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1 Revision

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<tr>
<td>10</td>
<td>Updated illustration with arm.</td>
</tr>
<tr>
<td>11</td>
<td>Added this new section.</td>
</tr>
<tr>
<td>19</td>
<td>Updated Art. No., texts and illustration with arm.</td>
</tr>
<tr>
<td>19</td>
<td>Added PUSH-335.</td>
</tr>
<tr>
<td>20</td>
<td>Updated Art. No., texts and illustration with arm.</td>
</tr>
<tr>
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<td>Updated illustration with arm.</td>
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<td>29</td>
<td>Updated illustration with arm.</td>
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<td>30</td>
<td>Changed “PUSH-325” to ”PUSH-335” and updated illustration with arm.</td>
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<td>Updated dimension.</td>
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<td>Updated illustration with arm.</td>
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<td>35</td>
<td>Updated illustration with arm.</td>
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<td>36</td>
<td>Updated illustration with arm.</td>
</tr>
<tr>
<td>38</td>
<td>Updated illustration with arm.</td>
</tr>
<tr>
<td>39</td>
<td>Updated illustration with arm.</td>
</tr>
<tr>
<td>40</td>
<td>Updated illustration with arm.</td>
</tr>
<tr>
<td>41</td>
<td>Updated illustration with arm.</td>
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<td>38</td>
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<td>Updated illustration.</td>
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<td>Updated illustration with arm.</td>
</tr>
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<td>63</td>
<td>Updated illustration with arm.</td>
</tr>
<tr>
<td>64</td>
<td>Updated illustration with arm.</td>
</tr>
<tr>
<td>66</td>
<td>Updated illustration with arm.</td>
</tr>
<tr>
<td>67</td>
<td>Added the fault for ”1 flashing LED”.</td>
</tr>
<tr>
<td>68</td>
<td>Updated Art. No. for PUSH and PULL/PULL-220 service kit and added PUSH-335.</td>
</tr>
</tbody>
</table>
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 age 8 and above, and persons with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, if they have been given supervision or instruction by a person responsible for their safety concerning safe operator use and the possible hazards involved. This does not however prevent those persons to use the door where the operator is installed.
- Cleaning and user maintenance shall not be made by children without supervision.
- Do not let children climb on or play with the door or the fixed/remote controls.
- In all instances, where work is being done, the area is to be secured from pedestrian traffic, and the power removed to prevent injury.
- 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 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 EMSW.

The EM EMSW is an automatic swing door operator developed to facilitate entrances to buildings and within buildings through swing doors. The EM EMSW is an electrohydraulic 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 breakout in this direction.

These operators shall be connected to a fire alarm system, see section 11.1, 14.2 or 14.3.

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

For use see User manual 1004131.

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 Group-trained technicians should be allowed to carry out these operations.
3.3 Electronic equipment reception interference

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

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

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

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

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

3.4 Environmental requirements

Entrematic Group 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 specification

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

<table>
<thead>
<tr>
<th>Manufacturer:</th>
<th>Entrematic Group AB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address:</td>
<td>Lodjursgatan 10, SE-261 44 Landskrona, Sweden</td>
</tr>
<tr>
<td>Type:</td>
<td>EM EMSW</td>
</tr>
<tr>
<td>Mains power supply:</td>
<td>230 V AC ±10%, 50 Hz, mains fuse max 10A</td>
</tr>
<tr>
<td><strong>Note!</strong> The mains power 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.</td>
<td></td>
</tr>
<tr>
<td>Power consumption:</td>
<td>Max. 230 W (Max 460 W Double door set)</td>
</tr>
<tr>
<td>Auxiliary voltage:</td>
<td>24 V DC, 700 mA (stabilized)</td>
</tr>
<tr>
<td>Motor fuse F1:</td>
<td>6,3 AT</td>
</tr>
<tr>
<td>Control fuse F2:</td>
<td>250 mAT</td>
</tr>
<tr>
<td>Door weight:</td>
<td>Max 250 kg</td>
</tr>
<tr>
<td>Door width:</td>
<td>Max 1600 mm</td>
</tr>
<tr>
<td>Max. Inertia J:</td>
<td>For PUSH = 80 kg m$^2$</td>
</tr>
<tr>
<td></td>
<td>For PULL = 28 kg m$^2$</td>
</tr>
<tr>
<td></td>
<td>Inertia = Door weight x (Door width)$^2$ / 3</td>
</tr>
<tr>
<td>The EM EMSW complies with the door weights/widths stated in the:</td>
<td>Controlled door closing, EN 1154 Table I, size 3-6</td>
</tr>
<tr>
<td></td>
<td>Coordination unit for rebated doors, EN 1158</td>
</tr>
<tr>
<td></td>
<td>Türschliesser mit Öffnungautomatik (Drechflügelantrieb), DIN 18263-4 AU Grösse 3-6</td>
</tr>
<tr>
<td>Safety requirements:</td>
<td>In compliance with DIN 18650–1/2</td>
</tr>
<tr>
<td>Ambient temperature:</td>
<td>-15°C to +30°C</td>
</tr>
<tr>
<td>Relative humidity:</td>
<td>max. 85%</td>
</tr>
<tr>
<td>Dimensions:</td>
<td>Length: EM EMSW (standard cover) 716 mm</td>
</tr>
<tr>
<td></td>
<td>EM EMSW-SPEC 750--1600 mm</td>
</tr>
<tr>
<td></td>
<td>EM EMSW-2 1435--3200 mm</td>
</tr>
<tr>
<td></td>
<td>Height: 110 mm</td>
</tr>
<tr>
<td></td>
<td>Depth: 110 mm</td>
</tr>
<tr>
<td>Degree of protection:</td>
<td>IP20</td>
</tr>
<tr>
<td>Degree of protection, control actuators:</td>
<td>IP54</td>
</tr>
<tr>
<td>Approvals:</td>
<td>Third party approvals from established certification organizations valid for safety in use, see Declaration of Incorporation.</td>
</tr>
</tbody>
</table>
This product is to be installed internally.

<table>
<thead>
<tr>
<th>Digit 1</th>
<th>Digit 2</th>
<th>Digit 3</th>
<th>Digit 4</th>
<th>Digit 5</th>
<th>Digit 6</th>
<th>Digit 7</th>
<th>Digit 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1,2,3</td>
<td>1,2,3,4</td>
<td>1,2,3,4</td>
<td>4</td>
</tr>
</tbody>
</table>

- **Type of drive, digit 1.**
  - 1 swing door drive

- **Drive durability, digit 2.**
  - 3 1 000 000 test cycles, at 4 000 cycles/day

- **Type of door leaf, digit 3.**
  - 1 swing door

- **Suitability for use as a fire protection door, digit 4.**
  - 2 suitable for use as a fire door

- **Drive safety devices, digit 5.**
  - 1 force limitation
  - 2 connection for external safety systems
  - 3 low energy

- **Special requirements for drives/functions/fittings, digit 6.**
  - 1 in escape routes with a break-out system
  - 2 in escape routes without a break-out system
  - 3 for self-closing fire protection doors with a break-out system
  - 4 for self-closing fire protection doors without a break-out system.

- **Safety at door leaf or leaves, digit 7.**
  - 1 with sufficiently dimensioned safety distances
  - 2 with protection to prevent fingers being crushed, shorn off or drawn in
  - 3 with integrated break-out unit
  - 4 with presence sensor

- **Ambient temperature, digit 8.**
  - 4 temperature range as specified by the manufacturer
4.1 Permitted door weight and door width

![Graph showing permitted door weight and door width]

- **J=80 kgm²**
- **J=28 kgm²**

Door weight (kg) vs. Door width (m) graph for PUSH and PULL arm configurations.
5 How the EM EMSW works

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

5.1 Opening

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

5.2 Closing

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

5.3 Functions on the Control Unit CSDB

5.3.1 Key Impulse

Key impulse will open the door in programme selection OFF, EXIT and AUTO and keep the door open during key hold open time.

Key hold open time can be adjusted between 0-30 sec.

5.3.2 Outer impulse

Outer impulse will open the door if programme selection is AUTO and keep the door open during the outer hold open time, which can be adjusted between 0-30 s.
5.3.3 Multi Voltage Input (MVI)

MVI impulse accepts a potential-free contact or 6-24 V AC/DC.

Status of lock (operation mode) can be selected via a function selector FS2 and depends on input TB2:11 and 13.

<table>
<thead>
<tr>
<th>FS-2 = OFF (factory setting)</th>
<th>FS-3 = OFF (factory setting)</th>
<th>TB2:11 and 13</th>
<th>TB2:11 and 13</th>
<th>TB2:11 and 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSDB (No PS)</td>
<td>AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
</tr>
<tr>
<td>EXB OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>EXB EXIT</td>
<td>EXIT</td>
<td>EXIT</td>
<td>EXIT</td>
<td>EXIT</td>
</tr>
<tr>
<td>EXB AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
</tr>
<tr>
<td>EXB OPEN</td>
<td>OPEN</td>
<td>OPEN</td>
<td>OPEN</td>
<td>OPEN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FS-2 = OFF (factory setting)</th>
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</tr>
</thead>
<tbody>
<tr>
<td>CSDB (No PS)</td>
<td>AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
</tr>
<tr>
<td>EXB OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>EXB EXIT</td>
<td>EXIT</td>
<td>EXIT</td>
<td>EXIT</td>
<td>EXIT</td>
</tr>
<tr>
<td>EXB AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
<td>AUTO</td>
</tr>
<tr>
<td>EXB OPEN</td>
<td>OPEN</td>
<td>OPEN</td>
<td>OPEN</td>
<td>OPEN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FS-2 = OFF (factory setting)</th>
<th>FS-3 = ON</th>
<th>TB2:11 and 13</th>
<th>TB2:11 and 13</th>
<th>TB2:11 and 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSDB (No PS)</td>
<td>OFF</td>
<td>Open door</td>
<td>Open door</td>
<td>Open door</td>
</tr>
<tr>
<td>EXB OFF</td>
<td>OFF</td>
<td>Open door</td>
<td>Open door</td>
<td>Open door</td>
</tr>
<tr>
<td>EXB EXIT</td>
<td>EXIT</td>
<td>Open door</td>
<td>EXIT</td>
<td>Open door</td>
</tr>
<tr>
<td>EXB AUTO</td>
<td>AUTO</td>
<td>Open door</td>
<td>AUTO</td>
<td>Open door</td>
</tr>
<tr>
<td>EXB OPEN</td>
<td>OPEN</td>
<td>Open door</td>
<td>OPEN</td>
<td>OPEN</td>
</tr>
</tbody>
</table>

* +6-24 V DC must be connected to TB2:13 and MVI jumper must be removed.

Programme selector must not be connected to TB2:13 if input is 6-24 V. Connect instead programme selector to EXB.

MVI impulse will unlock the lock and open the door or only unlock the lock (changes the operation mode of the operator). Can be selected via the function selector FS3.

MVI hold open time can be adjusted between 0-30 sec.
5.3.4 Kill Input

When kill is activated, the door will close immediately if not already closed. Hold open and low pass filter timers are reset.

Key impulse will open lock during activated kill if not connected to TB2:5 for 0 V DC.

When kill is deactivated, the door will act according to current input status.

Several kill inputs are possible to connect in parallel with other CSDB control units. Connect kill on the first operator according to the connection diagram. The second, third etc. operator is only to be connected in parallel, from terminal 5 to 5 and 6 to 6.

Kill function is selected via a function selector (Kill jumper).

As an alternative to the shown connection under Connection of activation units and accessories on page 50, an alarm loop 24 VDC can be connected to the CSDB connect +24 VDC to terminal 6 and 0 VDC to terminal 5.

5.3.5 Limit Switch Open

The limit switch indicates a fully open door and can be adjusted for opening angles up to 120º.

When the limit switch is activated the motor will stop. If the limit switch is not activated, the motor will stop after 14 sec.

If the limit switch is deactivated when the door is open, the motor will restart to reposition the door.

The LED indicates an activated limit switch.

Contact rating: 1A, 48 V DC, normally open.

5.3.6 Home Switch (optional)

When no home switch is mounted and the limit switch is deactivated in open position, a timer starts and after 6 sec the status will change from closing to closed door.

If the optional home switch is mounted, this will indicate closed door instead of the timer.

“Opening delay” for lock (0-3s) is ignored as soon as home switch is not activated.

“Slave delay” (0,5s) is ignored as soon as home switch for the master is not activated.

Presence impulse is ignored when home switch indicates a closed door within 6 seconds.

The LED indicates an activated home switch.

5.3.7 Lock output

The lock output is short circuit proof and can source a lock with 24V, 375 mA.

The output can be locked with power or locked without power. It can be selected via a function selector (Locked w. / w.o. power).

The lock activation time can be either 1,5 s + (opening delay) or until closing. It can be selected via a function selector (Lock time 1,5 s/until closing).

“Opening delay” for lock, the time that will pass before the motor starts, can be adjusted from 0-3 s.

If a home switch is installed, the lock opening time will first start when the home switch is deactivated. This to prevent door to jam in the lock, if presence detection is activated.
5.3.8 Double Door

The CSDB works as the master in a double door application and is connected to the slave unit CSDA-S.

The slave unit has a standard opening delay of 0.2 sec. The delay can be increased to 0.5 sec. to prevent jamming of thicker door leaves. This can be selected via a function selector (Slave Delay). Home switch is recommended to prevent delay during closing.

When there is a need for more power supply than a single CSDB can deliver, a second CSDB can be connected as a slave. The CSDB on the slave unit must then be configured as a slave. This can be selected via a function selector (Master / Slave).

To enable only one door to open, connect impulse parallel on both units. Slave door must have CSDB+EXB and the low pass filter potentiometer adjusted.

5.3.9 Push to Go

A push on the door will, from closed position, start an automatic opening cycle if the programme selection is AUTO or EXIT and remain open during the hold open time “Outer HOT” (0-30 s).

A home switch on the operator is needed to achieve Push to Go. Can be selected via a function selector (Push to Go).

The LED indicates when the home switch is active.

5.3.10 Error Messages

The LED indicates:

- Sensor error; 1 flash of 0.2 sec and then 1 sec pause etc.
- Lock error (too high current draw or short circuit); 1 flash of 0.2 sec and then 0.2 sec pause etc.
- CSDB defect; 3 or 4 flashes of 0.2 sec and 0.2 pause
- No slave connected and Slave monitoring jumper is missing; 7 flashes of 0.2 sec and 0.2 pause
- Slave connected but Slave monitoring jumper is not removed; 7 flashes of 0.2 sec and 0.2 pause
- Defect slave CSDA-S; 7 flashes of 0.2 sec and 0.2 pause
- Old slave connected and Slave monitoring jumper removed; 7 flashes of 0.2 sec and 0.2 pause

5.3.11 Programme Selector

A programme selector PS-3B, with three positions OFF-AUTO-OPEN, can be connected to the CSDB.

**Note!** If the MVI-input is used for 6-24 V, the PS-3B can not be used.

The key impulse is still valid in programme selection OFF.

Presence sensors are enabled in all programme selector settings but not when kill is active.

5.4 Functions on the Extension Unit EXB

5.4.1 Inner impulse

Inner impulse will open the door if programme selection is AUTO or EXIT and keep the door open during the hold open time.

The hold open time is adjustable from 0-30 sec.

5.4.2 Low Pass Filter (automatic cycle delay)

This function demands a constant inner impulse for a certain time to start an automatic cycle. The time can be adjusted from 0-5 sec.

During closing the door will reopen immediately if impulsed.
5.4.3 Presence Impulse

Presence impulse will prevent an open door from closing and will re-open a closing door and the control will make sure that the hold open time is not shorter than 1.5 s.

Presence impulse is ignored when home impulse is active.

Presence impulse is not a valid impulse if the door is manually opened.

Presence impulse is a valid impulse if the door is opened with Push to Go.

The input can be either “normally open” or “normally closed”, which can be selected via a function selector (Presence Impulse NO/NC).

5.4.4 Presence Detection

Presence Detection will prevent a closed door from opening and stop an opening door.

A blank out switch is used to blank out the sensor from seeing for instance a wall close to the open door. There can be two switches overlapping each other for the master door and two for the slave door.

Two LED’s indicate the blank out switch status. One LED for the master door and one for the slave door. The LED will light up if either of the two blanking switches is activated.

Presence detection can be selected via two function selectors, “Presence Detect Master” and “Presence Detect Slave”.

5.4.5 Sensor Monitoring

Test of Presence detection is performed before opening. Test of Presence impulse is performed before closing. The master sensors are tested first and the slave sensors are tested when the answer is received from master sensors.

If sensor test is not performed successfully the door will enter manual mode and report sensor error. The sensor test will continue during manual mode.

If no slave operator is present, when sensor monitoring is enabled, the “presence impulse slave” should be connected to “sensor test slave”.

It is only possible to monitor sensors with output of type normally closed (NC).

If the sensor error disappears during manual mode the door will re-enter automatic mode again.

Monitoring can be selected via a function selector (Presence Sensor Monitoring).

5.4.6 Overhead Presence Detection (OPD)

OPD impulse will prevent a closed door from opening and an open door from closing.

A moving door will ignore the OPD input. The OPD will be active 6 sec. after the door has started to close. If a home switch is mounted, the OPD will be active as soon as the door is closed.

OPD can be selected via a function selector (Sensor type OPD/Mat).

5.4.7 Mat Safety

Mat safety impulse will prevent a closed door from opening and an open door from closing.

No impulses are accepted during closing if mat is activated.

Mat safety can be selected via a function selector (Sensor type OPD/Mat).

5.4.8 LockOut

LockOut is used to ignore the OPD sensor during opening and closing. Output will be low when the door is considered closed, high during opening and open and toggling when the door is closing.

LockOut output will be low when the door is manually opened.
5.4.9 Programme selector

Programme selector PS-4C can be connected to the EXB.

The PS-4C, compared to PS-3B, has a fourth position EXIT that will make the CSDB ignore the outer impulse device.

Presence sensors are enabled in all programme selector settings but not when kill is active.
6 Models

One main model with standard cover is available of the EM EMSW. The operator are non-handed and not dependent on the hinges. The operator suits both pushing and pulling arm systems.

6.1 EM EMSW, standard cover (wall or door leaf mounted)

EM EMSW is the standard operator. Pushing arm system on a wall-mounted and on a door leaf-mounted operator shown.

**Wall mounted**

![Wall mounted diagram](AAD174)

**Door leaf mounted**

![Door leaf mounted diagram](ILL-01652)
### 7 Part identification & Accessories

#### 7.1 Arm systems, PUSH

![PUSH](image)

**Art. No. 1014113BK/SI**

It is used if the operator is installed on the wall on the opposite side of the door swing and approved for fire applications.

#### 7.2 Arm systems, PUSH-335

![PUSH-335](image)

**Art. No. 1011706BK/SI**

It is used if the operator is installed on the door leaf hinge side.

---

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mounting plate</td>
<td>10</td>
<td>Extension unit, EXB (option)</td>
</tr>
<tr>
<td>2</td>
<td>Motor/pump</td>
<td>11</td>
<td>End plate</td>
</tr>
<tr>
<td>3</td>
<td>Magnetic valve</td>
<td>12</td>
<td>Programme selector, PS-3B (option)</td>
</tr>
<tr>
<td>4</td>
<td>Hydraulic unit</td>
<td>13</td>
<td>Cover</td>
</tr>
<tr>
<td>5</td>
<td>Drive shaft</td>
<td>14</td>
<td>Bearing sleeve</td>
</tr>
<tr>
<td>6</td>
<td>Spring tube</td>
<td>15</td>
<td>Cable holder</td>
</tr>
<tr>
<td>7</td>
<td>Cable inlet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Mains connection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Control unit, CSDB</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CL1=</strong> Centre line, drive shaft</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>CL2=</strong> Centre line, hinge</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7.3 Arm system, PULL

**PULL**  
Art. No. 1011707BK/SI  
It is used if the operator is installed on the wall on the same side as the door swing.

7.4 Arm system, PULL-220

**PULL-220**  
Art. No. 1014114BK/SI  
It is used if the operator is installed on the wall on the same side as the door swing and when the door is 450-700 mm wide.

7.5 Arm system, ST-V / ST-H

ST-V, Art. No. 172312SI, 172313BK  
ST-H, Art. No. 172314SI, 172315BK  
**Note!** Door fitting not included.

It is used if the operator is installed on the wall on the same side as the door swing and break-out unit is required.

7.5.1 Options for ST-V / ST-H

**Door fitting standard**

Art. No.: 172071

**Door fitting Break-out**

Art. No. 172325 for pivot (break-out) door, **right** when the reveal A = 0-60 mm (0-2 3/8”) or **left** when A > 60-100 mm (>2 3/8”-3 15/16”) for ST-H/ST-V  
Art. No. 172327 for pivot (break-out) door, **right** when A > 60-100 mm (>2 3/8”-3 15/16”) or **left** when A = 0-60 mm (0-2 3/8”)

**Arm extension**

Art. No. 172320 required when the reveal A >60-100 mm (>2 3/8”-3 15/16”)
7.6 Further accessories

<table>
<thead>
<tr>
<th>4-Position Switch (with EXB) PS-4C</th>
<th>2-Position Switch PSW-2</th>
<th>3-Position Switch PS-3B</th>
<th>Extension unit EXB</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
</tr>
</tbody>
</table>

**Coordination unit, COOA**
Art. No. 100091

**PULL-Arm Reveal Spacer**
Art. No. 1014667BK/Si

**Middle piece kit**
Art. No. 1008385

**Finger protection strips**
Art. No. 833333
Art. No. 833334

**Cable kit slave**
Art. No. 656064

**PCB Attachment plate**
Art. No. 1003884

**Door stop**
Art. No. 100147

**PUSH, Arm Extensions**

<table>
<thead>
<tr>
<th>Reveal</th>
<th>Extension</th>
<th>Art. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-110 mm Up to 4-3/8&quot;</td>
<td>None (Standard arm) -</td>
<td>-</td>
</tr>
<tr>
<td>110-235 mm 4-3/8&quot; to 9-1/4&quot;</td>
<td>345 mm</td>
<td>173005BK/Si</td>
</tr>
<tr>
<td>235-360 mm 9-1/4&quot; to 14-1/8&quot;</td>
<td>230 mm + Joint part</td>
<td>173004BK/Si</td>
</tr>
<tr>
<td>360-485 mm 14-1/8&quot; to 19&quot;</td>
<td>345 mm + Joint part +</td>
<td>173005BK/Si</td>
</tr>
</tbody>
</table>

**Cable inlet**
Art. No. 1007567
**Drive Shaft Extension Kits**

- Art. No. 173107/173107SI
- Art. No. 173108/173108SI
- Art. No. 173109/173109SI

**Control unit, CSDA-F**

Art. No. 600081

**Drilling template**

Art. No. 1000219

**Tool kit to change rotation direction**

Art. No. 173719

**Restore after alarm button**

Art. No. 600090

**Limit Switch**

- Art. No. 655614 (L = 500 mm)
- Art. No. 1004205 (L = 2000 mm)

**Smoke Detector ORS 142**

Art. No. 738794

**Ceiling socket 143A**

for smoke detector
Art. No. 738795

**Ceiling socket 143W**

for smoke detector
Art. No. 738795

**Mounting plate**

<table>
<thead>
<tr>
<th>L (mm)</th>
<th>H (mm)</th>
<th>T (mm)</th>
<th>Art. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>125</td>
<td>6</td>
<td>173680</td>
<td></td>
</tr>
<tr>
<td>160</td>
<td>8</td>
<td>173661</td>
<td></td>
</tr>
</tbody>
</table>

**Door mounting kit**

(for door leaf mounted operators)
Art. No. 100132

**Shaft extension, SEK**

(including bearing for extension 70-420 mm)
Art. No. 173039
7.7 Labels

**Label kit** - including all below

Art. No. 1005227

- Emergency break-out, DIN right door
  Art. No. 1001785

- Emergency break-out, DIN left door
  Art. No. 1001786

- Activation by disabled people
  Art. No. 1003963

- Operator designed for disabled people
  Art. No. 1003964

- Supervision of child
  Art. No. 1001695
8 Pre-Installation

8.1 General tips/Safety concerns

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

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

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

8.2 Fastening requirements

<table>
<thead>
<tr>
<th>Base material</th>
<th>Minimum requirements of wall profile*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>5 mm **</td>
</tr>
<tr>
<td>Aluminium</td>
<td>6 mm **</td>
</tr>
<tr>
<td>Reinforced concrete</td>
<td>min. 50 mm from the underside</td>
</tr>
<tr>
<td>Wood</td>
<td>50 mm</td>
</tr>
<tr>
<td>Brick wall</td>
<td>Expansion shell bolt, min. M6x85, UPAT PSEA B10/25, min. 50 mm from the underside</td>
</tr>
</tbody>
</table>

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

** Thinner wall profiles must be reinforced with rivnuts.
8.3 Tools required

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

8.4 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/ST. The pushing arm system PUSH must always have a shaft extension, minimum 50 mm.

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

For installation follow the instructions for the applicable arm system.
8.5 Installation examples for fire approved doors

Illustrations below show examples of approved reinforcements when mounting a fireproof swing door operator.

**Note!** The type approval for fireproof swing doors is valid only with the arm system PUSH. Reveal max 480 mm and shaft extension max 70 mm.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Steel min. 50x5, L=min. 100, centered for mounting holes (4x)</td>
<td>6</td>
<td>Wood screw M6, KST, L=45 (2x)</td>
</tr>
<tr>
<td></td>
<td>This is a requirement with aluminium profiles.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Screw M6, FS-TT FZB, Taptite, L=40 (4x)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Steel min. 50x5, L=min. 150, centered at the arms length on the door.</td>
<td>7</td>
<td>Rivnut M6, FTT/ST, L=15,9 (4x)</td>
</tr>
<tr>
<td></td>
<td>This is a requirement with aluminium profiles.</td>
<td></td>
<td>Screw M6, FS-TT FZB Tabtite, L=40 (4x).</td>
</tr>
<tr>
<td></td>
<td>Screw M6, FS-TT FZB, Tabtite, L=40 (2x).</td>
<td></td>
<td>Rivnuts are only allowed to be used with steel profiles with thickness of min 1,5 mm.</td>
</tr>
<tr>
<td>3</td>
<td>Steel min. 50x5, L=min. 100, centered for mounting holes (4x)</td>
<td>8</td>
<td>Rivnut M6, FTT/ST, L=15,9 (2x)</td>
</tr>
<tr>
<td></td>
<td>This is a requirement with aluminium profiles.</td>
<td></td>
<td>Screw M6, FS-TT FZB, Tabtite, L=40 (2x).</td>
</tr>
<tr>
<td></td>
<td>Screw M6, FS-TT FZB, Tabtite, L=50 (4x) Distance piece Ø10/13</td>
<td></td>
<td>Rivnuts are only allowed to be used with steel profiles</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Expansion-shell bolt (4x)</td>
<td>9</td>
<td>Rivnut M6, FTT/ST, L=15,9 (4x)</td>
</tr>
<tr>
<td></td>
<td>(for brickwall min. M6x85, UPAT PSEA B 10/25)</td>
<td></td>
<td>Screw M6, FS-TT FZB, Tabtite, L=50 (4x) Distance piece Ø10/13.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rivnuts are only allowed to be used together with a plasterboard beam made of steel with a material thickness of min 1,5 mm.</td>
</tr>
<tr>
<td>5</td>
<td>Wood screw M6, KST, L=min. 70 (4x)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distance piece Ø10/13</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9 Mechanical installation

This instruction comprises the installation of the EM EMSW with arm systems PUSH, which push the door open and PULL / ST-V/H, which pull the door open. See also “QuickStart” which is enclosed with each operator.

9.1 Wall mounted operator with arm system PUSH

![Diagram of wall mounted operator with arm system PUSH]

Drilling template
Art. No. 1000219

ø 5,1 mm, 8x
Cont. “Wall mounted operator with arm system PUSH”

1. Marking the location of the installation
2. Preparatory work
3. Wall mounted operator with arm system PUSH
4. Insertion of the cable inlet hole
5. Installation of the arm system
6. Final adjustment of the operator
Cont. “Wall mounted operator with arm system PUSH”

Adjust +/– 1 tooth = ±5°

25 Nm
9.2 Door leaf mounted operator with arm system PUSH-335

CL1 Pivot or butt hinges
CL2 Operator drive shaft
1 Cable inlet at end plate
2 Door mounting kit, Art. No. 100132, optional
3 Reinforcements required in door leaf and at the fixing holes
9.3 Wall mounted operator with arm system PULL, PULL-220 and ST

Note! If the operator is not ordered for pulling arm system, the direction of rotation must be reversed.

9.3.1 Changing the direction of rotation
9.3.2 Installation of operator with arm system PULL

Top of door

Drilling template
Art. No. 1000219
(turnable)

1

Drilling template
Art. No. 1000219
ø 5,1 mm, 8x
Cont. “Installation of operator with arm system PULL”

3. (Cable inlet hole)

4. Connect mains power

5. Connect mains power
Cont. “Installation of operator with arm system PULL”
Cont. “Installation of operator with arm system PULL”
9.3.3 Installation of operator with arm system ST

1. Top of door

2. Outside open door

Drilling template
Art. No. 1000219

\(A > 60 - 100\) (Optional)

\(A = 0 - 60\)

\(\varnothing 5.1 \text{ mm}, 6x\)

Outside open door

Drilling template
Art. No. 1000219

\(\varnothing 5.1 \text{ mm}, 6x\)
Cont. “Installation of operator with arm system ST”

3

Outside open door

96

25

ø 16 mm (Cable inlet hole)

4

Outside open door

291

6x

ø 16 mm
Cont. “Installation of operator with arm system ST”

5

Connect mains power

6

Note, the way of mounting the arm!

7

143

Note, the way of mounting the arm!
Cont. “Installation of operator with arm system ST”

8

9

10

10a

10b

10c
Cont. “Installation of operator with arm system ST”

11

12
Cont. “Installation of operator with arm system ST”
10 Electrical connection

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

- Place the electric switch easily accessible from the operator. If a 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.

10.1 Control units

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

10.1.1 CSDB

This basic control unit is equipped with inputs for connection of automatic and manual activation units such as radars, photocells, normal push buttons, emergency push buttons etc. Electro-mechanical striking-plate and slave control unit CSDA-S for double doors can be connected.

10.1.2 CSDA-S

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

10.1.3 EXB

This extension unit is mounted on top of the CSDB to extend the CSDB functions with inputs for presence impulse, presence detection, inner impulse, off and exit.

10.1.4 CSDA-F

This unit is, together with CSDB, mainly used for fire doors. Electro-mechanical striking-plate 24 V AC can be connected.
10.2 Connection of control unit CSDB – single doors

Connect the mains power to the mains terminal block.

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

**Note!** It is important that the high and low voltage cables are well separated and fixed. The high voltage cables must be routed and fixed on one side of the drive unit by using the enclosed cable holders and the low voltage cables must be routed on the opposite side using the same type of cable holders.

---

1) See page 48 when connecting "Kill"
2) If 6-24 VDC on TB2: 11-13, remove jumper.
3) Remove jumper when connecting to slave CSDA-S (but not when connecting to slave CSDB).
10.3 Connection of control units CSDB and CSDA-S – double doors

For double door operators, both operators have to be connected to the mains. A six-pole cable (enclosed) has to be connected between TB1 on the CSDB and TB6 on the CSDA-S.

**Note!** It is important that the high and low voltage cables are well separated and fixed. The high voltage cables must be routed and fixed on one side of the drive unit by using the enclosed cable holders and the low voltage cables must be routed on the opposite side using the same type of cable holders.
10.4 Connection of control units CSDB/CSDB – double doors

For double door operators both operators have to be connected to the mains. A three-pole cable (not enclosed) has to be connected between TB1 on the CSDB (master) and TB2 on the CSDB (slave).

**Note!** It is important that the high and low voltage cables are well separated and fixed. The high voltage cables must be routed and fixed on one side of the drive unit by using the enclosed cable holders and the low voltage cables must be routed on the opposite side using the same type of cable holders.

Door mounted sensors must be connected to its own master and slave CSDB/EXB.
10.5 Connection of extension unit EXB – option

The extension unit EXB is to be installed on top of the CSDB.

a. Connect the flat cable on the EXB to the CSDB.

b. Snap on the EXB to the CSDB.

Note! It is important that the high and low voltage cables are well separated and fixed. The high voltage cables must be routed and fixed on one side of the drive unit by using the enclosed cable holders and the low voltage cables must be routed on the opposite side using the same type of cable holders.
10.6 Sensor cable inlet
11 Start-Up

Adjust the operator to have maximum 25% duty cycle, which means motor run time.

Give a short opening impulse by strapping the impulse input and adjust if necessary as follows. See also illustration under Closing torque.

See the “Guide for installers of Powered Pedestrian Swing Doors”, document PRA-0006, for calculation of speed.

a Set the hold open time with the potentiometer on the control unit.

b Adjustment of the opening speed.

- Adapt the high speed opening HSO, to the existing traffic situation. Turning clockwise decreases the speed.
- The low speed opening LSO, needs to be adjusted only if the door is extremely heavy. Turning clockwise decreases the speed.

Note! If it is hard to obtain an even and smooth braking, the opening torque (pump pressure) must be reduced.

c Adjustment of the closing speed.

- Adjust the low speed closing LSC as low as the traffic situation allows. Turning clockwise decreases the speed.
- If a higher closing speed is required, open the high speed closing valve HSC (closed from factory).

Note! If the installation requires adjustment of the closing torque follow the instructions on page 48.

d Fine-adjust the opening angle by means of the limit switch. The limit switch is slid into a groove in the hydraulic unit and tightened with a lock screw. By moving the limit switch sideways, the opening angle is changed.

Note! To make the adjustment easier, the limit switch can be moved to the underside of the hydraulic unit. Any of the grooves at the motor side of the outgoing shaft can be used.

e If an electromechanical striking plate is installed, an additional “lock-kick” can be obtained during the last 5° of the closing cycle by adjusting the screw LK on the hydraulic unit. This screw is normally closed. Adjust by opening the screw 90° and check the function.

Note! Opening the screw too much may delay the opening.

f Connect the activation units.

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

h Special care should be taken regarding entrapment between driven parts and surrounding fixed parts.

11.1 Closing torque

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

The closing torque (spring force) is adjusted by means of an Allen screw placed at the end of the spring tube. The end plate has to be dismantled. Turning the screw clockwise increases the force. One turn equals a torque change of approx. 1 Nm (28 turns from min. to max.). The door must be in open position when extremely low torque is adjusted.

Note! Max opening force in escape route is 150 N.
11.2 Opening torque

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

a  The factory set torque for PUSH is 70 Nm and for PULL 40 Nm at a door opening angle of 0-2°.

b  Measure the opening torque by using a spring balance and adjust if necessary.

The torque is adjusted by means of an Allen screw placed on the pump. Turning clockwise increases the opening torque/pump pressure. One turn equals a torque change of approx. 30 Nm.
11.3 Connection of activation units and accessories

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

External Alarm loop

1) Set FS-1 to OFF, when connecting "Kill"
2) Set FS-2 to ON
3) If PS-3B and "Time switch", connect "Time Switch" in serial to TB2:13
4) Switching is dependent on Key HOT
12 Cover

The cover and mounting plate are manufactured in clear anodized aluminium. The end plates are made of steel.

12.1 Fitting and removing the cover

Break off and snap on the fill cover into the mounting plate for output shaft. Snap on the other fill cover for the second slot.

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

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.

1 Fill cover (2 pcs)
2 End plate
3 Earth/Fastening screw
12.2 Middle piece cover
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.

<table>
<thead>
<tr>
<th></th>
<th>Product label: Mandatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Emergency break-out: Mandatory, if approved for escape route.</td>
</tr>
<tr>
<td>C</td>
<td>Entrematic Group door sticker: Mandatory, if applicable to highlight the presence of the glass (applied to all glass sections that are moving).</td>
</tr>
<tr>
<td>D</td>
<td>Supervision of child: Mandatory, if applicable (applied to both sides of the door). To be placed on entrances where the risk analysis shows use by children, elderly and disabled.</td>
</tr>
<tr>
<td>E</td>
<td>Operator designed for disabled people: Recommended, if applicable (applied to both sides of the door).</td>
</tr>
<tr>
<td>F</td>
<td>Activation by disabled people: Recommended, if applicable.</td>
</tr>
<tr>
<td>G</td>
<td>SITAC label: Mandatory in SE</td>
</tr>
</tbody>
</table>
14 Installation on fire doors

- The EM EMSW is approved in accordance with DIN 18263-4 for use on fire doors. The approval covers compliance with EN1154 Table 1, sizes 3-6, for use on fire doors with controlled door closing. For size 3 max door leaf weight is 60 kg and max door leaf width is 950 mm. For size 6 max door leaf weight is 120 kg and max door leaf width is 1400 mm.

- For rebated double doors the coordination unit COOA, which is an accessory integrated in the EM EMSW, can be used. The COOA is in compliance with EN1158, which guarantees for a correct closing order both after manual and automatic openings.

- The EM EMSW can be connected to the overriding fire alarm central and, if required, emergency push buttons for door closing can be installed locally. When the signal is broken, an opening or open door will immediately close.

- The Arm System PUSH must be used.

14.1 Control unit CSDA-F (option)

For a more advanced solution, a special control unit CSDA-F can be installed alongside the basic control unit CSDB. This unit can be used as a central for required detectors, manual push button for closing etc. It also secures that the automatic door opening function will not be restored after alarms from detectors or after manual door closing. To restore the automatic door operation each door must receive a separate restoring signal.

The connection of CSDA-F can be carried out in two ways:

- For automation of fire doors without overriding fire detection and alarm system.

- For automation of fire doors with overriding fire detection and alarm system.

Different connection examples are shown on page 57 and page 57.

Cover length (with CSDA-F)

Single door operators L = 865-1600 mm
Double door operators L = 1560-3200 mm
14.1.1 Connection of control unit CSDA-F – single door

**Note!** It is important that the high and low voltage cables are well separated and fixed. The high voltage cables must be routed and fixed on one side of the drive unit by using the enclosed cable holders and the low voltage cables must be routed on the opposite side using the same type of cable holders.

In order to prevent faults caused by short circuit (unintended electrical connection) a separate laying of the lines to the external fire detectors is required.
14.1.2 Connection of control unit CSDA-F – double door

14.1.3 Function check
Check that the systems works:

- Connect the mains.
- Give a reset on "Restore after alarm button".
- Give impulses on terminal 7-8 on CSDB.
- Cut the jumper terminal 10-12 on CSDA-F during the opening cycle.
  Make sure that opening cycle is interrupted and that the door closes.
- Give a new opening impulse - the operator shall not open.
- Connect the jumper (or the alarm loop) between terminal 10-12.
- Give a reset on "Restore after alarm button".
- Give a new impulse and the door shall make a new open/close cycle.
14.2 Automation of fire doors without overriding fire detection and alarm system

14.2.1 General connection

For this type of installation the required fire detectors are direct-connected to the CSDA-F.

![Diagram](image)

14.3 Automation of fire doors with overriding fire detection and alarm system

This connection is only possible if the fire alarm system has a potential free breaking contact. To make the fire doors close on an alarm, the contact must open. Required fire detectors are to be connected to the alarm system. A push button for manual door closing can be connected to each door. The number of fire doors that can be connected to the breaking contact in the alarm system depends on the breaking capacity of the contact.
The capacity of the fire alarm system power supply is calculated according to the number of CSDA-F used x 0.05 A.

14.3.1 Connection of CSDA-F to a fire alarm system

![Diagram of CSDA-F connection to fire alarm system](image-url)
15 Installation and adjustments - Low Energy Operator

To limit entrapment force and push opening force, parameters to work with are pump pressure, opening and closing time, spring tension and the way the PUSH arm system is mounted. The PULL arm system is standard mounted.

All force measurements are made at the door handle approx. 25 mm from the leading edge.

a) Install the operator as to the manual but the PUSH arm system door adaptor should be moved 50 mm further out from the hinges (illustration 1).

b) Adjust the spring closing force to desired value but max 67 N. The door must be in open position when adjusting. It is only necessary to measure the force in open position were the force is highest.

c) Adjust the closing time from 90-0º (illustration 2), on the LSC valve only (fully close the HSC valve). See diagram for opening and closing time.

   **Note!** Add 2 seconds for latch check.

d) Check that max manual opening force does not exceed 90 N. It is only necessary to measure the force in open position were the force is highest.

e) Adjust the pump opening force to max 67 N in closed position.

f) Adjust the back check (illustration 3), on the LSO valve, to 2 seconds.

g) Adjust the opening time from 0-80º (approx. 200 mm from full open position, see illustration 3), on the HSO valve. See diagram for opening and closing time.

h) Adjust the hold open time, on the potentiometer, to desired value but minimum 5 seconds

15.1 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.
15.2 Swing Doors Opening and Closing Time

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

15.2.1 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 50 kg the minimum opening and closing time will be ~3,5 seconds.

---

15.3 Diagrams for Door weight

a) Measure the door width (DW) and the door height (DH) in metres for one door leaf only.

b) Calculate the area DW x DH

c) Select diagram for your type of door and the actual glass thickness. Find the weight.

Example: Aluminium door with measurement DW = 1.5 m, DH = 2 m and glass thickness 12 mm. Calculate 1.5 x 2 = 3 m². 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).
15.3.1 Aluminium frame with glass

Example

15.3.2 Steel frame with glass
15.3.3 Solid wood

![Graph showing door leaf weight vs. area for different wood thicknesses.](image-url)
16 Installation instructions for Accessories

16.1 COOA - Coordination unit

16.1.1 EM EMSW 2 - Push

Installation of coordination unit

The brackets ① ② are to be mounted to the pump flange on the “master” door operator and the wire wheel ③ to the drive shaft on the “slave” door operator.

Note! If the “master” and “slave” doors are interchanged, the brackets are to be fitted to the underside of the pump flange.

a) Fit the hook bracket ① to the pin in the pump flange and screw the bracket tight.
b) Fit the lever bracket ② onto the hooks on the hook bracket ① including return spring ⑦.
c) Install the wire through the plastic hoses ⑧ and fix to the motor screws with cable straps ④.
d) Mount the wire wheel ⑤ on the “slave” door operator using screw and washer. The wheel is to be mounted in accordance with fig. A or B depending on which door being the “slave” door. Always on top of the operator.
e) Close the doors and mount the wire in the lever bracket ② and in the wire wheel ③ with the spring ⑥ pre-tensioned approx. 10 mm. Open the “master” door and let it hook up. Adjust the spring tension (loosen the wire) so that the “master” door starts to close with normal speed.
f) Adjust the closing time to approx. 6 seconds.
g) Mount the follow roller (carry bar) ⑧ according to illustration.
h) Give opening impulse and check the function.
16.1.2 EM EMSW 2 - Pull

![Diagram of installation instructions]

1 Hook bracket  4 Cable strap  7 Return spring
2 Lever bracket  5 Balance spring
3 Wire wheel  6 Plastic hose

Installation of coordination unit

The brackets ①② are to be mounted to the pump flange on the “master” door operator and the wire wheel ③ to the drive shaft on the “slave” door operator.

**Note!** If the “master” and “slave” doors are interchanged, the brackets are to be fitted to the underside of the pump flange.

a Fit the hook bracket ① to the pin in the pump flange and screw the bracket tight.
b Fit the lever bracket ② onto the hooks on the hook bracket ① including return spring ⑦.
c Install the wire through the plastic hoses ⑥ and fix to the motor screws with cable straps ④.
d Mount the wire wheel ③ on the “slave” door operator using screw and washer. The wheel is to be mounted in accordance with fig. A or B depending on which door being the “slave” door. Always on top of the operator.
e Close the doors and mount the wire in the lever bracket ② and in the wire wheel ③ with the spring ⑤ pre-tensioned approx. 10 mm. Open the “master” door and let it hook up. Adjust the spring tension (loosen the wire) so that the “master” door starts to close with normal speed.
f Adjust the closing time to approx. 6 seconds.
g Give opening impulse and check the function.
16.2 PAG

Adjustment of impulse sensitivity

Important notice
To avoid bodily injury, the opening time from closed to fully open door must not be less than 4 seconds.

If door stop is mounted on operator, PAG can be mounted on opposite side.
16.3 Door stop

- Install door stop to top side of output spindle to prevent door from extending beyond 90°.
- Mount door stop when door is in open position with a clearance of 2 mm (2/32") as shown below. Fine adjust, if necessary, on limit switch and/or on armsystem.
# 17 Troubleshooting

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible reasons why</th>
<th>Remedies/Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The door does not open</strong>&lt;br&gt;- <em>The motor does not start</em></td>
<td>Programme selector is set to OFF</td>
<td>Change setting</td>
</tr>
<tr>
<td></td>
<td>Motor power is missing</td>
<td>Check motor cable</td>
</tr>
<tr>
<td></td>
<td>Mains power is missing</td>
<td>Check power</td>
</tr>
<tr>
<td></td>
<td>Fuse has blown</td>
<td>Replace fuse</td>
</tr>
<tr>
<td></td>
<td>Activation unit does not function</td>
<td>Strap impulse inputs</td>
</tr>
<tr>
<td>- <em>The motor starts</em></td>
<td>Electric striking plate is binding</td>
<td>Adjust striking plate</td>
</tr>
<tr>
<td></td>
<td>Arm system has come loose</td>
<td>Readjust pre-tension and tighten arm system</td>
</tr>
<tr>
<td><strong>The door does not open to required angle</strong></td>
<td>Limit switch opening has come loose</td>
<td>Check limit switch</td>
</tr>
<tr>
<td><strong>The door does not close</strong></td>
<td>Constant impulse is created</td>
<td>Disconnect activation unit or replace control unit</td>
</tr>
<tr>
<td><strong>The door does not open fast enough</strong></td>
<td>Pump pressure is too low</td>
<td>Adjust pump pressure</td>
</tr>
<tr>
<td><strong>The door opens with too much delay</strong></td>
<td>”Lock-kick” valve is opened too much</td>
<td>Adjust valve screw</td>
</tr>
<tr>
<td><strong>No smooth braking during operation</strong></td>
<td>Pump pressure too high</td>
<td>Adjust pump pressure</td>
</tr>
<tr>
<td></td>
<td>Low speed distance too short</td>
<td>Increase opening angle, or increase pre-tension of arm system</td>
</tr>
<tr>
<td><strong>High sound level</strong></td>
<td>Motor in contact with mounting plate</td>
<td>Mount two extra screws at the motor side to seduce the mounting plate to the wall</td>
</tr>
<tr>
<td><strong>The door does not stay open or cannot open</strong></td>
<td>Magnetic valve out of operation</td>
<td>Check by pressing the pin on top of the magnetic valve. If the door stops, then check the resistance (should be 150 ohm) for the wire between the magnetic valve and the control unit.</td>
</tr>
<tr>
<td><strong>1 flashing LED</strong></td>
<td>Door mounted sensor defect</td>
<td>Check wire or replace sensor</td>
</tr>
<tr>
<td></td>
<td>Too high current sensor or short circuit</td>
<td>Check wire or replace lock</td>
</tr>
<tr>
<td><strong>3 or 4 flashing LED</strong></td>
<td>CSDB default</td>
<td>Replace control unit</td>
</tr>
<tr>
<td><strong>7 flashing LED</strong></td>
<td>No slave connected and slave monitoring jumper is missing</td>
<td>Replace jumper</td>
</tr>
<tr>
<td></td>
<td>Slave connected but slave monitoring jumper is not removed</td>
<td>Remove jumper</td>
</tr>
<tr>
<td></td>
<td>CSDA-S defect</td>
<td>Replace control unit</td>
</tr>
<tr>
<td></td>
<td>Old CSDA-S connected and slave monitoring removed</td>
<td>Replace jumper</td>
</tr>
</tbody>
</table>
18 Service/Maintenance

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

<table>
<thead>
<tr>
<th>Part</th>
<th>Part number</th>
<th>Cycles/hour in operation</th>
<th>Abusive Environment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>&lt;10</td>
<td>&lt;100</td>
</tr>
<tr>
<td>Vibration absorbers and oil plug</td>
<td>331003882</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>PUSH/PUSH-335 service kit</td>
<td>330000485BK/SI</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>PULL/PULL-220 service kit</td>
<td>330000486BK/SI</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>ST-V/H service kit</td>
<td>331003887</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>Limit switch</td>
<td>33655614</td>
<td>24</td>
<td>12</td>
</tr>
<tr>
<td>Capacitor</td>
<td>33655599</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>CSDB-230 control unit</td>
<td>331004115</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>CSDA-S</td>
<td>600089</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>CSDA-F</td>
<td>600081</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>