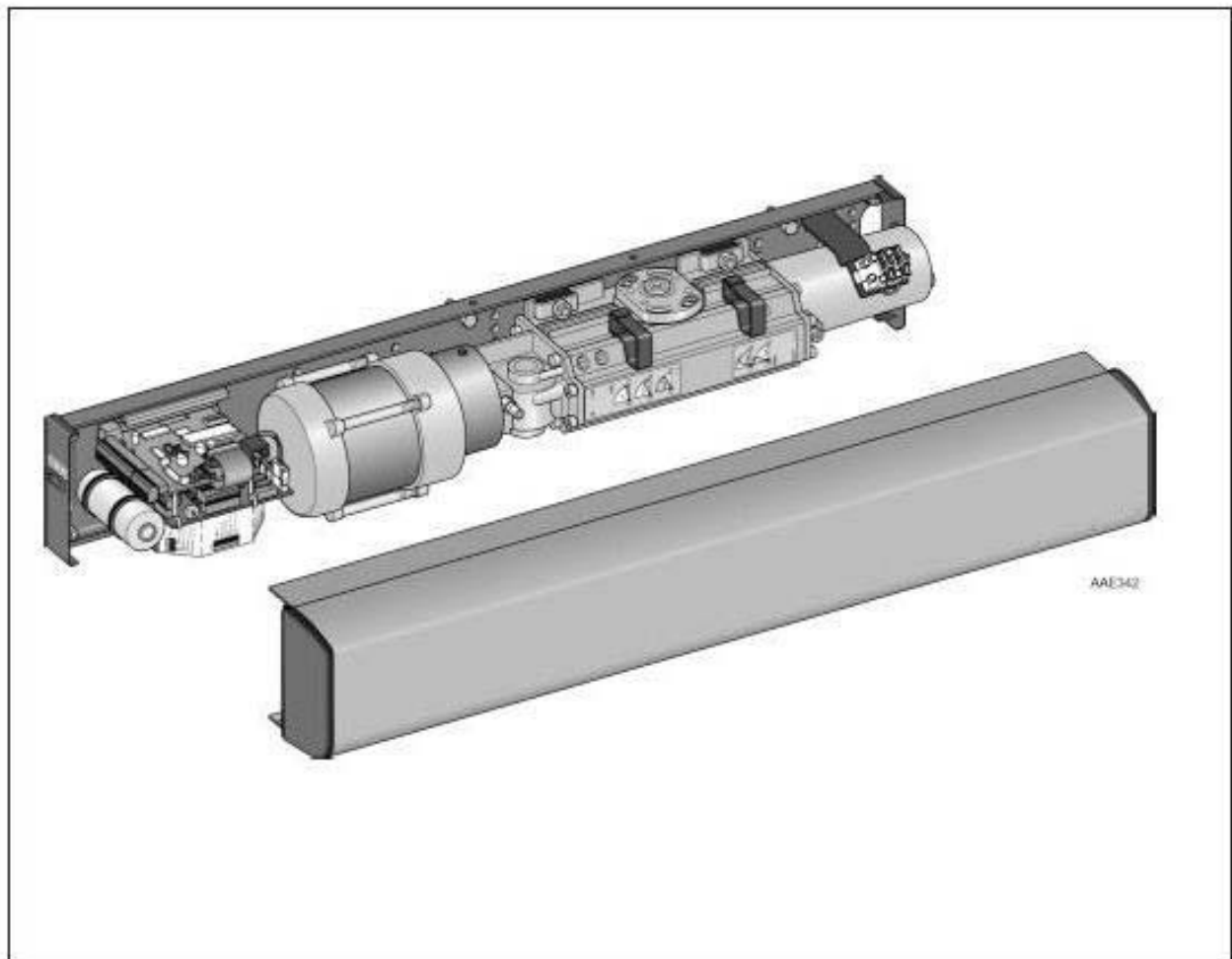


## Besam PowerSwing Installation, Adjustment and Troubleshooting Manual



Complies with ANSI/BHMA A156.10 standard for Power Operated Pedestrian Doors and A156.19 standard for Power Assist and Low Energy Power Operated Doors. UL 325 Listed.

US23-0922-02 10-21-2002



# CAUTION

**Improperly adjusted doors** can cause injury and equipment damage.

Inspect door operation daily using safety checklist in Owner's Manual and at door.

Have door adjusted as described in Owner's Manual.

Safety devices must be in place and operational.

Have door inspected at least once a year by an AAADM inspector, and always after any adjustment or repair.

In the following manual, the word:

**Caution** means that injury or property damage can result from failure to follow instructions;

**Note** indicates important steps to be followed or important differences in equipment.

## Revision

---

At each revision **all revised pages** will get a new updated issue number (year-month-day). **The first leaf** (pages 1 and 2) will always have the same issue number as the revised pages. Changes will be marked with a vertical line in the margin. The table below shows the latest issue numbers.

Page	Issue No.	Page	Issue No.	Page	Issue No.
01	10-21-2002	15	10-21-2002	29	01-18-2001
02	10-21-2002	16	01-18-2001	30	01-18-2001
03	10-21-2002	17	10-21-2002	31	10-21-2002
04	01-18-2001	18	01-18-2001	32	10-21-2002
05	01-18-2001	19	10-21-2002	33	01-18-2001
06	10-21-2002	20	10-21-2002	34	01-18-2001
07	01-18-2001	21	10-21-2002	35	10-21-2002
08	10-21-2002	22	10-21-2002	36	01-18-2001
09	01-18-2001	23	10-21-2002	37	01-18-2001
10	10-21-2002	24	10-21-2002	38	01-18-2001
11	10-21-2002	25	10-21-2002	39	01-18-2001
12	10-21-2002	26	01-18-2001	40	10-21-2002
13	10-21-2002	27	01-18-2001	41	01-18-2001
14	10-21-2002	28	01-18-2001		

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## Important Notice!

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

## Radio and Television Reception

---

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been designed to comply with the emission limits in accordance with EN 500811 (US market FCC Part 15) which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Re-orient the receiving antenna.

Relocate the receiver with respect to the equipment.

Move the receiver away from the equipment.

Plug the receiver into a different outlet so that equipment and receiver are on different branch circuits.

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

## Note!

---

Instructions, design, specifications and illustrations which are contained in this manual are not binding. Rights reserved for changes without previous notice.

This manual contains the necessary details and instructions for the installation, maintenance and service of the Besam PowerSwing.

The Besam PowerSwing is suitable for most types of external and internal swing doors. The operator can be mounted to walls on either side of the door for pull or push action and is suitable for single or double doors fitted with butt hinges or center pivots.

The motor, oil pump and hydraulic unit are combined into a compact unit mounted alongside the control unit within the cover. The operator is connected to the door leaf with a range of different arm systems.

## Function Description

---

The Besam PowerSwing works electro-hydraulically. It opens with an AC-motor that via a hydraulic unit and an arm system transmits the power to the door leaf. The closing power is from a coil spring. The movement of the door is controlled by limit switches and valve screws.

### Opening

---

When an opening impulse is received by the control unit, the motor starts and the hydraulic unit rotates the drive shaft and arm system (door) with high speed towards open position. Before fully open position the speed is reduced to low speed. The door stops and the motor rotation ceases when the selected door opening angle is reached. This open position is kept by a hydraulic valve.

### Closing

---

The spring closing starts when the hold open time has run out. Before fully closed position the speed is reduced to low speed, which will be kept until the door is completely closed. The door is kept closed by spring power. To overcome the resistance of a striking plate a “lock kick” can be adjusted to required level.

# Technical Specifications

Mains power	120 V AC $\pm$ 10 %, 60 Hz fuse 10 A <b>Note!</b> Switch with clearly marked off-position, having a contact separation of at least 3 (1/8") mm in all poles, must be incorporated in the fixed wiring. The operator can also be plug-connected to a wall socket.
Power consumption	max. 230 W
Auxiliary voltage	13-20 V DC, 275 mA 24 V DC, 375 mA (stabilized)
Motor fuse F1	10 Amp (10 ATH)
Control fuse F2	1/2 Amp (500 mA)
Recommended max. door weight	Arm system PUSH 250 kg (550 lb) for door leaf width 1600 mm (63")  Arm system PULL 100 kg (220 lb) for door leaf width 1400 mm (55"). Higher door weights on request.  <u>The PowerSwing complies with the door weights/widths stated in the:</u>  Controlled door closing, EN 1154 sizes 3-6  Electrically powered hold-open device for swing doors, EN 1155  Coordination unit for rebated doors, EN 1158  Türschliesser mit Öffnungsautomatik (Drehflügelantrieb) DIN 18263-4 AU Grösse 3-6  ANSI/BHMA A156.10, A156.19  UL325/CUL325  SITAC 0166/99
Ambient temperature	-30°C to +50°C (-22°F to 122°F)
Dimensions:	
PowerSwing	Length: 716 mm, 746-1600 mm * (28-3/16", 29-17/32" – 63")
PowerSwing-2	Length: 1435-3200 mm (56 1/2" – 126") Height: 110 mm (4-11/32") Depth: 110 mm (4-11/32")

To be installed internally or externally with suitable weather protection.

\* 716 is the European short header package.

746 allows for the operator to be mounted to the adapter plate with the addition of 2 cover clips.

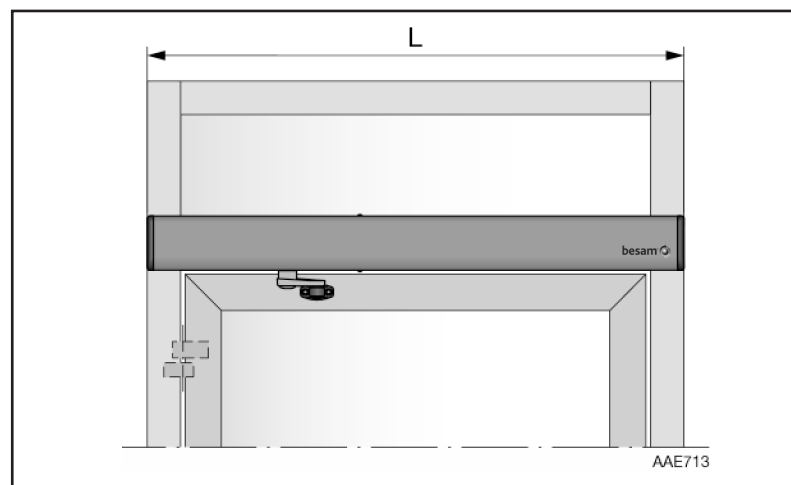
Two main models of the Besam PowerSwing are available:

- PowerSwing,
- PowerSwing-2, double door operators

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

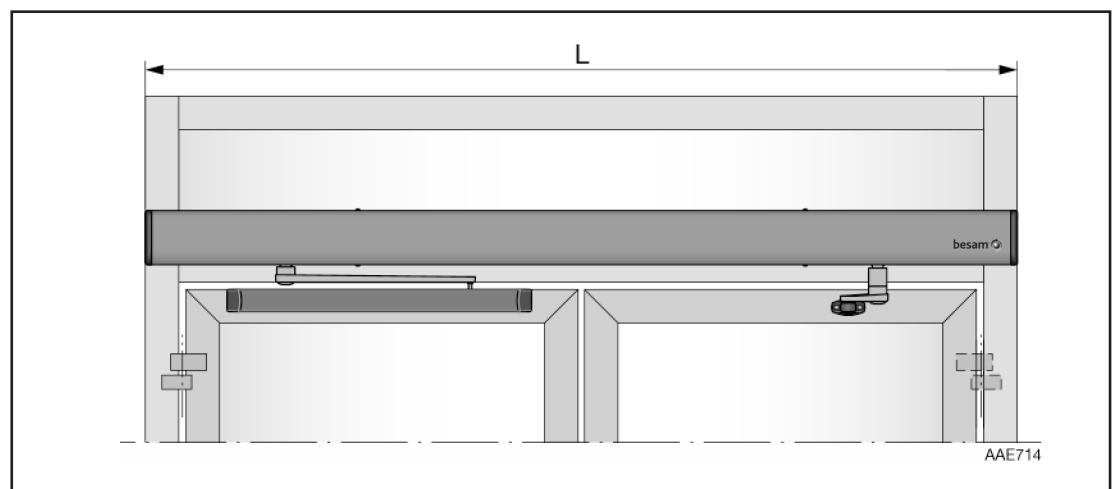
## PowerSwing

The operator is offered standard in an oversize length which is field cut to required length. Optionally length L may be specified to the factory as part of order. Pushing arm system shown.

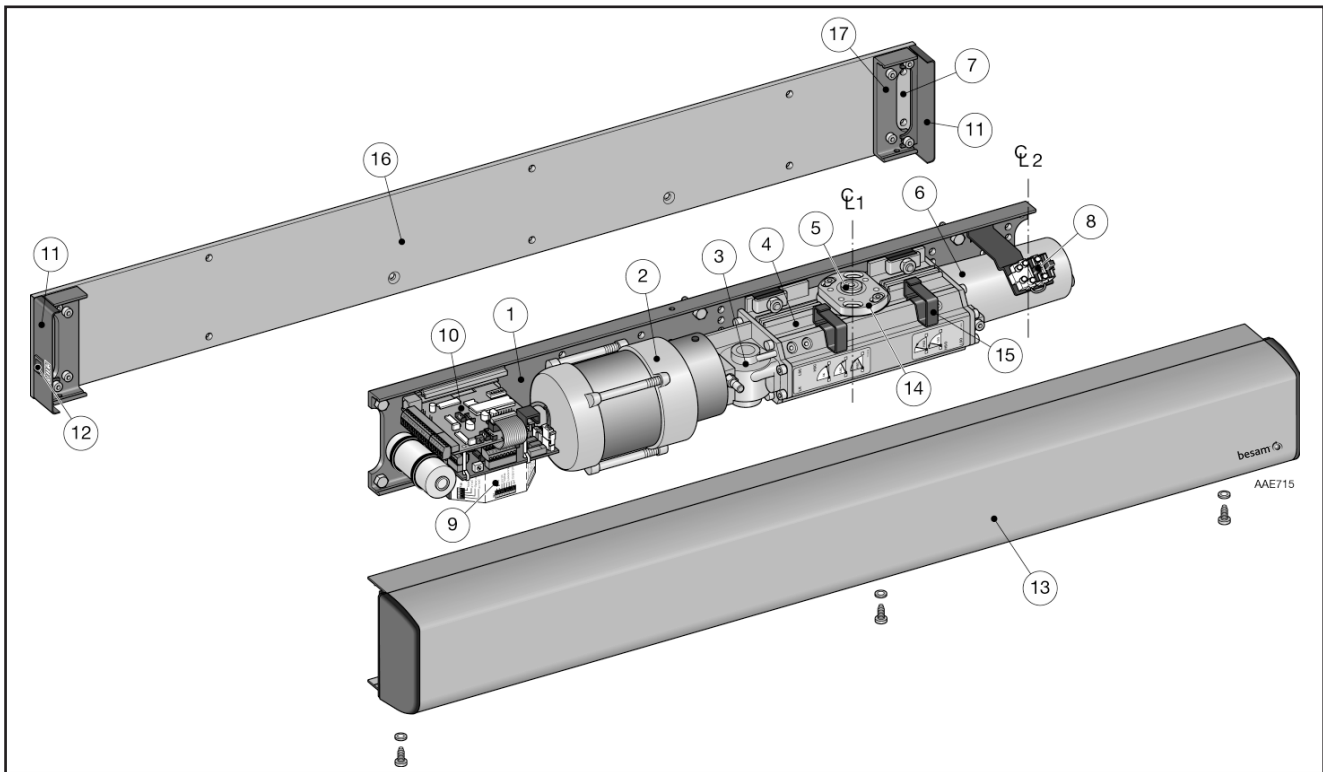


## PowerSwing-2, double door operators

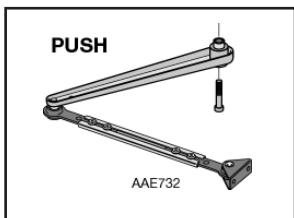
The designation PowerSwing-2 means that two operators are mounted under the same cover to open one door each. The operator is offered standard in an oversize length which is field cut to required length. Optionally length L may be specified to the factory as part of order. Pushing and pulling arm system shown. It is also possible to use two pushing or two pulling arm systems.



# Part Identification & Options

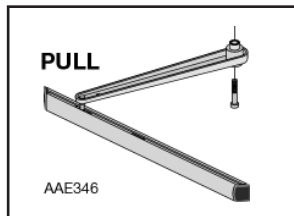


- |                   |                                  |                                       |                              |
|-------------------|----------------------------------|---------------------------------------|------------------------------|
| 1. Mounting plate | 6. Spring tube                   | 11. End plate                         | 15. Cable holder             |
| 2. Motor/pump     | 7. Cable inlet                   | 12. Programme selector, PS3A (option) | 16. Adapter plate            |
| 3. Valve          | 8. Main connection               | 13. Cover                             | 17. Cover mounting clip      |
| 4. Hydraulic unit | 9. Control unit, CSDA            | 14. Bearing sleeve                    | CL1 Center line, drive shaft |
| 5. Drive shaft    | 10. Extension unit, EXA (option) |                                       | CL2 Center line, hinge       |



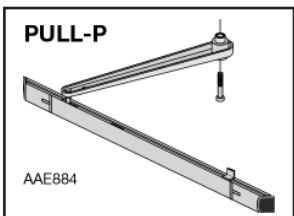
**Arm system, PUSH** P/N: 173 009 BK (173 883, Hybrid)

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



**Arm system, PULL** P/N: 100 125 BK

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



**Arm system, PULL-P** P/N: 100 134 BK

This arm system is delivered with drive arm, guide shoe door fitting, and panic break-out.



**Push Plates**

P/N: 75-02-101



P/N: 75-02-102



P/N: 75-02-107



P/N: 75-02-108



P/N: 75-02-280

**Remote Push Plates**

P/N: 75-02-273



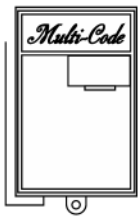
P/N: 75-02-272



P/N: 75-02-269



P/N: 75-02-270

**Remote receiver**

P/N: 75-02-271

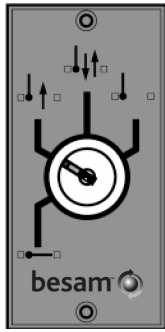
**Installation box for narrow plates**

P/N: 75-21-002

**Tool kit to change rotation direction**

P/N: 173 719

**4-Position Switch with key**



**PS-4H (with CSDA)**

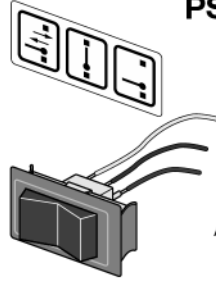
P/N: 655 954

**PS-4C (with EXA)**

P/N: 655 845

AAE809

**3-Position Switch PS-3A**

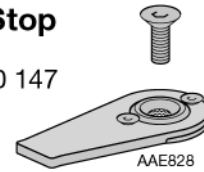


AAE829

P/N: 600 080

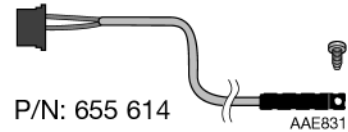
**Door Stop**

P/N: 100 147



AAE828

**Limit Switch**

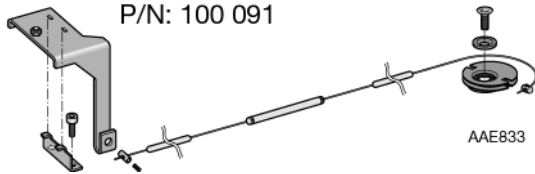


P/N: 655 614

AAE831

**Coordination unit, COOA**

P/N: 100 091



AAE833

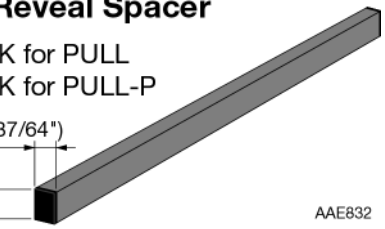
**PULL-Arm Reveal Spacer**

P/N: 173 804BK for PULL

P/N: 173 831BK for PULL-P

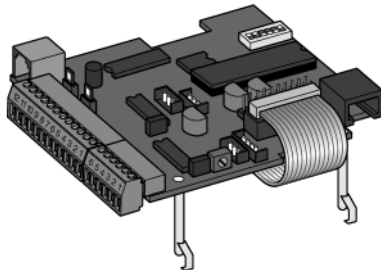
40 mm (1-37/64")

60 mm  
(2-23/64")



AAE832

**Extension unit, EXA**

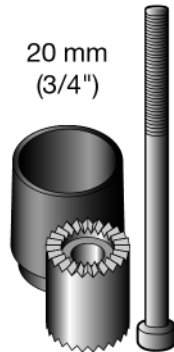


P/N: 600 075

AAE834

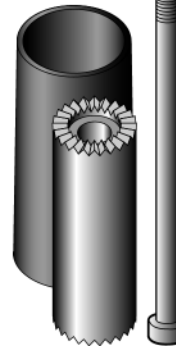
**Drive Shaft Extension Kits**

20 mm  
(3/4")



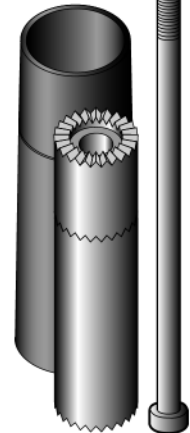
P/N: 21-03-205

50 mm  
(2")



P/N: 21-03-206

70 mm  
(2-3/4")



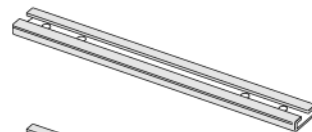
P/N: 21-03-207

AAE808

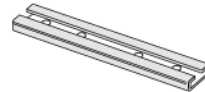
**PUSH-Arm Extensions**

Reveal	Extension
Up to 4-3/8" 0-110 mm	None (Standard arm)
4-3/8" to 9-1/4" 110-235 mm	345 mm
9-1/4" to 14-1/8" 235-360 mm	230 mm + Joint part
14-1/8" to 19" 360-485 mm	345 mm + Joint part

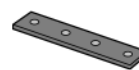
**345 mm extension**  
P/N: 21-06-173005



**230 mm extension**  
P/N: 21-06-173004



**Joint part**  
P/N: 21-06-173191



AAE848

This instruction comprises the installation of the Besam PowerSwing with arm systems **PUSH** which push the door open and **PULL** which pull the door open. Always make sure, before commencing the installation, that the door leaf and the wall are properly reinforced at the attachment points.

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

See also "Installation examples" page 37.

\*Thin-wall profiles must be reinforced with rivnuts

## Tools required

---

Torx T8, T10, T20 and T25  
Metric hexagonal key 3, 4 and 6 mm.  
Flatblade screwdriver, small  
Torque wrench with metric Allen socket 6 mm.

## Installation on double doors

---

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

Example: if PULL has a 20 mm (3/4") extension, the PUSH must have a 70 mm (2 3/4") extension. If PULL has 0 mm extension, the PUSH must have a 50 mm (2") extension.

For installation follow the instructions for the applicable arm system.

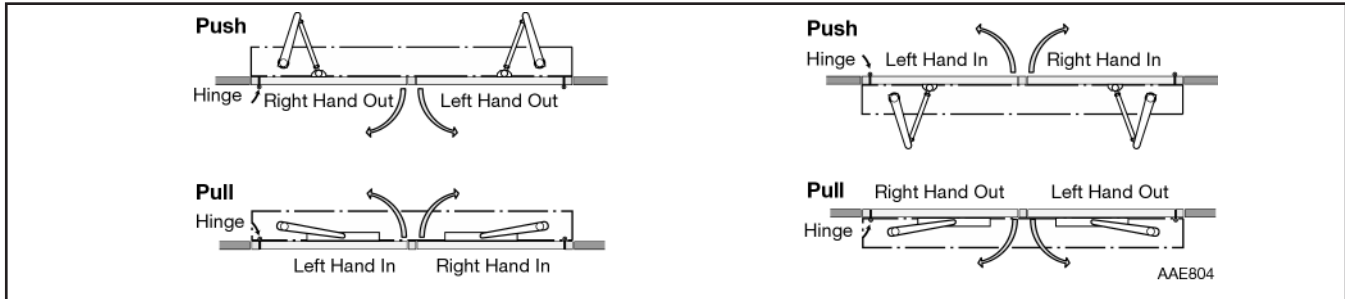
## Note:

---

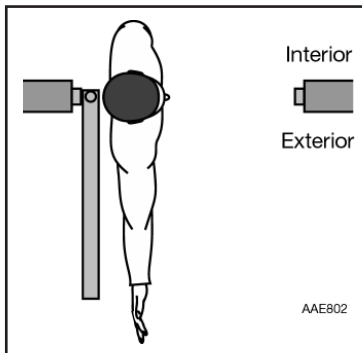
**The short operator package requires the installer to follow the "Mounting Plate Applications" installation procedure. For jamb to jamb applications (full length header box surface applied) the installer must use "Adapter Plate Application".**

# Door/Operator Handing

## Operator Handing



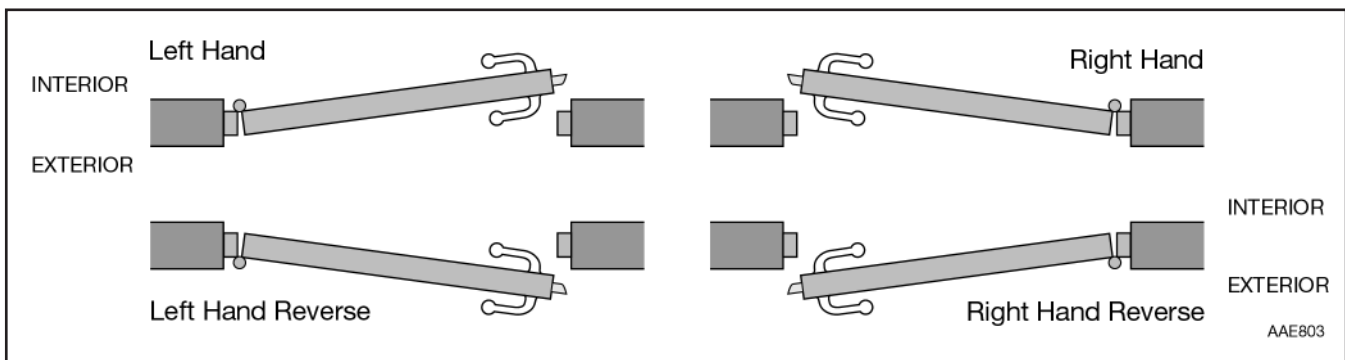
## Door Handing (Automatic Door Industry)



Door handing is determined by standing with your back to the hinges. The side to which the door normally opens (right or left) is the handing of the door. The door is an inswing door if it opens to the inside and an outswing door if it opens to the outside. The diagram to the left shows a right-handed outswing door.

## Door Handing (Architectural Hardware Industry)

You may occasionally see references to terms such as 'right hand reverse' or 'left hand reverse.' See diagram below for definition, paying particular attention to the location and placement of the hinge. Because of the varied hardware items applicable, a swing door type has to be identified by a specific hand. The hand of a door is always as viewed from the exterior side of a door. Reverse designations apply to such hardware as rim type panic exit devices and latch locks which have a beveled latch for locking purposes on doors that swing out.

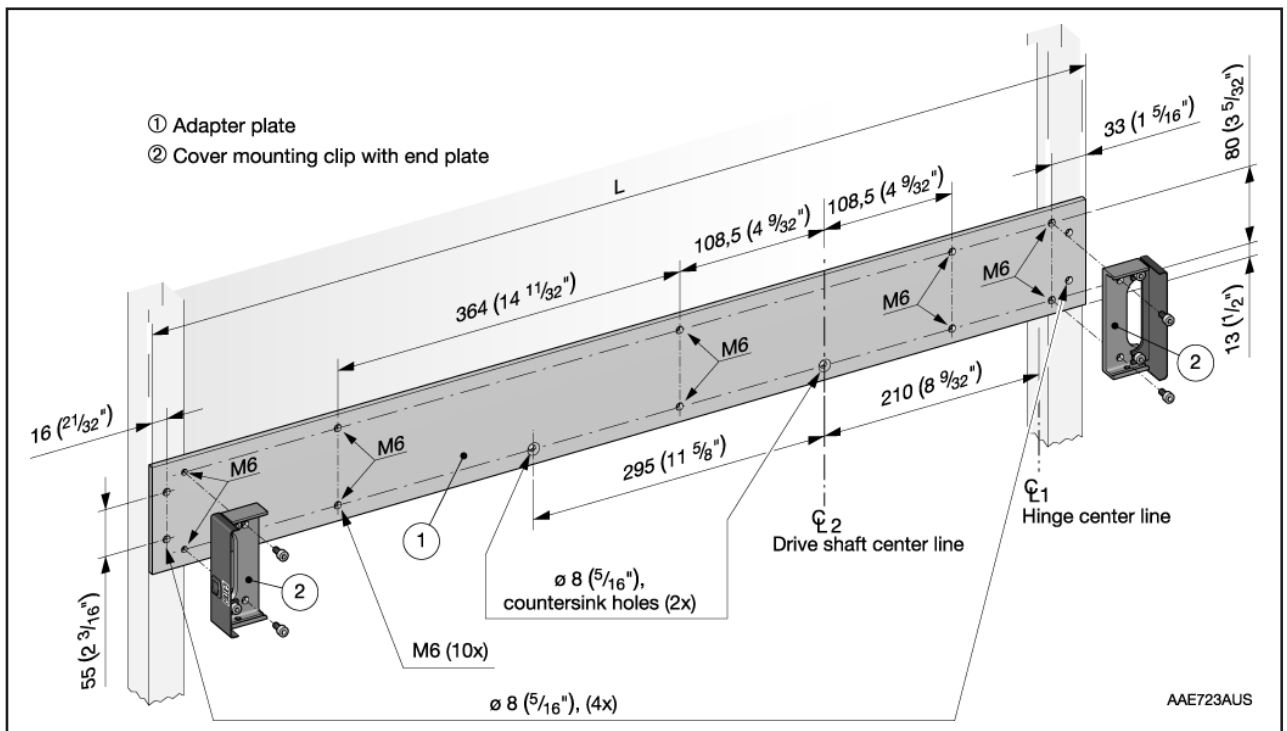


## Installation with Adapter Plate

**Note: Consider all power wire entry locations and secondary signaling wires before preparing adapter plate.**

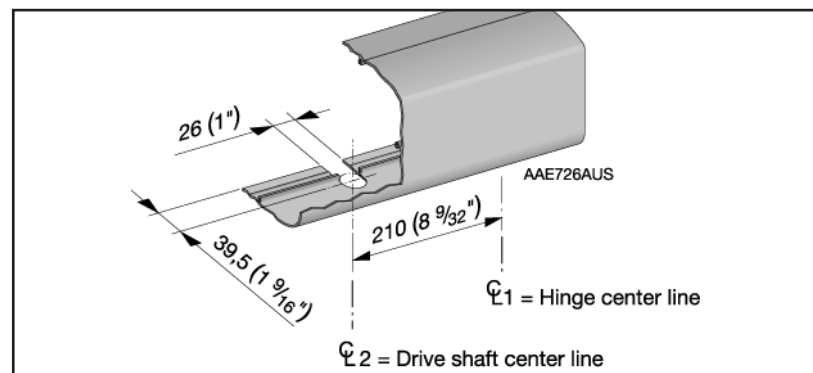
### Preparation of Adapter Plate

1. Cut the adapter plate to correct length, L.
2. Establish the "hinge center line",  $\text{CL}_1$ .
3. Mark and drill the six holes  $\varnothing 8 \text{ mm}$  ( $5/16''$ ) for the fixing of the adapter plate to the jambs and header. Countersink two holes as shown in the illustration so that the screw heads do not interfere with the operator.
4. Mark, drill and thread 6 holes for the fixing of the operator and 4 holes for fixing of the cover mounting clips with end plates.



### Locating and Creating Slot in the Cover for the Drive Shaft

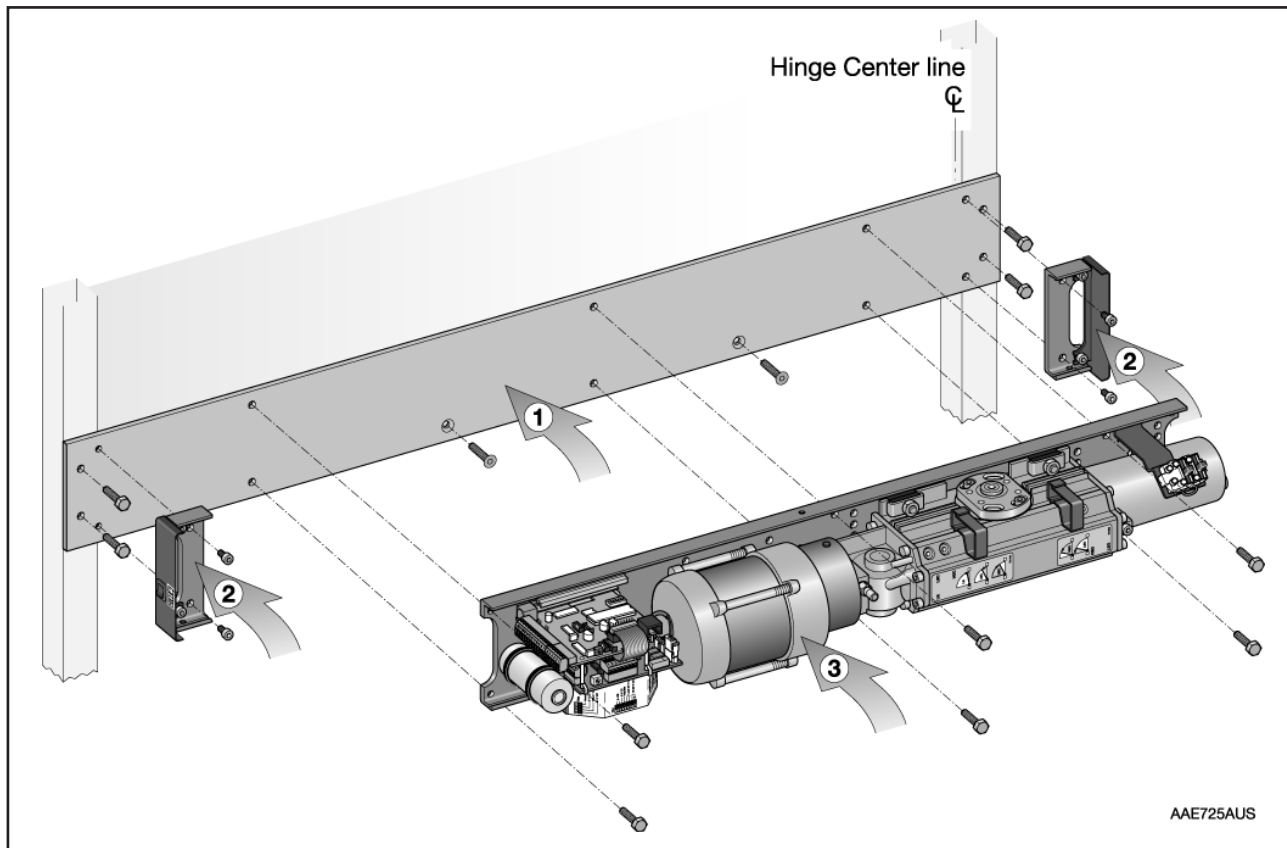
1. Use a 1" hole saw to cut the round hole for the output spindle.
2. Use a sabre saw to make two straight cuts.



## Installation

Establish the installation height X (PUSH) or Z (PULL) considering the arm system to be used:

- Pushing arm system, PUSH, see page 15.
  - Pulling arm system, PULL/PULL-P, see page 18. Note! If required, change the direction of rotation before mounting the operator, see page 17.
1. Fix the adapter plate to the wall.
  2. Mount the cover mounting clips with end plates.
  3. Mount the operator.



### Arm System, PUSH

Mount arm system in accordance with the instructions and illustrations on pages 15-16.

### Arm System, PULL

Mount arm system in accordance with the instructions and illustrations on pages 18-19.

### Arm System PULL-P

Mount arm system in accordance with the instructions and illustrations on pages 18-19 together with separate instructions enclosed with the arm system.

# Operator with Arm System PUSH

## Establish the Installation Height

Establish the installation height X which is the distance from the underside of the wall to the underside of the mounting plate or adapter plate for jamb to jamb. Mark distance X on the wall. X can be between 2 – 87 mm ( $3/32'' - 3-7/16''$ ) depending on the shaft extension used; none, 20, 50 or 70.

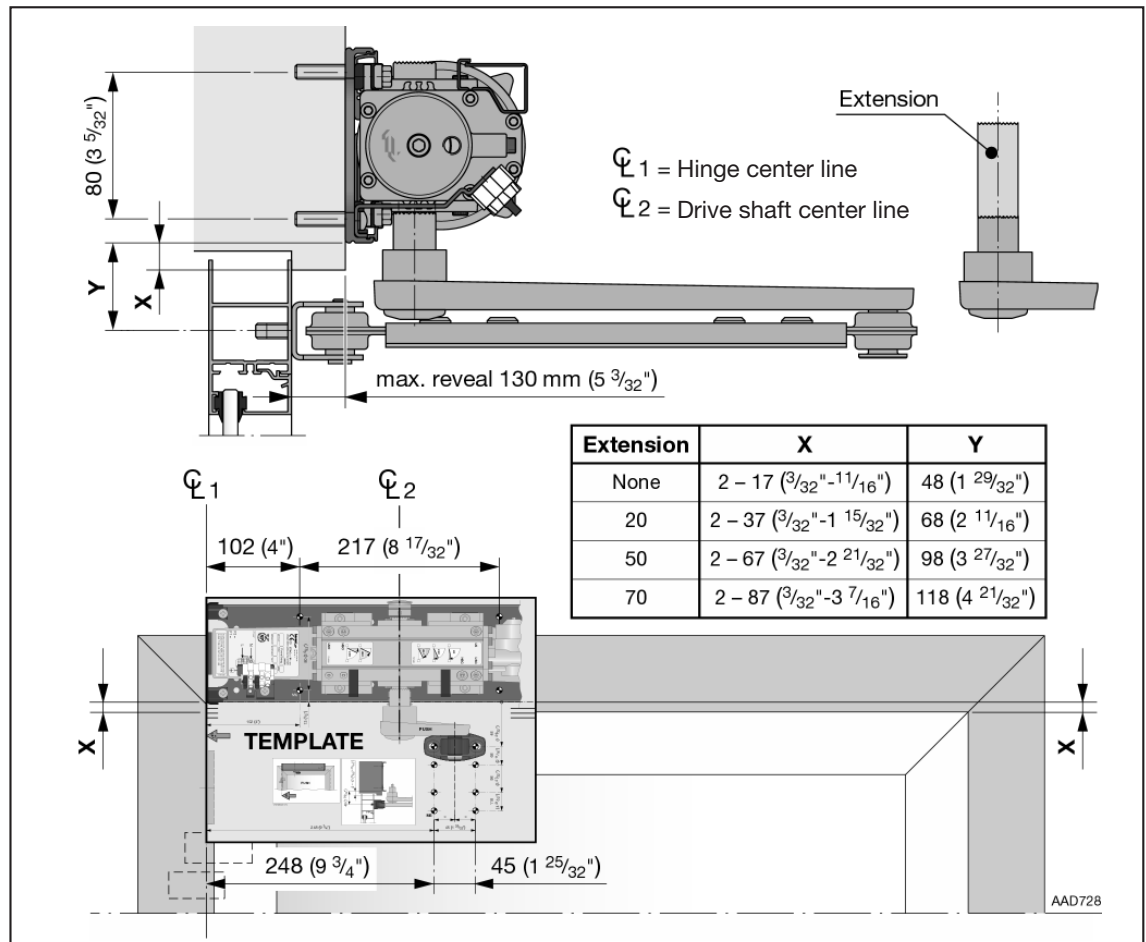
**Note: 2 mm ( $3/32''$ ) achieves a flush unit when cover is mounted.**

## Mounting the Drive Unit (Mounting Plate Application)

1. Stick the template to the wall aligned with the hinges and with the underside of the mounting plate aligned with the mark on the wall.
2. Ensure that the template is perfectly horizontal. Punch and drill the four mounting holes and the two holes for the door fitting.
3. Remove the template.
4. Tap, plug or reinforce with rivnuts and screw the drive unit tight.

## Mounting the Door Fitting with Telescopic Part

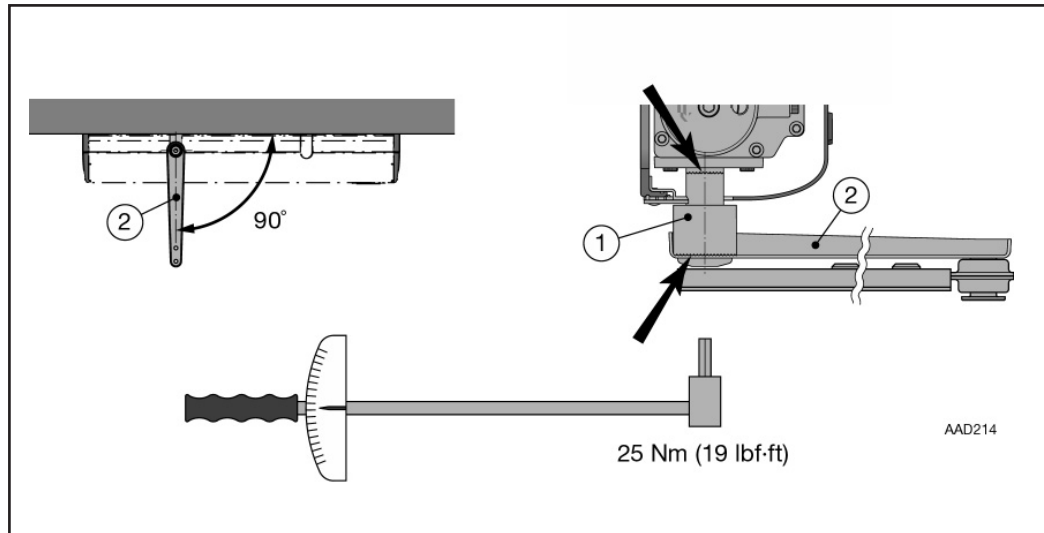
1. Remove the door fitting from the arm system.
2. Screw the door fitting to the door leaf tight.



## Mounting the Drive Arm

1. Mount the drive arm and adaptor on the operator drive shaft at an angle of  $90^\circ$  to the wall.
2. Ensure that the teeth of the adaptor engage fully with the operator shaft but especially with the drive arm, so they are not damaged when the drive arm is tightened. Tighten the screw to a torque of 25 Nm (19 lbf . ft).

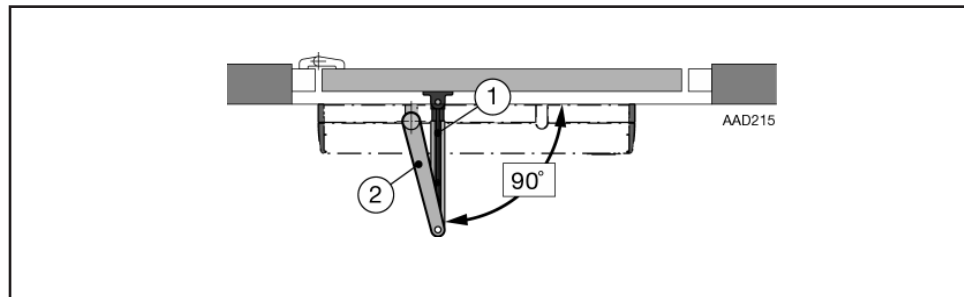
- ① Adaptor
- ② Drive arm



## Adjusting the arm system (Spring tension preloading)

1. Open the door and connect the door fitting with the drive arm (do not tighten the lock screws).
2. Close the door and keep it closed.
3. Turn the drive arm until the telescopic part is at an angle of  $90^\circ$  to the door.
4. Tighten the telescopic part with the lock screws.

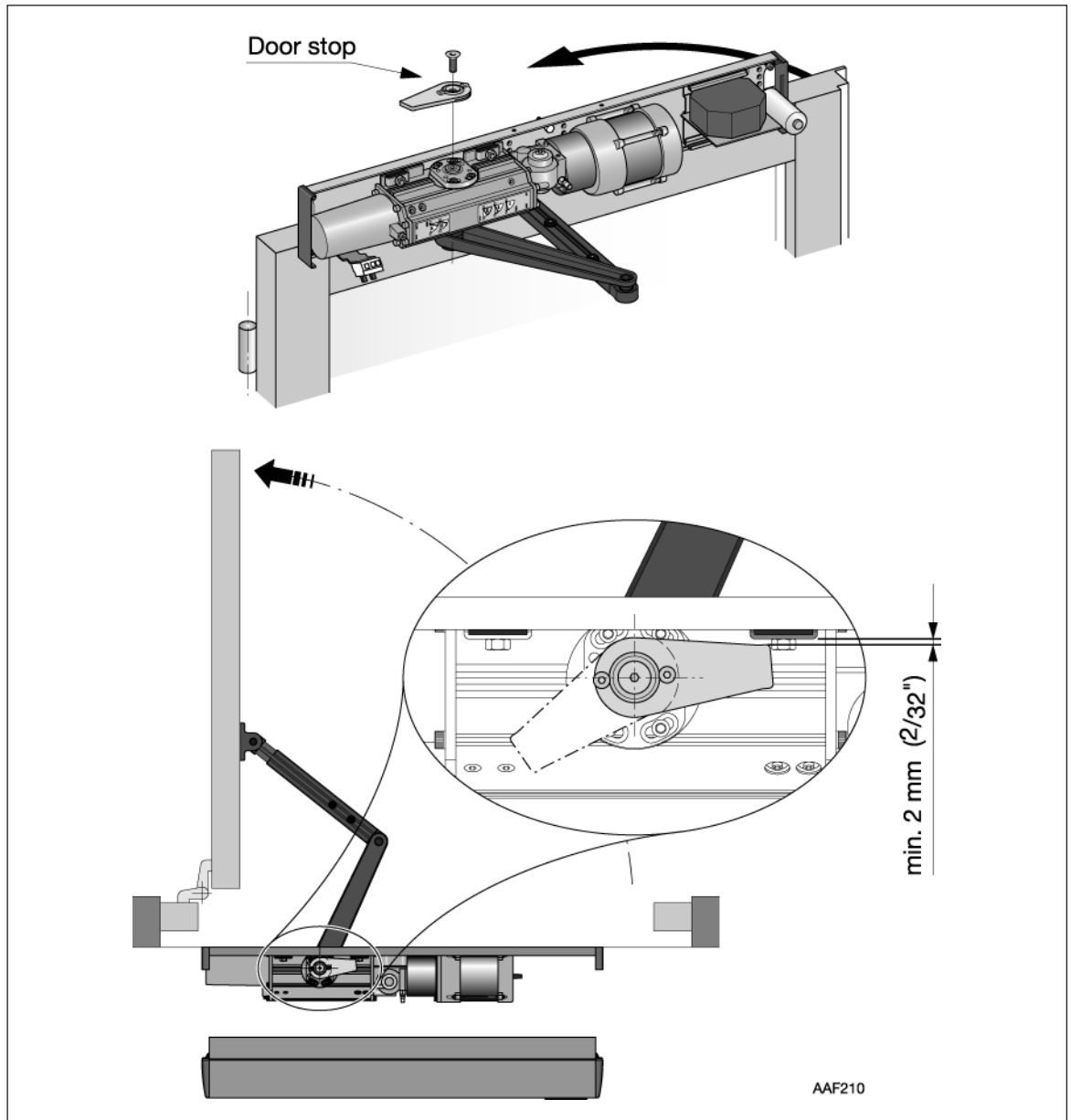
- ① Telescopic part
- ② Drive arm





## Installing the Door Stop

1. Install door stop to top side of output spindle to prevent door from extending beyond 90°.
  2. Mount door stop when door is in open position with a clearance of 2 mm (2/32") as shown below. Fine adjust, if necessary, on limit switch and/or on armsystem.
- Note!** If door stop cannot be mounted on top of operator, remove washer and mount stop on bottom side between shaft and arm system.



## Checking the Door Movement

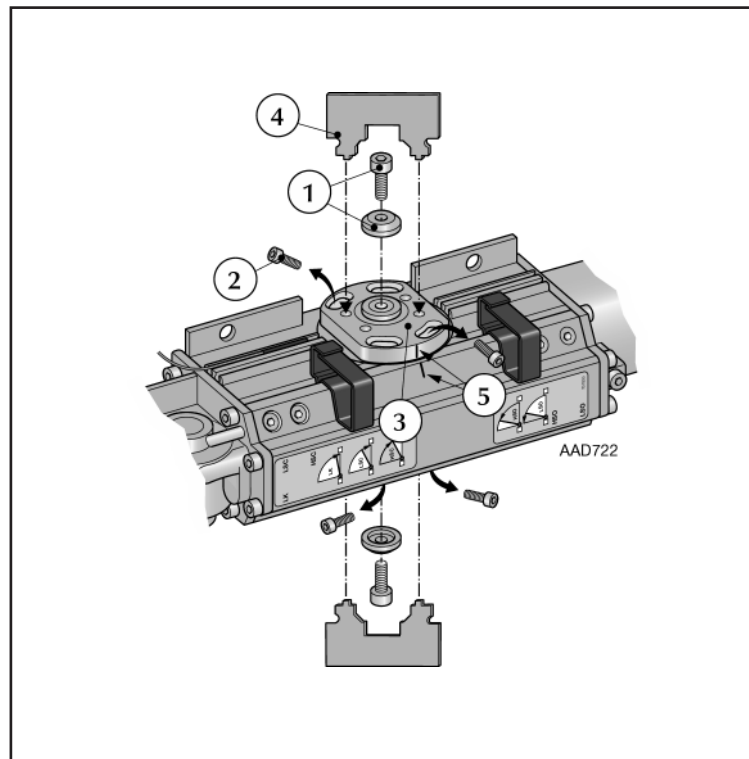
Open the door by hand to its maximum extent. Then let it close of its own accord. Check that the opening/closing movements are smooth and free. Continue on page 20 for electrical installation.

## Operator with Arm System PULL/PULL-P

If the operator is not ordered as an **“operator package with arm system PULL”** the direction of rotation must be reversed.

### Changing the Direction of Rotation

1. Mount the washers and screws in the drive shaft, one from each side.
2. Dismantle the screws (4 pcs) from the bearing sleeves on both sides.
3. Fit the tools in the holes, one from each side and turn both bearing sleeves simultaneously approx.  $165^\circ$  until the setting lines in the bearing sleeves are aligned with the setting lines in the housing.
4. Remount the four screws in the bearing sleeves and dismantle the washers and screws.



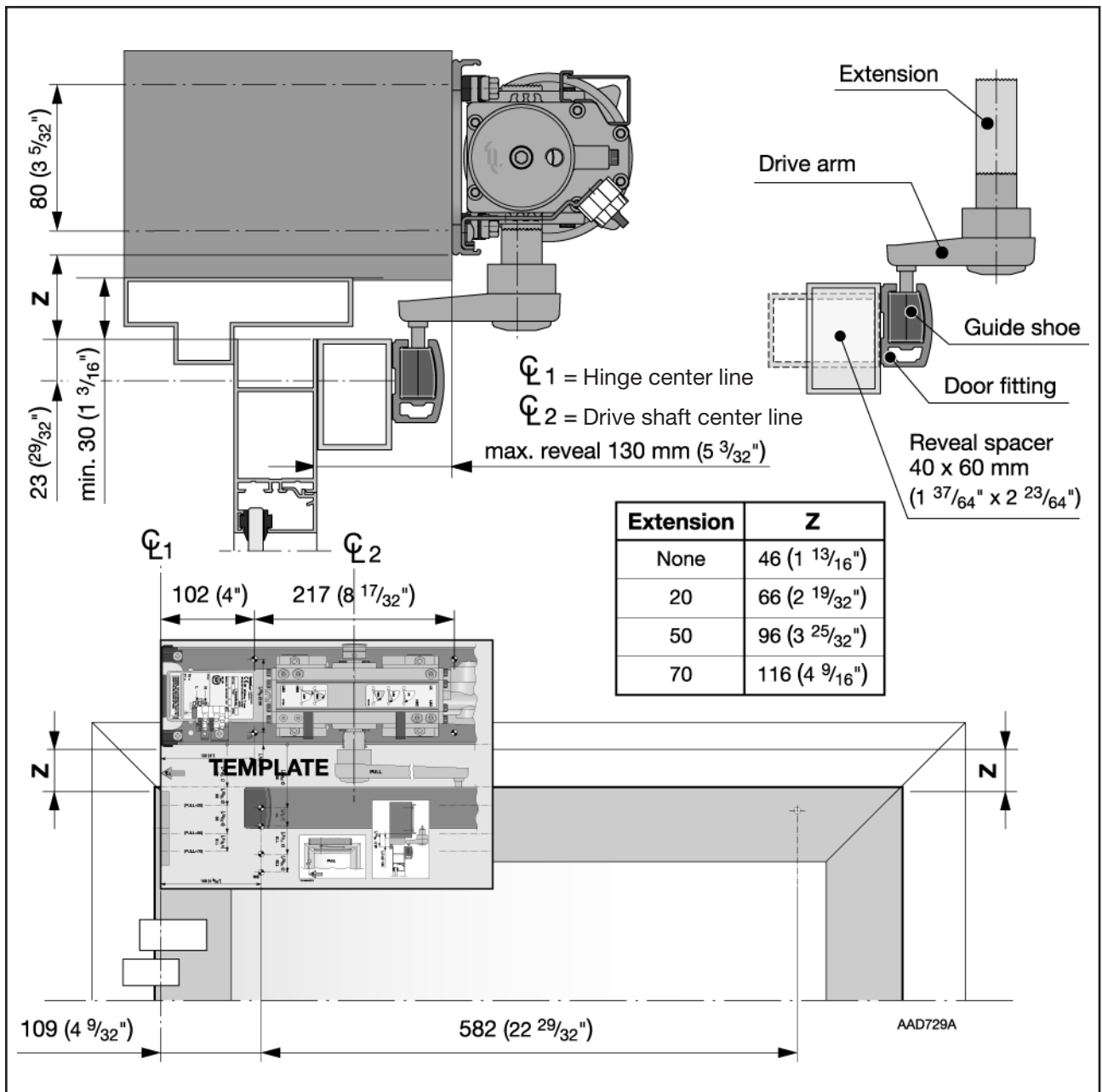
- |                          |                 |
|--------------------------|-----------------|
| ① Washer and screw       | ④ Tool          |
| ② Screw (4 pcs)          | ⑤ Setting lines |
| ③ Bearing sleeve (2 pcs) |                 |

## Establish the Installation Height

Establish the installation height **Z** which is the distance from the top of the door to the underside of the mounting plate. Mark distance **Z** on the wall. **Z** can be 46, 66, 96 or 116 mm (1-13/16", 2-19/32", 3-3/4" or 4 9/16") depending on whether a shaft extension is used or not.

## Mounting the Drive Unit (Mounting Plate Application)

1. Stick the template to the wall aligned with the hinges and with the underside of the mounting plate aligned with the mark on the wall.
2. Ensure that the template is perfectly horizontal. Punch and drill the four mounting holes and the two holes for the door fitting.
3. Remove the template.
4. Tap, plug or reinforce with rivnuts and screw the drive unit tight.



---

## Mounting the Drive Arm and Door Fitting, PULL/PULL-P

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**Note!** For installation of PULL-P (panic break-out) see also illustration (drawing No. 655990) page 21.

1. Connect the main power (see page 21).
2. Open the door to an angle of 90°.
3. Give constant impulse by strapping the impulse inputs on the control unit. The drive shaft turns to a factory-set position.
4. Slide the guide shoe into the door fitting.
5. Using dimensions shown from hinge center line, mount the door fitting to the door panel fastening securely.
6. Mount the drive arm on the drive shaft with the door in unchanged position (90°). Ensure that the teeth of the adaptor fit well with the operator drive shaft and the drive arm.
7. Tighten the screw to a torque of 25 Nm (19 lbf . ft).
8. Slide the arm stop against the guide shoe and then back 20 mm (3/4"). The guide shoe must not hit the arm stop during normal operation. Fasten the arm stop.
9. Remove the strapping. The motor turns off and the door closes.
10. Snap on the end plates to the door fitting.

---

## Checking the Door Movement

---

Push the door to its fully open position. Check that it can open to the required angle and that the guide shoe runs easily in the track of the door fitting. Check also that the complete arm system operates without problems.

Drill  $\varnothing$  9.5 (3/8")

Door hinge

min. 30 (1 3/16")

max. reveal 130 mm (5 1/8")

Panic breakout Force max. 220 N (49 lbf)

Extension	Z
None	46 (1 13/16")
20	66 (2 19/32")
50	96 (3 25/32")
70	116 (4 9/16")

The arm system PULL-P complies with

- pFEN 12650-1, for door size 3-6
- ANSI/BHMA A156.10

**1** Short slide track

**2** Long slide track

**3** Ball catch

**4** Arm stop

**5** Ball seat

**6** Hinge

**7** Door stop

**8** Rubber absorber

**9** Magnetic switch G1

**10** Magnet

**11** Crimp connectors

**12** Drive arm

**13** End caps

**14** Flexible steel hose FLS

**15** Fastening hole (4 pcs)

**16** Lock screws

**17** Reveal spacer (optional) 40/60 mm (1 5/16"/2 3/16")

**Mounting instruction for magnetic switch G1**

To make sure that the operator is disconnected when the door is panicked a switch must be connected to the terminals TB1:1 and 2 on the CSDA.

1. Drill a 9.5 mm (3/8") hole in the door leaf just behind the magnet for the magnetic switch G1.
2. Extend the cable length for the switch G1.
3. Mount the magnetic switch G1 and the flexible steel hose FLS in accordance with the picture.
4. Connect G1 to CSDA TB1:1 and 2 and remove kill jumper TB8:6.

\* If door width is <math><900\text{ mm}</math> (35 7/16") in the door leaf, slide track and operator must be mounted closer to the hinge.

**Installation of PULL-P**

1. Mark and drill the 4 fastening holes  $\varnothing$  4.6 (3/16") in the door leaf.
2. Mount the two short slide tracks.
3. Slide the hinge into the short slide track next to the door hinge and make sure they are aligned (A). Secure with the lock screw.
4. Slide the long slide track into the hinge and make sure they are aligned (B). Secure with the lock screw.
5. Slide the ball catch into the short slide track at the front of the door and make sure they are aligned (C). Secure with the lock screw.
6. Slide the arm stop into the long slide track. Position it close to the hinge and secure it with the lock screw (will be adjusted later).
7. Slide the drive arm with its guide shoe into the long slide track.
8. Slide the ball seat into the long slide track. Make sure the magnet is facing the door.
9. Close the slide track and press the ball seat against the ball catch. Secure with the lock screw.
10. Mount the door stop on the ball seat.
11. Fix the rubber absorber at the door frame behind the door stop.
12. Adjust the spring pre-tension on the ball catch to its maximum and then release 2 turns.
13. Check break-out force with a balance by pulling the door into panic direction. Max force must not be higher than 220 N (49 lbf). Adjust if necessary.
14. Open the door to an angle of 90°.
15. Give constant impulse.
16. Mount the drive arm to the operator with the door in unchanged position.
17. Tighten the screw to a torque of 25 Nm (19 lbf-ft).
18. Slide the arm stop against the guide shoe and then back 20 mm (3/4").
19. Remove the constant impulse and let the door close.
20. Stick the rubber absorbers to the frame just behind the arm.
21. Snap on the two end caps to the slide track.

**Art. No. 100 134BK**

AAER2B

**besam**  
entrance solutions

**B 655 990**

**PULL-P**  
Arm system for PowerSwing

Installation drawing

**Note!**

During any work with the electrical connections the **main power** must be disconnected.

## Control Units

---

The operator can be equipped with different control units adapted to the functions required.

### CSDA

---

This basic control unit is equipped with inputs for connection of automatic and manual activation units such as radars, photocells, normal push buttons, emergency push buttons etc. Electro-mechanical strike, slave control unit CSDA-S for double doors as well as presence sensor IFD with limited functions can also be connected.

### CSDA-S

---

This slave control unit is used together with CSDA for double doors as explained above.

### EXA

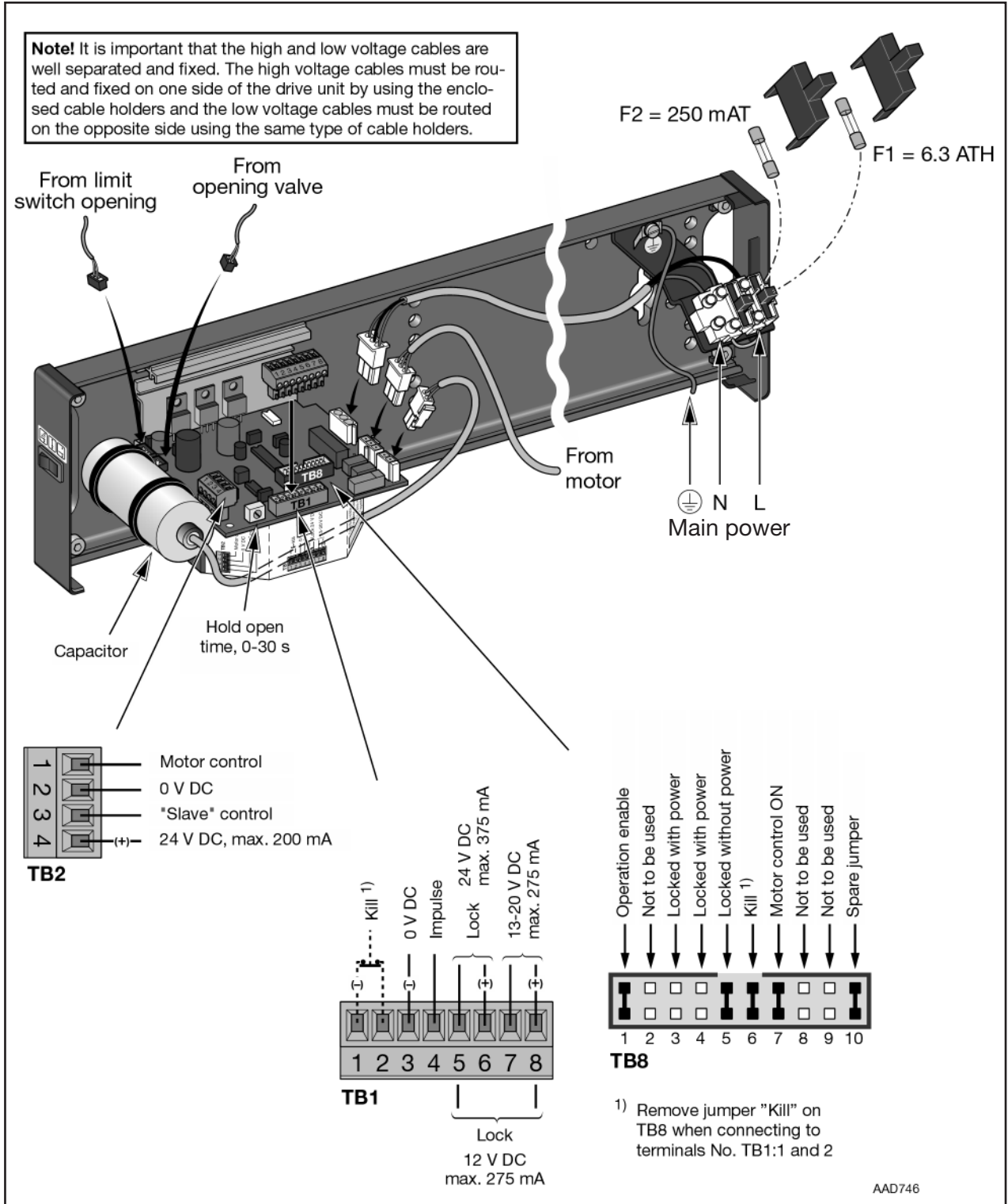
---

This extension unit is mounted on top of the CSDA to extend the CSDA functions with inputs for Push & Go, key impulse, presence impulse, inner and outer impulse, off, exit, open and presence detection for both doors on a double door application etc.

# Connection of Control Unit CSDA – Single Doors

Connect the main power to the main terminal block.

**Note!** Accessories and activation units must **not** be connected until the adjustment of speeds etc. has been carried out.



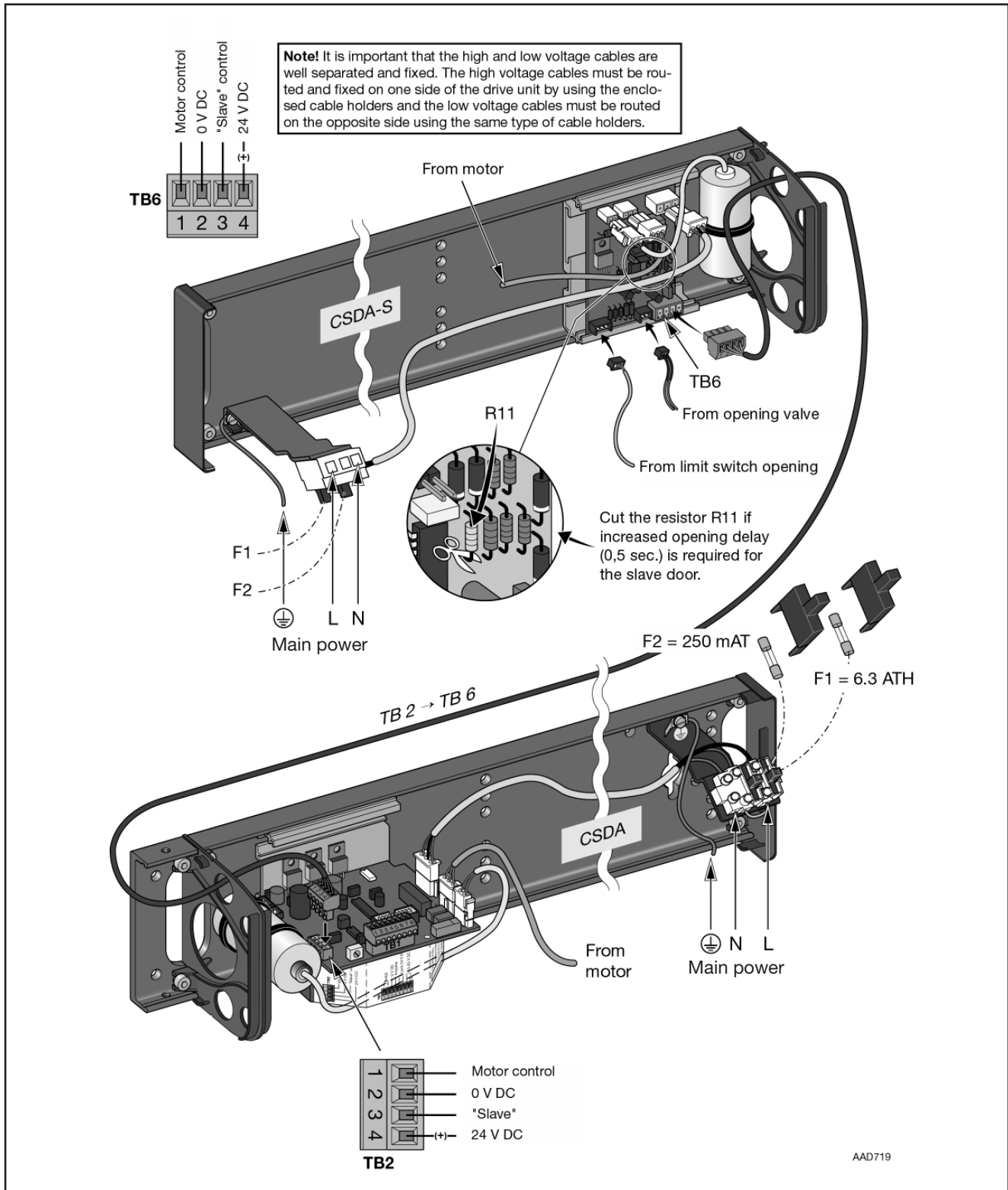
AAD746



## Connection of Control Units CSDA and CSDA-S – Double Doors

For double door operators both operators have to be connected to the main power. A four-pole cable (not enclosed) has to be connected between TB2 on the CSDA and TB6 on the CSDA-S.

**Note: Two CSDA controls can be used with signal inputs shared!**

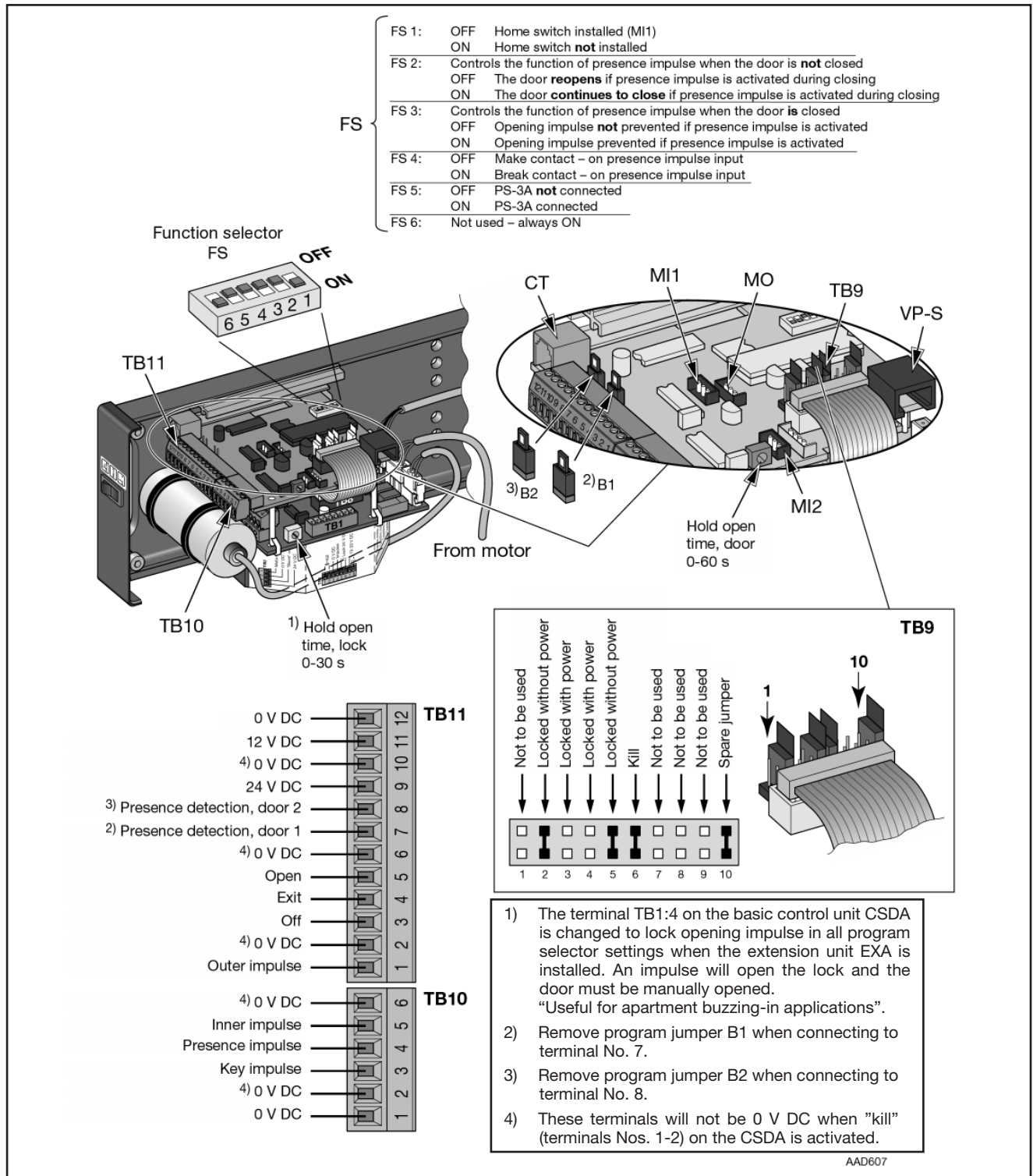




## Connection of Extension Unit EXA – Option

The extension unit EXA is to be installed on top of the CSDA.

- Move the factory-set jumpers on TB8/CSDA to TB9/EXA.
- Connect the flat cable to TB8 on the CSDA.
- Snap on the EXA to the CSDA.



**Caution:** Settings must be within ANSI/BHMA  
A156.10 for Pedestrians or  
A156.19 for Low Energy

Give a short opening impulse by strapping the impulse input and adjust if necessary as follows. See also illustration on page 26.

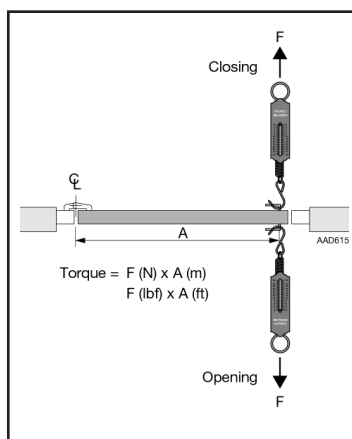
1. Set the hold open time with the potentiometer on the control unit.
2. Adjustment of the **opening speed**.
  - a) Adapt the high speed opening HSO to the existing traffic situation. Turning clockwise decreases the speed.
  - b) The low speed opening LSO needs to be adjusted only if the door is extremely heavy. Turning clockwise decreases the speed.

**Note!** If it is hard to obtain an even and smooth braking, the opening torque (pump pressure) must be reduced.
3. Adjustment of the **closing speed**.
  - a) Adjust the low speed closing LSC as low as the traffic situation allows. Turning clockwise decreases the speed.
  - b) If a higher closing speed is required, open the high speed closing valve HSC (closed from factory).

**Note!** If the installation requires adjustment of the closing torque follow the instructions on page 25.
4. Fine-adjust the **opening angle** by means of the **limit switch** ③. The limit switch is slid into a groove in the hydraulic unit and tightened with a lock screw. By moving the limit switch sideways the opening angle is changed.

**Note!** To make the adjustment easier, the limit switch can be moved to the underside of the hydraulic unit. Any of the grooves at the motor side of the outgoing shaft can be used.
5. If an electromechanical striking plate is installed, an additional “**lock-kick**” can be obtained during the last 5° of the closing cycle by adjusting the screw LK on the hydraulic unit. This screw is normally closed. Adjust by opening the screw 90° and check the function.

**Note!** Opening the screw too much may delay the opening.
6. Connect the activation units.
7. Check that the installation complies with valid regulations and requirements from the authorities.



## Closing Torque

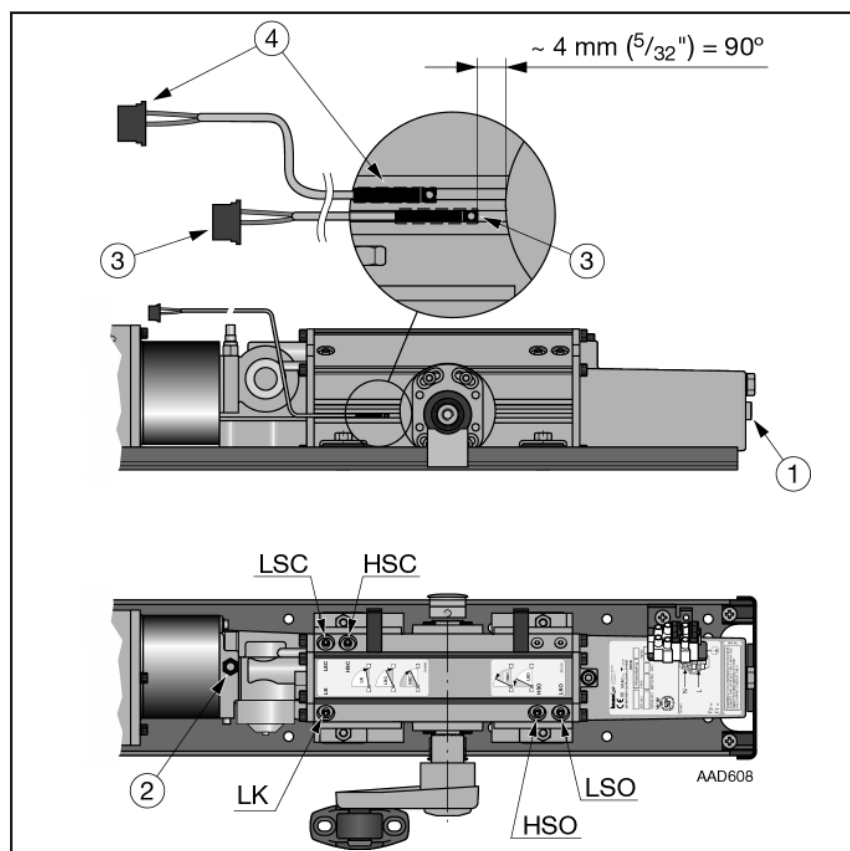
To comply with authority requirements or to overcome over/under pressure the closing torque can be adjusted.

The closing torque (spring force) is adjusted by means of an Allen screw ① placed at the end of the spring tube. The end plate has to be dismantled. Turning the screw clockwise increases the force. One turn equals a torque change of approx. 1 Nm (0.75 lbf.ft). The door must be in open position when the torque is adjusted.

## Opening Torque

If the closing torque (spring force) has been changed, or if the door does not open to its full extent, the opening torque (pump pressure) must be adjusted as follows:

1. The factory set torque for PUSH is 70 Nm (52 lbf.ft) and for PULL 40 Nm (30 lbf.ft) at a door opening angle of 0-2°.
2. Measure the opening torque by using a spring balance and adjust if necessary. The torque is adjusted by means of an Allen screw placed on the pump ②. Turning clockwise increases the opening torque/pump pressure. One turn equals a torque change of approx. 30 Nm (22 lbf.ft).



HSO = High speed opening  
 LSO = Low speed opening  
 HSC = High speed closing (normally closed)  
 LSC = Low speed closing  
 LK = Screw for adjustment of "lock kick"  
 (normally closed)

- ① Screw for adjustment of spring force.
- ② Screw for adjustment of pump pressure.
- ③ Limit switch for adjustment of opening angle
- ④ Limit switch (option), 1 A, 200 V DC

Note! The hydraulic unit has grooves both on the upper side and on the underside. The limit switch can be slid into any of the grooves at the motor side of the outgoing shaft.

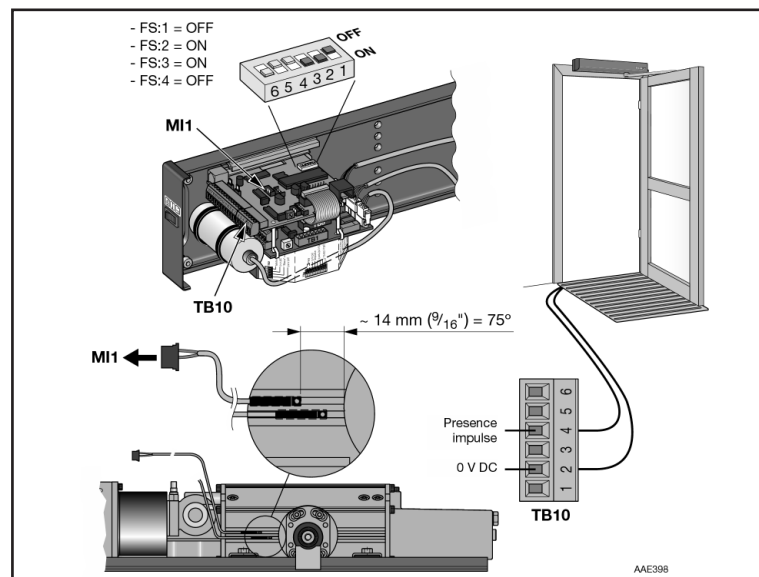


## Connection of Mat to Extension Unit EXA

Mat safety means that:

- a closed door will not open, if the mat is active
- an open door will not close, if the mat is active
- during opening the door will continue to open, even if the mat is activated
- during closing the door will continue to close, even if the mat is activated
- opening impulses are prevented during closing, if the mat is active.

To obtain mat safety an optional limit switch is required. Connect the limit switch to MI1 and set the function selectors FS:1 = OFF, FS:2 = ON, FS:3 = ON and FS:4 = OFF on the EXA.

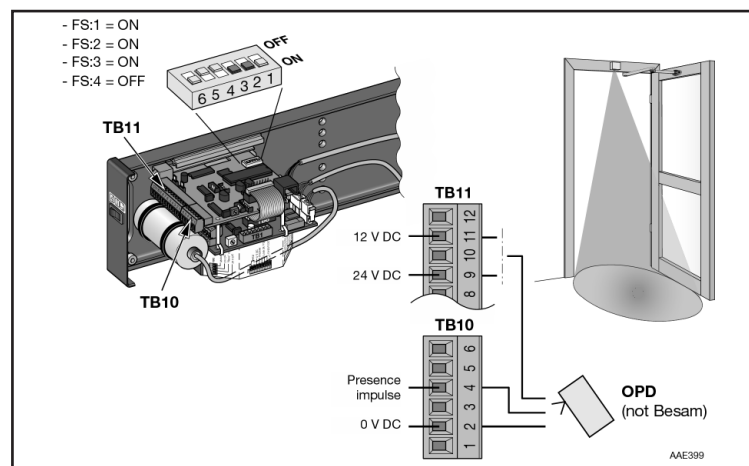


## Connection of OPD to Extension Unit EXA

OPD (Overhead Presence Detection) safety means that:

- a closed door will not open, if the OPD is active
- an open door will not close, if the OPD is active
- during opening the door will continue to open, even if the OPD is activated
- during closing the door will continue to close, even if the OPD is activated
- opening impulses are **not** prevented during closing, if the OPD is active.

To obtain OPD safety set the function selectors FS:1 = ON, FS:2 = ON, FS:3 = ON and FS:4 = OFF on the EXA.

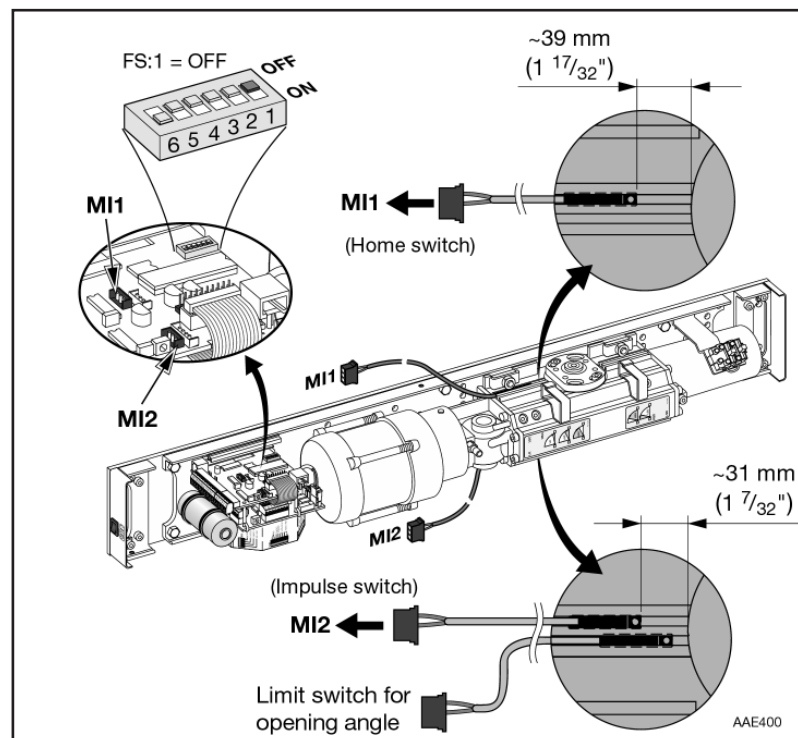


## Connection of Push & Go to Extension Unit EXA

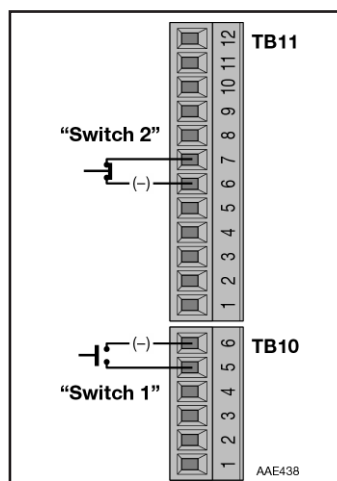
Push & Go means that the door opens automatically from closed position if manually pushed.

To obtain Push & Go two optional limit switches are needed.

1. Install the limit switch MI2 for the impulse.
2. Check that the switch gives opening impulse when the door is manually pushed open 5°. Adjust if necessary.
3. Install the second limit switch MI1 for the home position on the opposite side of the operator.
4. Set the function selector FS:1 = OFF on the EXA.
5. Adjust, if necessary, the position of the switches.



## Connection of Airing position to extension unit EXA (Useful in private residence, cat/dog door)



The airing position means that the door can be set permanently partially open to required position.

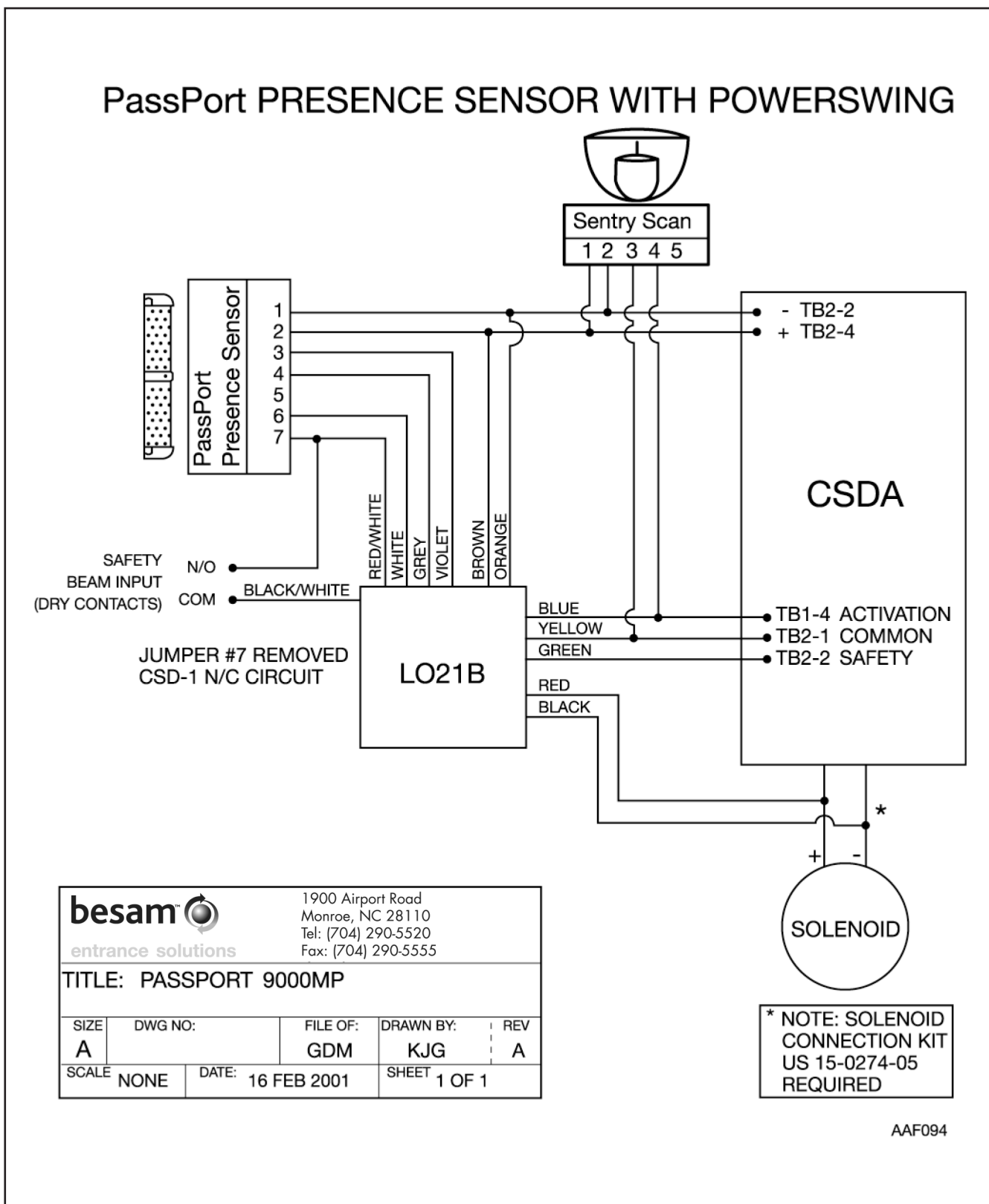
To obtain this function proceed as follows:

1. Remove the jumper B1 from the EXA.
2. Connect a bistable switch "Switch 1" (NO) to TB10:5 and 6. Used to give opening impulse.
3. Connect a bistable switch "Switch 2" (NC) to TB11:6 and 7. Used to stop the door in required position.

To obtain the required airing position proceed as follows:

1. Give opening impulse on "Switch 1".
2. Give stop impulse on "Switch 2" at the required airing angle during the opening.

# Connection of PassPort Presence Sensor



AAF094



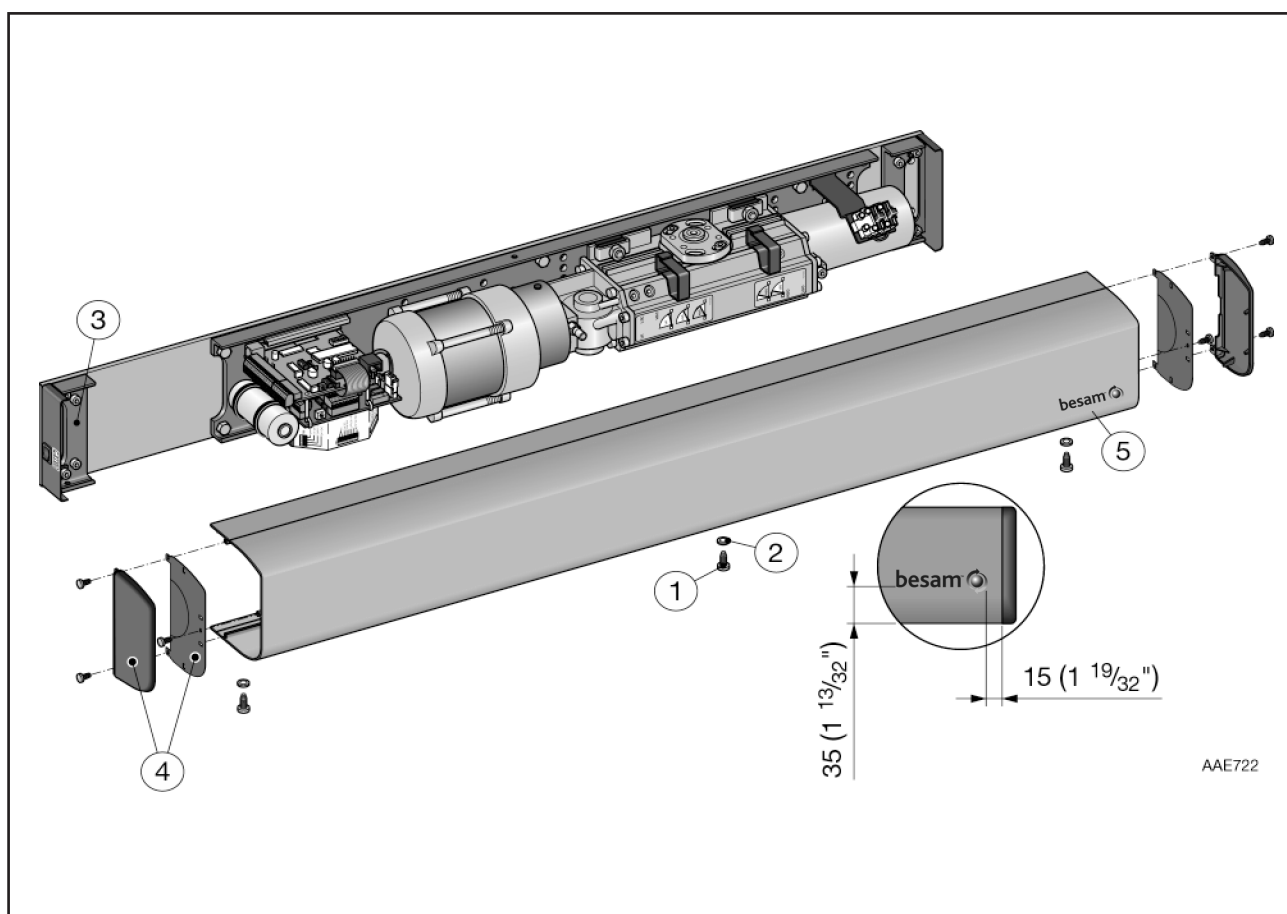
The cover and mounting plate are manufactured in clear anodized aluminium. The end plates are made of a black self-extinguishing plastic material.

## Fitting and Removing the Cover

Mount the end plates ④ to the cover as shown below.

The cover is slid over flanges in the end plates and fixed to the underside of the mounting plate with one screw and one toothed washer for ground connection.

Stick the Besam logotype to the cover – see below.



- ① Ground/Fastening screw
- ② Star washer for earth connection
- ③ Cover mounting clip with end plate
- ④ End plates for cover
- ⑤ Besam logotype



1. The Besam Fire Door Accessory Package for SINGLES consists of U.L. Fire Listed Besam Automatic Door Operator, Activating Device (push plates, mats, etc.) & Caution labels. For PAIRS the package consists of the Listed Operators, F50 (Locknetics 490) Series Electric Latching Mechanism & (Power Supply where necessary), Activating device (push plates, mats, etc.) & Caution Labels. Installation instructions for the Besam package are provided below. Follow the installation instructions provided by the manufacturers of the U.L. door(s); frames; hinges; detectors & the Listed Von Duprin (#8827F, #8847F, #3347F; #9947F & #6213 or similar) fire exit hardware.
2. Fire exit hardware is designed for manual use without automatic door operators.
  - 2a) For Single Doors With Rim Devices:

Follow the installation instructions for the UL Fire Listed Besam operator (Electra 150, Swingmaster 350/450/MP series & Power Swing) as applicable. Use wiring diagram US23-0216 sheet # 4 as required in conjunction with the Listed fire exit hardware & Von Duprin #6213 (Continuous Duty Coil – FAIL SECURE) Electric Strike or equivalent Listed Strike & compatible Listed hardware.
  - 2b) For Pairs Of Doors With Vertical rods:

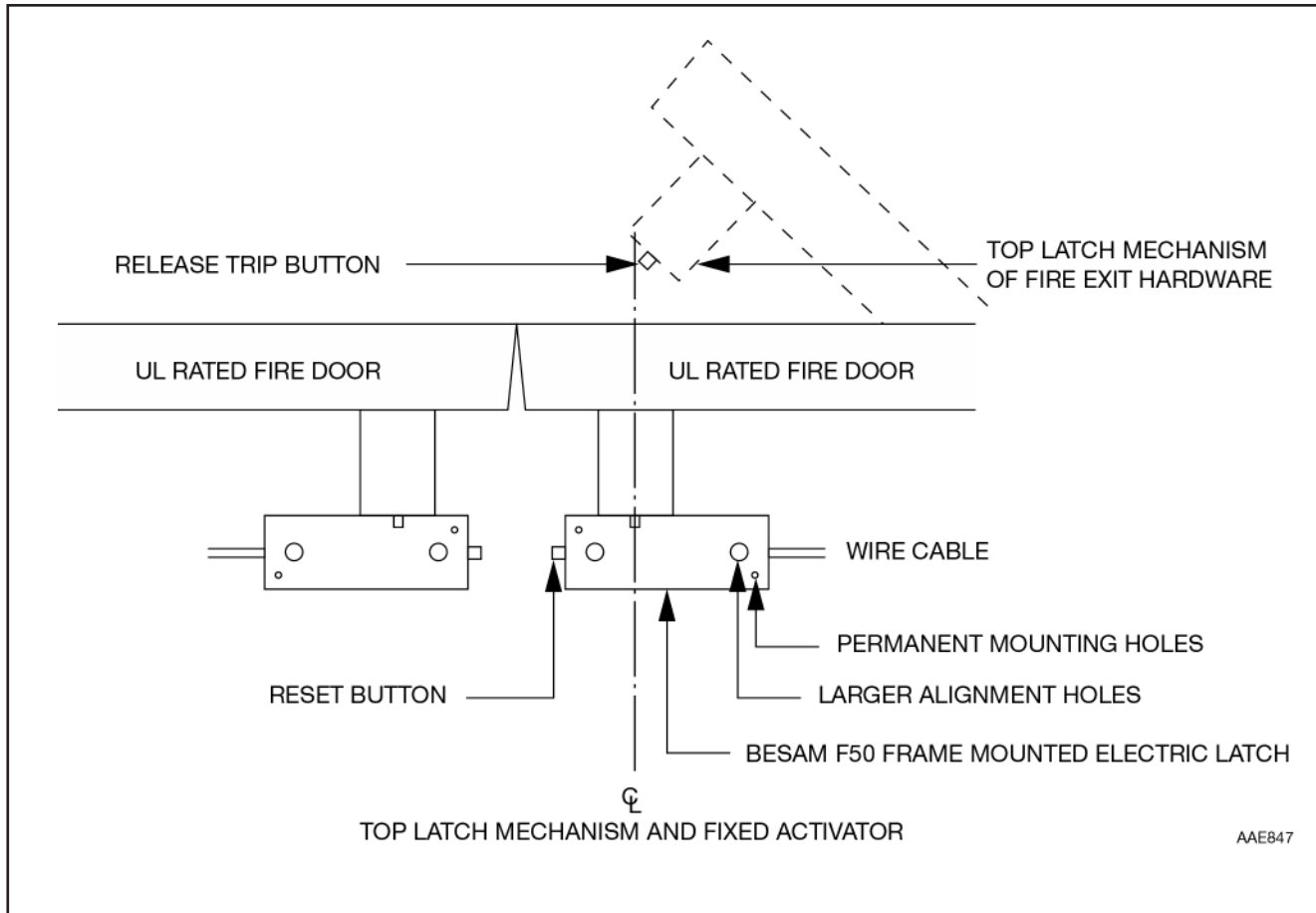
Follow the installation instructions for the UL Fire Listed Besam operator (Electra 150, Swingmaster 350/450/MP series & Power Swing as applicable. The frame mounted fixed activators (provided by the hardware manufacturer) aligning with the Tripper button at the upper latch mechanism; **MUST BE REPLACED** with the Besam F50 Series Electric Latching Mechanism. Connection to the F50 Series Latch is (2) jumper wires from the operator control board; refer to wiring diagram US23- 0216 sheet # 4 as required.

NOTE: Depending upon doorframe profile, a filler plate may be necessary for F50 Series Latch installation. Mount as required, to frame surface using hardware provided.
3. Secure the door in a fully closed position. Using a square, extend a centerline mark on the frame from the fire exit hardware release button to the face of the frame where the Besam F50 Series Latch is to be installed. Also, mark a centerline from the activating plunger of the latch so it can be aligned with the mark on the frame.

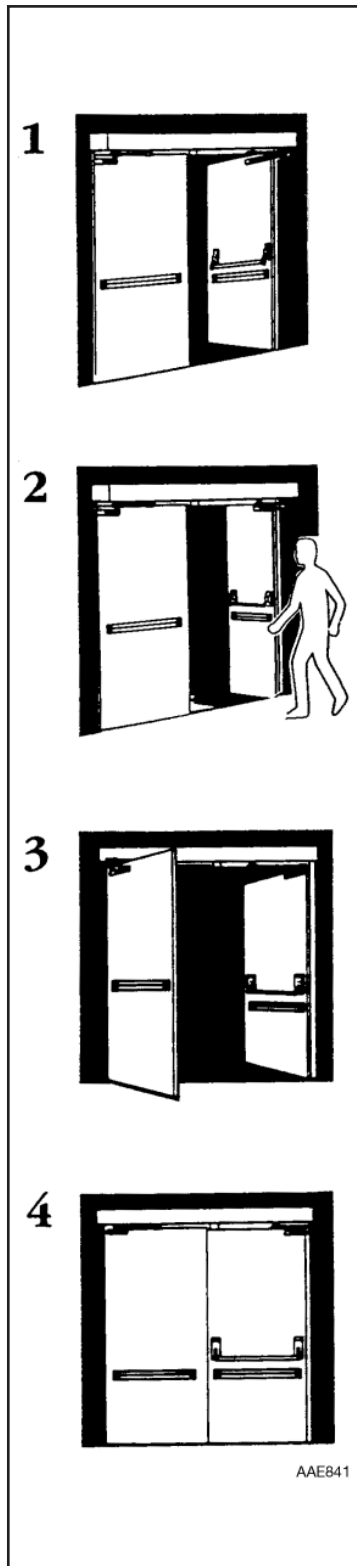
NOTE: Wire harness side of F 50 Series Latch installation on hinge side. Remove latch cover.
4. Align release button centerline on the frame with the F50. Series Latch centerline (see sketch fig. 1), & slowly slide the device towards the release button until fire exit hardware is released.

NOTE: Care should be taken in setting up this release stroke. Since only 1/8” of movement is required, mark the two larger mounting holes only. Drill & tap for #10-24 bolts (supplied) & install the Besam F50 Series Latch assembly.
5. Manually push door ajar & reset fire exit hardware. Allow door to return to closed position. Fire exit hardware should activate if properly aligned; readjust if necessary.

6. Follow step #5, manually hold plunger of Besam F50 Series Latch as if it were energized. Panic hardware should not activate; release plunger. Panic hardware should activate; adjust as required & tighten bolts.
7. Drill & tap remaining mounting holes & install #10-24 bolts; this assures proper alignment.



8. Wire the Besam F50 Series Latch, power supply & detectors according to wiring diagram US23-0216 sheet # 4 as applicable.
9. Select the proper wiring connection shown on drawing US23-0216 sheet # 4 for (PAIRS) Electra 150 or Swingmaster Series 350/450/MP & Power Swing operators. The connections deactivate the operators immediately when the Besam F50 Series Latch is de-energized by a UL listed heat &/or smoke detector or central alarm system, which is acceptable by local authority. The system is ready for operation.



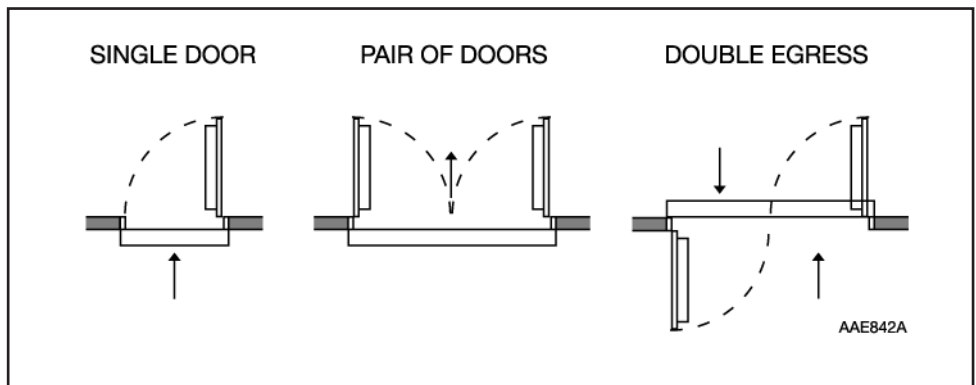
- 1) Normal Operation: Doors provide separation of spaces but function as a fully automatic door system.
- 2) When people approach the doors, they will open automatically, and close once someone has passed through the doorway.
- 3) In the event of smoke, fire or a power failure, a UL listed sensing device (smoke, heat or central alarm detector) sends an impulse to deactivate the operator and the F50 latch mechanism.
- 4) Automation to the doors is removed. The fire door latches positively secure after each manual operation. The doors now function as manual fire doors.
- 5) When power is restored or alarm condition is removed, push the reset button of the F50 series latch and depress the crossbar of the panic device to unlatch the door and restore automatic operation.

### What is provided by Besam?

The fire door accessory package is a complete Underwriter’s Laboratories (UL and CUL) listed package:  
 PowerSwing surface-applied automatic swing door operator (for exterior and heavy duty use).  
 F50 series electromagnetic latch mechanism to keep upper and lower panic device vertical rods in retracted position.  
 Standard activating and safety devices: Visionpulse presence sensors, push plates witches or contact mats.  
 Caution labels.

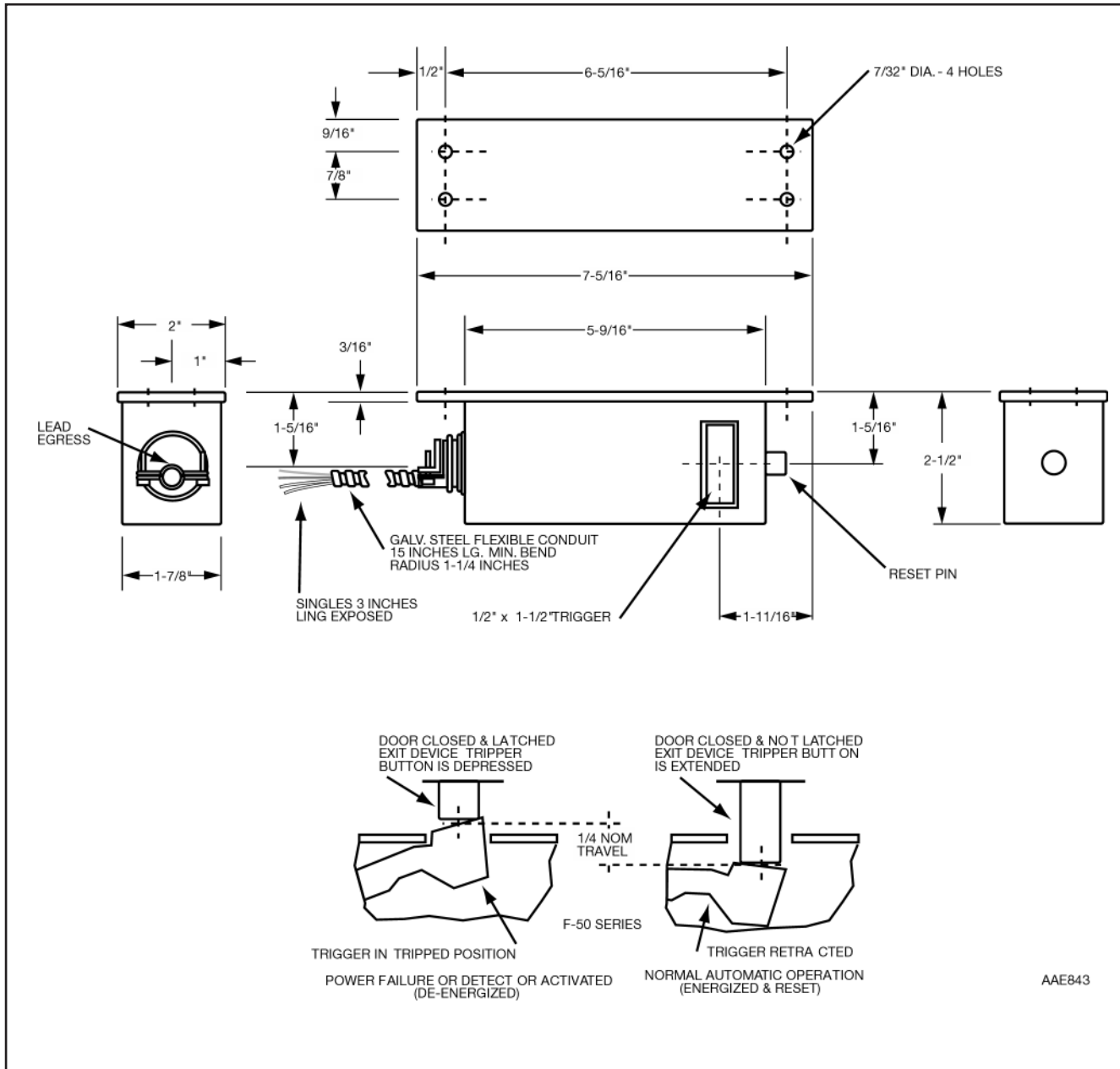
### What is provided by you?

UL listed fire doors and frames.  
 For pairs of doors UL listed fire exit hardware (concealed or surface applied).  
 UL listed sensing device for smoke or heat (accessory package may be wired directly into the central alarm system if available).  
 For single doors UL listed electric strike compatible with UL listed rim panic device (concealed or surface rod devices are not approved for single doors).  
 Besam automatic fire door accessory package, PowerSwing, is designed to be used with “A” or “B” labeled fire doors.

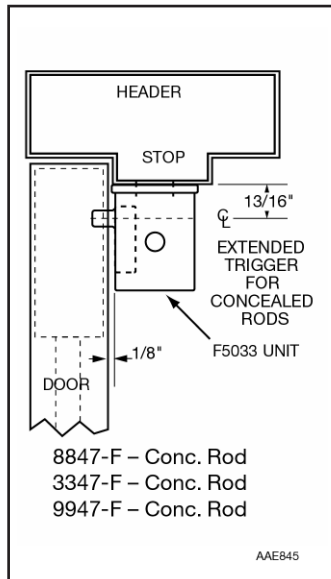
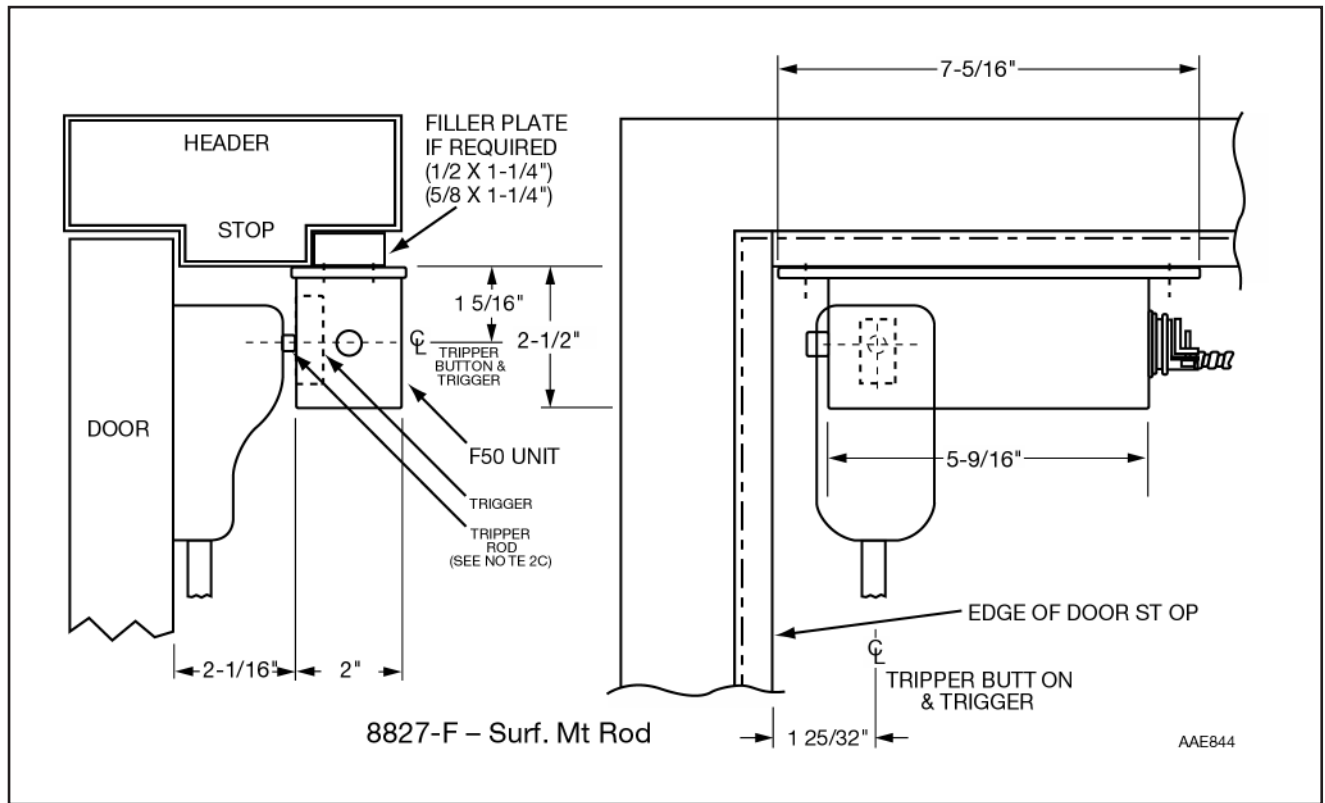


## Besam F-50 Series Latch

Operator is surface applied, mounted with push arm. (Latch, panic & wiring details) using SwingMaster style header plus operator adaptor plate.



## Besam F-50 Series Latch.



## Notes:

1. The electro-magnetic latch release is located in line with the tripper button of the Von Duprin vertical rod exit device.
2. Mounting of the latch release:
  - A. If filler plate is required, mount to top surface of frame as shown, using mounting hardware provided.
  - B. Close and latch the door. Depress the exit device tripper button, and hold with tape if needed.
  - C. Hold latch release against top mounting surface of frame and center latch release trigger in line with the rod, with the tripper button just touching the trigger.
  - D. Spot centers for four mounting holes, using the 490 mounting plate as a template.
  - E. Remove latch release and tap or drill four holes for #10-24 machine screws or #10 sheet metal screws.
  - F. Mount latch release with hardware provided.
  - G. Recheck unit trigger location per step C.

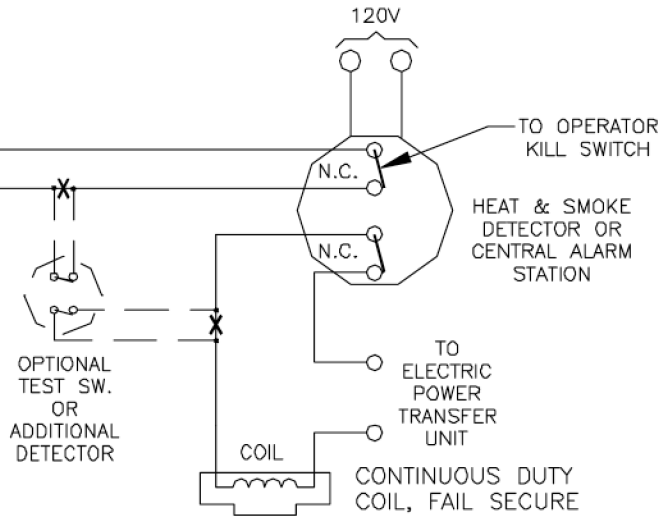
Handing of latch release may be changed by removing the "L" shaped cover and mounting plate and reassembling in opposite positions. The cable egress is a flexible metal conduit with a 1-1/4 inch minimum bend radius.

REVISIONS				
ZONE	REV	DESCRIPTION	Date	APPROVED

# SINGLE

REF MANUAL No. AAD058US

NOTE: REMOVE JUMPER #6 FROM TB8



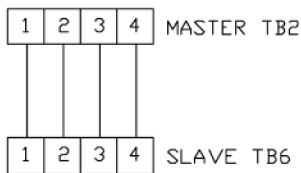
ALTHOUGH VON DUPRIN MODEL 6213 ELECT. STRIKE (FAIL SECURE) IS SHOWN, ANY UL FIRE LISTED ELECTRIC PANIC SYSTEM MAY BE USED.

# PAIRS

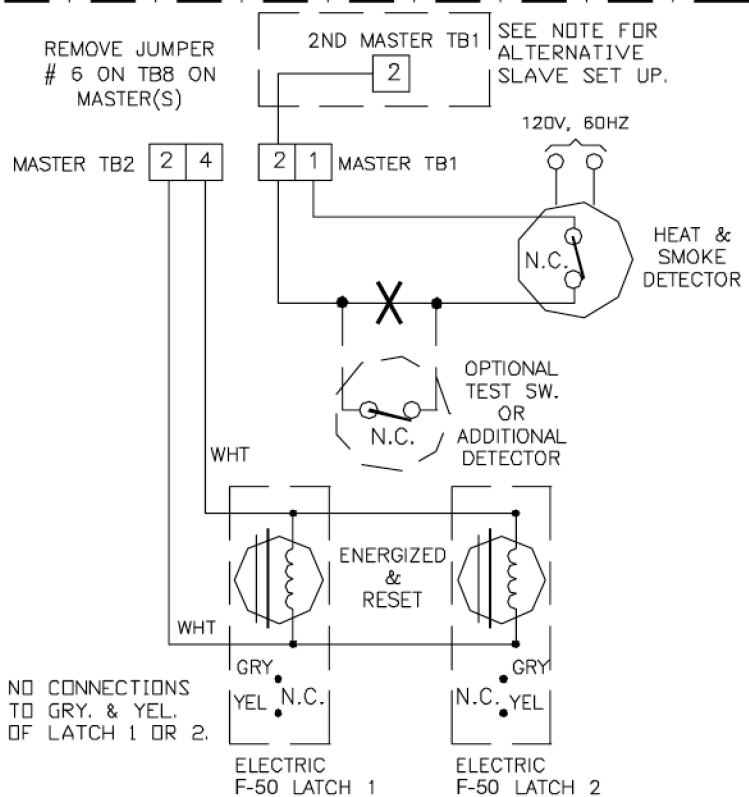
## NOTE:

WIRING DIAGRAM SHOWS MASTER CONTROL WITH 2ND MASTER AS A SLAVE.

FOR MASTER CONTROL WITH BASIC SLAVE CONTROL BOARD INTERFACE CONNECTION BETWEEN BOARDS IS MSTR. TB2 1234 TO SLAVE TB6 1234.



REF MANUAL No. AAD058US



**besam**  
entrance solutions  
1900 Airport Road  
Monroe, NC 28110  
Tel: (704) 290-5520  
Fax: (704) 290-5555

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE THICKNESS OF COATINGS  
TOLERANCES ON:  
2-PLACE DECIMALS ± .01 ALL  
3-PLACE DECIMALS ± .005 SURF  
ANGLES ± .5 125/

## FIRE DOOR CONNECTIONS POWERSWING

SIZE A	DWG./INV NO. US23-0216	REV -
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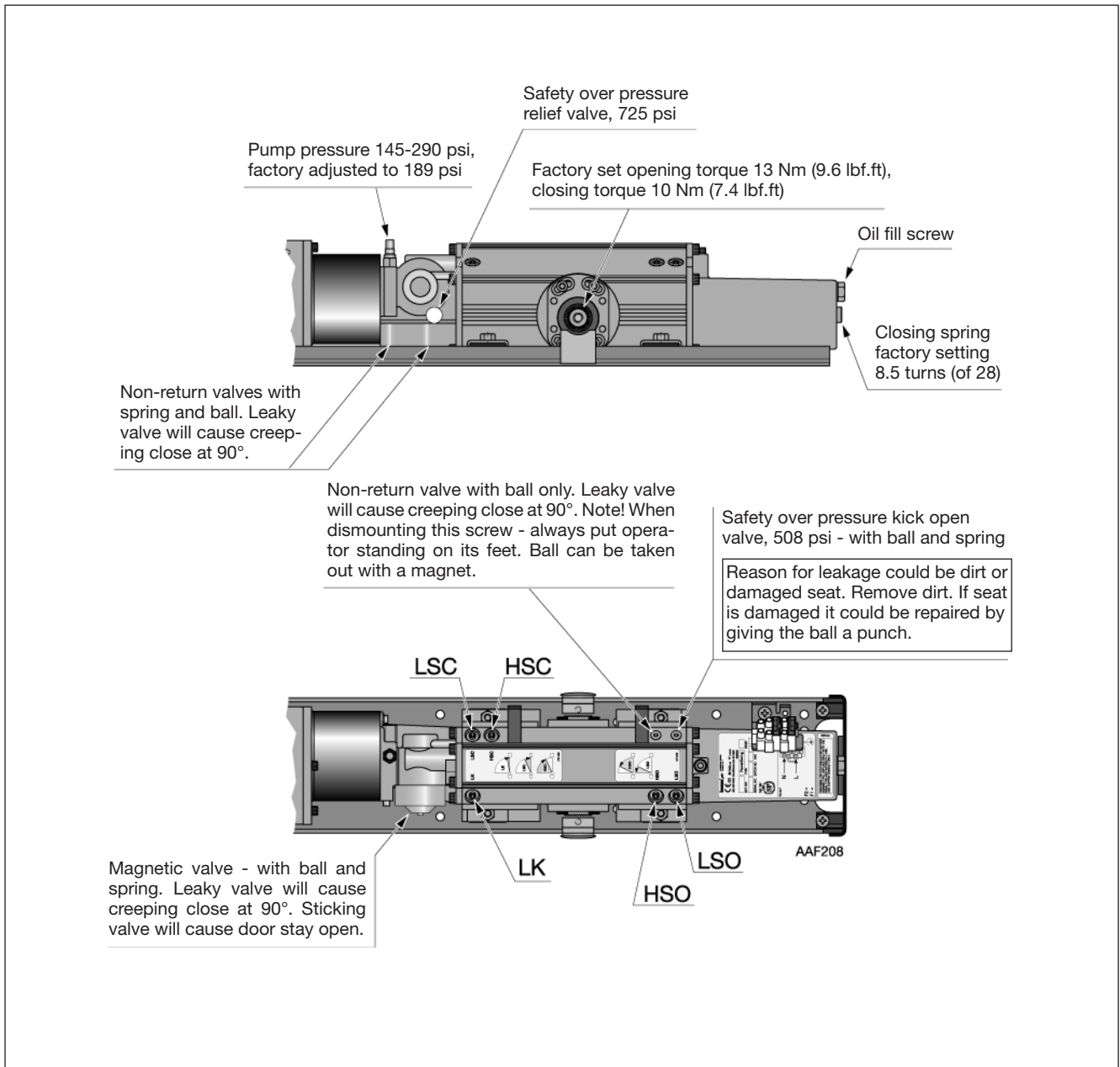
DRN. BY CJMcc	DATE 7/28/00	CHK. BY	DATE	SCALE NONE	SHEET 4 OF 4
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Installation on fire doors AAFR46

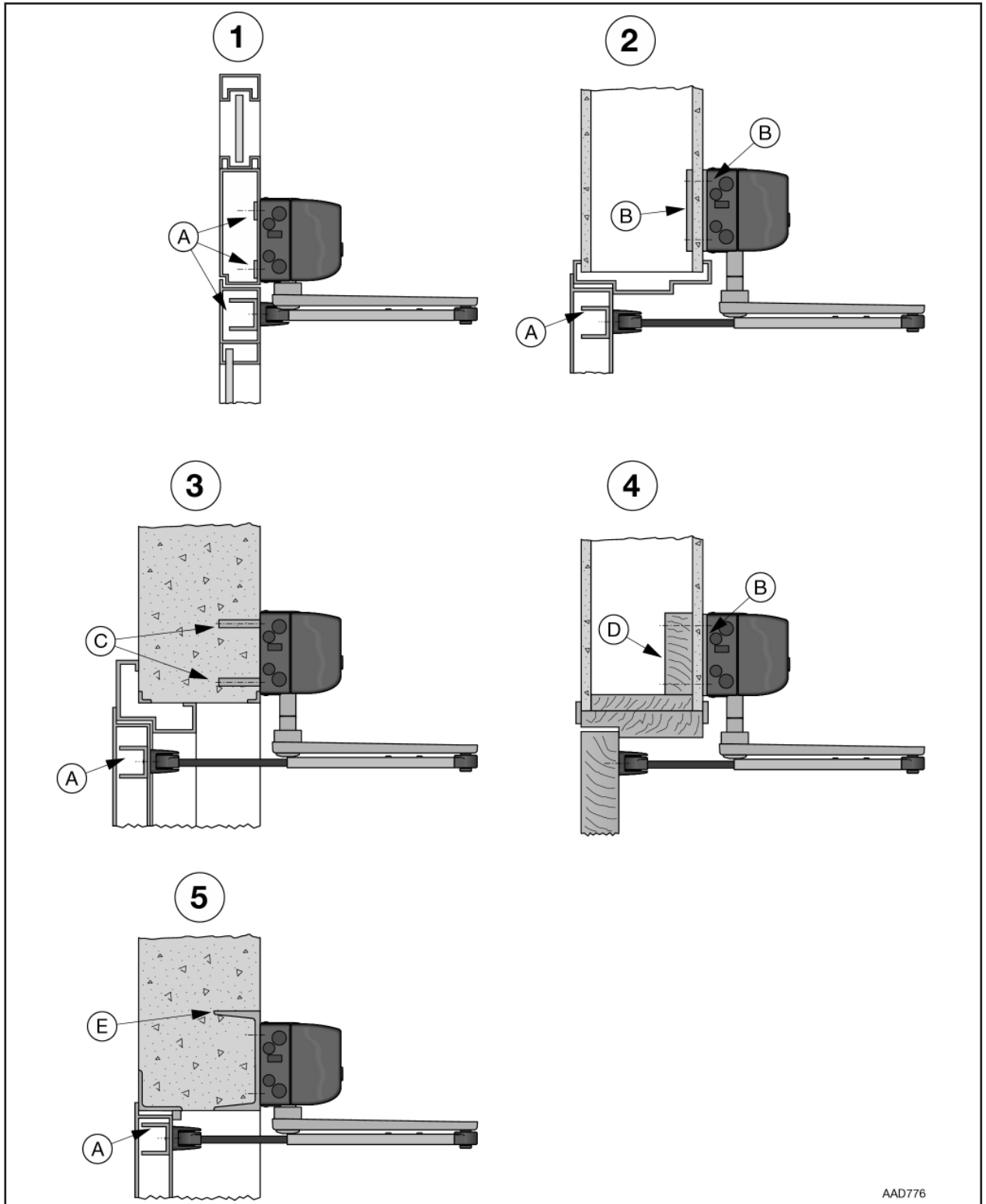
FAULT	POSSIBLE REASONS WHY	REMEDIES/EXPLANATION
<b>The door does not open</b>		
- <i>The motor does not start</i>	Position switch is set to OFF Motor power is missing Mains power is missing Fuse has blown Activation unit does not function Kill jumper removed Kill jumper removed + kill switch open	Change setting Check motor cable Check power Replace fuse Strap impulse inputs Replace jumper Reset switch or replace switch if broken
- <i>The motor starts</i>	Electric striking plate is binding Pump pressure too low Arm system has come loose  Internal failure	Adjust striking Increase pump pressure Readjust pretension and tighten arm system Replace operator
<b>The door does not open to the required angle</b>	Limit switch opening has come loose	Check limit switch
<b>The door opens too far</b>	Opening limit switch has come loose Opening limit switch broken	Check limit switch Replace limit switch
<b>The door does not close</b>	Constant impulse is created Hold open delay too long Control unit defective	Disconnect activation unit Adjust potentiometer Replace control unit
<b>The door does not open fast enough</b>	Pump pressure too low "Lock-kick" adjusted too high	Adjust pump pressure Readjust
<b>The door opens with too much delay</b>	"Lock-kick" valve is opened too much	Adjust valve screw
<b>No smooth braking during opening</b>	Pump pressure too high Low speed distance too short	Adjust pump pressure Increase opening angle, or Increase pre-tension of arm system

FAULT	POSSIBLE REASONS WHY	REMEDIES/EXPLANATION
<b>The door does not stay open</b>	Magnetic valve out of operation	<p>Check by pressing the pin on top of the magnetic valve.</p> <p>If the door stops, then check the resistance (should be 150 ohm) for the wire between the magnetic valve and the control unit.</p>

### Factory settings and identification







AAD776

- ① Aluminium profile system
- ② Plasterboard wall
- ③ Reinforced concrete wall and brick wall
- ④ Plasterboard wall
- ⑤ enforced concrete wall

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







---

**ASSA ABLOY**

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