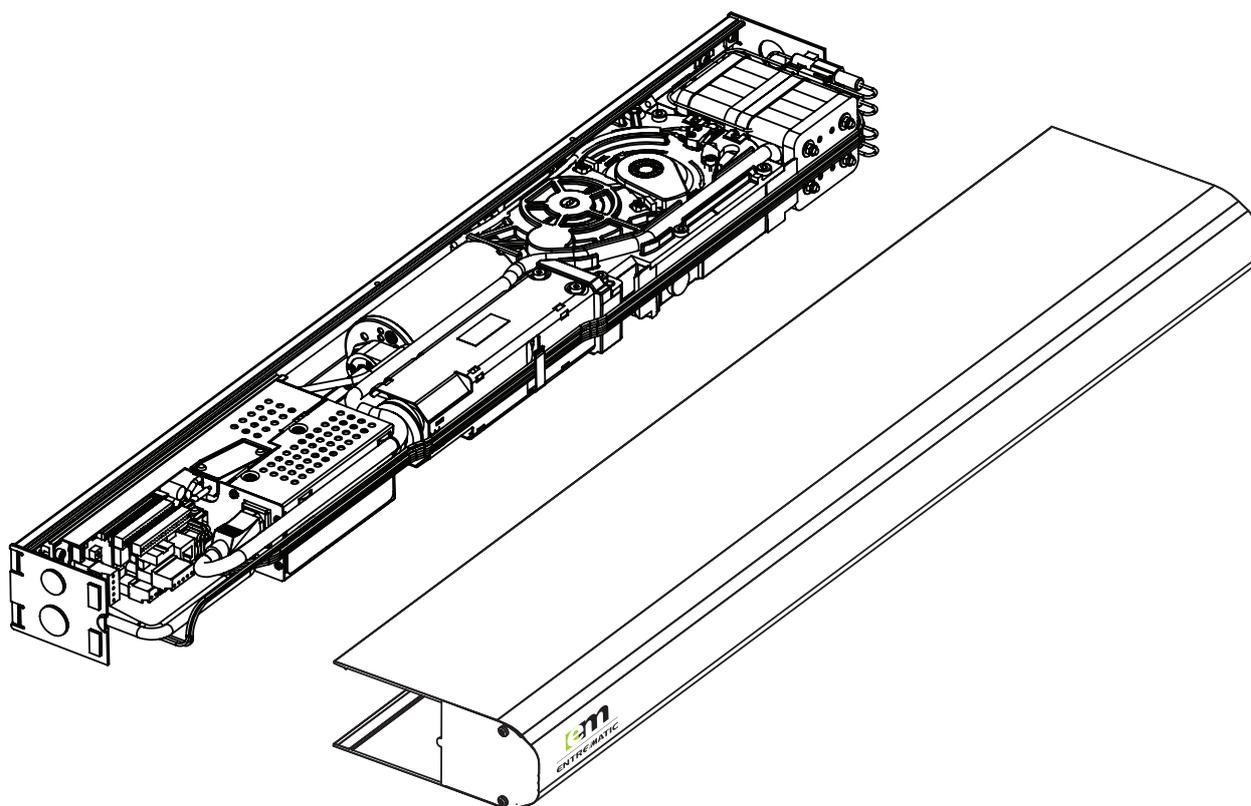


Swing Door Operator EM PSW250



Installation and Service Manual Original instructions

© All rights in and to this material are the sole property of Entrematic Nordic AB. Copying, scanning, alterations or modifications are expressly forbidden without the prior written consent of Entrematic Nordic AB. Rights reserved for changes without prior notice.

Backtrack information: folder:Workspace Main, version:a474, Date:2018-08-07 time:05:15:06, state: Frozen

CONTENTS - Original instructions

1	Revision	6
2	Instructions for safe operation	7
3	Important information	8
3.1	Intended use	8
3.2	Safety precautions	8
3.3	Electronic equipment reception interference	8
3.4	Environmental requirements	9
4	Technical specifications	10
4.1	Permitted door weight and door width for EM PSW250	11
5	How the EM PSW250 works	12
5.1	Opening	13
5.2	Closing	13
5.3	Control switch	13
5.3.1	OFF/AUTO/OPEN switch	13
5.4	Functions on the basic control unit CUS7	14
5.4.1	Power failure	14
5.4.2	Closing torque	14
5.4.3	Extended closing torque (CLTQ)	14
5.4.4	Power assist (POAS)	14
5.4.5	Push and go (PAG)	14
5.4.6	Inverse (INV)	14
5.4.7	Activation delay (AD)	14
5.4.8	Overhead presence detector (OPD), frame mounted	14
5.4.9	Mat	15
5.4.10	Double acting	15
5.5	Functions on the extension unit EXU-SI	16
5.5.1	KILL or FIRE function	16
5.5.2	Function of locks	16
5.5.3	Program selector (wall mounted)	16
5.5.4	Impulses	16
5.5.5	OPEN/CLOSE impulse	16
5.5.6	Power failure mode (backup batteries are installed) – optional	16
5.5.7	Nurse and bed functionality	18
5.6	Functions on the extension unit EXU-SA	19
5.6.1	Presence impulse approach, door mounted	19
5.6.2	Presence detection swingpath, door mounted	19
5.6.3	Monitored safety sensors	19
5.6.4	FIRE input	19
5.6.5	Relay output	19
6	Models	21
6.1	Single operator, surface mounted	21
6.2	Double operator, surface mounted	22
7	Part identification	23
8	Arm systems	25
8.1	Pushing installation with PUSH-arm	25
8.2	Pulling installation with PULL-arm	26
8.3	20 mm extension	26
8.4	Pushing installation with PULL-arm	27
8.5	Drive shaft extension kits	28
9	Options	29
9.1	Control switches	29
9.1.1	4-position switch PS-4C (operates the electric lock)	29
9.2	Sync cable for double doors (synchronizing of 2 operators)	29
9.3	Coordination unit	29
9.4	LED Cable	30

9.5	Battery backup unit	30
9.6	Cover piece kit	30
9.7	Closing time board kit	30
9.8	Fire kit	31
9.9	Mounting plate (for reinforcement of wall)	31
9.10	Labels	32
10	Pre-installation	33
10.1	General tips/Safety concerns	33
10.2	Operator/Door handing	33
10.3	Installation examples	34
10.4	Fastening requirements (but not included)	34
10.5	Tools required	35
11	Mechanical installation	36
11.1	PUSH arm system	39
11.2	PULL arm system	45
11.3	Operator with sliding PUSH arm system	51
11.4	Inverse installation with PUSH arm system	52
11.5	Inverse installation with PULL arm system	53
11.6	Installation of coordination unit on Fire Door installations	54
12	Electrical connection	60
12.1	Control units	61
12.1.1	CUS7	61
12.1.2	Arm system selection	61
12.1.3	Extension units EXU-SI / EXU-SA	62
12.1.4	Extension unit EXU-SI	63
12.1.5	Extension unit EXU-SA	64
12.1.6	Installation on double doors	65
12.2	How to cut the jumper on the sync cable for double doors	65
12.3	Double door installations	66
12.4	Settings for double doors	66
12.5	Sensor cable inlet	67
12.6	Reset and indication device for Fire Doors	68
13	Start-up	70
13.1	Spring pre-tension	70
13.2	Micro switch	71
13.3	Adjusting the door stop	71
13.4	Auto-learn-automatically sets back and latch check (recommended)	73
13.4.1	Push the LEARN BUTTON (LRN)	74
13.4.2	Double doors	74
13.5	General adjustment	74
13.6	Connection of activation units and accessories	75
14	Cover	76
14.1	Fitting and removing the cover	76
14.2	Cover piece kit	76
15	Signage	77
16	Advanced settings	78
16.1	Learn with advanced setting of "back- and latch-check"	78
16.2	Revert to default values for "back- and latch-check" (Level 1)	78
16.3	Changing group of parameters (Level 2)	79
16.4	Classification (Level 3)	82
16.5	Overhead Presence Detection and Interlock (Level 4)	83
16.6	Enhanced Lock Kick, Fire Input and Extended Arm Selection (Level 5)	84
17	Guide for installation and adjustments	85
17.1	Complementary Safety Devices Swing Doors	85
17.2	Swing Doors Opening and Closing Time	85
17.2.1	How to find the correct opening and closing time	85
17.3	Diagrams for Door weight	86
17.3.1	Aluminium frame with glass	86

18	Troubleshooting	87
18.1	Error indication	88
19	Service/Maintenance	89

1 Revision

Following pages have been revised:

Page	Revision 16.0 → 17.0
General	Replaced roman numbers with letters in the whole file.
24	Added new spare parts.
30	Updated illustration and renamed title to cover piece kit.
34	Added new notes for wall profiles 3-5 and 4-6 mm.
40	Updated the illustrations with new clamps.
41	Updated the illustrations with new clamps.
46	Updated the illustrations with new clamps.
47	Updated the illustrations with new clamps.
49	Updated the illustrations with new clamps.
74	Removed "Closing behavior at fire alarm".
75	Updated "Eye-Tech" to "EMSP59-M".
76	Updated the illustration for the cover piece kit.
84	Updated "Enhanced" to "Extended" in status 13.
88	Updated the reason and remedy for Three 0.3s.
88	Updated the reason for Five 0.3s and Ten 0.3s.

2 Instructions for safe operation



- Failure to observe the information in this manual may result in personal injury or damage to equipment.
- To reduce the risk of injury to persons - use this operator with single or double pedestrian swinging or folding doors only.
- Do not use the equipment if repair or adjustment is necessary.
- Disconnect supply when cleaning or other maintenance is to be carried out.
- The operator can be used by children over 8 years of age if they have been instructed by a person in charge of their safety.
- The operator can be used by children 8 years of age or younger if they are supervised by a person responsible for their safety.
- The operator can be used by persons with impaired physical, sensory or mental capacity if they have been instructed by a person in charge of their safety.
- Cleaning and user maintenance shall not be made by children.
- Do not let anyone climb on or play with the door or the fixed/remote controls.
- Risk of battery explosion if wrong type of battery is used.
- The door has no safety during auto-learn cycle. Remain clear of swing path of door, as door may close rapidly.
- In all instances, where work is being done, the area is to be secured from pedestrian traffic, and the power removed to prevent injury.
- In the event that the KILL circuit is activated, all Safety Functions of the door will be overridden causing the door to close even though an object or person may be in the door's path of travel, and therefore may be subject to injury. This mode of operation is most generally used to isolate an area in the event of a fire.
- The doorset can be operated automatically by sensors or manually by activators. It can also be used manually as a door closer.

3 Important information

3.1 Intended use

The EM PSW250 is an automatic swing door operator developed to facilitate entrances to buildings and within buildings through swing doors. The EM PSW250 is an electromechanical operator approved for fire door applications. It is to be installed indoors where it is suitable for almost all types of external and internal swing doors. This widely-used operator can be found on applications ranging from handicapped-access in private homes to high-traffic retail operations.

Door operator used in escape routes shall be installed so that the door opens in the escape direction unless the system allows break-out in this direction.

The motor and gear box 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.

The door is designed to offer continuous use, a high degree of safety and maximum lifetime. The system is self-adjusting to the effects caused by normal variations in the weather conditions and to minor friction changes caused by e.g. dust and dirt.

For escape in emergency situations the doorset is opened manually.

This manual contains the necessary details and instructions for the installation, maintenance and service of the Swing Door Operator EM PSW250.

For use see User manual 1008788.

Save these instructions for future reference.

3.2 Safety precautions

Be sure to complete a risk assessment and site acceptance test before taking the door into operation.

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 Entrematic Nordic-trained technicians should be allowed to carry out these operations.

3.3 Electronic equipment reception interference

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

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

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

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

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

3.4 Environmental requirements

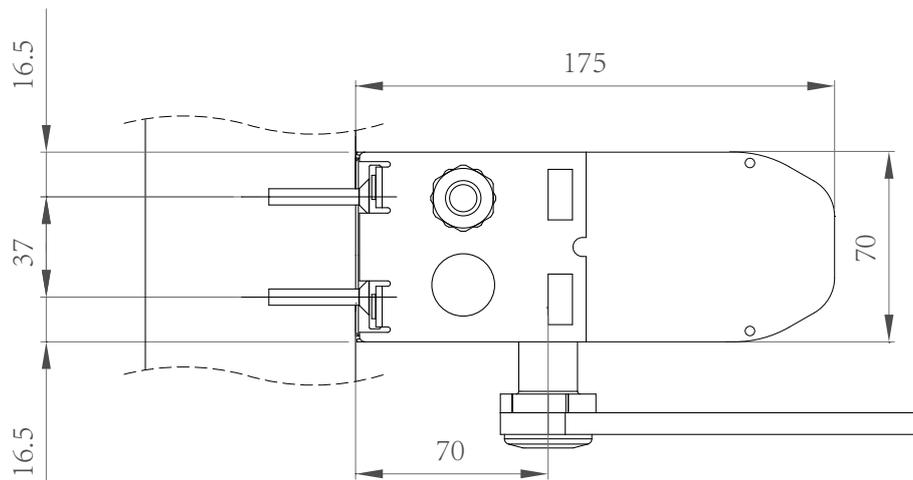
Entrematic Nordic products are equipped with electronics and may also be equipped with batteries containing materials which are hazardous to the environment. Disconnect power before removing electronics and battery and make sure it is disposed of properly according to local regulations (how and where)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

4 Technical specifications

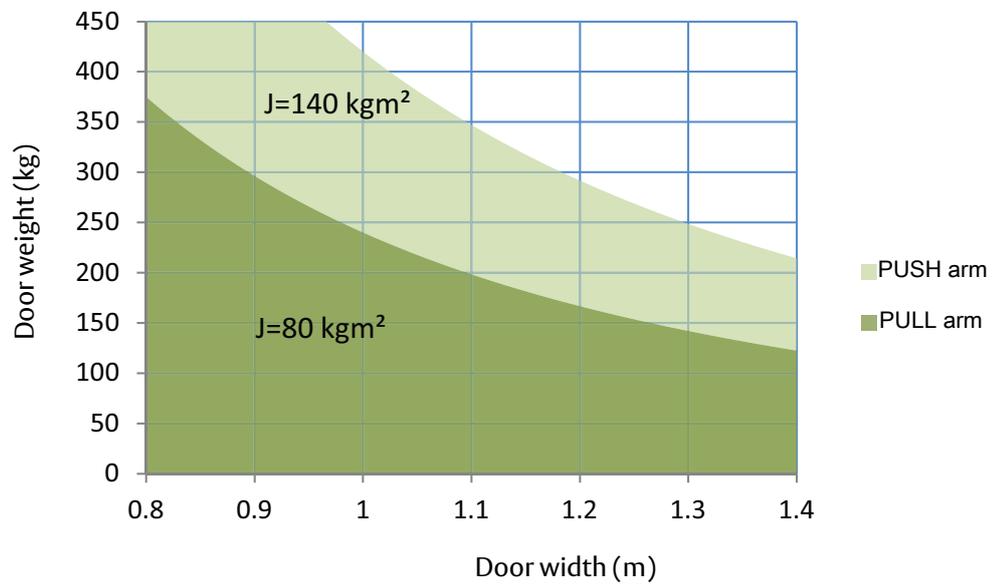
Ensure that the door operator with technical specification below is suitable for the installation.

Manufacturer:	Entrematic Nordic AB
Address:	Lodjursgatan 10, SE-261 44 Landskrona, Sweden
Type:	EM PSW250
Mains supply:	100-240 V AC +10/-15%, 50/60 Hz, mains fuse max 10A (building installation) Note! The mains supply shall be installed with protection and an all-pole mains switch with isolating capability of Category III, at least 3 mm between contacts, shall be installed according to local regulations. These articles are not provided with the door.
Power consumption:	Max. 300 W
Auxiliary voltage:	24 V DC, max. 700 mA
Mains fuse F1, F2:	2 x T 6,3 AH/250 V
Door size:	PUSH arm system; size 4 - 7 PULL arm system; size 4 - 6
Max. Inertia J:	For PUSH = 140 kgm ² For PULL = 80 kgm ² Inertia = Door weight x (Door width) ² / 3
Electro-mechanical locking device:	Selectable: 12V DC, max. 1200 mA or 24 V DC, max. 600 mA
Door opening angle:	PUSH arm: 80° - 110°, with reveal 0 - 367 mm PULL arm: 80° - 110°, with reveal -20 - 130 mm
Opening time (0° - 80°):	Variable between 2.5 - 12 seconds
Closing time (90° - 10°):	Variable between 4 - 12 seconds
HOLD open time:	1.5 - 30 seconds
Ambient temperature:	-20 °C to +45 °C
Relative humidity:	Max. 95%
Drive unit weight:	7.6 kg
Class of protection:	IP20
Degree of protection, control actuators:	IP54
Approvals:	Third party approvals from established certification organizations valid for safety in use, see Declaration of Incorporation.

This product is to be installed internally.



4.1 Permitted door weight and door width for EM PSW250



5 How the EM PSW250 works

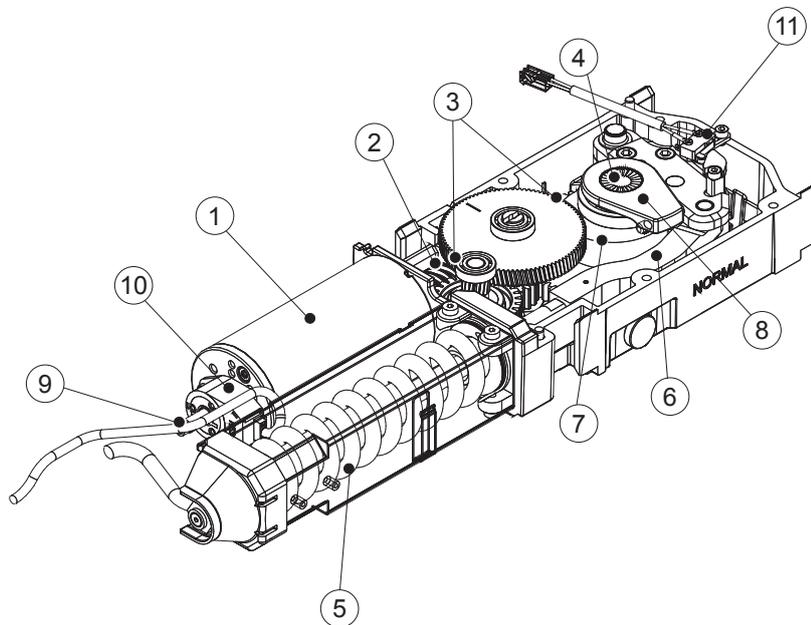
The swing door operator EM PSW250 uses a DC motor which is connected to the output shaft by a combination of a worm gear and spur gears. The push- or pull arm system that is connected to the output shaft opens the door in a surface mounted application.

There is an adjustable spring mechanism, consisting of a helical compression spring combined with a linkage system including a pressure roller that acts on a cam curve that is attached to the output shaft. During opening of the door, the compression spring is tensioned by the rotation of the output shaft. During the closing cycle, the accumulated spring force is transferred to the output shaft by means of the cam curve and the pressure roller. The transferred spring force is acting in the closing direction.

The spring force can be adjusted so that there is appropriate force to close the door when it is manually operated or if there is a power failure.

It is possible to increase the closing force by using the motor in combination with the spring and thereby increase the door closing force (powered close).

The mechanism consist of:



- 1 Motor
- 2 Worm gear
- 3 Two spur gears
- 4 Output shaft
- 5 Helical compression spring
- 6 Spring mechanism that transfer the spring force to the output shaft
- 7 Cam to optimise the torque on the output shaft
- 8 Mechanical door stop on the output shaft (adjustable)
- 9 Shaft for a mechanical coordinator
- 10 Encoder
- 11 Micro switch

5.1 Opening

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

If the door is obstructed while opening, it will either stall or stop which can be selected with a DIP-switch (SOS). Stop on stall is always active in program selector Mode Off.

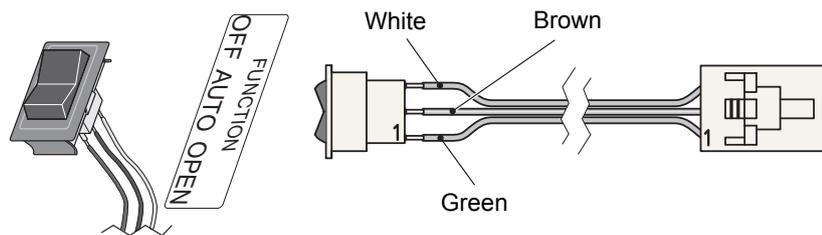
- Continue on stall - the door will continue to try to open during the hold open time.
- Stop on stall - the door will, even if hold open time has not expired, close after 2 seconds.

5.2 Closing

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

5.3 Control switch

5.3.1 OFF/AUTO/OPEN switch



Function	Program
OFF	Key is the only valid impulse.
AUTO	Every impulses are valid.
OPEN	The door is held permanently open.

5.4 Functions on the basic control unit CUS7

See page 61 for more information.

5.4.1 Power failure

During power failure the operator acts as a door closer with controlled closing speed and a micro switch will make a lock kick to secure latching (only fire rated version and no Inverse installation).

5.4.2 Closing torque

To comply with authority requirements or to overcome over/under pressure the closing torque can be adjusted according to EN1154.

5.4.3 Extended closing torque (CLTQ)

If the potentiometer CLTQ is set to 0°, the door will close with normal spring power. If the potentiometer is turned clockwise, the motor will increase the closing torque. Extended closing torque will be reduced to zero:

- If the door mounted sensor is activated in closed position or during closing (even if manually opened). Applies not to program select OFF.
Also, Extended closing torque will be canceled after the first closing by KILL, in all program selections (except SLAVE door with older firmware).

5.4.4 Power assist (POAS)

If the potentiometer POAS is set to 0°, the door gives no power assist. If the potentiometer is turned clockwise, the motor will give/increase power assist when the door is opened manually. The range of the POAS is depending on the spring pre-tension.

5.4.5 Push and go (PAG)

DIP-switch to select Push and Go, ON or OFF. Push and Go is available from any door position. Push and Go is not active in programme selector setting OFF.

5.4.6 Inverse (INV)

DIP-switch to select when inverse installation.

To be used for doors in emergency escape routes where the door has to open in case of fire alarm (smoke evacuation). The door is opened by spring force and closed by motor operation. If lock is used, the lock must fulfill the ELtVTR-standard.

5.4.7 Activation delay (AD)

This function requires a constant inner impulse for the specified time before the door will open. Fixed 2 sec.

During closing the door will reopen immediately if impulsed.

5.4.8 Overhead presence detector (OPD), frame mounted

When an OPD sensor is mounted on the frame or operator cover just above the swing side of the door, it will—when activated—either keep the door open or closed. The sensor input is not sensitive during opening and closing. Lock-out signal is available as it is required by some OPD sensors for proper function.

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

5.4.9 Mat

Mat safety means that:

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

5.4.10 Double acting

Opening inwards and with panic break out outwards see Quick Start 1016464.

5.5 Functions on the extension unit EXU-SI

Also see page 63 for more information.

5.5.1 KILL or FIRE function



In the event that the KILL or FIRE circuit is activated, all Safety Functions of the door will be overridden causing the door to close even though an object or person may be in the door's path of travel, and therefore may be subject to injury. This mode of operation is most generally used to isolate an area in the event of a fire. In double doors, coordinator shall be used to ensure correct closing.

- During KILL the control will ignore all signals and close door(s) at normal speed or 5 seconds (see page 74).
- If impulse controlled KILL or FIRE: The operator will resume normal operation after a KILL RESET. When manual RESET, jumper must be removed and reset button connected to terminal No. 8 and Ground.
- Or if state controlled KILL When KILL signal is no longer active, operator will resume normal operation.
- The behavior of the lock during KILL depends on the group of parameters. See page 79.

5.5.2 Function of locks

- The lock output is short circuit proof and can source a lock with 24 V DC, max. 600 mA. Lock function is active in programme selection EXIT and OFF
- The control has an available output of DC for external locks
- DIP-switches to select 12 or 24 V DC, locked with or without power
- DIP-switch for lock release and potentiometer for opening delay
- DIP-switch for lock kick to overcome binding in the locking device during closing (inactivated for Inverse door)
- Input to unlock signal from lock. Potentiometer for opening delay is to be set to max. As soon as unlock signal is received the door will start to open. The lock output signal shall be active low.
- If the door cannot fully close, the operator will perform a lock retry (once if manually, twice if automatically open).

5.5.3 Program selector (wall mounted)

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

Note! In OFF-position the operator will comply with the Low Energy Regulation and the door mounted sensors will be disregarded.

5.5.4 Impulses

- Input for OUTER impulse, KEY impulse and OPEN/CLOSE impulse.

5.5.5 OPEN/CLOSE impulse

The impulse will open the door and the door will stay open until a new impulse is given. If no impulse is given the door will close after 15 minutes. This can be made infinite by changing group of parameters, see page 79.

OPEN/CLOSE impulse works only in program selection AUTO. Can be programmed for OFF and EXIT as well.

5.5.6 Power failure mode (backup batteries are installed) – optional

- In case of power failure, normal operation can be carried out with impulses from the KEY SWITCH.

- Two contacts are available for connection of 2 x 12 V batteries (NiMH).
- DIP-switch for monitoring of batteries is also available. Faulty battery will be indicated by the LED on the CU-ESD. If selected the relay on EXU-SA can give a contact information. An audible warning signal can be achieved by using the accessory board AIU. It is connected to the 24 VDC and plugged into the EXU-SA relay output terminal. The Battery Monitoring always has to be reset, when the batteries have been replaced. It is done by pressing the Learn button, while battery mode is active (mains disconnected).

Note! If battery mode is POWER SAVE, the reset has to be made during the door is opened by Key impulse.

- During POWER FAILURE the operator will finish the actual operating cycle and then switch of the battery supply. The battery powered operator can be reactivated to achieve a new operating cycle by an impulse on the KEY input.
- The operating mode during battery power can be changed from POWER SAVE to CONVENIENCE, see page 79. During CONVENIENCE MODE the operator will work as normal until the batteries are discharged. The batteries are rechargeable and will be charged by the control unit in the operator. New, fully charged batteries can typically open and close a door max. 300 times in convenience mode. In power save mode the operator can stand-by in up to 1 week, waiting for KEY impulse.

The following sensors are not active during battery operation POWER SAVE mode.

- Mat
- Overhead presence detector (OPD/OPS), frame mounted
- Presence impulse approach, door mounted
- Presence detection swingpath, door mounted

Note! All sensors works normally in CONVENIENCE MODE.

5.5.7 Nurse and bed functionality

Solution 1

Connect a bridge between 3 and 7 on the Slave EXU-SI.

Use any impulse on master to open master door.

Use Open/Close impulse on Slave to open both doors.

Solution 2

Connect a bridge between 3 and 7 on the Slave EXU-SI.

Set dip switch PAG on Master board to ON.

Use any impulse on master to open master door.

Push slave door manually and it will open up automatically and stay open until master door is closing.

Active in Program Selection OFF, EXIT, AUTO and OPEN.

Solution 3

Connect a 1/0 switch between 3 and 7 on the Slave EXU-SI.

Switch in pos. 1, impulses on master will open only master door.

Switch in pos. 0, impulses on master will open both doors.

Solution 4

Connect a bridge between 3 and 7 on Slave EXU-SI.

Set dip switch PAG on Slave board to On.

Any impulse on the master control unit:

- Shorter than 2s opens only master door.

- Longer than 2s opens both doors.

Note! How to connect KILL input is determined by chosen parameter group at the slave, be sure that chosen group has KILL-impulse configuration Normally Open. If KILL has to be Normally Closed, terminal 3 and 7 should be disconnected instead of connected.

5.6 Functions on the extension unit EXU-SA

Also see page 64 for more information.

5.6.1 Presence impulse approach, door mounted

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

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

5.6.2 Presence detection swingpath, door mounted

When a sensor that is mounted on the swing side of a door detects an object, it will send a command to the control unit to stall the door. If the control unit has received a short signal from the sensor and there is still hold open time left on the control unit, the door will continue on its way open if the object has cleared.

The inhibit/blanking potentiometer can be adjusted so that the sensor will avoid detecting a wall or object near the full open position. Presence detection has a higher priority than presence impulse.

Note! When installed as a pair of doors the presence detection signal will stop both doors, except for double egress doors. The behavior for double egress doors can be changed (see page 79). The sensor is not active in program mode OFF or manually opened door. In this OFF-mode the operator fulfills the Low Energy Standards.

5.6.3 Monitored safety sensors

Both presence impulse and presence detection can be monitored. If a sensor becomes defective, the operator will not accept any impulses if the presence detection sensor is defective. The door remain in closed position and can be used as a manual door.

If the presence impulse sensor is defective, the door will remain in open position. Switching the program selector to OFF will set the door control to low energy mode. Key impulse can be used as impulse.

5.6.4 FIRE input

Ground and 24 VDC are used for supply of smoke detectors, see page 69.

Connection of fire alarm 12, 24 or 48 VDC is possible to connect to the FIRE input, see page 75 and 84.

5.6.5 Relay output

A potential free contact COM/NO/NC used in the below four different way, where the first three are chosen by Parameter group (see 'Relay' in table at page 79). When indicating Error or KILL, the error relay is resting (connection COM-NC), and when indicating Door open or closed it is activated (connection COM-NO).

- Error indication
For external error indication, see page 88.
- KILL output
Used for distribute KILL-signal to other door sets.
- Lock output
Used for control locks with other voltage than 12/24 VDC.

- Door indication (HW-wired with jumper)
Used for indicate an open or closed position of the door. The indication position is set by adjusting the inhibit/blanking potentiometer. For indication of closed door, adjust the Blanking potentiometer to minimum. For indication of open door, open the door by program select OPEN or any open-impulse, and adjust the Blanking potentiometer so that the Blanking LED is lit only in open position (or above desired position, just like blanking).

6 Models

Three main models of the EM PSW250 are available:

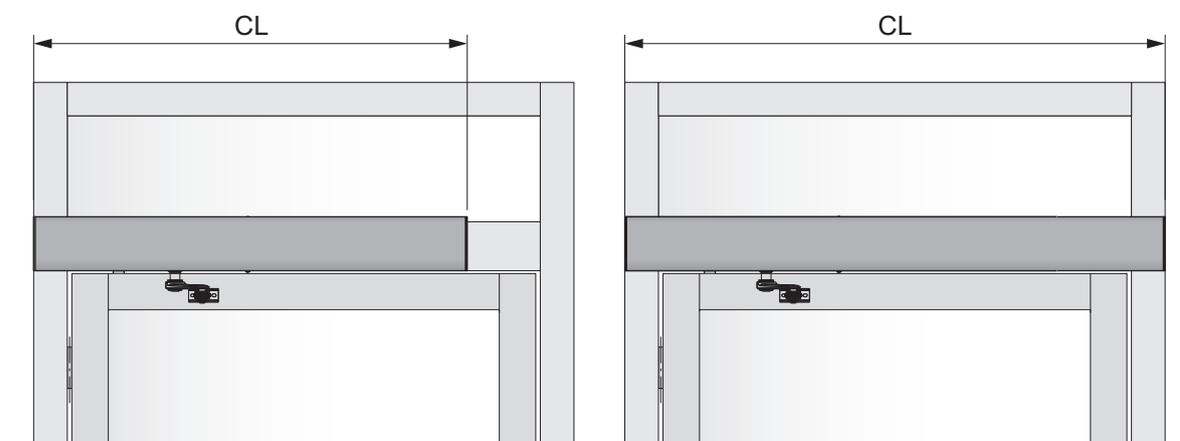
- Single doors
- Double doors (two operators)
- Double egress doors (two operators)

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

6.1 Single operator, surface mounted

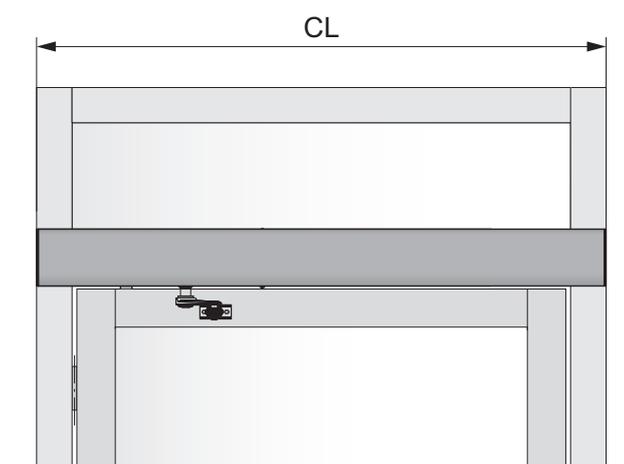
The product is delivered complete with back plate, control unit, end plates and cover. Total cover length CL includes end plates.

Pushing arm system shown.



Standard cover.
CL = 840

Modular cover using cover piece beside standard cover.
CL_{min.} = 840
CL_{max.} = 1684



Full length cover.
Not available from Entrematic Nordic, to be arranged locally.
CL_{min.} = 840
CL_{max.} = 1684

6.2 Double operator, surface mounted

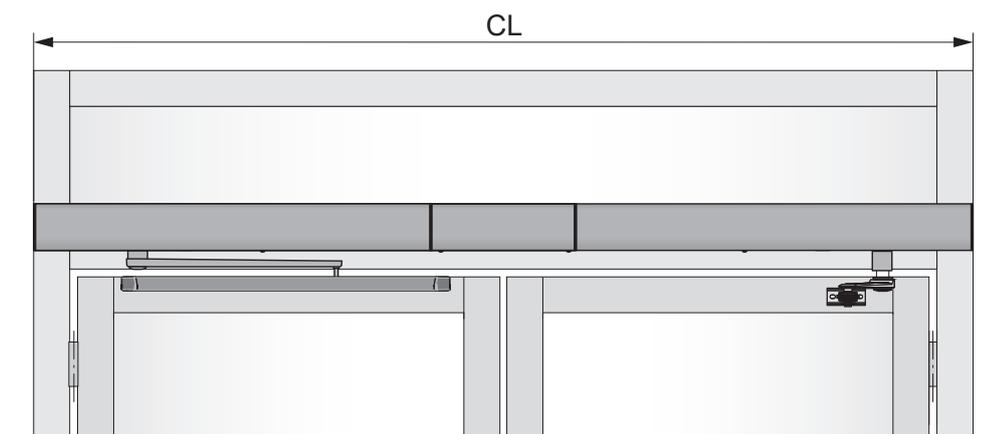
The product is delivered complete with back plate, control unit, end plates and cover. Total cover length CL includes end plates.

Two operators can be mounted under the same cover (full length or a modular) to open one door each. Pushing and pulling arm system shown (double egress).

It is also possible to use two pushing or two pulling arm systems.

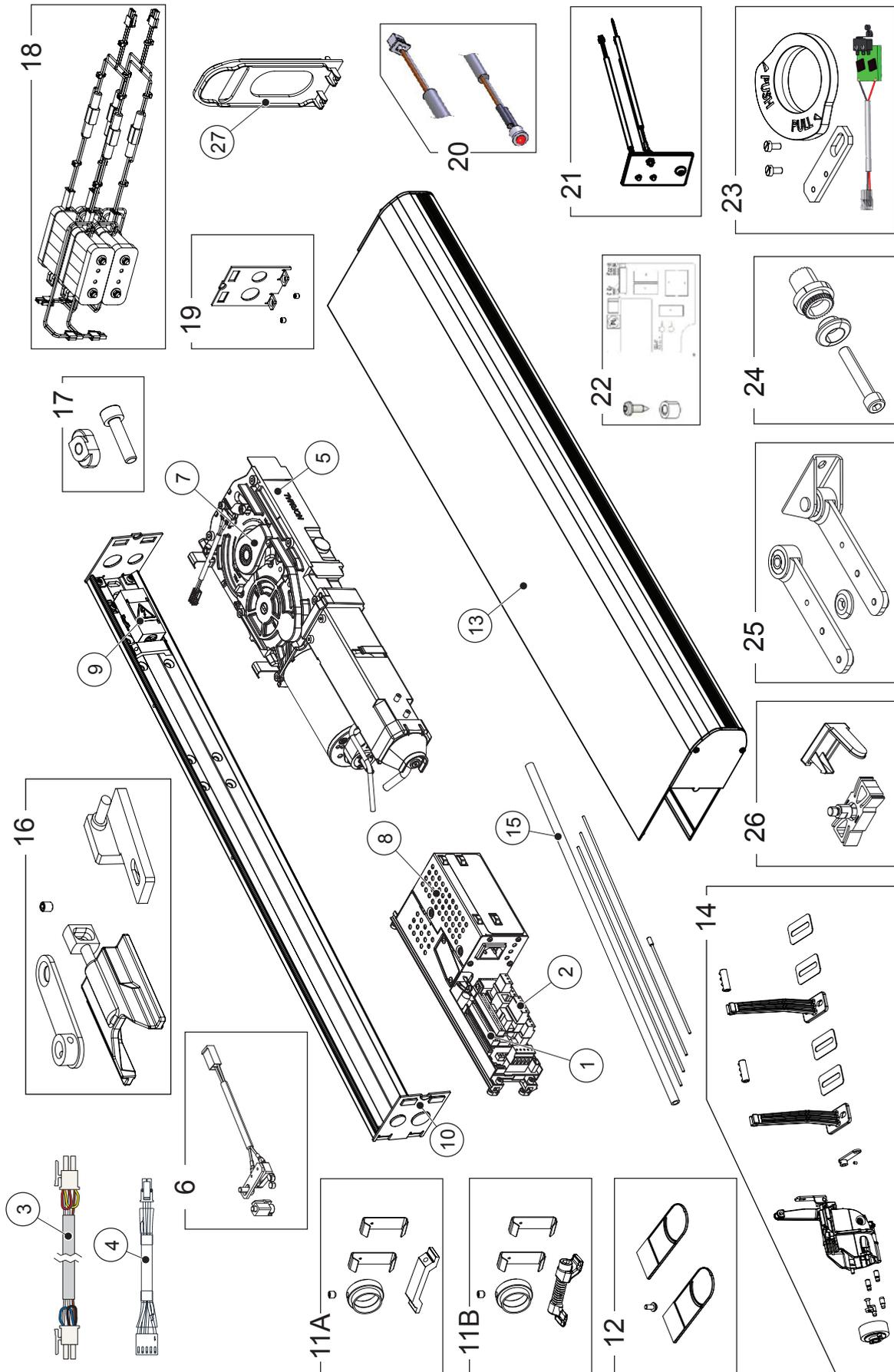


Full length cover.
Not available from
Entrematic Nordic, to
be arranged locally.
 $CL_{\min.} = 1684$
 $CL_{\max.} = 3284$



Modular cover using
cover piece between
two standard covers.
 $CL_{\min.} = 1714$
 $CL_{\max.} = 3284$

7 Part identification



Item No.	Art. No.	Description
1	331003554	EXU-SI kit for security & impulse
2	331003557	EXU-SA kit for safety
3	331003583	Cable sync kit
4	330000483	Encoder cable
5	330000487F	Transmission unit PSW250 Fire (not for use in DE, GB and SE)
	330000487F-PUSH	Transmission unit PSW250 Fire PUSH
	330000487F-PULL	Transmission unit PSW250 Fire PULL
	330000487F-SYM	Transmission unit PSW250 Fire SYM
6	330000488	Micro switch kit
7	330000489	Stop arm kit
8	331011678	Control unit CUS7 without EXU-boards
9	331008344	Connection box spare kit
10	330000490	OFF/AUTO/OPEN switch kit
11A	330000554	Fixing kit Transmission unit until w.1845
11B	330000759	Fixing kit FB Transmission unit from w.1845
12	330000491BK/SI	Fill cover
13	331011887BK/SI	Cover
14	1013484	Coordinator top assembly kit
15	1013316	Rod kit
16	330000682	Coordinator service kit
17	330000684	Fixing for control unit CUS7
18	1012561	Battery assembly
19	331007825BK/SI	Bottom end plate
20	331008615	LED cable
21	1011784	Reset & Indication device
22	1012240	Closing brake kit
23	331009903	Micro switch board & cam
24	330000484BK/SI	Adaptor kit
25	330000485BK/SI	PUSH arm service kit
26	330000486BK/SI	PULL arm service kit
27	331017738BK/SI	Middle cap (2 pcs)

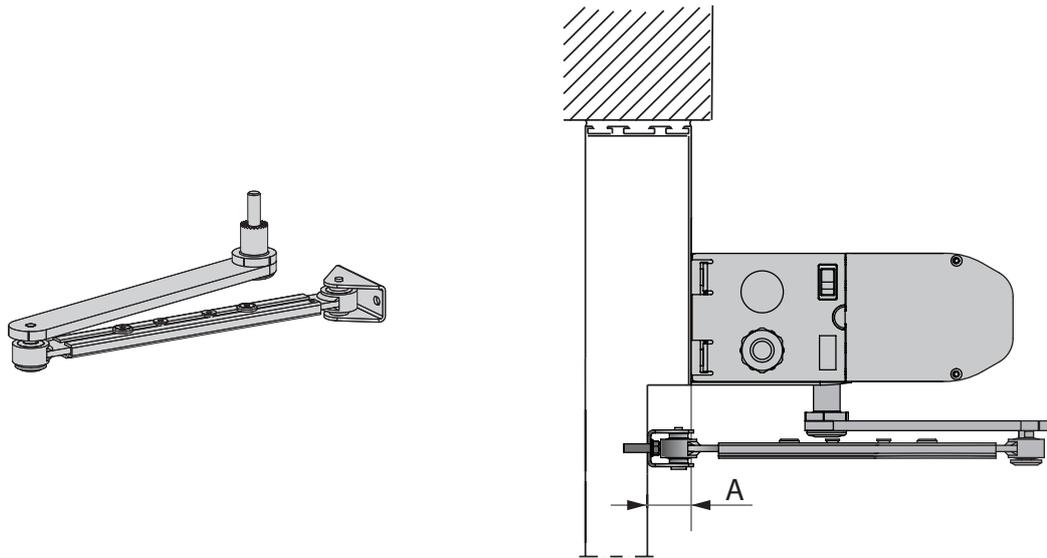
8 Arm systems

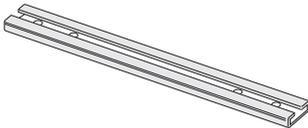
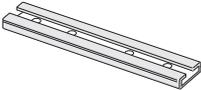
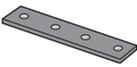
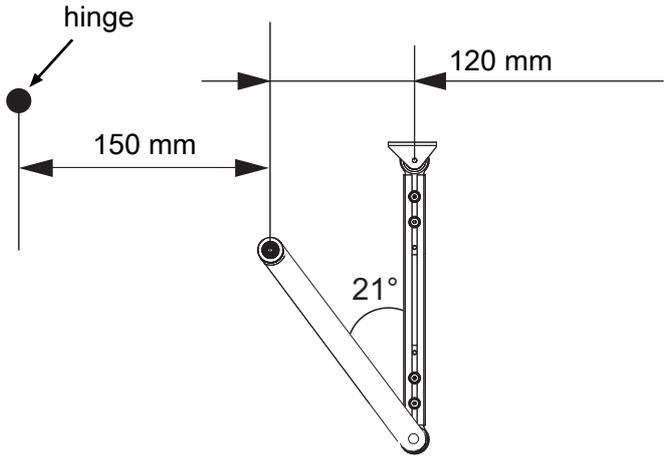
The installation process of arm systems is the same for Fire door installations and Inverse installations.

8.1 Pushing installation with PUSH-arm

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 for A up to 300 mm.

Art. No.: 1011706BK/SI



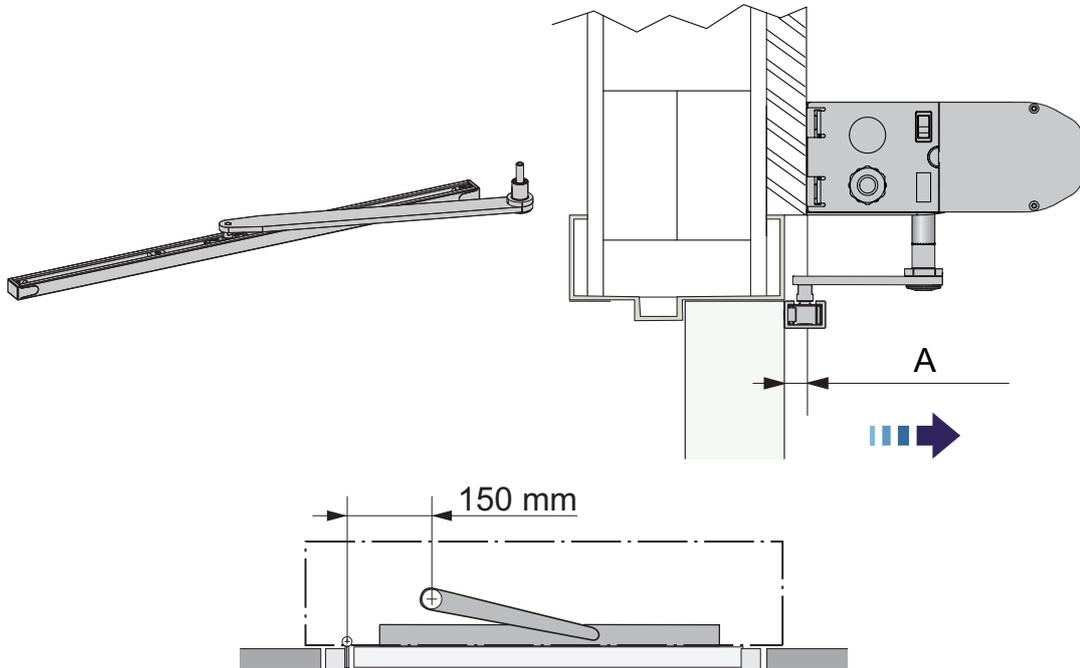
Frame depth	
Extension  345 mm extension Art. No.: 173005BK/SI  230 mm extension Art. No.: 173004BK/SI  Joint part Art. No.: 173191	
	A = reveal
None (Standard arm)	0-22 mm
Extension L=345 mm	22-137 mm
Extension L=230 mm + joint part	137-252 mm
Extension L=345mm + 230 mm + joint part	252-367 mm

8.2 Pulling installation with PULL-arm

This arm system is delivered with drive arm, guide shoe and door fitting. Approved for fire door application for A up to 130 mm.

PULL, Art. No.: 1011707BK/SI (A = -20-130 mm)

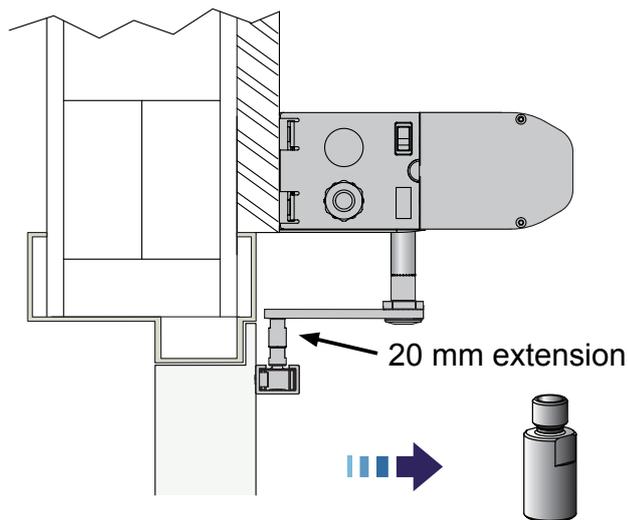
PULL-220, Art. No.: 1014114BK/SI (A = -20-65 mm), only for LE Performance



8.3 20 mm extension

Extension 20 mm for PULL/PAS and lower mounting of slide track profile.

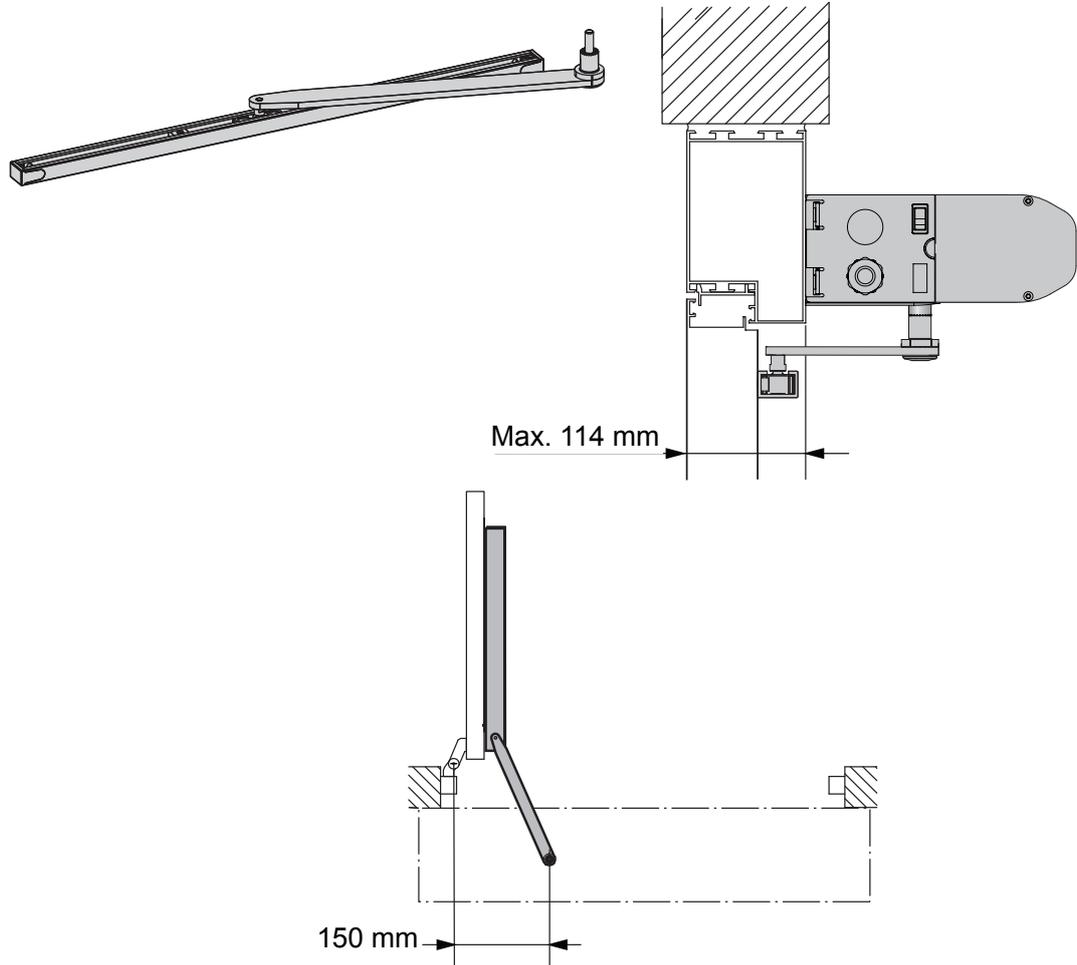
Art. No.: 1011205



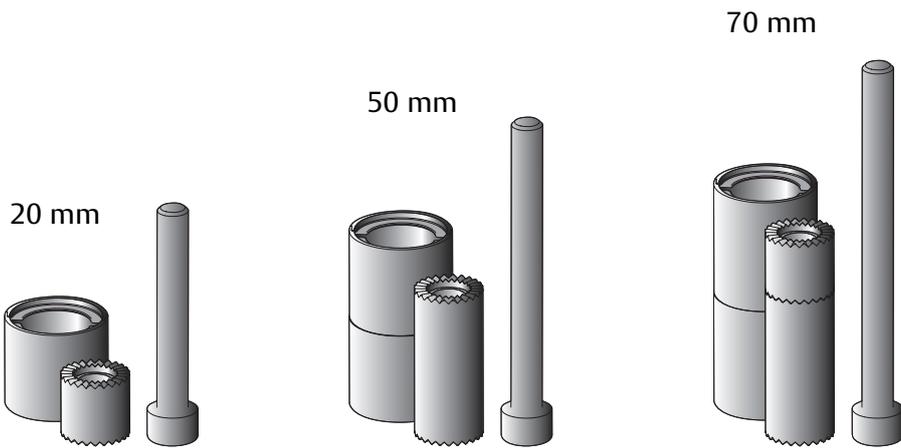
8.4 Pushing installation with PULL-arm

This arm system consists of main arm, slide track, guide shoe and shaft adapter. It can be fitted on combinations of doors and jambs (walls), where the wall thickness does not exceed approx. 114 mm. Dimensions given here correspond to an opening angle of 90-100°.

PULL, Art. No.: 1011707BK/SI

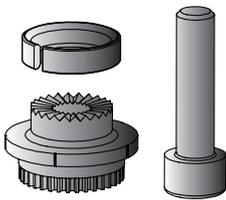


8.5 Drive shaft extension kits



Art. No.: 1011767 BK/SI Art. No.: 1011782 BK/SI Art. No.: 1011783 BK/SI

Lower adapter M10, used for 20 mm lower installation height.



Art. No.: 1011705BK/SI

9 Options

9.1 Control switches

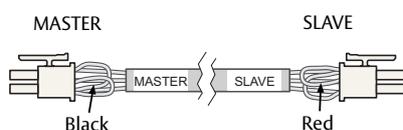
9.1.1 4-position switch PS-4C (operates the electric lock)



Art. No.:
655845

Position	Function
	OFF The door is closed. 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 with a key switch (if fitted).
	EXIT Passage from inside only. The door is normally locked if an electromechanical locking device has been fitted. The door can only be opened with the inner activation unit and with a key switch (if fitted).
	AUTO Normal position The door can be opened with the inner and outer manual and/or automatic activators. The electric strike, if fitted, is open.
	OPEN The door is held permanently open by the motor.

9.2 Sync cable for double doors (synchronizing of 2 operators)

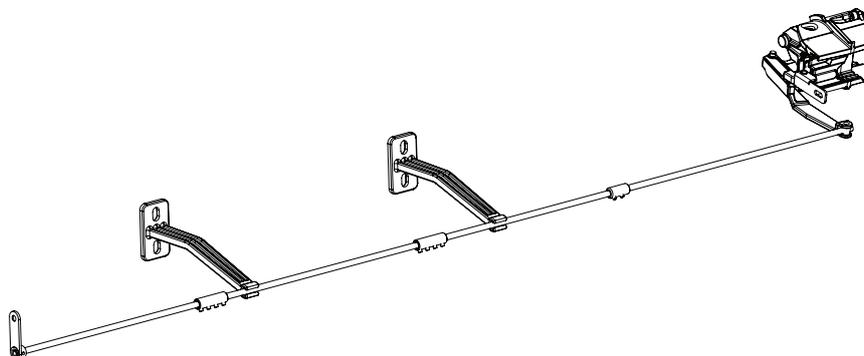


Note! The connection/markings of the sync cable determines which of the operators is the MASTER and SLAVE.

Art. No.: 1003583

9.3 Coordination unit

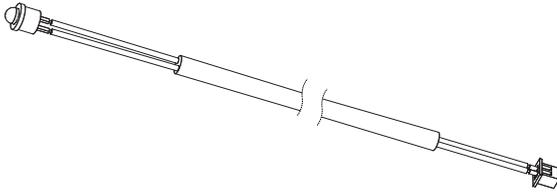
To coordinate rebated doors in a double door installation and to make sure the doors are closed in right order. See page 54 for installation and adjustment.



Art. No.	Description
1013484	Coordinator top assembly
1013316	Rod kit

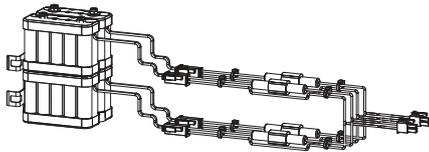
9.4 LED Cable

External status indicator LED



Art. No.: 1014687

9.5 Battery backup unit



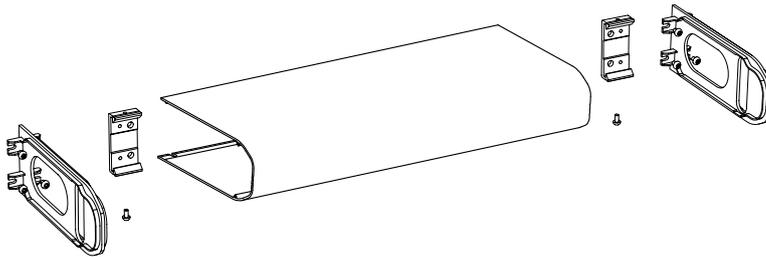
Note! Disconnect mains when replacing battery.



Risk of battery explosion if wrong type of battery is used.

Art. No.: 1012561

9.6 Cover piece kit



Art. No.: 1011665BK/SI

9.7 Closing time board kit

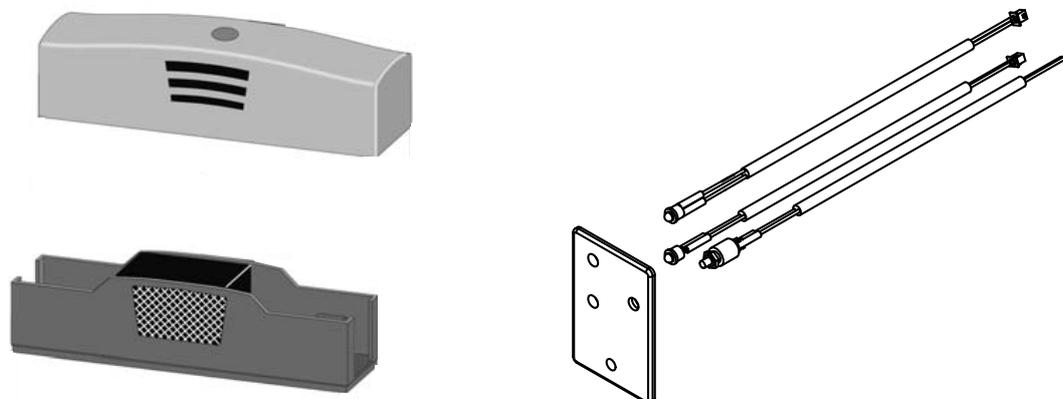
To fulfill the DIN 18263-4 standard it is necessary to mount and connect this board to the lock kick.

Art. No.: 1012240

9.8 Fire kit

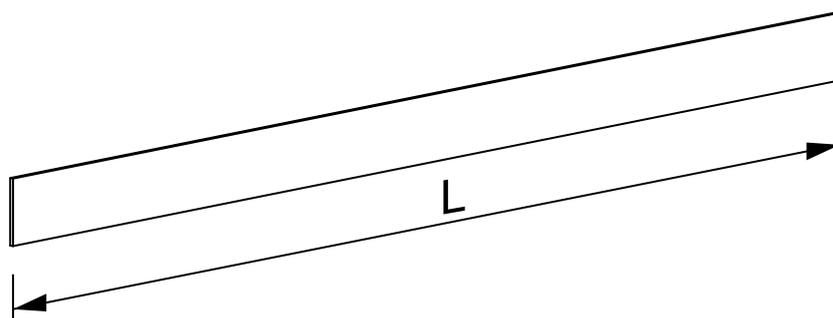
For fire door installations.

Containing a smoke detector ORS142W with silver cover, a Reset & Indication Device, Closing brake kit and a three pole connection cable harness.



Art. No.: 1011785

9.9 Mounting plate (for reinforcement of wall)



Art. No.	Description	Remark
701588CLS	Cut to size, state L (716-3300 mm)	125 x 6 mm
1014965CLS	Cut to size, state L (716-3300 mm)	80 x 6 mm

9.10 Labels

Label kit- including all below
Art. No.: 1012241



Emergency break-out, DIN right door



Emergency break-out, DIN left door



Activation by disabled people



Operator designed for disabled people



Supervision of child

10 Pre-installation

10.1 General tips/Safety concerns

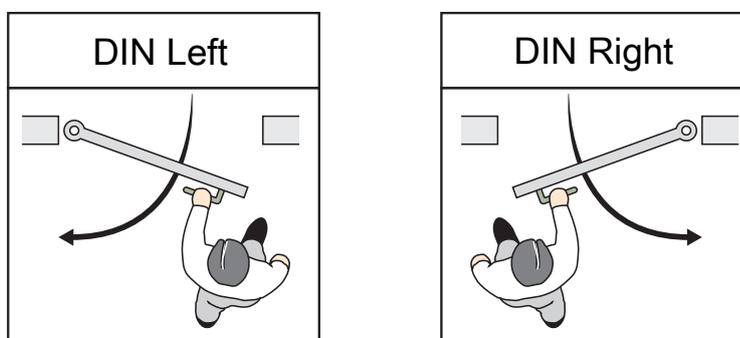


In all instances, where work is being done, the area is to be secured from pedestrian traffic, and the power removed to prevent injury.

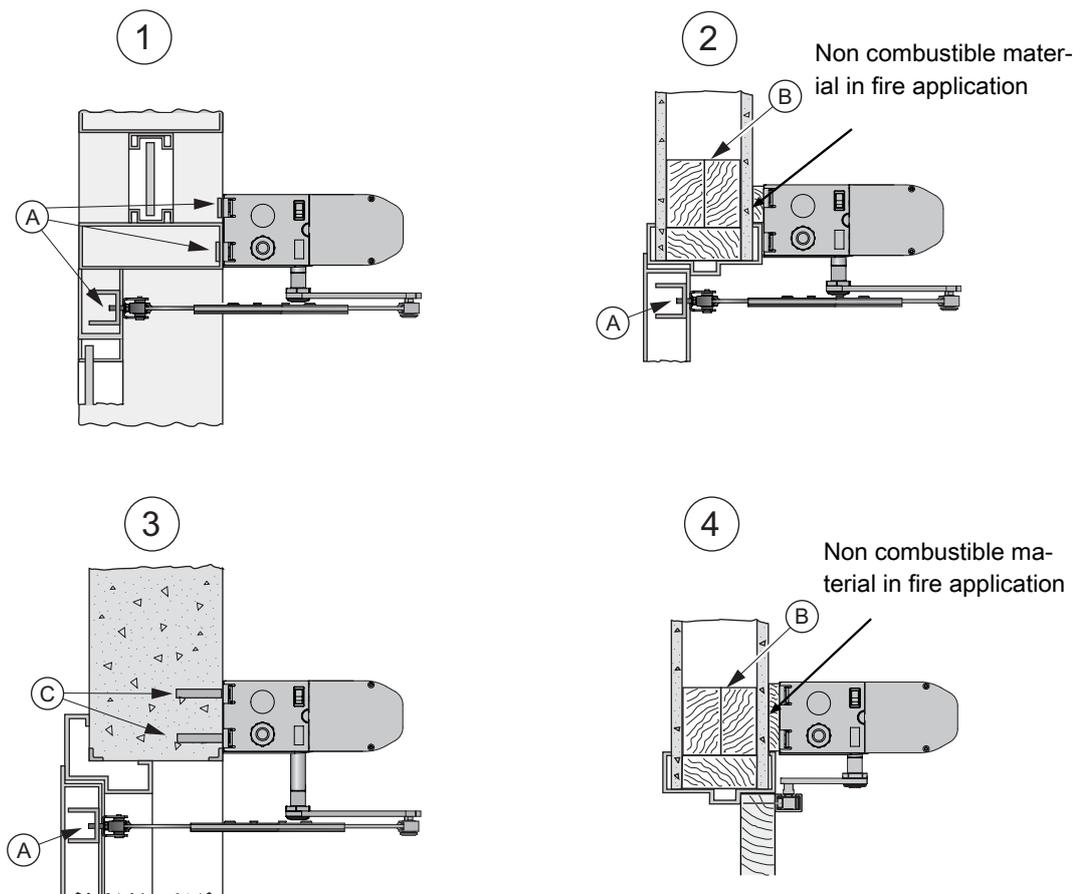
- If there are sharp edges after drilling the cable outlets, chamfer the edges to avoid damage to the cables.
- For enhanced security and vandalism protection, always mount the operator access in the interior of a building whenever possible.
- Make sure the ambient temperature is in the range specified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

10.2 Operator/Door handing

Operator/Door handing (DIN Right or DIN Left) is determined by which side the hinges are mounted seen from the swing side.



10.3 Installation examples



1 Aluminium profile system

2 Plasterboard wall

3 Reinforced concrete wall and brick wall

4 Plasterboard wall

A Steel reinforcement or rivnut

B Wood reinforcement

C Expansion-shell bolt (for brick wall min. M6x85, UPAT PSEA B10/25)

10.4 Fastening requirements (but not included)

Base material	Minimum requirements of wall profile*
Steel	5 mm**
Aluminium	6 mm***
Reinforced concrete	min. 50 mm from the underside
Wood	50 mm
Brick wall	Expansion-shell bolt, min. M6x85, UPAT PSEA B10/25, min. 50 mm from the underside

* Entrematic Nordic minimum recommended requirements. Building Codes may give different specifications.

** Thinner wall profiles (3-5 mm) must be reinforced with rivnuts.

*** Thinner wall profiles (4-6 mm) must be reinforced with rivnuts.

10.5 Tools required

- Metric Allen keys 1.5; 2.5; 3; 4; 5 and 6 mm
- Torque wrench 8 Nm, 14 Nm and 50 Nm
- Allen key 1.5; 2.5 and 3 mm with spherical tip
- Torx T10 and T20
- Tool for screw between cover and backplate
- Flatblade screwdriver (potentiometer and terminal size)
- Screwdriver (Philips size 2)
- Nut driver, 5 and 7 mm
- Tape rule
- Power drill and set of drill bits
- Center punch
- Wire stripper
- Silicone sealant
- Installation and Service Manual (this manual)

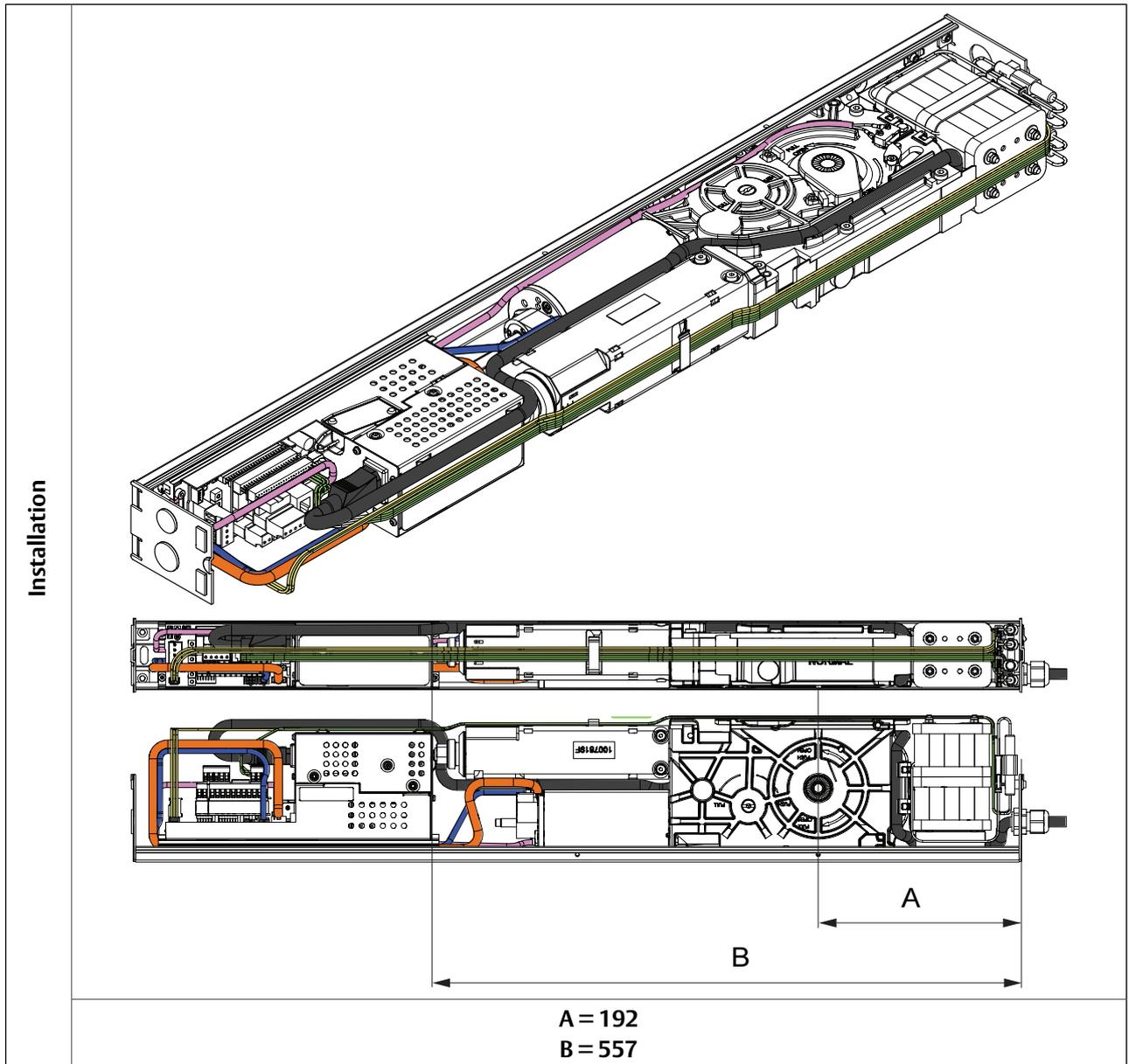
11 Mechanical installation

The operator is mounted on either side of the door header depending on type of doors. The door is controlled with a push or pull arm system.

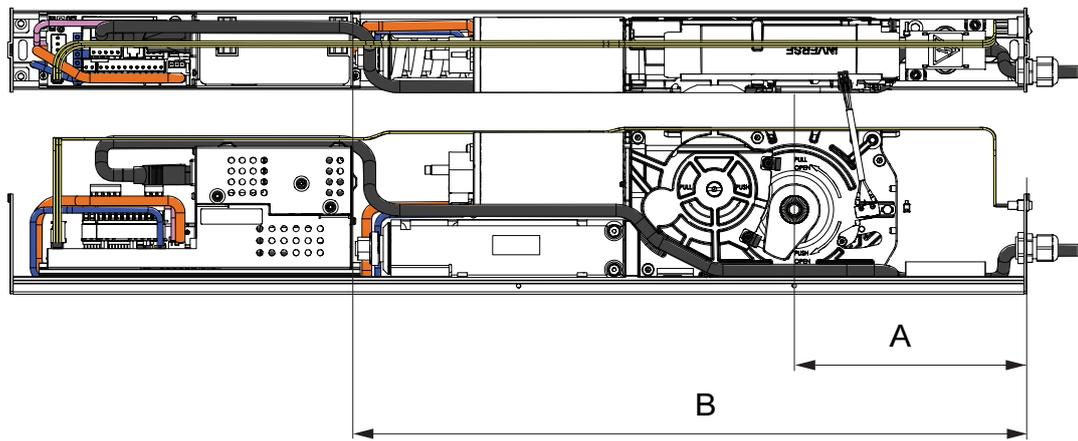
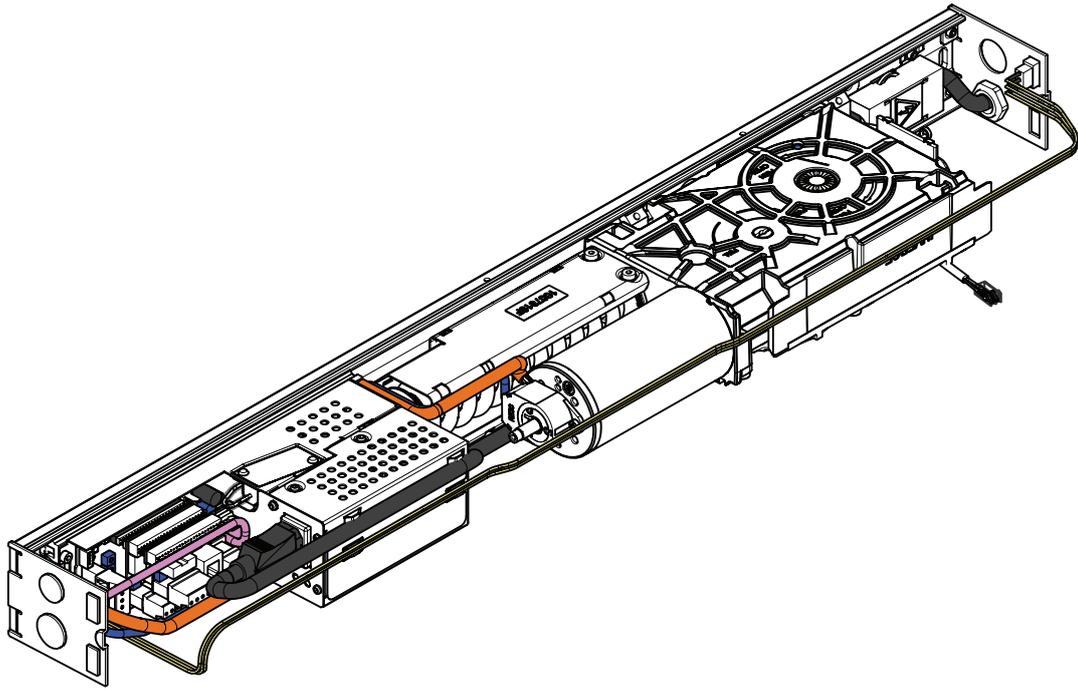
If a coordination unit is to be installed on a double door installation, mount the coordinator base with rotor before mounting the transmission unit, see page 54.

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

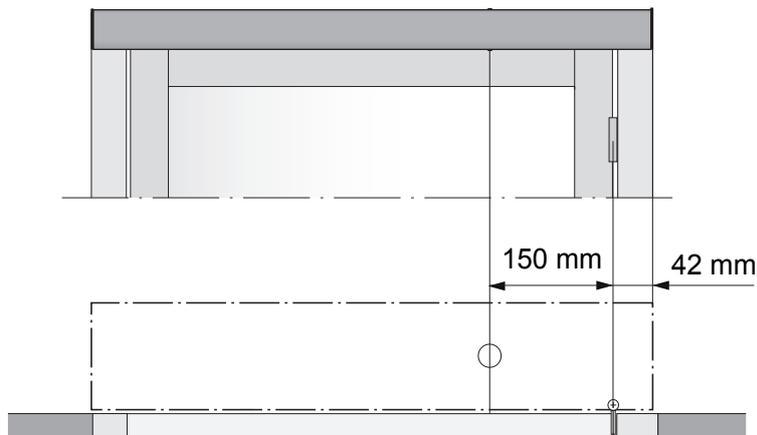
Make sure to mount the drive unit at measurement A and the control unit at measurement B. The illustrations also show how to route the cables. If there are sharp edges after drilling the cable outlets, chamfer the edges to avoid damage to the cables.



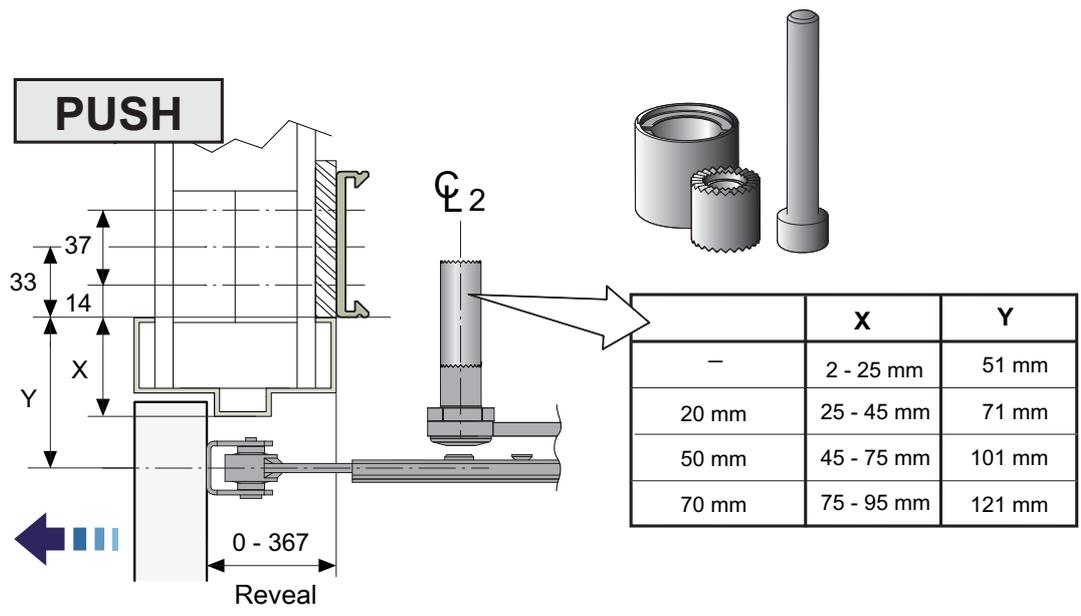
Inverse installation



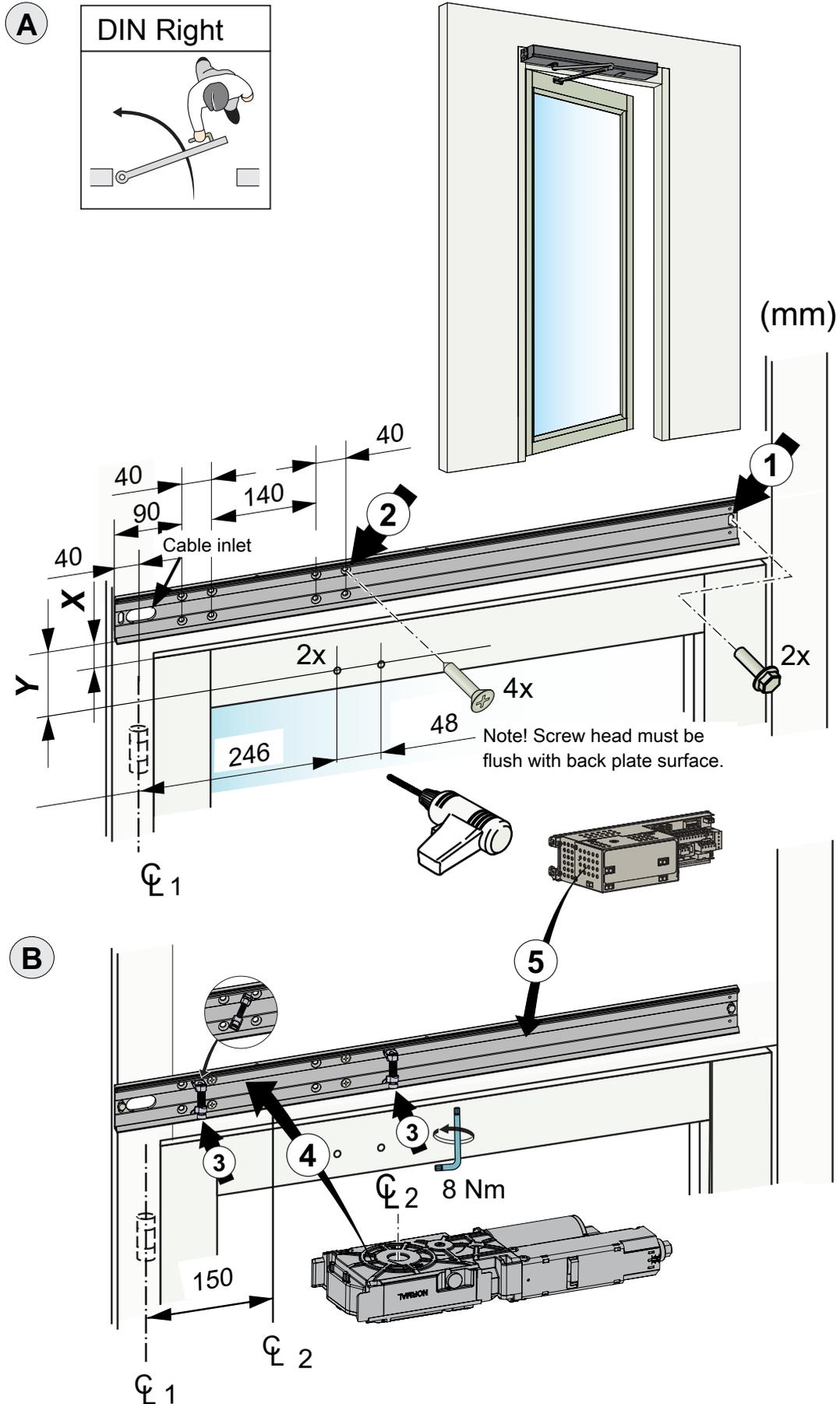
A = 192
B = 557



11.1 PUSH arm system

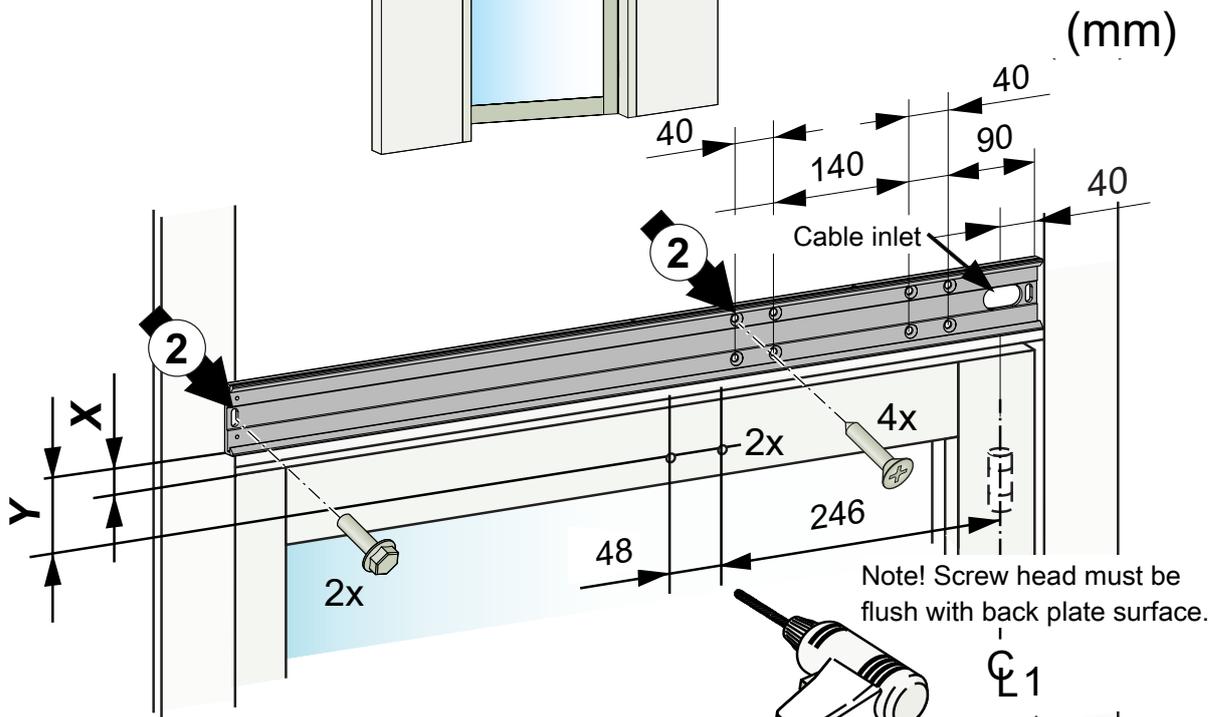
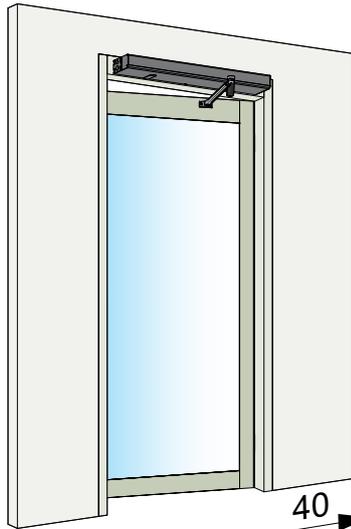
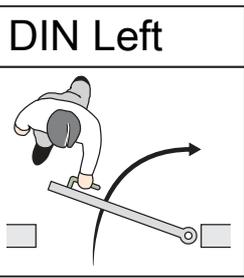


Operator with PUSH arm system

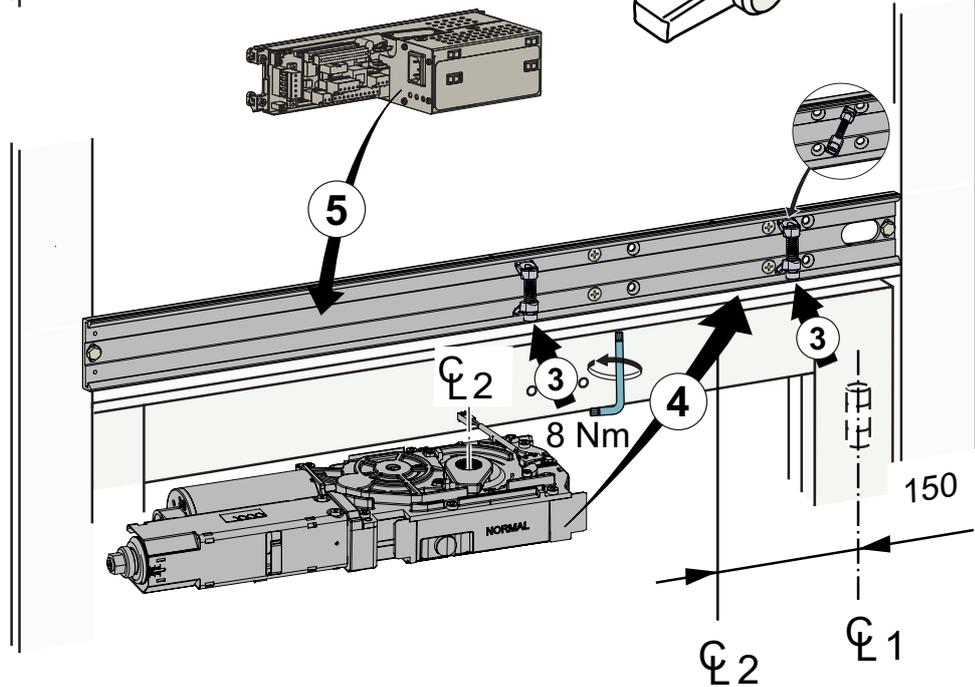


Continuous "Operator with PUSH arm system"

A

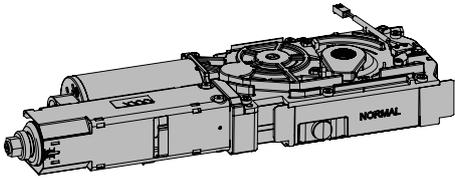


B

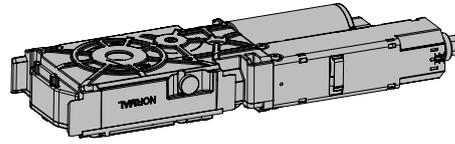


Continuous "Operator with PUSH arm system"

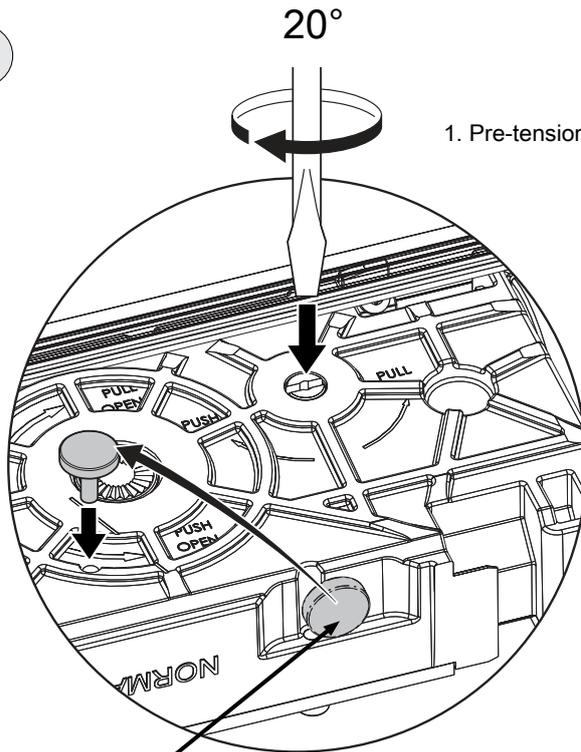
C DIN Left



C DIN Right



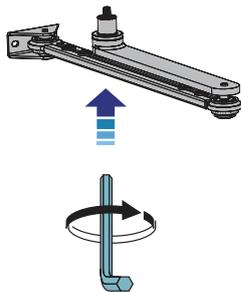
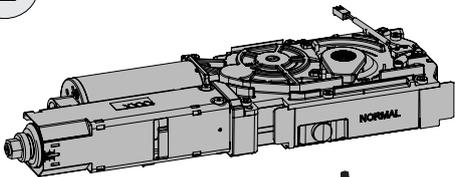
D



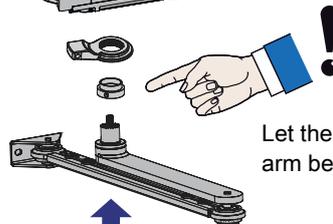
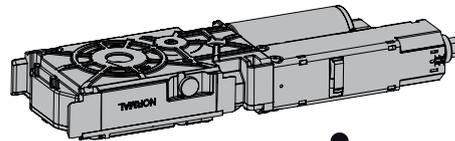
1. Pre-tension the spring

2. Secure the pre-tension by the pin

E

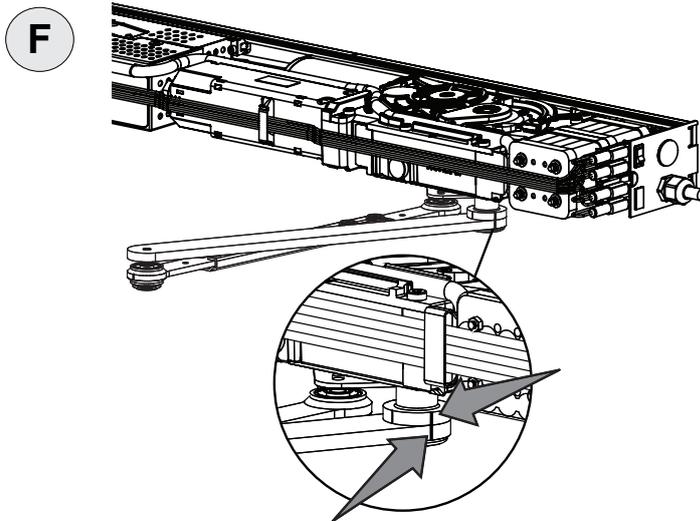


Do not tighten.

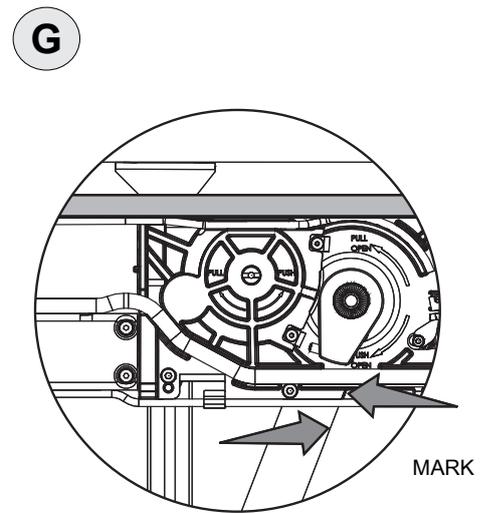


Let the stop arm locator and the stop arm be loose.

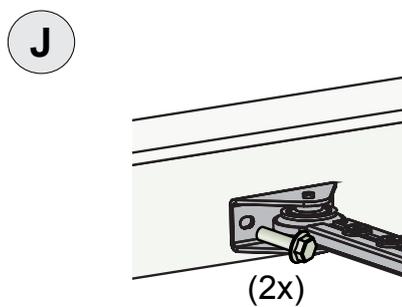
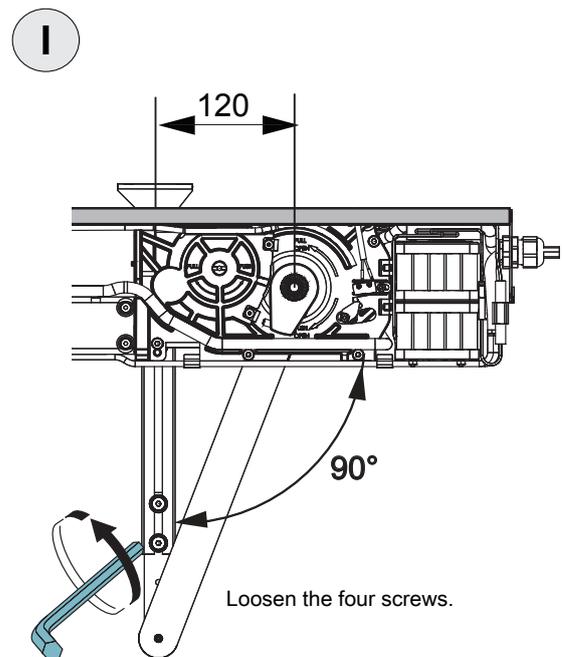
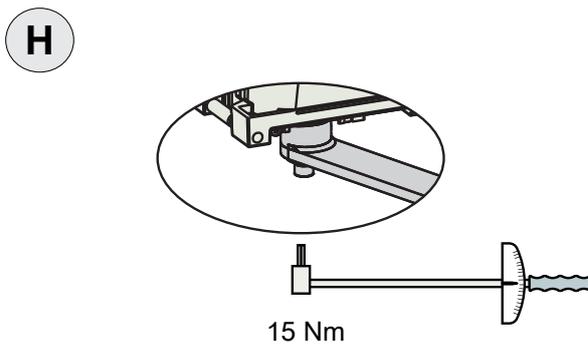
Continuous "Operator with PUSH arm system"



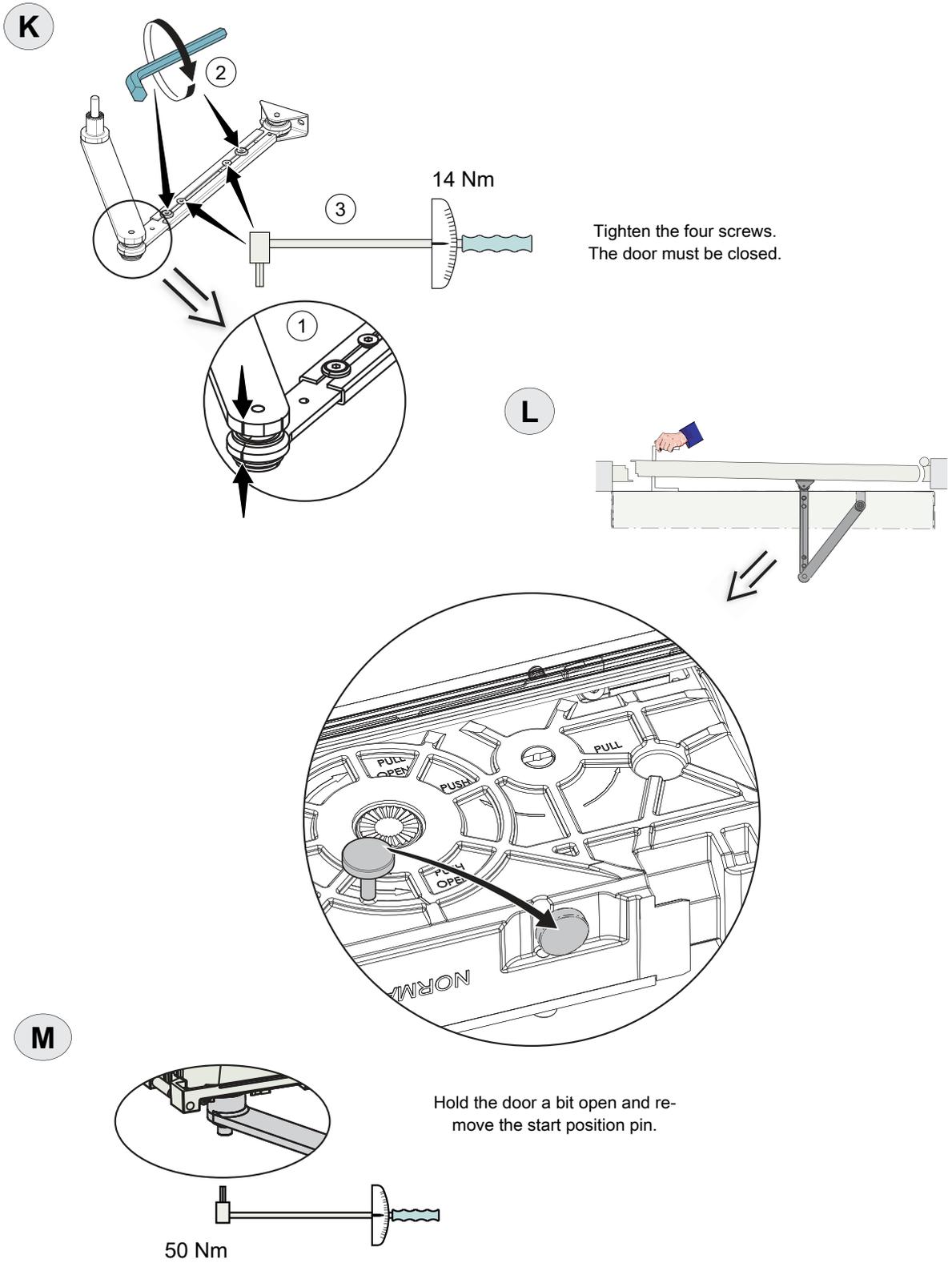
Align the marks between arm and adaptor.



Align the arm with the operator mark.



Fasten the arm system to the door.

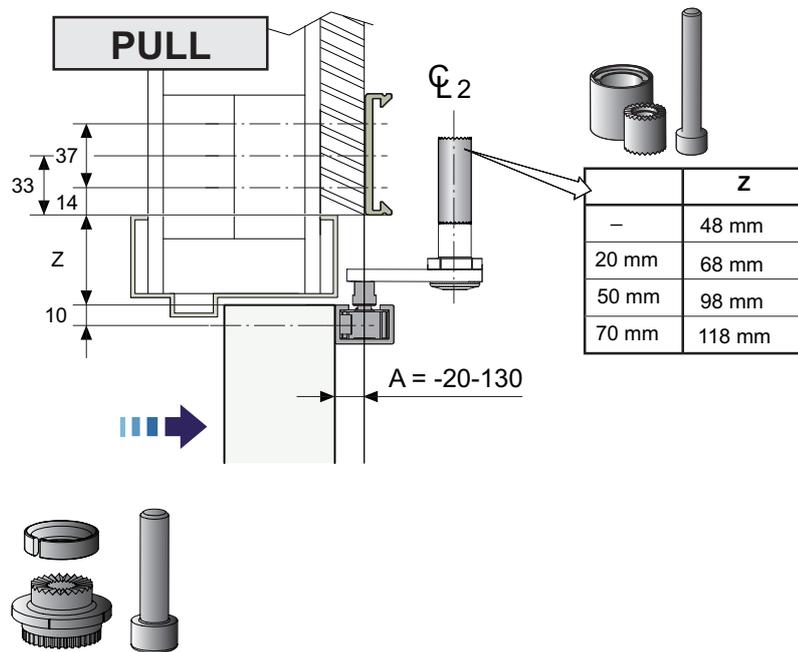


See the table on page 25 for available extensions.

Continue on page 60.

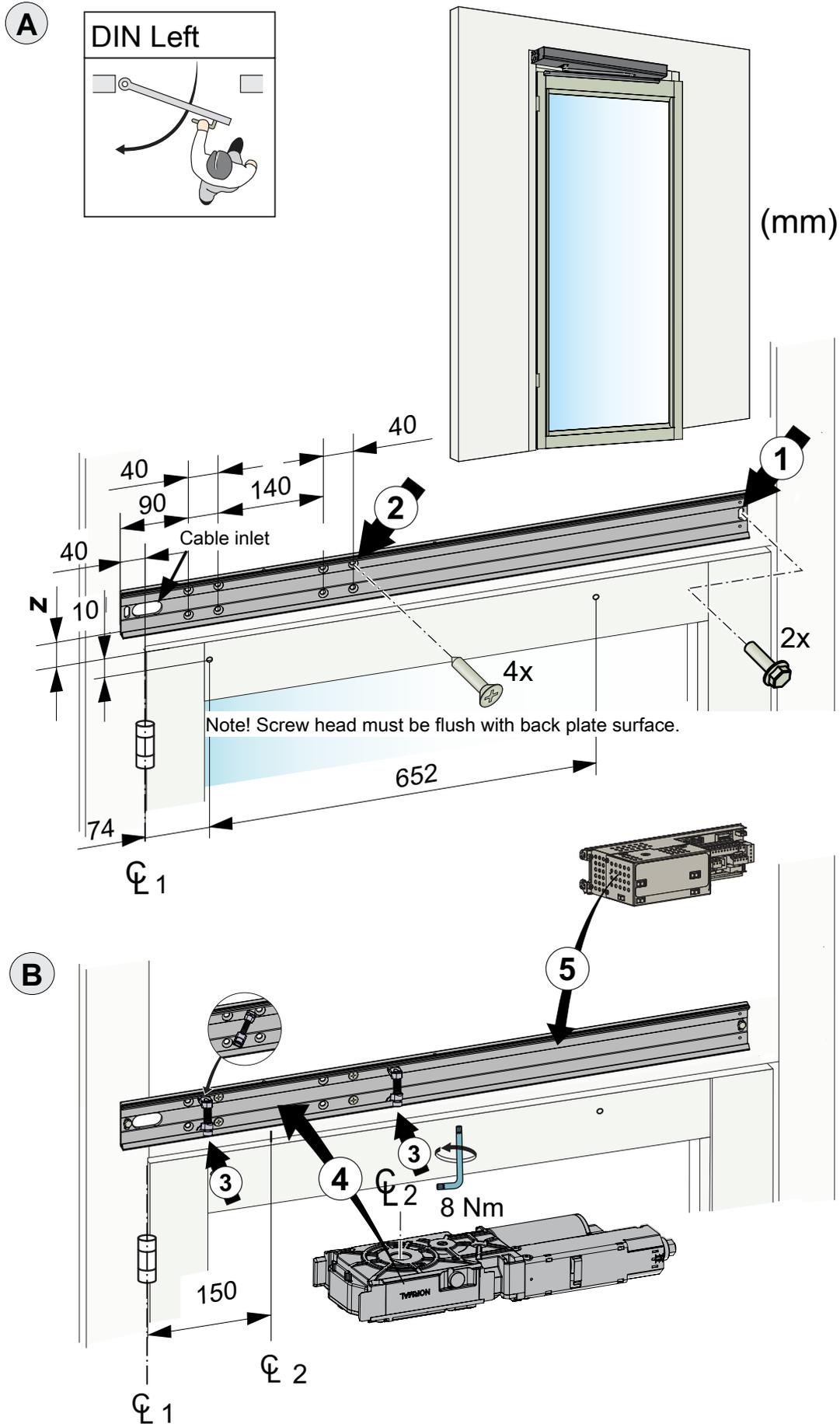
11.2 PULL arm system

Slim slide track



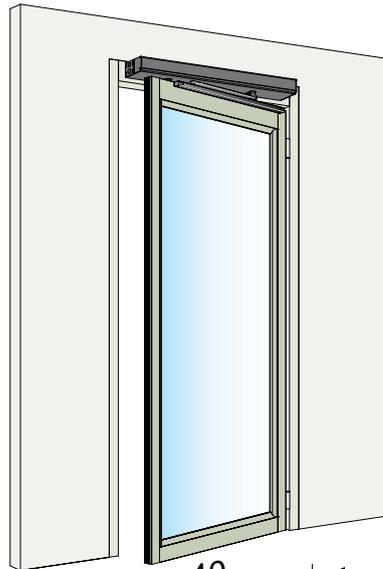
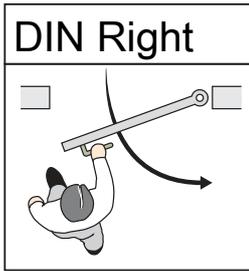
Note! Measurement Z must be reduced by 20 mm if lower adapter from kit 1011705BK/SI is used.

Operator with PULL arm system

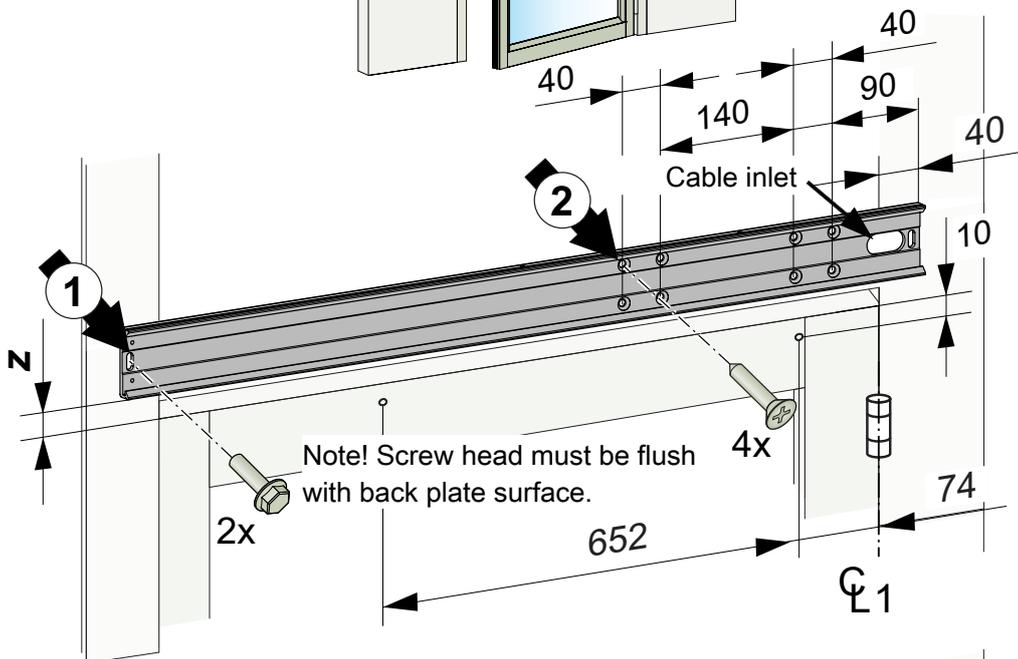


Continuous "Operator with PULL arm system"

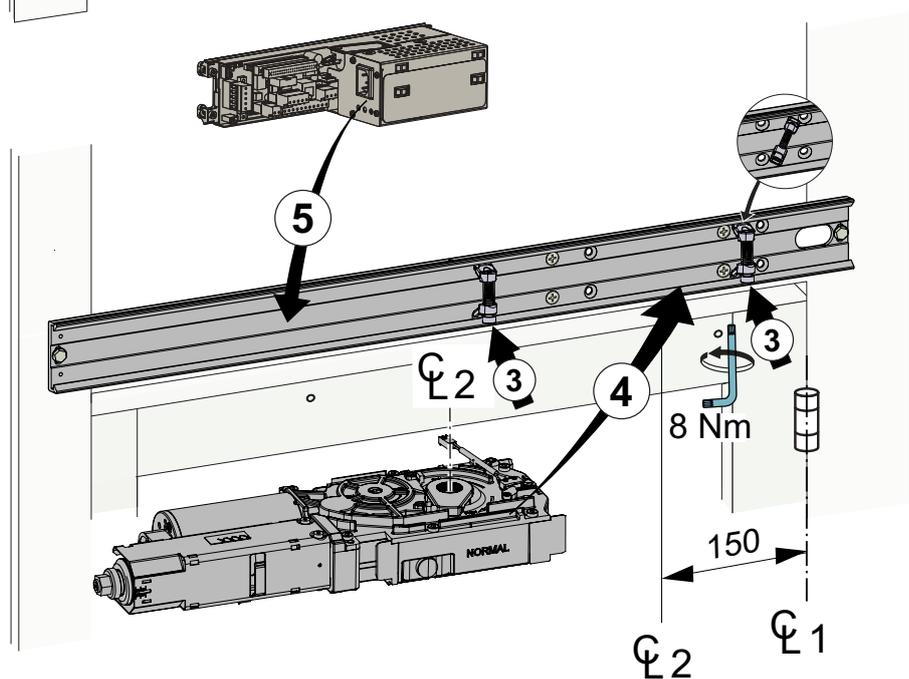
A



(mm)



B

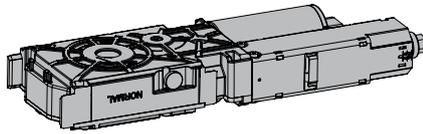
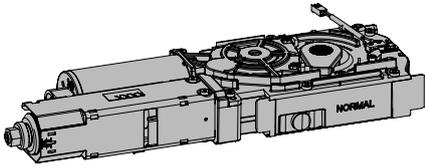


Continuous "Operator with PULL arm system"

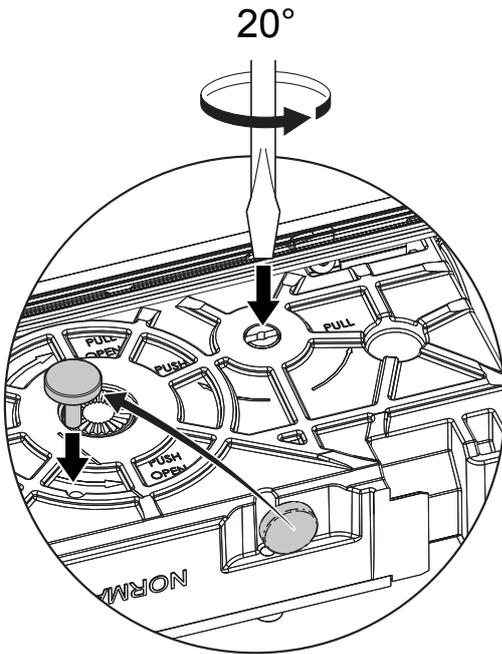
C

DIN Right

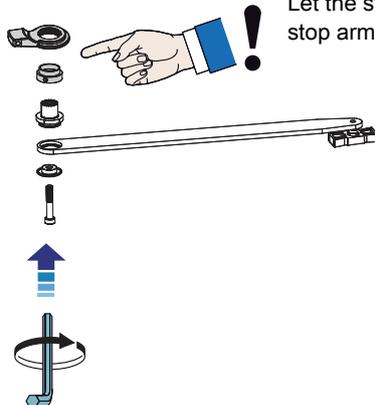
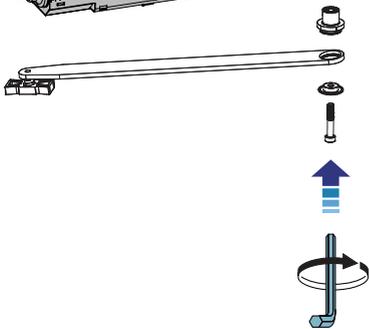
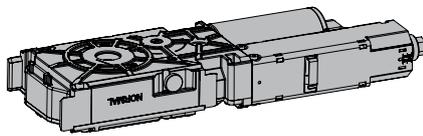
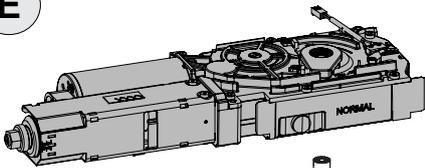
DIN Left



D



E

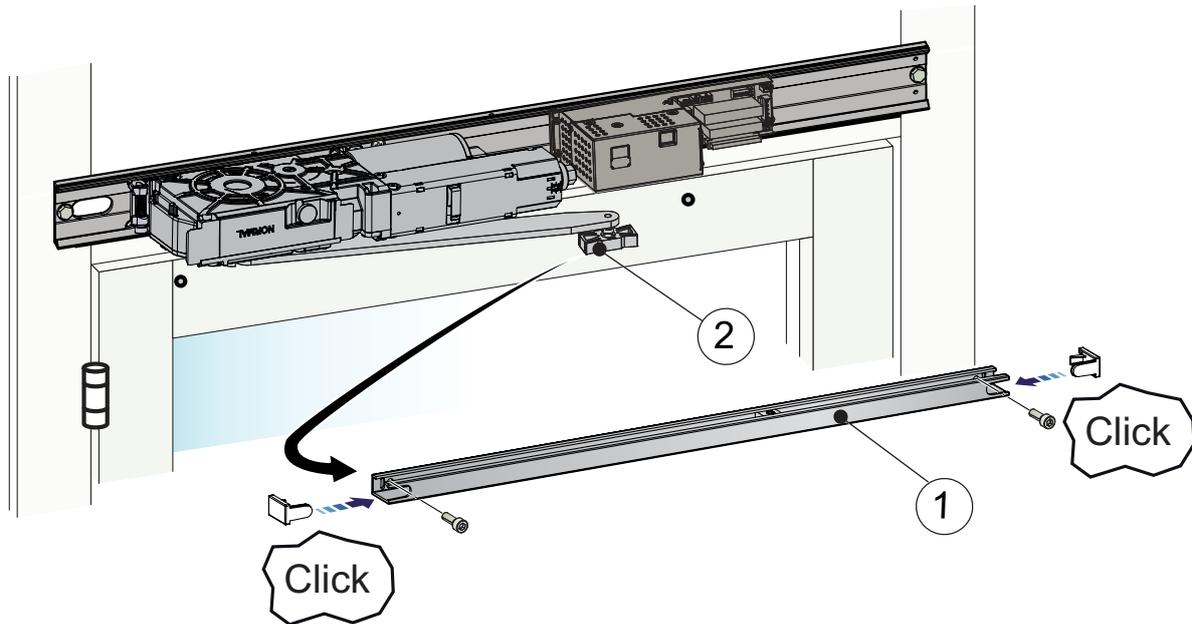


Let the stop arm locator and the stop arm be loose.

Do not tighten.

Slim slide track

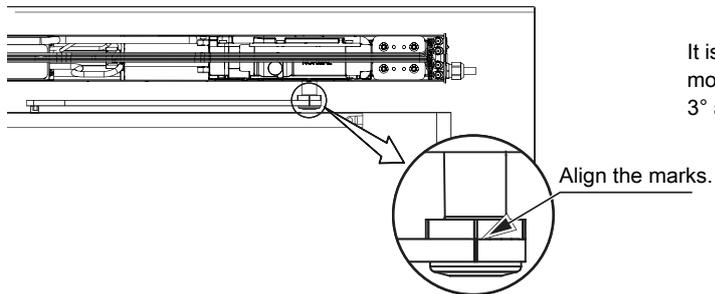
Attach the slide track (1) to the door with the guide shoe (2) fitted into the track. Use appropriate screws.



- 1 Slide track
- 2 Guide shoe

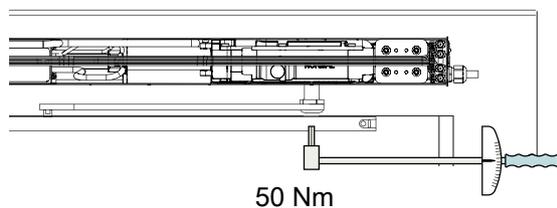
Continuous. "Operator with PULL arm system"

F

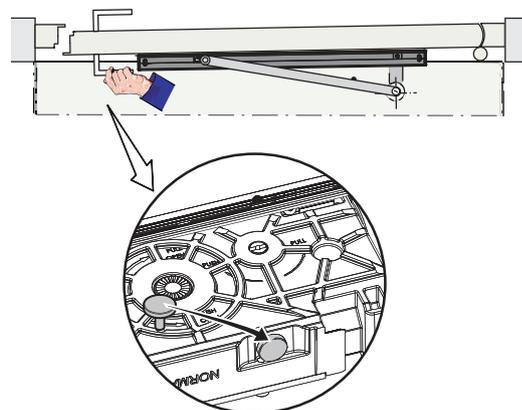


It is important to align the marks correctly. If necessary move one mark at a time. This corresponds to approx. 3° and will give a precision of ±1,5°.

G



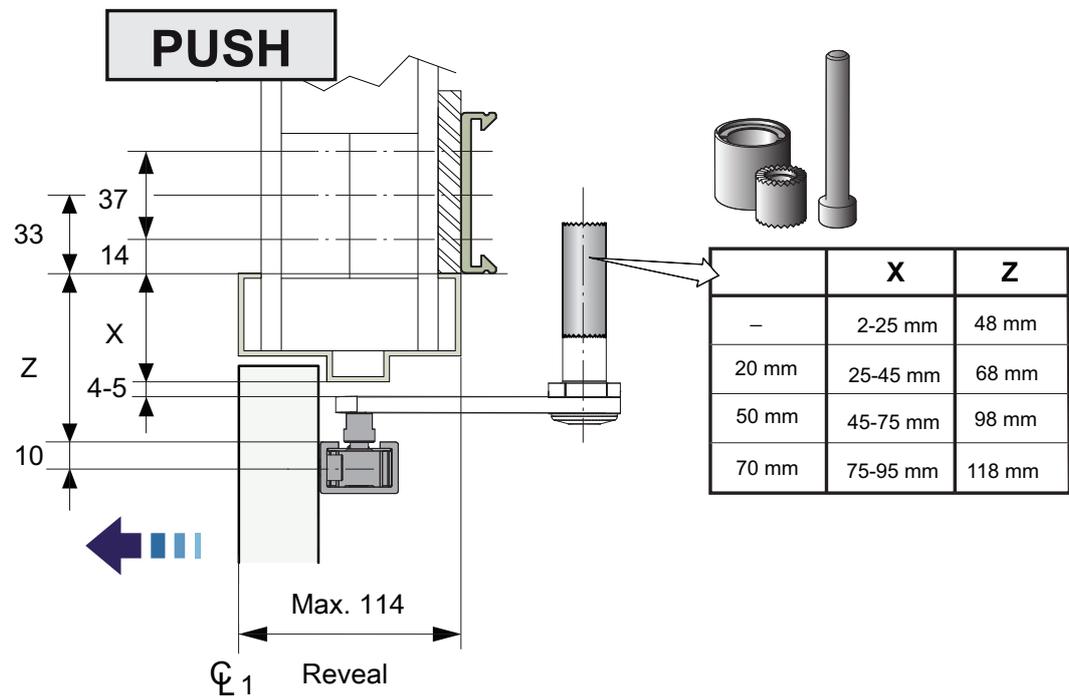
H



Hold the door a bit open and remove the start position pin.

11.3 Operator with sliding PUSH arm system

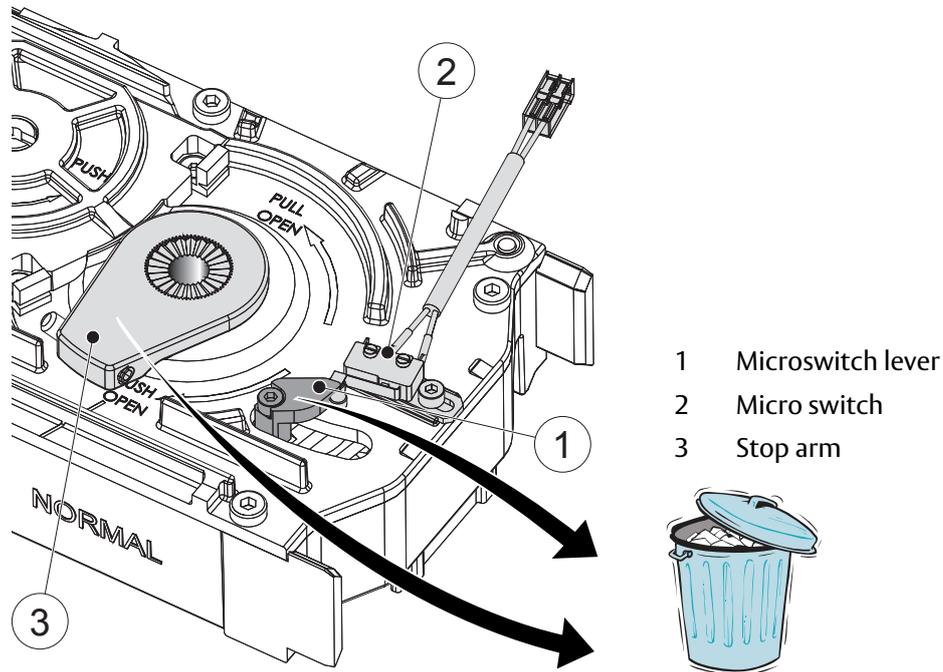
Slim slide track



See instructions for PULL installation.

11.4 Inverse installation with PUSH arm system

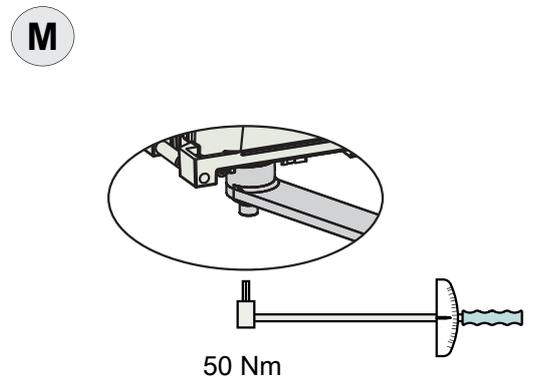
Remove the microswitch lever (1), but not the micro switch (2). Remove also the stop arm (3).



Note! Set dip switch INV to ON for Inverse operation, see 12.1.1 on page 61.

Spring pre-tension should not be more than 7 mm.

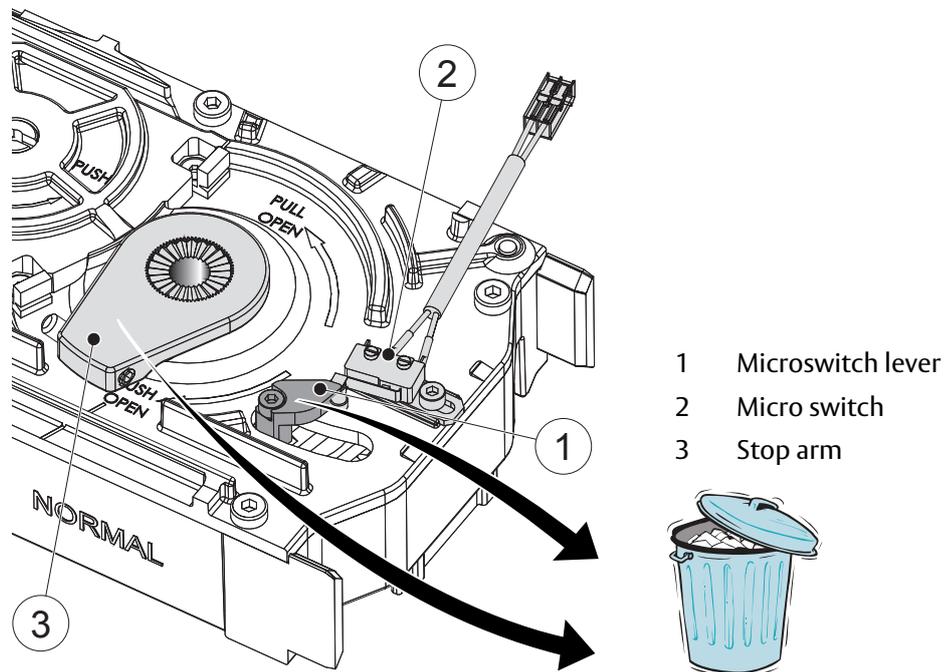
Follow step **A** to **K** in section PUSH arm system on page 39, with the difference that the operator is turned 180° so the "INVERSE" text on the operator is visible and do not make step **D** and **I**.



If necessary, adjust by moving the adaptor one step at a time.

11.5 Inverse installation with PULL arm system

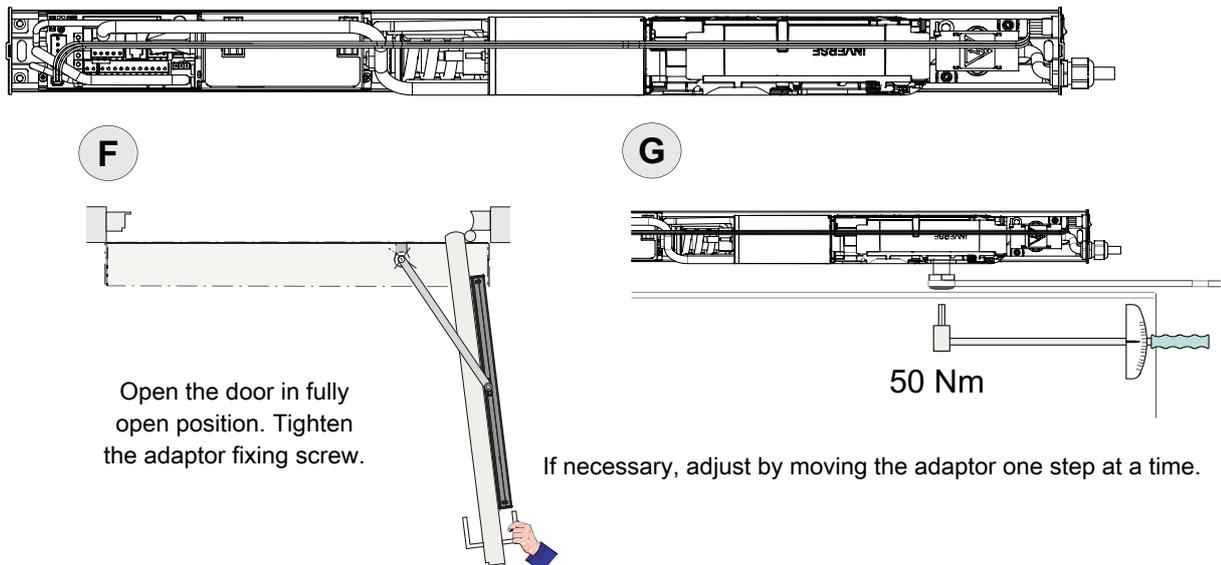
Remove the microswitch lever (1), but not the micro switch (2). Remove also the stop arm (3).



Note! Set dip switch INV to ON for Inverse operation, see 12.1.1 on page 61.

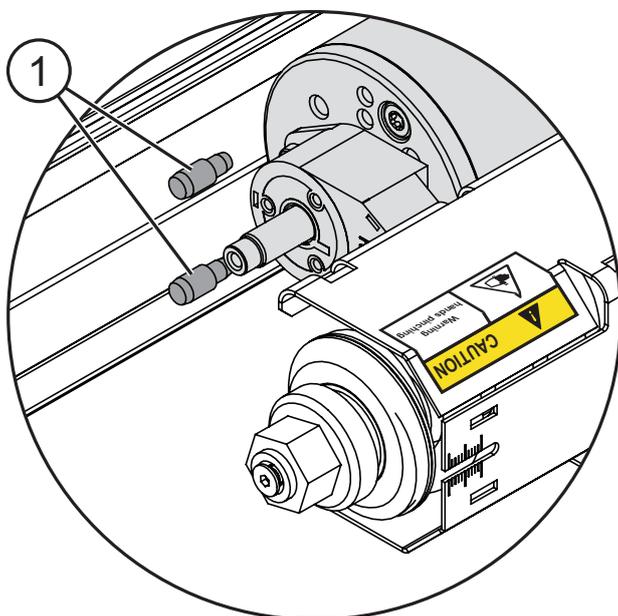
Spring pre-tension should not be more than 7 mm.

Follow step **A** to **E** on page 46, with the difference that the operator is turned 180° so the "INVERSE" text on the operator is visible and do not make step **D**.



11.6 Installation of coordination unit on Fire Door installations

Before installing the transmission unit do step a-e below. Screw in the two steering pins (1) for the coordinator base.



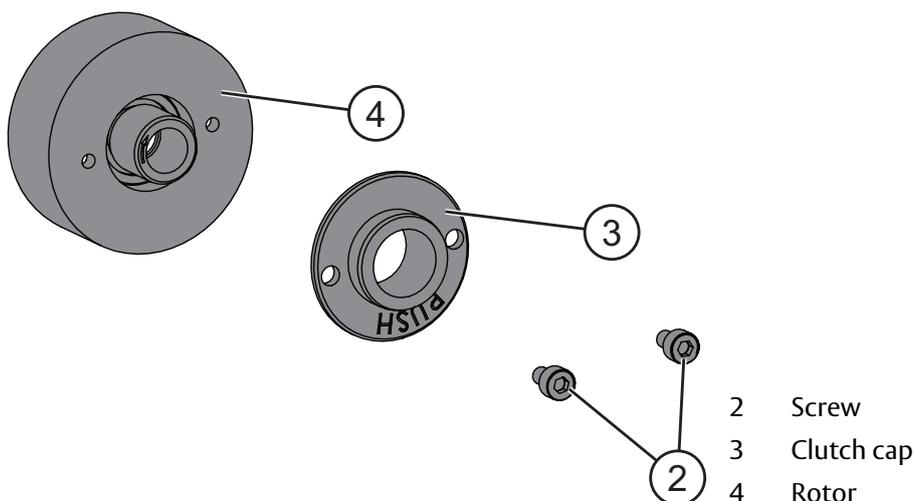
1 Steering pin

Mount the rotor (parts 2 to 4 below) before the motor is installed on the back plate. Install the control unit when the installation of the coordination unit is completed.

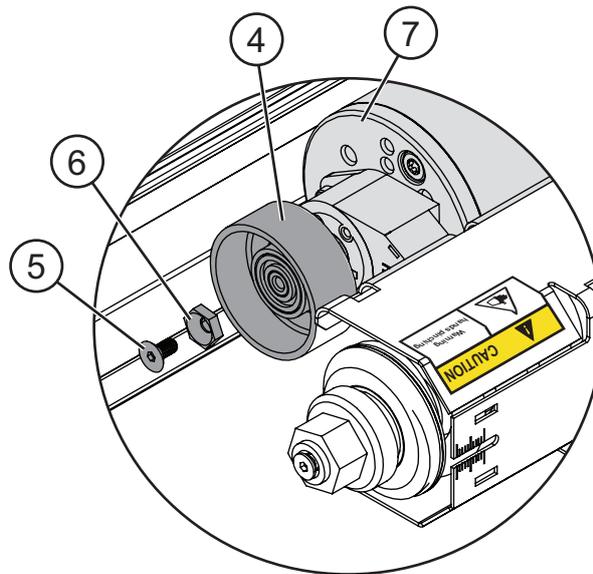
If the coordination unit will be installed on an existing installation it is possible to move the control unit a little bit to be able to reach the motor unit during installation.

Link rod length = hinge to hinge - 980 mm

- Loosen the screws (2) and remove the clutch cap (3) from the rotor (4).
- Turn the clutch cap (3) depending on PULL or PUSH installation. PULL visible for PULL-installation and PUSH visible for PUSH-installation.
- Fasten the screws (2).

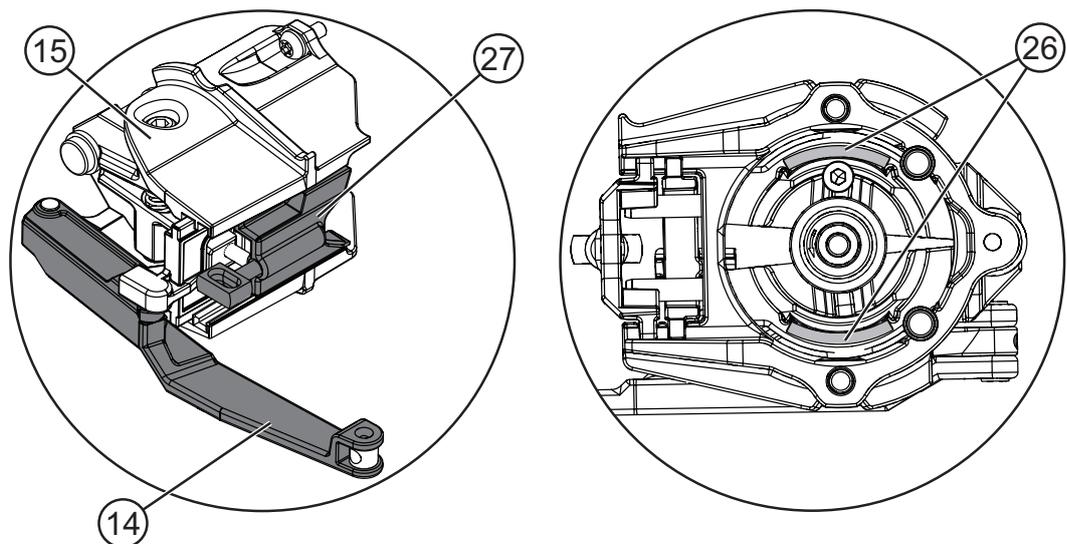


- d Mount the rotor (4) on the motor unit (7) with the screw (5) and washer (6) on the master drive unit = for the door that opens first and closes last.



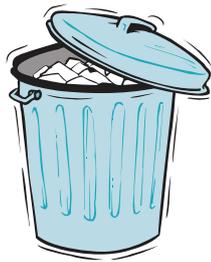
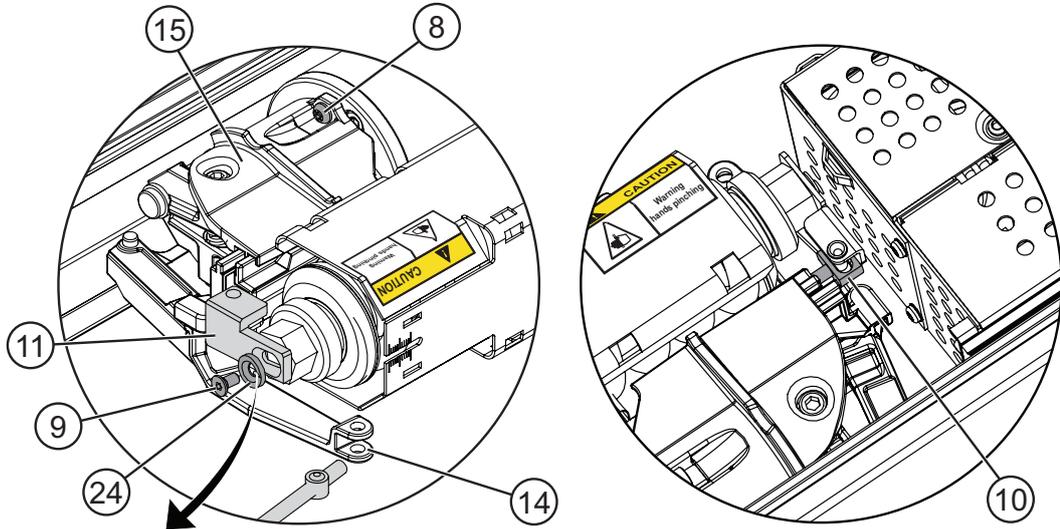
- 4 Rotor
- 5 Screw
- 6 Washer
- 7 Motor unit

- e Release the brake (26) by pushing in the linkage arm (14), so that the brake (26) is opened, push the fork (27) into the coordinator base (15).



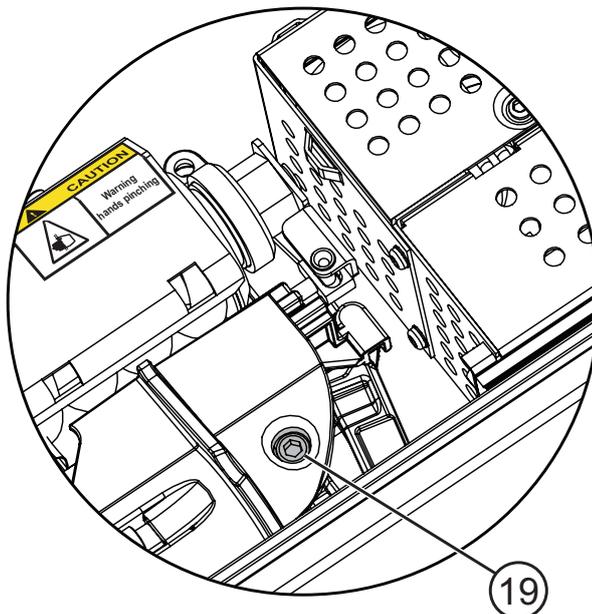
- 14 Linkage arm
- 15 Coordinator base
- 26 brake
- 27 fork

- f Mount the coordinator base (15) with the two screws (8) on the master drive unit. Remove the screw (9) and throw the washer (24) away when mount the acceptor (11) on the adjuster (10). Mount the screw (9) through the acceptor (11).
- g Mount the transmission unit. Adjust the adjuster (10) by turning until the master door stops at 15-18° from fully closed (this angle should be smaller than the electrical coordinator). Close the door by pressing the linkage arm (14).



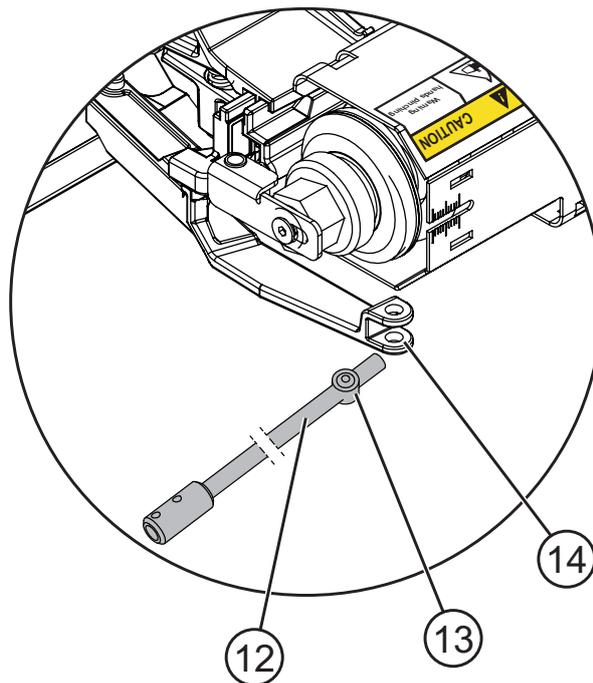
- 8 Screw
- 9 Screw
- 10 Adjuster
- 11 Acceptor
- 14 Linkage arm
- 15 Coordinator base
- 24 Washer

- h Adjust the braking torque to > 50 Nm measured on the door leaf by turning one or both screws (19).



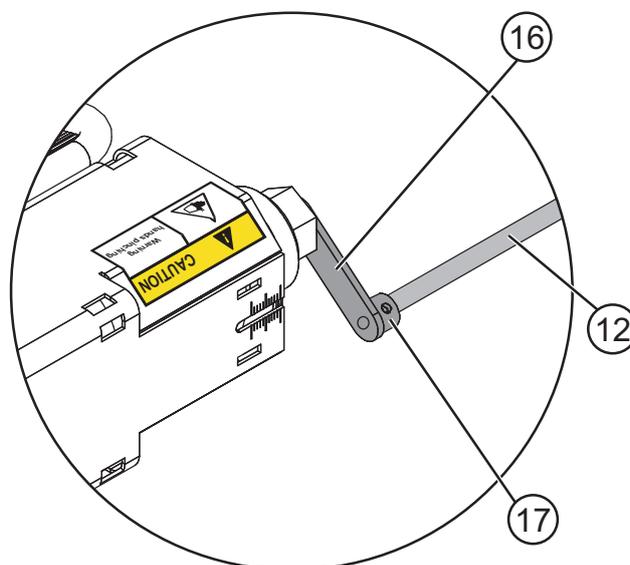
- 19 Screw

- i Mount the link rod (12) with its adaptor (13) into the linkage arm (14).



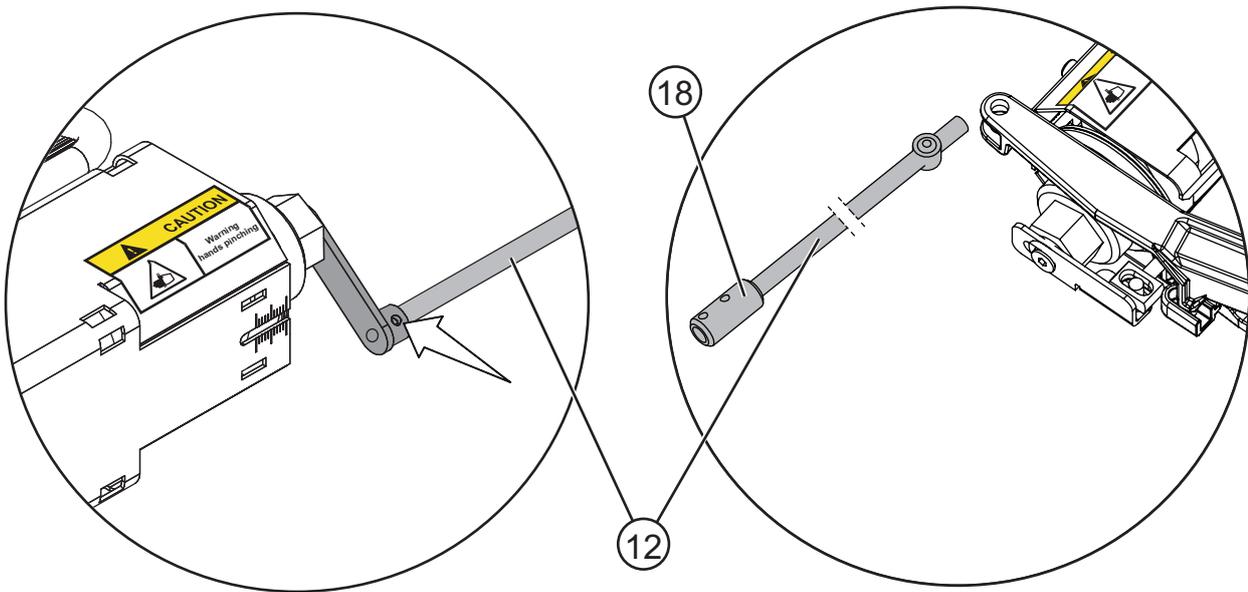
- 12 Link rod
- 13 Adaptor
- 14 Linkage arm

- j Mount on the other side of the link rod (12) to the slave motor unit with the signal (16). Fasten the stop screw (17).



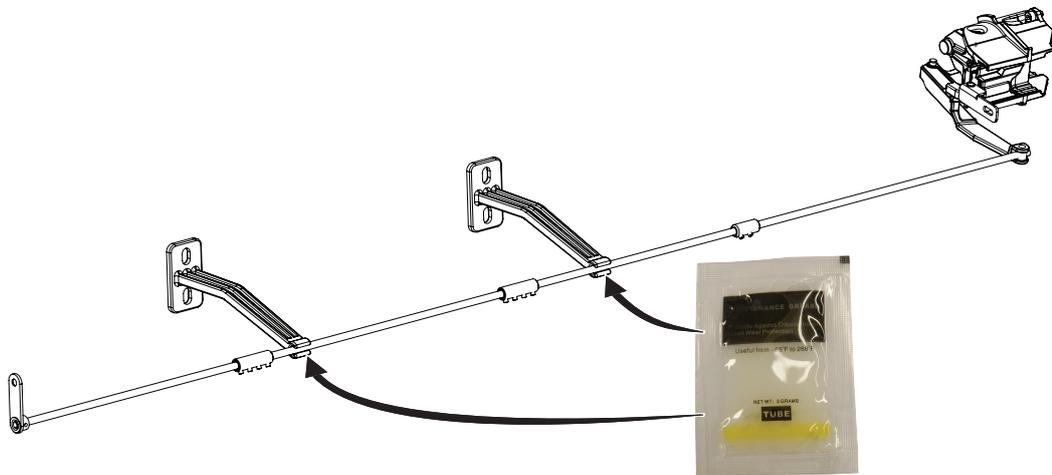
- 12 Link rod
- 16 Signal
- 17 Stop screw

- k Adjust the release of the brake by loosening the joint (18) and turning the link rod (12) close to the master drive unit. Make the angle between the doors near closed position.

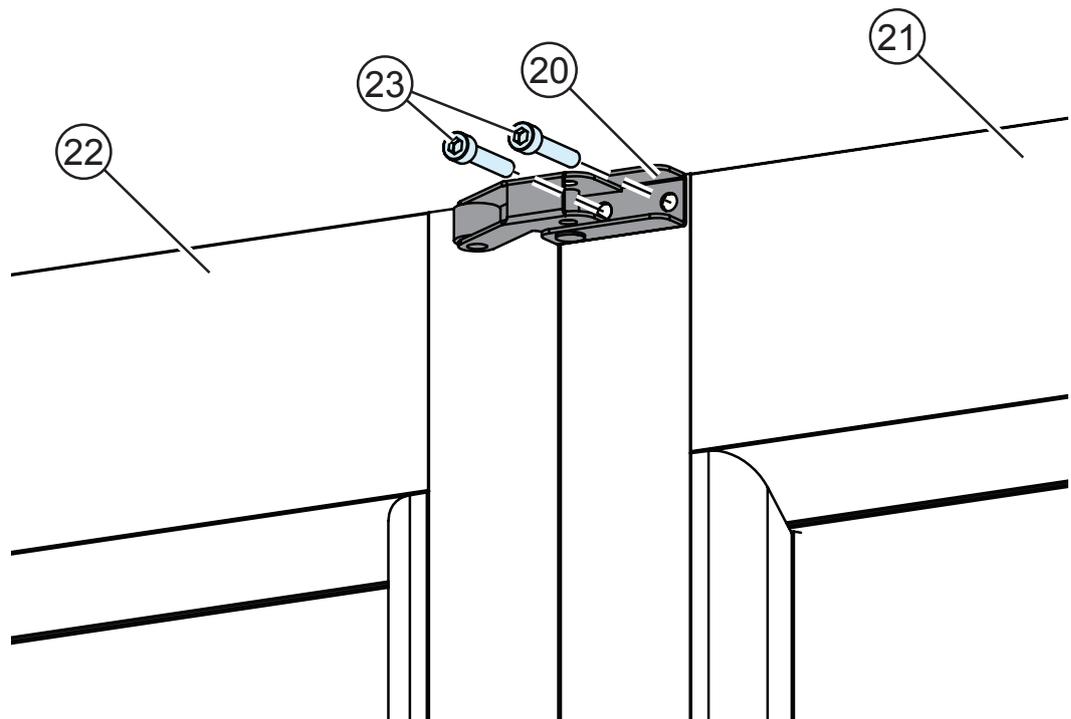


- 12 Link rod
- 18 Joint

- l Route the cables, see illustrations on page 37.
- m Put the grease on the rod support.



- n Mount the follower roller (20) at the leading edge close to the top of the slave door leaf (21) with the appropriate screws (23).



- 20 Follower roller
- 21 Slave door leaf
- 22 Master door leaf
- 23 Screw

12 Electrical connection

Note! During any work with the electrical connections the **mains** must be disconnected.

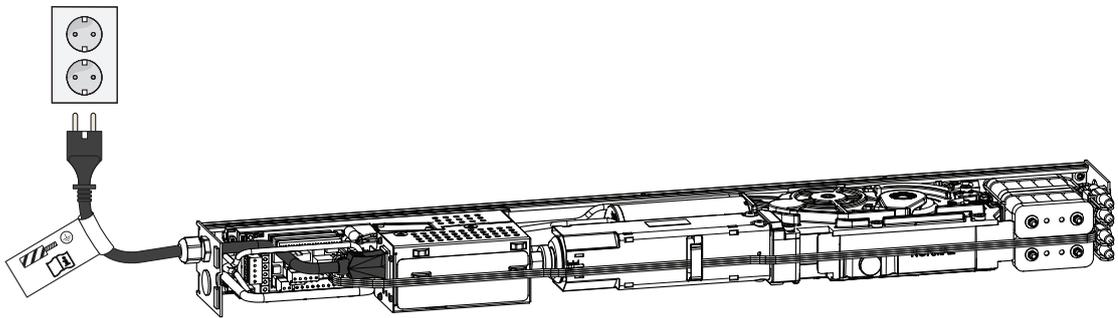
- Place the electric switch easily accessible from the operator. If an plug contact is used in the installation the wall socket shall be placed easily accessible from the operator.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

See Auto-learn-automatically sets back and latch check (recommended) on page 73.

Mains connection

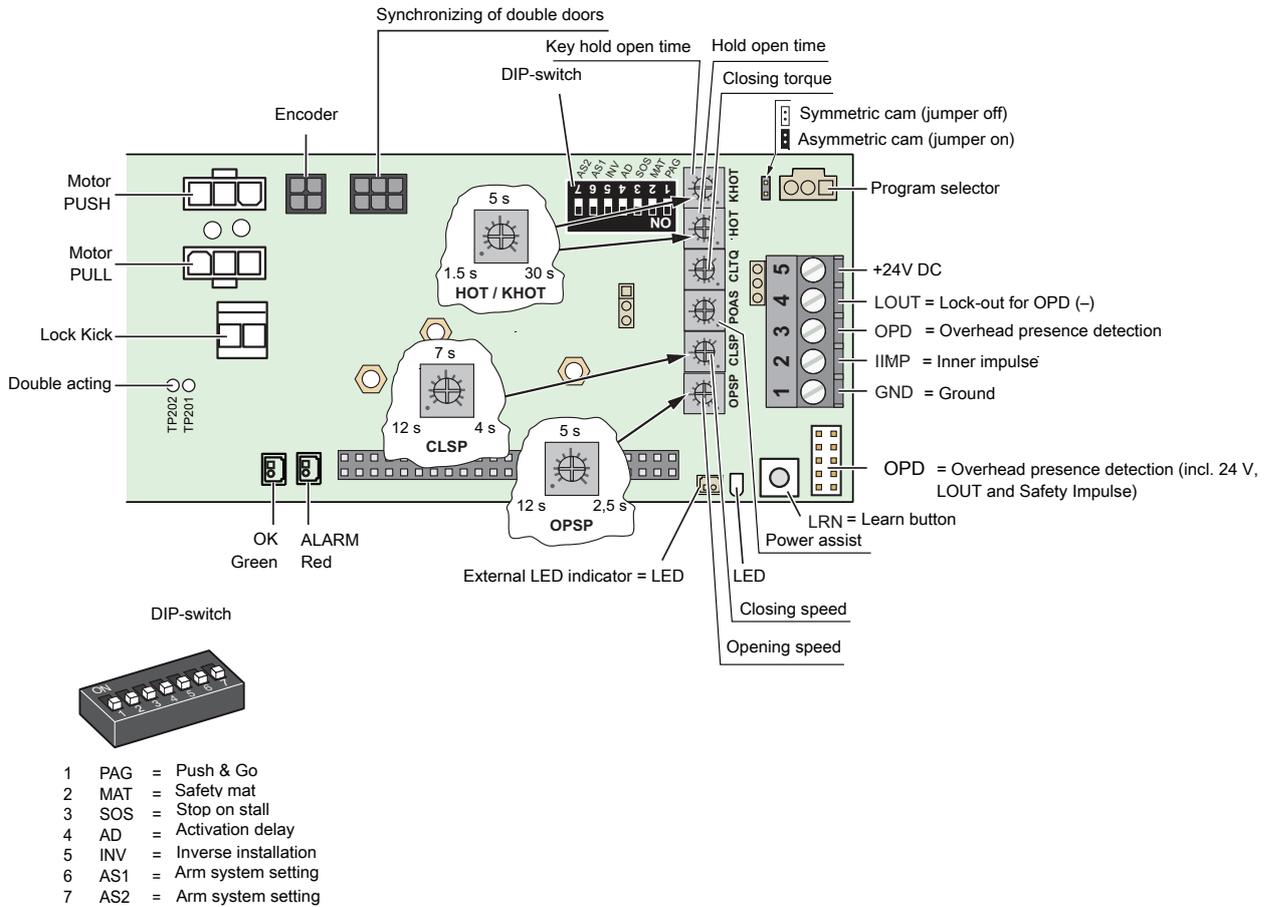
- a Switch off the mains.
- b Connect the plug contact to the wall socket or connect to the mains switch.

Standard



12.1 Control units

12.1.1 CUS7



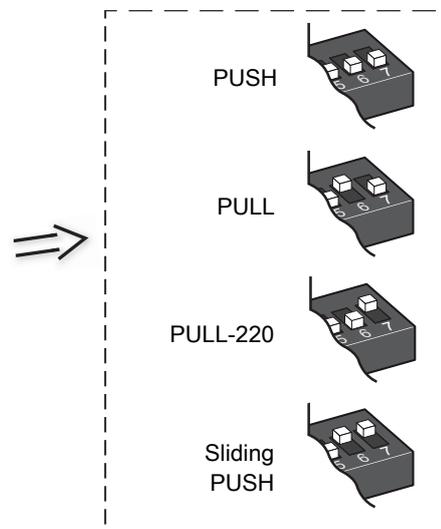
Note! Connect the motor cable to either PUSH or PULL depending on arm system.

12.1.2 Arm system selection

Factory set arm configuration is PUSH, if other is required:

Select arm configuration on the DIP-switches according to the table below.

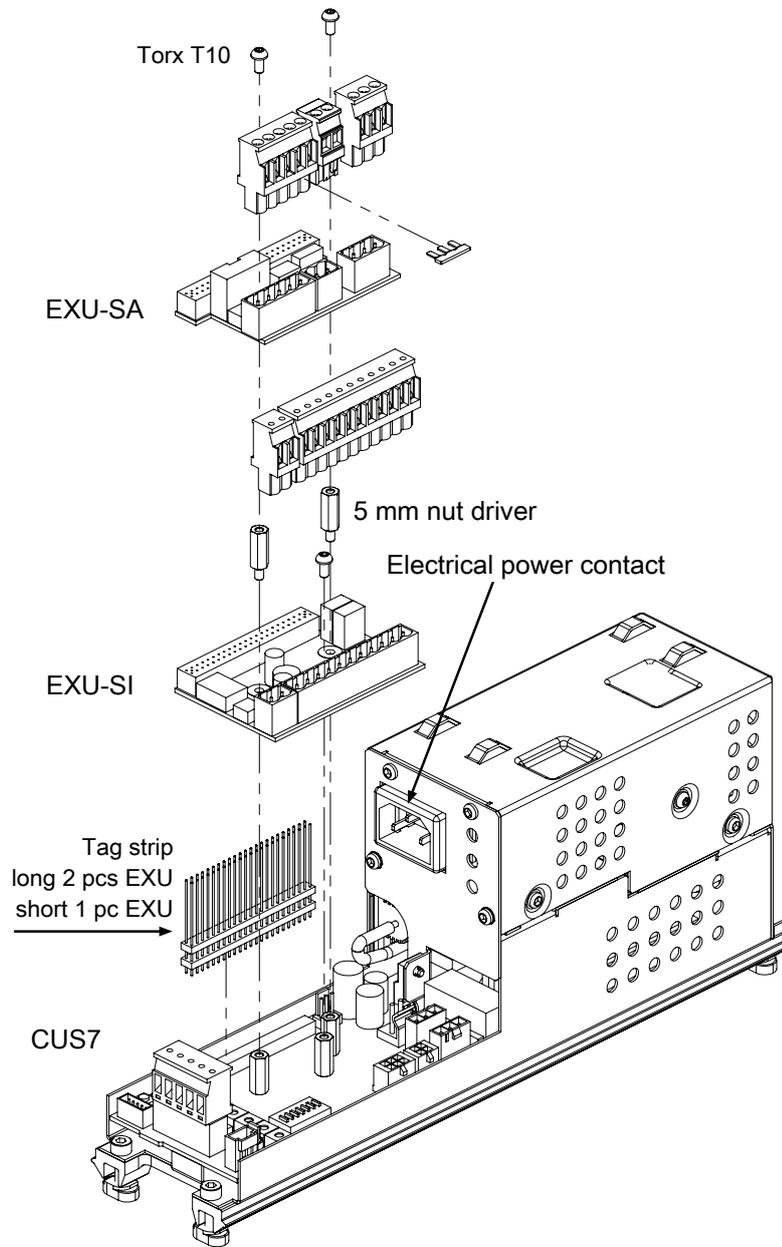
Type of arm system	ON=1 OFF=0	
	AS 1 DIP 6	AS 2 DIP 7
PUSH	0	0
PULL	1	0
PULL-220 (narrow door)	0	1
Sliding PUSH	1	1



Note! After changing any system selection a new LEARN must be carried out.

12.1.3 Extension units EXU-SI / EXU-SA

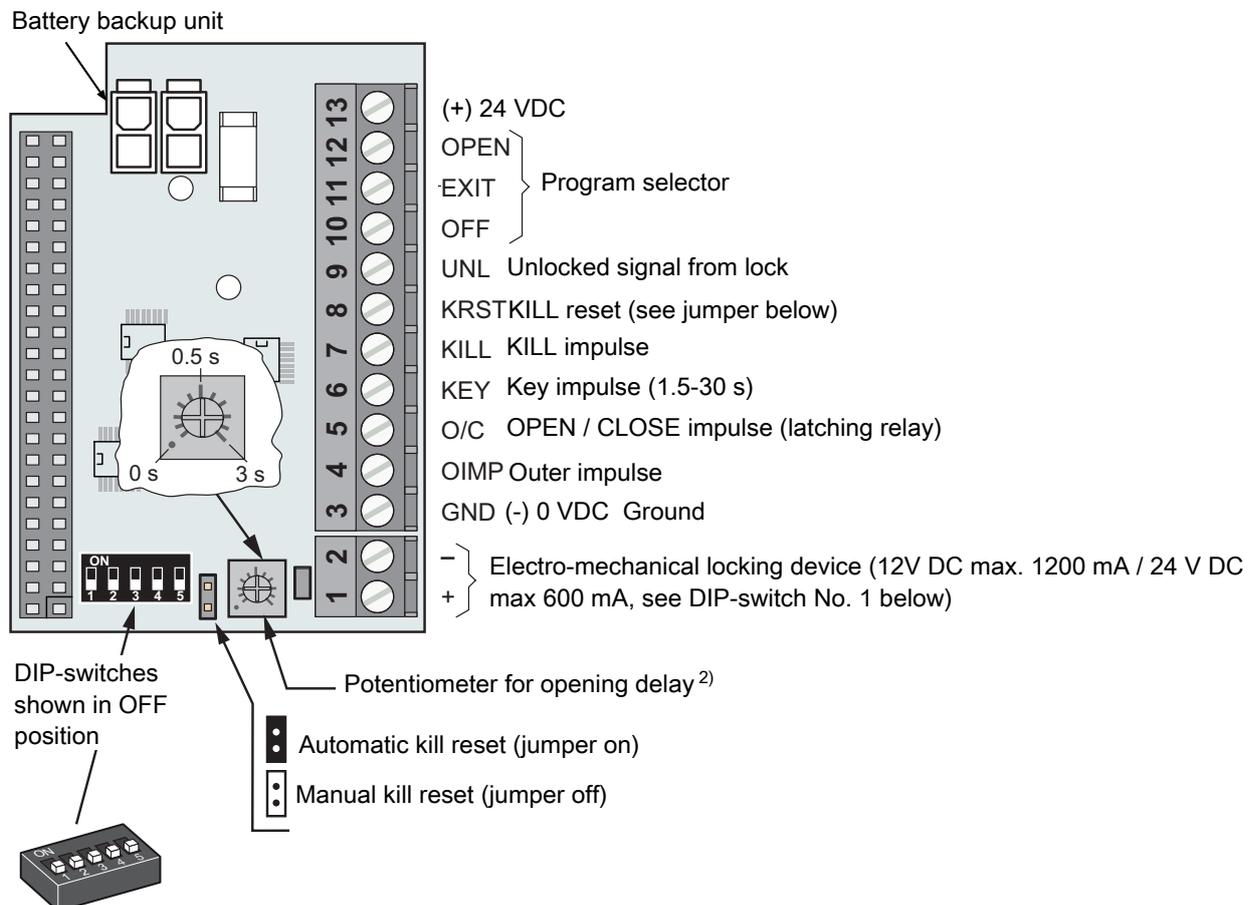
Installation



12.1.4 Extension unit EXU-SI

This extension unit has inputs for electro-mechanical lock, program selector, batteries, KILL function, OPEN/CLOSE, KEY opening and outer impulse.

Functions



1 Lock 12 V (OFF) / 24 V (ON)*

2 Locked without power (OFF) / with power (ON)*

3 Lock release*²⁾

4 Lock kick¹⁾

5 Battery monitoring

¹⁾ Position OFF: Smooth closing, to be used on doors without lock.

Position ON: More powerful closing, to be used on doors with lock, to overcome binding in the locking device (inactivated for Inverse door).

²⁾ If the switch is set to ON, the LOCK RELEASE is active during the opening delay time set by the potentiometer. For PAIR OF DOORS installations, the LOCK RELEASE works in sequence: First the MASTER then the SLAVE.

Note! Lock only functions when Program Selector is in OFF or EXIT.

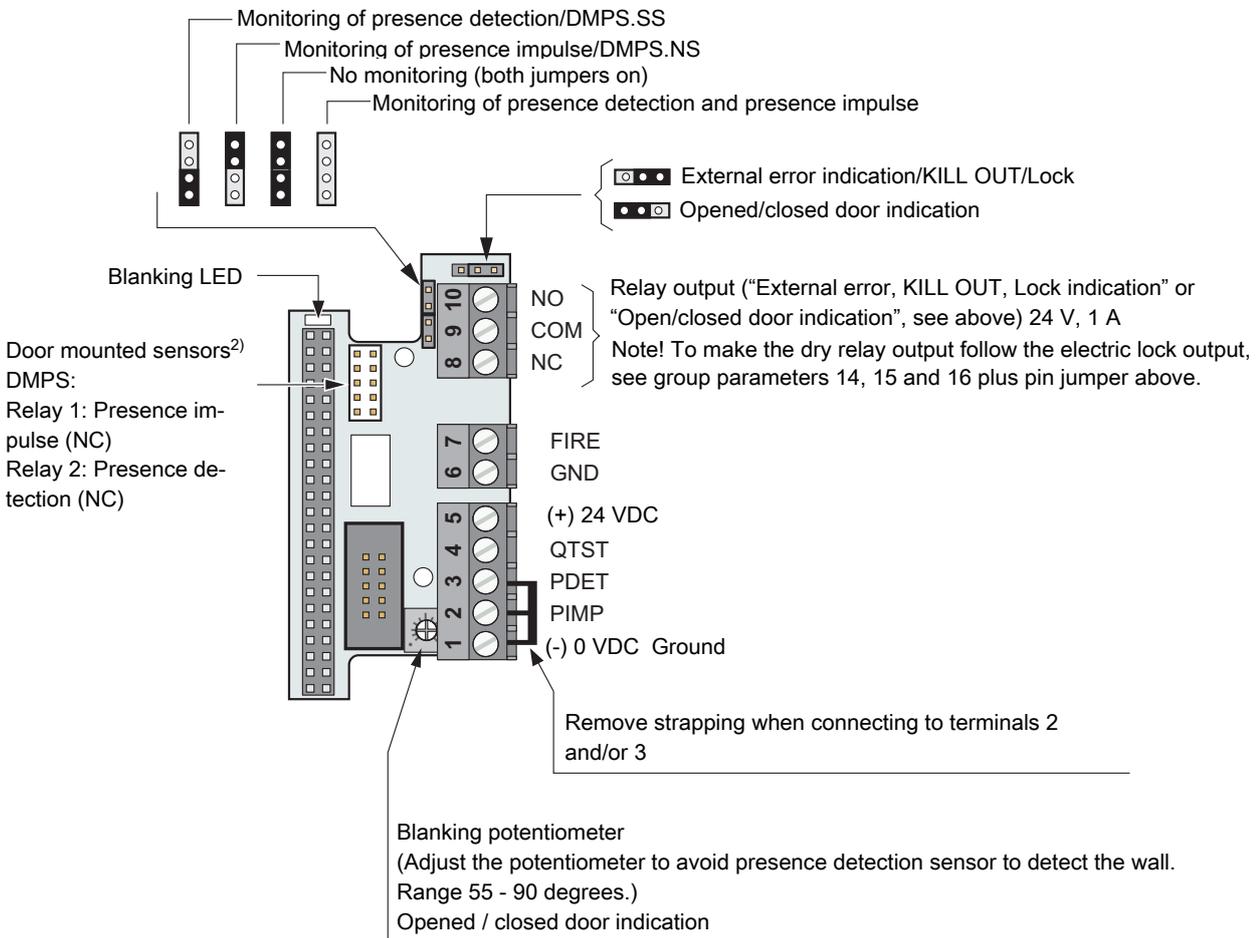
* After changing any system selection a new LEARN must be carried out.

With selection 'Locked without power' is the lock energized from 0 to 10 degrees at opening.

12.1.5 Extension unit EXU-SA

This extension unit has inputs for door mounted sensors, which can give presence impulse on approach side and/or presence detection on swing path side. Relay output for error indication, KILL output, Lock output or door indication is also integrated. When the jumper for the relay is set to 'Open/Closed door indication', its activation will follow the Blanking LED.

Functions



QTST = Sensor monitoring and reference for KILL (NC)

PDET = Presence detection (NC)¹⁾

PIMP = Presence impulse (NC)¹⁾

¹⁾ If not used strap to "Ground".

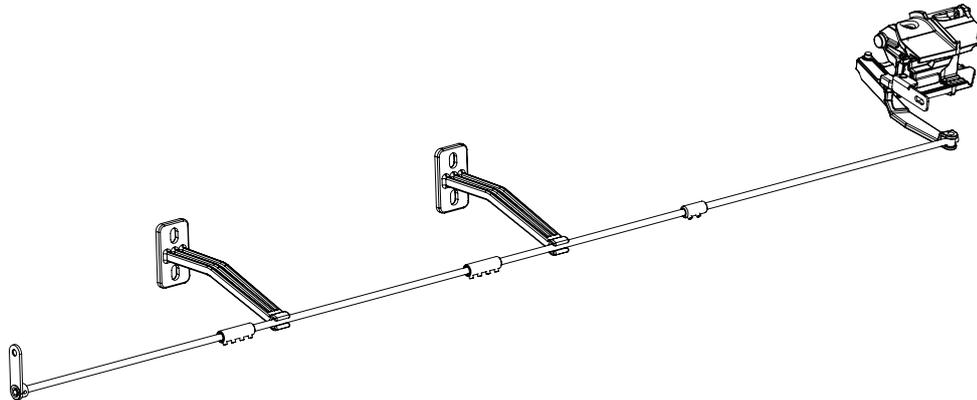
²⁾ Remove strapping from terminals 2 and/or 3.

12.1.6 Installation on double doors

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

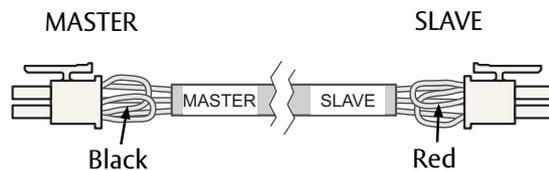
Example: if PULL has a 20 mm extension, the PUSH must have a 70 mm extension. If PULL has 0 mm extension, the PUSH must have a 50 mm extension.

For installation, follow the instructions for the applicable arm system. If using a closing coordinator, see page 54 a-e before starting the installation.



12.2 How to cut the jumper on the sync cable for double doors

Note! Connect a cable between Master CU and Slave CU.

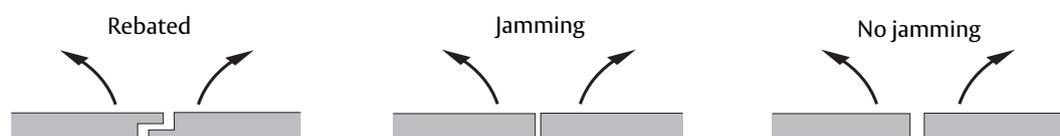


Note! The connection/markings of the sync cable determines which of the operators is the MASTER and SLAVE.

For a Rebated door;

- the **Master door** must **open** before the **Slave door**
- the **Slave door** must **close** before the **Master door**

Function		Door design		Cut the jumper with color	
Opening	Closing	Rebated	Jamming	MASTER side	SLAVE side
Synchronous	Synchronous	No	No	No cutting	No cutting
Synchronous	Asynchronous	Yes	No	Cut black	No cutting
Asynchronous	Asynchronous	Yes	Yes	No cutting	Cut red
Double egress		—	—	Cut black	Cut red



12.3 Double door installations

There are three different types of double door installations:

- Rebated – Has an overlapping master door, can be opened synchronously if it is not jamming and must be closed asynchronously to avoid that the doors will jam or close in the wrong order.
- Jamming – This door type needs to be opened and closed asynchronously to avoid that the doors will jam with each other.
- Not jamming, not rebated – This door type has doors that always can move independently of each other and can be opened and closed synchronously.

12.4 Settings for double doors

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

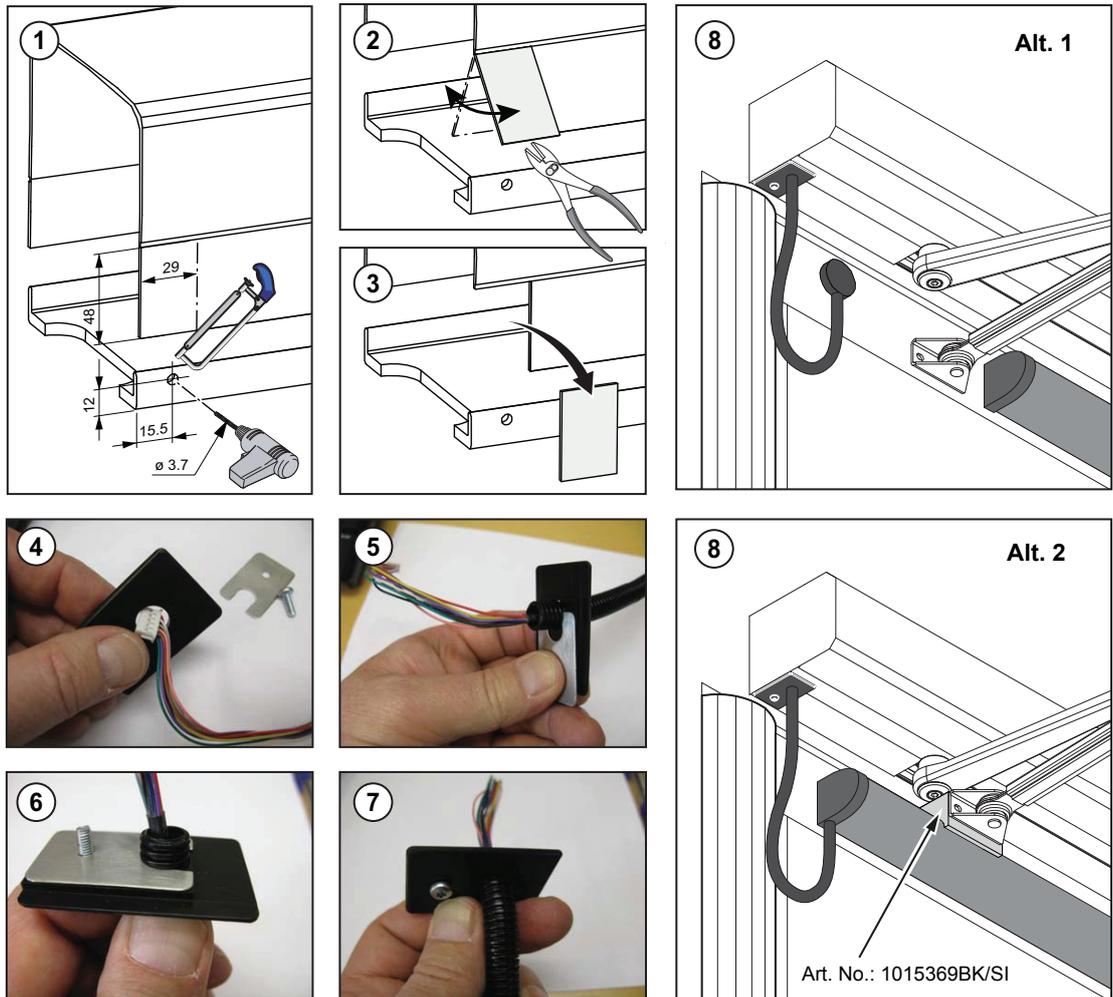
* For “Double egress doors”, these functions must be set separately for MASTER and SLAVE as the arm systems as well as the air pressure may be different.

Note!

- Locks on the MASTER and SLAVE doors must be connected to the control unit (CU) on the corresponding operator.
- Inner and outer impulses can be connected to either MASTER or SLAVE CU or both.
- The OPD/OPS is to be connected to the MASTER CU except for “Double egress”, where each OPD/OPS must be connected to corresponding CU.
- Door leaf mounted sensors must always be connected to corresponding CU.

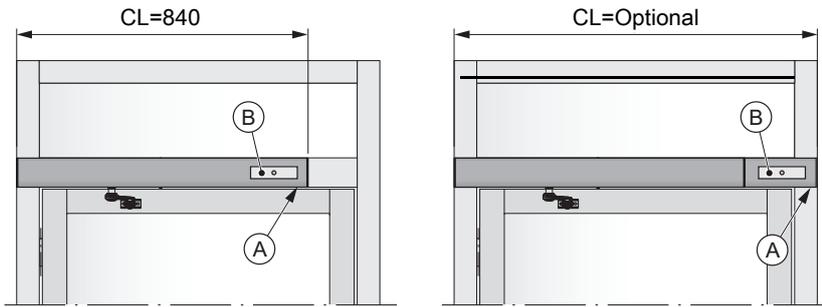
12.5 Sensor cable inlet

Art. No.: 1007567

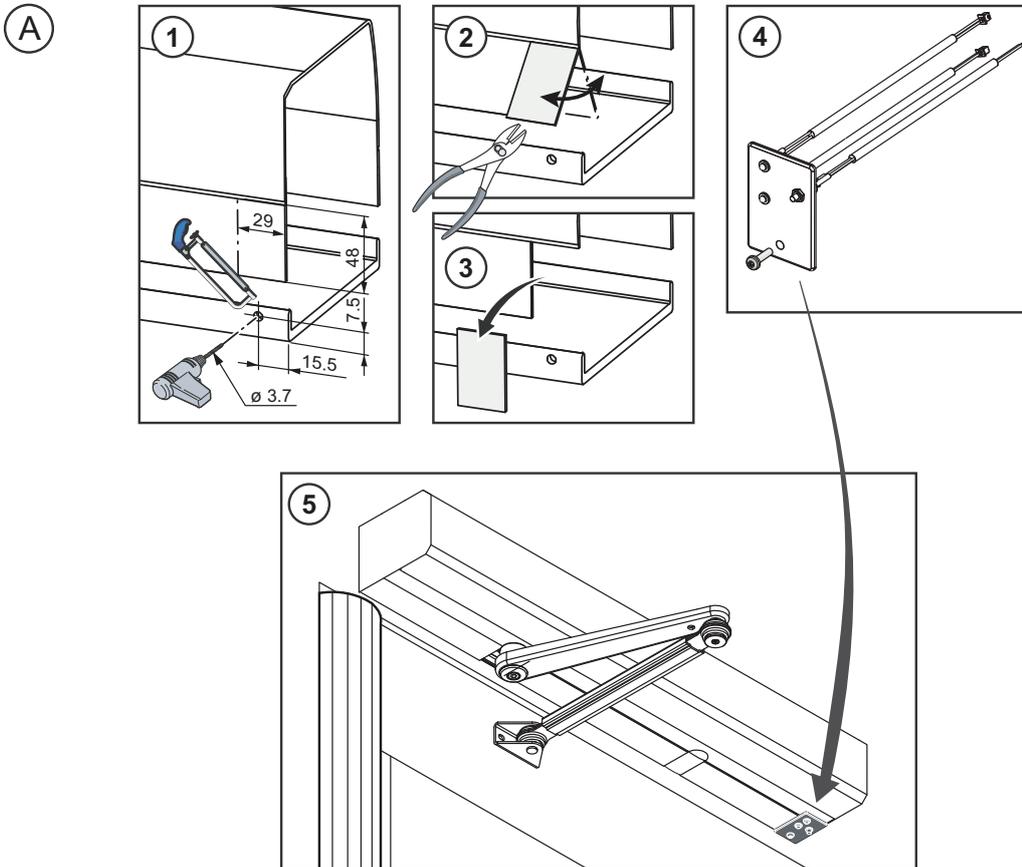
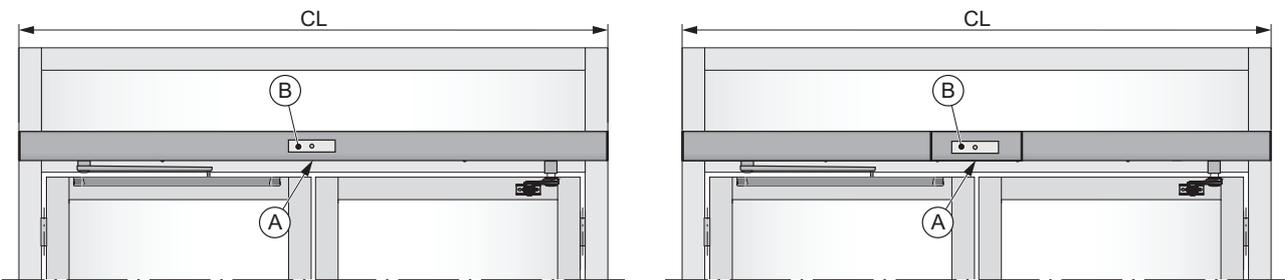


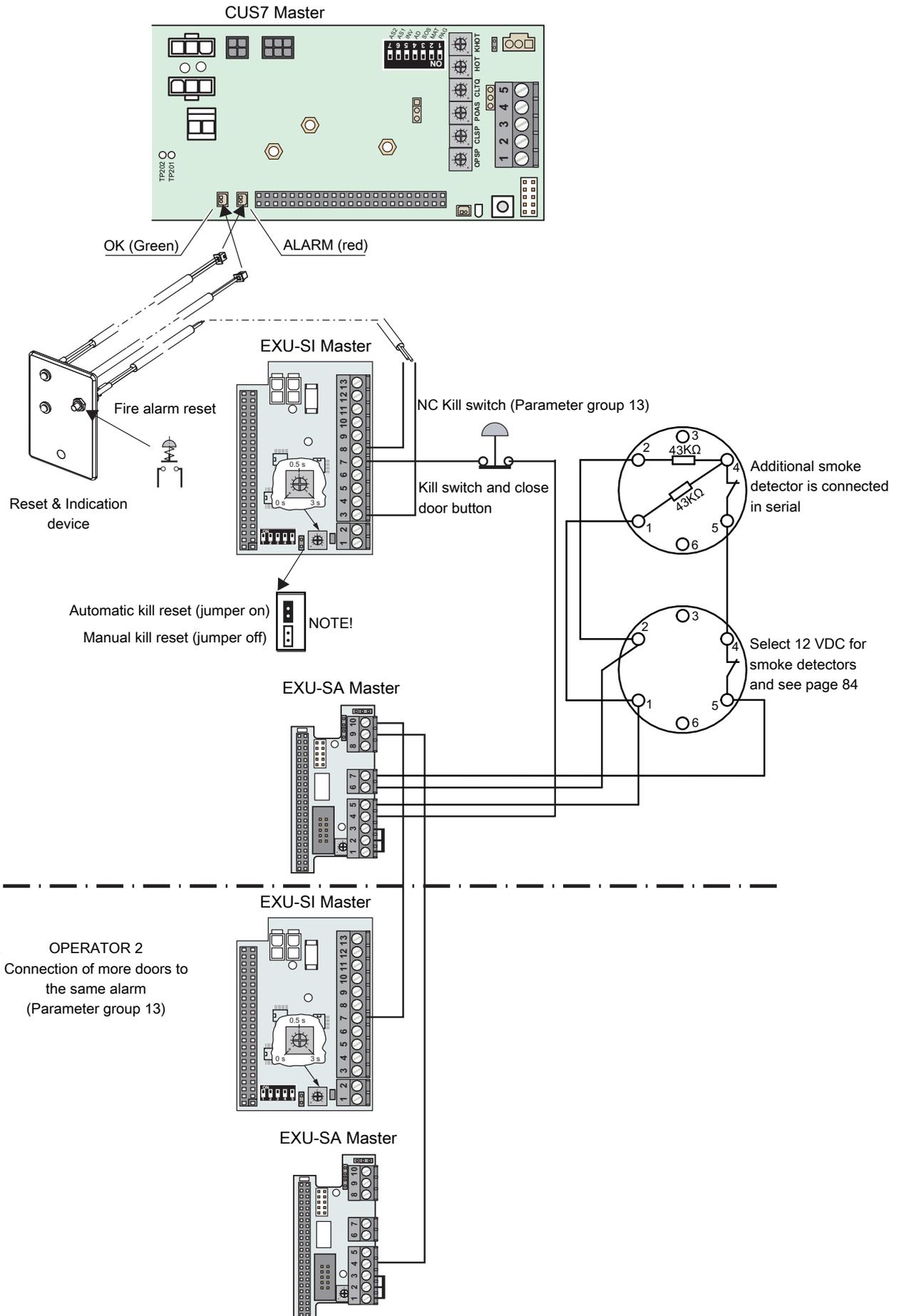
12.6 Reset and indication device for Fire Doors

Art. No.: 1011784



- (A) Reset & Indication device
- (B) Smoke detector

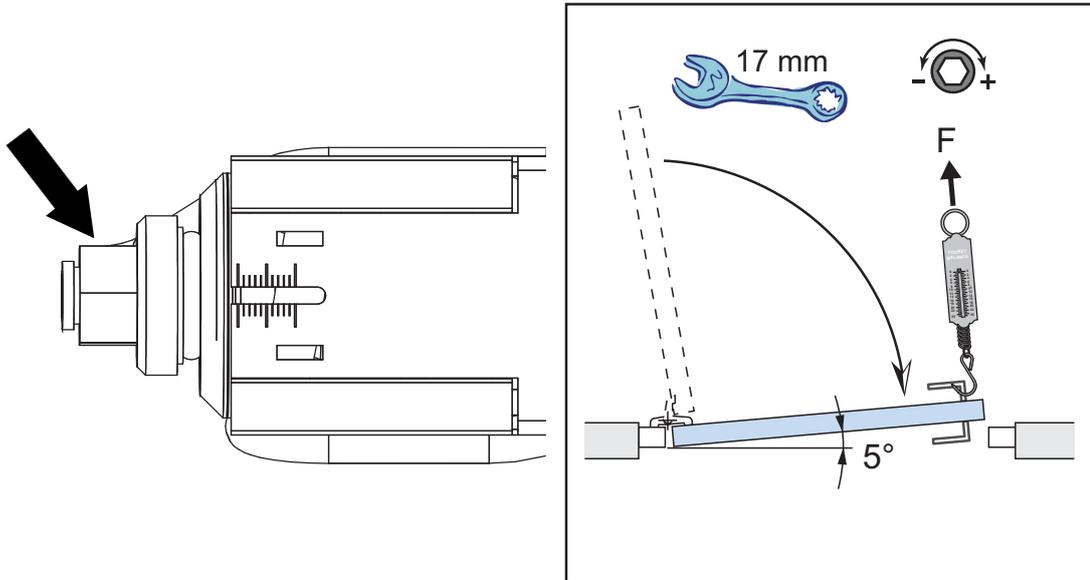




13 Start-up

13.1 Spring pre-tension

The spring pre-tension is **factory set to EN4**. The closing torque (spring force) is adjusted by an hexagon nut placed at the end of the spring. Turning the nut clockwise increases the force. One turn equals a torque change of approx. 7-9 Nm for PUSH and 4-6 Nm for PULL (approx. 7 turns from min. to max.).



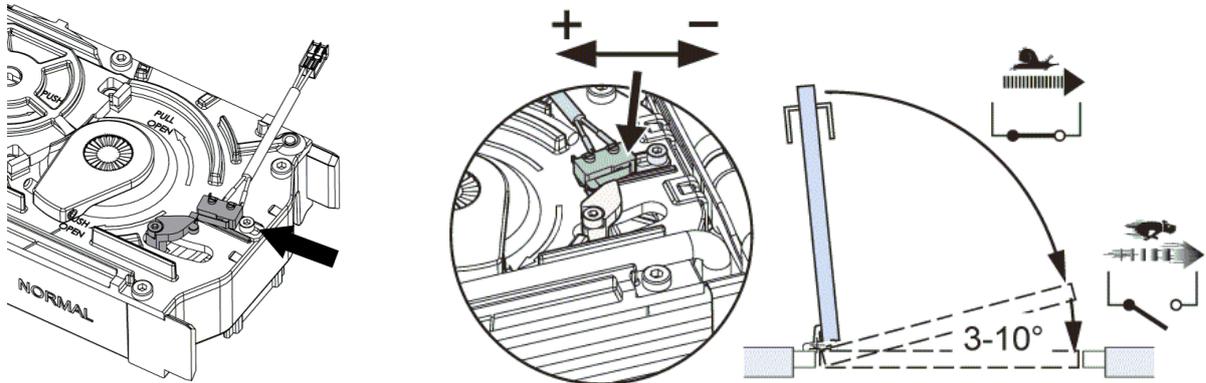
Door closer power size according to EN1154	Recommended door leaf width mm max.	Closing torque Between 0° and 4°		Opening torque Between 0° and 60°
		Nm min.	Nm max.	Nm max.*
4	1100	26	<37	62
5	1250	37	<54	83
6	1400	54	<87	134
7	1600	87	<140	215

* **Note!** Max opening force in escape route is 150 N.

Note! The table above is only for Normal operator (fire door installations). For Inverse doors (emergency opening function) max. spring pre-tension is 7 mm, and it has to be adjusted at the installation time so the door opens and closes in a smooth way.

13.2 Micro switch

Check and adjust the micro switch, controlling the lock kick at power failure.

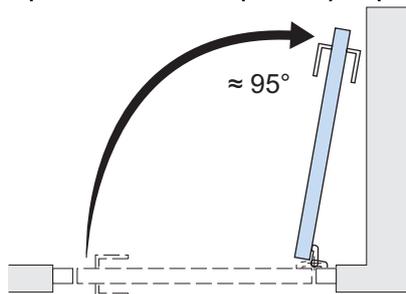


13.3 Adjusting the door stop

a Close the door.

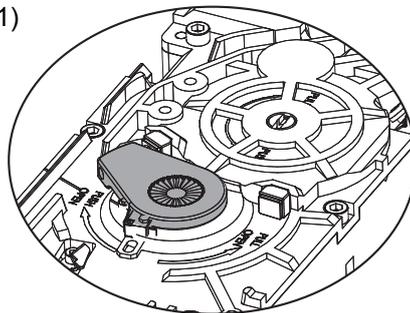


b Open the door to required open position, plus approx. 15 mm. Put a doorbuffer under the door.

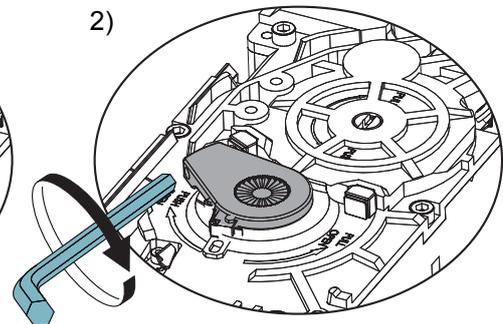


c When stop arm is on top of the operator, lift the door stop arm up and mount it on the splines, as close as possible to the stop block 1). Fine-adjust if necessary with the screw on the stop arm 2).

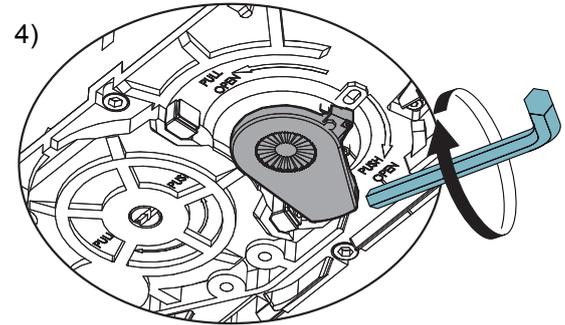
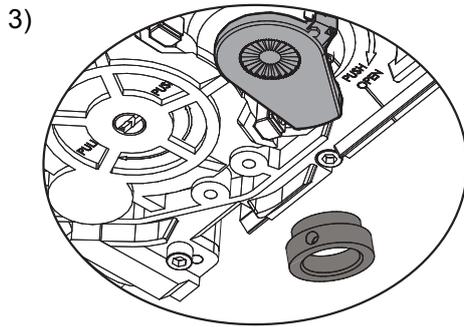
1)



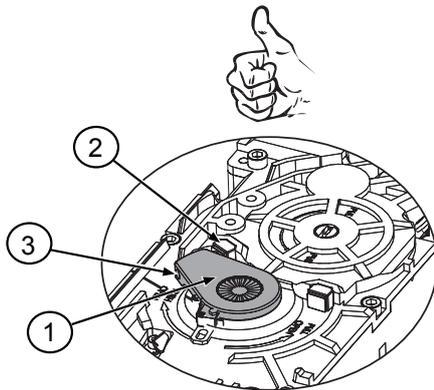
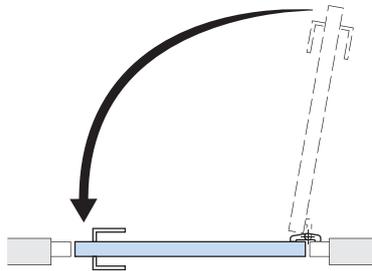
2)



- d When stop arm is on the bottom of the operator, loose the stop arm locator and the stop arm. Mount the stop arm on the splines, as close as possible to the stop block 3). Mount the stop arm locator. Fine-adjust if necessary with the screw on the stop arm 4).



- e Close the door.

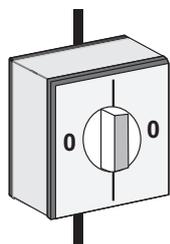


- 1 Stop arm
- 2 Stop block
- 3 Fine-adjustment screw

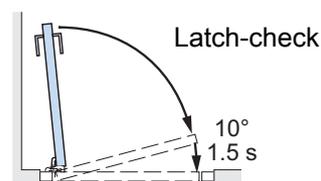
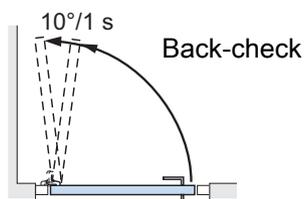
13.4 Auto-learn-automatically sets back and latch check (recommended)

This learning is performed by pushing the LEARN BUTTON (LRN).

- Switch on the electrical power (the operator will find its closed position) and make sure the LED is on.



- Before the learning procedure starts, make sure that the door has been properly closed i.e., not by force.
- A new learn must be carried out in following situations
 - If any of the parameters SPRING PRE-TENSION and CLOSING TORQUE (CLTQ) are changed after performing a learn.
 - If any of the arm system DIP-switches are changed.
- A confirmation by pushing the learn button is enough in following situations
 - If any changing of the MAT-dip.
 - When replacing any of the extension units.
 - When changing of Locked with/without power.
 - When changing of Lock 12/24 V.
- Learn can be carried out with activation units and locks connected.
- The back-check will be automatically adjusted to 10° and 1 second before open position. The latch-check will be automatically adjusted to 10° and 1.5 seconds before closed position.



13.4.1 Push the LEARN BUTTON (LRN)



The door has no safety during auto-learn cycle. Remain clear of swing path of door, as door may close rapidly.

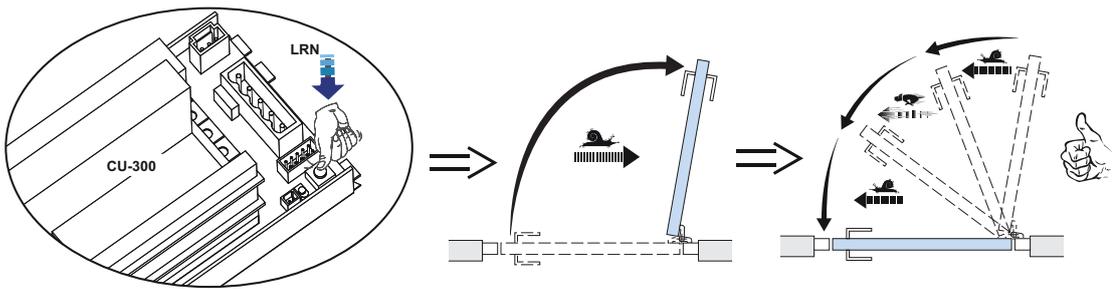
Note! If the learn button is just pushed ones, a learn for reveal 0-100 mm will be carried out. For greater reveal keep the button pressed, and release it when the status LED is blinking for desired reveal, see below table.

LED flash frequency	Reveal [mm]	Available for arm systems
One 0.3 s flash, 2 s pause	0 -- 100	PUSH, PULL, Sliding PUSH
Two 0.3 s flash, 2 s pause	101 -- 200	PUSH, PULL
Three 0.3 s flash, 2 s pause	201 --	PUSH, PULL-600

When the learn button is pressed the status LED starts to blink and will not stop until learn is concluded.

Note! If no floor door stop is mounted, stop the door in required opening position.

The learn cycle starts with sensor detection, during which the door will stand still. When the door starts moving the spring tension and door inertia are measured and the door open and close position is saved. When the learn is concluded the back-check, latch-check, opening time and closing time are calculated. The changed settings affect the behavior of the installation and must be verified.



13.4.2 Double doors

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

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

13.5 General adjustment

- Set the hold open time with the potentiometer on the control unit.
- Adjust the opening speed (OPSP). Turning clockwise increases the speed.
- Adjust the closing speed (CLSP). Turning counter-clockwise decreases the speed.
- Connect the required activation units.
- Check that the installation complies with AHJ (Authority Having Jurisdiction).

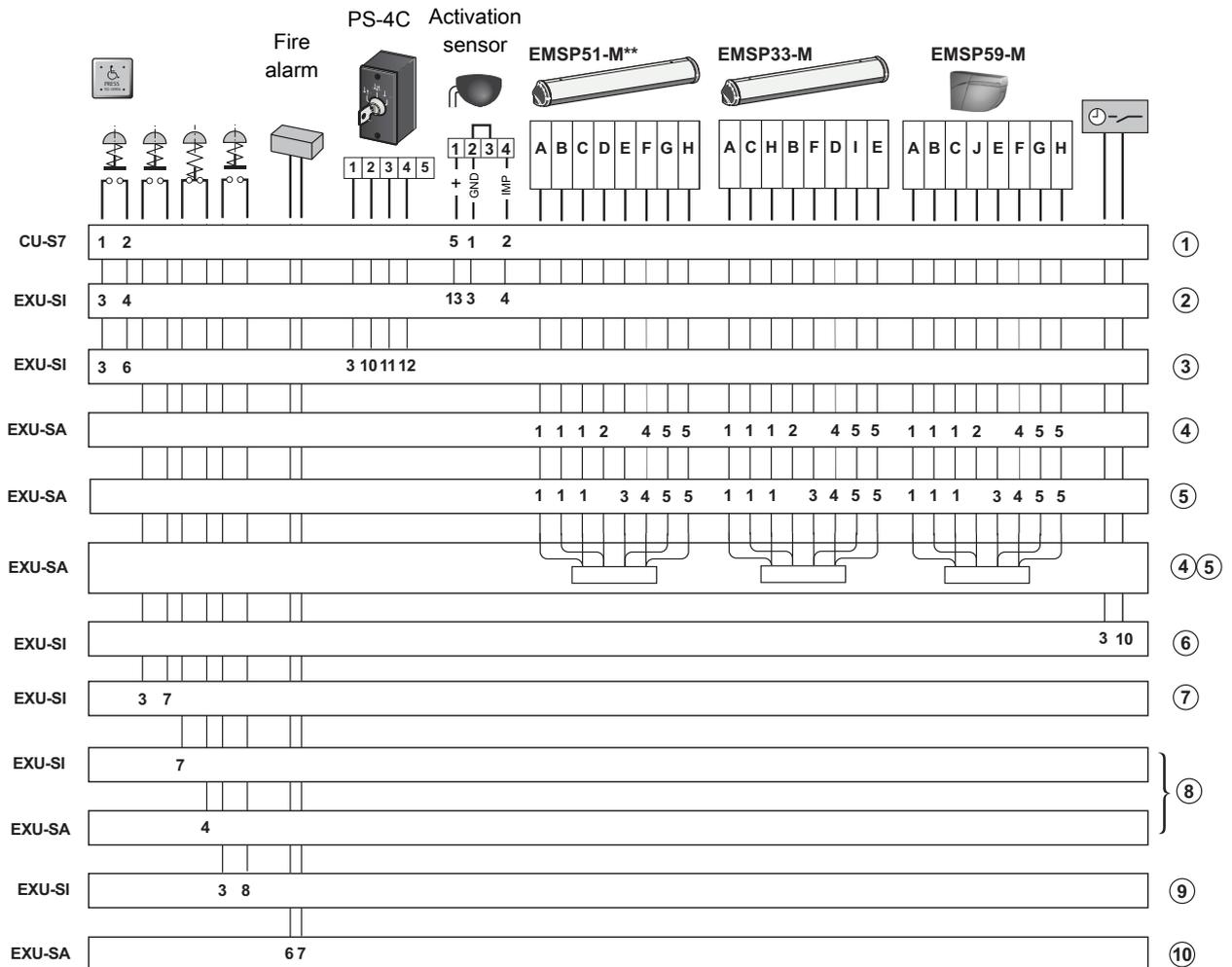
13.6 Connection of activation units and accessories

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

Door mounted

When sensors are used in order to avoid contact with the door leaf it is required that the presence detect sensor and the presence impulse sensor fulfills Performance Level = c according to EN ISO 13849-1. These sensors shall also be monitored (tested) by EM PSW250 door operator.

** Note! When using the quick connector, opening and closing side will be reversed.
 Configure sensor EMSP33-M:
 DIP A7 to ON (for Master sensor)
 DIP B4 to ON for Presence impulse
 DIP B4 to OFF for presence detection



- | | |
|--|----------|
| ① Inner impulse | A Brown |
| ② Outer impulse | B Yellow |
| ③ Key Impulse | C Pink |
| ④ Presence impulse | D Violet |
| ⑤ Presence detection | E White |
| ⑥ Off | F Blue |
| ⑦ Kill impulse NO | G Red |
| ⑧ Kill impulse NC, fire alarm, smoke detector | H Green |
| ⑨ Fire alarm reset | I Black |
| ⑩ External fire alarm (Select 12, 24 or 48 VDC, see page 84) | J Grey |

14 Cover

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

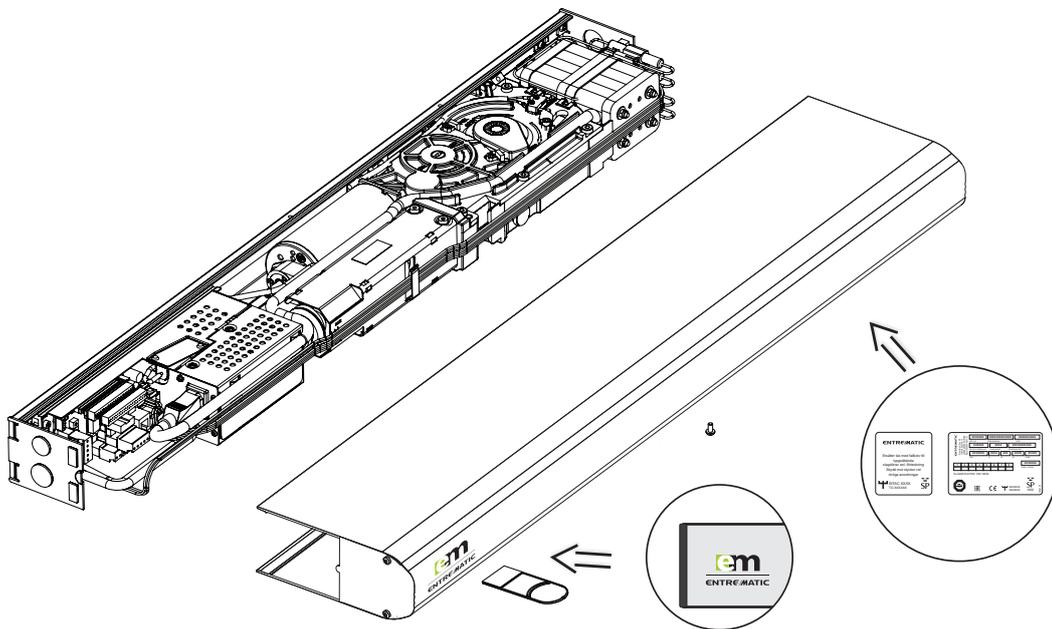
14.1 Fitting and removing the cover

The cover is slid over flanges in the back plate so that the ridges fit in the grooves. Snap on the fill cover into the slot for output shaft. Secure cover with the screw.

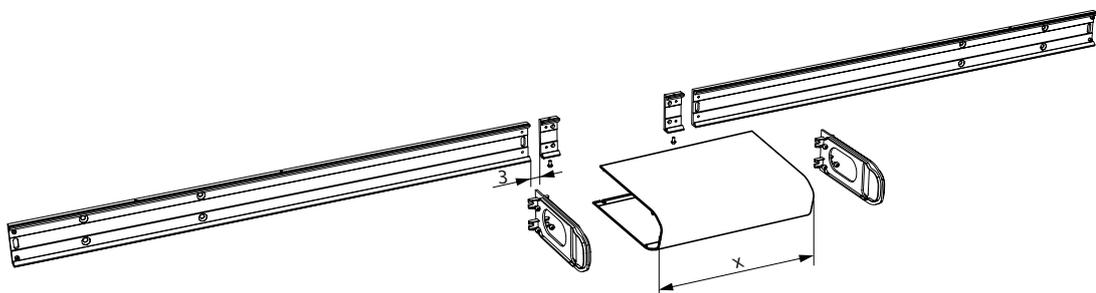
When properly installed and adjusted, attach the product label, which includes the CE mark on the right side of the lower part of the operator cover (see illustration).

Apply the EM logotype to the cover – see illustration.

Only for SE: Apply the SITAC label next to the product label - see illustration.



14.2 Cover piece kit



	X
Single door	CL-843.5
Double door	CL-1682

15 Signage



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.

(A)	Product label: Mandatory
(B)	Emergency break-out: Mandatory, if approved for escape route.
(C)	Entrematic Nordic door sticker: Mandatory according to Entrematic Nordic brand instructions, European directives and equivalent national legislation outside the European Union, to highlight the presence of the glass.
(D)	Supervision of child (applied to both sides of the door): Mandatory according to national regulations. Recommended, if the risk analysis shows use by children.
(E)	Operator designed for disabled people: Recommended, if applicable (applied to both sides of the door).
(F)	Activation by disabled people: Recommended, if applicable.
(G)	No entry, identifying one-way traffic: Mandatory in GB and US, if applicable, not included in the product.
(H)	SITAC label: Mandatory in SE

16 Advanced settings

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

See the prerequisites for performing a “learn” in section Auto-learn-automatically sets back and latch check (recommended) on page 73.

- a Push the button once as for auto-setting.
The status LED starts to blink. Same as for auto-setting.
- b Stop the door at required open position.
- c The door reverts towards closed position.
- d Stop the door at required latch-check position.
- e The door reverts to learn the back check.
- f Stop the door at required back check.
- g Remove the stop.
- h The door reverts to closed position.

16.2 Revert to default values for “back- and latch-check” (Level 1)

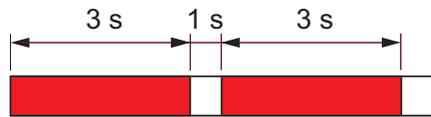
- a Disconnect batteries if any.
- b Disconnect the mains.
- c Press the LEARN BUTTON (LRN) and keep it depressed.
- d Connect the mains.
- e Watch the ERROR LED.



- f Release the LEARN BUTTON after 1 flash (LED is out).
- g The BACK CHECK, LATCH CHECK and OPEN POSITION have now reverted to default values.
- h Disconnect the mains.
- i Next time the mains is connected, a new learn is needed to be run, and the operator will use the default values.

16.3 Changing group of parameters (Level 2)

- a Disconnect batteries if any.
- b Disconnect the mains.
- c Press the LEARN BUTTON (LRN) and keep it depressed.
- d Connect the mains.
- e Watch the ERROR LED.



- f Release the LEARN BUTTON after 2 flashes (LED is out).
The ERROR LED flashes a number of short flashes that corresponds to the parameter group number (see table). After a short pause the LED will repeat the group number, and so on.
- g Pushing the LEARN BUTTON once, increases the parameter group number. When the highest parameter group number is reached it will start with number 1 (default) again.
- h Push the button until you get the requested parameter group. Ensure that the requested group of parameters has been selected by counting the number of flashes.
- i Disconnect the mains.
- j Next time the mains is connected, the operator will use the new group of parameters.

Parameter/ Group	1 (default)	2	3	4	5	6	7	8	9	10
OPEN/CLOSE HOLD OPEN TIME	15 minutes	Infinite	15 minutes	15 minutes	15 minutes	15 minutes	15 minutes	15 minutes	15 minutes	15 minutes
Battery mode	Power save	Power save	Convenience	Power save	Power save	Power save	Power save	Power save	Power save	Convenience
KILL mode	Locked during KILL	Locked during KILL	Locked during KILL	Lock follows program selector during KILL	Locked during KILL	Locked during KILL	Locked during KILL	Locked during KILL	Lock follows program selector during KILL*	Locked during KILL
OBSTRUCTION mode¹⁾	Door closer	Door closer	Door closer	Door closer	Reverses when obstructed	Door closer	Door closer	Door closer	Door closer	Reverses when obstructed
DOUBLE EGRESS mode	Separate presence detection	Separate presence detection	Separate presence detection	Separate presence detection	Separate presence detection	Common presence detection	Separate presence detection	Separate presence detection	Separate presence detection	Separate presence detection
LOCK RETRY²⁾	On	On	On	On	On	On	Off	On	On	On
OPEN/CLOSE impulse	In AUTO mode	In AUTO mode	In AUTO mode	In AUTO mode	In AUTO mode	In AUTO mode	In AUTO mode	In OFF, EXIT and AUTO mode	In AUTO mode	In AUTO mode
KILL Impulse Configuration²⁾	Normally Open	Normally Open	Normally Open	Normally Open	Normally Open	Normally Open	Normally Open	Normally Open	Normally Closed Monitored	Normally Open
Relay²⁾	Error indication	Error indication	Error indication	Error indication	Error indication	Error indication	Error indication	Error indication	Error indication	Error indication
Double acting²⁾	No	No	No	No	No	No	No	No	No	No

* The lock unlocks at impulse during KILL in EXIT mode.

1) If set to REVERSES WHEN OBSTRUCTED, the operator re-opens when obstructed, similar to a presence impulse.

2) In double door installations, for SLAVE this parameter will follow the parameter group chosen at the SLAVE, regardless MASTER config.

In the default setting, if there is a bind with the strike plate when the door is closing the door will try to close two extra times in automatic operation, OFF or EXIT mode and once in manual operation. This function can be switched off (see "LOCK RETRY" and parameter group 7), and in a double-door application SLAVE must be configured separately (see note 2) about why.

Parameter/ Group	11	12	13	14	15	16	17	18	19	20	21
OPEN/CLOSE HOLD OPEN TIME	15 minutes	15 minutes	15 minutes	15 minutes	Infinite	Infinite	15 minutes	15 minutes	15 minutes	15 minutes	15 minutes
Battery mode	Power save	Power save	Power save	Power save	Convenience	Convenience	Power save	Convenience	Power save	Power save	Convenience
KILL mode	Unlocked during KILL	Unlocked during KILL	Locked during KILL	Unlocked during KILL	Locked during KILL	Locked during KILL	Unlocked during KILL	Lock follows prog. Selector during KILL*	Unlocked during KILL	Unlocked during KILL	Unlocked during KILL
OBSTRUCTION mode ¹⁾	Door closer	Door closer	Door closer	Door closer	Reverses when obstructed	Reverses when obstructed	Reverses when obstructed	Reverses when obstructed	Door closer	Reverses when obstructed	Door closer
DOUBLE EGRESS mode	Separate presence detection	Separate presence detection	Separate presence detection	Separate presence detection							
LOCK RETRY ²⁾	On	On	On	On							
OPEN/CLOSE impulse	In AUTO mode	In AUTO mode	In AUTO mode	In AUTO mode	In OFF, EXIT and AUTO mode	In OFF, EXIT and AUTO mode	In AUTO mode	In AUTO mode	In AUTO mode	In AUTO mode	In AUTO mode
KILL Impulse Configuration ²⁾	Normally Open	Normally Closed Monitored	Normally Closed Monitored	Normally Closed Monitored	Normally Open	Normally Closed Monitored	Normally Closed Monitored	Normally Closed Monitored	Normally Closed Monitored	Normally Closed Monitored	Normally Closed Monitored
Relay ²⁾	KILLout	KILLout	KILLout	Lock	Lock	Lock	Error indication	Error indication	Error indication	Error indication	Error indication
Double acting ²⁾	No	Yes	Yes	Yes							

* The lock unlocks at impulse during KILL in EXIT mode.

1) If set to REVERSES WHEN OBSTRUCTED, the operator re-opens when obstructed, similar to a presence impulse.

2) In double door installations, for SLAVE this parameter will follow the parameter group chosen at the SLAVE, regardless MASTER config.

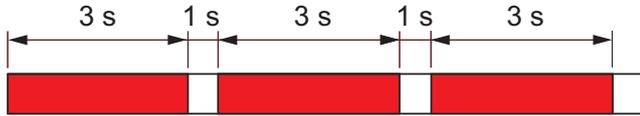
In the default setting, if there is a bind with the strike plate when the door is closing the door will try to close two extra times in automatic operation, OFF or EXIT mode and once in manual operation. This function can be switched off (see "LOCK RETRY" and parameter group 7), and in a double-door application SLAVE must be configured separately (see note 2) about why.

Note! If relay output is used for Lock even at SLAVE, use parameter group 15 in SLAVE.

In double door installations with Double Acting, SLAVE must have same parameter group as MASTER.

16.4 Classification (Level 3)

- a Disconnect batteries if any.
- b Disconnect the mains.
- c Press the LEARN BUTTON (LRN) and keep it depressed.
- d Connect the mains.
- e Watch the ERROR LED.



- f Release the LEARN BUTTON after 3 flashes (LED is out).
- g Identify the current classification
The ERROR LED flashes an amount of short flashes that correspond to the classification number. After a short pause the LED will repeat the classification number and so on.
- h Changing the classification
If you push the LEARN BUTTON once, the classification number will increase. When you have reached the highest classification number it will start at number one again.
 - Push the button until you get the requested classification
 - Disconnect the mains
Next time the mains is connected, the operator will use the new classification.

i Classification table

Classification	1	2
	Full power(Default)	Low energy
Standard		EN 16005
Opening speed	2.5 - 12 s	Automatic limitation 1.69 J
Closing speed	4 - 12 s	Automatic limitation 1.69 J

The fastest setting of Opening Speed and Closing Speed are automatically limited to the value in the table, and can only be reduced.

If classification 2, Low energy, is used the operator will automatically follow the speed limitation in EN 16005.

The learn procedure must be carried out after a change of the classification setting.

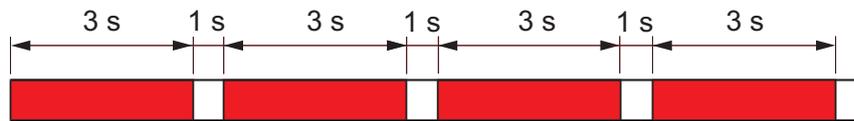
Speed settings for Low energy mode

The table shows minimum opening time to back check or to 80° open or minimum closing time from 90° to 10° open.

Width of door leaf (mm)	Door mass (kg)				
	50	60	70	80	90
	Time (s) min				
750	3,0	3,2	3,2	3,3	3,5
850	3,1	3,1	3,2	3,4	3,6
1000	3,2	3,4	3,7	4,0	4,2
1200	3,8	4,2	4,5	4,8	5,1

16.5 Overhead Presence Detection and Interlock (Level 4)

- a Disconnect batteries if any.
- b Disconnect the mains.
- c Press the LEARN BUTTON (LRN) and keep it depressed.
- d Connect the mains.
- e Watch the ERROR LED.



- f Release the LEARN BUTTON after 4 flashes (LED is out).
- g Identify the current monitoring
The ERROR LED flashes an amount of short flashes that correspond to the status number. After a short pause the LED will repeat the status number and so on.
- h Changing the status
If you push the LEARN BUTTON once, the status number will increase. When you have reached the highest status number it will start at number one again.

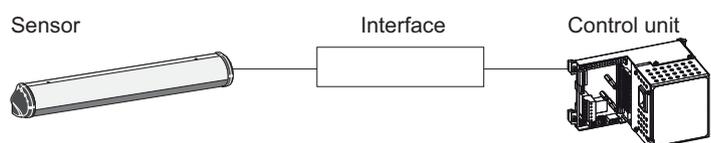
Level 4:	1 (Default)	2	3	4	5	6
OPD-monitoring	OFF	ON	OFF	OFF	OFF	OFF
Interlock*	OFF	OFF	Slave (Locked)	Slave (Closed)	Master (Locked)	Master (Closed)

* Interlock cannot be used together with OPD-sensors. If (Locked) is used the operator must be in EXIT or OFF mode.

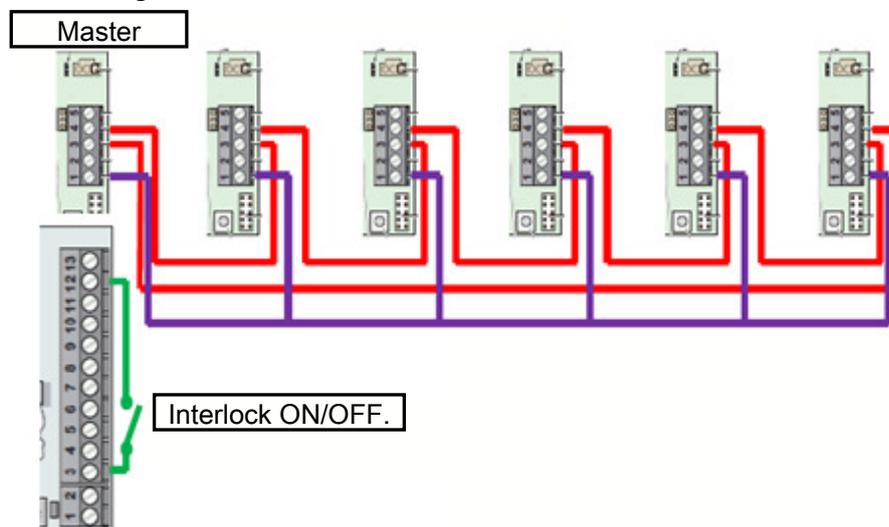
- Disconnect the mains
- Next time you connect the mains the operator will use the new status setting.

- i Recommended settings for sensor SP34-M

Sensor dip switch settings
 Dip 1 = ON
 Dip 2-8 = OFF
 Interface dip switch settings
 Dip 1, 4 and 7 = OFF
 Dip 2, 3, 5, 6 and 8 = ON



- j Interlocking connections



16.6 Enhanced Lock Kick, Fire Input and Extended Arm Selection (Level 5)

- a Disconnect batteries if any.
- b Disconnect the mains.
- c Press the LEARN BUTTON (LRN) and keep it depressed.
- d Connect the mains.
- e Watch the ERROR LED.



- f Release the LEARN BUTTON after 5 flashes (LED is out).
- g Identify the current lock kick status
The ERROR LED flashes an amount of short flashes that correspond to the status number. After a short pause the LED will repeat the status number and so on.
- h Changing the status
If you push the LEARN BUTTON once, the status number will increase. When you have reached the highest status number it will start at number one again.

Level 5:	1 (Default)	2	3	4	5	6
Lock-Kick Type	Basic	Enhanced	Basic	Enhanced	Basic	Enhanced
Fire-input **	OFF	OFF	12V	12V	24V	24V
Arm Selection	Basic	Basic	Basic	Basic	Basic	Basic
	7	8	9	10	11	12
Lock-Kick Type	Basic	Enhanced	Basic	Enhanced	Basic	Enhanced
Fire-input	48V	48V	OFF	OFF	12V	12V
Arm Selection	Basic	Basic	Extended	Extended	Extended	Extended
	13	14	15	16		
Lock-Kick Type	Basic	Enhanced	Basic	Enhanced		
Fire-input	24V	24V	48V	48V		
Arm Selection	Extended	Extended	Extended	Extended		

** When Fire-input is used all other configuration has to be done before selection of 12V, 24V or 48V.

Basic Arm Selection		Extended Arm Selection
PUSH	00	-
PULL	10	PULL-600, 250 mm, -20-230
PULL-220	01	PULL-600, 420 mm, -20-230
Sliding PUSH	11	-

- Disconnect the mains
Next time the mains is connected, the operator will use the new status setting.

Fire Alarm signal, U_f, shall be selectable among: OFF, 12 VDC, 24 VDC and 48 VDC. U_f shall be interpreted as ok, no fire alarm, in the following range: 0,85 x U_f to 1,2 x U_f. Reset same as KILL RESET.

17 Guide for installation and adjustments

17.1 Complementary Safety Devices Swing Doors

If there is any risk for finger jam, add finger protection strip at the hinge side for internal doors, article No. 833334 or add finger protection roll for external doors, article No. 833333.

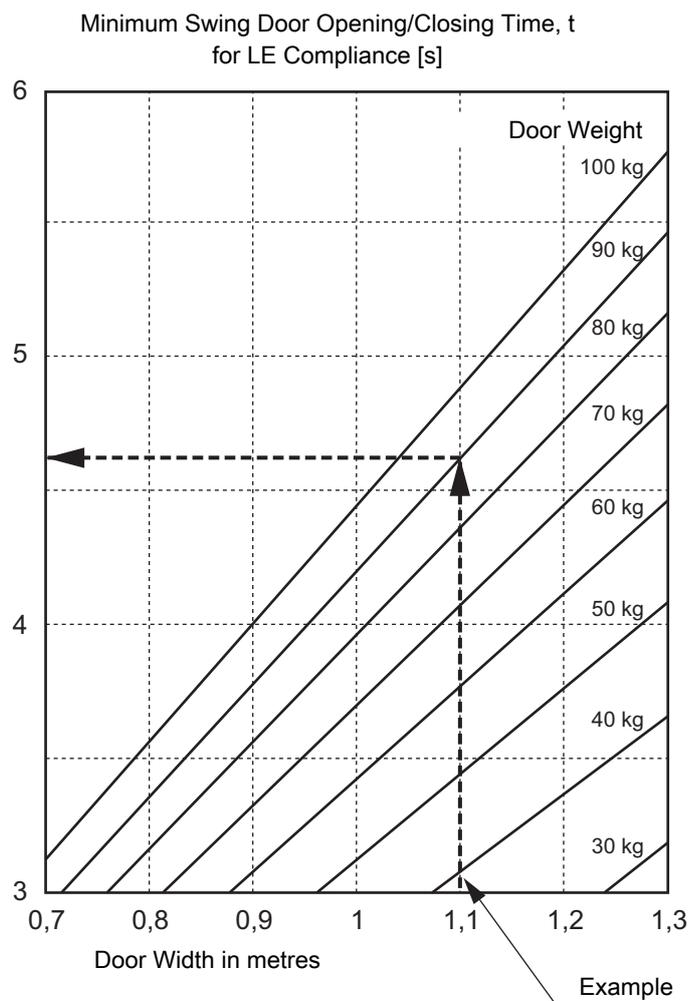
17.2 Swing Doors Opening and Closing Time

Adjust, as a minimum, the operator's opening and closing time according to the diagram below.

17.2.1 How to find the correct opening and closing time

- Measure the door width.
- If the door weight is unknown, follow the instructions in "Diagrams for door weight".
- Go into the diagram below to find the correct minimum opening/closing time "t".

Example: If the door width is 1,1 m and the door weight is 80 kg the minimum opening and closing time will be ~4,3 seconds.



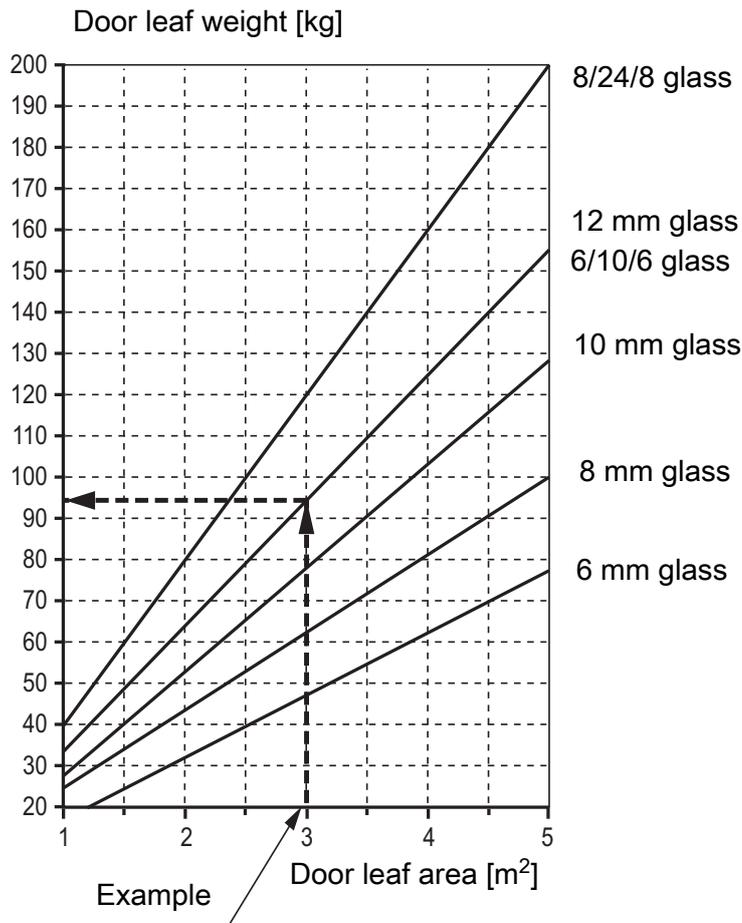
17.3 Diagrams for Door weight

- Measure the door width (DW) and the door height (DH) in metres for one door leaf only.
- Calculate the area $DW \times DH$.
- Select diagram for your type of door and the actual glass thickness. Find the weight.

Example: Aluminium door with measurement $DW = 1.5\text{ m}$, $DH = 2\text{ m}$ and glass thickness 12 mm. Calculate $1.5 \times 2 = 3\text{ m}^2$. Look into the first diagram for “Aluminium Frame with glass”. Start with the area and follow the line up to the 12 mm glass, go left to receive the door weight 95 kg.

Note! The weights can vary depending on the door design (the table shows only typical values).

17.3.1 Aluminium frame with glass



18 Troubleshooting

Fault	Possible reasons why	Remedies/Explanations
The door does not open The motor does not start	Control switch is set to OFF	Change the setting of the control switch
	Electrical power is missing	Check the electrical power power switch
	Activation unit does not function	Strap impulse inputs
	Presence detection is activated	Check that there are no objects in the detection zone
The motor starts but the door does not open	KILL activated	Deactivate KILL
	Mechanical lock is locked	Unlock the lock
	Something jammed beneath the door	Remove object
	Electric striking plate is binding	Select lock release Adjust striking
The door does not close	Arm system has come loose	Use the tool and the nib, put the door in required open position. Tighten the arm system.
	Control switch is set to HOLD OPEN	Change the setting of the OFF/AUTO/OPEN switch
	Presence impulse is activated	Remove objects in the detection zone
The door does not close	Something jammed beneath the door	Remove object

18.1 Error indication

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

LED flash frequency/Display message	Reason	Remedy
One 0.3 s flash, 10 s pause etc.	Kill impulse is active	Make a kill reset, reset kill switch or reset fire alarm
One 0.3 s flash, 2 s pause etc.	+ 24 V DC external error	Check for short circuit
	Sensor monitoring error	Check for broken monitored sensor
Two 0.3 s flashes, pause etc.	Battery defective	Replace battery (normal operation with electrical mains). If Battery Monitoring DIP is ON, then probably a reset of this is needed (after changed batteries), see section 5.5.6.)
Three 0.3 s flashes, pause etc.	Control unit or Transmission unit defect	Replace control unit or Transmission unit
Four 0.3 s flashes, pause etc.	Encoder error	Check the encoder cable. Open and close the door manually and thereafter check the automatic function. If the operator is still out of function replace the drive unit.
Five 0.3 s flashes, pause etc.	Locking device defective or lock with too high current draw	Check for e.g. short circuit in the locking device Replace locking device
	EXU-SI board defective	Replace EXU-SI board
Six 0.3 s flashes, pause etc.	Sync cable not connected or defective (double door only)	Connect the sync cable
		Replace the sync cable
Seven 0.3 s flashes, pause etc.	SLAVE control unit defective (double door only)	Check the flash frequency on the SLAVE LED and take necessary measures in accordance with this table.
Eight 0.3 s flashes, pause etc.	Motor overheated	Wait for the motor to cool down
Nine 0.3 s flashes, pause etc.	Blocked door and constant impulse	Toggle impulse
Ten 0.3 s flashes, pause etc.	Settings have been made that requires a new learn or opening angle out of spec (80-110°)	Make a new learn or adjust opening angle to be inside spec
Twelve 0.3 s flashes, pause etc.	Motor connected to wrong socket or wrong arm system configured on AS-dips.	Disconnect mains and then correct motor connection and correct arm systems dips.
Thirteen 0.3 s flashes pause etc.	Interlock error	Check Interlock Connection

19 Service/Maintenance

Regular inspections shall be made according to national regulations and product documentation by an Entrematic Nordic-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.

As with all other technical products, an automatic door needs maintenance and service. It is essential to know the importance of maintenance to have a reliable and safe product.

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

The "Service Log Book" shall be used together with the "Site Acceptance Test and Risk Assessment" document provided. Keep both documents available for maintenance and service records.

The table below shows the recommended interval in months, when to replace parts during preventive maintenance.

Part	Part number	Cycles/hour in operation			Abusive Environment
		<10	<100	>100	
		Low traffic	Medium traffic	High traffic	
Adaptor kit	330000484BK/SI	24	12	6	6
PUSH arm service kit	330000485BK/SI	24	12	6	6
PULL slim service kit	330000486BK/SI	24	12	6	6
Micro switch kit	330000488	24	12	6	6
Stop arm kit	330000489	24	12	6	6
Battery*	33738753	24	24	24	24
Transmission unit PSW250 Fire PUSH	330000487PUSH	60	60	60	60
Transmission unit PSW250 Fire PULL	330000487PULL	60	60	60	60
Transmission unit PSW250 Fire (not for use in DE, GB and SE)	330000487F	60	60	60	60
Control unit CUS7 without EXU-boards	331011678	60	60	60	60
EXU-SI kit for security & impulse	331003554	60	60	60	60
EXU-SA kit for safety	331003557	60	60	60	60

* Disconnect mains when replacing battery.

Risk of battery explosion if wrong type of battery is used. If Battery Monitoring DIP is ON, then a reset of this is needed (after changed batteries), see page 16.

ENTRE//MATIC

Entrematic Nordic AB, Lodjursgatan 10, SE-261 44 Landskrona, Sweden

Tel: +46 10 47 48 300

www.entrematic.com • info.em@entrematic.com