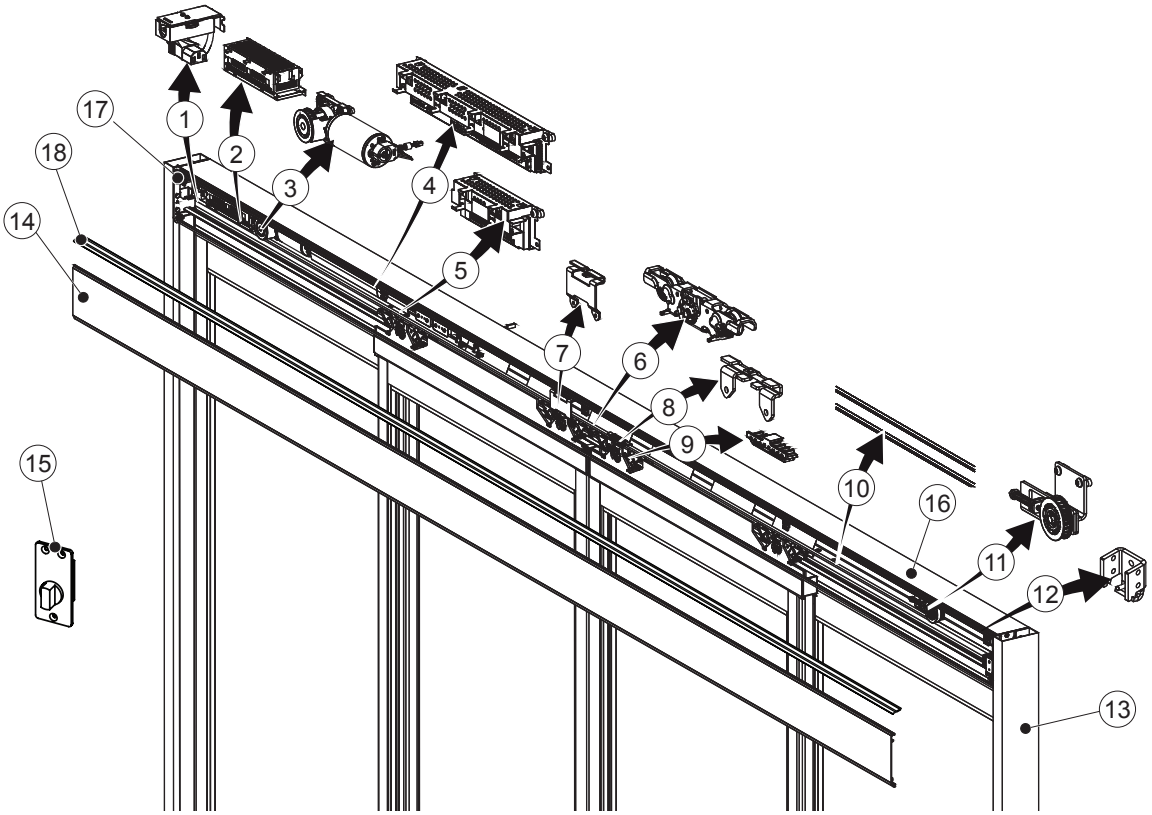
6 Models

ASSA ABLOY Entrance Systems provides several layouts for the Besam SL500 sliding door system. Operators can be bi-parting or single slide (left or right handed) and sidelites may be installed fixed to the interior or hinged to Break-out in emergencies. (See illustrations of various layouts in the "Installation Examples" section on page 19.)

All Besam SL500 systems are ready for installation when delivered. The sidelites and active leaves are fully prepared and all hardware is installed. Operators are supplied with all mounting hardware, and rivnuts have been installed in the side jambs.

Before installing the Besam SL500 system, check to see that you have been supplied the correct equipment and that, all necessary tools and hardware are at hand. Also, check the installation site for any factors that might interfere with proper installation. (See "Installation Examples" section on page 19.)

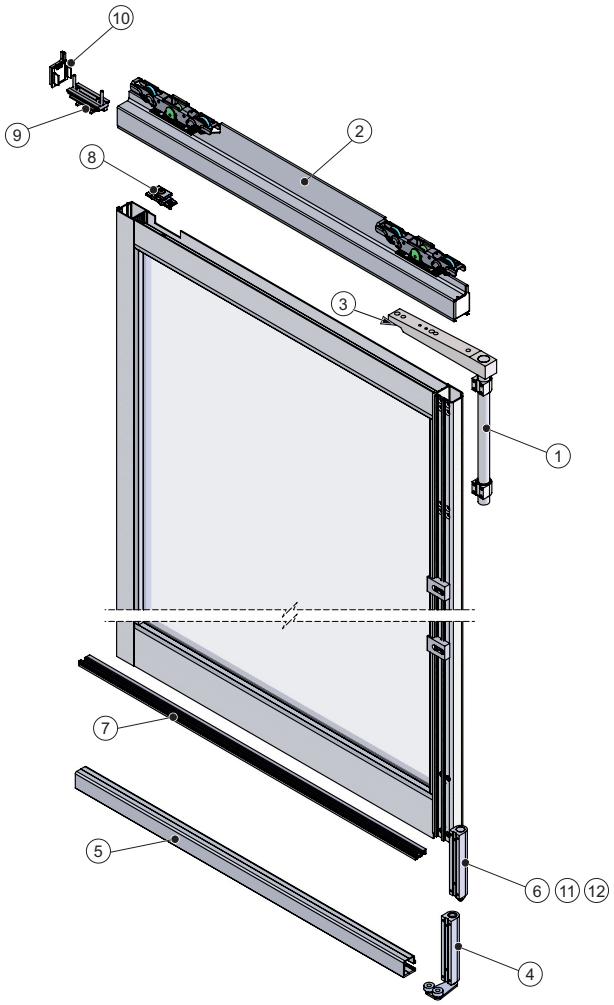
7 Identification



No.	Description	P/N	No.	Description	P/N
1	Mains connection	1008184	10	Tooth belt	1701406
2	Power supply unit (PSU 150)	1008147	11	Tension wheel	1007118
3	Drive unit	1007035	12	Door stop	1008112
4	Main control unit (MCU)	1007773	13	Jamb tube	US01-0931-LLXX
				Slick tube	US01-0438-LLXX
5	I/O Unit (IOU)	1007779	14	Cover	1007366-LLXX
6	Carriage wheel	1010786 (2 wheel holder)	15	Standard operation mode selector	US15-1500-04 (5 pos, flush mounted)
					US15-1500-05 (3 pos, flush mounted)
7	Transmission bracket (high)	1007365	16	Support beam	1010590-LLXX
8	Transmission bracket (low)	1007364	17	Jamb plate	1007343 (A), 1007344 (B)
9	Belt clamp	1006906	18	Replaceable aluminium track	1010591-LLDB

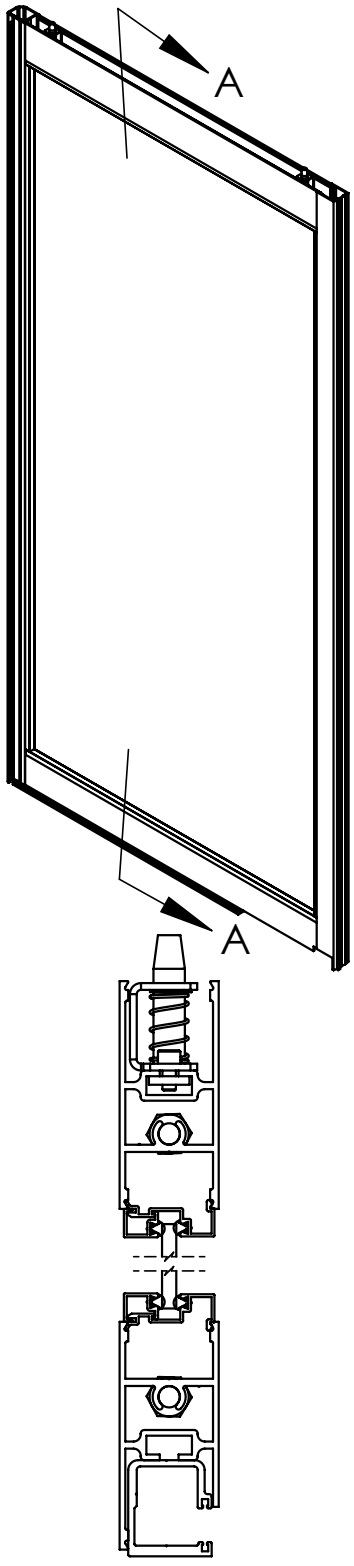
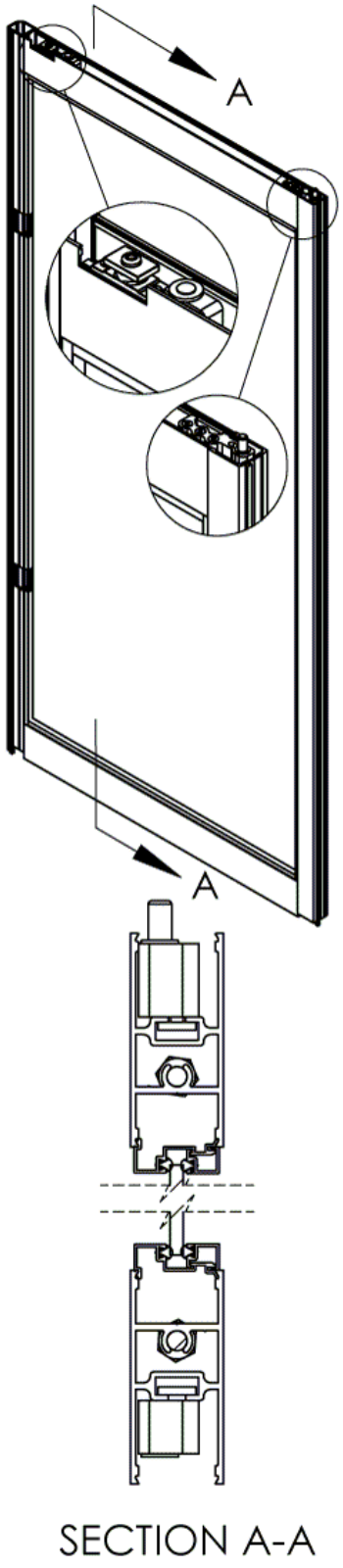
7.1 Options

7.1.1 Active Leaf Panic Break-Out System

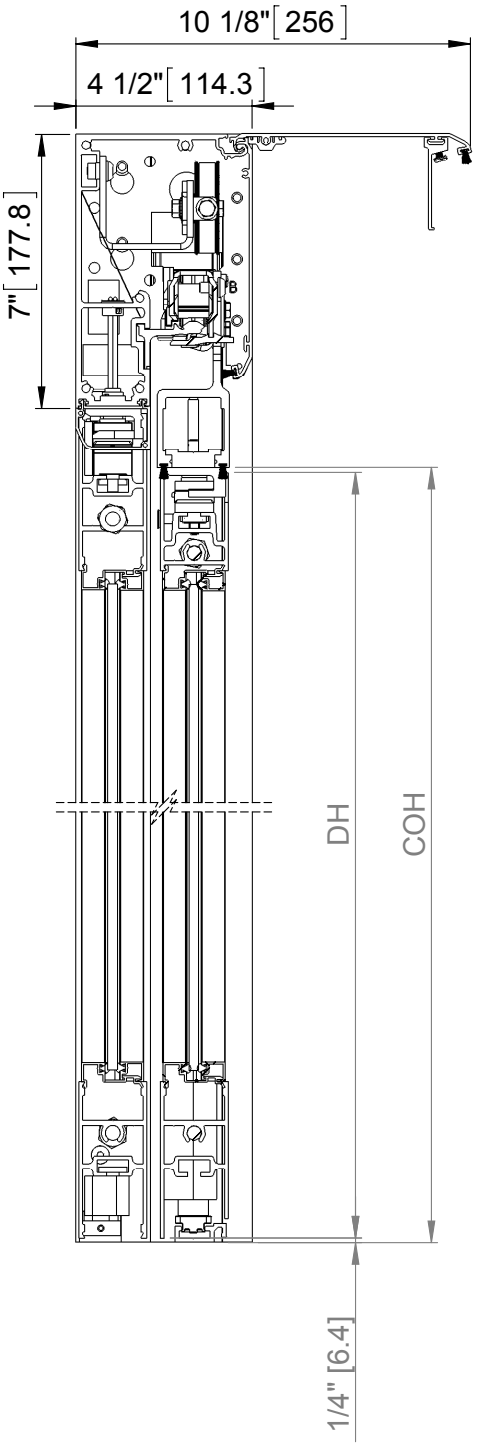


No.	Description	P/N	No.	Description	P/N
1	Panic Swing Arm (PSA)	US05-0545-01	7	Pin Track Guide (FBO)	US01-0433
2	Door Carrier	1007561-11XX	8	Ball Catch	US05-1609-04
3	Anti-Sag Adjuster	_	9	Ball Catch Receiver	US05-1609-01,-02
4	Bottom Guide (FSL)	US15-0644-02	10	End Cap	1008415
5	Roller Track Guide (FSL)	50-01-100	11	T-Block	1013796
6	Bottom Guide (FBO)	US15-0435-01	12	Pin Guide	50-20-135

7.1.2 Sidelites Fixed and Break-Out

Sidelite, Fixed (FSL)	Sidelite, Break-Out (FBO)
	

8 Space required



9 Pre-Installation

This section will help you to determine the right configuration and preparation for your doors.

a Is this a Surface Applied or Concealed Package?

b Is this installation a bi-parting or single-slide?

c If a single slide, what is the handing, left or right? (See "Door Handing" section on page 98).

d Does this installation include a transom? (If so, see Transom Manual shipped with this package).

e Where will power and signal wires enter the operator housing? (Back, End cover, Transom tube.)

f Is this a Full Break-Out (FBO), Fixed Sidelite (FSL), or Non Panic installation?

9.1 General tips/Safety concerns

In all instances, where work is being done, the area is to be secured from pedestrian traffic, and the power removed to prevent injury.

- If there are sharp edges after drilling the cable outlets, chamfer the edges to avoid damage to the cables.
- For enhanced security and vandalism protection, always mount the operator access in the interior of a building whenever possible.
- Make sure the ambient temperature is in the range specified in section Technical specification.
- 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.
- Unpack the operator and make sure that all parts are delivered in accordance with the packing note and that the operator is in good mechanical condition.
- Ensure proper material is being used for the door leaves and that there are no sharp edges. Projecting parts shall not create any potential hazards. If glass is used bare glass edges shall not come in contact with other glass. Toughened or laminated glass are suitable glasses.
- For support beam length over 5 m, remove the wheel holders and motor, or two technicians are needed.
- Ensure that entrapment between the driven part and the surrounding fixed parts due to the opening movement of the driven part is avoided. The following distances are considered sufficient to avoid entrapments for the parts of the body identified;
  - for fingers, a distance greater than 25 mm or less than 8 mm
  - for heads, a distance greater than 200 mm
  - for feet, a distance greater than 50 mm
  - and for the whole body, a distance greater than 500 mm
- Danger points shall be safe guarded up to a height of 2.5 m from the floor level.
- The operator shall not be used with a doorset incorporating a wicket door.

It is not possible to replace a Besam operator component with a component from a different brand.

10 Mechanical Installation

10.1 Checking

Make sure that the wall is properly reinforced at the installation points.

Check that the wall material has the necessary reinforcements and that the floor is level and smooth.

The beam/wall used to fix the support beam must be flat and smooth. If necessary use mounting spacers behind the support beam to keep it straight.

Fastening requirements	
Wall material	**Minimum requirements***
Steel	3/16" (5 mm)**
Aluminum	1/4" (6 mm)**
Reinforced concrete	min. 2" (50 mm) from the edge
Wood	2" (50 mm)
Brick wall	Expansion-shell bolt, min. 1/4" x 3 1/2", min. 2" (50 mm) from the edge

* ASSA ABLOY Entrance Systems minimum recommended requirements. Building Codes may give different specifications

** Thinner wall profiles must be reinforced with rivnuts

10.1.1 Test Equipment

- Stopwatch
- Force gauge (50 lb. force range)
- Multimeter

10.1.2 Tools required

- Set of metric box and wrenches
- Spirit level (48” +)
- Tape rule
- Power drill and set of drill bits, Unibit, Hammer drill
- Metric hex key set 8, 6, 5, 4, 3 mm and 2.5 mm
- Screw driver Torx T20, T27
- Flat blade screw driver (small/medium/large)
- #2 Phillips screw driver
- Center punch
- Wire stripper
- Plumb bob
- Silicone sealant
- Pencil

Additional mounting hardware (not supplied - see fastening requirements above)

10.2 Installation Overview

This is only a summary of the installation process. See the rest of this manual for detailed information.

a Start by determining the answers to the pre-installation questions.

b First install header to jamb tubes if concealed, tilt into place, level and plumb, then secure to rough opening with shims and appropriate fasteners. See "Surface Applied" section on page 23, for fastener recommendations. If surface applied mount operator to rough opening header and level.

c Full Break-Out: mount the pin or threshold guide track.

d Fixed Sidelite: mount the roller guide track.

e Non-Panic: mount the non-panic floor guide(s).

f Mount the sidelites.

g Mount the moving door panels.

h Adjust all door panels for alignment and smooth manual movement. Adjust all break-outs to comply with applicable building codes.

i Connect tooth belt from drive unit to active door panels.

j Complete all electrical connections to other operators or optional equipment.

k Adjust the control unit for optimal and safe performance, in accordance with current ANSI/BHMA A156.10 specifications.

l Adjust sensor systems for optimal and safe performance in accordance with current ANSI/BHMA A156.10 specifications.

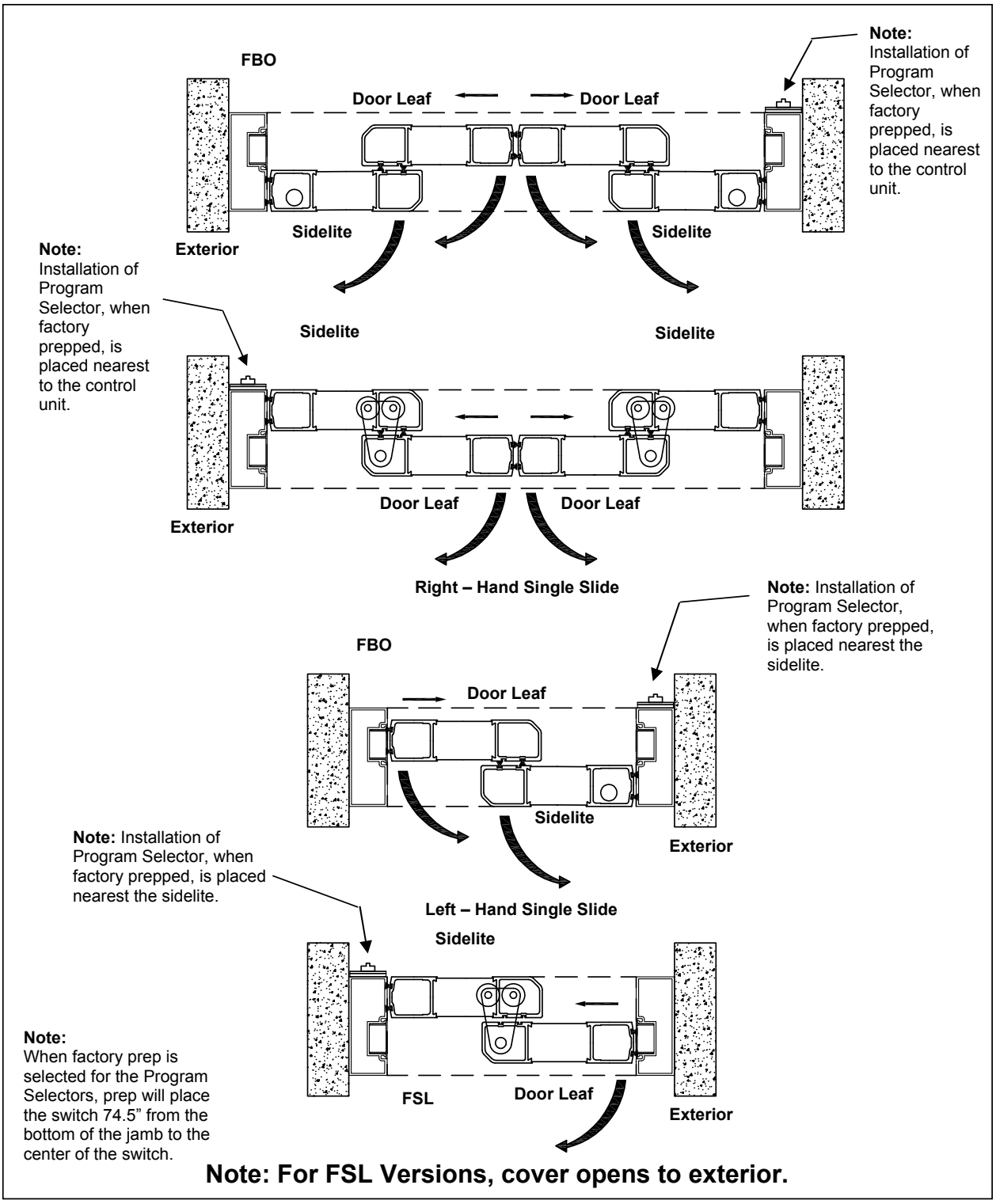
m Apply safety signage to the door(s).

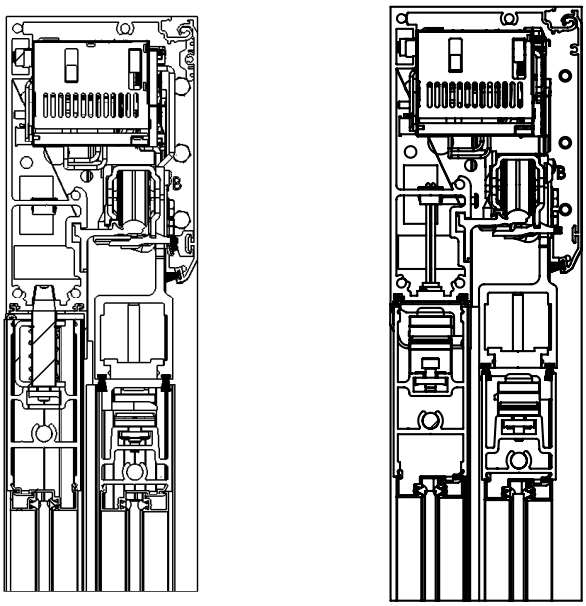
n Train facility manager in operation.

o Explain to the facility manager the daily safety check described in the owner's manual, and leave a copy of the owner's manual with the facility manager.

10.3 Installation Examples

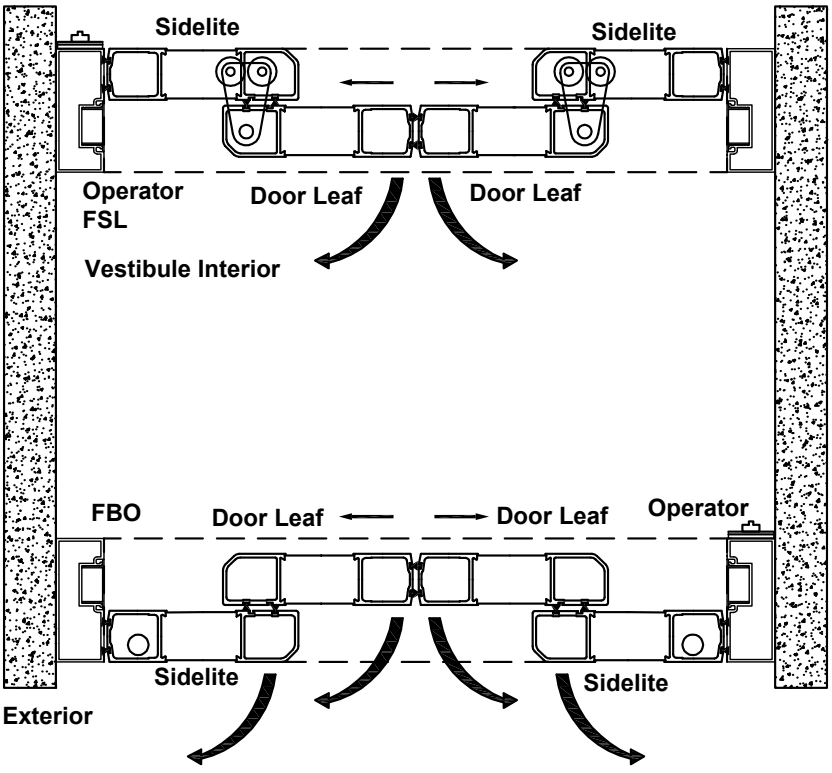
10.3.1 Concealed





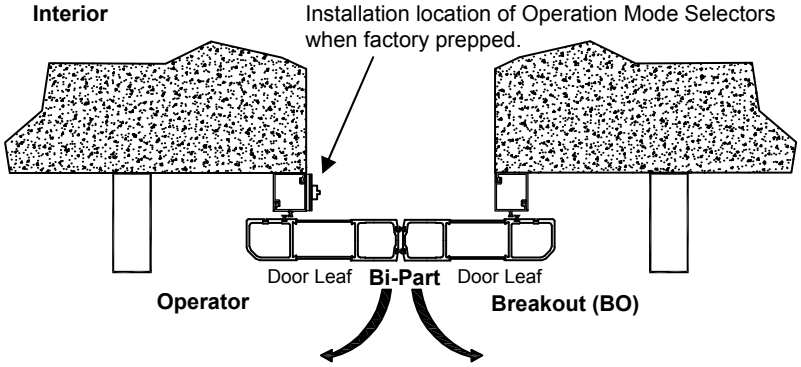
FSL **FBO**

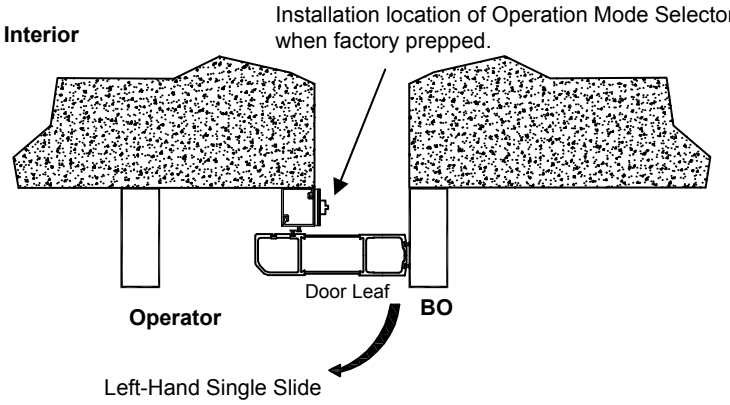
Breakout in Bi-Part Vestibule
(Half for Single Side)

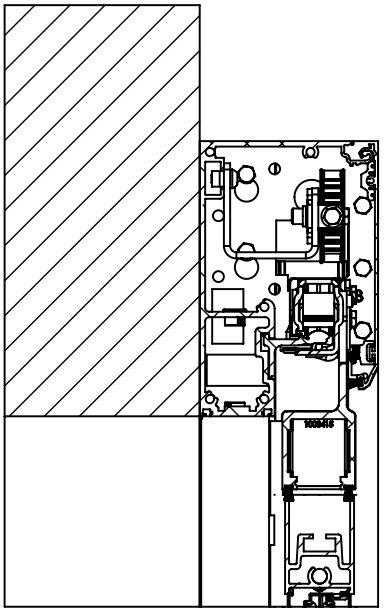


Note: Operator covers both face interior for ease of access.

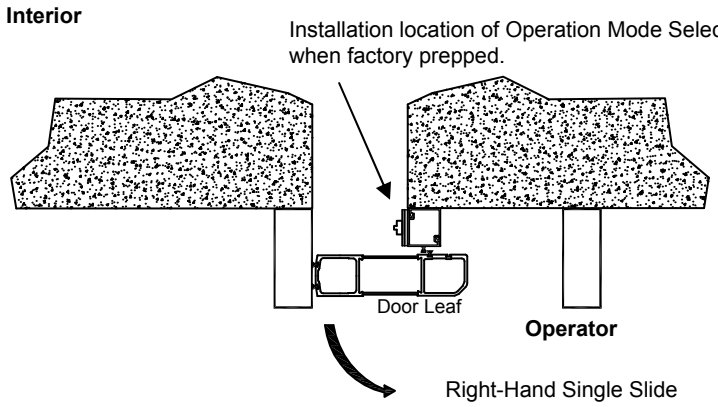
10.3.2 Surface Applied







For Vestibule Applications
Use concealed systems

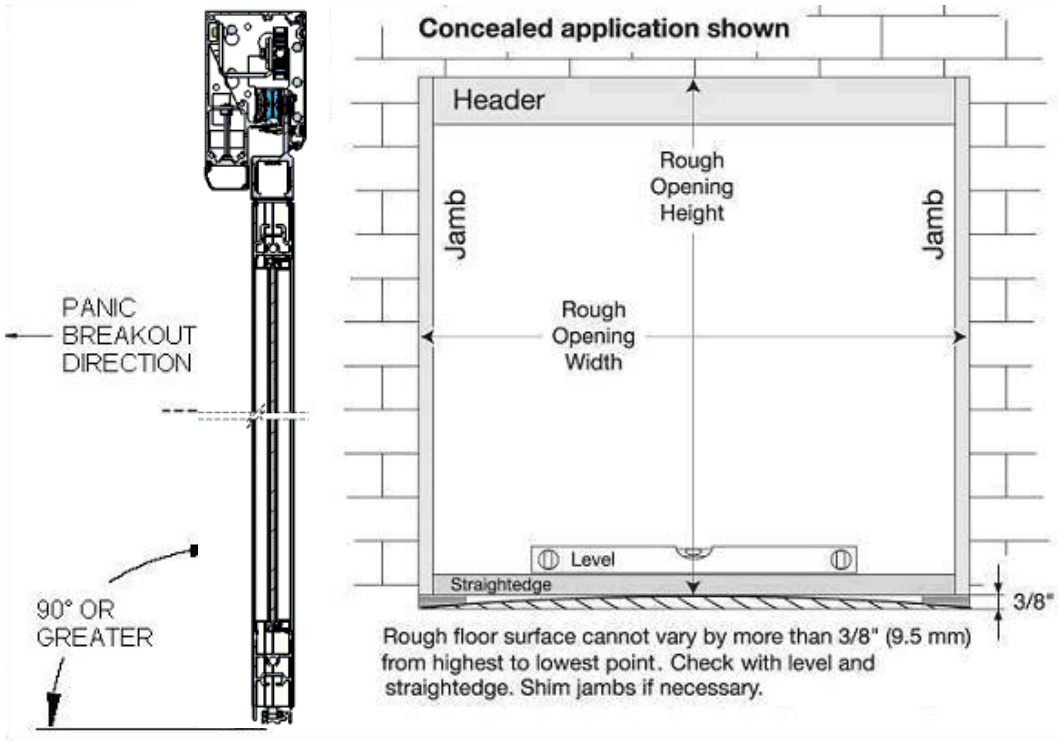


10.4 Site Inspection

The rough opening must be plumb and square and the finished floor must not vary by more than 3/8" from the highest to the lowest point. If necessary, have the floor leveled before attempting to install the sliding door system.

It is important to check the floor level within the path of the doors in Break-Out mode. The doors must not encounter any obstruction when broken out. The grade of the floor in the direction of break-out should ideally be 90° or greater, measuring from the highest point of the floor (see below).

For concealed applications the rough opening width should be 1/2" wider than the overall frame width of the sliding door system, and the rough opening height should be 1/4" higher than the overall frame height. For standard installations, the overall frame height will be 89-3/4", higher with transoms.



For Surface Applied Standard Applications all narrow frame with 1/4” glass, both Single Slide and Bi-parts, the overall frame height is 91”. (Overhead Concealed overall frame height is 89 ¾”.)

10.5 Installation and Adjustment Processes

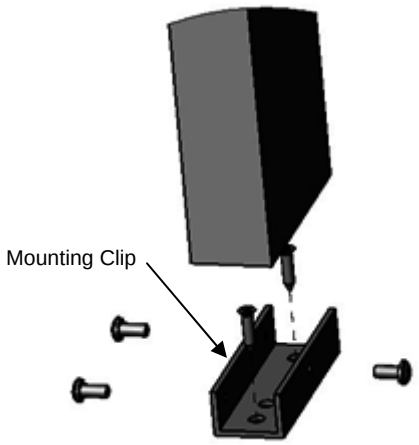
10.5.1 Surface Applied Mechanical Installation

In most instances, Surface Applied installation is similar to the Overhead Concealed Package installation with the exception that it is mounted to the side of the door opening. With this in mind, rather than to repeat the same information, references are made within this process to those found in the Overhead Concealed Package installation process.

a Ensure that existing doorframe work is square to the threshold and the threshold area is level including the break-out area. Reference "Checking – Marking Out – Fastening" section on page 26. Look for high spots in the floor, if there is a slight rise in the floor at any point then the bottom of the jambs should be set level with the highest point, with the header leveled across the opening. Reference, "Leveling Header and Jambs" process on page 28.

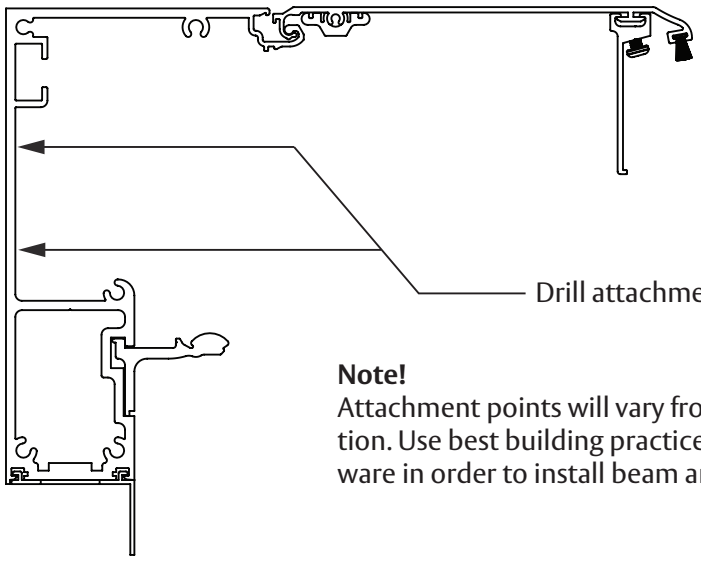
b Using the same criteria as above, check the wall where the beam and jamb will be attached. Look for high spots and fill in the valleys and shim where our fasteners will be going in order to give the beam a flat level surface to be mounted. Failure to do this could cause the beam to bend and twist, resulting in component binding.

c Determine location of Mounting Clip – mark, drill and secure.



d Attach Jamb Tubes to Header. See "Checking – Marking Out – Fastening" on page 26.

e Lift Header and dry fit. Drill for attachment and attach to substrate or wall using standard construction methods.

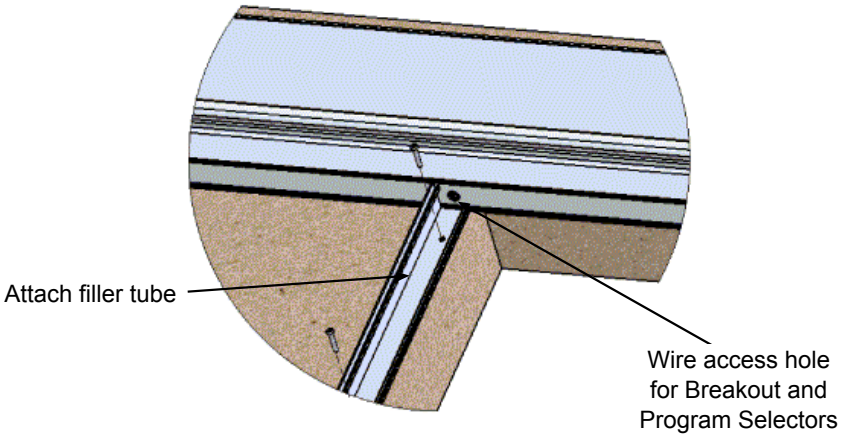


Note!
Attachment points will vary from application to application. Use best building practices and appropriate hardware in order to install beam and jambs securely.

f Caulk back of Header and Jambs and attach to existing structure.

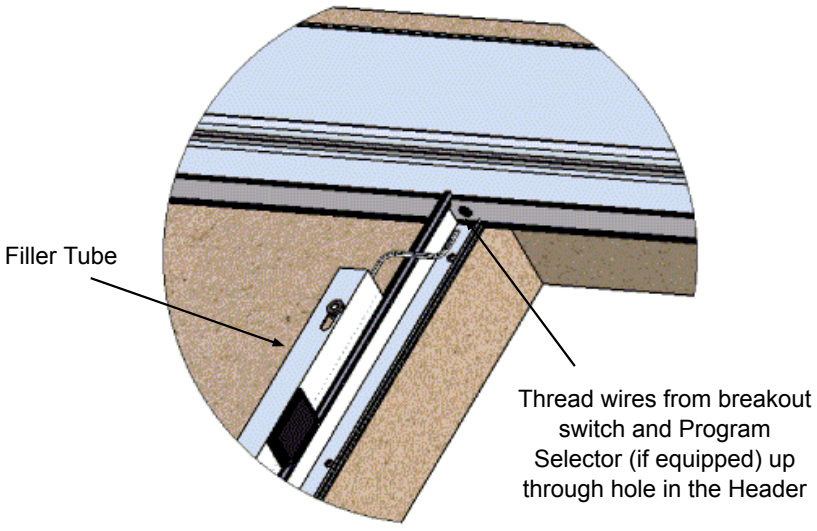
g Slide Filler Tube apart and attach back section of it to existing structure so that it will be flush with the existing opening and so that the wire can access the hole(s) in header.

Ensure that the surface is even, particularly when attaching to block or concrete surfaces - level and shim as necessary. (Failure to provide and even surface results in warping the profile making it impossible to snap the filler tube together.)



h Layout the other half of the Filler Tube allowing the wire to be run up through Filler Tube to Header, threading wire through wiring hole in Header.

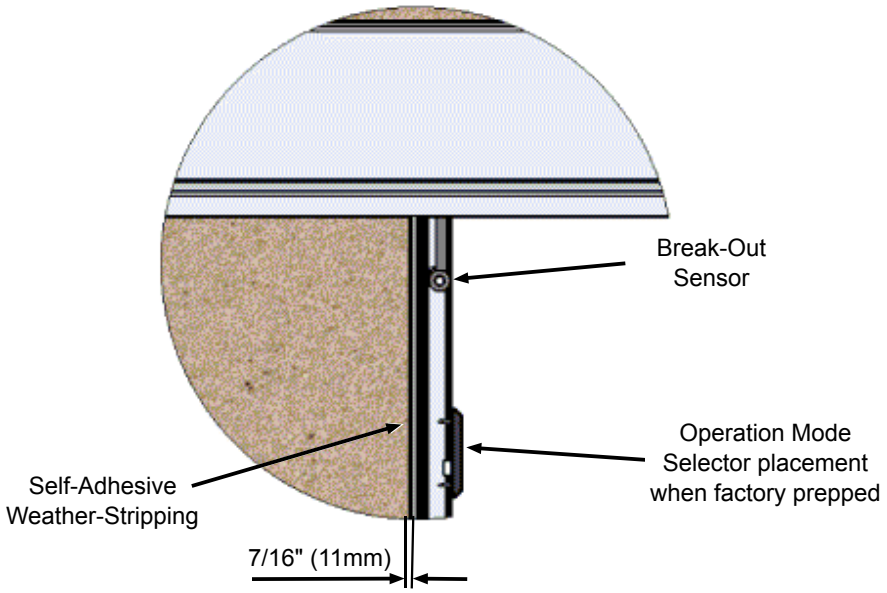
Use care that all holes are deburred to prevent electrical shorts.



i Attach other half of Filler Tube to half mounted on existing structure.

Note: If there is any bowing to the Filler Tube, the Filler Tube halves will not snap securely in place.

j Attach Self-Adhesive Weather-Stripping, where shown below.



k Connect the breakout wires and operation mode selector cable, see "Connection of electrical units" on page 50.

l To attach doors to Beam, see "Hanging the Active Door Leaves (Full Break-Out)" on page 34.

m To attach drive belt, see "Attachment /Adjustment of the Cable Tensioner/ Tooth Belt Fitting" on page 38.

n To adjust Levelers and to attach anti-riser, see "Hanging the Active Door Leaves (Full Break-Out)" on page 34.

o To install Door Stops and make adjustments, see "Adjustment of the Leading Edge (to Avoid Finger Traps)" on page 39.

p Once the doors are properly adjusted, adjust Break-Out Sensor in a manner that allows it to sense the presences of the doors until doors are broke out. (This is accomplished by setting the sensor so that it aligns with the magnetic strip in the door frame.)

q For sensor system connection, see "Connection of activation units" on page 51 to complete this task.

r Secure cover and attach with screws. See "Installing/Removing the Cover" on page 45.

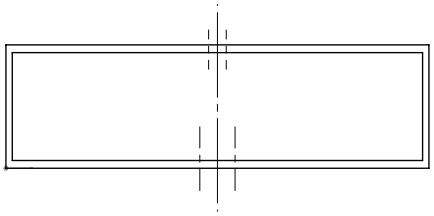
10.5.2 Overhead Concealed Mechanical Installation

Checking – Marking Out – Fastening

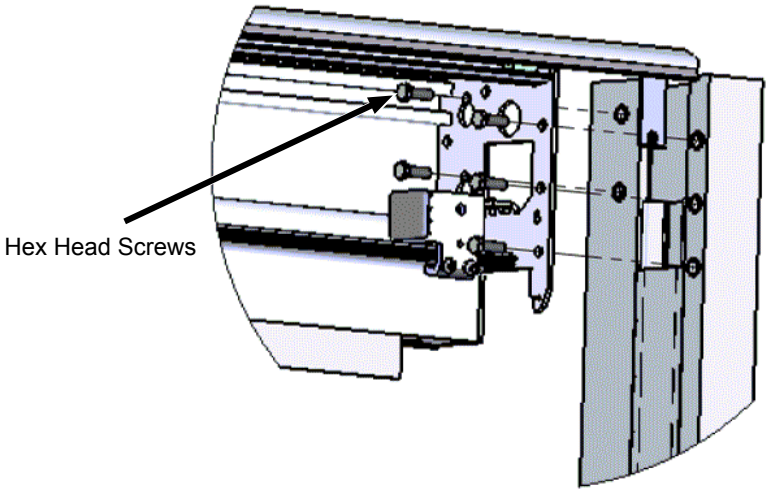
a Mark the center of the rough opening width and the center of the header. (The center marks will be aligned during installation.)

b Drill holes at the top, middle and bottom of the jambs for securing to the door opening. (Adjust for site conditions that may require the holes to be at a certain height.)

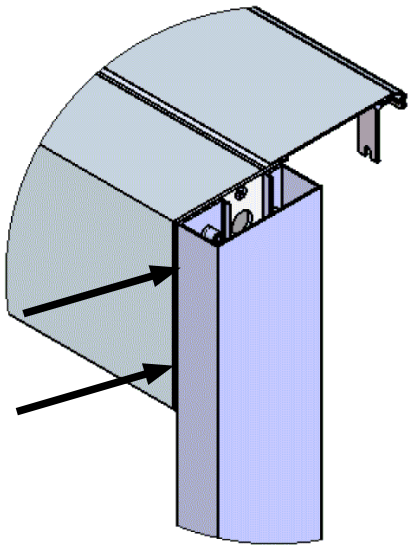
c Drill 1/4" holes through the face or pocket of the jamb and out the back. Then drill the back holes to a minimum of 1/2" to allow for later adjustment – see illustration.



d Mount jambs to beam using five screws per jamb. (ASSA ABLOY Entrance Systems jambs are factory prepared for Header installation.)



e Check that jamb and beam are aligned where indicated below.

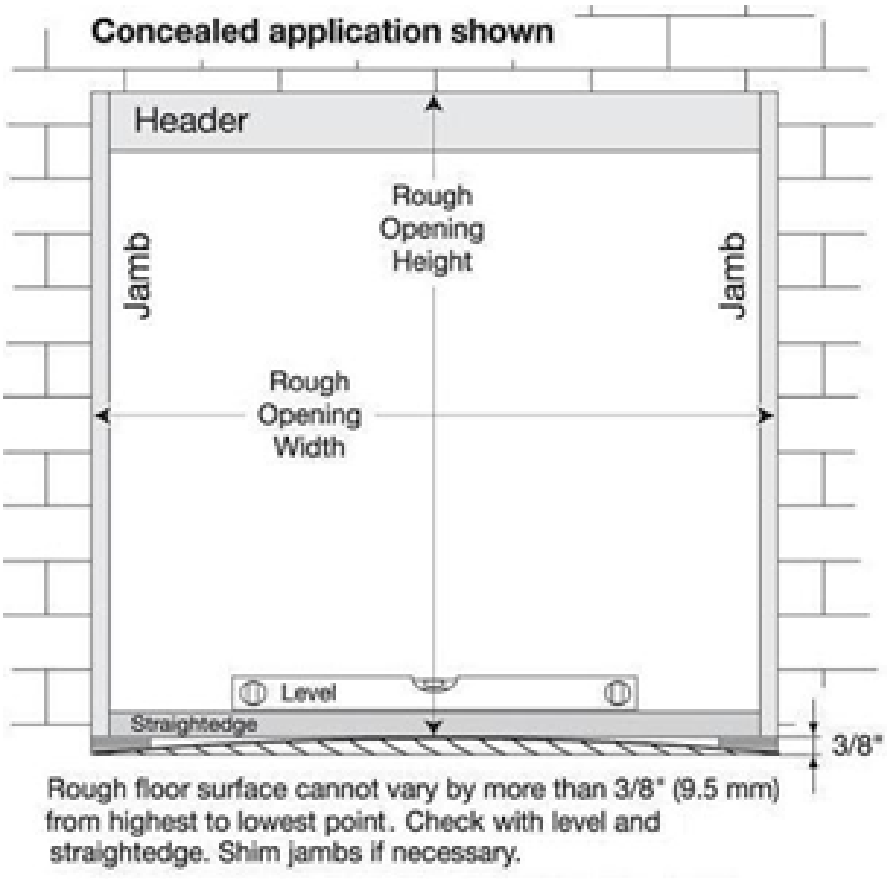


f If the beam to jamb is not properly aligned, loosen the screws and align beam to jamb and retighten screws.

Leveling Header and Jambs

Note: The header and jambs must be square and level to ensure a proper installation!

a Inspect the rough door opening, measuring from side to side and using a level, to find areas where shims may be needed. Look for high spots in the floor, if there is a slight rise in the floor at any point then the bottom of the jambs should be set level with the highest point of the floor, with the header leveled across the opening. Also, check the floor in the break-out panel's swing area for being level. Any high spots will need to be considered when setting header height.



b Tilt header/jamb assembly up into rough opening in wall, being careful to pull power through access hole in jamb.

c Start with one jamb. Loosely install the middle fastener, using a level on the outside of the frame to plumb the jamb. Confirm that the header is level across the opening. Repeat for the opposing jamb, loosely installing first the middle fastener, then the top and bottom. Return to the first jamb and install the remaining top and bottom fasteners loosely.

d Starting with the top screws on both jambs, equally shim behind both jambs, leaving equal gaps and centering the package in the door opening. Tighten the top fasteners. Use your level on the inside of one jamb to determine shim requirements for the middle fastener, then shim and tighten. Repeat for the bottom fastener. Shim and tighten the middle and bottom fasteners on the other jamb in the same way. Check for jamb bowing with a straightedge and correct if present.

e If the header and jambs are truly square, the top and bottom jamb-to-jamb measurements will be identical and both diagonal measurements will be identical. If necessary, strings can be taped from corner-to-corner on the outside of the jambs. The strings should cross in the center of the door opening, slightly touching each other. If there is a gap between the strings or the strings are pushing against each other, than the package is twisted and needs adjusting.

Fitting the Floor Guide Track

The following are installation steps for floor mounted guide tracks, recess and surfaced mounted pin guide tracks and G channel tracks for Fixed Sidelite applications.

Note: It is important that the floor guide track is installed level, to prevent derailment of the floor guide foot when the door is swung out and to provide proper door operation.

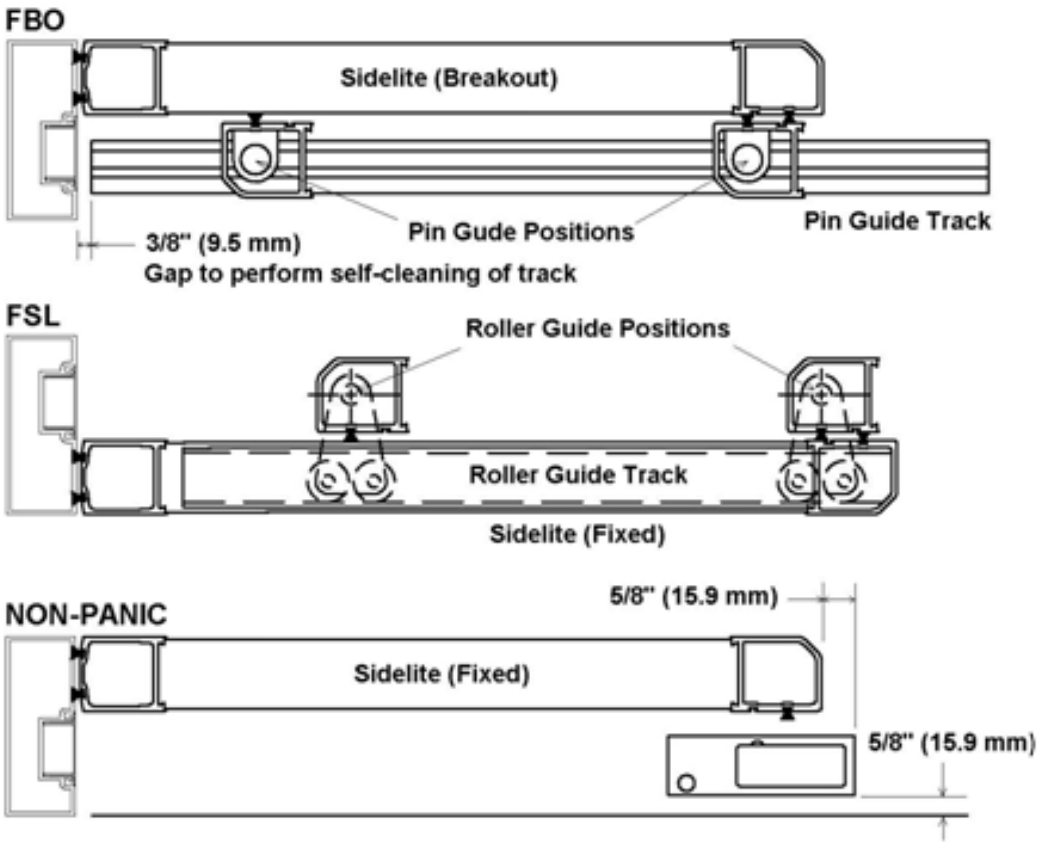
a Inspect the floor for conditions such as high and low spots that can cause the track to twist and rock. High spots (such as small rocks) should be removed; shim the track assembly at the low spots.

b Using a chalk line, snap a reference line from jamb to jamb on the side where the track is being installed.

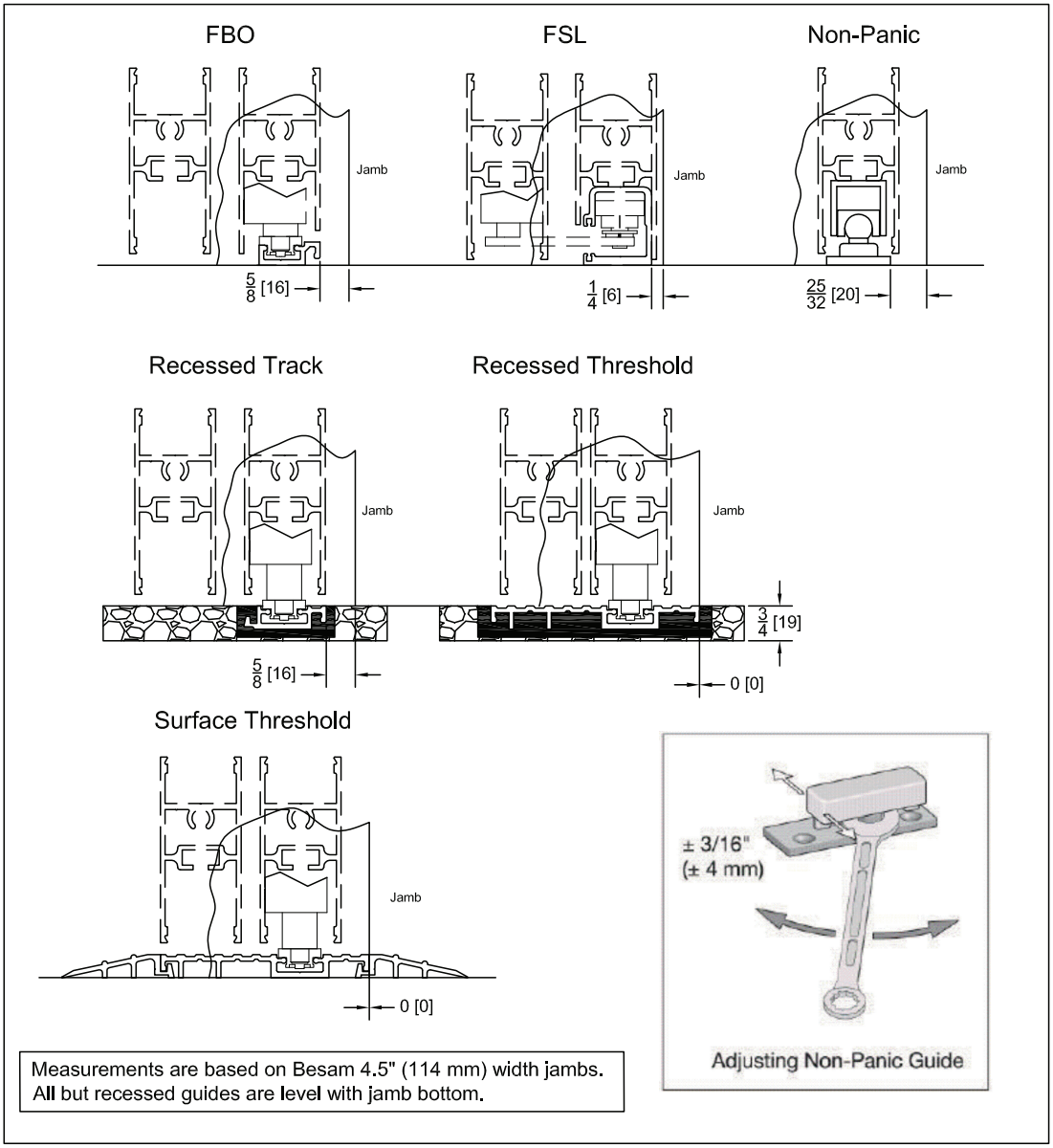
c Using the measurements provided (see "Site Inspection" on page 22), lay the track in place. While standing on the track and keeping it in line with the chalk line, mark the holes to be drilled.

d Secure the track to the floor with concrete anchors and screws, leveling it with shims from end to end. If possible, a sealant should be used under the track assembly. To check for proper leveling, measure from the top of the track to the bottom of the header, checking for the same result at each fastener.

Note: All screws must be countersunk and fully tightened to avoid interference with guide travel.



Fitting the Floor Guide Track Cont.



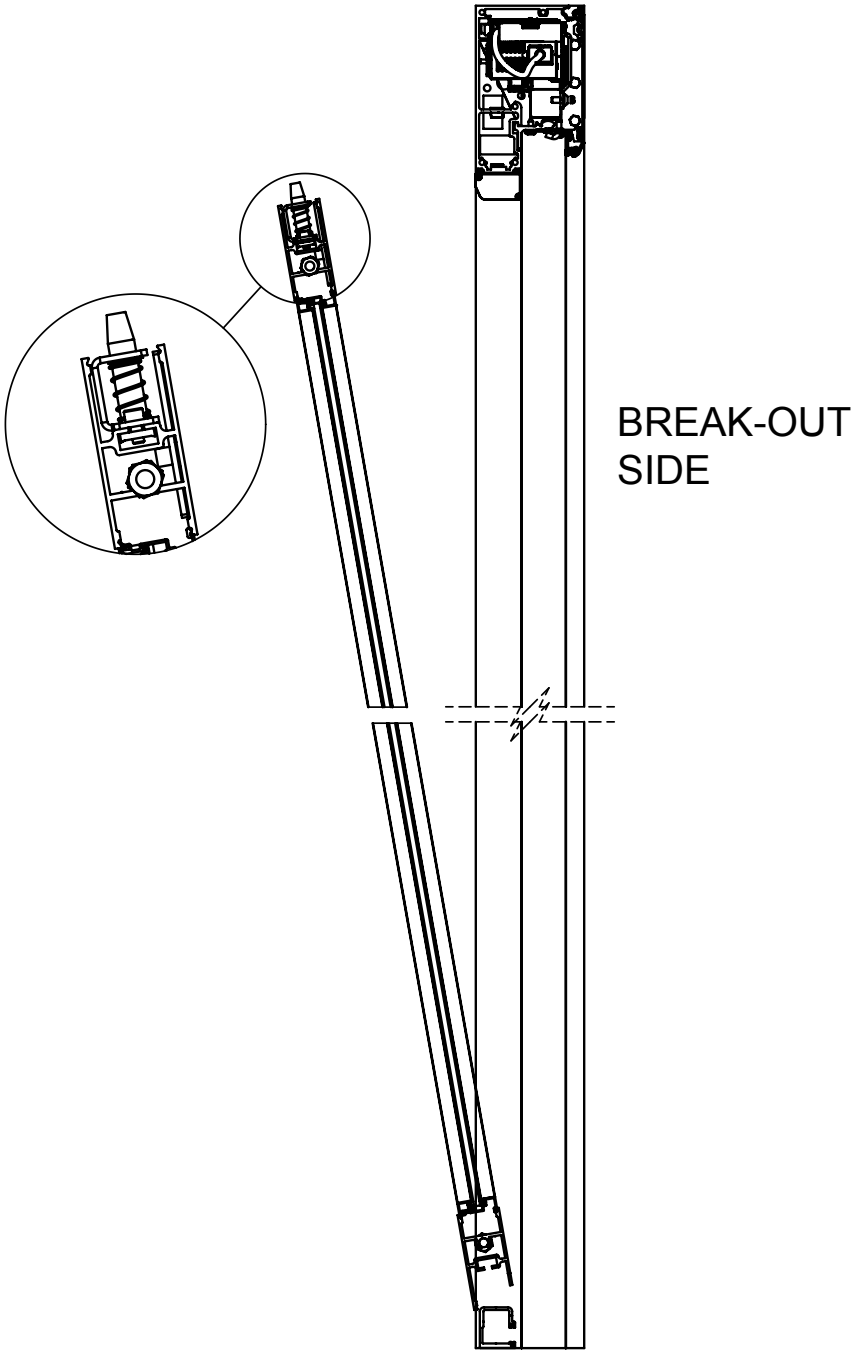
Measurements are based on Besam 4.5" (114 mm) width jambs.
All but recessed guides are level with jamb bottom.

Fixed Sidelite Installation Procedure

Note: Remove any glass stop or packing material from the sidelite before installation.

a End load the sidelite panel on the roller track guide. Depress the spring loaded pins located at each end of the top door rail and guide into the mating holes located in the beam. Slide the panel against the jamb, leaving 1/8" (3mm) gap. Check panel to ensure that both pins have engaged into the header.

b For bi-part, install 2nd sidelite as above.



Door Carrier

The door carriers can have either two or four wheels depending on door leaf weight. Door carriers with two wheels can be used when each door leaf weighs up to 265 lbs (120 kg) and door carriers with four wheels when each door leaf weighs up to 530 lbs (240 kg).

Full Break-Out Sidelite Installation Procedure

Note: Remove any glass stop or packing material from the sidelite before installation.

a Install and level any thresholds (surface or recessed) before installing any of the door panels.

b Check that jamb mounted bottom pivot is installed and tight. Also make sure that the pivot plate is also secured to the floor.

c If the pivot base does not rest fully on the floor, support the pivot base with shims.

d Place the bearing washer on the pivot base.

e Set the sidelite on the pivot and tilt it into place. (There should be no more than 1/8" between the bottom of the header and the top of the sidelite.)

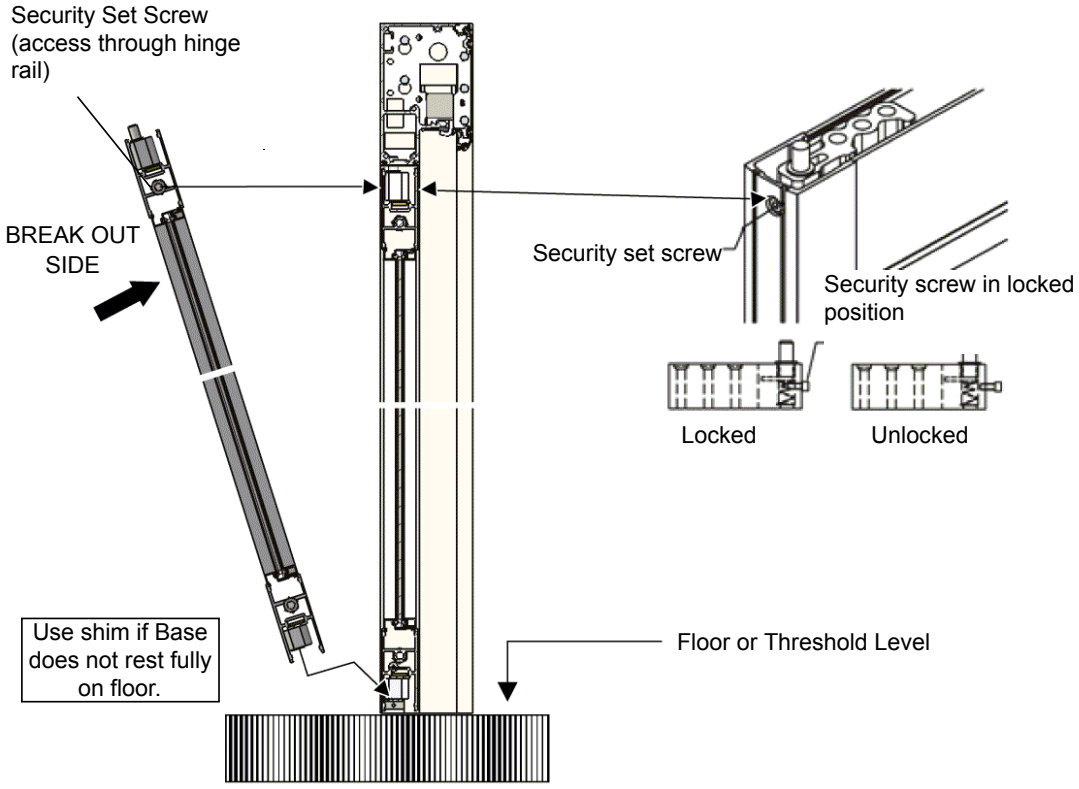
f To adjust, raise or lower the bottom pivot by loosening the set screw at the side of the floor portion of the pivot and turn the shaft clockwise to lower the sidelite and counter clockwise to raise the sidelite; then retighten the set screw.

g With the sidelite on the bottom pivot, carefully push down the top spring-loaded pivot pin and line it up with its receiving hole in the header portion of the pivot until the shaft pops into place.

h Check all clearances and adjust the Break-Out Latch (See "Adjusting Ball Catch" section on page 41 and "Adjusting Magnetic Catch (Option)" section on page 42).

i If the distance between the jamb and hinge stile needs to be adjusted, loosen the top and/or bottom door portion pivot and slide left or right. Once adjusted properly, retighten screws.

j When all sidelite panels are installed, tighten top pivot security set screw to prevent depressing (carding) pivot pin.



Setting the Active Leaf Roller Guide Pivot (Fixed Sidelite)

Before installing the active leaves, make the electrical connections in "Electrical connections" on page 46. Do not apply mains power.

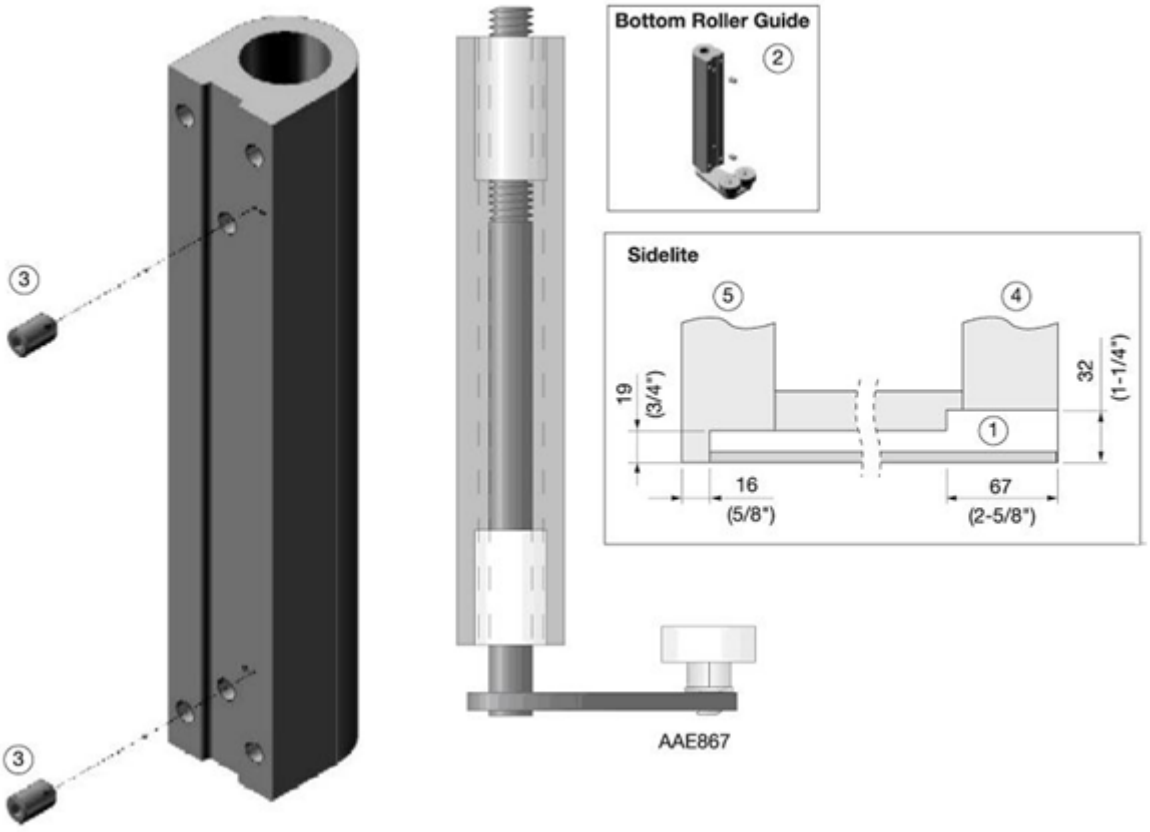
a Temporarily loosen and remove the doorstop. With the door positioned so that the carriage wheels are riding on the track in the header beam, adjust the carriage wheels to a height that will raise the door slightly off the finished floor. Be sure the antirisers are in the “unlock” position. See "Anti-Riser Operation" on page 35.

b Slide the door to the open position until the roller guide lines up with the cut out in the roller track, and insert the bottom guide. (If the roller guide does not line up properly with the cut out, loosen the roller guide top set screw, which is accessible when the panel is broken out. Adjust the roller guide until it will slide into the cut out.) Slide the door closed.

c Proceed to adjust the door as instructed in section titled, "Height Adjustment" on page 37. With the door(s) adjusted properly, position the roller guide so that it has clearance to slide open and closed without any drag on the top or bottom of the track assembly. Retighten top setscrew. Reposition the doorstops and adjust accordingly to avoid finger traps at trailing edge, see "Adjustment of the Leading Edge (to Avoid Finger Traps)" on page 39.

d The bottom set screw on the roller guide can be adjusted to create drag on the door pivot when the door is broken out.

e Set the anti-risers on each carriage wheel to the “lock” position. See "Anti-Riser Operation" on page 35.



Hanging the Active Door Leaves (Full Break-Out)

a Raise the door leaf and place it carefully over the floor guide, ensuring the pin washer is in place.

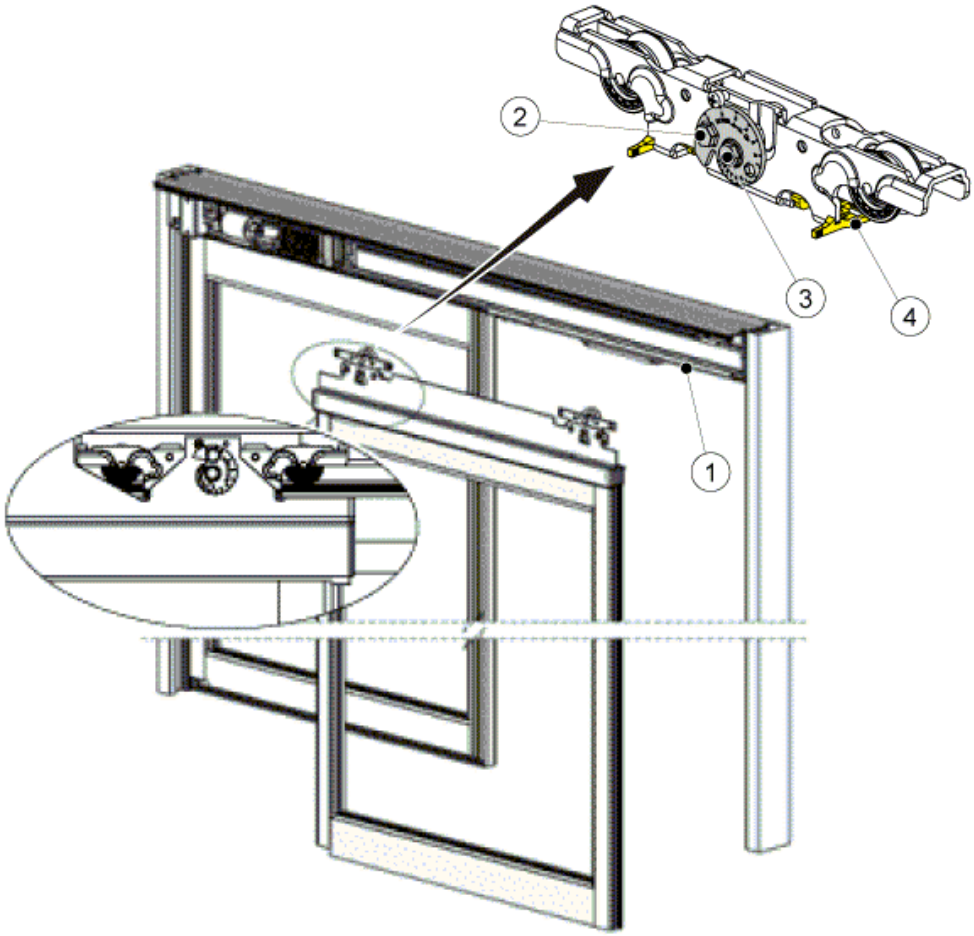
b Lean the door leaf against the frame, set the anti-risers (4) on each carriage wheel to "unlocked" and lift the wheel fittings over the sliding track.

c Loosen the fastening screws (3) and let door settle.

d Adjust the screw (2) until the door leaf is about 1/4" (6.5 mm) above the floor. Adjustment range ±5/16" (±8 mm).

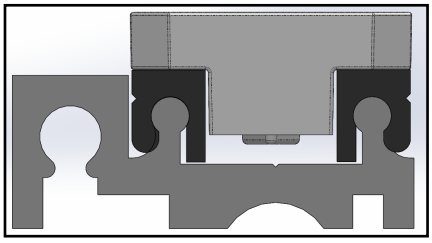
e Tighten the fastening screw (3) to secure the assembly.

f Set the anti-risers (4) on each carriage wheel to the “locked” position. See "Anti-Riser Operation" on page 35.



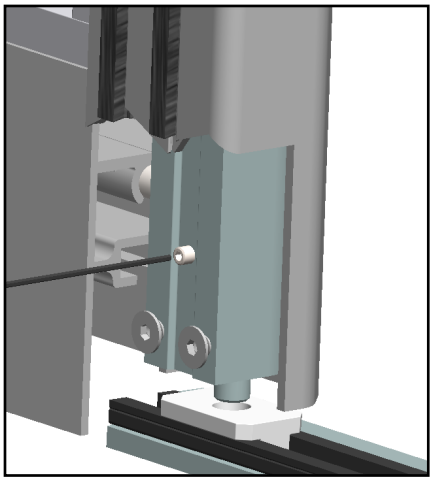
1 Sliding track
2 Height adjustment screw
3 Fastening screw
4 Anti-riser

g Install t-block onto track.



h Position the t-block underneath the pivot pin.

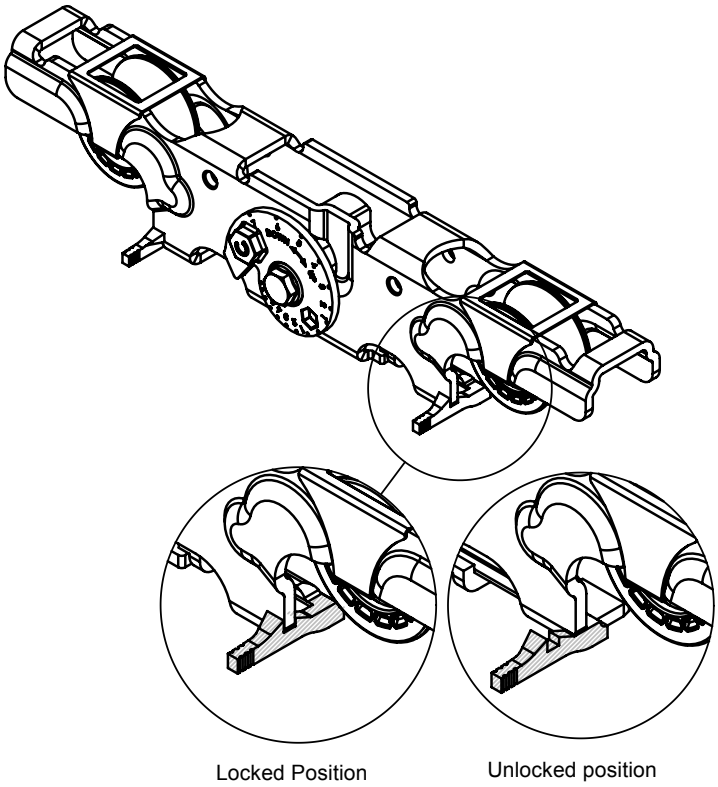
i Using a 3mm hex key, loosen the set screw in the pivot pin assembly to release the pivot pin.



Anti-Riser Operation

a To lock the anti-riser, depress both tabs and push until it engages on the wheel bracket.

b To unlock anti-riser, depress both tabs and pull.



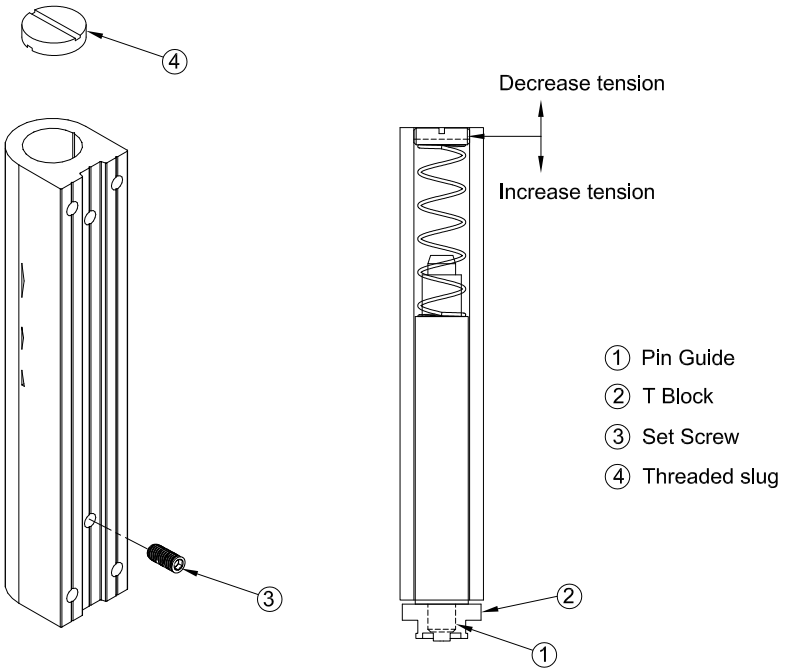
Setting the Active Leaf Pin Guide Pivot (Full Break-Out)

Note: Before installing the active leaves, make the electrical connections in "Electrical connections" on page 46. Do not apply mains power.

Spring tension has been factory adjusted; it may be changed to ensure that pin stays engaged in track. Readjustment requires removing the pivot from the door and adjusting the threaded slug.

For additional security, the pin guide may be locked at its highest point of travel along the floor track, using the setscrew.

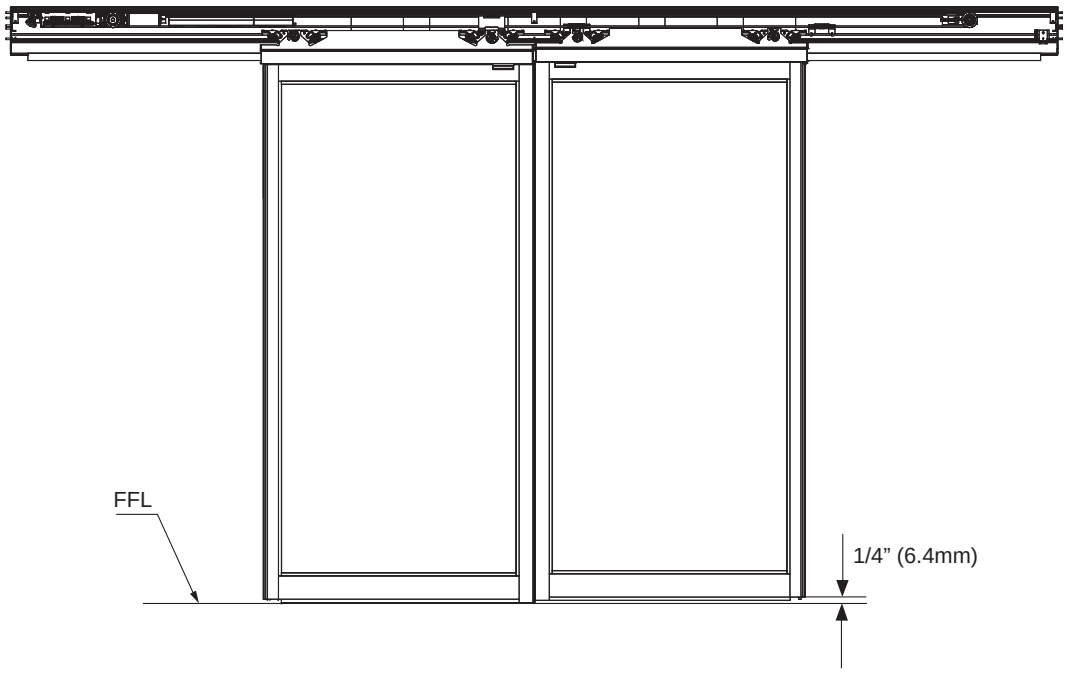
Note: If this option is selected, then you must level the floor track in order for the pin to stay completely engaged.



Height Adjustment

The height adjustment is to be carried out with the vertical adjustment screw as described in section titled, "Hanging the Active Door Leaves (Full Break-Out)" on page 34.

- It is very important that the door leaf hangs vertically after the adjustment and that bi-parting doors are parallel in the closed position (no gap at the top or bottom).
- The guide pin roller (frame doors) should not touch the upper edge of the door guide track or become easily disengaged.
- If a weather brush is used on the lower edge of the door leaf, it should only lightly touch the floor.
- Check that the door leaf is parallel with the fixed panel.



FFL = Finished Floor Level

Note: Once the door height is adjusted, verify that doors do not exceed a force of 30 pounds applied in either direction to prevent the door from closing.

Attachment /Adjustment of the Cable Tensioner/ Tooth Belt Fitting

Please note, that the Besam SL500 is viewed from the cover side.

The tooth belt fitting joining the belt ends is factory-mounted to the lower or upper part of the tooth belt, depending on package type.

Bi-parting operators

a Put doors in fully closed position.

b Move the lower transmission bracket that is factory installed to the belt until it is over the carriage wheel fitting at the leading edge of the left hand door leaf.

c Attach the lower transmission bracket to the carriage wheel fitting using the enclosed screws.

d Attach the upper transmission bracket to the carriage wheel fitting at the leading edge of the right hand door leaf using the enclosed screws.

e Orient the belt clamp on the belt such that it is centered on the upper transmission bracket and slide onto the belt.

f Slide the belt clamp into the upper transmission bracket until it snaps in and is secured. It may be necessary to slightly move the centerline slightly to the right or to the left to find the most optimal position for the belt clamp.

g Check door panels for proper centering in the fully closed and opened positions.

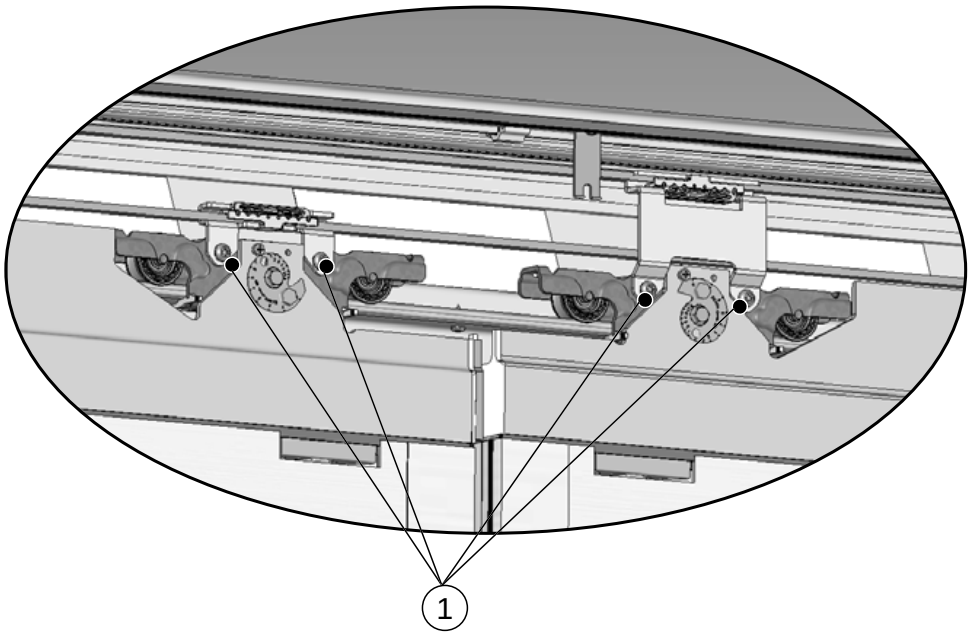
Single-sliding operators

a Put door in fully closed position.

b Move the upper/lower transmission bracket that is factory installed to the belt until it is over the carriage wheel fitting of the door leaf.

c Attach the tooth belt fitting to the carriage wheel fitting using the enclosed screws (1).

d Check door panel for fully opened and closed position.



For RH FBO/LH FSL (SA), the bracket will attach to carriage wheel on the leading edge of door leaf. For LH FBO/RH FSL (SA), the bracket will attach to the trailing edge of the door leaf.

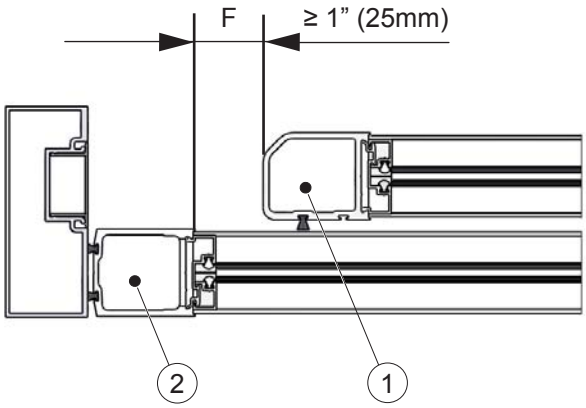
Adjustment of the Leading Edge (to Avoid Finger Traps)

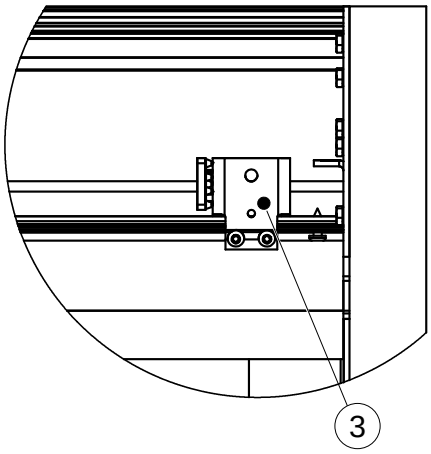
a Push the doors by hand to the desired opening.

b **Note:** For door frames made by others, the leading edge of the door leaf must not pass the vertical rail of the sidelite leaf, but must stop at least 1" (25 mm) before to avoid finger traps.

c Loosen the doorstops, move them in against the carriage wheel fittings and tighten firmly.

d Check that the required opening and finger protection (if any) are achieved.





F= Safety distance (finger protection frame doors by others)

1 Sidelite

2 Active Sliding Leaf

3 Door stop

Checking and Adjusting the Belt Tension

If the belt tension has to be corrected, proceed as follows:

a Loosen the screw (1) in the middle of the tension wheel without removing it.

b Screw the adjustment screw (2) to its outmost position.

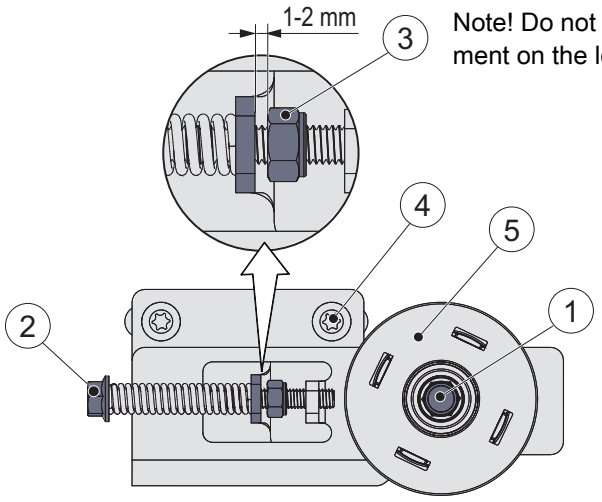
c Loosen the tension wheel assembly fixing screws (4).

d Tension the belt by pulling the tension wheel assembly by hand as hard as possible.

e Tighten the tension wheel assembly fixing screws (4) with a **torque of 10 Nm**.

f Tighten the belt tension adjustment screw (2) until there is a gap of approx. 1-2 mm, but no further, between the lock nut (3) and the edge according to illustration below. Be sure not to overtighten, otherwise the screw might damage the tension wheel (1).

g Retighten the screw in the middle of the tension wheel (1) with a **torque of 30 Nm**.



1 Screw
2 Adjustment screw
3 Lock nut
4 Tension wheel assembly fixing screw
5 Tension wheel

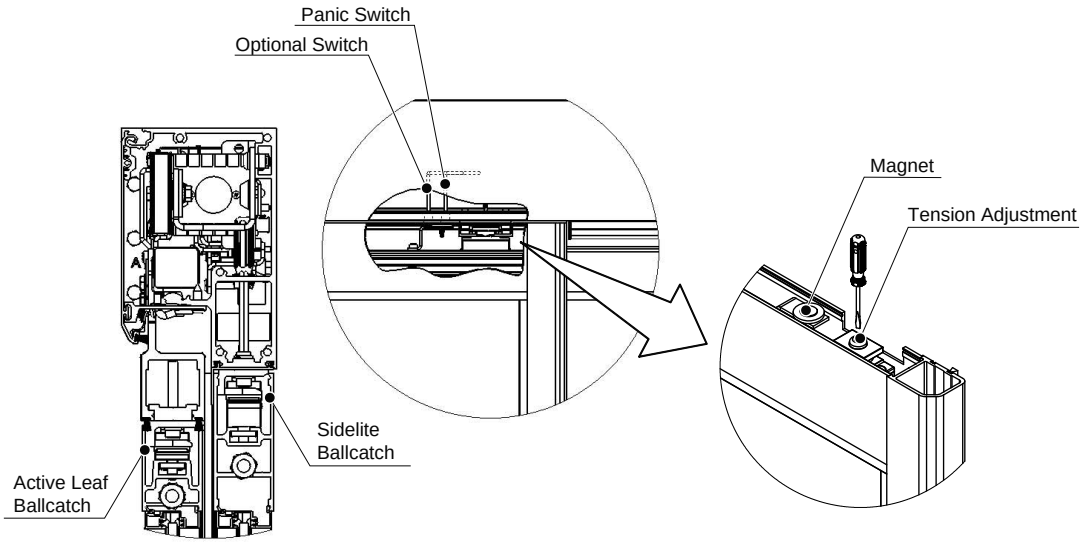
Interlocks for FBO Units

Slide the active leaf(s) into the closed position and check to see that the interlock hardware engages the sidelite cutouts. Adjust Interlock (and shim if necessary) for proper alignment.

Adjusting Ball Catch (Sidelite and Fast Leaf)

- Check that the sidelite door assembly engages properly with the sidelite header assembly. Both can be repositioned slightly if necessary.
- Adjust the tension on the ball catch by turning the adjustment screw, to meet local egress codes. To increase tension, turn the screw counterclockwise. To decrease tension, turn the adjustment screw clockwise. Tension is not to exceed 50 lbs. break out force; see ANSI/BHMA standards at back of manual. Installer must verify that without power, break-out force does not exceed 50 lbs or local egress codes.

A magnetic panic break out switch (bi-parting units have two) shuts the operator off when the sidelite is opened. A ceramic magnet is located in the upper horizontal sidelite rail. The switch(s) are located over the magnet in the bottom face of the beam. The magnet location can be field adjusted by loosening the bracket mounting screw. See Electrical section to wire the break out switches (MCU terminals 1 and 3).



Note: FSL (Fixed Sidelites) utilize a strip magnet on top rail of the active panel and a reed switch in the sidelite.

Adjusting Magnetic Catch (Sidelite and Fast Leaf Option)

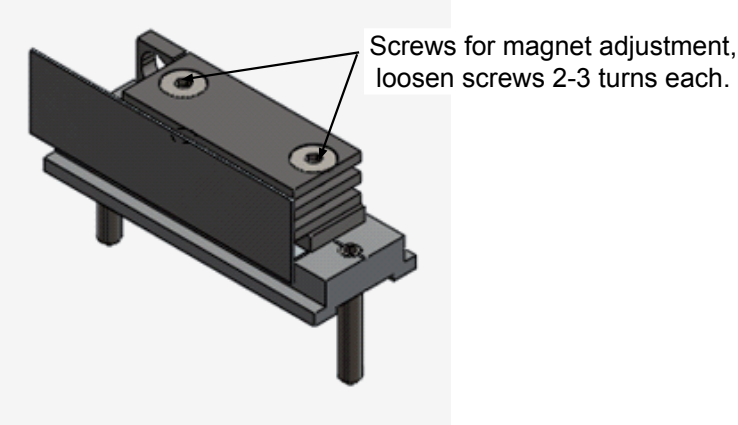
a Check that the sidelite door assembly engages properly with the sidelite header assembly. Both can be repositioned slightly if necessary.

b Adjust the tension on the magnetic catch by moving the magnets back and forth inside the magnetic catch, as required by local egress codes. Tension is not to exceed 50 lbs. break out force; see ANSI/BHMA standards at back of manual. Installer must verify that without power, break-out force does not exceed 50 lbs.

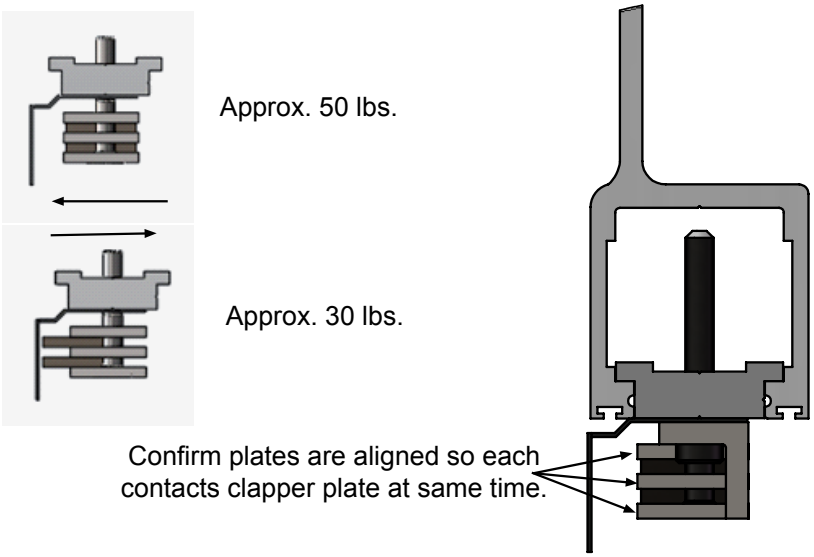
Potential hazard of shattering magnets if not handled correctly, use hand and eye protection at all times when working with magnetic catch.

Gap between door-header/door-carrier should not exceed 1/8" gap in order for magnetic catch to function properly.

Loosen screws shown to adjust magnets. Only loosen screws 2-3 turns each with a 4MM allen key. Use plastic shim to adjust magnet away from clapper plate. Place plastic shim in center of each magnet and tap shim in order to move magnet.



c Verify that plates that hold magnets are aligned so each contacts clapper plate at same time while re-tightening screws. Tension of magnetic catch should be able to be adjusted down to approx. 30 lbs.



PSA Arm Adjustment

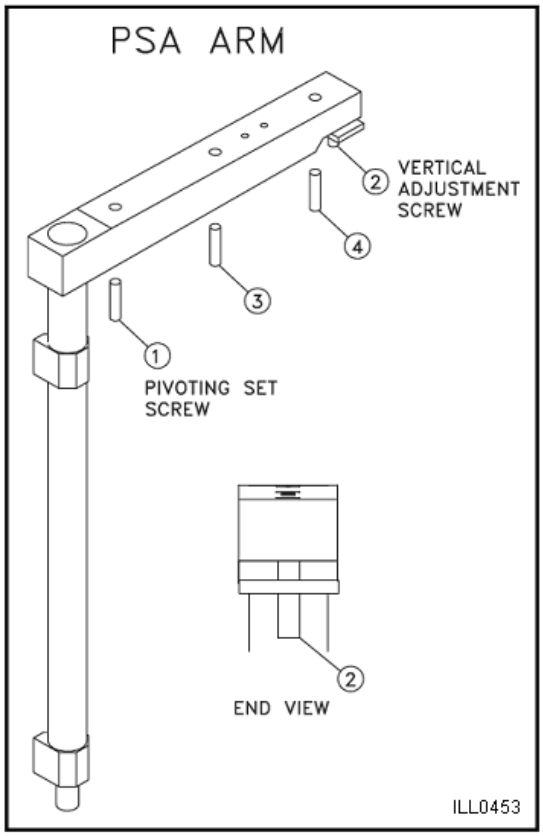
a Open door and lock down screw (1) (pivoting set screw) of PSA arm, and loosen setscrews (3) and (4).

b Adjust screw (2) (PSA vertical adjustment screw) on PSA arm to lift the door and ball catch lead edge into alignment with ball catch receiver.

Note: If the glass has not previously been installed, you will need to recheck alignment once the glass is in place and readjust as necessary.

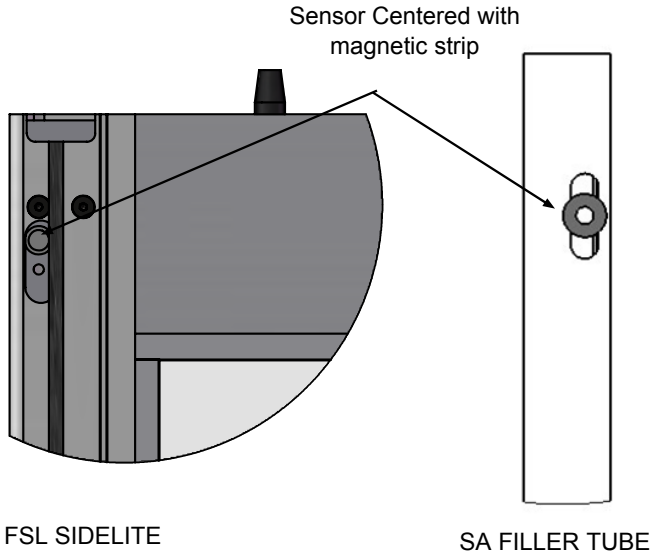
c Once the adjustment is complete, tighten remaining setscrews (3) and (4) on PSA arm and close the door engaging the ball catch.

d Confirm that the lead edge of the door and lead edge of the carriers are still flush.

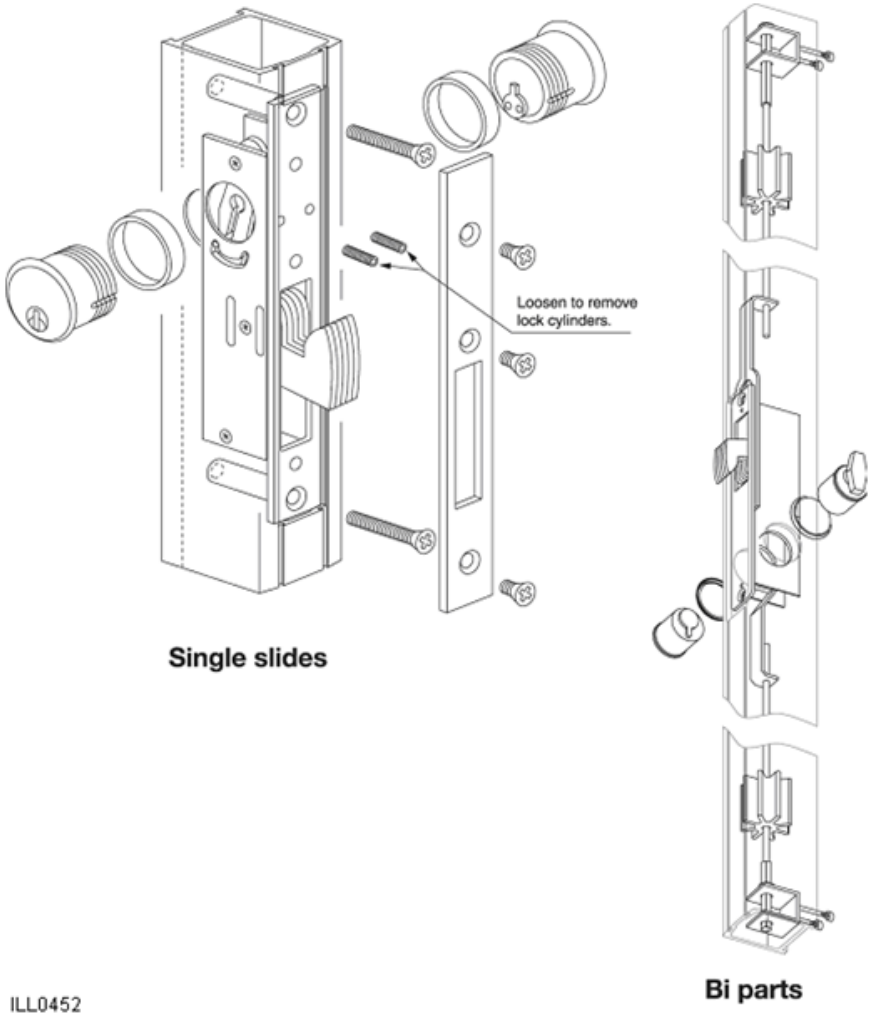


FSL Break-Out Switch Adjustment

Adjust the Break-Out Switch in the sidelite up or down so it is centered with the magnetic strip located in the top of the active panel.



Manual Lock System Adjustment and Re-Keying



10.5.3 Installing/Removing the Cover

In all instances, where work is being done, the area is to be secured from pedestrian traffic, and the power removed to prevent injury.

Cover latching can be achieved when the cover is in the full open position by pressing the cover toward the unit. (Usually when opening the cover, it will latch with little effort, making it appear to be an automatic function.)

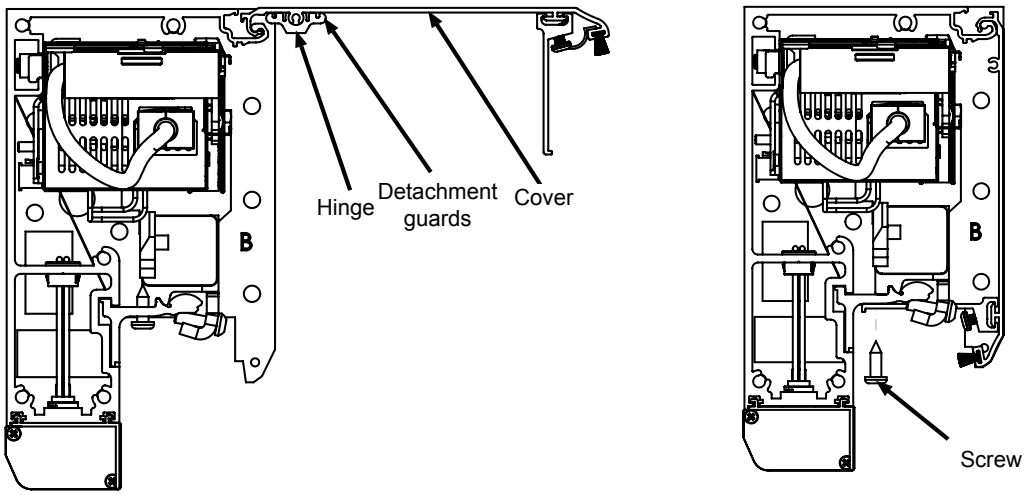
To unlatch the cover, lift slightly, pull and the cover will rotate downward, thereby allowing it to close.

To secure the cover, unlatch and close, then tighten the screws located in each end and/or the center, ensuring that they fall in the slots on the cover latches.

To fully remove the cover, start by uninstalling each detachment guard. Next, disconnect wiring coming from the sensors. Lift cover off of the hinge on the beam.

To install the cover, center the cover on the beam and mate the hinge portion of the cover to the beam. Install the detachment guards equally spaced down the length of the beam. Re-connect any wires that were disconnected.

Close and secure cover with screws, as shown below.



11 Electrical connections

Note: During any work with the electrical connections the **mains power** and the **electrical emergency unit must be disconnected**.

A suitable Lockout is required for OSHA regulation compliance and highly recommended for personal safety.

- 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.

Note: Permanent wiring shall be employed as required by local codes.

11.1 Installation

a Open the cover, see page 45.

b Install but do not connect activation units, presence sensors and accessories.

c Install and connect the mains cables, see page 47.

d Carry out Start-up, see page 55.

11.2 Mains connection

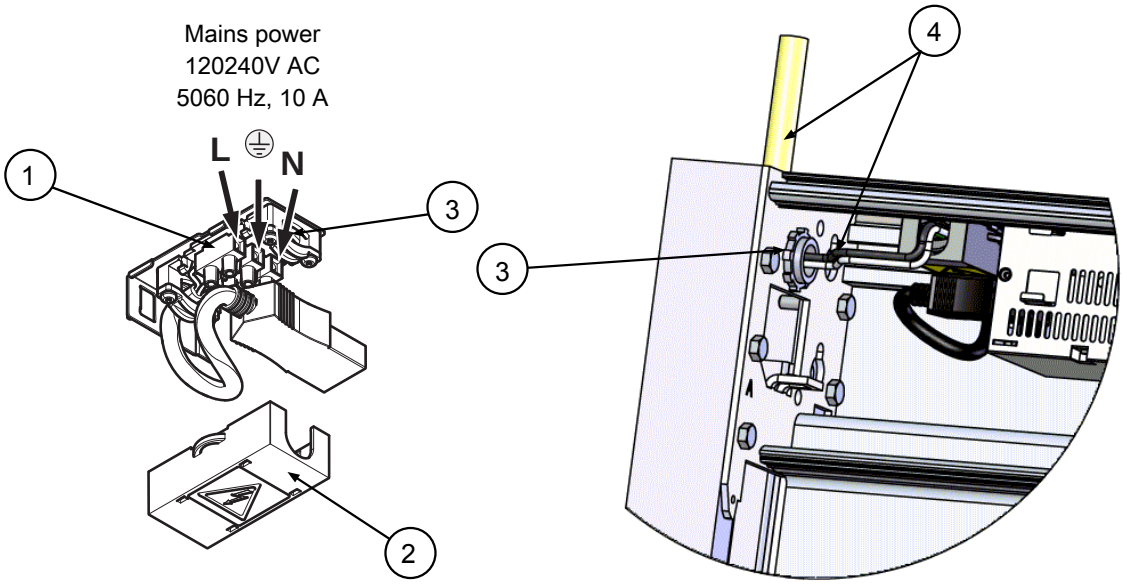
The incoming mains, which is a single phase 50/60 Hz AC voltage between 100 V -10% and 240 V +10% fuse 10 AT, is connected in the mains connection unit.

a Remove the protective lid (2).

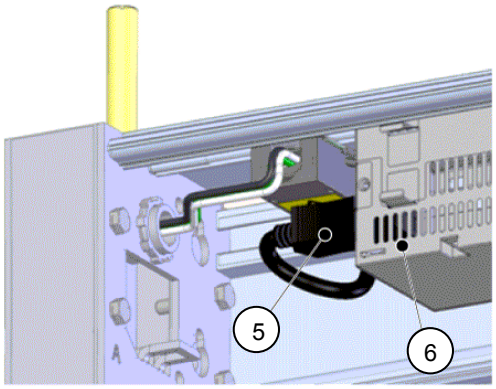
b Connect the incoming mains power (4) through the strain relief (3) to the connection block (1) as shown in the illustration below.

c Put the protective lid (2) back in place.

Installer must properly ground door package! Improper grounding can lead to risk of personal injury.



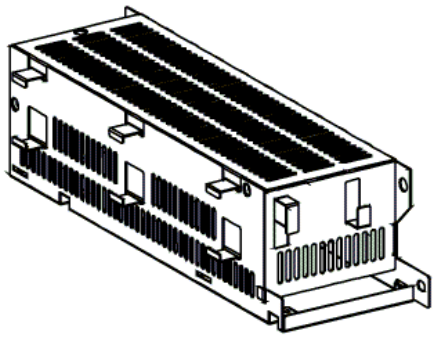
1 Mains connection block
2 Protective lid
3 Strain relief
4 Incoming mains power



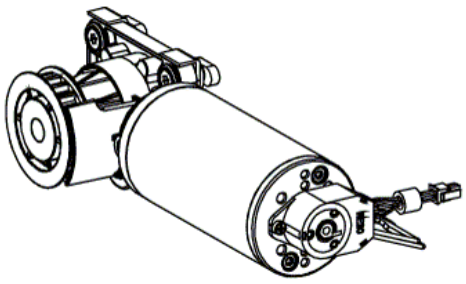
The mains connection (5) must remain isolated until the wiring is completed. Then connect to the supply unit (6).

11.3 Electrical units

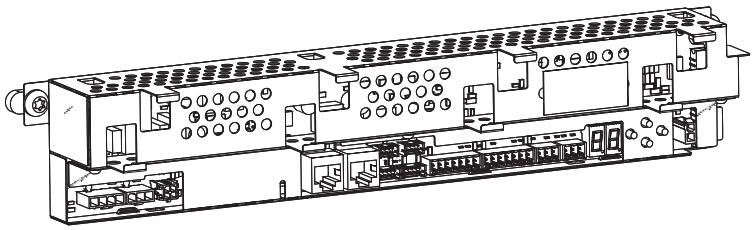
11.3.1 Power supply unit (PSU 150)



11.3.2 Drive unit



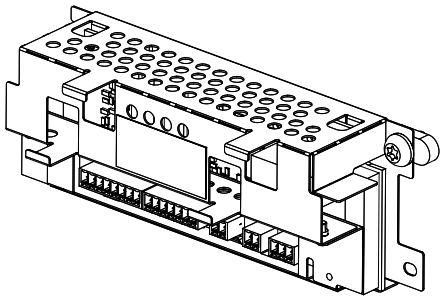
11.3.3 Main control unit (MCU)



The main control unit has the connection for the power supply, drive unit, operation mode selector, activation units, electromechanical lock and batteries. An installer interface with a two digit display and four push buttons is used for function selection, adjustments and for troubleshooting. See page 55 for details.

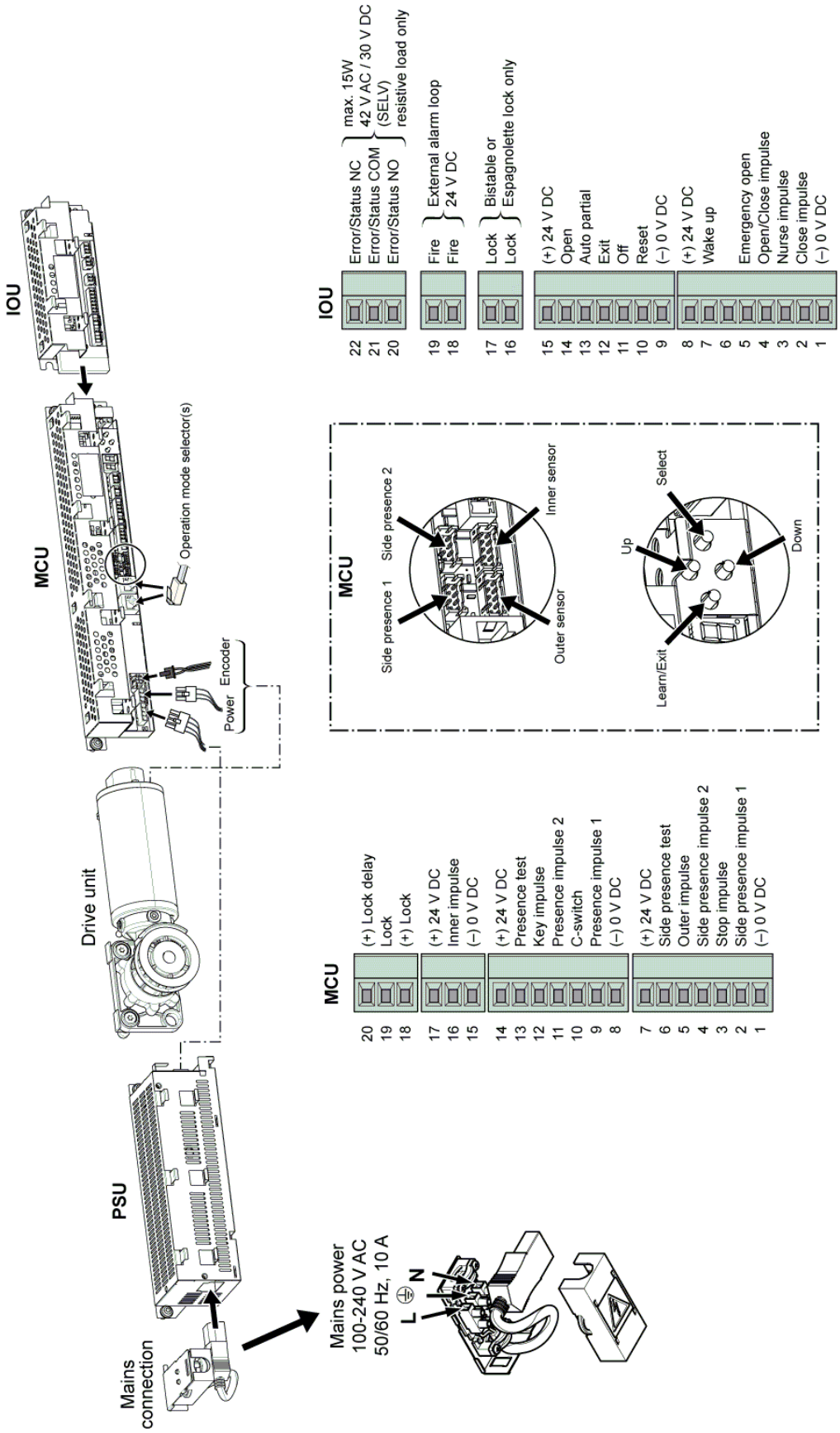
11.3.4 Additional electronic units can be connected for extra functionality

I/0 unit (IOU)



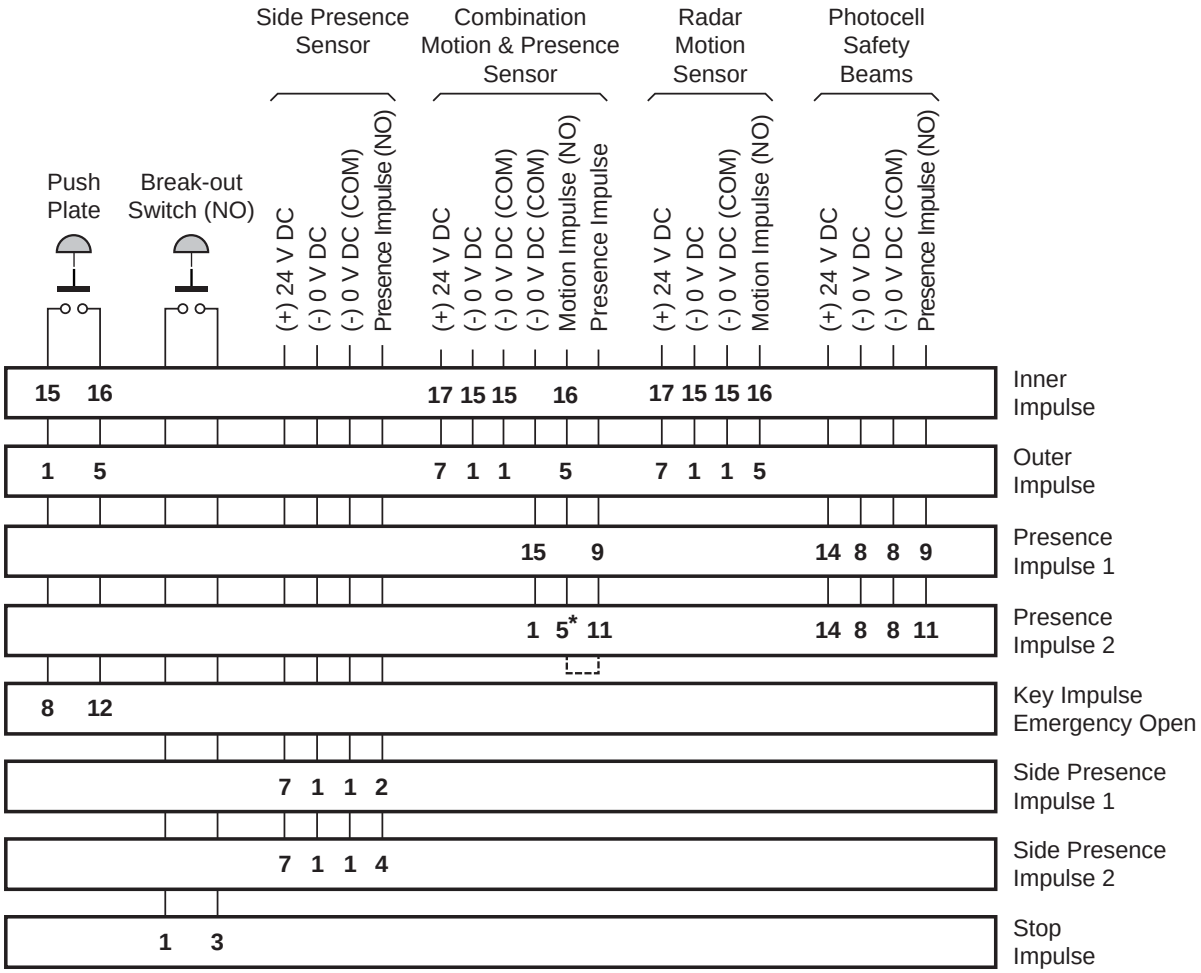
For extra functionality like Close impulse, Nurse impulse, Open/Close impulse, Emergency open impulse (fireman's opening), connection of optional operation mode selector and fire alarm an I/O unit is used. This unit has also a relay output for external error or status indication, maximum 15W, 42VAC / 30 VDC (SELV), resistive load only.

11.3.5 Connection of electrical units



11.3.6 Connection of activation units

See sensor manuals for mounting and adjustments. Protective device shall comply with EN 12978.

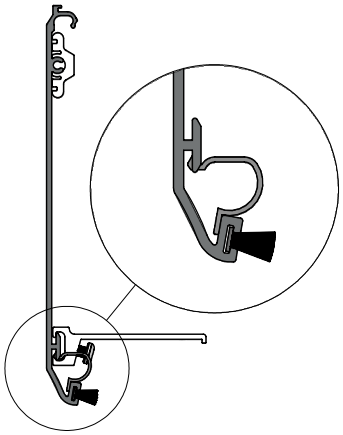


* One-way Traffic-Side, not intended for use, must have a jumper in place between Motion Signal Output (5) and Presence Impulse Input (11)

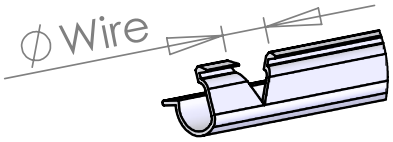
11.3.7 Cover sensor wire routing

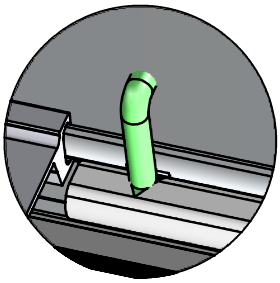
Once the sensor on the cover has been installed, protect the sensor wiring down the length of the cover using the cover clips provided.

a Space clips no further than 2" (50mm) apart.

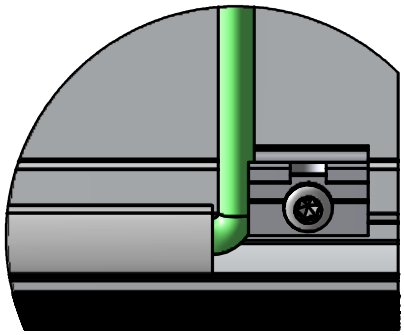


b Locate a clip as shown where the sensor wire comes through the cover. Cut a v-notch in this clip the same size of the wire approximately ½" (12mm) from the end and run the wire through this notch, then down through the clip. Ensure that the length of wire between this notch and where it comes out from the cover is tight and lies next to the cover.

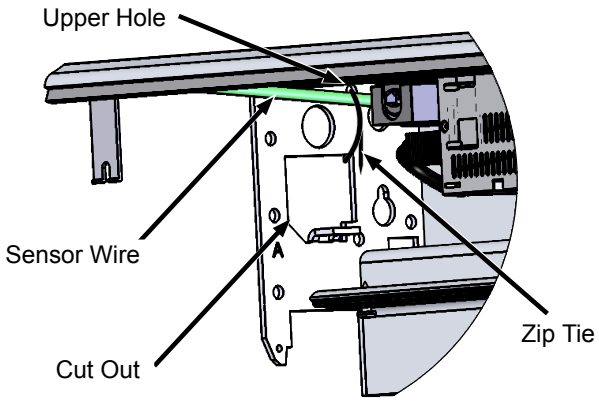




c Locate a clip as shown spaced approximately ¼" (6mm) away from the end cover latch and run the wire between this clip and the cover latch to the beam.



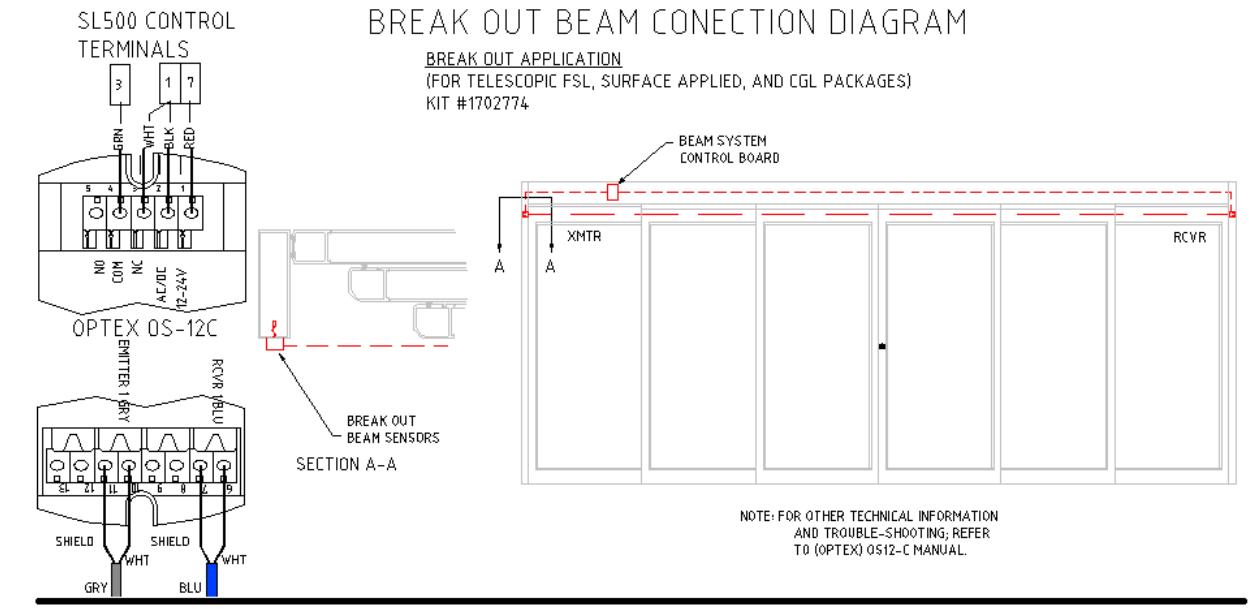
d Once the wire is ran into the beam, zip tie the wire to the jamb mounting plate as shown- through both the small, upper hole on the backside of the 7/8" (22mm) main power hole and the cutout.

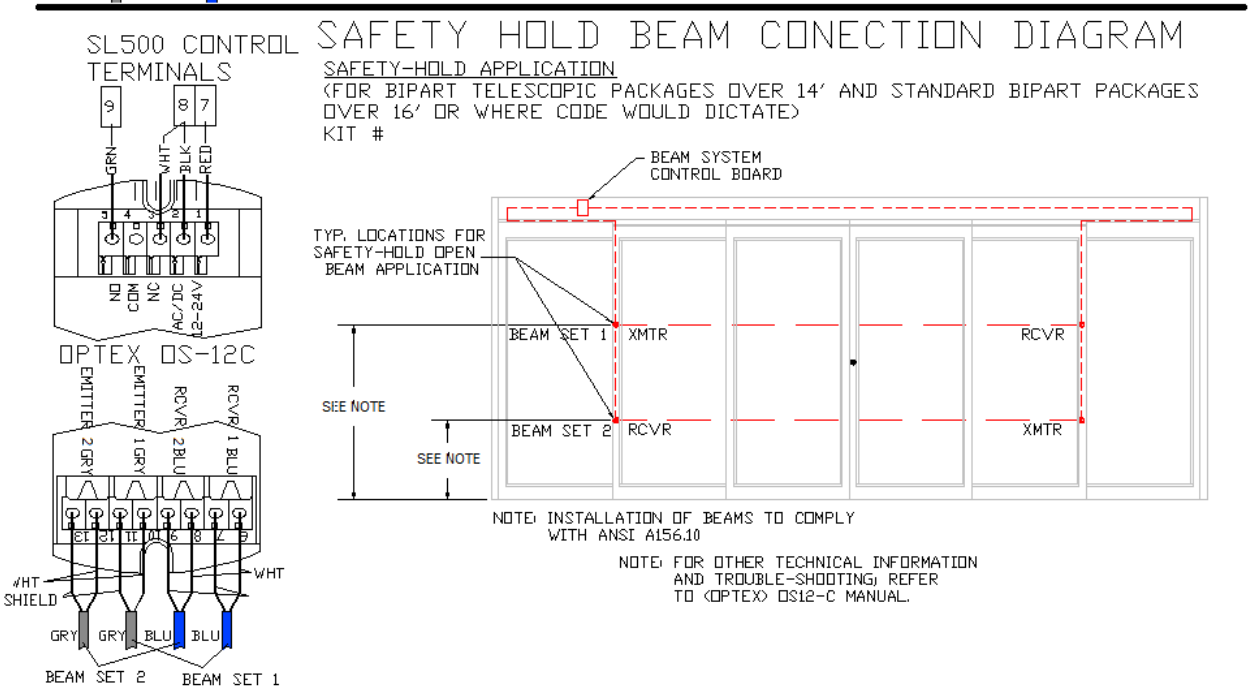


e Run the sensor wire to the main control along the back wall of the beam using the factory installed rectangular plastic cable holders.

f Close and open the cover and ensure that the wire does not come into the path of any moving parts.

12 Break Out/Safety – Hold Beam Connection Diagram





13 Start-Up

Start-up and adjustment must be carried out in the following order when the operator is installed.

a Connect the mains plug to the control unit.

b Push the learn button for 2 seconds before making any connection into the terminals. Release the learn button when there is a flashing "L" in the display.

c The learn cycle starts 2 seconds after the learn button is released.

d When the learn is finished the display can shown different parameters that could not be set automatically during the learn cycle. These parameters shall be entered by the installer. See page 57.

e Give a Push And Go and see that the door runs as expected.

f Disconnect the power and connect all accessories such as well adjusted sensors, breakout switches, lock and batteries.

g Connect the mains plug to the control unit.

h Check that the sensors are in standby mode, deactivated, and there is no traffic in the door opening.

i Push the Learn button and make a learn. In the second learn all the accessories and sensors shall be learned into the control unit.

j Check the door movement by giving an impulse on the operator.

k If necessary adjust the door speed parameters to the required speeds.

l Check that the installation complies with valid regulations and requirements from the authorities.

13.1 Adjustments and selection of special operating functions

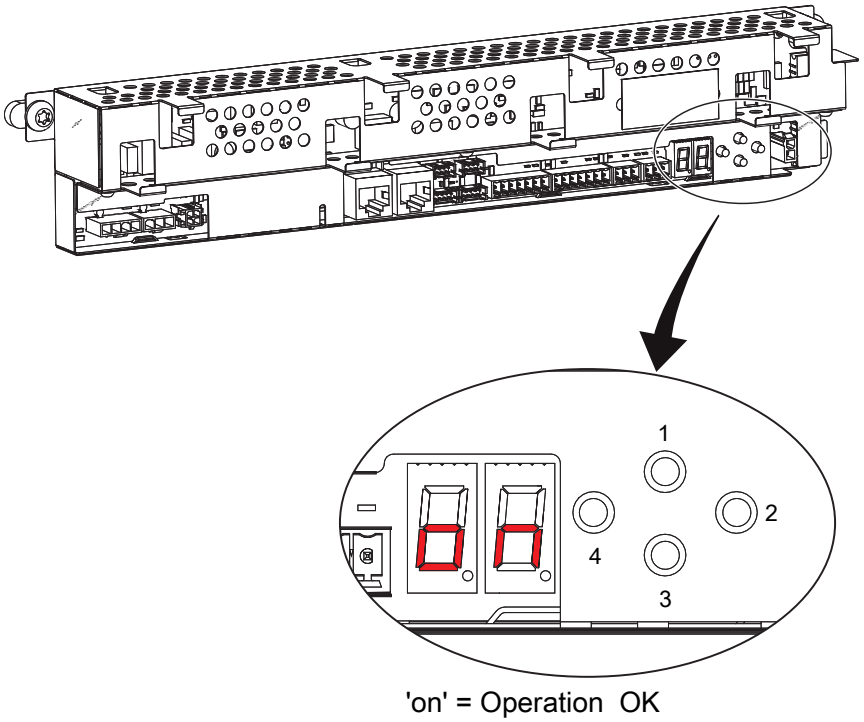
The main control unit has a two-digit display that shows text and/or digits. On the right side of the display are four push buttons. The display can show 4 different modes:

a Parameter mode. In Parameter mode the display shows parameters from 00 to C6. A parameter control different behavior in the operator.

b Value mode. In Value mode the display shows values from 00 - 99. A value sets how a parameter shall act.

c Error mode. Error mode shows what error group and error code that is active.

d Status mode. Status mode shows what impulses that are active in to the MCU.



1 Up (to step up in parameter or value menu)

2 Select (enters into parameter or value menu and program a value into memory)

3 Down (to step down in parameter or value menu)

4 Learn/Exit (Learn has 3 functions, 1 quick learn, 2 Normal learn, 3 default setting, Exit jumps out from value menu without saving or parameter menu)

Up and Down buttons steps between the different parameters or values.
Select steps from the standby mode into the parameter mode or steps from the parameter mode into the value change mode. In the value change mode, pushing Select, will program the selected value into the selected parameter and step back to the parameter mode.
Learn/Exit button initiate a learn of the control unit if the MCU is in the standby mode. Learn/Exit button will exit the value programming mode and enter the parameter mode without saving the value. Learn/Exit button will exit the parameter mode and enter the standby mode.

Fingers may be trapped by the belt transmission bracket. Set the operation mode selector (OMS) to OPEN before doing any configurations with the buttons.

Active error

E1 = flashing letter E followed by a digit displays an active error (1-9). The digit shows the main type of error. The display switches between this main error and a two digit number to specify the error.

If several errors are active they are displayed in a sequence. Errors are cleared by a RESET from the operation mode selector (OMS) or by turning off and on the mains power. For a detailed description of errors, see Troubleshooting on page 92.

13.2 The Learn function can be one of three different types

1 Push the Learn/Exit button for **more than one and less than two** seconds, then each connected electronic module is recognized.

2 Push the Learn/Exit button for **more than two seconds** and the display flashes L. A complete Learn cycle will start after 2 seconds when the Learn/Exit button is released. The complete learn cycle includes the learn in point no. 1.
The following accessories/parameters are automatically detected and set during the learn cycle.

Accessory/Parameter	Parameter number
Adjustment of closing speed according to ANSI/BHMA A156.10 standard.	02
Electromechanical lock and which type	05, 06, 98
Controlling of connected sensors output, NO/NC	07, 08, 27, 28, 46
If the sensors are monitored or not	09, 16, 29, 66, 91
Battery and battery size	41
Espagnolette lock parameters	43, 44, 90, 93
Measuring of clear opening width	59
Power supply type	64
Calculation of door weight	68
Calculation of friction in the system.	69
Second inner impulse	93

When the learn cycle has ended the door will stay closed. If there are some parameters that couldn't be configured automatically during the learn cycle the door will open. The display will show first a "P" and then what parameter that couldn't be auto configured, e.g. whether the door is bi-parting or single sliding (parameter 67 Door Type). These parameters has to be configured by the installer.

1 Push the right button, Select, to start editing parameters.

2 Push the Select button once again and the value of this parameter is shown while flashing.

3 Push the Up or Down buttons to select the right value.

4 Push the Select button to confirm and program the selected value.

5 Continue to configure the rest of the unlearned parameters.

6 Push the Learn/Exit button for more than two seconds and the display shows 'on'. After two seconds delay the door closes and is ready for operation or for further adjustments.

3 Push the Learn/Exit button for more than **ten seconds** and the operator returns to default factory set parameters. After 2 seconds the display starts to flash a L in the display after another 8 seconds the display goes back to what it showed before the start of the default setting.

13.3 Display test and configuring of parameters

a When the display shows "on", push the Select button and each of the two display windows make a rotating test pattern.

b Verify that all seven segments of the two display windows are lit during the test. If not there is a risk of misjudgment of the digits shown in a defective display.

c When the display test is finalized the display shows two steady digits indicating the first parameter.

d Push the Up or Down buttons to select the parameter to adjust.

e Push the Select button again to read out the shown value of the selected parameter. The value is shown as two flashing digits.

f Push the Up or Down buttons to adjust the value in the allowed range.

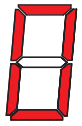
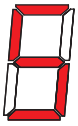
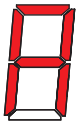
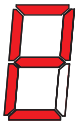
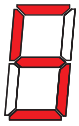
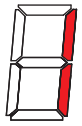
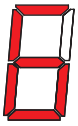
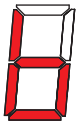
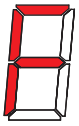
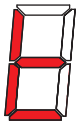
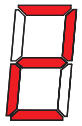
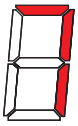
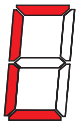
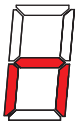
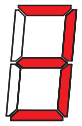
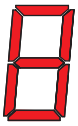
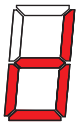
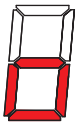
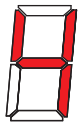
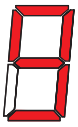
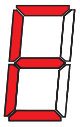
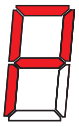
g When the correct value is selected push the Select button again and value will be programmed into the MCU memory.

h Push the Exit button once and leave value editing **without** making any changes.

i Push Exit button once again to leave parameter selection. The display shows '**on**'.
It is also possible to return to normal operation '**on**' by waiting three minutes without pushing any button.

Note: The value is programed into the MCU when pushing select regardless if the value is changed or not. When a value is programmed into the MCU that parameter is excluded from the learn cycle. If a new learn is made the programmed parameter will remain unchanged.

To have the parameters included in the learn cycle again you have to make a default setting of the MCU, (see above).

Display	Character	Display	Character	Display	Character	Display	Character	Display	Character
	0		5		A		e		S
	1		6		b		F		t
	2		7		C		n		
	3		8		d		o		
	4		9		E		P		

13.4 Status indication on the display

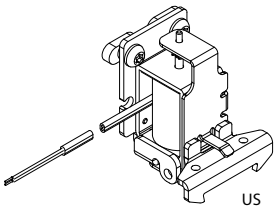
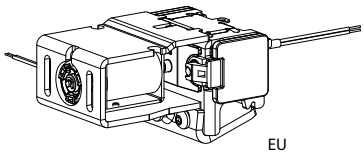
Select status indication by setting parameter 5E = 01.

The display shows the different impulses that are active. The status viewing starts with showing St as for Status, then one or many numbers representing the different active impulses in to the operator.

The different impulses are:

00 = Key impulse
01 = Inner impulse
02 = Outer Impulse
03 = Synchronisation impulse
04 = Interlock in impulse
05 = Presence impulse 1
06 = Presence impulse 2
07 = Side Presence impulse 1
08 = Side Presence impulse 2
09 = Stop impulse
10 = Emergency open impulse
13 = Close command
14 = Nurse impulse
24 = Push and Go impulse
25 = Open-Close impulse
28 = Fire impulse
47 = Interlock Disable

13.5 Description of parameters

Main control board parameters			
No.	**Parameter Name**	**Value (Default value)**	**Description**
00	High Speed Opening	(2.3 (70))	Sets the maximum opening speed. Unit cm/s.
01	Low Speed	(2.3 (70))	The low speed is self adjusting to optimal operation if this parameter is set to max. Depending on authority or installation requirements the low speed, low speed distance opening and/or closing can be further reduced. Unit cm/s
02	High Speed Closing	(0.43 (13))	Sets the maximum closing speed. Unit cm/s.
03	Hold Open Time	(02)	The general hold open time for Inner and Outer impulses. Unit seconds.
04	Key Hold Open Time	(07)	Hold open time for Key impulse. Unit seconds.
05	Lock Configuration (main control)	00-05 (00)	Europe = Low Energy locks Never LD in escape routes! LDP = locked **with** power (fail safe) LD = locked **without** power (fail secure)  US  EU
	No lock	00	No lock
	LDP	01	LDP = Locked with power. Only used with US lock.
	LD	02	LD = Locked without power. Only used with US lock.
	LDP LE	03	LDP LE = Locked with power low energy. Used with EU lock.
	LD LE	04	LD LE = Locked without power low energy. Used with EU lock.
	Not to be used	05	Not to be used
06	Lock release	00-01 (00)	If "Lock Release" is On, the door will apply force in the closing direction when the lock is unlocking. This is made to prevent a lock from being stuck in locked position when opening. Should be set to On when an electromechanical lock is installed.
	Off	00	
	On	01	
07	Presence Impulse 1 Configuration	00-01 (00)	This parameter determines if a presence impulse is normally open (NO) or normally closed (NC).
	NO	00	Normally open
	NC	01	Normally closed
08	Presence Impulse 2 Configuration	00-01 (00)	This parameter determines if a presence impulse is normally open (NO) or normally closed (NC).
	NO	00	Normally open
	NC	01	Normally closed

Main control board parameters			
No.	**Parameter Name**	**Value (Default value)**	**Description**
09	Presence Impulse Monitoring	00-02 units (00)	Presence impulse monitoring is a demand to be activated in escape routes according to EN 16005 or DIN 18650 if the door travels faster than adjusted according to PRA-0004.
	No monitoring of precense impulse	00	Set to “00” if no monitoring of Presence impulse sensors is required or if no presence impulse sensors are installed.
	Presence impulse 1	01	Set to “01” if one Presence impulse sensor shall be monitored (if only one sensor is used this sensor has to be connected to MCU TB:9, Presence impulse 1).
	Presence impulse 1 and 2	02	Set to “02” if two Presence impulse sensors shall be monitored.
10	Emergency Unit Monitoring	00-02 (00)	The emergency unit will be tested by shutting of the power to the MCU and open the door with the emergency unit. The test is never done in operation mode selection OPEN and normally not in OFF, if not parameter 37 “Emergency Action In OFF Mode”, is set to On, see below. Authorities can demand that the emergency unit is monitored on a regular basis, see parameter 40 “Emergency Unit Test Interval” below. Half an hour before this time has elapsed the following outer impulse generates an emergency opening test. If there is no outer impulse within the next half hour, the operator control unit generates the opening impulse by itself (“ghost impulse”). The test is also always performed after a Reset and after changing operation mode selection from a position where a test is not done to a position where the test is a demand.
	Off	00	
	Convenience Monitoring	01	(01) is a simpler one-channel monitoring, this can be done with both MCU and MCU-ER. Convenience monitoring can also be used when monitoring the Convenience battery parameter 38. It will only indicate empty battery.
	Redundant monitoring	02	(02) is a redundant two-channel monitoring that is a demand for escape route according to: EN 16005 or DIN 18650. The redundant two-channel monitoring requires the MCU-ER control unit.
11	Partial Open Position	00-99 % (70)	Sets the “winter opening” size. Note: Must be 99 (= 100%) in escape routes. Unit % of COW.
12	Opening Direction	00-01 (00)	When changing this parameter and "Emergency Unit Monitoring" parameter 10 = 02. Remember to also set the Escape jumpers right, see page 50.
	CW	00	
	CCW	01	The tension wheel lock can only work in one opening direction, CW and cannot be used in CCW.
13	Hold Force	00-60 N (0.0 (00))	Adjustment of the force used to keep the door in closed position (ND motor max 30 N, HD and DD motor max 60 N). Unit N.

Main control board parameters			
No.	**Parameter Name**	**Value (Default value)**	**Description**
15	Run Program	01-05(05)	Performance adjustment. Sets how fast or slow the door shall accelerate or break.
	Smooth	01	For light doors.
	Max Performance	05	For heavy doors.
16	Inner Impulse (motion) Monitoring	00-01 (00)	According to EN 16005 or DIN 18650 it is a demand to have Inner impulse monitoring = On in escape routes. When inner impulse monitoring is selected C-switch is disabled.
	Off	00	Disables monitoring
	On	01	Enables monitoring
17	Outer Impulse (motion) Monitoring	00-01 (00)	If the escape rout is in the direction of the outer sensor it is a demand to have outer impulse monitored according to EN 16005 or DIN 18650. When outer impulse monitoring is selected C-switch is disabled.
	Off	00	Disables monitoring
	On	01	Enables monitoring
20	Partial Hold Open Time	00-60 sec (02)	Hold open time for Inner & Outer impulses with operation mode selection PARTIAL and for the Nurse impulse. Unit seconds.
21	Push & Go Hold Open Time	00-60 sec (02)	Hold open time after a Push & Go. Unit seconds.
22	Auto Width Activation Time	00-60 sec (10)	Auto width activation time is available if parameter 61=01 "Auto Width" is selected. If the door has not closed during the auto width activation time and the door is open or opening the door will open to full open door. Unit seconds.
23	Auto Width Resume Time	00-60 sec (10)	When the door have been closed during the auto width resume time, the next opening impulse will open the door to partial open position. Only available if parameter "Auto Width" 61=01. Unit seconds.
24	Jam Hold Time	00-10 sec (02)	Sets how long time the door shall be stopped when a jam is detected during opening and also the time until the door can restart after a Stop impulse. Unit seconds.

Main control board parameters			
No.	**Parameter Name**	**Value (Default value)**	**Description**
25	Interlock Disable Time	00-60 sec (00)	The parameter controls the time that interlock is valid. Only active if "Interlock Function" parameter 6A = 01.
		00	If the time is set to 00, interlock is always active.
		01-60	The "Interlock Disable Time" starts to count down the moment a valid opening impulse is made on the first door. If the first door does not close during the "Interlock Disable Time" the second door is not interlocked any more and will also open. When both doors are closed Interlock Disable Time will be reset. Unit seconds.
26	Presence Hold Open Time	00-60 sec (02)	Hold open time for Presence impulses 1 & 2. At least 2 sec to meet ANSI demand. Unit seconds.
27	Side Presence Input 1 Configuration	00-01 (00)	Parity of side presence sensor.
	NO	00	Normally open
	NC	01	Normally closed
28	Side Presence Input 2 Configuration	00-01 (00)	Parity of side presence sensor.
	NO	00	Normally open
	NC	01	Normally closed
29	Side Presence Impulse monitoring	00-02 units (00)	
	No monitoring of Side Precense impulse	00	Set to “00” if no monitoring of Side Presence impulse sensors is required or if no Side Presence impulse sensors are installed.
	Side Presence impulse 1	01	Set to “01” if one Side Presence impulse sensor shall be monitored (if only one sensor, it has to be connected to MCU TB:2, Side Presence impulse 1).
	Side Presence impulse 1 and 2	02	Set to “02” if two Side Presence impulse sensors shall be monitored.
30	Side Presence Activation Distance	00-99 dm (0.0 (00))	
		00	If value 00 is selected an activated side presence impulse will slow down the door to safe speed during the entire door opening, from fully closed to fully open.
		01-99	01-99 dm is counted from open position. The side presence impulse can only be activated the last decimeters entered in this parameter. (This is an inhibit signal for side presence). In an escape route the door has to open to 80% within 3 sec. after an inner impulse. Unit dm.

Main control board parameters			
No.	**Parameter Name**	**Value (Default value)**	**Description**
31	Sensor Type	00-01 (01)	Select type of monitoring for the combined sensors. Choose between 1-wire (00) or 2-wire (01) monitoring.
	1-wire monitoring	00	1-wire monitoring, combined sensors have only one test input for monitoring for both presence and impulse field.
	2-wire monitoring	01	2-wire monitoring, the sensor has separate monitor inputs for both presence and impulse. When 2-wire monitoring is selected the C-Switch function is switched to inner/outer impulse monitoring if monitoring is selected, see parameter 16 and 17.
32	Active Brake on Stop	00-01 (01)	
	Off	00	The door will freewheel until it stops.
	On	01	The operator will brake the doors actively during 1 sec. on a Stop impulse.
33	Push & Go in EXIT Mode Selection	00-01 (00)	
	Off	00	Push & GO **is not** active in OFF and EXIT mode selection.
	On	01	Push & GO **is** active in OFF and EXIT mode selection.
34	Hold Force in EXIT and OFF Mode Selection	00-01 (00)	With an electromechanical lock this hold force can be unnecessary.
	Off	00	
	On	01	
35	Toggle Operation Mode Selector after Stop	00-01 (01)	In operation mode selection OFF the mode must be changed before normal operation after a Stop impulse.
	Off	00	
	On	01	
36	Emergency Action	00-01 (01)	Fire closing or Emergency opening.
	Closing	00	The door will **close** on fire impulse or power failure.
	Opening	01	The door will **open** on fire impulse or power failure.
37	Emergency Action in OFF Mode	00-01 (00)	Decides if "Emergency Action" shall be performed also in mode selection OFF (= opens also in the middle of the night).
	Off	00	
	On	01	
38	Convenience battery	00-01 (00)	When this parameter is set to On (01), with a 24V (UPS) battery the operator will continue its normal operation in case of mains power failure. Monitoring will be made if parameter 10 is set to Convenience Monitoring (01). Not approved in escape routes!
	Off	00	
	On	01	

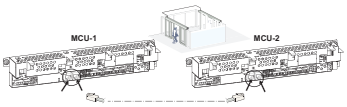
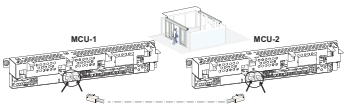
Main control board parameters			
No.	**Parameter Name**	**Value (Default value)**	**Description**
39	Battery Wake-up	00-01 (00)	The parameter controls how the door is acting on Key impulse or Battery wake up in mode selection OFF without mains power. The parameter "Emergency Action In OFF Mode" (37) must also be set to Off (00).
	Open	00	If "Battery Wakeup" is set to Open (39 = 00) the impulse is opening the door fully and stop there.
	Open/Close	01	If "Battery Wakeup" is set to Open/Close (01) and parameter "Emergency Action" (36) is set to Opening (01) the impulse is opening the door fully, remains open for the time set by parameter "Key Hold Open Time" (04) and will then close, lock and disconnect the battery.
3A	Lock Door After Fire Closing	00-02(00)	The parameter sets how the lock will react when a active fire closing impulse is activated.
	Follow Mode Selector	00	
	Always Unlock	01	
	Always Lock	02	
40	Emergency Unit Test Interval	04-23 hours (04)	The time set in this parameter controls the maximum time until the next automatic test of the emergency unit is performed. Unit hour.
41	Battery Type	00-02 (00)	What type of battery that is mounted in the operator is identified during the Learn.
	No battery	00	
	12V	01	After power failure, doors will either open once or close once.
	24V	02	After power failure, doors cycle open and closed until battery drains.
42	Remain Locked at Stop	00-01 (01)	The parameter sets how the lock shall act when Stop impulse is activated (for example break-out).
	Off	00	The locked door will be unlocked when Stop impulse is activated.
	On	01	The locked door remains locked when Stop impulse is activated.
43	Opening Delay For Lock	00-99 sec x 0.1 (00)	The time the opening is delayed (0.0-9.9 sec) after an opening impulse is given in operation mode selections OFF and EXIT. Unit s.
44	Exit Lock	00-01 (01)	This parameter controls the electro-mechanical lock in the operation mode selector setting EXIT.
	Off	00	The electromechanical lock **is not** locked in EXIT.
	On	01	The electromechanical lock **is** locked in EXIT.
45	Stop Function	00-01 (01)	When this parameter is set to On (01) the Stop impulse is enabled, otherwise it is disabled.
	Off	00	
	On	01	

Main control board parameters			
No.	**Parameter Name**	**Value (Default value)**	**Description**
46	Stop Configuration	00-01 (00)	Configuration of the Stop impulse. Choose between normally open (NO) or normally closed (NC) Stop impulse.
	NO	00	Normally open
	NC	01	Normally closed
47	C-Switch Configuration	00-01 (01)	Configuration of "C-Switch" (electronic limit switch) output, NO (00) or NC (01).
	NO	00	Normally open
	NC	01	Normally closed
48	C-Switch Activation Distance	00-99 dm (0.33 (01))	The C-Switch is an open collector output. The value in the parameter decides how far one door leaf shall travel from closed position before the c-switch change state. Unit dm.
49	Opening Max Force	02-19 N x10 (33.7 (15))	The force applied from the operator to the door leaf during opening. Unit N.
4A	Close Kick Force	00-19 N x10(42.7 (19))	The force applied from the operator to the door leaf during the close kick. Unit N.
50	Closing Max Force	02-19 N x10 (29.2 (13))	The force applied from the operator to the door leaf during closing. Unit N.
51	Push & Close	00-01 (00)	When this parameter is set to On (01) the motor will in operation mode selections OFF or EXIT try to close the door with the force selected by parameter 50 "Closing Max Force", if someone tries to open it manually. Push & Close is also known as "poor man's lock".
	Off	00	
	On	01	
52	Push & Close Timeout	00-99 sec x10 (60)	Adjustable time for how long time the door will continue to "fight back" when someone is trying to force it open. Unit s.
53	Operator Type	00-02 (00)	
	Slider	00	
	Prison Cell Door (PCD)	01	The operator is not available at the moment.
	UniTurn	02	When Besam SL500 is mounted in a Besam UniTurn.

Main control board parameters			
No.	**Parameter Name**	**Value (Default value)**	**Description**
54	Service needed Operating Hours	00-60 h x1000 (00)	Set time before yellow LED in operation mode selector will start flashing. To clear the service needed indication you have to push both up and down arrow on the MMI at the same time for 5 seconds when the display shows on. After 5 s the display will show SE during another 5 s, release the up and down buttons. While the display shows SE pres Select button and the counters Operating hours and Operating cycles will be set to zero. Unit hour X 1000.
55	Service Needed Opening Cycles	00-50 cycles x100.000 (00)	Set number of openings before yellow LED in operation mode selector will start flashing. To clear the service needed indication you have to push both up and down arrow on the MMI at the same time for 5 seconds when the display shows on. After 5 s the display will show SE during another 5 s, release the up and down buttons. While the display shows SE pres Select button and the counters Operating hours and Operating cycles will be set to zero. Unit cycles X 100.000.
56	Service Needed Locking Cycles	00-50 cycles x10.000 (00)	Set number of lockings before yellow LED in operation mode selector will start flashing. This parameter can not be zeroed by MMI interface. The parameter has to be increased to the next level of service interval. Unit cycles X 10.000.
57	Low Speed Distance, Opening	00-99 cm (3.9 (10))	“Creep speed” distance during opening. Unit cm.
58	Low Speed Distance, Closing	00-99 cm (3.9 (10))	“Creep speed” distance during closing. Unit cm.
59	Open Position	00-99 dm (9.8 (30))	Opening width of one door leaf. The parameter shall be set automatically by performing a Learn cycle. Unit dm.
5A	Uniturn jam detection distance	00-20 cm	The door will not reopen for jam detection during closing within the configured distance. Unit cm.
5B	Robbery function	00-01 (00)	Lock for robbery functionality is not yet available.
	Off	00	
	On	01	

Main control board parameters			
No.	**Parameter Name**	**Value (Default value)**	**Description**
5C	Pharmacy open 1 position	00-99 cm (50)	Lock for pharmacy functionality is not yet available. The door will open the configured distance when a Pharmacy impulse 1 is given. The distance is calculated on one door leaf. This parameter is active when parameter "Pharmacy Function" (9C) is set to On. Unit cm.
5D	Pharmacy open 2 position	00-99 cm (30)	Lock for pharmacy functionality is not yet available. The door will open the configured distance when a Pharmacy impulse 2 is given. The distance is calculated on one door leaf. This parameter is active when parameter "Pharmacy Function" (9C) is set to On. Unit cm.
5E	Status indication	00-01 (00)	The operator shows the status indication on the LED display of the MCU. See page 59 for more information.
	Off	00	
	On	01	
5F	Default programming	00-01	Default programming sets the parameters to the factory default values.
	Off	00	It is **not** possible to perform a default programming from the MMI.
	On	01	It is possible to perform a default programming from the MMI.
60	Learn	00-01 (01)	Sets the possibility to perform a learn cycle.
	Off	00	It is **not** possible to perform a learn cycle from MMI.
	On	01	It is possible to perform a learn cycle from MMI.
61	Auto Width	00-01 (01)	If this function is selected (01) and the operation mode selection is AUTO PARTIAL. the door will open from partial open width to full open width, if an opening impulse is given and the door has not closed during the time selected in parameter 22 “Auto Width Activation Time”. Must **not** be used in escape routes.
	Off	00	Partial Open.
	On	01	Auto Width.
62	Partial Function	00-01 (00)	With this function the door can be selected to be partially opened or partially closed (see below 63 “Partial Closed Position”).
	Opened	00	Partial Open or Auto Width.
	Closed	01	Partial Closed Position, (Auto Airing).

Main control board parameters			
No.	**Parameter Name**	**Value (Default value)**	**Description**
63	Partial Closed Position	00-30 cm (11.8 (03))	"Partial closed position" (Auto airing function) can be obtained by selecting "Partial Function" (62) Closed (01). An airing position of the door can be set between 0-30 cm measured from the closed position on one door leaf. The operation mode selector is to be set to AUTO PARTIAL and the closed position of the doors will then be the "Partial Closed Position" . Unit cm.
64	Power Supply Type	00-02 (01)	50 / 150 / 75 W power supply depending on desired performance and installed power supply.
	50W	00	
	150W	01	
	75W	02	
65	Sustainable Drive Mode	00-01 (00)	The electromechanical lock will never lock in Exit mode selection even if parameter 44 is set to On (01). The (+) 24 V DC to accessories like sensors is turned off when the mode selector is in Off and the door is closed. Motor power is limited to 75 W even if parameter 71 is set to a higher value.
	Off	00	
	On	01	
66	Stop Impulse Monitoring	00-01 (00)	Monitoring enables (01) or disables (00) monitoring of the Stop impulse. Stop impulse is not allowed in escape route, unless break out system is used.
	Off	00	
	On	01	
67	Door Type	00-01 (00)	To be able to adapt closing speeds according to UL regulation door type has to be selected.
	Single sliding	00	
	Biparting	01	
68	Door weight	01-40 kg x10 (882 (40))	Will be estimated during the Learn but can also be altered manually. Unit kg x 10.
69	Friction	00-99 N (0.0 (00))	The friction when moving the door is automatically measured during a Learn. The friction for the different performance levels are: Standard not more than 30N. High not more than 50N. Exceptional not more than 70N. Unit N.

Main control board parameters			
No.	**Parameter Name**	**Value (Default value)**	**Description**
6A	Interlock Function	00-01 (00)	Interconnection cable or IOU needed. Interconnection of operators  Maximum cable length 500 m. Length over 30 m, use a straight-through shielded twisted pair (STP/FTP) cable.
	Off	00	
	On	01	
6b	Synchronizing Function	00-01 (00)	Interconnection cable needed. Interconnection of operators  Maximum cable length 500 m. Length over 30 m, use a straight-through shielded twisted pair (STP/FTP) cable.
	Off	00	
	On	01	
6C	External Bus Device ID	01-99 (01)	In a chain of interconnected operators one of them has to be the **main** operator. This operator shall have the value 01. Up to two operation mode selectors can be connected to the chain of interconnected operators. Both of the operation mode selectors are configured in the **main** MCU. All other interconnected operators shall have different values in this parameter. This to make every operator unique.
6d	Extended Hold Open Time Function	00-01 (00)	+ 5 sec. hold open time on doors often reopening during closing.
	Off	00	
	On	01	
6E	MMI access code	00-01 (01)	If this parameter is set to single push (00) the parameters are not locked and when set to the four pushes code (01) the possibility to adjust parameters call for a special enabling code (select, learn/exit, learn/exit, select) before altering parameters into the MCU / MCU-ER will be possible.
	One push	00	
	Four pushes	01	
6F	MCU-OMS group	01-10 (00)	This parameter groups MCU with OMS. Units with the same value are in the same group. Units in the same group listens to each other.

Motor control parameters			
No.	**Parameter Name**	**Value**	**Description**
70	Motor Type	00-01 (01) (01)	Depending on desired performance.
	Normal Duty	00	
	Heavy Duty	01	
71	Max Motor Power	03-15 W x10 (15)	The max amount of power the motor can be supplied with. Max motor power will not deliver more power to the motor then parameter (64) "Power supply type" is put to. Unit W x 10.
72	Motor Overtemperature Recovery Value	95	Do not alter, shall always be 95! For authority use only.

I/O Board parameters			
No.	**Parameter Name**	**Value**	**Description**
90	Function Select IOU-TB:3	00-03 (01)	
	No function	00	
	Nurse function	01	The door will open to partial opening in operation mode selections EXIT, AUTO and AUTO PARTIAL.
	LDE up	02	Espagnolette lock. Sets input to LDE lock up.
	Interlock out	03	When configuring for interlock also set parameter 6A = 01
91	Function Select IOU-TB:4	00-04 (01)	
	No function	00	
	Open/Close Function	01	One impulse opens the door the next impulse closes the door. Available in OMS mode EXIT, AUTO, PARTIAL.
	Interlock disable function	02	Disables interlock, both doors can be open at the same time.
	Sensor test output	03	Sets inner impulse monitoring for the second inner impulse on the IO unit. Set also parameter 93 = 3.
	Interlock in	04	When configuring for interlock also set parameter 6A = 01.
92	Open/Close Timeout	00-60 min (00)	The time set in this parameter controls when a door shall start closing automatically if left open by an Open/Close impulse. 00 min = no automatic closing. Unit minutes.
93	Function Select IOU-TB:2	00-03 (01)	
	No function	00	
	Close function	01	Close impulse is selected. This impulse will immediately close the door, even during opening, and remain closed as long as the Close impulse is active. The electro-mechanical lock will lock the closed door. Parameter “Inner Impulse Monitoring” must **not** be set to On to prevent unintended closing of an escape route door.
	LDE down	02	Espagnolette lock. Sets input to LDE lock down.
	Inner impulse	03	When two inner impulses are to be used. Sets input to inner impulse 2.
94	Fire Impulse Function	00-01 (00)	Depending on configuration in Emergency Action (36), the door will open or close on fire impulse. Fire impulse override presence impulse. At closing, the door will not reopen on jam.
	Off	00	Fire impulse disabled.
	On	01	Fire impulse enabled.
95	Emergency Open Impulse Function	00-01 (01)	Fireman’s opening.
	Off	00	
	On	01	
96	Emergency Open Impulse Configuration	00-01 (00)	Configures the button used for Fireman’s opening.
	NO	00	Normally open
	NC	01	Normally closed

I/O Board parameters			
No.	**Parameter Name**	**Value**	**Description**
97	Operation Mode Selector Function	00-01 (00)	Switch / timer / relay / "old" operation mode selector (5-wire).
	Off	00	
	On	01	
98	Lock Configuration	00-03 (00)	LDB = locked with power and bistable, LDE = espagnolette lock. Both can be used as **night lock** of escape routes.
	No lock	00	No lock
	Bi-stable lock	01	LDB = locked with power and bistable
	Espagnolette lock	02	LDE = espagnolette lock
	Bi-stable lock UniSlide	03	LDB = locked with power and bistable
	Not to be used	04	Not to be used
99	Function Select IOU-TB:6	00-02 (01)	Possibility to disable Sustainable drive mode or to disable Mode Selector with this function through I/O board pin 6.
	No function	00	
	Sustainable Disable	01	Disables Sustainable drive mode. It is possible to disable sustainable drive mode. As long as TB:6 is active the operator will run with full power.
	Mode Selector Disable	02	Disables Mode Selector. When parameter is set to value 02 the OMS is locked. IOU and PSK-6U are not affected. If an impulse is given on IOU TB:6 the indication LED on OMS will be steady red during 15 seconds and it is possible to change mode selection.
9A	Priority of the I/O operation mode selector	25-99(30)	The lower the number is the higher the priority.
9B	Choose group of the I/O operation mode selector	00-10(01)	This controls which MCU that looks at which OMS. It is possible to group different OMS to different MCU. MCU and OMS with same group number listens to each other. If value 00 is selected the IOU mode selector controls all operators.
9C	Pharmacy function	00-01(00)	Lock for pharmacy functionality is not yet available.
	Off	00	
	On	01	

Escape route parameters			
No.	**Parameter Name**	**Value**	**Description**
A0	Escape Route Motor Configuration	01-02 (01)	Single motor or double motor depending on authority demand.
	1-motor	01	
	2-motor	02	

Operation mode selector parameters			
No.	**Parameter Name**	**Value**	**Description**
b0	Operation Mode Selector Variant, OMS-1	01-04 (04)	Europe = 5 buttons (04).
	3 buttons with EXIT	01	
	3 buttons with AUTO	02	
	4 buttons	03	
	5 buttons	04	
b1	Operation Mode Selector Key Lock, OMS-1	00-02 (00)	Four pushes = $^{A}_{SS}A$. Parameters configured automatically by the operator are locked when changed through the MMI. These parameters will not be changed with a new learn cycle. Three different access code choices for operation mode selector: The default access (01) is obtained by pushing an arrow symbol pointing up or down for 2 seconds. An optional access code (02) can be selected where the access is obtained by briefly pushing in turn the arrow up symbol, followed by the arrow down symbol, followed by the arrow down symbol again and at last the arrow up. The entire code must be entered within 3 seconds. No access code (00).
	Off	00	
	Hold for two sec	01	
	Four pushes	02	
b2	Operation Mode Selector Service Indication, OMS-1	00-01 (01)	Yellow flashing service LED. Service indication on operation mode selector. No service indication (00). Indicate service (01).
	Off	00	
	On	01	
b3	Choose Priority of the operation mode selector, OMS-1	25-99 (40)	The lower the number the higher the priority.
b4	Choose group of the operation mode selector, OMS-1	00-10 (01)	This controls which MCU that looks at which OMS. It is possible to group different OMS to different MCU. MCU and OMS with same group number listens to each other. If a OMS is set to 0 this OMS controls all operators that is connected in that loop.
b5	Choose display mode of the operation mode selector, OMS-1.	00-01 (01)	In Show local mode the OMS shows the last setting made on the OMS. In Show system mode the OMS shows the setting that the operator is put to. It is shown with one flach every 5 s. When the OMS is flashing every 5 s it is not possible to change the mode on the OMS.
	Show system mode	00	
	Show local mode	01	

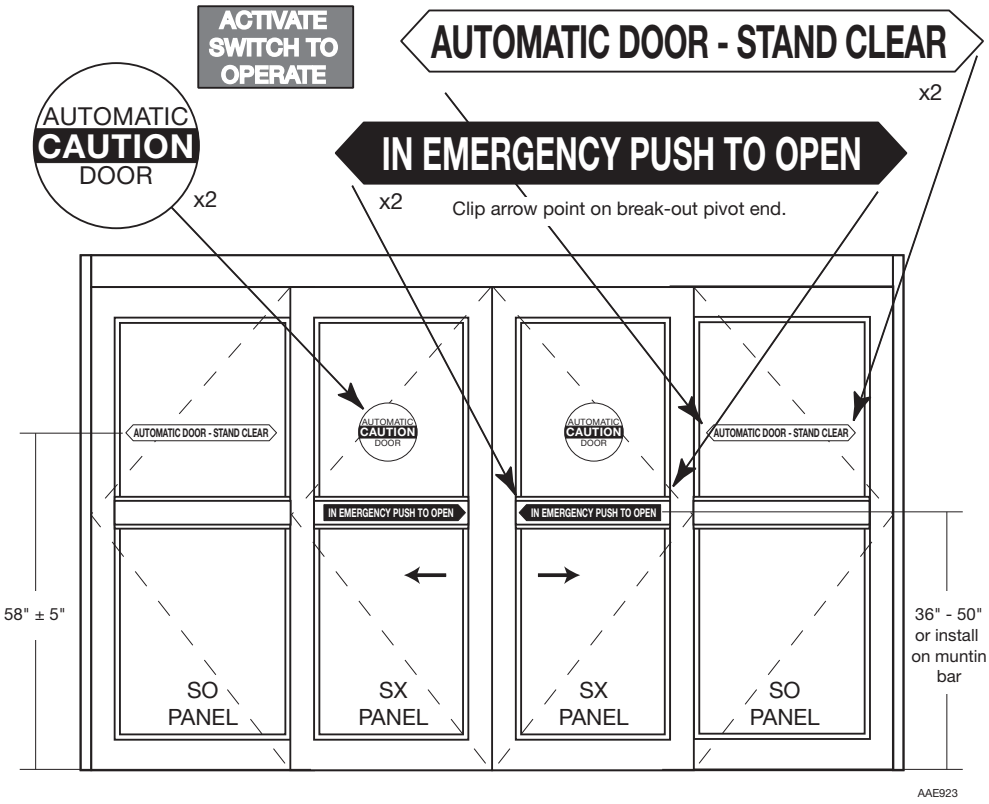
Operation mode selector parameters			
No.	**Parameter Name**	**Value**	**Description**
b6	Choose Terminal mode of the operation mode selector, OMS-1	00-02 (02)	
	The buttons on OMS are disabled	00	
	The OMS-1 adapts to system mode	01	
	The OMS-1 is setting the operation mode	02	
b7	Mode Selector, Self Service Indication, OMS-1	00-01 (01)	Orange flashing service LED. Self service indication on operation mode selector.
	Off	00	No self service indication.
	On	01	Indicate self service.
b8	Mode Selector, Key Impulse, OMS-1	00-02	
	Disabled	00	Disables the possibility to give key impulse.
	Login Required	01	Login required on the OMS to enable the possibility to give key impulse.
	Enabled	02	Enables the possibility to give key impulse.
C0	Operation Mode Selector Variant, OMS-2	01-04 (04)	Europe = 5 buttons(04).
	3 buttons with EXIT	01	
	3 buttons with AUTO	02	
	4 buttons	03	
	5 buttons	04	
C1	Operation Mode Selector Key Lock, OMS-2	00-02 (00)	Four pushes = $^{A}_{SS}{}^{A}$. Parameters configured automatically by the operator are locked when changed through the MMI. These parameters will not be changed with a new learn cycle. Three different access code choices for operation mode selector: The default access (01) is obtained by pushing an arrow symbol pointing up or down for 2 seconds. An optional access code (02) can be selected where the access is obtained by briefly pushing in turn the arrow up symbol, followed by the arrow down symbol, followed by the arrow down symbol again and at last the arrow up. The entire code must be entered within 3 seconds. No access code (00).
	Off	00	
	Hold for two sec	01	
	Four pushes	02	
C2	Operation Mode Selector Service Indication, OMS-2	00-01 (01)	Yellow flashing service LED. Service indication on operation mode selector. No service indication (00). Indicate service (01).
	Off	00	
	On	01	

Operation mode selector parameters			
No.	**Parameter Name**	**Value**	**Description**
C3	Choose Priority of the operation mode selector, OMS-2	25-99 (40)	Selectable between 25 - 99 The lower the number the higher the priority.
C4	Choose group of the operation mode selector, OMS-2	00-10 (01)	Selectable between 00 - 10 This controls which MCU that looks at which OMS. It is possible to group different OMS to different MCU. MCU and OMS with same group number listens to each other. If a OMS is set to 0 this OMS controls all operators that is connected in that loop.
C5	Choose display mode of the operation mode selector, OMS-2.	00-01 (01)	In Show local mode the OMS shows the last setting made on the OMS. In Show system mode the OMS shows the setting that the operator is put to. It is shown with one flach every 5 s. When the OMS is flashing every 5 s it is not possible to change the mode on the OMS.
	Show system mode	00	
	Show local mode	01	
C6	Choose Terminal mode of the operation mode selector, OMS-2	00-02 (02)	
	The buttons on OMS-2 are disabled	00	
	The OMS-2 adapts to system mode	01	
	The OMS-2 is setting the operation mode	02	
C7	Mode Selector, Self Service Indication, OMS-2	00-01 (01)	Orange flashing service LED. Self service indication on operation mode selector.
	Off	00	No self service indication.
	On	01	Indicate self service.
C8	Mode Selector, Key Impulse, OMS-2	00-02	
	Disabled	00	Disables the possibility to give key impulse.
	Login Required	01	Login required on the OMS to enable the possibility to give key impulse.
	Enabled	02	Enables the possibility to give key impulse.

14 Signage

ANSI/BHMA standard 156.10 and ASSA ABLOY Entrance Systems standards specify that caution signs must be affixed to both sides of any power operated pedestrian door. With double doors, signs should be applied to each door. Sliding doors with swinging (Break-out leaves) shall be provided with signs reading “IN EMERGENCY PUSH TO OPEN”. The signs shall have red backgrounds with contrasting letters one-inch high minimum. The signs shall read horizontally and be located adjacent to the lockstile on a centerline 36 inches minimum and 60 inches maximum from the floor, applied to the side appropriate for egress. ANSI/BHMA A156.10. In addition, the sign “AUTOMATIC DOOR” with letters 1/2” high minimum will be applied to the door, visible from both sides. If switch activated, use “AUTOMATIC DOOR - ACTIVATE SWITCH TO OPERATE”.

Note: The kit decals are double-sided and normally will only need to be applied to one side of a clear glass door. If the decals are not clearly visible on the other side due to the condition of the glass (e.g., tinted or textured glass), the decals should be placed on both sides.



Check that all required signage is applied and intact. Mandatory indicates that the signage is required by European directives and equivalent national legislation outside the European Union.

15 Accessories

15.1 Interconnection cable

Interconnection cable is used for controlling several operators with one or more operation mode selectors (OMS) and for interlocking or synchronization.

Operators can communicate with each other by connecting an interconnection cable between the operators.

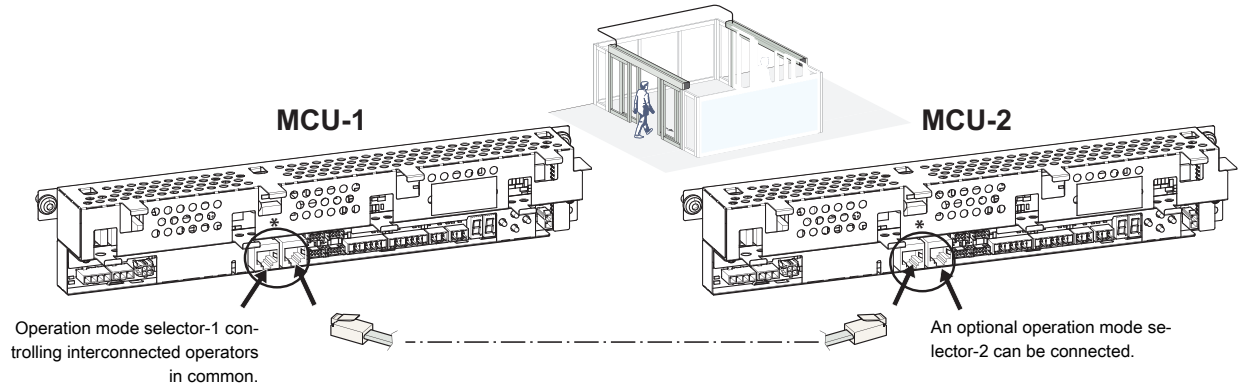
Cable connection:

Pin 1 to pin 1

.....

.....

Pin 8 to pin 8



15.2 Program selectors

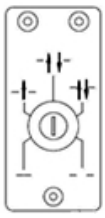
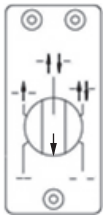
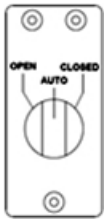
15.2.1 Program Selectors and Functions

The functions of the door are selected with mechanical or key Program Selectors:

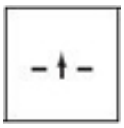
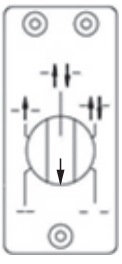
a 5 Position with Key uses 1/2" spacer or can be surface mounted

b 5 Position Mechanical Switch, flush or surface mounted.

c 3 Position Mechanical Switch, flush or surface mounted.

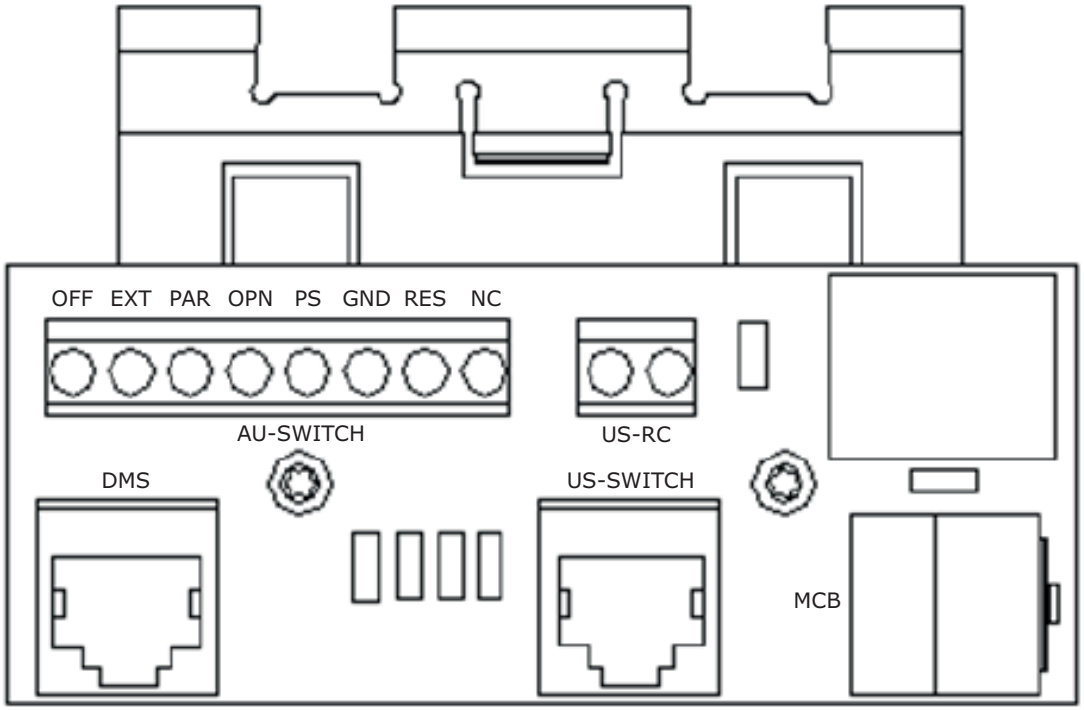
5 Pos Switch (Key)	5 Pos Knob Switch	3 Pos Knob Switch
		

Program Selector Functions

	OFF (Closed)	The inner and outer activation units are disconnected. The door is locked if an electro-mechanical locking device has been installed. The door can be opened with an emergency push-button/key switch (if installed).
	EXIT (One Way Traffic)	Passage through doorway from one side only. The door is locked if an electro-mechanical locking device has been attached. The door can be opened with an activation to INNER IMPULSE 2 or KEY IMPULSE 6.
	*AUTO	Two-way traffic, normal operation of the door. The door can be opened with the inner and outer activation units and with an emergency push-button/key switch (if installed).
	AUTO partial	Two-way traffic. The door can be opened partially with the inner and outer activation units and with an emergency push-button/key switch (if installed).
	OPEN	The door is permanently held open.
	RESET	Momentarily (5 seconds), set the Program Selector as shown and then place at "AUTO" or "OFF" position. The operator makes a system test of the battery, electro-mechanical lock, watchdog relay and closed position. It also reads FS switch settings, CSW distance and Time Delay. After closing, the operator is reset and ready for normal operation again.

* 3-pos switch is selectable between AUTO and EXIT functionality at the AUTO position by removing the jumper on the back side of the switch.

15.3 Accessory board



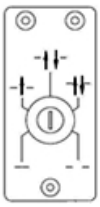
The labelling on the accessory board is as follows:

DMS	Digital Mode Selector
US-SWITCH	Knob/Key Switch
MCB	Main Control Board
AU-SWITCH	Auxillary Switch
US-RC	Remote Control/Night Mode [1]
OFF	Off (makes dorrs inactive)
EXT	Exit only (1 Way traffic)
PAR	Partial Opening
OPN	Open (Keeps doors open)
PS	Program selector including resistor
GND	Ground
RES	Reset (Resets package)
NC	Not Connected

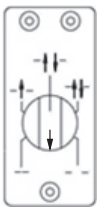
1 **Note:** Remote Control/Night Mode, requires a normally open dry contact. The circuit must be closed for Night Mode.

15.4 Program selector options

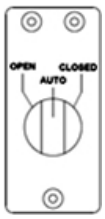
Pro gram Selectors



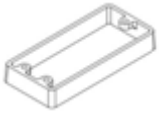
5 Pos Switch (Key)
US15-1500-06



5 Pos Knob Switch
US15-1500-04

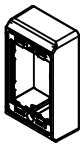


3 Pos Knob Switch
US15-1500-05

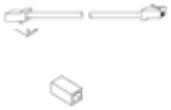


Spacer
US15-1500-03 Spacer Kit, Switch also part of Kit
US15-1500-06 5 Pos Key Sw Kit

Vinyl Decal
US24-1500-51 Vinyl Decal, obtained with kits
US15-1500-04 (5 Pos Knob Sw Kit) and US15-1500-06 (5 Pos Key Sw Kit)

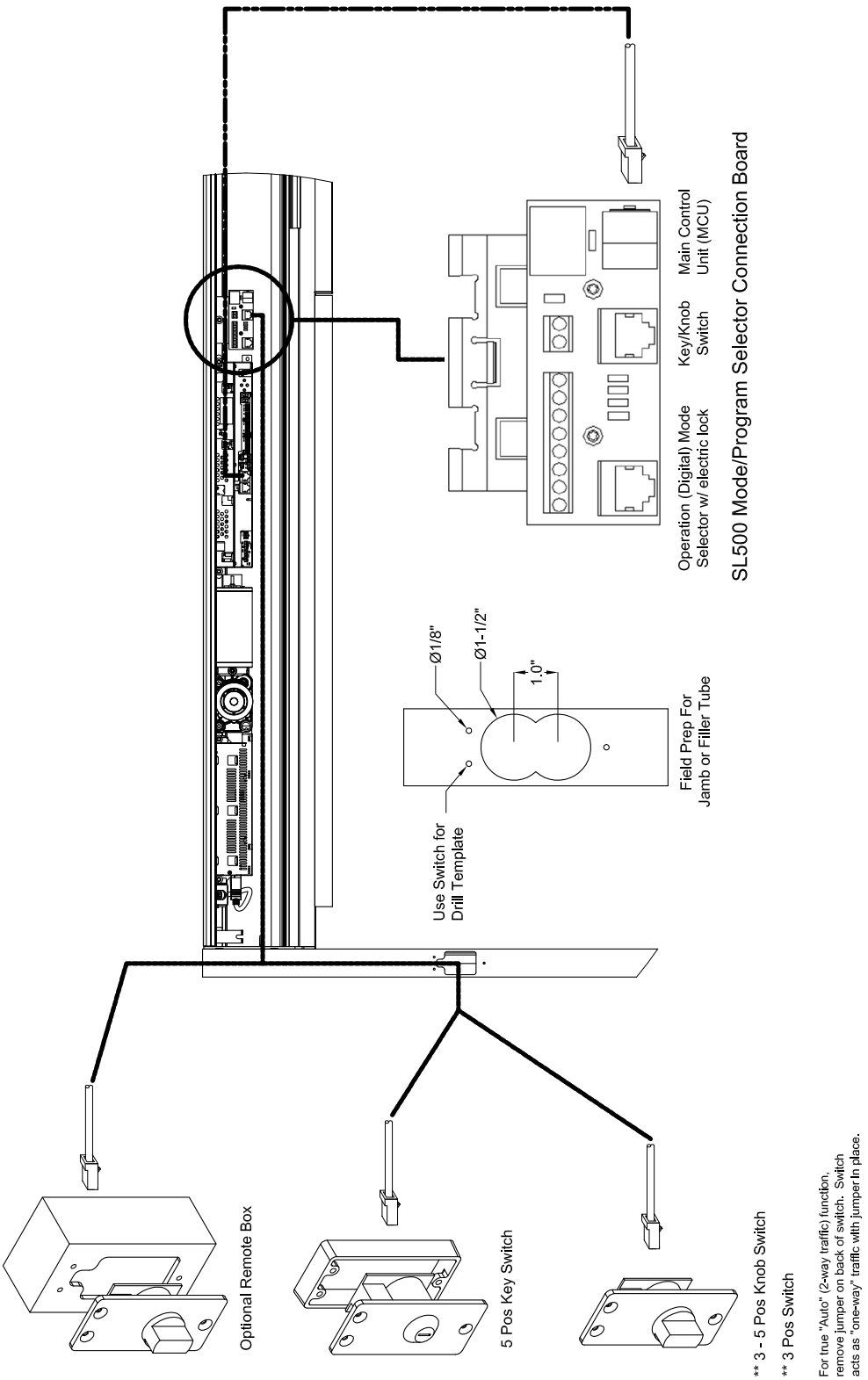


Optional Remote Box
US15-1500-07 Remote Switch Box Kit, also contains
US15-1500-02 PS Extension Kit (8ft Cable RJ45 & Cable Coupler)



PS Extension Kit
US15-1500-02 PS Extension Kit (8ft Cable RJ45 & Cable Coupler)

15.5 Connection of program selectors

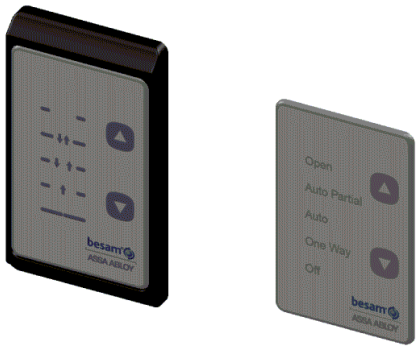
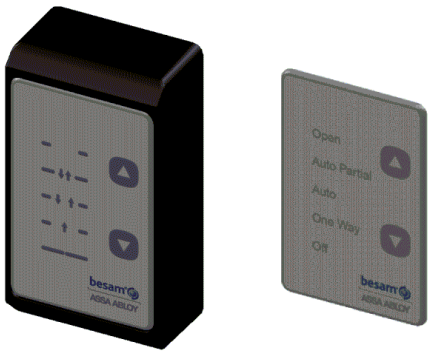
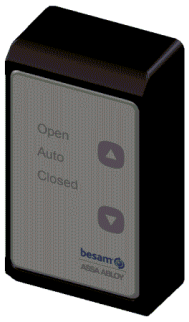


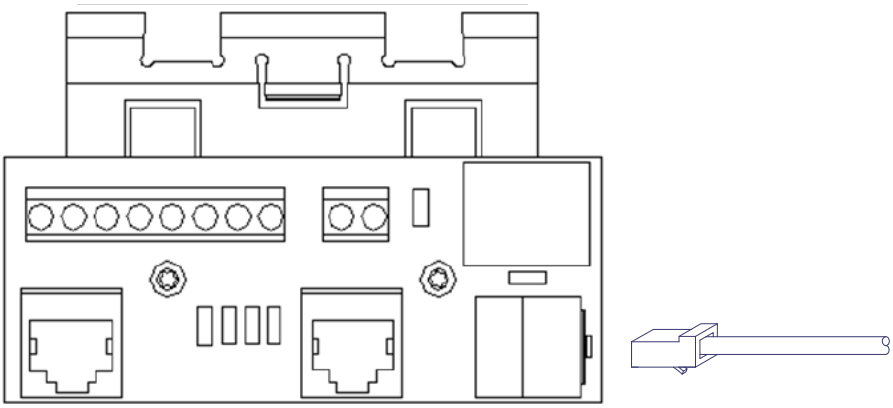
15.6 Operation mode selectors (OMS)

15.6.1 Types

A narrow version with measurements WxH 1 9/16"x 1 3/16" (40x80 mm), with either 5 or 3 buttons are available.

The operation mode selectors can be flush mounted in profiles or in electrical wall boxes. The operation mode selectors can also be installed surface applied in wall boxes.

Flush mounted	Surface mounted
	
	



Operation (Digital) Mode Selector w/ electric lock

Key/Knob Switch

Main Control Unit (MCU)

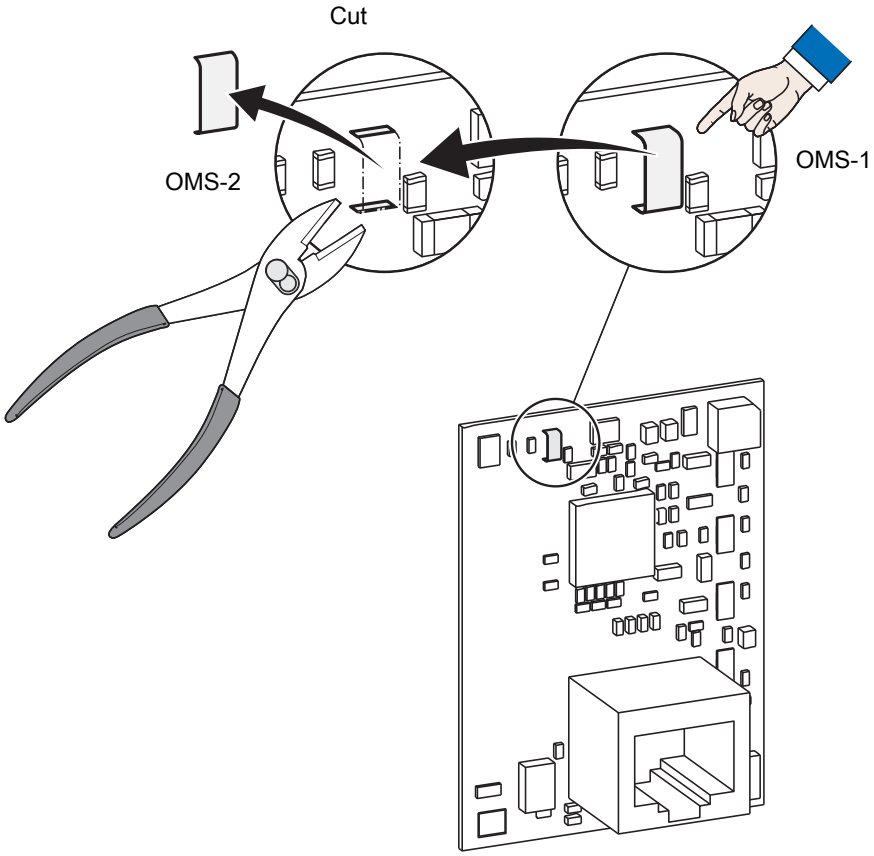
SL500 Mode/Program Selector Connection Board

Note: The only time a operation mode selector is plugged into the connection board is when an electric lock is present.

15.6.2 Configuration of mode selectors

One or two operation mode selectors can be used. When connecting one operation mode selector to a MCU this mode selector (**OMS-1**) gets the parameters B0 - B6 on the **main MCU**.

If a second operation mode selector (**OMS-2**) is to be connected the jumper has to be cut, see picture. This operation mode selector will be named **OMS-2** and gets parameters C0 - C6 on the **main MCU**.



15.6.3 Operation mode selector (OMS) functionality

Check how to install interconnected units before configuring the operation mode selector (OMS). See section 15.1 on page 78.

All functionality is programmed through the MMI on the main MCU-1.

There are mainly three (3) different types of configurations for MCU and OMS. But there are a lot of different choices and combinations that are possible. Several options are listed below.

The "configure parameter" shows which parameter to change from the default setting to obtain the function described.

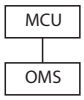
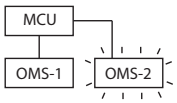
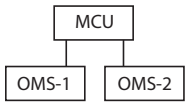
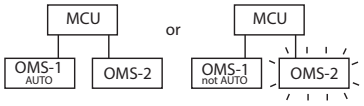
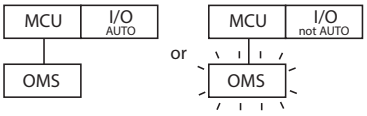
Grouping operators

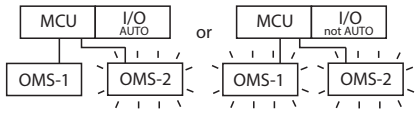
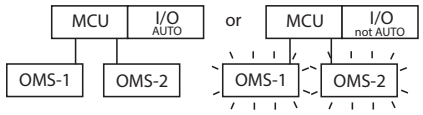
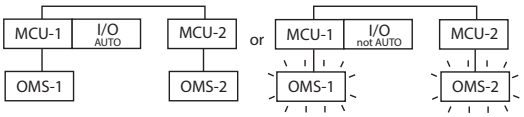
When connecting several MCU together they might need to be grouped together. MCUs are grouped by entering the same value in the group parameter, MCU 6F, IOU 9B, OMS-1 B4, OMS-2 C4. The units that are grouped together will operate together. If OMS or IOU has the value 00 in the group parameter these units will control all interconnected MCUs regardless of group value.

Priority of operation mode selectors (OMS)

The priority of the operation mode selectors (OMS) determine which operation mode selector (OMS) that shall decide the mode selection on the MCU. The lower the number is in parameter Priority of mode selector the higher priority it has.

If two mode selectors have the same value, the mode selector pushed last is the one that will control the MCU.

1	Single control 	One MCU and one OMS. MCU is controlled by the OMS. No configuration needed.
2	Single control with display 	One MCU and two OMS. OMS-1 controls the MCU and the OMS-2 shows the active mode selection. OMS-2 is flashing once every 5 second to show that it is remotely controlled. It is not possible to change mode selection on OMS-2 even if OMS-1 is in AUTO. Configure parameter MCU, C5 = 0, C6 = 0.
3	Dual control 	One MCU and two OMS. Both OMS-1 and OMS-2 controls MCU. Both OMS show the same operation mode. If operation mode is changed on OMS-1, OMS-2 get the same operation mode, and vice versa. Configure parameter MCU, B6 = 1, C6 = 1.
4	Single control with OMS override 	One MCU and two OMS. OMS-1 controls MCU and overrides OMS-2. When OMS-1 is in AUTO, OMS-2 controls MCU. When OMS-1 is **not** put to AUTO, OMS-2 shows active mode selection. OMS-2 is flashing once every 5 second to show that it is remotely controlled. Configure parameter MCU, C3 = 45, C5 = 0.
5	Single control with I/O unit override 	One MCU with I/O unit and one OMS. OMS controls MCU when I/O unit is in AUTO. When I/O unit is **not** in AUTO, I/O unit controls MCU and OMS shows active mode selection. OMS-1 is flashing once every 5 second to show that it is remotely controlled. Configure parameter MCU, B5 = 0.

6	Single control with display and I/O unit override 	One MCU with I/O unit and two OMS. OMS-1 controls the MCU if I/O unit is in AUTO. OMS-2 shows the active mode selection. OMS-2 is flashing once every 5 second to show that it is remotely controlled. It is not possible to change mode selection on OMS-2 even if OMS-1 and I/O unit is in AUTO. When I/O unit is not in AUTO I/O unit overrides OMS-1. When I/O unit is not in AUTO both OMS-1 and OMS-2 show active mode selection. OMS-1 and OMS-2 are flashing once every 5 second to show that it is remotely controlled. Configure parameter MCU, B5 = 0, C5 = 0, C6 = 0.
7	Dual control with I/O unit override 	One MCU with I/O unit and two OMS. Both OMS-1 and OMS-2 control MCU if I/O unit is in AUTO. Both OMS show the same operation mode. If operation mode is changed on OMS-1, OMS-2 gets the same operation mode, and vise versa. If I/O unit is **not** in AUTO, OMS-1 and OMS-2 show active mode selection. OMS-1 and OMS-2 are flashing once every 5 second to show that they are remotely controlled. Configure parameter MCU, B5 = 0, B6 = 1, C5= 0, C6 = 1.
8	Local paired, single control with I/O unit override 	Two (or more) MCU, two OMS and one I/O unit connected to MCU-1. OMS-1 controls MCU-1 (or more in that group). OMS-2 controls MCU-2 (or more in that group) when I/O unit is in AUTO. When I/O unit is not in AUTO, I/O unit controls all MCU. OMS-1 and OMS-2 show active mode selection. OMS-1 and OMS-2 are flashing once every 5 second to show that they are remotely controlled. Configure parameter MCU-1, 9B = 0, B5 = 0, C4 = 2, C5 = 0. Configure parameter MCU-2 (and all MCU in group 2) 6F = 2.

Operation of operation mode selector (OMS)

The different operation modes are selected by pushing the arrow symbols pointing upwards or downwards. When a button is pushed a buzzer will sound. The present selection is indicated by a blue light to the left of the function symbol.

When an arrow symbol has not been pushed for 15 seconds the access will be locked.

In the upper right corner a flashing light can be displayed.

- A red light every other second is indicating an error in the door operator MCU. If the error remains after a RESET a service visit is required. See also page 92.

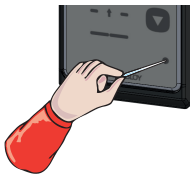
- If the red light is quickly flashing 3 times per second it is indicating an internal error in the operation mode selector (OMS).

- An orange light every other second is indicating a status or condition that can be cleared by the owner e.g. a break-out door is standing open.

- A yellow light every other second is indicating that maintenance is due.

The operation mode selectors are available with 5 selections (plus RESET).

With 5 selections OPEN, AUTO PARTIAL, AUTO, EXIT and OFF functions can be obtained.

Symbol	Text	Function
	OPEN	The door is permanently open. The door can be moved by hand e.g. for window cleaning. All activation units except for the emergency push button (if fitted) are disconnected.
	AUTO PARTIAL	Two-way traffic, AUTO PARTIAL is obtained. The door can be opened partially with the inner and outer activation units and with a key switch (if fitted). With an emergency push-button the door opens fully.
	AUTO	Two-way traffic, normal operation of the door. The door can be opened with the inner and outer activation units and with a key switch/emergency push-button (if fitted).
	EXIT	Passage from inside only. The door is normally locked if an electromechanical locking device has been fitted. The door can only be opened with the inner activation unit or with a key switch/emergency push-button (if fitted).
	OFF	This function is only used on emergency escape doors after it is certain that all people have left the building. The door cannot be opened with inner and outer activation units. The door is locked if an electromechanical locking device has been fitted. The door can be opened partially with a key switch (if fitted). With an emergency pushbutton (if fitted) the door opens fully. The door can also be opened partially from the operation mode selector if the arrow down button is held for 2 seconds. No access code is necessary for this and the key impulse is indicated by briefly showing a blue light to the left of the OPEN symbol and then a flashing blue light to the left of the OFF symbol for another 15 seconds.
	RESET	By briefly pushing the dot, placed in the lower right corner of the operation mode selector, with a narrow object, the door operator will make a RESET function with a system test. The door will return to the closed position (if not in operation mode selection OPEN or if an error is present) and is then ready for normal operation.

15.7 Interlocking

Used between two operators when the first operator must close before the other one can open (typical to reduce energy losses and not for security reasons). Interconnecting cable required, see below.

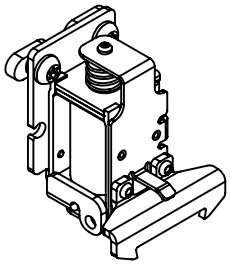
15.8 Synchronization

Used between the operators of two single sliding doors, working together in very large openings. Interconnecting cable required, see below.

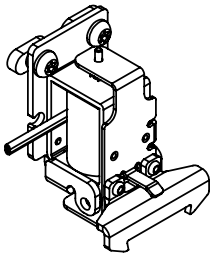
15.9 Electrical locks

Note: The espagnolette lock is at the moment not allowed to mount in escape routs.

Locked with power (LDP), locked without power (LD).



LDP (Fail Safe)
P/N: 1008354



(Fail Secure)
P/N: 1008167

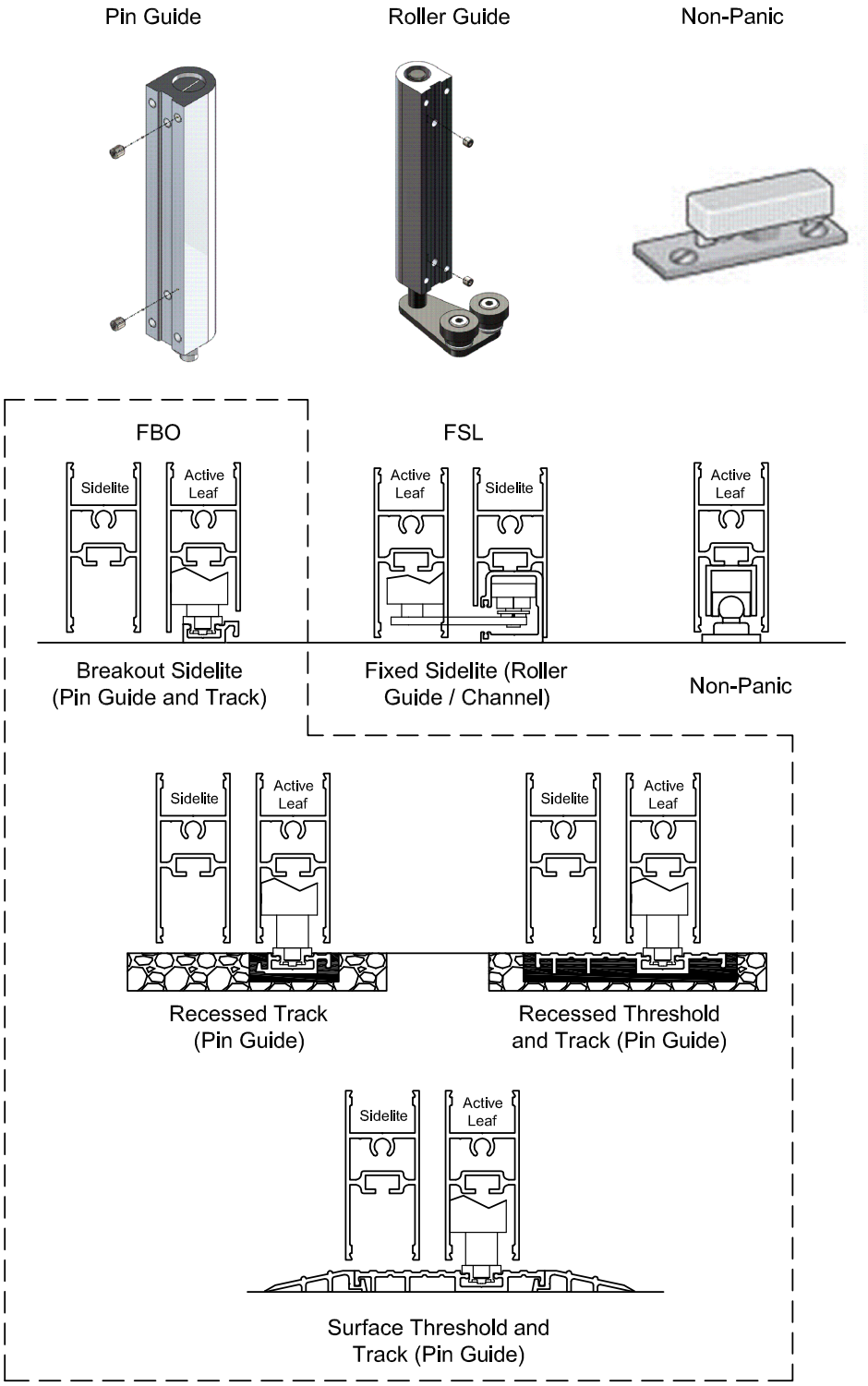
15.10 Motion sensors

Motion and presence sensors, see separate manuals or installation drawings.

15.11 Night mode

Remotely put door into exit only via an automated system. Requires a NO contact.

15.12 Bottom Guide Systems



Three basic guide systems are available:

a The standard pin guide
   - (FBO, or Full Break Out) with guide track
   - The roller guide (FSL, or Fixed Sidelite) with fixed sidelite track

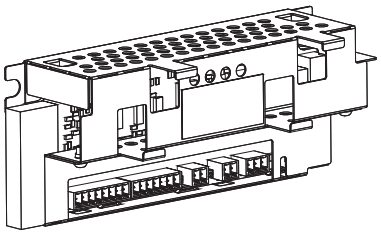
b The non-panic floor guide

c The FBO pin guide has several options for guide tracks, including:

- Recessed track (flush with floor level)
- Recessed threshold and surface threshold

See Installation Requirements section for guide installation.

Extra functionality that requires an I/O-unit (IOU):



I/0 unit (IOU)
P/N: 1007779

15.13 Open / Close function

One button impulse, will alternate between Open and Close. The door will stand open until next impulse or can after an adjustable time delay automatically start to close even if a new impulse is not received.

15.14 Fire alarm connection

Used to emergency open or fire close the door with mains power on.

15.15 Nurse function

Used mostly in combination as a Nurse - Bed function. Nurse opens the door to partial open position, and bed (connected to inner or outer impulse) opens to full open position.

Nurse works in operation mode selections Exit, Auto.

The Nurse impulse has the same hold open time as partial open.

15.16 Remote Exit mode

Remotely put door into Exit via an remote system, like timer. Requires a N/O contact.

15.17 Emergency open impulse

Used to give opening (fireman's opening) impulse to the door in any operation mode selector setting. With electrical emergency unit also during power failure.

16 Troubleshooting

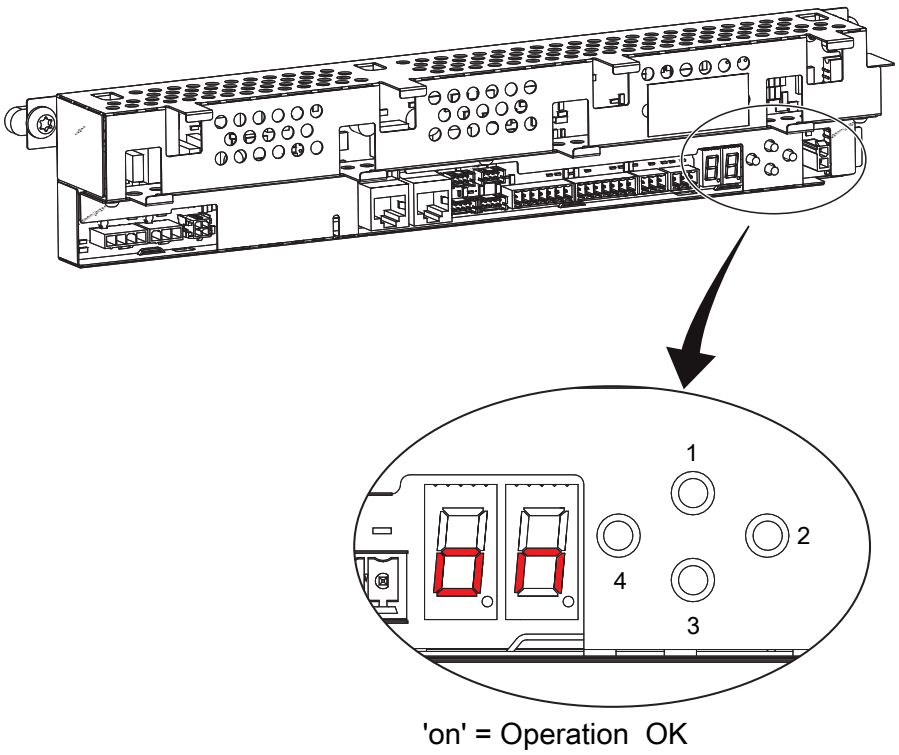
Before starting the troubleshooting, check that the operation mode selector setting is correct. Start the troubleshooting by checking the mechanical and electrical parts of the operator in the following order.

The electromechanical parts are fixed in the support beam. To replace these components, the complete unit is to be loosened and replaced.

16.1 Main control unit display

The main control unit is equipped with a two digit display for error indication.

- During normal operation the display shows '**on**'.
- If the display is extinguished check the mains power, power supply cable and perform a RESET. If the problem remains replace the main control unit or the power supply.
- When an error is active the display is alternating between a main error type e.g. E4 and a second two digit number specifying the error more in detail e.g. 03. If several errors are active they will be displayed in sequence. On each electronic unit there is also a green light emitting diode (LED). An extinguished or flashing LED is indicating that this unit is failing.



'**on**' = operation OK

16.2 Mechanical checking and remedies

Disconnect the mains power and batteries, if fitted. Unlock all mechanical locks. Pull the door leaf manually and check that the door can be easily moved over the complete sliding track/floor guide. If the door leaf stops or is hard to move, the reason may be sand, stones, rubbish etc. in the floor guide.

The door leaf may also be jamming on the floor or on the weather proofing brush strips. Clean the floor guide, adjust the door leaf height/depth or take other necessary measures e.g. replacement of worn parts until the door leaf is running smoothly when manually operated.

16.3 Error description and remedies

Main error: E1 Sensor Error		
Detailed error	**Reason**	**Remedy**
19 Inner Impulse Error	The control unit doesn't get a test answer, from the activation unit.	Make sure that the monitoring output is connected and the connections are OK.
		Replace the monitored inner activation unit.
20 Fire Impulse Error	The control unit doesn't get a test answer, from the fire alarm.	Make sure that the fire alarm connections are OK.
29 Outer Impulse Error	The control unit doesn't get a test answer, from the activation unit.	Make sure that the monitoring output is connected and the connections are OK.
		Replace the monitored outer activation unit.
30 Stop Impulse Error	The control unit doesn't get a test answer, from the stop impulse.	Make sure that the monitoring output is connected and the connections are OK.
31 Side Presence Impulse Error	The control unit doesn't get a test answer, from the activation unit.	Make sure that the monitoring output is connected and the connections are OK.
		Replace the side presence activation unit.
32 Presence Impulse Error	The control unit doesn't get a test answer, from the activation unit.	Make sure that the monitoring output is connected and the connections are OK.
		Replace the presence activation unit.

Main error: E2 Emergency Unit Error		
Detailed error	**Reason**	**Remedy**
21 Emergency Unit Error	The battery voltage drops due to low capacity.	Charge or replace the battery.
	The battery voltage measurement is wrong.	Replace the escape route unit (if present), otherwise replace the main control unit.
25 Battery Error	The battery is disconnected, short circuited or the internal thermal fuse in the battery is defective. The charging current is out of specification.	Make sure that the cables are OK and connected.
		Charge or replace the battery.
		Replace the main control unit.
26 Emergency Action Time-out	The door is prevented its emergency unit test within a stated time, due to high friction or jammed door.	Make sure that the door can open to the fully open position.

Main error: E3 Electronic Unit Error		
Detailed error	**Reason**	**Remedy**
00 RAM Error	Internal RAM memory error.	RESET, and if the problem remains, replace the electronic unit having a flashing or extinguished LED.
01 ROM Error	Internal ROM memory error.	RESET, and if the problem remains, replace the electronic unit having a flashing or extinguished LED.
02 EEPROM Error	Serious internal EEPROM memory error.	RESET Download a Default parameter set and perform a RESET. If the problem remains, replace the main control unit?
05 Ambient Temperature Error	Ambient temperature measurement is wrong.	RESET, and if the problem remains, replace the main control unit.
06 Break Chopper Error	Not possible to activate break Chopper.	RESET, and if the problem remains, replace the main control unit.
08 A/D Converter Error	The internal A/D converter is broken.	RESET, and if the problem remains, replace the electronic unit having a flashing or extinguished LED.
10 Register Error	Internal register error.	RESET, and if the problem remains, replace the electronic unit having a flashing or extinguished LED.

Main error: E3 Electronic Unit Error		
Detailed error	**Reason**	**Remedy**
11 OS Error	Internal program error.	RESET, and if the problem remains, replace the electronic unit having a flashing or extinguished LED.
14 Lock Current Error	The lock is defective.	Check that the right lock is installed, and if the problem remains, replace the lock.
		RESET, and if the problem remains, replace the main control unit.
17 Hardware Watchdog Error	It is not possible to disable the motor bridge.	RESET, and if the problem remains, replace the main control unit.
18 EEPROM Critical Write Error	Internal write EEPROM memory error. This error mainly occurs when it is impossible to change a configuration parameter.	RESET, and if the problem remains, replace the main control unit.
22 24 V Over Current Error	The auxiliary 24 V output is overloaded.	RESET, and if the problem remains, check the connected sensors and other 24 V accessories.
		RESET, and if the problem remains, replace the electronic unit having a flashing or extinguished LED.
23 Lock Circuit Error	It is not possible to disconnect the lock with the lock relay.	RESET, and if the problem remains, replace the main control unit.
24 Learn Error	The Learn cycle has timed out.	Make sure that the door can make a full open/close cycle. Check for high friction or jammed door and then make a new Learn.
27 LDB/LDE Lock Error	The LDB or LDE lock is defective.	Check that the right lock is installed; the limit switches are working and if the problem remains, replace the lock.
33 Flash Code Error	Serious internal programming error.	RESET, and if the problem remains, replace the main control unit.
34 Output Enable Error	Test of safety related circuits failing.	RESET, and if the problem remains, replace the main control unit.
35 Link Voltage Error	The internal link voltage measurement is wrong.	RESET, and if the problem remains, replace the main control unit.
41 Brake Chopper Error	The brake chopper measurement is wrong.	RESET, and if the problem remains, replace the main control unit.

Main error: E4 Motor / Encoder Error		
Detailed error	**Reason**	**Remedy**
03 Encoder Error	The encoder, encoder cable, or motor cable is damaged.	Make sure that the encoder cable and the motor cable are connected.
	Wrong motor type is selected.	Check Motor Type configuration.
04 Motor Current Error	The motor cable or the encoder cable is damaged.	Make sure that the encoder cable and the motor cable are connected.
	Wrong motor type is selected.	Check Motor Type configuration.
09 Encoder Cable Error	The encoder cable is damaged.	Make sure that the encoder cable is connected, otherwise replace the encoder cable.

Main error: E5 Lock Error		
Detailed error	**Reason**	**Remedy**
07 Lock Failure	The lock or something else was preventing the door from opening the first 14 mm from closed position.	Make sure that the lock is operating without friction.
		Make sure that Hold Force and Lock Release parameters are set correctly.

Main error: E6 Communication Error		
Detailed error	**Reason**	**Remedy**
12 Motor Control Communication Error	Motor control processor disconnected from the internal bus.	RESET, and if the problem remains, replace the main control unit.
13 Door Control Communication Error	Door control processor disconnected from the internal bus.	RESET, and if the problem remains, replace the main control unit.
36 Escape Route Communication Error	Escape route unit processor disconnected from the internal bus.	RESET, and if the problem remains, replace the escape route control unit.
37 I/O Communication Error	I/O control unit disconnected from the internal bus.	RESET, and if the problem remains, replace the I/O control unit.
51 Web Communication Error	Web control unit disconnected from the internal bus.	RESET, and if the problem remains, replace the Web control unit.
52 Hi-O Communication Error	Web Hi-O unit disconnected from the internal bus.	RESET, and if the problem remains, replace the Hi-O control unit.
53 Operation Mode Selector Communication Error	Operation mode selector disconnected from the external bus.	RESET, check connections, and if the problem remains, replace the operation mode selector.
54 External Communication Error	The external bus is malfunctioning.	RESET, and if the problem remains, replace the main control unit.

Main error: E7 Motor Temperature High		
Detailed error	**Reason**	**Remedy**
16 Motor Temperature High	The duty cycle of the door is too high for the current Speed settings and Hold Open Time.	If the motor is warm, put the door in operation mode OPEN and wait for at least 1 minute. Reduce Speeds and increase Hold Open Time parameters.
	The heavy-duty motor is replaced by a normal duty motor.	Put the door in operation mode selection OPEN and wait for at least 5 minutes.

Main error: E8 Non-critical Error		
Detailed error	**Reason**	**Remedy**
49 EEPROM Non-critical Write Error	The main control unit cannot write error log or event log information to the EEPROM memory.	RESET, and if the problem remains, replace the main control unit if it is important to read logged information.
50 EEPROM Access Error	The EEPROM queue is full.	Too many Events to log. Reduce the number of events to log in the Event Log configuration.

16.4 After remedy or replacement the operator has to be checked as follows:

a Study the door movement and adjust the functions to the values required for a smooth door operation and make sure to complete with local regulations.

b Check that correct functions and values have been selected for the installed accessories and that the installation complies with valid regulations and requirements from the authorities.

c Clean the cover and the doors.

17 Service/Maintenance

Regular inspections shall be made according to national regulations and product documentation by an ASSA ABLOY Entrance Systems-trained and qualified technician. Regular scheduled maintenance should be in accordance with national requirements and product documentation. This is especially important when the installation concerns a fire-approved door or a door with an emergency opening function.

As with all other electro-mechanical products, an automatic door requires regular maintenance and service. It is essential to know the importance of regulary scheduled maintenance to have a reliable and safe product.

Regular service and adjustments will ensure a safe and proper operation of an automatic door unit.

17.1 Service

a Remove dust and dirt from the operator. Dirt on the sliding track should be removed with methylated spirits. If necessary replace the sliding track.

b None of the parts need lubrication.

c The tooth belt must be kept dry and clean. Check the belt tension.

d Check that all nuts and bolts are tightened well.

e Adjust, if necessary, the door leaf speed, the HOLD OPEN TIME and the door leaf position to comply with valid regulations and requirements.

f Check that the function of emergency escape units always is operational.

g If an electromechanical lock, LDP (locked with power) or LDB (bi-stable), is installed check the function as follows:

- Set the operation mode selector to EXIT. The door should open and close without any sound from the lock.
- Set the operation mode selector to OFF. Make sure the door can not be opened by pulling the door leaf in the opening direction.
- When the operation mode selector is set back to EXIT, two clicking sounds (LDB) or one clicking sound (LDP) indicate that the lock is unlocked. The door should then open and close without any sound from the lock.

17.2 Planned Maintenance Checklist

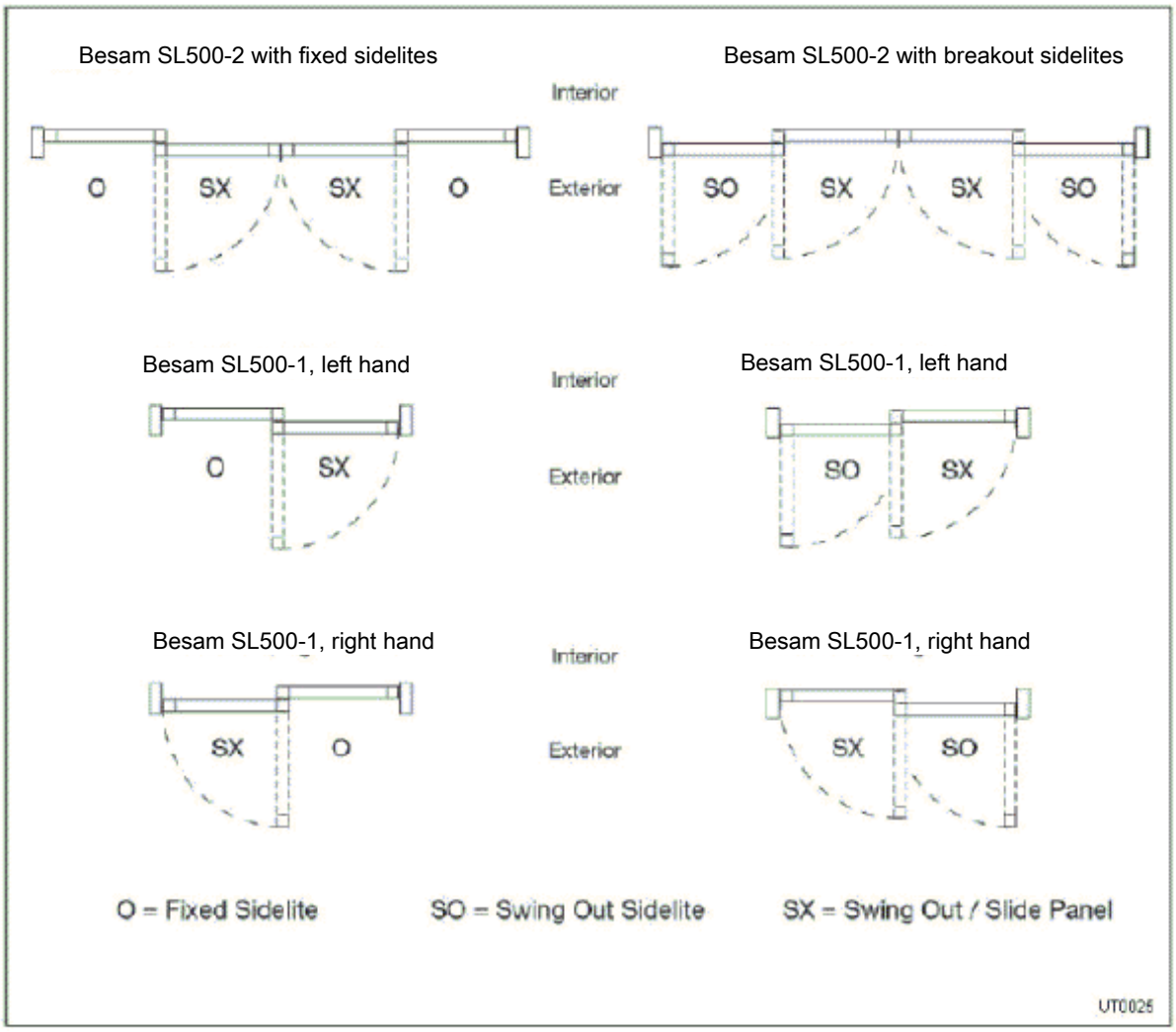
- Measure / Adjust Speeds – Measure to ANSI/BHMA A156.10 and local codes; adjust if necessary (Open time - 1.5 seconds or longer).
- Measure / Adjust Forces – Measure to ANSI/BHMA A156.10 and local codes; adjust if necessary.
- Measure / Adjust Time Delays – Measure to ANSI/BHMA A156.10 and adjust if necessary.
- Check Functioning – Mats, Sensors, Operator/Control, and Push Plates per device checklist.
- 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, 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.
- Visually check door for operation.
- Check activation and threshold detection devices.
- Check for tripping hazards.
- Check door function switch.
- Check for proper operation of lock assembly.
- Check for loose glass stops or damaged glass.
- Check all panels for damaged or loose weather stripping.
- Check panic latches for proper release force.
- Check panic circuit operation for operator cut off or spring return.
- Check bottom guide assembly for proper adjustment and for excessive wear.
- Remove access cover, and check motor and gear box for leakage and noise.
- Inspect drive pulleys and belt for proper alignment.
- Clean hanger rollers and repair or replace if damaged. Adjust roller height if necessary.
- Inspect anti-riser for damage and/or binding.
- Ensure that all wiring in the header is properly routed and protected from any moving parts.
- Reinstall and secure access cover and recheck the complete door operation.
- Clean door, glass and header thoroughly.

Note on the Planned Maintenance review, any recommendations to improve door performance and reliability, and review with customer.

18 Door Handing & Layout

18.1 Door Handing (Automatic Door Industry)

Sliding door handing is referenced from the exterior side of the door opening. Bi-parting sliders are not handed.



19 ANSI / BHMA A156.10 - 2011

From American National Standard for power-operated pedestrian doors. Please refer to full standard if necessary, obtainable through BHMA at (212) 661-4261. All figures referred to below can be found in the full standard. Excerpts reprinted with BHMA permission.

19.1 Sliding Doors

Automatic Sliding Doors are flat panels that slide horizontally or linearly. These systems have a variety of configurations. No matter what the configuration or system, automatic sliding doors shall include sensors, or control mats and signage for the safety and convenience of the user.

For control mats, joining of control mats and performance requirements of control mats, refer to the full ANSI/BHMA standard.

Motion sensors shall detect a 28 inch (710 mm) minimum high person or equivalent and moving at a rate of 6 inches (150 mm) per second towards the center of the door within the detection areas described.

Presence sensors shall detect a stationary 28-inch (710 mm) minimum high person or equivalent within the detection areas described for a minimum of 30 seconds.

8.1.1 **Activating zones** for swinging, sliding and folding doors shall have a minimum **width** equal to the width of the lear opening measured at 8 in. and 30 in. perpendicular from the face of the closed door(s). The length from the face of the door shall be 43 in. minimum measured at the center of the clear opening. Detection shall be effective to within 5 in. from the face of the door measured at the center of the clear opening. **Exception:** If the 43" activating zone length is not practical due to physical or environmental conditions, it shall be permissible to be reduced to 30 inches, along with an additional sign, visible from the side.

8.3 Sliding Doors

8.3.1 Sliding doors shall have an activating zone as defined in 8.1.1.

8.3.2 A presence sensor shall be used to detect a person fully in the space between two non overlapping activating zones for the width of the clear opening as follows:

8.3.2.1 If photo electric beams are used (See Figure A-18A):

(1) A minimum of four photo electric beams shall be installed, two minimum on each side of the sliding door. The beams' location shall alternate from side to side. The lowest beam shall be installed 6 to 28 in. from the floor and the other three at a spacing between 6 and 12 in. apart with the top beam at 45-55 in. from the floor. The photo electric beam area of detection shall extend across the clear door opening. (See Figure A-18A); and

(2) The beams shall be installed within 3 in. from the centerline of the slide door; and

(3) The beams shall remain active from fully open to within 6 in. of closed; and

(4) The door shall remain fully open for 2.5 seconds minimum after loss of detection.

8.3.2.2 If an overhead presence sensor is used through the door opening it (See Figure A- 18B.):

(1) Shall detect a 28 in. minimum high person and extend out a minimum of 5 in. from the face of the door on each side; and

(2) The detection zone shall remain active from open to within 6 in. of closed, or shall have an overhead presence sensor active area within 3 in. from the face of the door or, a minimum of two photo electric beams on one side of the door, with the lower beam installed 6-28 in. and top beam 45-55 in. from the floor. (See Figure A-18B.)

(3) If beams are required they shall be installed within 3 in. from the centerline of the slide door and remain active from fully open to within 6 in. of closed.

(4) The door shall remain fully open for 1.5 seconds minimum after loss of detection.

8.3.2.3 If overhead presence sensors are installed on each side of the sliding door opening (See Figure A-18C.):

(1) They shall not have an inactive area more than 5 in. extending out from the face of the door. If the inactive area exceeds 3 in. from the face of the door, it shall have a minimum of two photo electric beams on one side of the door, with the lower beam installed 6-28 in., and top beam 45-55 in. from the floor; and

(2) The detection zone shall remain active from open to within 6 in. of closed.

(3) If beams are required they shall be installed within 3 in. from the centerline of the slide door and remain active from fully open to within 6 in. of closed.

(4) The door shall remain fully open for 1.5 seconds minimum after loss of detection.

8.3.2.4 If photo electric beams are used on one side of the door and an overhead presence sensor is installed on the opposite side of the sliding door opening (See Figure A-18D):

(1) A minimum of two photo electric beams shall be installed on one side of the door with the lower beam installed 6-28 in. and top beam 45-55 in. from the floor; and

(2) The beams shall be installed within 3 in. from the centerline of the slide door; and

(3) The overhead presence sensor installed on the side opposite the beams shall not have an inactive area more than 5 in. extending out from the face of the door; and

(4) The beams and overhead presence sensor must remain active from fully open to within 6 in. of closed; and

(5) The door shall remain fully open for 2.5 seconds minimum after loss of detection.

8.3.3 Sliding doors used for one way traffic shall be provided with a secondary activating zone on the side not intended for approach. The secondary activating zone shall extend a minimum of 24 in. from the face of the door and be effective to within 5 in. from the face of the door measured at the center of the door opening. The zone shall have a minimum width equal to the width of the clear opening measured at 8 inches perpendicular from the face of the closed door.

10. ENTRAPMENT PROTECTION

10.1 Sliding Doors

10.1.1 A sliding door shall be adjusted so that the **closing speed** is one foot per second maximum per leaf to latch check for doors weighing up to and including 160 lbs (71 kg):
For doors weighing more than 160 lbs (71 kg):

$V = \sqrt{(161 / W)}$ where:

V = Velocity in ftlsec

W = Weight of Door in lbs

10.1.2 **Latch check** shall occur for sliding doors at no less than 2 in. from the closed position of each sliding door leaf.

10.1.3 A **stopped** sliding door shall not require more than 30 lbf (133 N), measured at the leading edge, to prevent it from closing at any point in the closing cycle.

10.1.4 Sliding doors provided with a **break away device** shall require no more than a 50 lbf (222 N) applied 1 inch (25 mm) from the leading edge of the lock stile for the break out panel to open. Break away devices (swinging panels) for doors that slide on the egress side of an opening shall be equipped with a self closing device or interrupt automatic operation when used in the break out mode. Break away devices incorporating swing out sidelites shall interrupt automatic operation when used in the break out mode.

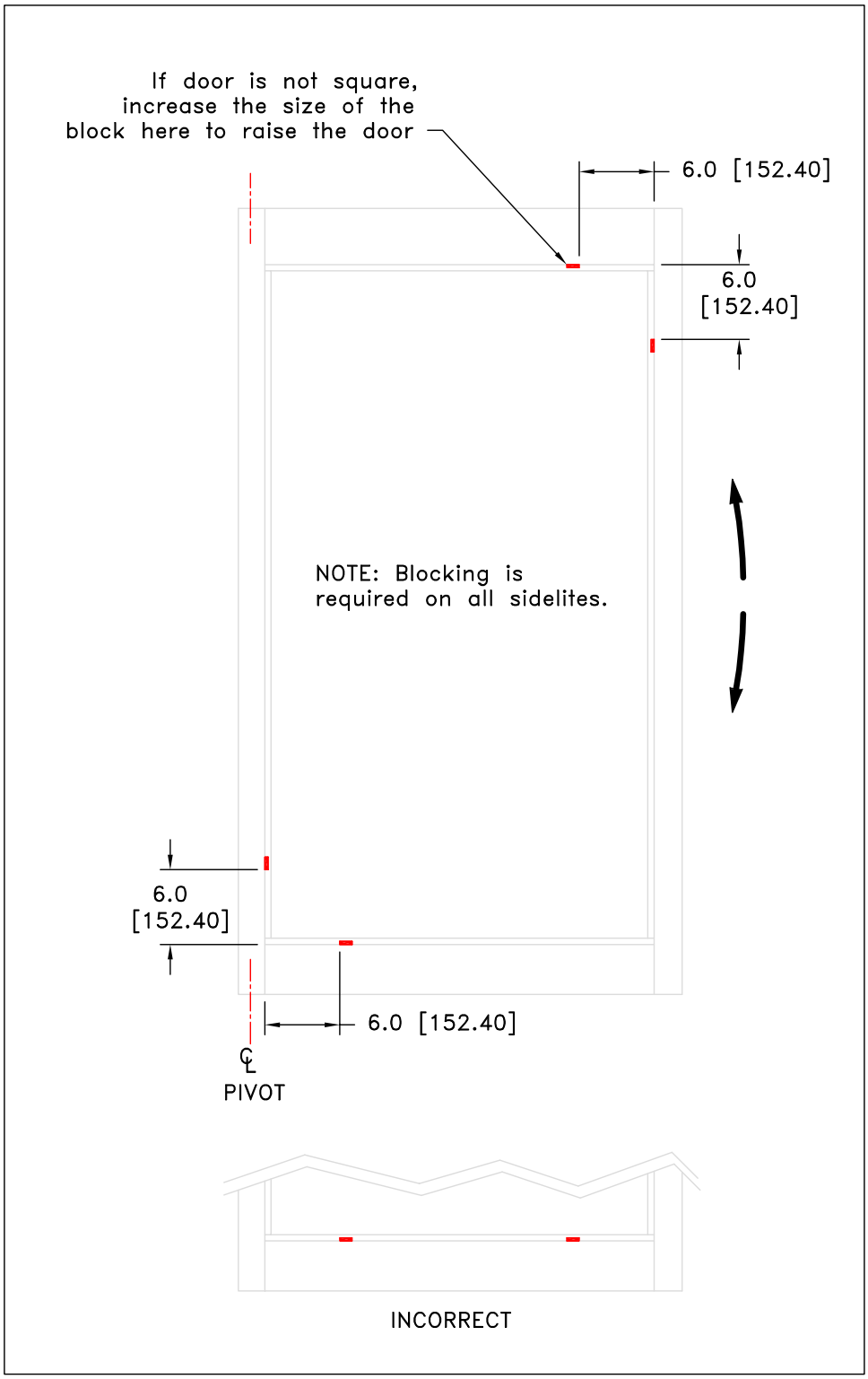
10.1.5 Sliding doors utilizing **sensors or control mats** shall remain fully open a minimum of 1.5 seconds after loss of detection, unless otherwise specified within this standard.

10.1 Entrapment Protection measures shall be taken under neutral air conditions.

11. Signage

For Signage, see full standard.

20 Glazing and Blocking of Glass



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