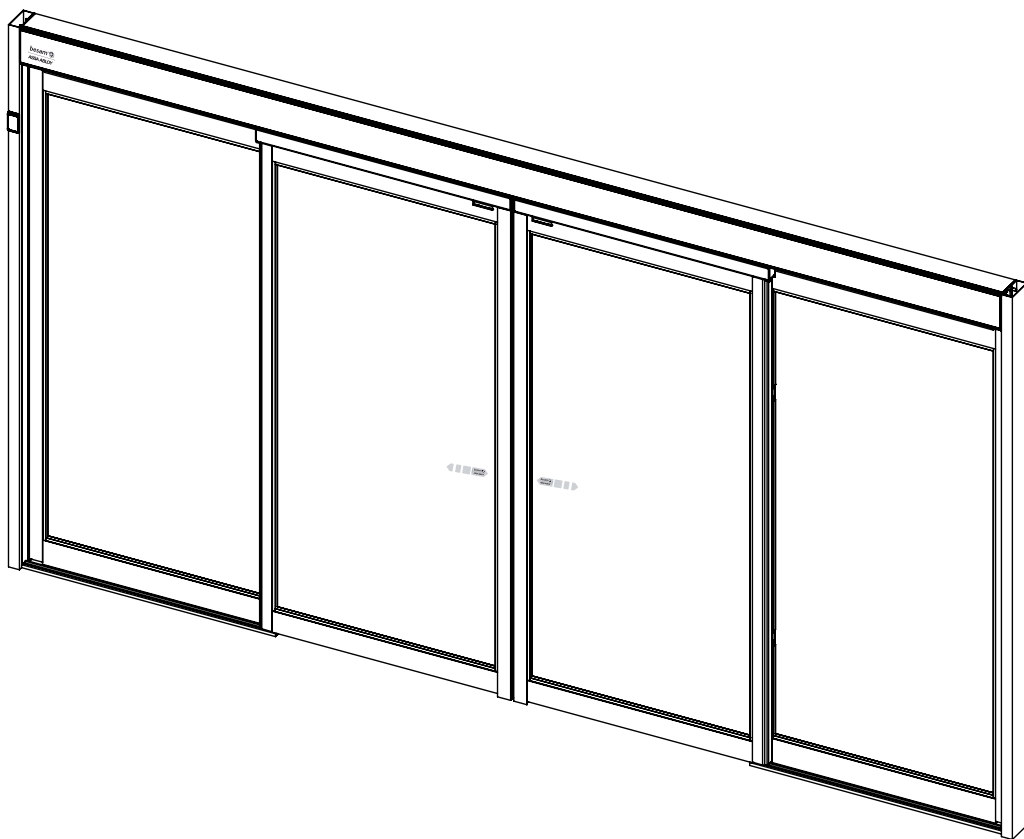


Sliding Door Operator Besam SL500

Installation and Service Manual



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1 Revision

Following pages have been revised:

Page	Revision - → 1.0
	This is the first version of this manual

2 Important information

WARNING!



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.

Save these instructions for future reference.

2.1 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 Besam 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.

2.2 Safety precautions

- Do not climb on door parts
- Do not let children play with the door or the fixed controls.
- Keep remote controls away from children

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. Training is needed to carry out these tasks safely. Only Besam-trained technicians should be allowed to carry out these operations.

2.3 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. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

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

Besam 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.

2.4 Glazing materials

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

3 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 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
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: 35.43" – 118" (900 – 3000 mm) Single Slide: Besam SL500-R/L: 35.43" – 118" (900 – 3000 mm)
Opening and closing speed:	Bi-Parting: (Besam SL500-2) Variable up to approx. 4.5 ft/sec. (1.4m/s) 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 122°F (-20 °C to +50 °C)
Relative humidity (non-condensing):	Max. 85%
The Besam SL500 complies with: ANSI/BHMA A156.10, UL 325, UL 60730, NFPA 79	
To be installed internally or with suitable weather protection externally.	

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.

4 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).

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 expired.

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.

Microprocessor for precise control

The microprocessor has an integral self-monitoring device that detects most interference or faulty signals in door operation. If an input signal does not correspond to the preprogramming, the microprocessor automatically takes necessary measures to ensure a safe operation.

Emergency escape

The Besam SL500 can be combined with an emergency unit that automatically opens or closes¹ 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 light 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 mode selection OFF.

¹ Electrical emergency operation unit only

Safety sensors

Safety sensors must be installed per ANSI A156.10 Standards for Power Operated Pedestrian Applications.

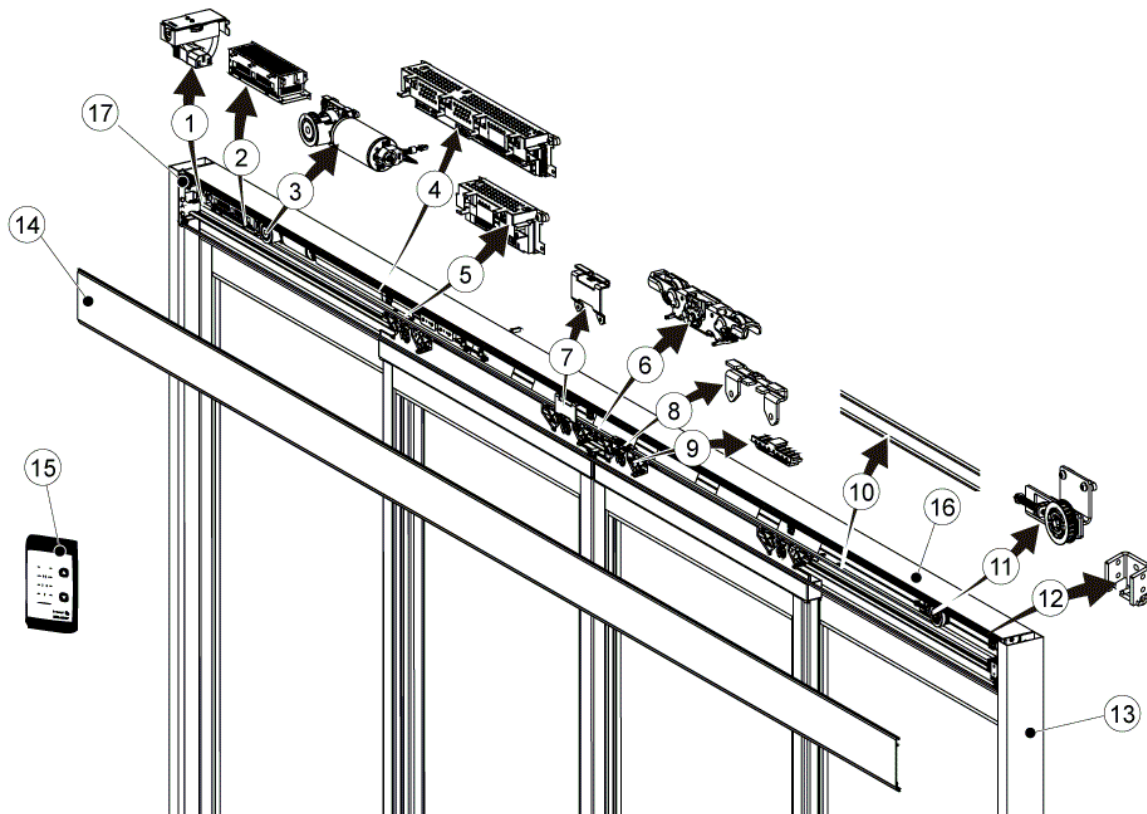
5 Models

Besam 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.)

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.)

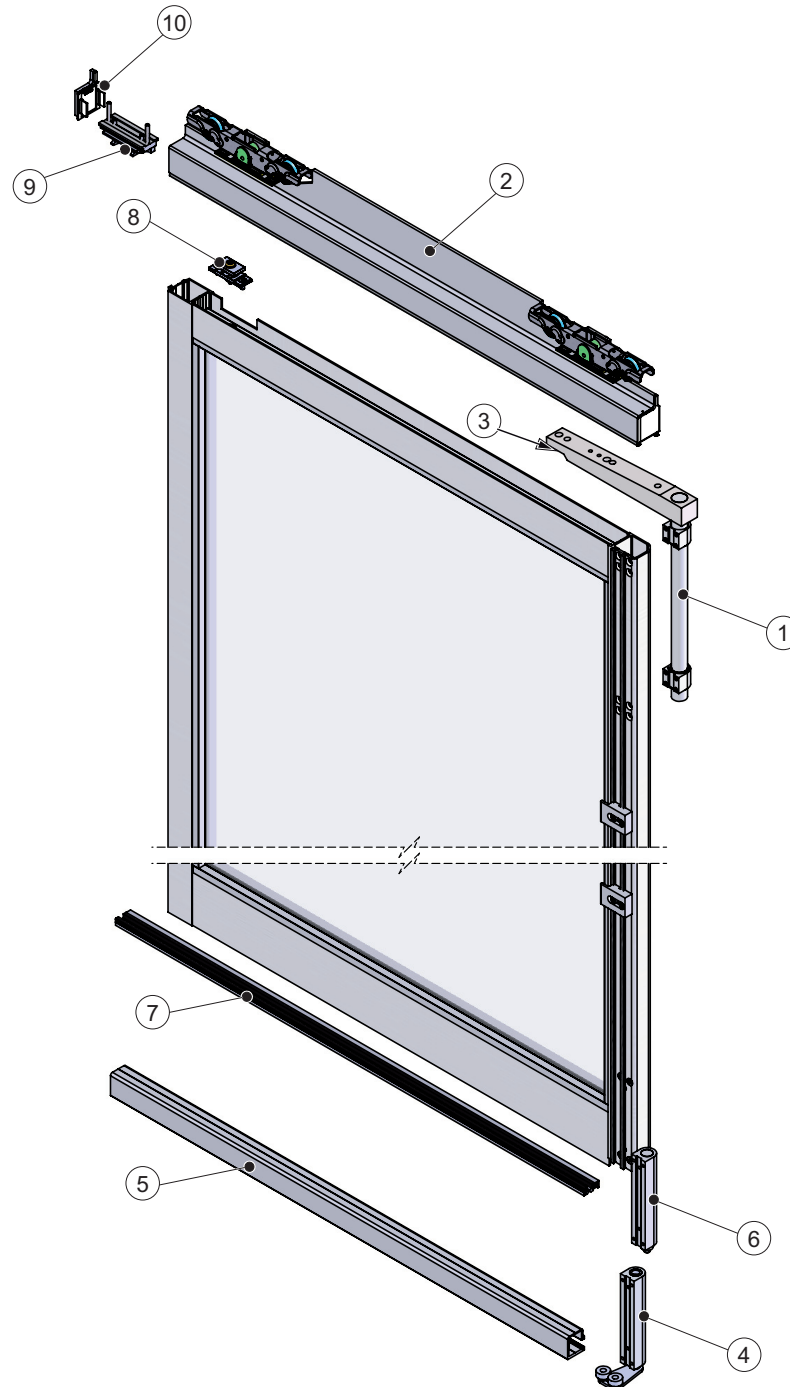
6 Identification



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	US-01-0931-LLXX
				Slick tube	US01-0438-LLXX
5	I/O Unit (IOU)	1007779	14	Cover	1007366-LLXX
6	Carriage wheel	1009163 (2 wheel holder) 1009164 (4 wheel holder)	15	Standard operation mode selector	1009340 (5-pos, flush mounted) 1009341 (3- pos, flush mounted)
7	Transmission bracket (high)	1007365	16	Support beam	1007044-LLXX
8	Transmission bracket (low)	1007364	17	Jamb plate	1007343 (A), 1007344 (B)
9	Belt clamp	1006906			

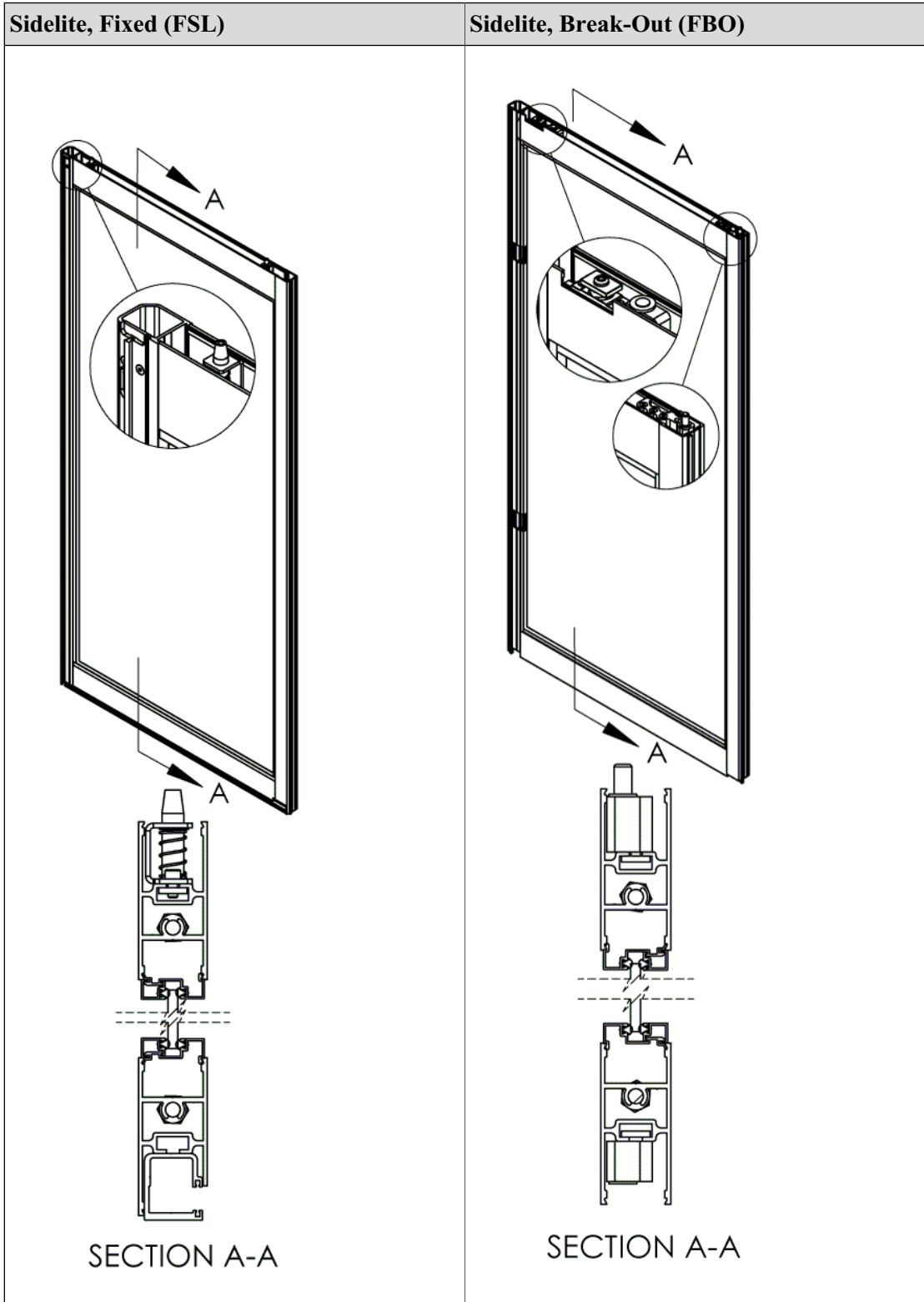
6.1 Options

6.1.1 Active Leaf Panic Break-Out System

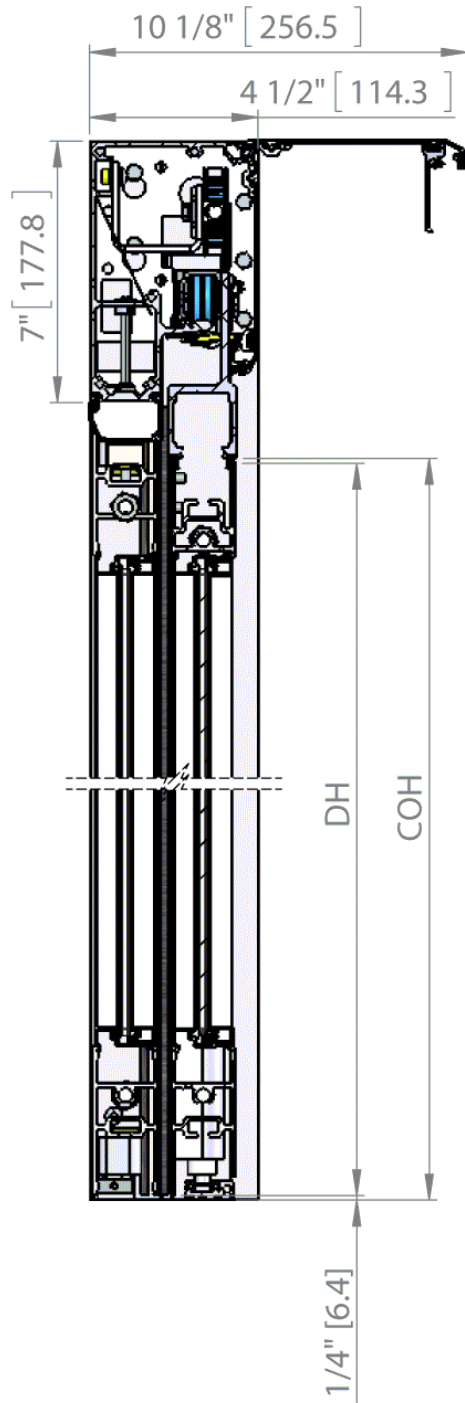


- | | | | |
|---|--------------------------|----|---------------------------------|
| 1 | Panic Swing Arm (PSA) | 6 | Bottom Guide (FBO) with T-block |
| 2 | Door Carrier | 7 | Pin Track Guide (FBO) |
| 3 | Anti-Sag Adjuster | 8 | Ball Catch |
| 4 | Bottom Guide (FSL) | 9 | Ball Catch Receiver |
| 5 | Roller Track Guide (FSL) | 10 | End Cap |

6.1.2 Sidelites Fixed and Break-Out



7 Space required



8 Mechanical Installation

8.1 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

* Besam minimum recommended requirements. Building Codes may give different specifications

** Thinner wall profiles must be reinforced with rivnuts

8.1.1 Test Equipment

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

8.1.2 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 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)

8.2 Pre-Installation Questions

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 and Setup Section).
- 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?

8.2.1 General Tips / Safety Concerns



Make sure that the power is off before installing.

After installation, final adjustment for proper operation of the door system, shall be performed in the field.

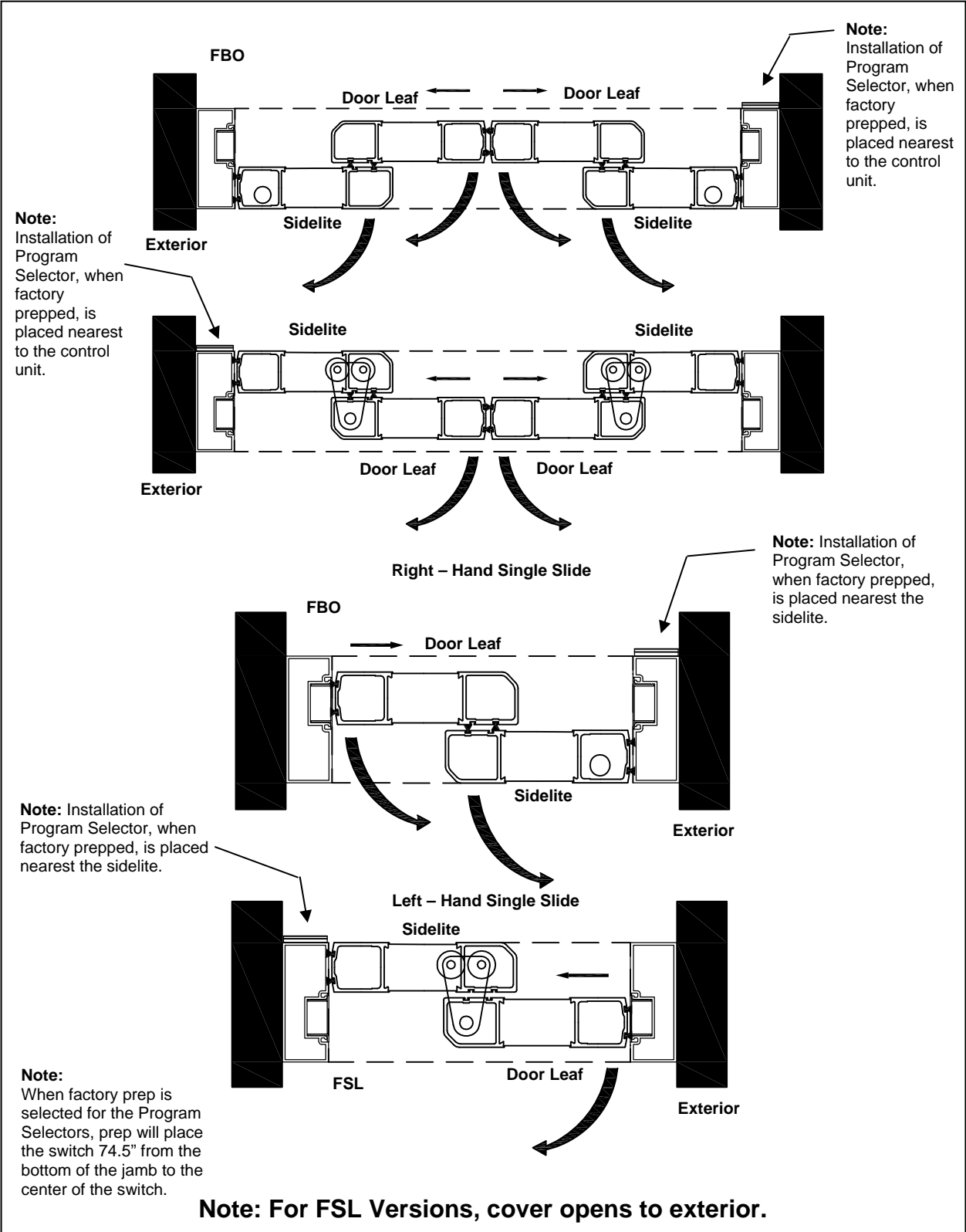
8.3 Installation Overview

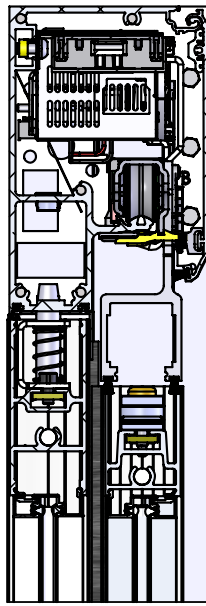
This is only a summary of the installation process. See the rest of this manual for detailed information.

- 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, 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.

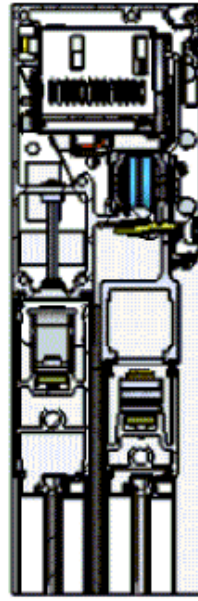
8.4 Installation Examples

8.4.1 Concealed



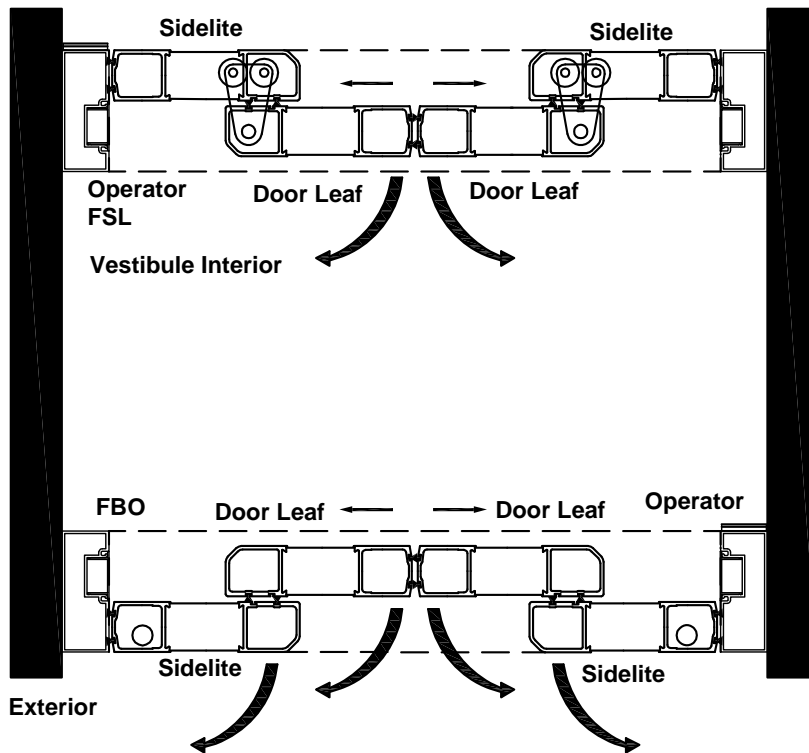


FSL



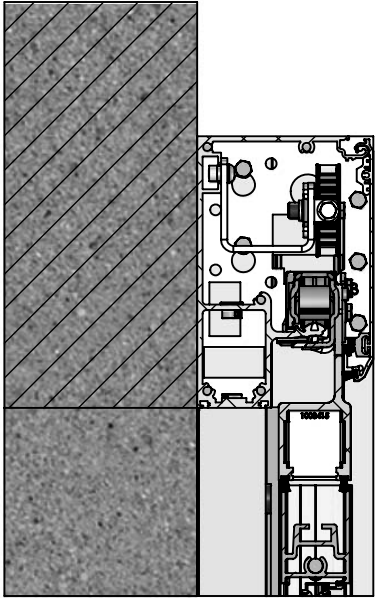
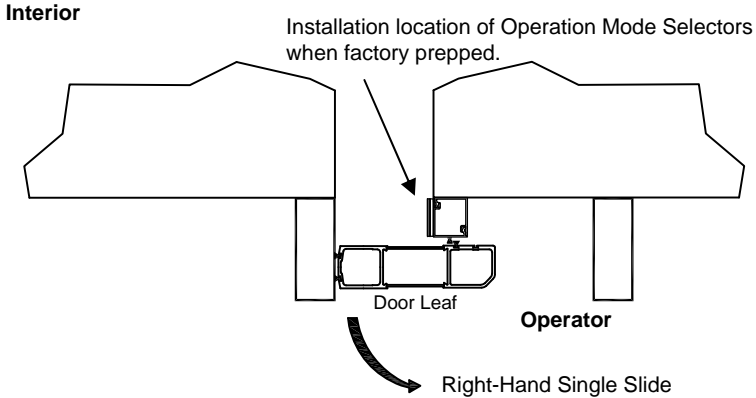
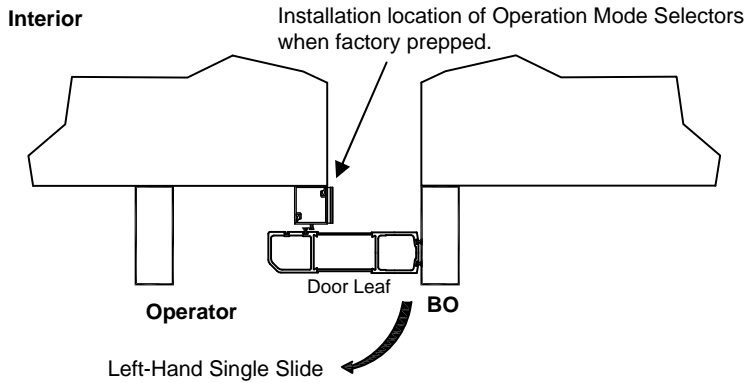
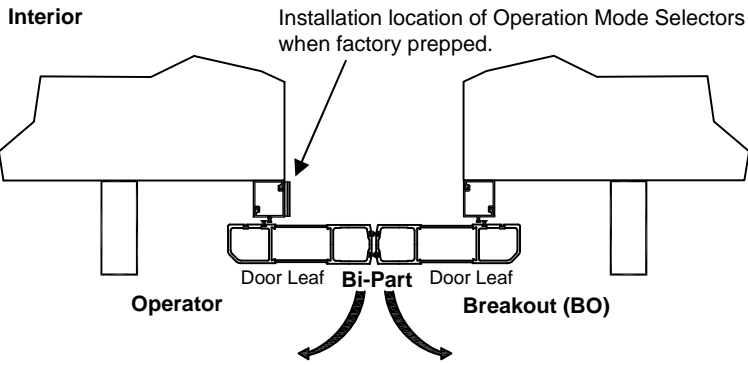
FBO

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



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

8.4.2 Surface Applied



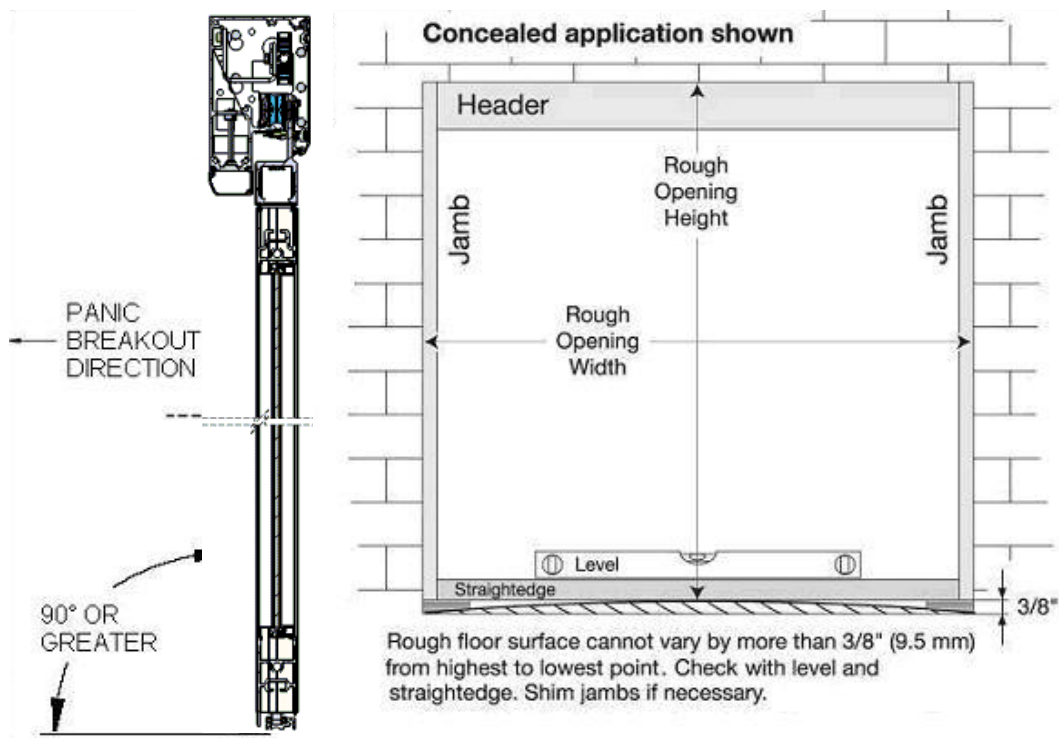
For Vestibule Applications
Use concealed systems

8.5 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.



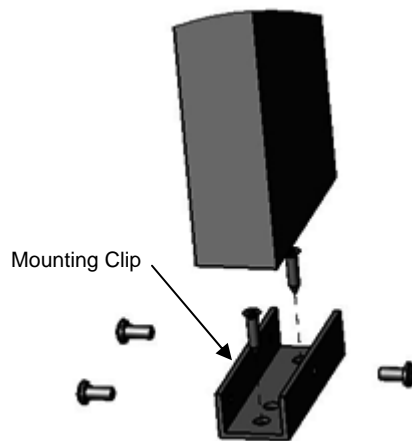
For Surface Applied Standard Applications all narrow frame with 1/4" glass, both Single Slide and Bi-parts, the overall frame height is 91". (Overhead Concealed overall frame height is 89 3/4".)

8.6 Installation and Adjustment Processes

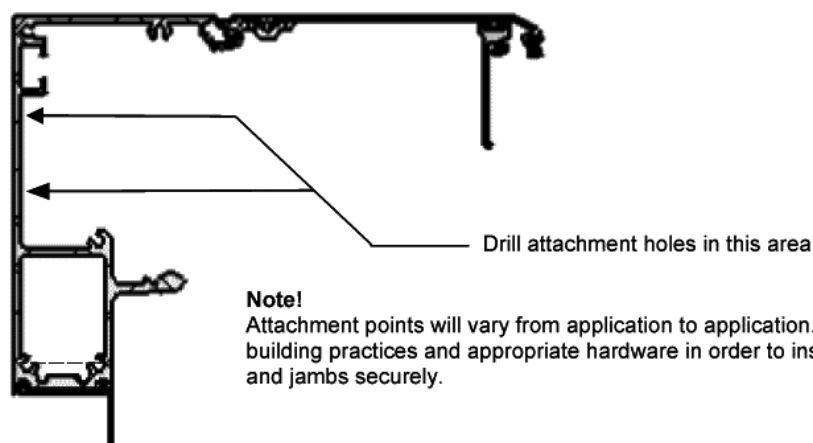
8.6.1 Surface Applied Mechanical Installation

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” on page 24 section). 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” on page 26 process.
- 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.



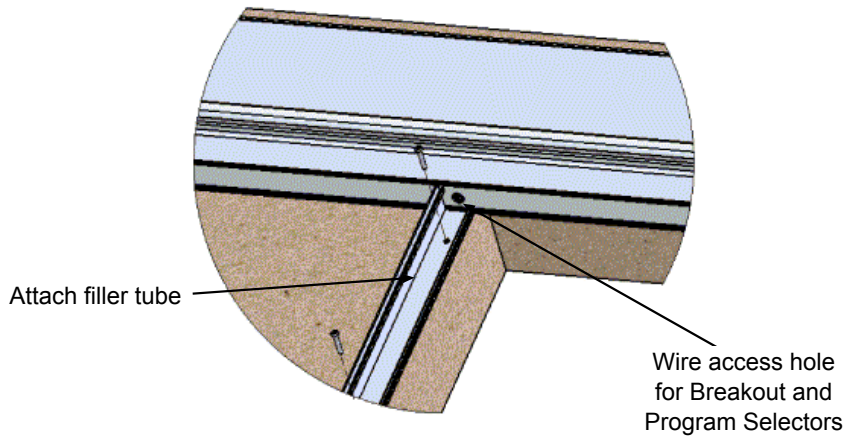
- d Attach Jamb Tubes to Header. See “Checking – Marking Out – Fastening” on page 24.
- e Lift Header and dry fit. Drill for attachment and attach to substrate or wall using standard construction methods.



- 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.



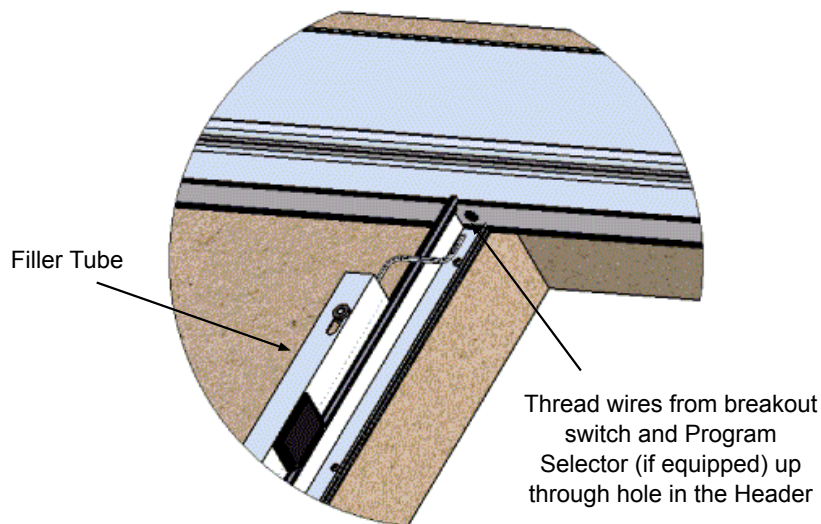
Ensure that the surface is even, particularly when attaching to block or concrete surfaces - level and shim as necessary. (Failure to provide an even surface results in warping the profile making it impossible to snap the filler tube together.)



- 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.



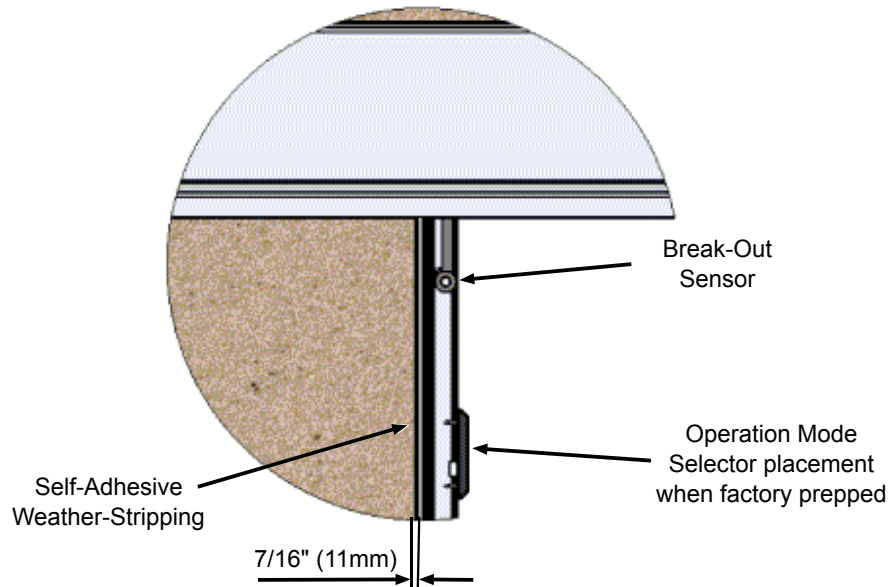
Use care that all holes are deburred to prevent electrical shorts.



- 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.

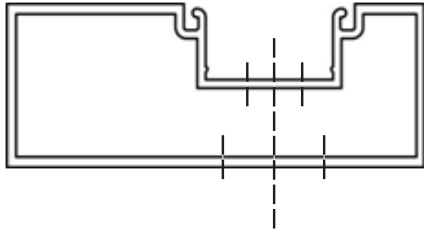


- k Connect the breakout wires and operation mode selector cable, see “Connection of electrical units” on page 49.
- l To attach doors to Beam, see “Hanging the Active Door Leaves (Full Break-Out)” on page 33.
- m To attach drive belt, see “Attachment of Tooth Belt Fittings” on page 37.
- n To adjust Levelers and to attach anti-riser, see “Hanging the Active Door Leaves (Full Break-Out)” on page 33.
- o To install Door Stops and make adjustments, see “Adjustment of the Leading Edge (to Avoid Finger Traps)” on page 38.
- 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 50 to complete this task.
- r Secure cover and attach with screws. See “Installing/Removing the Cover” on page 44.

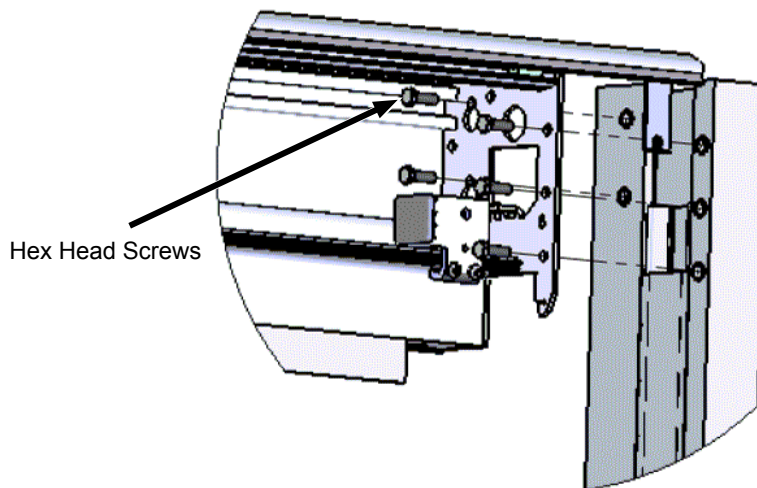
8.6.2 Overhead Concealed Mechanical Installation

Checking – Marking Out – Fastening

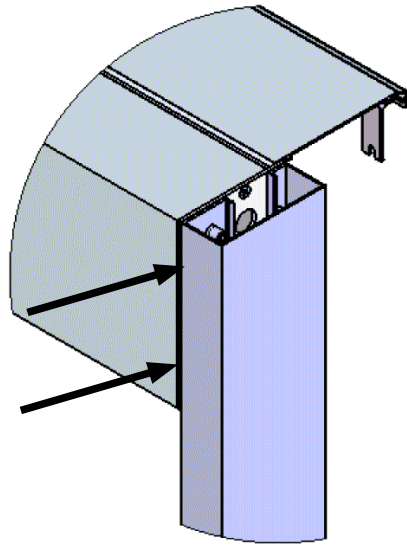
- a Mark the center of the rough opening width and the center of the header. (The center marks will be aligned during installation.)
- b Drill holes at the top, middle and bottom of the jambs for securing to the door opening. (Adjust for site conditions that may require the holes to be at a certain height.)
- 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. (Besam jambs are factory prepared for Header installation.)



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

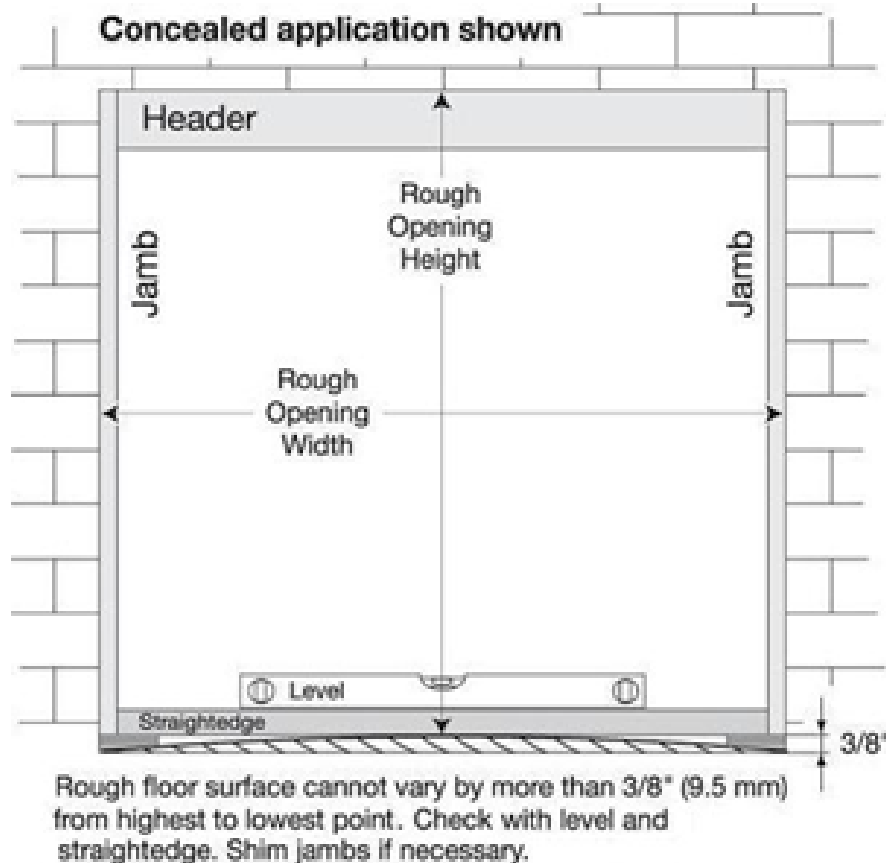


- f If the beam to jamb is not properly aligned, loosen the screws and align beam to jamb and retighten screws.

Leveling Header and Jamb

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.

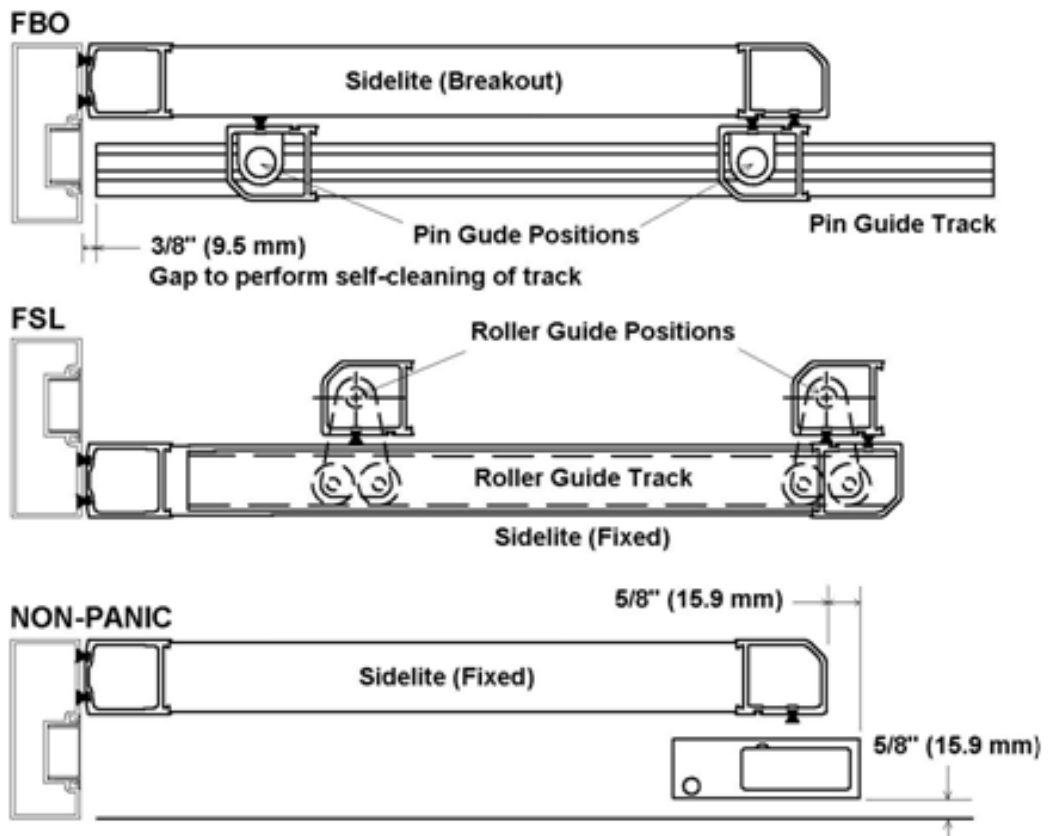
Fitting the Floor Guide Track

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.

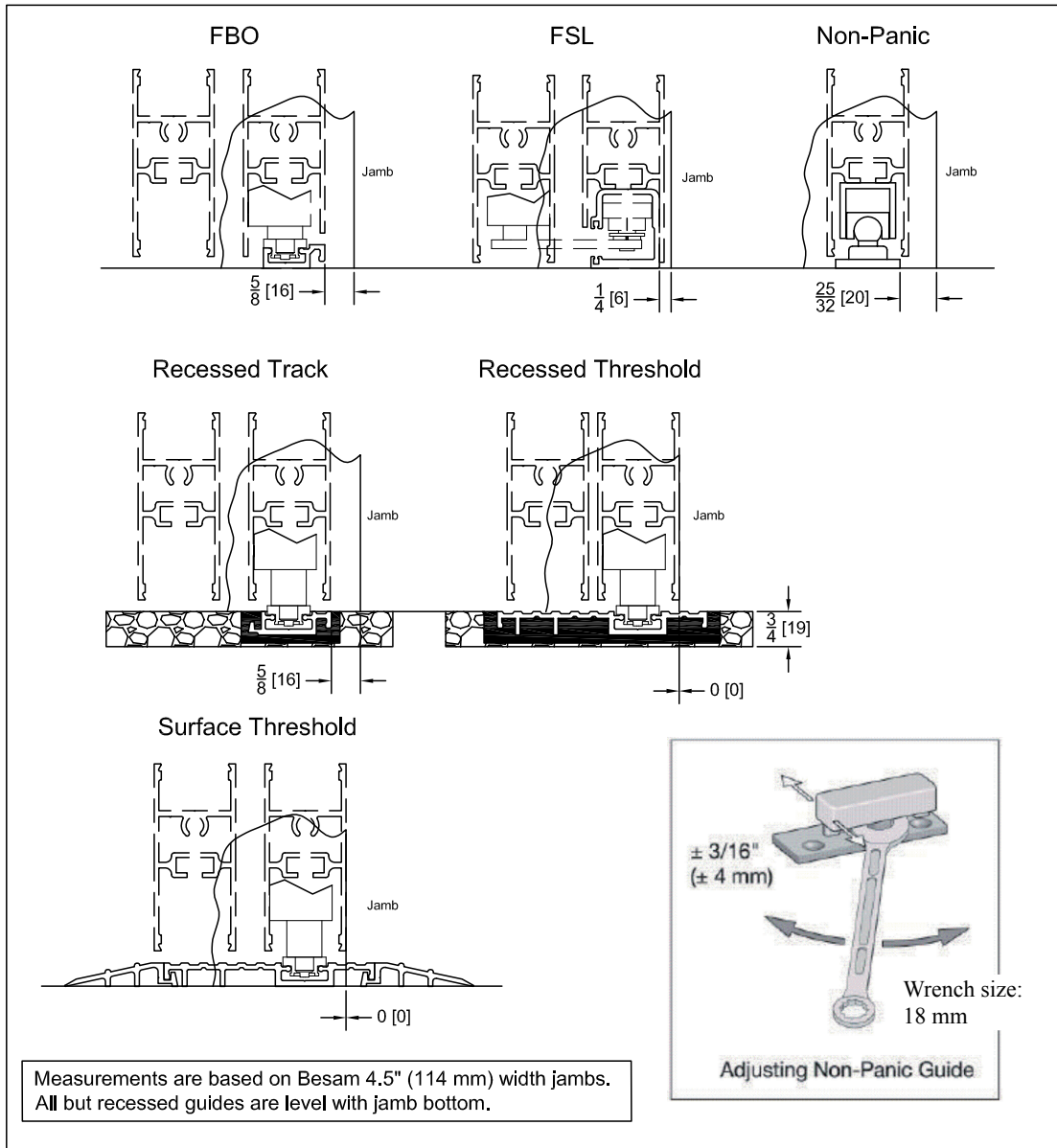
Note: It is important that the floor guide track is installed level, to prevent derailment of the floor guide foot when the door is swung out and to provide proper door operation.

- 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 20), 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.



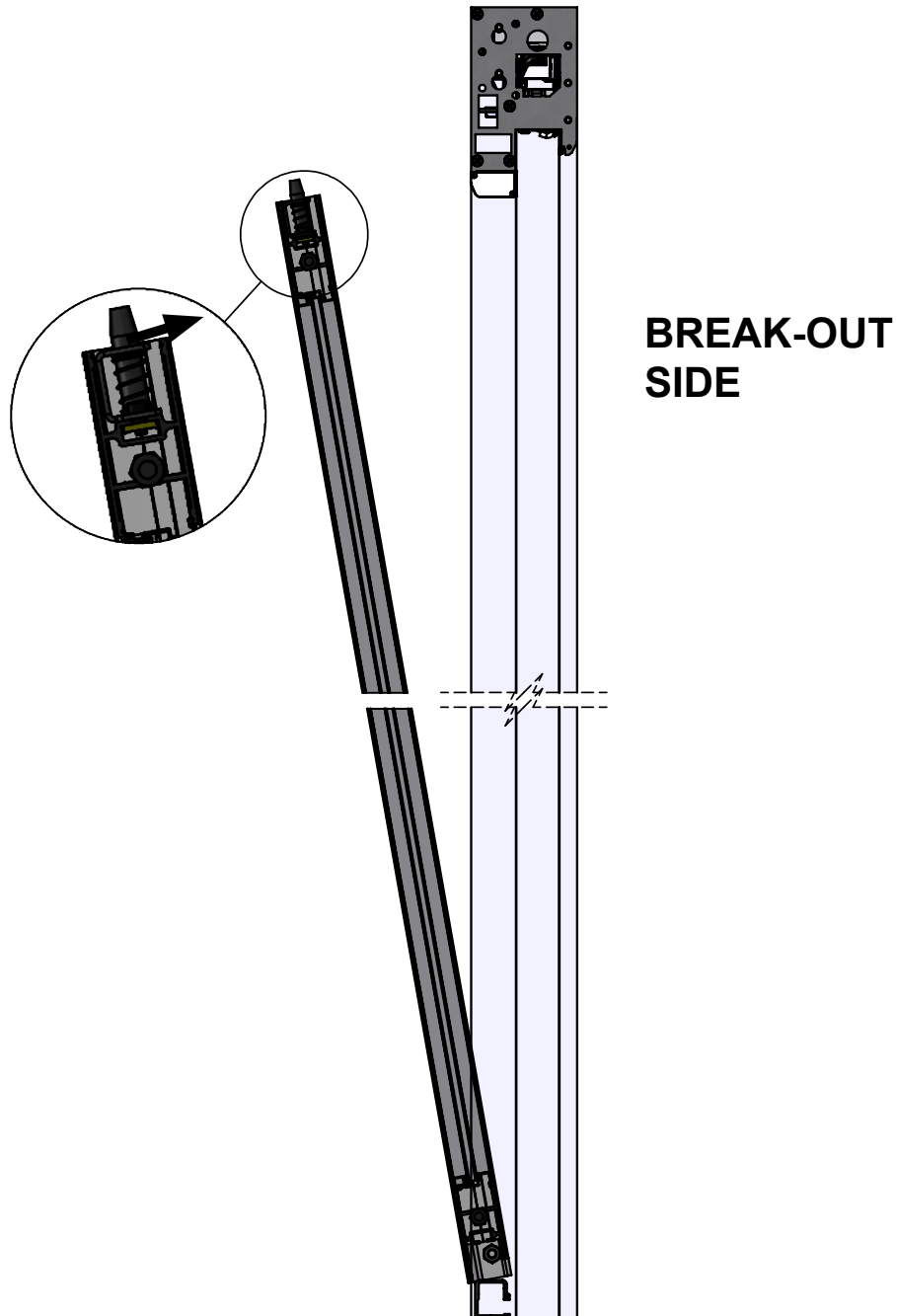
Fitting the Floor Guide Track Cont.



Fixed Sidelite Installation Procedure

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

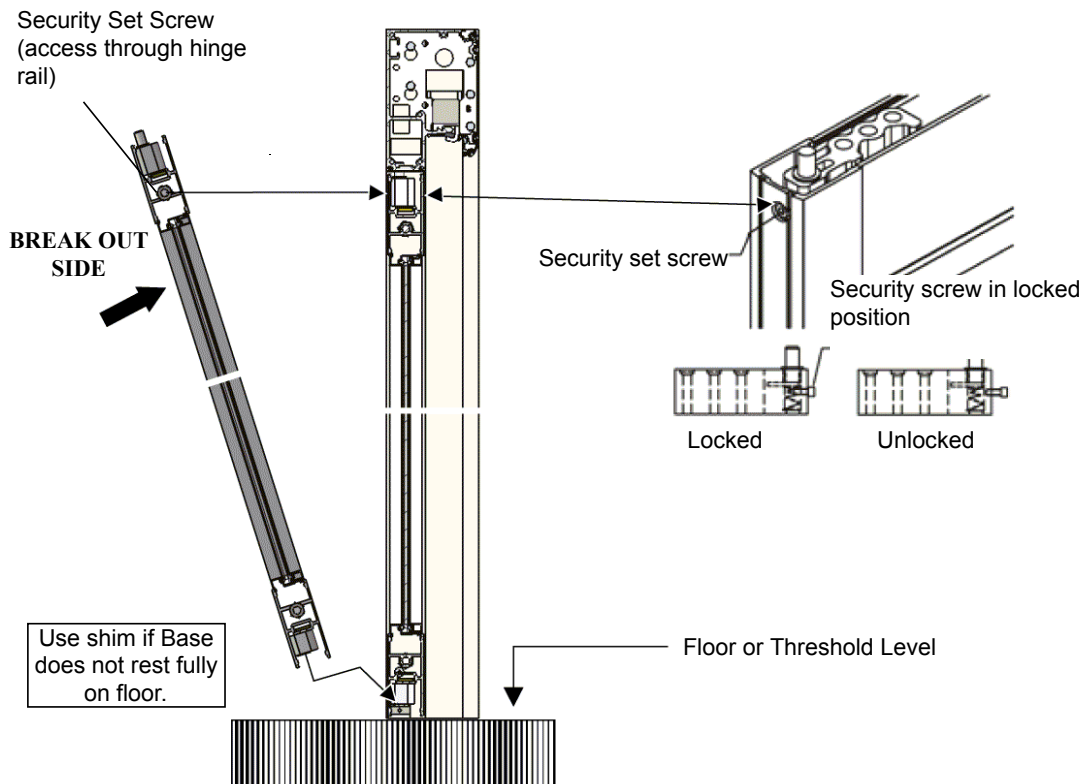
- a End load the sidelite panel on the roller track guide. Depress the spring loaded pins located at each end of the top door rail and guide into the mating holes located in the beam. Run Break-out pigtails up through hole in beam before the pins lock into the beam. Slide the panel against the jamb, 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.



Full Break-Out Sidelite Installation Procedure

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

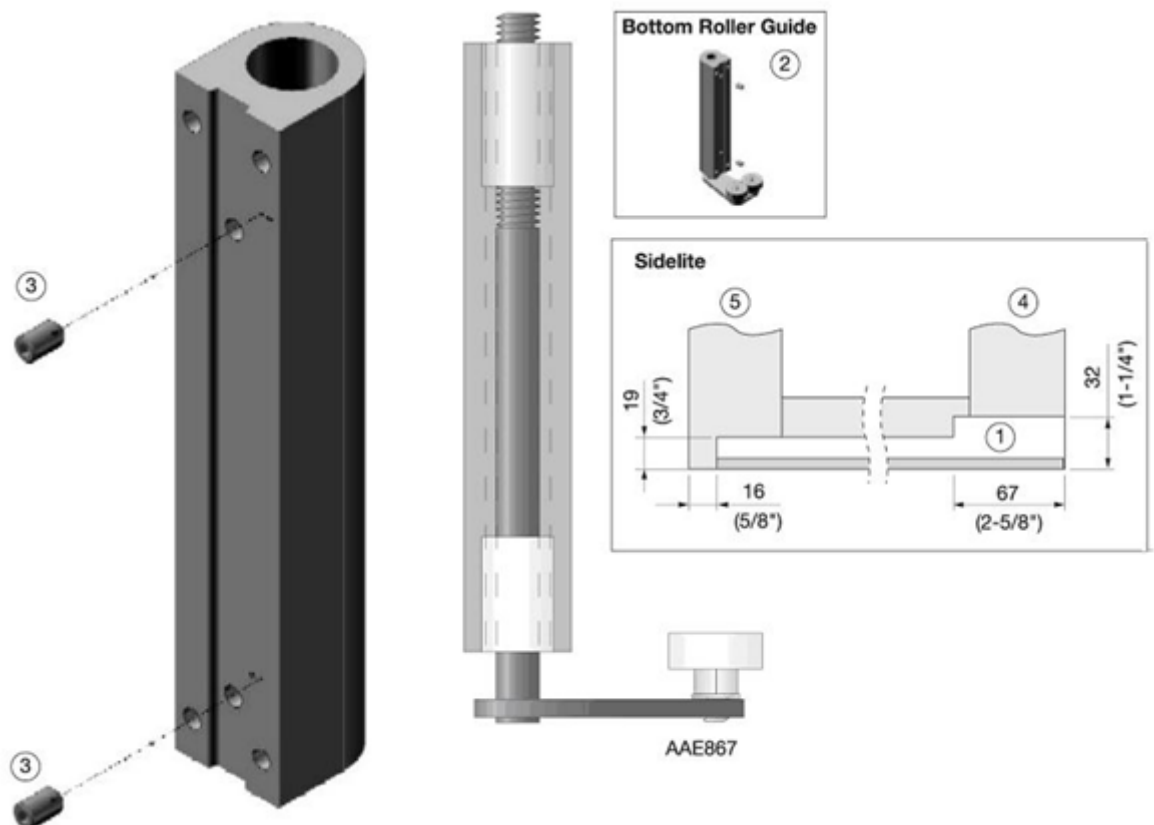
- a Install and level any thresholds (surface or recessed) before installing any of the door panels.
- b Check that jamb mounted bottom pivot is installed and tight. Also make sure that the pivot plate is also secured to the floor.
- c If the pivot base does not rest fully on the floor, support the pivot 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 Adjust Ball/Magnetic Catch section).
- 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)

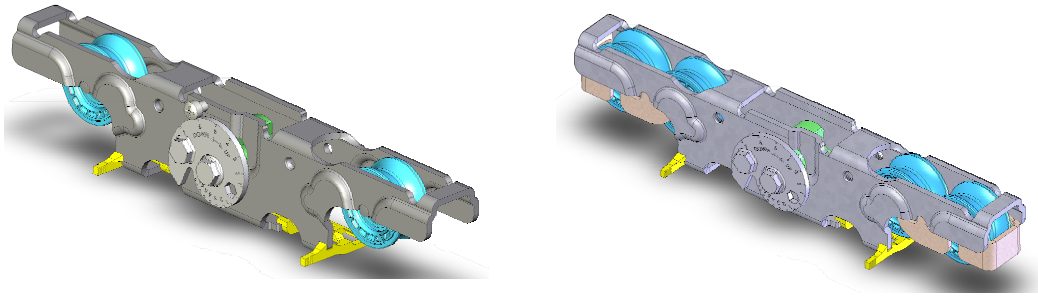
Before installing the active leaves, make the electrical connections in Electrical connections. Do not apply mains power.

- 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 34.
- 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 36. 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 38.
- 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 34.



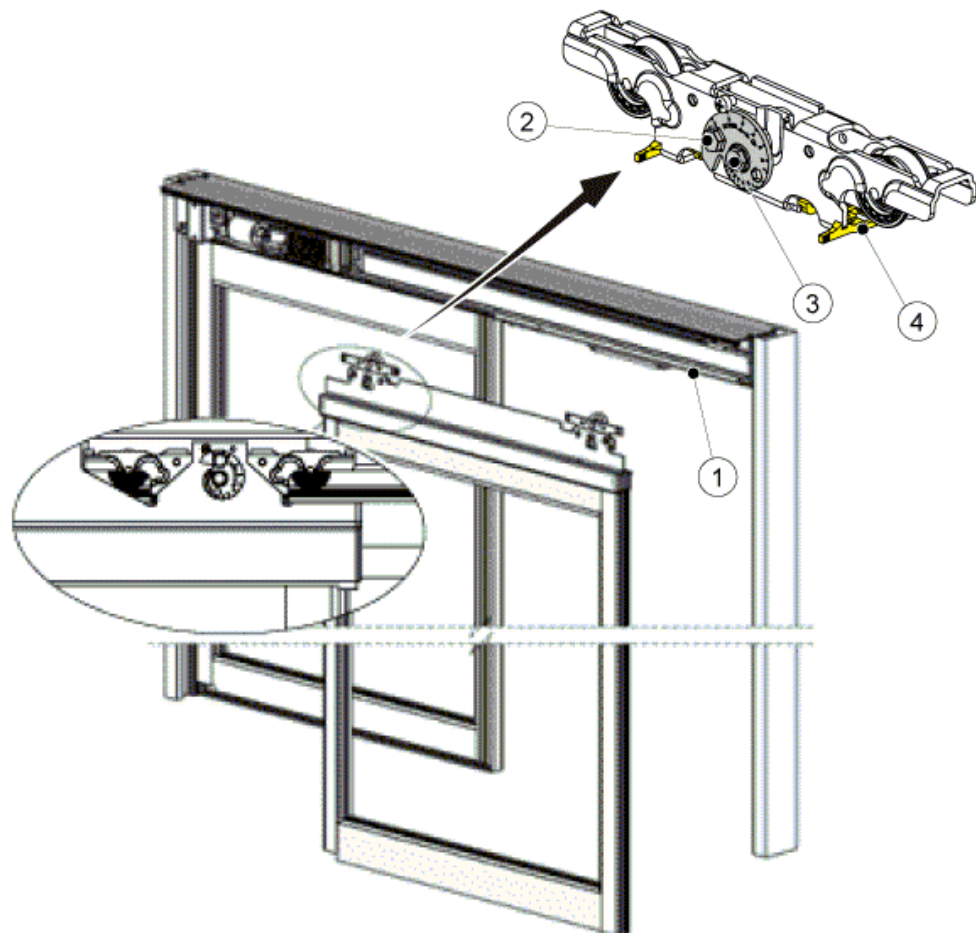
Door Carrier

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).



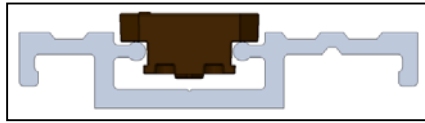
Hanging the Active Door Leaves (Full Break-Out)

- 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 "un-locked" 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 $\pm 5/16"$ (± 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.

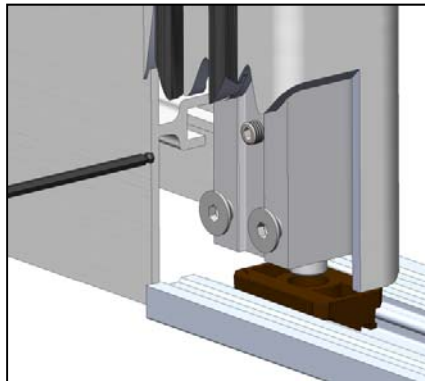


- 1 Sliding track
- 2 Height adjustment screw
- 3 Fastening screw
- 4 Anti-riser

- g Install t-block onto track. It can be slid into the bottom track from the end or may be snapped in from the top.



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

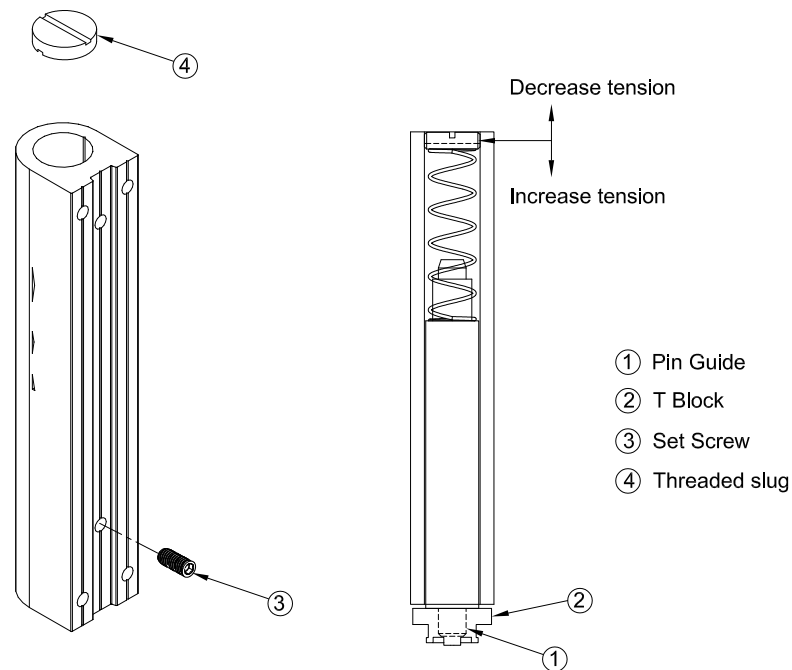
Setting the Active Leaf Pin Guide Pivot (Full Break-Out)

Note: Before installing the active leaves, make the electrical connections in Electrical connections. 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.

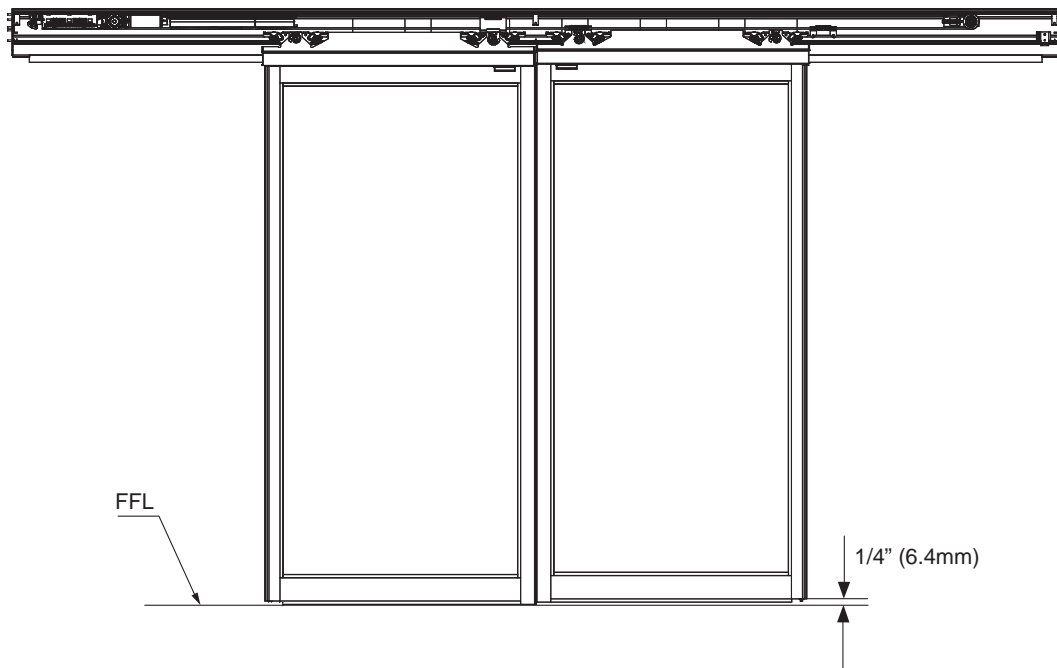
Note: If this option is selected, then you must level the floor track in order for the pin to stay completely engaged.



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 33.

- 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 of Tooth Belt Fittings

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

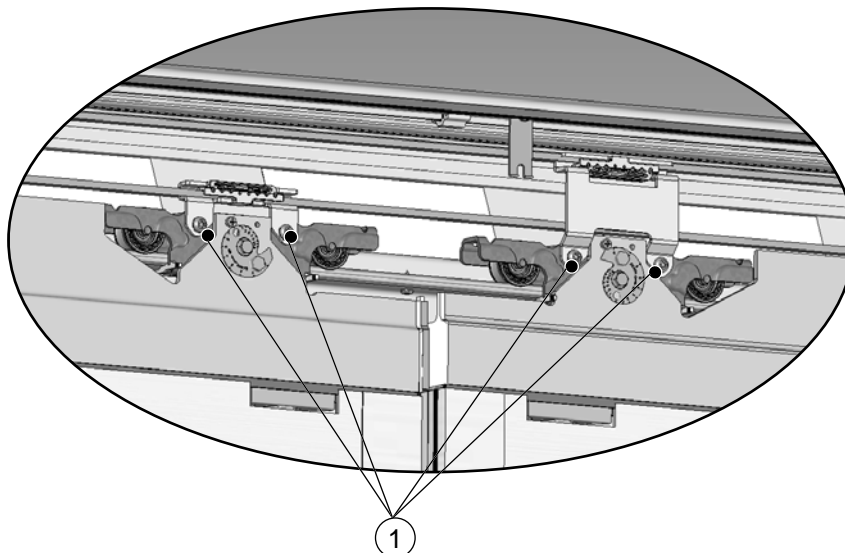
The tooth belt fitting joining the belt ends is factory-mounted to the lower or upper part of the tooth belt, depending on package type.

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

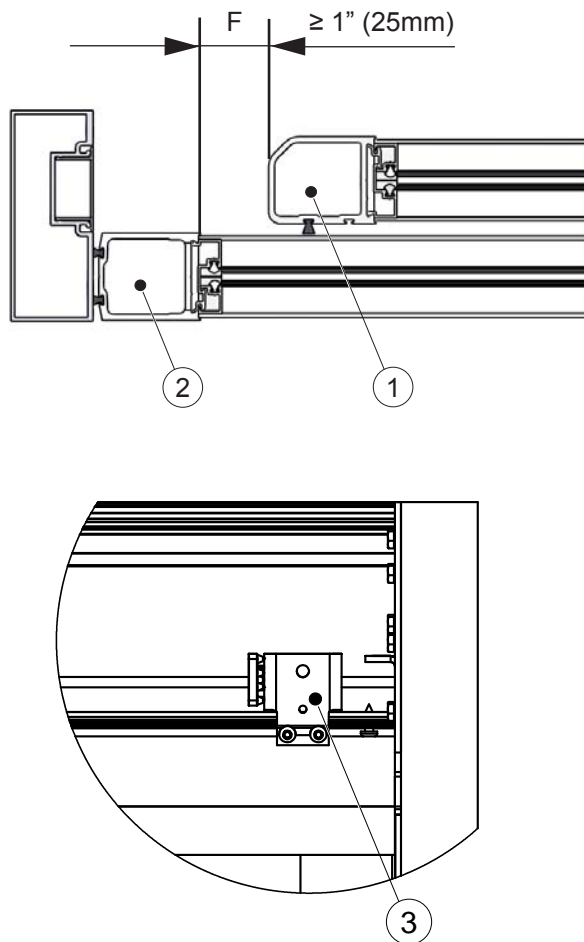
- a Put door in fully closed position.
- b Move the upper/lower transmission bracket that is factory installed to the belt until it is over the carriage wheel fitting of the door leaf.
- c Attach the tooth belt fitting to the carriage wheel fitting using the enclosed screws (1).
- d Check door panel 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

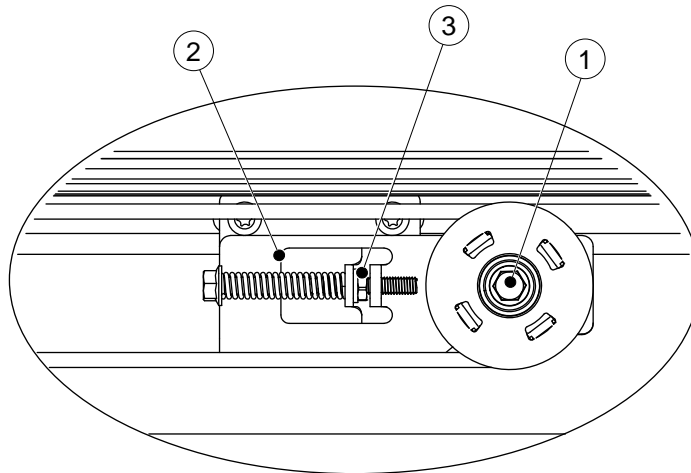
2 Active Sliding Leaf

3 Door stop

Checking and Adjusting the Belt Tension

The belt tension is factory-adjusted and readjustment is normally not needed. If the belt tension has to be corrected, proceed as follows:

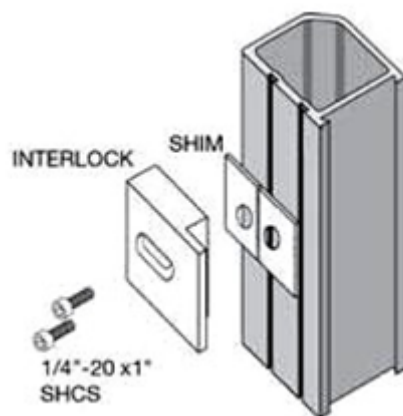
- a Loosen the screw in the middle of the tooth belt wheel (1) without removing it.
- b Tighten the belt tension adjustment screw (2) until the washer (3) is visible loose. Be sure not to overtighten, otherwise the screw will damage the belt wheel (1).
- c Retighten the screw in the middle of the tooth belt wheel (1).



- 1 Belt Wheel
- 2 Adjustment Screw
- 3 Washer

Interlocks for FBO Units

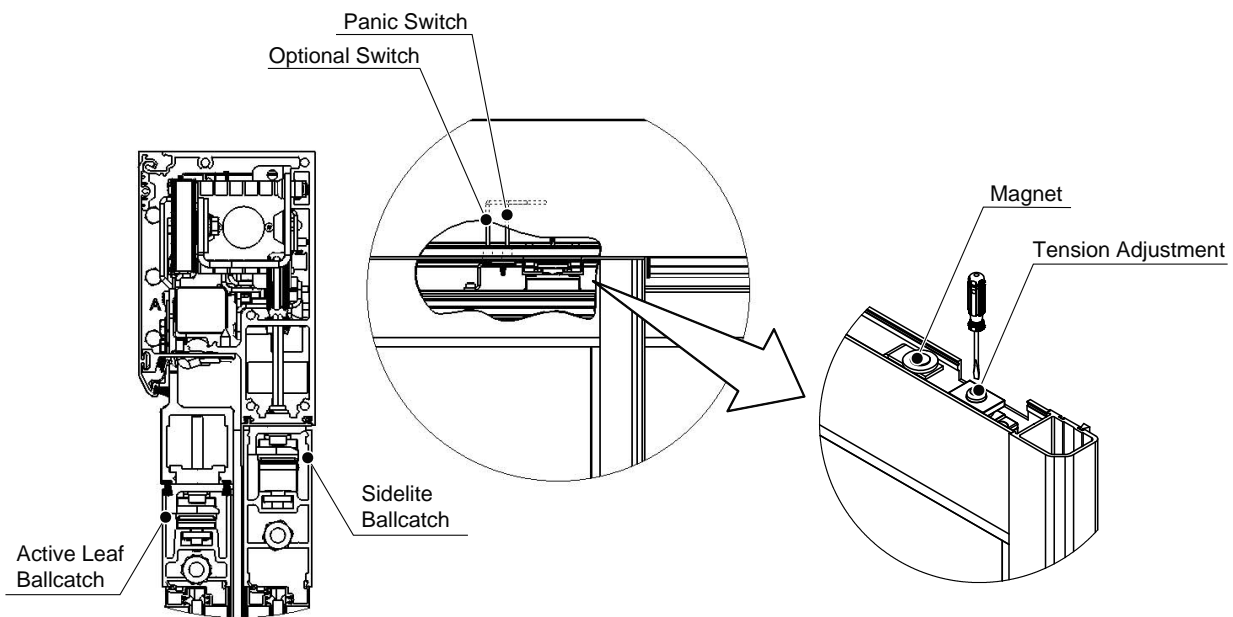
Slide the active leaf(s) into the closed position and check to see that the interlock hardware engages the sidelite cutouts. Adjust Interlock (and shim if necessary) for proper alignment.



Adjusting Ball Catch

- 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/BH-MA 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 (Option)

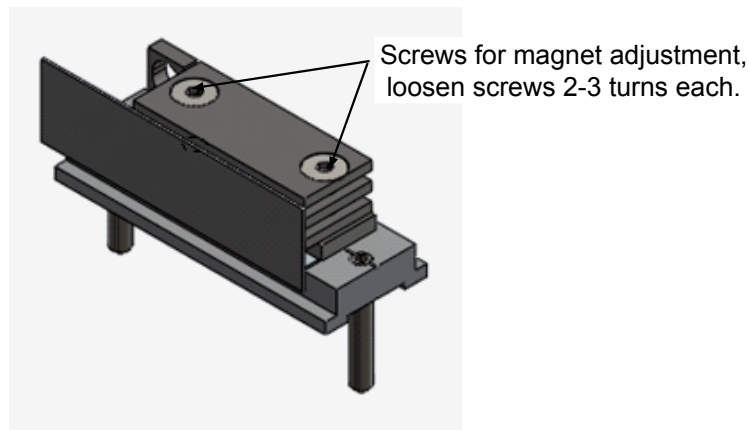
- a Check that the sidelite door assembly engages properly with the sidelite header assembly. Both can be repositioned slightly if necessary.
- b Adjust the tension on the magnetic catch by moving the magnets back and forth inside the magnetic catch, as required by local egress codes. Tension is not 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.



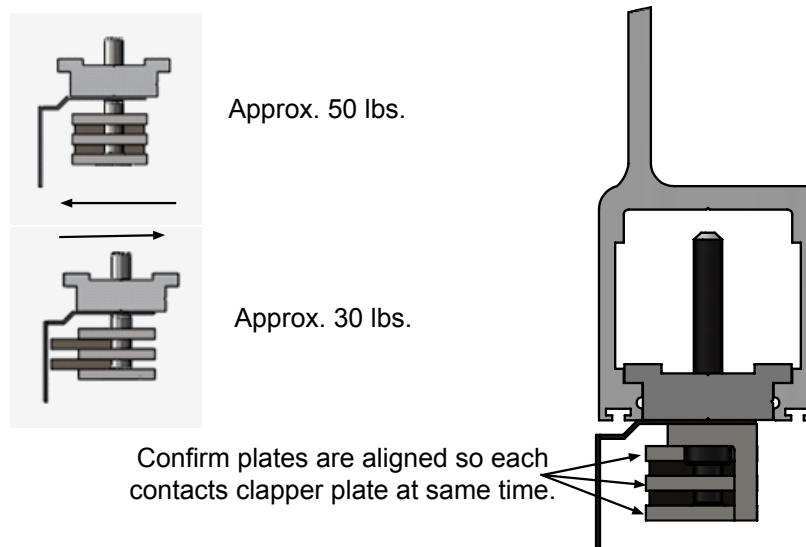
Potential hazard of shattering magnets if not handled correctly, use hand and eye protection at all times when working with magnetic catch.

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.

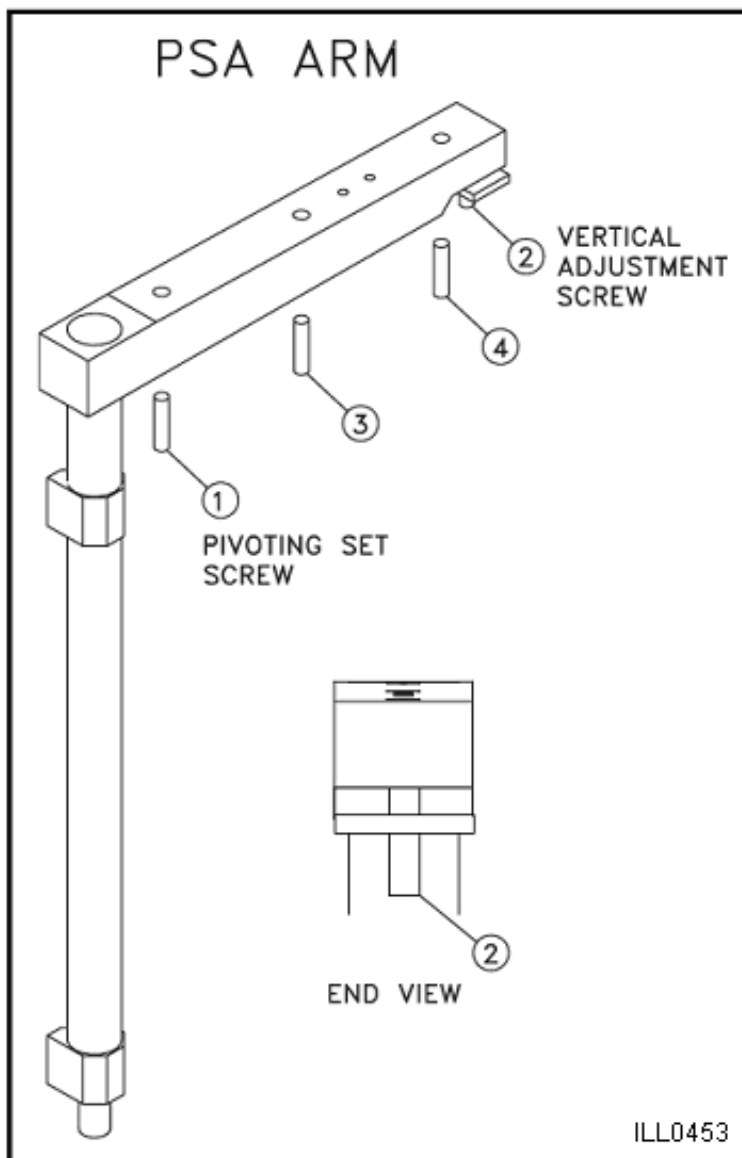


PSA Arm Adjustment

- a Open door and lock down #1 screw (pivoting set screw) of PSA arm, and loosen setscrews #3 and #4.
- b Adjust #2 screw (PSA vertical adjustment screw) on PSA arm to lift the door and ball catch lead edge into alignment with ball catch receiver.

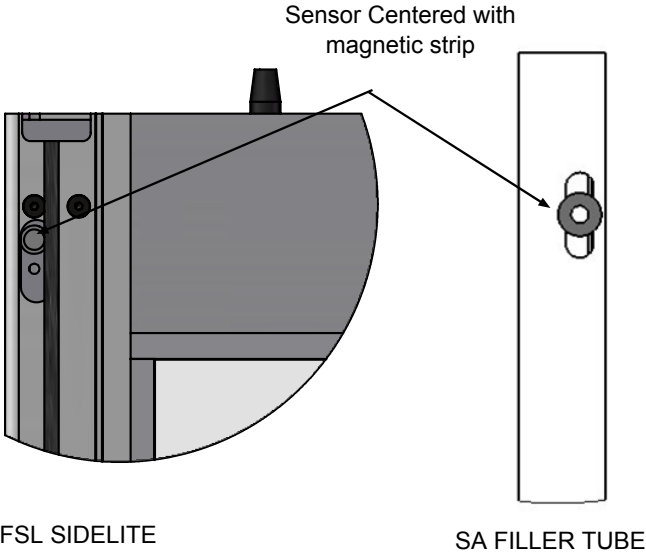
Note: If the glass has not previously been installed, you will need to recheck alignment once the glass is in place and readjust as necessary.

- 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.

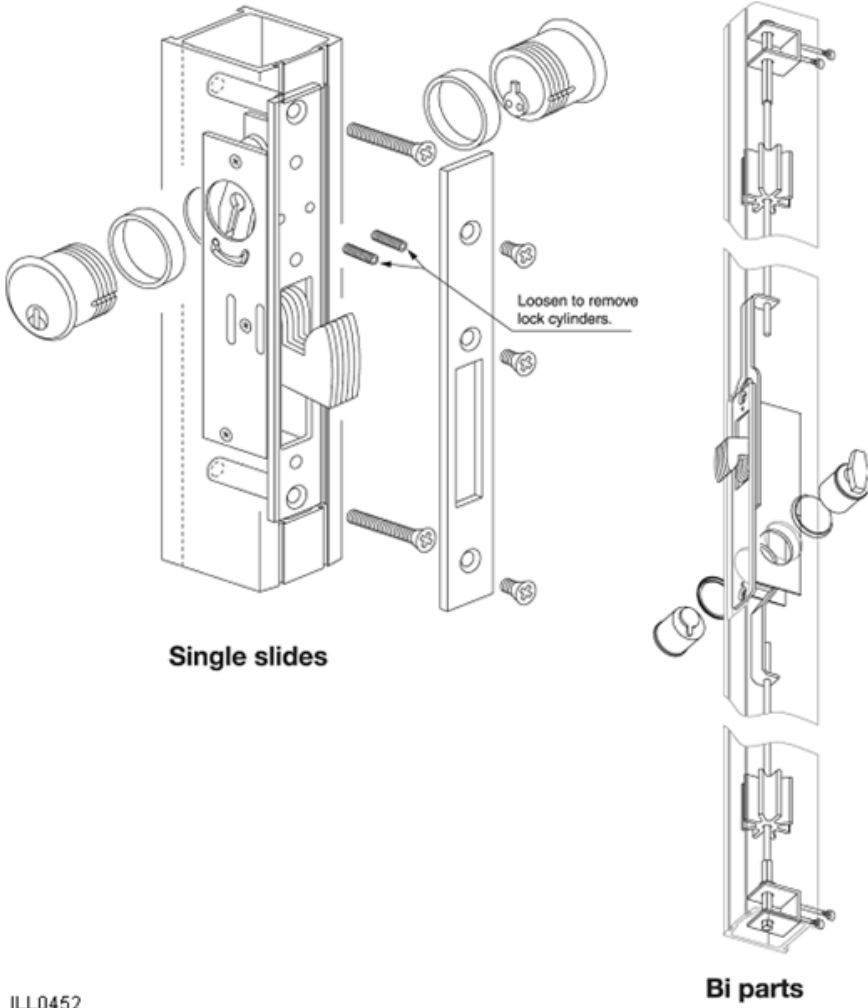


FSL Break-Out Switch Adjustment

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



8.6.3 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.)

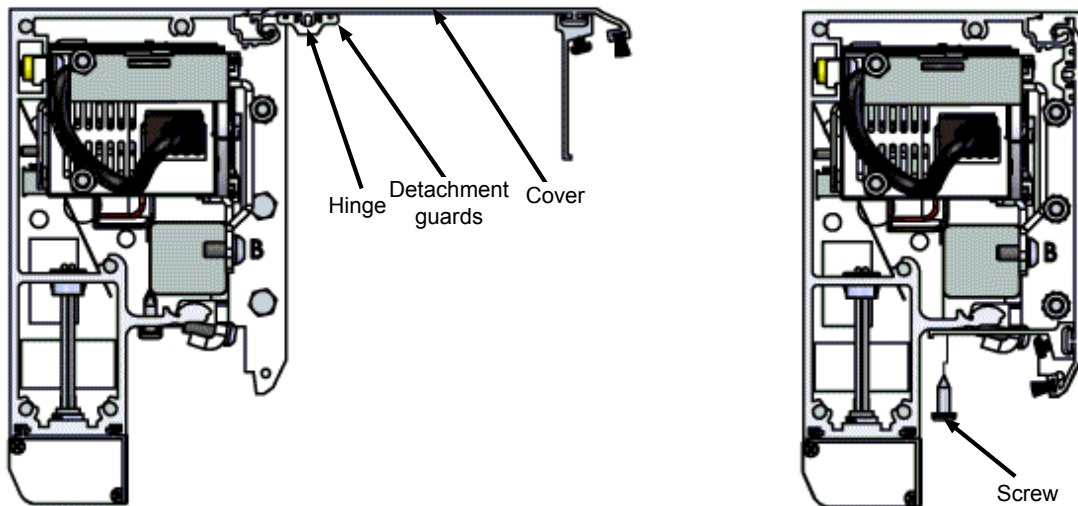
To unlatch the cover, lift slightly, pull and the cover will rotate downward, thereby allowing it to close.

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.



9 Electrical connections

Note: During any work with the electrical connections the

- **mains power to the power supply unit** 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.

9.1 Installation

- a Open the cover, see page 44.
- b Install but do not connect activation units, presence sensors and accessories.
- c Install and connect the mains cables, see page 46.
- d Carry out Start-up, see page 58.

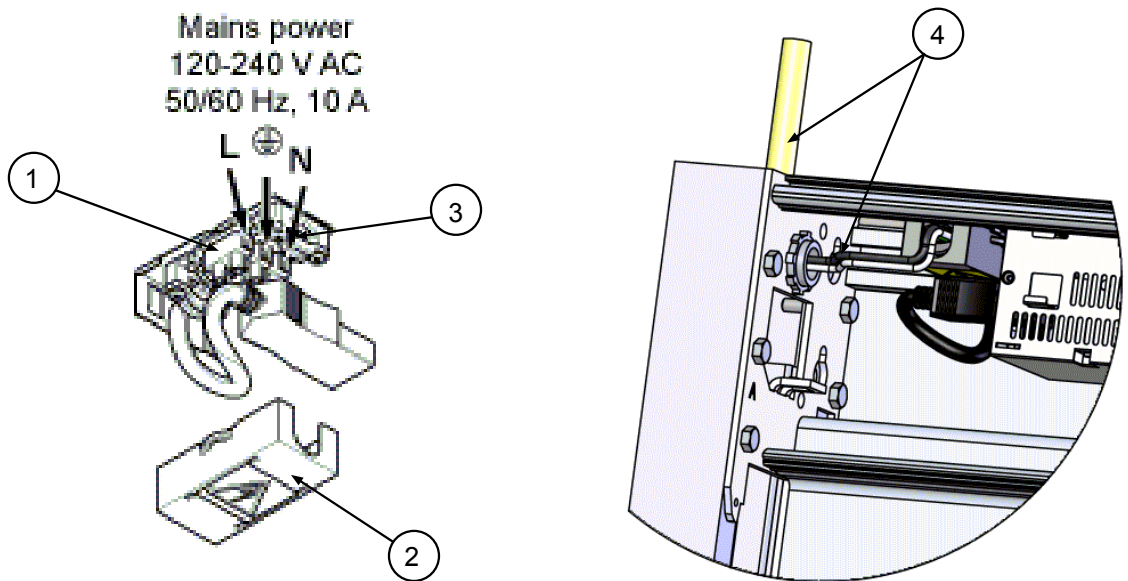
9.2 Mains connection

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.

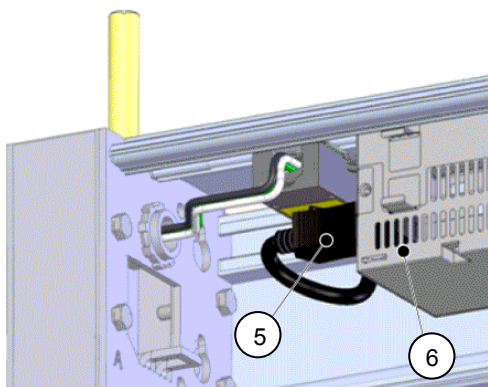
- a Remove the protective lid (2).
- b Connect the incoming mains power (4) through the strain relief (3) to the connection block (1) as shown in the illustration below.
- c Put the protective lid (2) back in place.



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



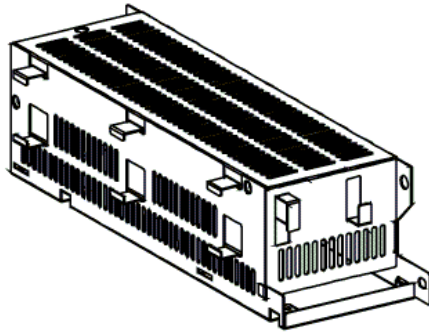
- 1 Mains connection block
- 2 Protective lid
- 3 Strain relief
- 4 Incoming mains power



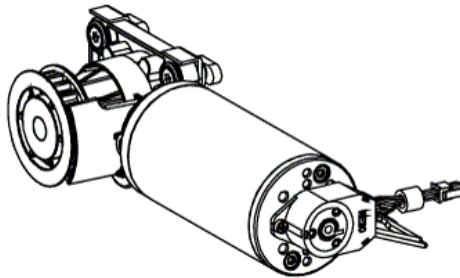
Do not connect the main connection cable (5) to the power supply unit (6) until all units are connected.

9.3 Electrical units

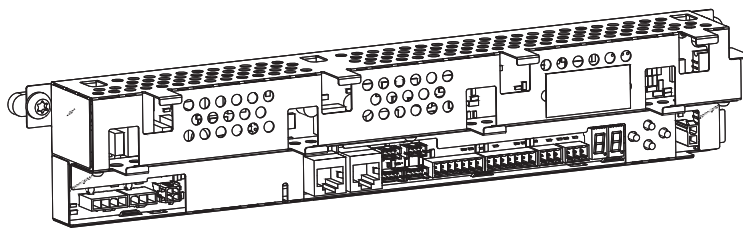
9.3.1 Power supply unit (PSU 150)



9.3.2 Drive unit



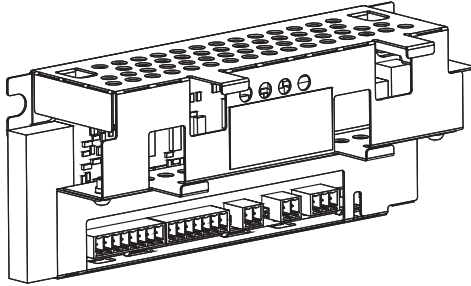
9.3.3 Main control unit (MCU)



The main control unit has the connection for power supply, drive unit, operation mode selector, activation units, electromechanical lock and batteries. Activation units can be connected with connectors directly to the main control unit or via terminal blocks. An installer interface with a two digit display and four push buttons is used for function selection, adjustments and for troubleshooting. See page 58 for details.

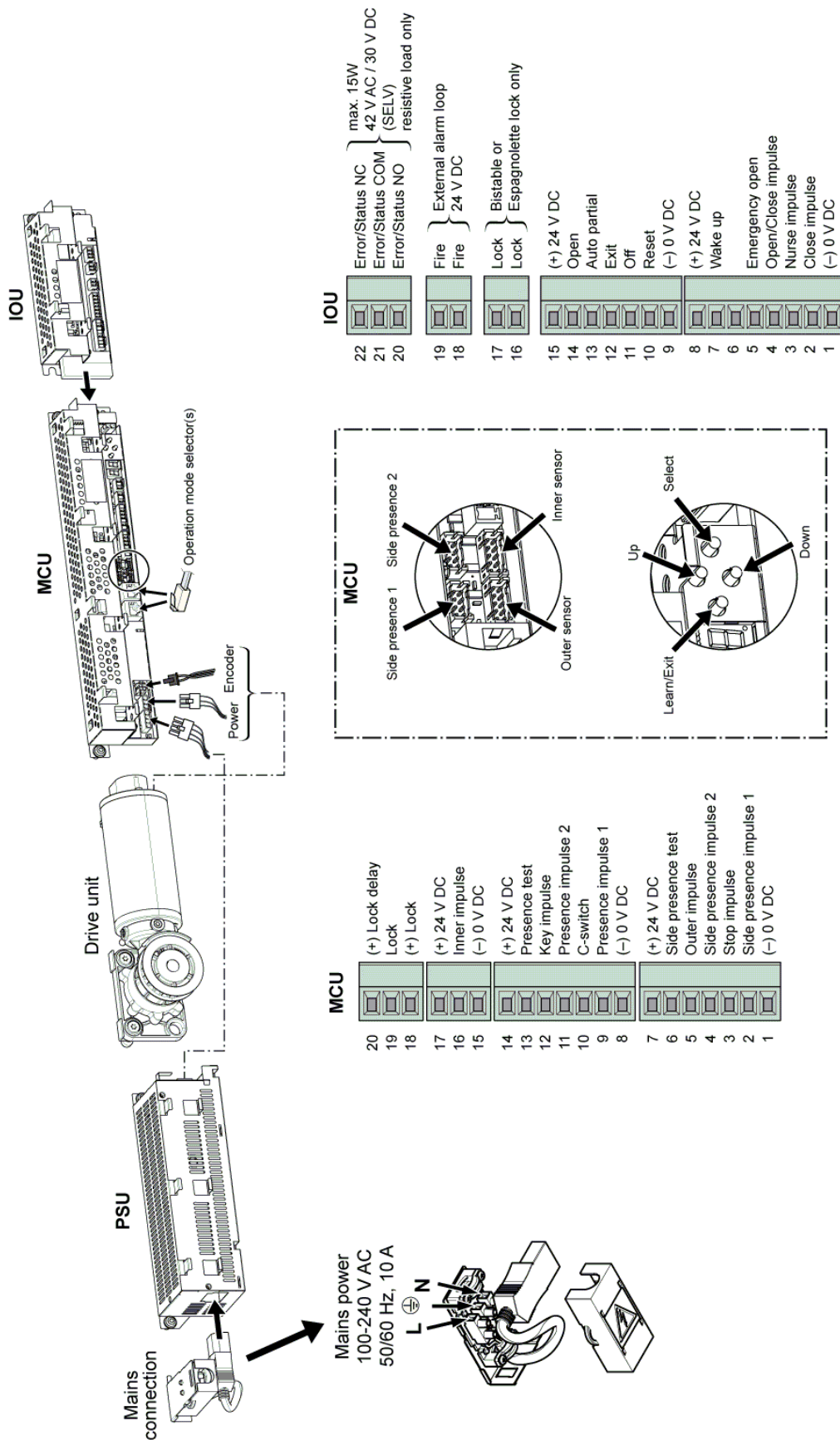
9.3.4 Additional electronic units can be connected for extra functionality

I/O unit (IOU) (Option)

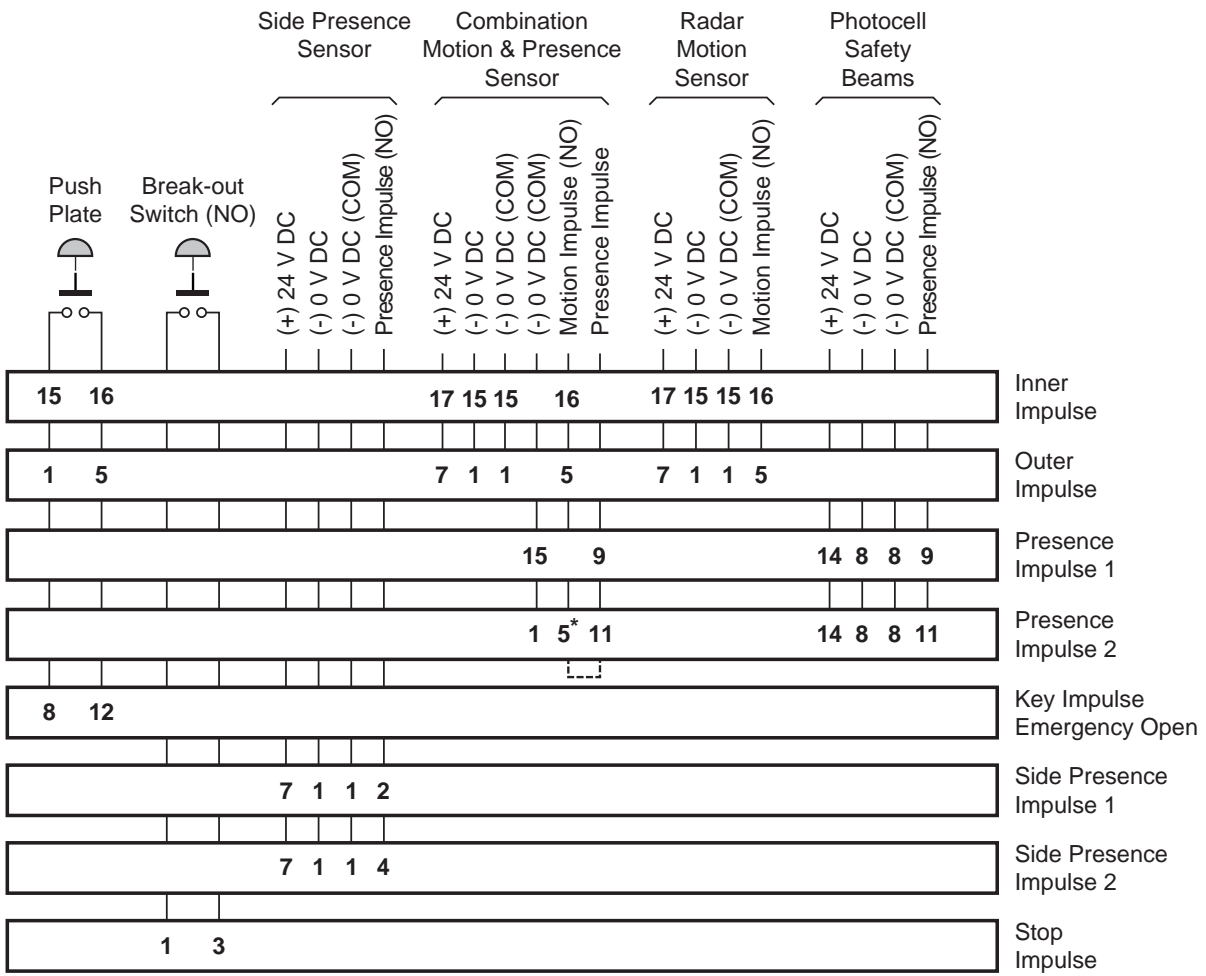


For extra functionality like Close impulse, Nurse impulse, Open/Close impulse, Emergency open impulse (fireman's opening), connection of optional operation mode selector and fire alarm an I/O unit is used. This unit has also a relay output for external error or status indication, maximum 15W, 42VAC /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

9.3.5 Connection of electrical units



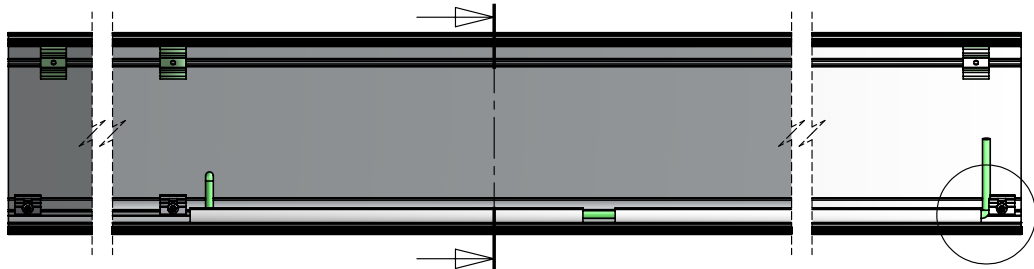
9.3.6 Connection of activation units



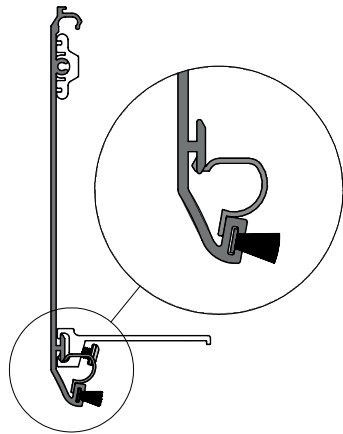
* One-way Traffic-Side, not intended for use, must have a jumper in place between Motion Signal Output (5) and Presence Impulse Input (11)

9.3.7 Cover sensor wire routing

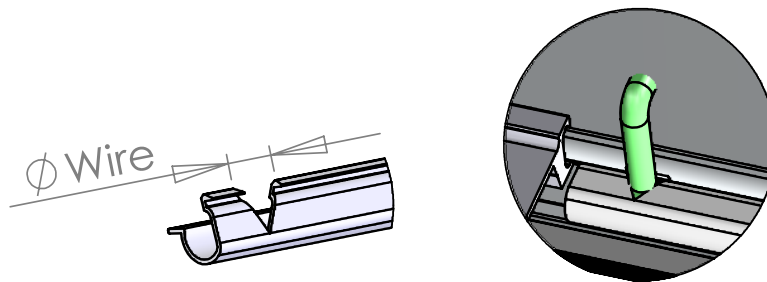
Once the sensor on the cover has been installed, protect the sensor wiring down the length of the cover using the cover clips provided.



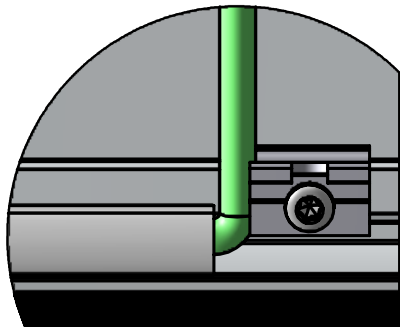
- a Orient clips as shown and either snap or slide onto the cover.



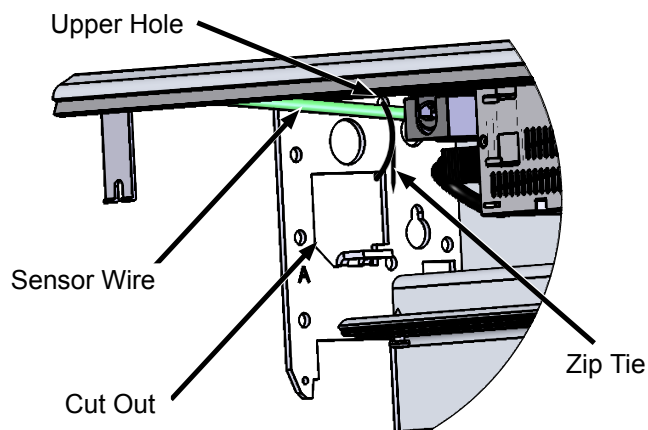
- b Space clips no further than 2" (50mm) apart.
- c Locate a clip as shown where the sensor wire comes through the cover. Cut a v-notch in this clip the same size of the wire approximately $\frac{1}{2}$ " (12mm) from the end and run the wire through this notch, then down through the clip. Ensure that the length of wire between this notch and where it comes out from the cover is tight and lies next to the cover.



- d Locate a clip as shown spaced approximately 1/4" (6mm) away from the end cover latch and run the wire between this clip and the cover latch to the beam.

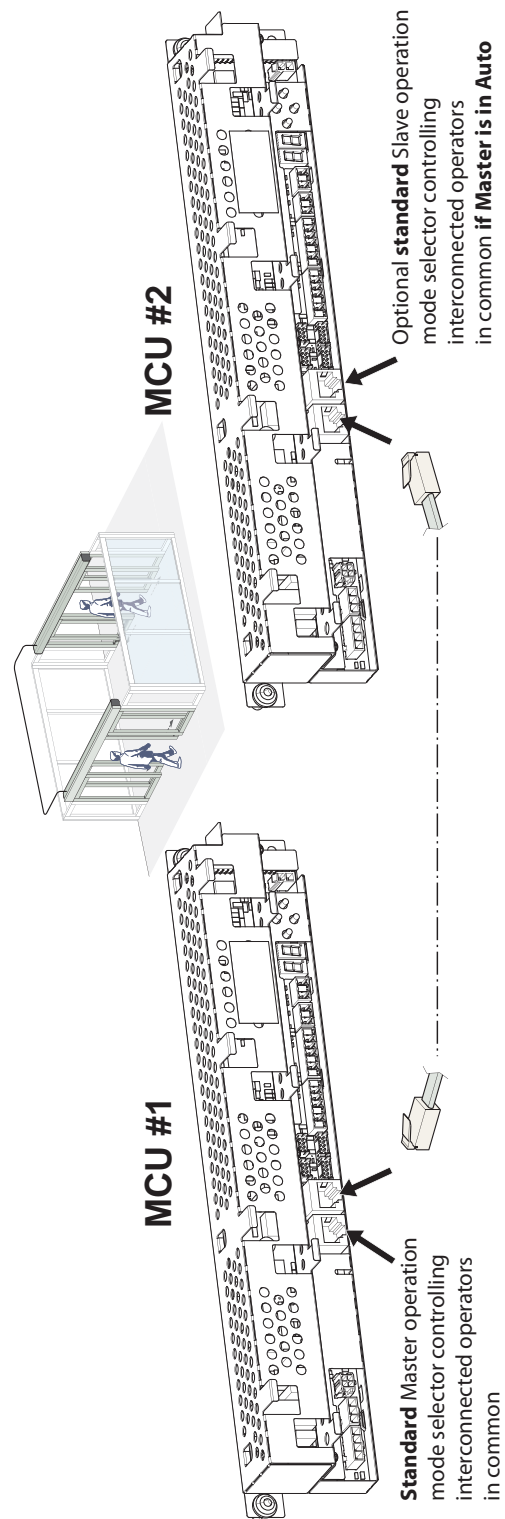


- e Once the wire is ran into the beam, zip tie the wire to the jamb mounting plate as shown—through both the small, upper hole on the backside of the 7/8" (22mm) main power hole and the cutout.



- f Run the sensor wire to the main control along the back wall of the beam using the factory installed rectangular plastic cable holders.
- g Close and open the cover and ensure that the wire does not come into the path of any moving parts.

9.3.8 Interconnection of operators



Install an interconnection cable between the operators **and** make sure that parameter 6C do **not** have the same value on the interconnected operators and then make a **Reset**.
Alter parameter 6A to value 01 for Interlocking function **or** alter parameter 6b to value 01 for Synchronizing function.

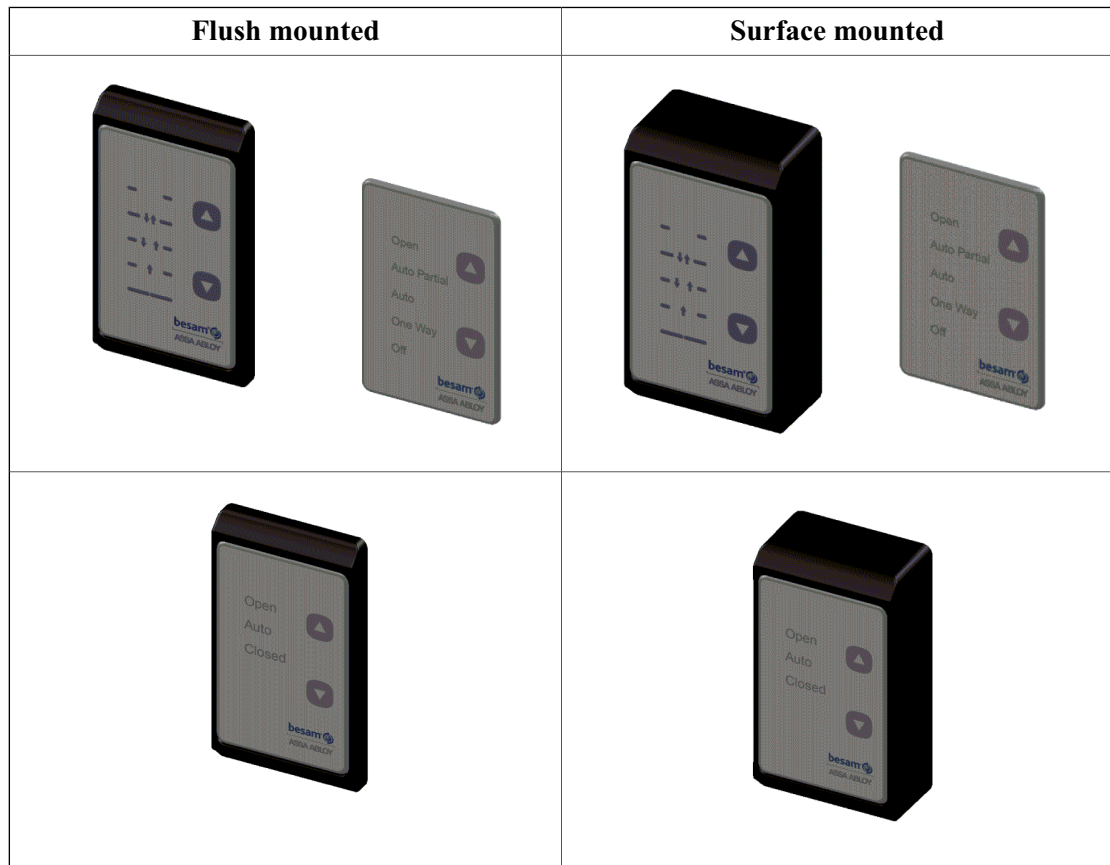
IOU units will control interconnected operators individually only.

9.3.9 Standard operation mode selectors

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.



Operation mode selector functionality

Three alternative selectable codes are used.

- The default access is obtained by pushing an arrow symbol pointing up or down for 2 seconds.
- An optional access code 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.

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 or text.

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

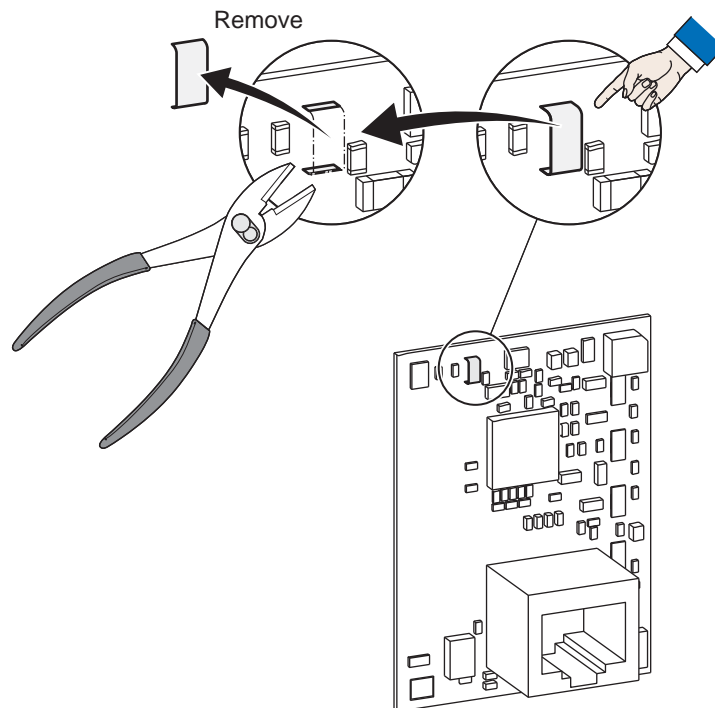
In the upper right corner a flashing light can be displayed.

- A red light every other second is indicating an error in the door operator. If the error remains after a RESET then service is needed. See also page 69.

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

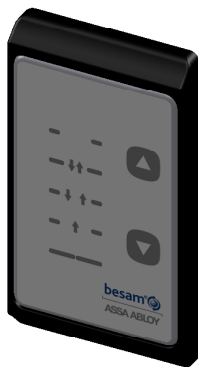
- An orange light every other second is indicating a status or condition that can be cleared by the owner e.g. a break-out door is standing open.
- A yellow light every other second is indicating that maintenance is needed.


One or two operation mode selectors can be used. When having two operation mode selectors, one will be a Master and will override the other, called Slave. While the Master is in AUTO the mode selection can be made from the Slave. A Slave mode selector has a cut jumper. See illustration below. The operation mode selector(s) can also be remotely controlled from e.g. a timer or an optional operation mode selector. IOU required. The standard operation mode selector(s) will not indicate the new selection made from the remote timer or operation mode selector.



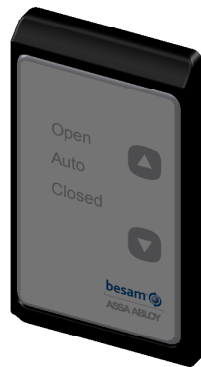
The operation mode selectors are available with 3 or 5 buttons (plus RESET).



With 5 buttons OPEN, AUTO PARTIAL, AUTO, ONE WAY 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).
— ↑ —	ONE WAY	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 or text and then a flashing blue light to the left of the closed symbol or text for another 15 seconds.
	RESET	By briefly pushing the globe of the logotype 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.

With 3 buttons OPEN, AUTO and CLOSED functions can be obtained.



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	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).
CLOSED	<p>This function is only used on emergency escape doors after it is certain that all people have left the building.</p> <p>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 push button (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 or text and then a flashing blue light to the left of the closed symbol or text for another 15 seconds.</p>
RESET  	By briefly pushing the globe of the logotype 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.

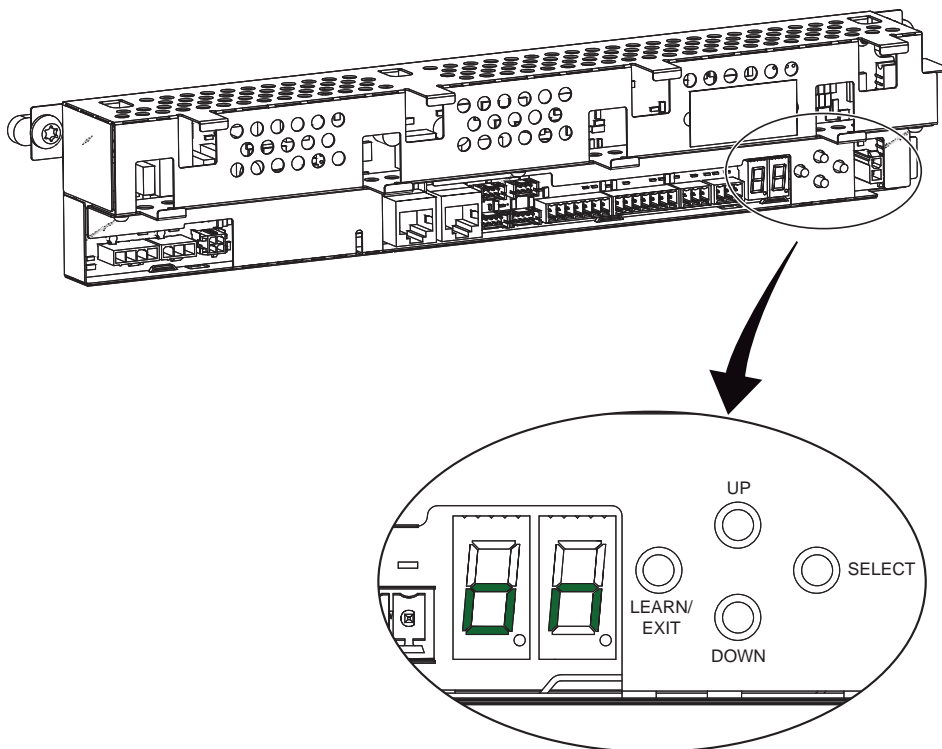
10 Start-Up

After installing the operator, the Start-up and adjustment must be carried out in the following order (see also Electrical connections).

- a Set the Program Selector to the “AUTO” position. With all accessories such as well adjusted sensors and breakout switches connected, connect the main power plug to the control unit. If the door is open and no opening or presence impulse is active, it will move to the closed position with low speed.
- b Push the Learn button, LB for 2 seconds to initiate a learn cycle. The display is flashing letter L. See detailed description on next page.
- c To check the door movement, give opening impulse by shorting the terminals speeds on the main control unit (MCU).
- d If necessary adjust the door speed parameters to the required speeds.
- e Check that the installation complies with valid regulations and requirements from the authorities.

10.1 Adjustments and selection of special operating functions

The main control unit has a two-digit display that can show text and/or digits.



'on' = operation OK

E1 = flashing letter E followed by a digit is displaying an active error (0-9) and this digit is showing the coarse type of error. It is alternating between this coarse error and a second two digit number specifying the error.

If several errors are present they will be displayed in sequence.

Errors can be cleared by a RESET from the operation mode selector or by turning off and back on the mains power. For a detailed description of errors, see Troubleshooting on page 12.

To the right of the display there are four push buttons, to the left a Learn/Exit button, to the right a Select button, one Up and one Down button.

The Learn function can be of three different types.

- By pushing the Learn/Exit for one second each connected electronic module, including the operation mode selector will be recognized.
- By pushing the Learn/Exit for two seconds the display will flash L and when the button is released a complete Learn cycle will start. The main power supply type is also detected. The door will first close, start to open a **short** distance and close again. It will sense if an electromechanical lock is installed and also find out of which type it is. It will then open the door and during the opening it will calculate the friction in the system. It will stop in the fully open position and register the clear opening width. It will also register connected sensors and can judge whether they are monitored or not. After a 4-10 seconds delay it will close again. During the closing it will automatically calculate the door weight and adjust the speed accordingly.

Some parameters, like whether the door is biparting or single sliding, cannot be determined automatically and have to be altered by the installer. If manual intervention is needed, the door will reopen and the Learn will end with the display alternating between P and two digits representing the parameter(s) that must be altered manually. By pushing the right Select button once you will enter this parameter and by pushing the Select button once again the value of this parameter will be shown while flashing. By pushing the Up or Down buttons you can step up or down the value within the allowed range. To confirm the selected value, push the right Select button again. When all values are right, push the Learn/Exit button for 2 seconds and the display will show '**on**'. After a two seconds delay the door will close and is ready for operation or for further adjustments.

- By pushing the Learn/Exit for ten seconds the operator will return to the default factory set parameters. While pushing, the display will flash L and when '**on**' is displayed it indicates that you have returned to the default parameters.

When pushing the right Select button the first time, each of the two display windows will make a rotating test pattern. Verify that all seven segments of the two display windows will be lit during the test. Otherwise there is a risk that you can misjudge the digits shown in a defective display. When the display test is finalized the display will show two steady digits representing a parameter. By pushing the up or down buttons you can step up or down to be able to select the parameter you want to adjust. By pushing the right Select button again you will be able to read out the present value of the parameter you have selected. It is shown as two flashing digits and can be adjusted within an allowed range, by pushing the Up or Down buttons. When the proper value is selected you push the right Select button again.

If you do not want to alter a new value you can always return to normal operation '**on**' by pushing the left Exit button. If you wait ten seconds without pushing any button you will also return to normal operation '**on**'.

Note: Some of the parameters below are not accessible, depending of different options installed. For further explanations of parameters below marked with *, see 10.2.			
Main control unit (MCU) parameters			
Param. ID	Description	Range	Default value
00	High Speed Opening	0.33- 2.30 ft/s (10-70 cm/sec)	2.3 (70)
01*	Low Speed	0.16-2.30 ft/s (05-70 cm/sec)	2.3 (70)
02	High Speed Closing	0.33-2.30 ft/s (10-70 cm/sec)	0.43 (13)
03	Hold Open Time	00-60 sec	20
04	Key Hold Open Time	00-60 sec	70
05	Lock Configuration (main control). No lock(00) / LDP(01) / LD(02)	00-02	00
06*	Lock Release. Off(00) / On(01)	00-01	00
07*	Presence Input 1 Configuration (main control). NO(00) / NC(01)	00-01	00
08*	Presence Input 2 Configuration (main control). NO(00) / NC(01)	00-01	00
09*	Presence Impulse Monitoring	00-02 units	00
10*	Emergency Unit Monitoring. Off(00) / On(01)	00-01	00
11	Partial Open Position	00-99 %	70
12	Opening Direction. CW(00) / CCW(01)	00-01	00
13*	Hold Force	0.0-13.5 lbf (00-60 N)	0.0 (00)
14*	Group / Parameter Set	00-99	00
15	Run Program. Smooth (01) to max performance (05)	01-05	05
20	Partial Hold Open Time	00-60 sec	02
21	Push & Go Hold Open Time	00-60 sec	02
22*	Auto Width Activation Time	00-60 sec	10
23*	Auto Width Resume Time	00-60 sec	10
24*	Jam Hold Time	00-10 sec	02
25*	Interlock Disable Time	00-60 sec	00
26*	Presence Hold Open Time	00-60 sec	02
27	Side Presence Input 1 Configuration. NO(00) / NC(01)	00-01	00
28	Side Presence Input 2 Configuration. NO(00) / NC(01)	00-01	00
29*	Side Presence Impulse Monitoring	00-02 units	00
30*	Side Presence Activation Distance	0.0-32.5 ft (00-99 dm)	0.0 (00)
31*	Sensor Type. 1-wire(00) / 2-wire(01) monitoring	00-01	01
32*	Active Brake on Stop. Off(00) / On(01)	00-01	01



Note: Some of the parameters below are not accessible, depending of different options installed. For further explanations of parameters below marked with *, see 10.2.

Main control unit (MCU) parameters

Param. ID	Description	Range	De-fault value
33	Push & Go in EXIT Mode Selection. Off(00) / On(01)	00-01	01
34	Hold Force in EXIT and OFF Mode Selection. Off(00) / On(01)	00-01	00
35*	Toggle Operation Mode Selector after Stop. Off(00) / On(01)	00-01	01
36*	Emergency Action. Closing(00) / Opening(01)	00-01	01
37*	Emergency Action in OFF Mode. Off(00) / On(01)	00-01	00
38*	Convenience Battery. Off(00) / On(01)	00-01	00
39*	Battery Wake-up. Open(00) / Open/Close(01)	00-01	00
40*	Emergency Unit Test Interval	04-23 hours	04
41	Battery Type. No battery(00) / 12V(01) / 24V(02)	00-02	00
42*	Remain Locked at Stop. Off(00) / On(01)	00-01	01
43*	Opening Delay for Lock	00-99 sec x 0.1	00
44*	Exit Lock. Off(00) / On(01)	00-01	01
45*	Stop Function. Off(00) / On(01)	00-01	01
46*	Stop Configuration. NO(00) / NC(01)	00-01	00
47*	C-Switch Configuration. NO(00) / NC(01)	00-01	01
48*	C-Switch Activation Distance	0.0-32.5 ft (00-99 dm)	0.33 (01)
49*	Opening Max Force	4.5-42.7 lbf (02-19 N x10)	33.7 (15)
50*	Closing Max Force	4.5-42.7 lbf (02-19 N x10)	29.2 (13)
51*	Push & Close. Off(00) / On(01)	00-01	00
52*	Push & Close Timeout	00-99 sec x10	60
53*	Operator Type. Normal(00) / PCD(01)	00-01	00
54*	Service Needed Operating Hours	00-60 h x1000	00
55*	Service Needed Opening Cycles	00-50 cycles x100.000	00
56*	Service Needed Locking Cycles	00-50 cycles x10.000	00
57	Low Speed Distance, Opening	0.0-39.9 inch (00-99 cm)	3.9 (10)
58	Low Speed Distance, Closing	0.0-39.9 inch (00-99 cm)	3.9 (10)
59*	Open Position	0.0-32.5 ft (00-99 dm)	9.8 (30)

Note: Some of the parameters below are not accessible, depending of different options installed. For further explanations of parameters below marked with *, see 10.2.			
Main control unit (MCU) parameters			
Param. ID	Description	Range	Default value
60*	Learn. Off(00) / On(01)	00-01	01
61*	Auto Width. Off(00) / On(01)	00-01	01
62*	Partial Function. Opened(00) / Closed(01)	00-01	00
63*	Partial Closed Position	0.0-11.8 inch (00-30 cm)	11.8 (30)
64	Power Supply Type. 65 W(00) / 150 W(01)	00-01	01
65*	Sustainable Drive Mode. Off(00) / On(01)	00-01	00
66	Stop Impulse Monitoring. Off(00) / On(01)	00-01	00
67	Door Type. Single sliding(00) / Biparting(01)	00-01	00
68*	Door Weight	22-882 lbs (01-40 kg x10)	882 (40)
69	Friction	0.0-22.3 lbf (00-99 N)	0.0 (00)
6A	Interlock Function. Off(00) / On(01)	00-01	00
6b	Synchronizing Function. Off(00) / On(01)	00-01	00
6c*	External Bus Device ID 2	01-99	01
6d*	Extended Hold Open Time Function. Off(00) / On(01)	00-01	00
70	Motor Type. Normal Duty(00) / Heavy Duty(01)	00-01	01
71	Max Motor Power	03-15 W x10	15
80	Operation Mode Selector Variant, Basic Master. Unspecified(00) / 3 buttons with AUTO(01) / 3 buttons with EXIT(02) / 4 buttons(03) / 5 buttons(04)	00-04	04
81	Operation Mode Selector Key Lock, Basic Master. Off(00) / Hold for two sec(01) / Four pushes(02)	00-02	00
82	Operation Mode Selector Service Indication, Basic Master. Off(00) / On(01)	00-01	01
85	Operation Mode Selector Variant, Basic Slave. Unspecified(00) / 3 buttons with AUTO(01) / 3 buttons with EXIT(02) / 4 buttons(03) / 5 buttons(04)	00-04	04
86	Operation Mode Selector Key Lock, Basic Slave. Off(00) / Hold for two sec(01) / Four pushes(02)	00-02	00
87	Operation Mode Selector Service Indication, Basic Slave. Off(00) / On(01)	00-01	01

Note: Some of the parameters below are not accessible, depending of different options installed. For further explanations of parameters below marked with *, see 64.

I/O Unit (IOU) parameters

Param. ID	Description	Range	Default value
90*	Nurse Function (I/O unit). Off(00) / On(01)	00-01	00
91*	Open/Close Function (I/O unit). Off(00) / On(01)	00-01	01
92*	Open/Close Timeout	00-60 min	00
93*	Close Function (I/O unit). Off(00) / On(01)	00-01	01
94*	Fire Impulse Function (I/O unit). Off(00) / On(01)	00-01	00
95*	Emergency Open Impulse Function (I/O unit). Off(00) / On(01)	00-01	01
96*	Emergency Button Configuration. NO(00) / NC(01)	00-01	00
97*	Operation Mode Selector Function (I/O unit). Off(00) / On(01)	00-01	01
98*	Lock Configuration (I/O unit). No lock(00) / LDB(01) / LDE(02)	00-02	00

10.2 Description of parameters marked with *

CT Name	Description
01 Low Speed	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.
06 Lock Release	If "Lock Release" is On, the door will apply force in the closing direction when the lock is unlocked. 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.
07, 08 Presence Input Configuration	This parameter determines if a presence impulse is normally open (NO) or normally closed (NC). The "Presence Impulse 1 and 2 Configuration" selected with the function selector applies also to "Stop Configuration".
09 Presence Impulse Monitoring	Set to "00" if no monitoring of Presence impulse sensors is required or if no presence impulse sensors are installed. Set to "01" if one Presence impulse sensor that shall be monitored is installed (Presence impulse 1). Set to "02" if two Presence impulse sensors that shall be monitored are installed (Presence impulse 1 and 2).
10 Emergency Unit Monitoring	<p>The emergency unit will be tested by opening the door with the emergency unit. The test is never done in program selection Open and also normally not in Off, unless parameter 37 "Emergency Action In OFF Mode", see below, is set to On.</p> <p>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, a ghost impulse will initiate the emergency unit test.</p> <p>The test is also always performed after a Reset and after changing program selection from a position where a test is not done to a position where the test is a demand.</p>
13 Hold Force	Adjustment of the force used to keep the door in closed position.
14 Group / Parameter Set	Preprogrammed parameter sets suitable for specific conditions.
22 Auto Width Activation Time	If "Auto Width" is chosen this time determines when the door shall open from partial open width to full open width.
23 Auto Width Resume Time	This parameter determines how long time that has to elapse before a new opening impulse does not open the door to full open width instead of partial open width after an Auto Width opening has been performed.
24 Jam Hold Time	Sets how long time the door shall be stopped when a jam is detected during opening and the time until the door can restart after a stop impulse.
25 Interlock Disable Time	This parameter controls the time the interlock input can prevent the actual door from opening. The time starts to count down at the moment a valid opening impulse is activated, and the door is opened when the interlock input is not active or the timer has elapsed. If the time is set to 00 the timer will not elapse, which means that the door will stay interlocked as long as the interlock input is active.
26 Presence Hold Open Time	The time the door is held open before closing after having reversed on a Presence impulse.

CT Name	Description
29 Side Presence Impulse Monitoring	This parameter is specifying how many presence sensors that shall be monitored. 00 = none, 01 = Presence impulse 1 only and 02 = Presence impulse 1 and 2.
30 Side Presence Activation Distance	If value 00 is selected an activated side presence impulse will slow down the entire door opening, from fully closed to fully open. If a value in the range 00-99 dm is selected, an activated side presence impulse will only slow down an opening door when the door leaf is within the configured distance from the fully open position
31 Sensor Type	Selection of sensor type. Choose between 1-wire (00) or 2-wire (01) monitoring. 2-wire monitoring is default.
32 Active Brake on Stop	In selection Off (00) the operator is freewheeling to stop after a Stop impulse. In selection On (01) the operator will make an active brake during 1 second after a Stop impulse.
35 Toggle Operation Mode Selector after Stop	The operator will stay in the present position after a Stop impulse in operation mode selection Off if this parameter is On (01) and will not move until the operation mode selector is turned to another selection. In parameter setting Off (00) the door will automatically close when the Stop impulse is restored.
36 Emergency Action	Fire closing (00) or Emergency opening (01) with EEU battery power in case of a mains power failure.
37 Emergency Action In OFF Mode	Decides if "Emergency Action" shall be performed also in program selection Off.
38 Convenience Battery	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 is not possible.
39 Battery Wake Up	This parameter controls how the door is acting on Key impulse or Battery wake up in program selection Off and without mains power. The parameter "Emergency Action In OFF Mode" must also be set to Off (00). If "Battery Wakeup" is set to Open (00) the impulse is opening the door fully and stop there. If "Battery Wakeup" is set to Open/Close (01) and parameter "Emergency Action" 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
40 Emergency Unit Test Interval	The time set in this parameter controls the maximum time until the next automatic test of the emergency unit is performed.
42 Remain Locked at "Stop"	If this parameter is set to On (01) the locked door remains locked when a stop impulse is activated.
43 Opening Delay For Lock	The time the opening is delayed (0.0-9.9 sec) after an opening impulse is given in the program selections Off and Exit.
44 Exit Lock	This parameter controls the electro-mechanical lock in the program selector setting Exit. If "Exit Lock" is set to On (01) the electromechanical lock is locked. If set to Off (00) the electro-mechanical lock is not locked in Exit.
45 Stop Function	When this parameter is set to On (01) the Stop impulse is enabled, otherwise it is disabled.

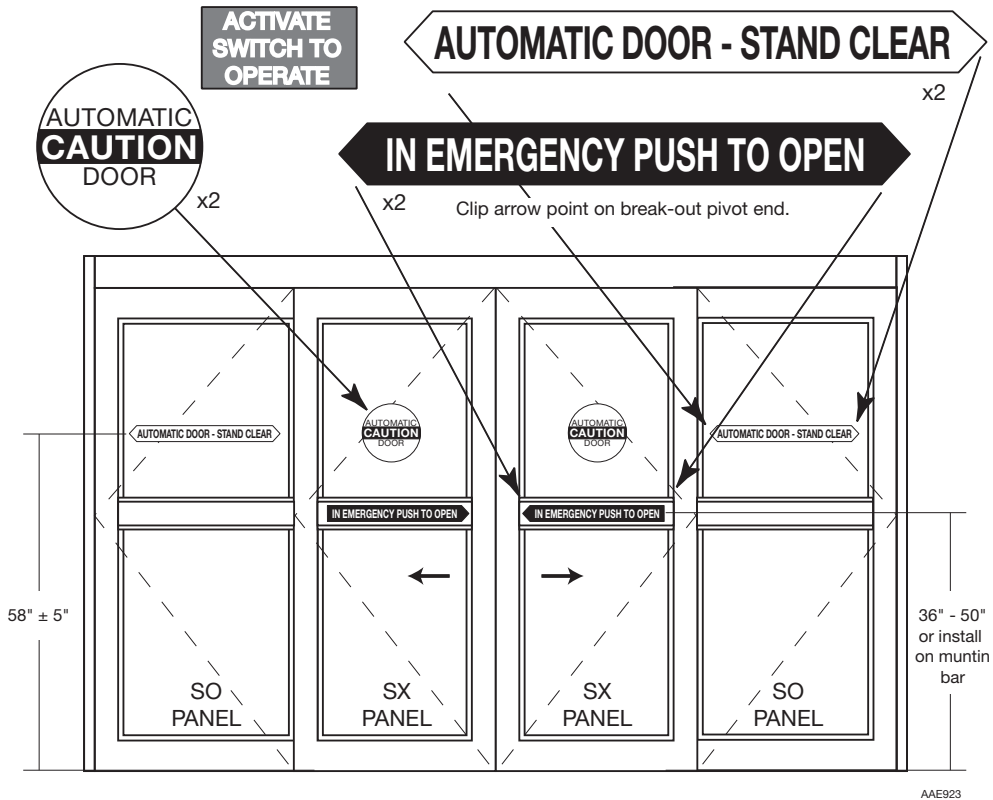
CT Name	Description
46 Stop Configuration	Configuration of the Stop impulse. Choose between normally open (NO) or normally closed (NC) Stop impulse.
47 C-Switch Configuration	Configuration of “C-Switch” (electronic limit switch) output, NO (00) or NC (01).
48 C-Switch Activation Distance	This parameter is the belt travel from the fully closed position where the electronic limit switch is changing its state.
49, 50 Max Force	These parameters are limiting the tractive force in the transmission belt during opening and closing respectively
51 Push & Close	When this parameter is set to On (01), the door 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.
52 Push and Close Timeout	If someone tries to open the door in operation mode selections Off or Exit for the time set by this parameter the door will open when this times has elapsed. 00 = will continuously try to close.
53 Operator Type	Always use setting 00.
54, 55, 56 Service Needed	When the selected value is reached the yellow light will flash every other second, indicating that maintenance is needed. Also parameters 82 and 87 are related.
59 Open Position	Opening width of one door leaf (unit=dm). The parameter can be set manually, or it can be set automatically by performing a learn cycle.
60 Learn	If this parameter is set to Off (00) the possibility to perform a learn cycle is disabled.
61 Auto Width	If this function is active (01) and the program selection Auto partial is selected the door will open from partial open width to full open width if an opening impulse has been active for the selected 22 “Auto Width Activation Time”.
62 Partial Function	With this function the door can be selected to be partially opened or partially closed (see below 63 “Partial Closed Position”).
63 Partial Closed Position	“Partial closed position” (Auto airing function) can be obtained by selecting “Partial Function” Closed (01). A fictive closed position of the door can be set between 0-30 cm (0-0.98 ft) measured from the real closed position. The program selector is to be set to Auto partial and the closed position of the doors will then be the “Partial Closed Position” set.
65 Sustainable Drive Mode	When selected the sensors are shut off in operation mode selection Off. The electromechanical lock is not powered in operation mode selection Exit (only in Off). The hold force used to keep an already closed door closed is minimized. The acceleration and braking of the door is smoother. All are actions to lower the power consumption.
68 Door Weight	During an initial Learn the operator is sensing the weight of the door to be able to adjust, acceleration, braking and speed profiles.
6c External Bus Device ID 2	When two or more operators are interconnected with each other (e.g. using a common operation mode selector, interlocking, synchronizing etc.) this parameter must be different in each operator.
6d Extended Hold Open Time Function	When On, the operator hold open time is increased to prevent repeated re-opening of the closing door during heavy traffic.

CT Name	Description
90 Nurse Function	When this parameter is set to On (01) the Nurse impulse will give a pedestrian partial opening in operation mode selections Exit, Auto and Auto partial. I/O unit required.
91 Open / Close Function	When this parameter is set to On (01) a single button toggling Open / Close impulse is available. I/O unit required.
92 Open / Close Timeout	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. I/O unit required.
93 Close Function	When this parameter is set to On (01) the security Close impulse is enabled. 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. If parameter "Inner Impulse Monitoring" is set to On the Close impulse will be disabled to prevent unintended closing of an escape route door. I/O unit required.
94 Fire Impulse Function	When On, an external alarm loop can be connected. An active alarm will perform the selected 36 Emergency Action (emergency open or fire close). I/O unit required.
95 Emergency Open Function	When On, an external Emergency open impulse (Fireman's opening) can be connected. An active impulse will always open the door (with electrical emergency unit also during a mains power failure). I/O unit required.
96 Emergency Button Configuration	Decides whether the Emergency open impulse used has NO or NC contact. I/O unit required.
97 Operation Mode Selector Function	When On, a standard switch or timer can be connected to the different operation mode selection inputs of the I/O module. The Reset input is always active (also when 97 is Off).
98 Lock Configuration	Used to select special electromechanical locks only, bistable or espagnolette type of locks. I/O unit required.

11 Signage

ANSI/BHMA standard 156.10 and Besam 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.

12 Troubleshooting

Before starting the troubleshooting, check that the operation mode selector setting is correct and then RESET the operator. 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, the complete unit is to be loosened and replaced.

12.1 Mechanical checking and remedies

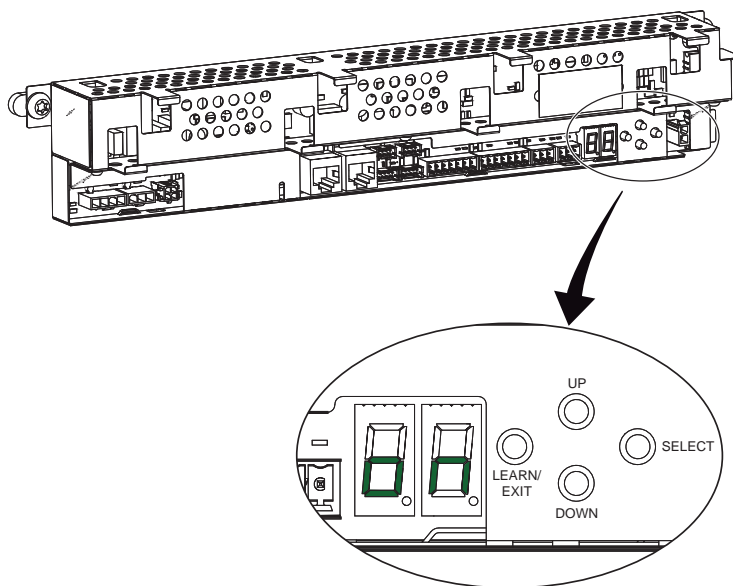
Disconnect the mains power. Unlock all mechanical locks. Pull the door leaf manually and check that the door can be easily moved over the complete sliding track/floor guide. If the door leaf stops or is hard to move, the reason may be sand, stones, rubbish etc. in the floor guide.

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

12.2 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 coarse 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

Coarse 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.
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.

Coarse 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 Activation Timeout	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.

Coarse 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.
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.
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.

Coarse error: E3 Electronic Unit Error		
Detailed error	Reason	Remedy
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.
Coarse 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.
Coarse error: E5 Lock Error		
Detailed error	Reason	Remedy
07 Lock Failure	The lock or something else was preventing the door from opening the first 9/16" (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.

Coarse error: E6 Communication Error		
Detailed error	Reason	Remedy
12 Motor Control Communication Error	Motor control processor disconnected from the internal bus.	Push the Learn button for 2 seconds, RESET, and if the problem remains, replace the main control unit.
13 Door Control Communication Error	Door control processor disconnected from the internal bus.	Push the Learn button for 2 seconds, 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.	Push the Learn button for 2 seconds, RESET, and if the problem remains, replace the escape route control unit.
37 I/O Communica- tion Error	I/O control unit disconnected from the internal bus.	Push the Learn button for 2 seconds, RESET, and if the problem remains, replace the I/O control unit.
51 Web Communica- tion Error	Web control unit disconnected from the internal bus.	Push the Learn button for 2 seconds, RESET, and if the problem remains, replace the Web control unit.
52 Hi-O Communica- tion Error	Web Hi-O unit disconnected from the internal bus.	Push the Learn button for 2 seconds, RESET, and if the problem remains, replace the Hi-O control unit.
53 Operation Mode Selector Commu- nication Error	Operation mode selector disconnected from the internal bus.	Push the Learn button for 2 seconds, RESET, check connections, and if the problem remains, replace the operation mode selector.
54 External Commu- nication Error	The external bus is malfunctioning.	Push the Learn button for 2 seconds, RESET, and if the problem remains, replace the main control unit.

Coarse error: E7 Motor Temperature High		
Detailed error	Reason	Remedy
16 Motor Tempera- ture 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.

Coarse 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.

13 Maintenance/Service

Regular inspections should be made according to national regulations and product documentation by a Besam-trained and qualified technician. The number of service occasions 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. Refer to Besam Pro-Active Care option services to learn more about service possibilities!

- 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.

13.1 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.

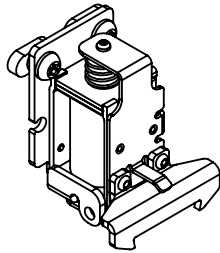
- Visually check door for operation.
- Check activation and threshold detection devices.
- Check for tripping hazards.
- Check door function switch.
- Check for proper operation of lock assembly.
- Check for loose glass stops or damaged glass.
- Check all panels for damaged or loose weather stripping.
- 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.

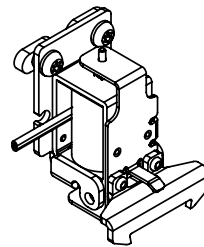
14 Accessories

Your BesamSL500 can be further improved with the following add-ons (please contact your local Besam company for detailed description).

- Motion and presence sensors, see separate manuals or installation drawings.
- Operation mode selectors
Flush or surface mounted. Master and slave operation mode selectors, see page 54.
- Electrical locks
Locked with power LDP (Fail Safe) or locked without power LD (Fail Secure).



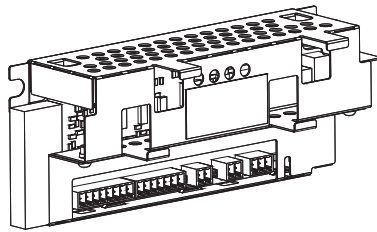
LDP (Fail Safe)
P/N: 1008354



LD (Fail Secure)
P/N: 1008167

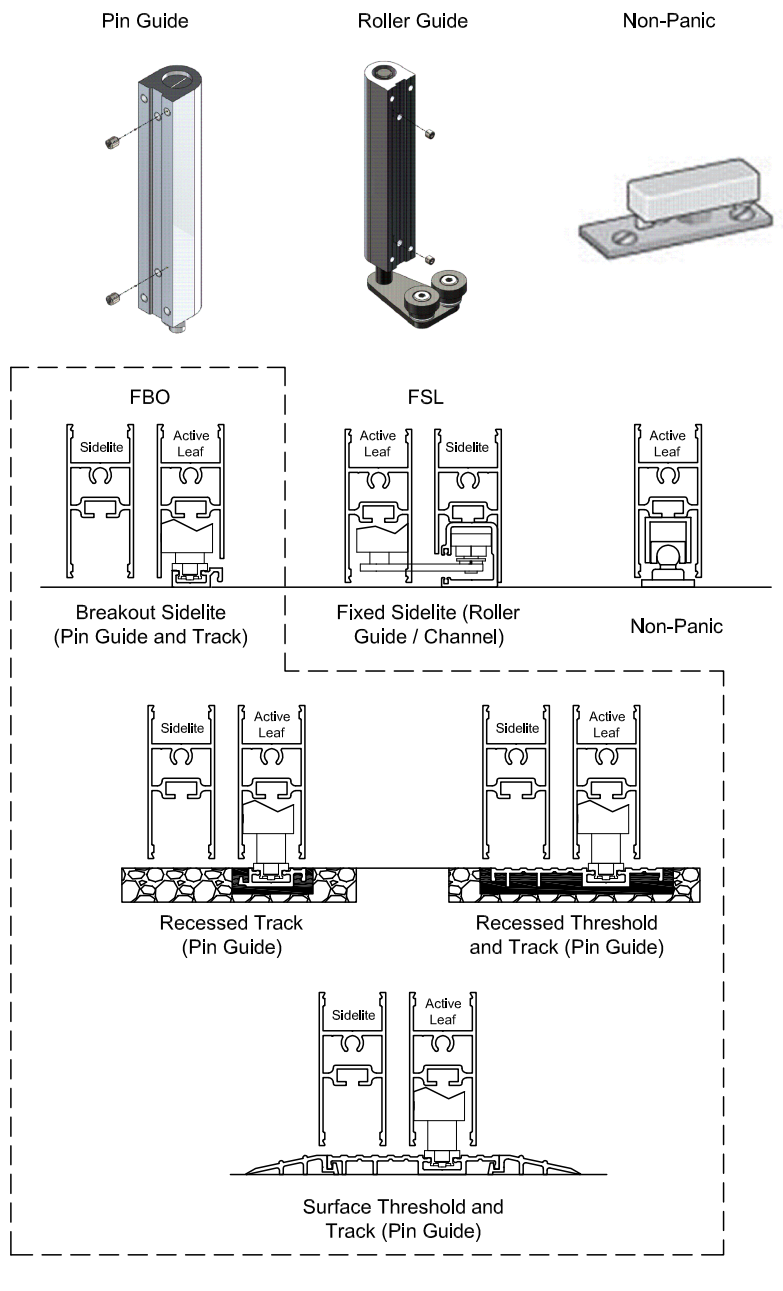
- Interlocking
Used between two operators when the first operator must close before the other one can open (typical to reduce energy losses and not for security reasons). Interconnection cable required.
- Synchronization
Used between the operators of two single sliding doors, working together in very large openings. Interconnection cable required.

- I/O functions:
 - Fire alarm connection
Used to emergency open or fire close the door with mains power on.
 - External error indication
Obtained if a lamp or a buzzer is connected.
 - Open / Close function
A 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.
 - Nurse function
A pedestrian partial opening in operation mode selections Exit, Auto and Auto partial. The Nurse impulse hold open time is adjustable.
 - Night mode
Remotely put door into exit only via an automated system. Requires a NO contact.



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

- Bottom Guide Systems

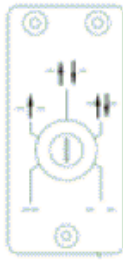


Three basic guide systems are available:

- 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

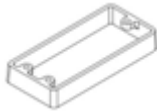
See Installation Requirements section for guide installation.

- Optional operation mode selectors



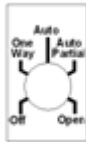
5 Operation Modes Switch (Key)

P/N: US15-1500-06



Spacer Switch Kit

P/N: US15-1500-03



Vinyl Decal (5 operation modes switch)

P/N: US24-1500-51



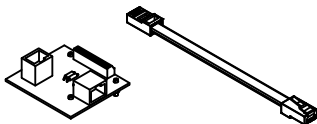
Remote Switch Kit

P/N: 1009342



Operation Mode Selector Extension Kit

P/N: US15-1500-02



PS Accessory Board Kit

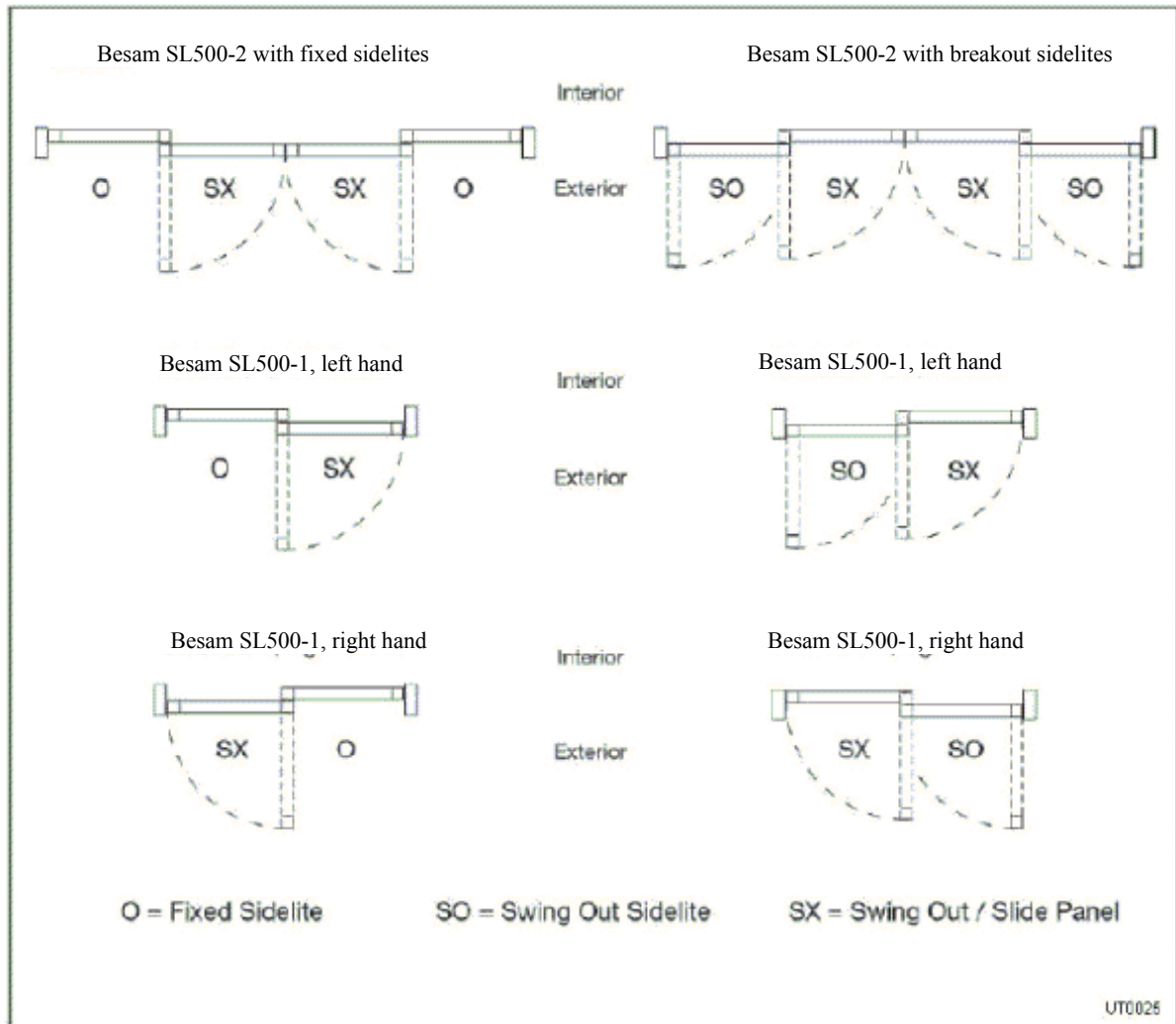
P/N: 1009426

Must not be used in combination with standard operation mode selectors when interconnecting two operators (interlocking or synchronizing).

15 Door Handing & Layout

15.1 Door Handing (Automatic Door Industry)

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



16 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.

16.1 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 ft/sec

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.

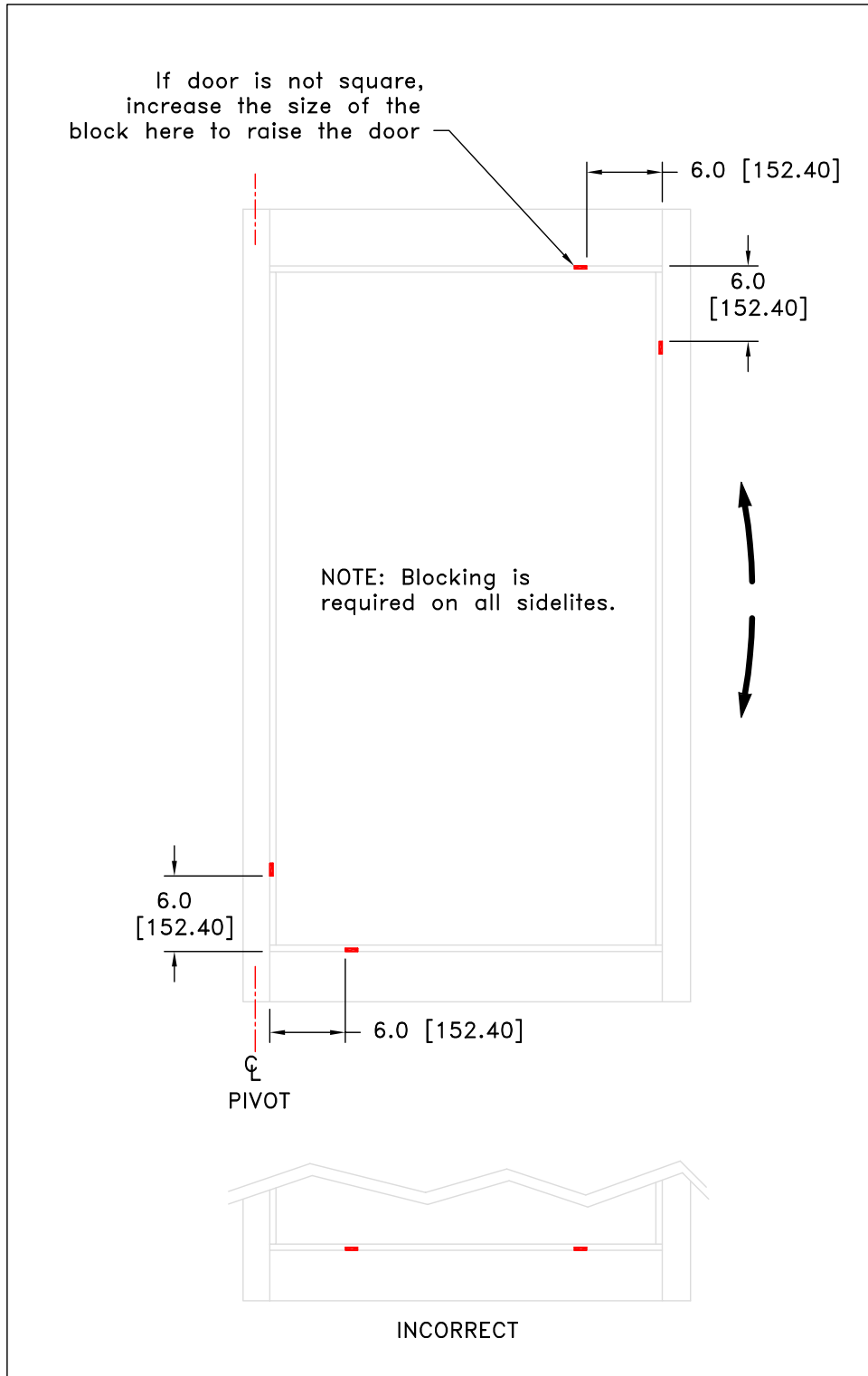
10.1.5 Sliding doors utilizing **sensors or control mats** shall remain fully open a minimum of 1.5 seconds after loss of detection, unless otherwise specified within this standard.

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

11. Signage

For Signage, see full standard.

17 Glazing and Blocking of Glass





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