Swing Door Operator
EM EMSW EMO

Installation and Service Manual
Original instructions
## CONTENTS - Original instructions

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1 Revision

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<td>Updated the illustration.</td>
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<td>Updated the illustration.</td>
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<td>Updated the illustration.</td>
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<td>Updated parts.</td>
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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.
- 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 EMO.

The EM EMSW EMO is an automatic swing door operator developed to facilitate entrances to buildings and within buildings through swing doors. The EM EMSW EMO is a low-energy operator using a DC motor and a gear-reduction system to drive an arm system, which opens the door. 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.

The motor and gear system are combined into a compact unit mounted alongside the control unit within the cover. The operator is connected to the door leaf with different arm systems.

For use see User manual 1005099.

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 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 specifications

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>
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<tbody>
<tr>
<td>Address:</td>
<td>Lodjursgatan 10, SE-261 44 Landskrona, Sweden</td>
</tr>
<tr>
<td>Type:</td>
<td>EM EMSW EMO</td>
</tr>
<tr>
<td>Mains supply:</td>
<td>100-240 V AC +10/-15%, 50/60 Hz, mains fuse max 10A (building installation)</td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Power consumption:</td>
<td>Max. 75 W</td>
</tr>
<tr>
<td>Auxiliary voltage:</td>
<td>24 V DC, max. 400 mA</td>
</tr>
<tr>
<td>Mains fuse F1, F2:</td>
<td>2 x T 6,3 AH/250 V</td>
</tr>
<tr>
<td>Door size:</td>
<td>PUSH arm system; size 4</td>
</tr>
<tr>
<td></td>
<td>PULL arm system; size 1</td>
</tr>
<tr>
<td></td>
<td>ST-V/H arm system; size 3</td>
</tr>
<tr>
<td>Max. Inertia J:</td>
<td>For PUSH = 45 km²</td>
</tr>
<tr>
<td></td>
<td>For PULL = 16 km²</td>
</tr>
<tr>
<td></td>
<td>Inertia = Door weight x (Door width)² / 3</td>
</tr>
<tr>
<td>The EM EMSW EMO complies with the door weights/widths stated in the: Controlled door closing, EN 1154 Table I, size 4</td>
<td></td>
</tr>
<tr>
<td>Electro-mechanical locking device:</td>
<td>Selectable: 12V DC, max. 500 mA or 24 V DC, max. 250 mA</td>
</tr>
<tr>
<td>Door opening angle:</td>
<td>PUSH arm: 80° - 110°, with reveal 0 - 305 mm</td>
</tr>
<tr>
<td></td>
<td>PULL arm: 80° - 110°, with reveal -20 - 130 mm</td>
</tr>
<tr>
<td>Opening time (0° - 80°):</td>
<td>Variable between 3 - 6 seconds</td>
</tr>
<tr>
<td>Closing time (90° - 10°):</td>
<td>Variable between 3 - 6 seconds</td>
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<tr>
<td>HOLD open time:</td>
<td>1.5 - 30 seconds</td>
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<td>Ambient temperature:</td>
<td>-20 °C to +45 °C</td>
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<tr>
<td>Relative humidity:</td>
<td>Max. 85%</td>
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<tr>
<td>Drive unit weight:</td>
<td>7.1 kg</td>
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<tr>
<td>Class of protection:</td>
<td>IP20</td>
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<tr>
<td>Degree of protection, control actuators:</td>
<td>IP54</td>
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<tr>
<td>Approvals:</td>
<td>Third party approvals from established certification organizations valid for safety in use, see Declaration of Conformity.</td>
</tr>
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<td>Complies with:</td>
<td>EN 16005, EN 60335-2-103, EN 1634-1</td>
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</table>
This product is to be installed internally.

4.1 Permitted door weight and door width

![Graph showing permitted door weight and door width with PUSH arm and PULL arm specifications.]

- Door weight (kg)
- Door width (m)

- **PUSH arm**
  - J=45 kgm²
  - J=16 kgm²

- **PULL arm**
5 How the EM EMSW EMO works

The swing door operator EM EMSW EMO uses a DC motor and a gear-reduction system to drive an arm system, which opens the door. Closing power is provided by a motor and a clock spring. An electronic control unit uses a motor encoder and a microprocessor to control the door’s movement.

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 Functions on the basic control unit CU-ESD

Also see page 52 for more information.

5.3.1 Power failure

During power failure the operator acts as a door closer with controlled closing speed.

5.3.2 Spring force

The operator is delivered with spring pre-tension factory set to 210°. If necessary, the spring tension can be electronically adjusted with a potentiometer to required closing force.

5.3.3 Extended closing force/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 force/torque.

5.3.4 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.

5.3.5 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.

5.3.6 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 is not active during opening and closing. Lock-out signal must be connected 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).

5.3.7 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 Functions on the extension unit EXU-SI
Also see page 54 for more information.

5.4.1 KILL function
• If KILL circuit is closed, the control will ignore all signals and close door(s) at normal speed.
• When KILL is no longer active, operator will resume normal operation.
• If KILL function must have manual reset, jumper must be removed and reset button connected to terminal No. 8 and Ground.
• The lock will lock when KILL is active regardless of program selector setting.
• The function of the lock can be changed during KILL (see page 66).
• In a double door application, KILL is only connected to the master operator.

5.4.2 Function of locks
• The lock output is short circuit proof and can source a lock with 12 V DC, max. 500 mA or 24 V DC, max 250 mA. Lock function is active in programme selection EXIT and OFF
• DIP-switch to select 12 or 24 V DC
• DIP-switch to select locked with or without power
• DIP-switch for lock release and potentiometer for opening delay
• DIP-switch for lock kick if door is not fully closed, to overcome binding in the locking device during closing
• 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 output signal shall be active low.

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

5.4.4 Impulses
• Input for OUTER impulse, KEY impulse and OPEN/CLOSE impulse.
5.4.5 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 66.

OPEN/CLOSE impulse works only in program selection ON.

5.4.6 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 AU. It is connected to the 24 VDC and plugged into the EXU-SA relay output terminal.
• During POWER FAILURE the operator will finish the actual operating cycle and then switch off 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 66. 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.
5.4.7 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.

5.5 Functions on the extension unit EXU-SA – optional

Also see page 55 for more information.

5.5.1 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).
5.5.2 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 66). The sensor is not active in program mode OFF, manually opened door or during battery operation.

5.5.3 Monitored safety sensors

Both presence impulse and presence detection can be monitored. If a sensor becomes defective, the operator will not accept any impulses and will then work as a manual door closer.

5.5.4 Open door indication

A relay output is used to indicate an opening cycle or a specific position of the door. The indication position is set by adjusting the inhibit/blanking potentiometer.

5.5.5 Error indication

A potential free contact COM/NO/NC for external error indication, see page 74.
6 Models

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

6.1 EM EMSW EMO, standard cover (wall mounted)

EM EMSW EMO is the standard operator. Pushing arm system shown. Measurement from hinge centerline to outgoing shaft is always 210 mm regardless if butt or pivot hinged systems.
## Part identification & Accessories

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Art. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>331003498</td>
<td>Transmission unit</td>
</tr>
<tr>
<td>2</td>
<td>331003532</td>
<td>Control unit CU-ESD</td>
</tr>
<tr>
<td>2a</td>
<td>331003554</td>
<td>EXU-SI (Kit to extend the security functions) - optional</td>
</tr>
<tr>
<td>2b</td>
<td>331003557</td>
<td>EXU-SA (Kit to extend the safety functions) - optional</td>
</tr>
<tr>
<td>3</td>
<td>331700607</td>
<td>Mains contact</td>
</tr>
<tr>
<td>4A</td>
<td>330000230</td>
<td>Door stop (transmission unit until w.1927)</td>
</tr>
<tr>
<td>4B</td>
<td>331019378</td>
<td>Stop arm kit (transmission unit from w.1927)</td>
</tr>
<tr>
<td>5</td>
<td>331011797</td>
<td>Mounting kit</td>
</tr>
<tr>
<td>5a</td>
<td>331003578</td>
<td>Cable holder (50 pcs)</td>
</tr>
<tr>
<td>6</td>
<td>331003543/K/SI</td>
<td>Bottom end plate</td>
</tr>
<tr>
<td>7</td>
<td>331004998</td>
<td>Cover</td>
</tr>
<tr>
<td>8</td>
<td>331003582</td>
<td>ON/OFF/HOLD open switch</td>
</tr>
<tr>
<td>9</td>
<td>331003567</td>
<td>Battery backup unit - optional</td>
</tr>
<tr>
<td>10</td>
<td>331003583</td>
<td>Sync cable - optional</td>
</tr>
<tr>
<td>11</td>
<td>330000233</td>
<td>Encoder cable</td>
</tr>
<tr>
<td>12</td>
<td>331005736</td>
<td>MUL</td>
</tr>
<tr>
<td>13</td>
<td>330000484/K/SI</td>
<td>Adaptor kit</td>
</tr>
<tr>
<td>14</td>
<td>330000485/K/SI</td>
<td>PUSH arm service kit</td>
</tr>
<tr>
<td>15</td>
<td>330000486/K/SI</td>
<td>PULL arm service kit</td>
</tr>
<tr>
<td>16</td>
<td>1006340</td>
<td>Cable kit</td>
</tr>
<tr>
<td>17</td>
<td>331095138/K/SI</td>
<td>Fill cover kit</td>
</tr>
<tr>
<td>18</td>
<td>331006504</td>
<td>Fixing kit transmission unit</td>
</tr>
<tr>
<td>18a</td>
<td>331003507</td>
<td>Allenkey head nut</td>
</tr>
<tr>
<td>19</td>
<td>331019159</td>
<td>Micro switch kit</td>
</tr>
</tbody>
</table>
7.1 Arm system, PUSH

Art. No. 1014113BK/Sl

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

7.1.1 PUSH-arm extensions

<table>
<thead>
<tr>
<th>Reveal = A</th>
<th>Extension</th>
<th>Art. No. 173005BK/Sl</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-100 mm</td>
<td>None (standard arm)</td>
<td>345 mm extension</td>
</tr>
<tr>
<td>100-215 mm</td>
<td>345 mm</td>
<td></td>
</tr>
<tr>
<td>215-305 mm</td>
<td>230 mm + Joint part</td>
<td>230 mm extension</td>
</tr>
</tbody>
</table>

Joint part
Art. No. 173191

7.2 Arm system, PUSH-335

Art. No. 1011706BK/Sl

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

7.3 Arm system, PULL

Art. No. 1011707BK/Sl

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 (pivot doors)**

Art. No. 172325, **right**, reveal A = 0-60 mm or **left** when A > 60-100 mm

Art. No. 172327, **right**, reveal A > 60-100 mm or **left** when A = 0-60 mm

**Arm extension**

Art. No. 172320 required when the reveal A >60-100 mm

7.6 Reveal spacer: PULL / PULL-220

Art. No. PULL 1014667BK/SI
7.7 20 mm extension

Extension 20 mm for PULL/PAS and lower mounting of slide track profile.
Art. No.: 1011205

7.8 Drive shaft extension kits

Lower adapter M8, used for 20 mm lower installation height.

Art. No. 1007618
7.9 Control switches

7.9.1 ON/OFF/HOLD open switch (will not operate electric lock)

Art. No. 1003582

<table>
<thead>
<tr>
<th>Function</th>
<th>Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>Impulses from activation units connected to XIMP are forwarded into inner impulse (see page 52).</td>
</tr>
<tr>
<td>OFF</td>
<td>Impulses from activation units connected to XIMP are not forwarded into inner impulse. These units cannot open the door.</td>
</tr>
<tr>
<td>HOLD</td>
<td>The door is held permanently open.</td>
</tr>
</tbody>
</table>

7.9.2 4-position switch PS-4C (operates the electric lock)

Art. No 655845

<table>
<thead>
<tr>
<th>Position</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>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).</td>
</tr>
<tr>
<td>EXIT</td>
<td>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).</td>
</tr>
<tr>
<td>AUTO</td>
<td>The door can be opened with the inner and outer manual and/or automatic activators. The electric strike, if fitted, is open.</td>
</tr>
<tr>
<td>OPEN</td>
<td>The door is held permanently open by the motor.</td>
</tr>
</tbody>
</table>
7.10 Sync cable for double doors (synchronizing of 2 operators)

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

![Diagram of sync cable connection](image)

**Note!** The connection/marking 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**

**How to cut the jumper for double doors**

<table>
<thead>
<tr>
<th>Function</th>
<th>Door design</th>
<th>Cut the jumper with color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening</td>
<td>Closing</td>
<td>Rebated</td>
</tr>
<tr>
<td>Synchronous</td>
<td>Synchronous</td>
<td>No</td>
</tr>
<tr>
<td>Synchronous</td>
<td>Asynchronous</td>
<td>Yes</td>
</tr>
<tr>
<td>Asynchronous</td>
<td>Asynchronous</td>
<td>Yes</td>
</tr>
<tr>
<td>Double egress</td>
<td></td>
<td>—</td>
</tr>
</tbody>
</table>

![Diagram showing Rebated, Jamming, and No jamming](image)
## Settings for double doors

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

* 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 is to be connected to the MASTER CU except for “Double egress”, where each OPD must be connected to corresponding CU.
- Door leaf mounted sensors must always be connected to corresponding CU.
- The slave door can be prevented to open, if kill is activated on the SLAVE control unit.
7.11 Extension units

For installation see page 53.

EXU-SI (kit for security functions)
Art. No. 1003554

EXU-SA (kit for safety functions)
Art. No. 1003557

AIU (Audible warning signal)
Art. No. 656083

7.12 Battery backup unit

Note! Disconnect mains when replacing battery. Risk of explosion if wrong type of battery is used.

Art. No. 1003567
7.13 Cover piece kit

7.13.1 Middle piece kit
Art. no 1008383

7.14 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 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.

8.2 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.
8.3 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)
8.4 Fastening requirements (but not included)

<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.

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

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

- Torx T10
- Metric Allen wrenches 2,5; 3; 4 and 6 mm
- Flatblade screwdriver (potentiometer and terminal size)
- Screwdriver (Philips size 2)
- Nut driver, 5 mm
- Carpenter’s level
- Tape rule
- Power drill and set of drill bits
- Center punch
- Wire stripper
- Silicone sealant
- Installation and Service Manual (this manual)

8.6 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.
9 Mechanical installation

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

9.1 Operator with PUSH arm system
Cont. "Operator with PUSH arm system"

2 DIN Right

Cable inlet

3 Mechanical installation
Operator should be attached using the top/centered bolt first, then follow pattern.
Cont."Operator with PUSH arm system"

1. DIN Left
2. PUSH

3. Diagram showing mechanical installation with dimensions:
   - 652 mm
   - 200 mm
   - 45 mm
   - 248 mm
   - 38 mm
   - 75 mm
   - 91 mm
   - 16 mm

4. Diagram showing installation with 4x screws.
Operator should be attached using the top/centered bolt first, then follow pattern.
Cont. "Operator with PUSH arm system"

6

PUSH

7

90°

8

25 Nm
9.2 Operator with PULL arm system

Note! Measurement Z must be reduced by 20 mm if lower adapter from kit 1007618 is used.
Cont. “Operator with PULL arm system”
Operator should be attached using the top/centered bolt first, then follow pattern.
Cont. "Operator with PULL arm system"

2. DIN Right

3. CL 1

8x

4x

ILL 0167
Operator should be attached using the top/centered bolt first, then follow pattern.
Cont. "Operator with PULL arm system"
9.3 Installation of operator with arm system ST
Cont. "Installation of operator with arm system ST"

2. DIN Left

Outside open door

3.
Operator should be attached using the top/centered bolt first, then follow pattern.
Cont. "Installation of operator with arm system ST"

2 DIN Right

Outside open door

3

6x
Operator should be attached using the top/centered bolt first, then follow pattern.
Cont. "Installation of operator with arm system ST"

Note, the way of mounting the arm!

143

26 N·m

IL-Ot603
Cont. "Installation of operator with arm system ST"
Cont. "Installation of operator with arm system ST"
Cont. "Installation of operator with arm system ST"

Cut out for arm bracket

DIN Left

DIN Right
10  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 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 Mains connection

a  Switch off the mains.

b Assemble the bottom end plates and tighten the two screws firmly.

c Connect the plug contact to the wall socket or connect to the mains switch.

  **Note!** The mains switch must be connected according to national regulation.

d  Connect the mains to the operator.

**Mains:** 100-240 V AC – 50/60 Hz

Alt. 1

Alt. 2

Symbol shown to ensure that the manual is read before the installation starts.
10.2 Control units

10.2.1 CU-ESD

The CU-ESD can be equipped with extension units, EXU-SI and/or EXU-SA, depending on the functions required. See page 12 or 14.

Factory set arm configuration is PUSH, if PULL or ST is required:

a. Switch power OFF
b. Select arm configuration
c. Switch power ON
10.2.3 Extension units EXU-SI / EXU-SA

**Installation**

To extend the functions, the extension units can be mounted on top of the control unit CU-ESD, separately or combined.
10.2.4 Extension unit EXU-SI

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

Battery backup unit

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.
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.
10.2.5 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**

- Monitoring of presence detection/DMPS.SS
- Monitoring of presence impulse/DMPS.NS
- No monitoring (both jumpers on)
- Monitoring of presence detection and presence impulse
- External error indication
- Opened door indication
- Relay output (“External error indication” or “Open door indication”, see above) 24 V, 1 A
- Not to be used.

**Diagram**

QTST = Sensor monitoring
PDET = Presence detection (NC)
PIMP = Presence impulse (NC)

1) If not used strap to “Ground”.
2) Remove strapping from terminals 2 and/or 3.
10.3 Sensor cable inlet

Art. No.: 1007567
11 Start-up

The spring pre-tension is **factory set to 210°** and is normally not necessary to adjust. If adjustment has to be carried out, see page 70.

11.1 Adjusting the door stop

a Close the door.

b **Turn the potentiometer SPTE to 0°** (if not already on 0°).

c **Switch on the mains** (the operator will find its closed position).

d **Open the door to required open position, plus approx. 5/8” (15 mm), by turning the potentiometer SPTE on the CU-ESD, clockwise.**

e **Lift the lock kick cam and the door stop arm up, mount the stop arm on the splines, as close as possible to the stop block 1). Fine-adjust if necessary with the screw on the stop block 2).**
Close the door by turning the potentiometer SPTE to 0° and let the door close.

**Note!** Impulses are not accepted if SPTE is more than 0°.

1. Micro switch
2. Lock kick cam
3. Stop block
4. Fine-adjustment screw
5. Door stop arm

### 11.2 Micro switch

Control the lock kick by turning the lock kick cam (2) when power is off. This lock kick gives a lock kick at power failure for the last 3-10 degrees of closing to make sure that the door will fully close and latch.
11.3 Auto-learn – automatically sets back and latch check (recommended)

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

- Before the learning procedure starts, make sure that the door has been properly closed i.e., not by force.
- If any of the parameters SPRING PRE-TENSION, CLOSING TORQUE (CLTQ) and LOCK RELEASE (DIP-switch No. 3 on EXU-SI) are changed after performing a learn, a new learn must be carried out.
- 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.

11.3.1 One push / two pushes on the LEARN BUTTON (LRN)

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

**One push (delayed opening)**

Push the button once. The door will open after 2 seconds and adjust the back-check and latch-check automatically.

**Two pushes (direct opening)**

Push the button twice. As above, but the door starts to move directly.

11.3.2 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 astragal doors and separate learning, the MASTER door must be held open before the SLAVE door learn is carried out.
11.4 General adjustment

a) Set the hold open time with the potentiometer on the control unit.
b) Adjust the opening speed (OPSP). Turning clockwise increases the speed.
c) Adjust the closing speed (CLSP). Turning counter-clockwise decreases the speed.
d) Connect the required activation units.
e) Check that the installation complies with Installation and adjustments on page 71.
11.5 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 = d according to EN ISO 13849-1. These sensors shall also be monitored (tested) by EM EMSW EMO 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
2. Outer impulse
3. Key Impulse
4. Presence impulse
5. Presence detection
6. Off
7. Kill impulse NO

A. Brown
B. Yellow
C. Pink
D. Violet
E. White
F. Blue
G. Red
H. Green
I. Black
J. Grey
12 Cover

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

12.1 Fitting and removing the cover

The cover is slid over flanges in the back plate so that the ridges fit in the grooves.
Break off and snap on the fill cover into the back plate for output shaft. Snap on the other fill cover for the second slot. 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.
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.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Product label: Mandatory</td>
</tr>
<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 (applied to both sides of the door): Mandatory according to national regulations. Recommended, if the risk analysis shows use by children.</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>
<tr>
<td>H</td>
<td>No entry, identifying one-way traffic: Mandatory in GB and US, if applicable, not included in the product.</td>
</tr>
</tbody>
</table>
14 Advanced settings

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

See the prerequisites for performing a “learn” under the heading Auto-learn – automatically sets back and latch check (recommended) on page 59.

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

14.2 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.

| 3 s |

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.
14.3 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.

![ERROR LED diagram]

- 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.

<table>
<thead>
<tr>
<th>Parameter/Group</th>
<th>1 (default)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPEN/CLOSE HOLD OPEN TIME</td>
<td>15 minutes</td>
<td>Infinite</td>
<td>15 minutes</td>
<td>15 minutes</td>
<td>15 minutes</td>
<td>15 minutes</td>
<td>15 minutes</td>
<td>15 minutes</td>
<td>15 minutes</td>
<td>15 minutes</td>
</tr>
<tr>
<td>BATTERY mode</td>
<td>Power Save</td>
<td>Power Save</td>
<td>Convenience</td>
<td>Power Save</td>
<td>Power Save</td>
<td>Power Save</td>
<td>Power Save</td>
<td>Power Save</td>
<td>Power Save</td>
<td>Convenience</td>
</tr>
<tr>
<td>KILL mode</td>
<td>Locked during KILL</td>
<td>Locked during KILL</td>
<td>Locked during KILL</td>
<td>Lock follows program selector during KILL</td>
<td>Locked during KILL</td>
<td>Locked during KILL</td>
<td>Locked during KILL</td>
<td>Lock follows program selector during KILL</td>
<td>Locked during KILL</td>
<td>Locked during KILL</td>
</tr>
<tr>
<td>OBSTRUCTION mode&lt;sup&gt;1)&lt;/sup&gt;</td>
<td>Door closer</td>
<td>Door closer</td>
<td>Door closer</td>
<td>Door closer</td>
<td>Reverses when obstructed</td>
<td>Door closer</td>
<td>Door closer</td>
<td>Door closer</td>
<td>Door closer</td>
<td>Reverses when obstructed</td>
</tr>
<tr>
<td>DOUBLE EGRESS mode</td>
<td>Separate presence detection</td>
<td>Separate presence detection</td>
<td>Separate presence detection</td>
<td>Separate presence detection</td>
<td>Separate presence detection</td>
<td>Common presence detection</td>
<td>Separate presence detection</td>
<td>Separate presence detection</td>
<td>Separate presence detection</td>
<td>Separate presence detection</td>
</tr>
<tr>
<td>LOCK RETRY</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>On</td>
<td>Off</td>
<td>On</td>
<td>On</td>
<td>On</td>
</tr>
<tr>
<td>OPEN/CLOSE impulse</td>
<td>In AUTO mode</td>
<td>In AUTO mode</td>
<td>In AUTO mode</td>
<td>In AUTO mode</td>
<td>In AUTO mode</td>
<td>In AUTO mode</td>
<td>In AUTO mode</td>
<td>In OFF, EXIT and AUTO mode</td>
<td>In AUTO mode</td>
<td>In AUTO mode</td>
</tr>
<tr>
<td>KILL Impulse Configuration</td>
<td>Normally Open</td>
<td>Normally Open</td>
<td>Normally Open</td>
<td>Normally Open</td>
<td>Normally Open</td>
<td>Normally Open</td>
<td>Normally Open</td>
<td>Normally Open</td>
<td>Normally Closed</td>
<td>Normally Open</td>
</tr>
</tbody>
</table>

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

As default the operator tries to close two times extra in automatic operation, OFF or EXIT mode and one time in manual operation, OFF or EXIT mode if there is a problem with binding striking plates. This function can be switched off (see LOCK RETRY above).

**Note!** When changing group of parameters, normally only the master control must be configured in a double door application. When changing from or to group seven, both MASTER and SLAVE must be configured.
14.4 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

<table>
<thead>
<tr>
<th>Classification</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Full power(Default)</td>
<td>Low energy</td>
</tr>
<tr>
<td>Standard</td>
<td>EN 16005</td>
<td></td>
</tr>
<tr>
<td>Opening speed</td>
<td>3 - 6 s</td>
<td>Automatic limitation 1.69 J</td>
</tr>
<tr>
<td>Closing speed</td>
<td>3 - 6 s</td>
<td>Automatic limitation 1.69 J</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Width of door leaf (mm)</th>
<th>Door mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
</tr>
<tr>
<td>Time (s) min</td>
<td></td>
</tr>
<tr>
<td>750</td>
<td>3.0</td>
</tr>
<tr>
<td>850</td>
<td>3.1</td>
</tr>
<tr>
<td>1000</td>
<td>3.2</td>
</tr>
<tr>
<td>1200</td>
<td>3.8</td>
</tr>
</tbody>
</table>

14.5 Overhead Presence Detection (OPD) Monitoring (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.

![3 s 1 s 3 s 1 s 3 s 1 s 3 s 3 s]

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.
   •  Push the button until you get the requested monitoring status, 1 = OFF (default), 2 = ON
   •  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
14.6 Lock kick (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.
• Push the button until you get the requested lock kick status, 1 = Basic (default), 2 = Enhanced
• Disconnect the mains
Next time the mains is connected, the operator will use the new status setting.

14.7 Lock unlocked status (Level 6)

**Note!** Only valid for locked without power = Fail secure.
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 unlocked 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.
• Push the button until you get the requested status, Lock is unlocked at
  1= Lock is unlocked when door is not closed
  2= Lock is unlocked when door is 0-10 degrees from closed position, during opening
• Disconnect the mains
Next time the mains is connected, the operator will use the new status setting.
15 Reducing / Increasing the “Spring pre-tension” (SPTE)

The spring pre-tension is factory set to 210° and is normally not necessary to adjust. If adjustment has to be carried out see below.

a) Loosen the door stop arm. Remove if fitted on the topside, slide down if fitted on the bottom.
b) Turn the potentiometer for spring pre-tension (SPTE) clockwise until the door opens to 45°.
c) Loosen the drive arm fixing screw.
d) Moving the door towards open position, reduces the tension, or:
   Moving the door towards closed position, increases the tension.
e) Tighten the drive arm.
f) Turn the potentiometer SPTE to 0°.
g) Open the door to required open position, plus approx. 15 mm, by turning the potentiometer SPTE clockwise.
h) Mount the door stop arm as close as possible to the open door stop block, fine-adjust with the screw if necessary.
i) Turn the potentiometer SPTE to 0°.
j) Push the LEARN BUTTON.
k) Let the door do the learn cycle without touching it.

Note! Max. allowable spring pre-tension is 210°. Over-tension may damage the spring or overheat the motor.
16 Installation and adjustments

16.1 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.

16.2 Swing Doors Opening and Closing Time

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

16.2.1 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.
16.3 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).

16.3.1 Aluminium frame with glass
## 17 Troubleshooting

<table>
<thead>
<tr>
<th>Fault</th>
<th>Possible reasons why</th>
<th>Remedies/Explanations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The door does not open</strong>&lt;br&gt;The motor does not start</td>
<td>Control switch is set to OFF</td>
<td>Change the setting of the control switch</td>
</tr>
<tr>
<td></td>
<td>Mains are missing</td>
<td>Check the mains switch</td>
</tr>
<tr>
<td></td>
<td>Activation unit does not function</td>
<td>Strap impulse inputs</td>
</tr>
<tr>
<td></td>
<td>Presence detection is activated</td>
<td>Check that there are no objects in the detection zone</td>
</tr>
<tr>
<td></td>
<td>KILL activated</td>
<td>Deactivate KILL</td>
</tr>
<tr>
<td></td>
<td>Potentiometer SPTE not turned to 0°</td>
<td>Turn SPTE to 0°</td>
</tr>
<tr>
<td><strong>The motor starts</strong></td>
<td>Mechanical lock is locked</td>
<td>Unlock the lock</td>
</tr>
<tr>
<td></td>
<td>Something jammed beneath the door</td>
<td>Remove object</td>
</tr>
<tr>
<td></td>
<td>Electric striking plate is binding</td>
<td>Select lock release</td>
</tr>
<tr>
<td></td>
<td>Arm system has come loose</td>
<td>Adjust striking</td>
</tr>
<tr>
<td><strong>The door does not close</strong></td>
<td>Control switch is set to HOLD</td>
<td>Change the setting of the control switch</td>
</tr>
<tr>
<td></td>
<td>Presence impulse is activated</td>
<td>Remove objects in the detection zone</td>
</tr>
<tr>
<td></td>
<td>Something jammed beneath the door</td>
<td>Remove object</td>
</tr>
<tr>
<td><strong>The operator has unknown spring pre-tension</strong></td>
<td>Too many adjustments carried out</td>
<td>a) Turn up the potentiometer SPTE until it is possible to loosen the door stop&lt;br&gt;b) Remove the door stop and the arm system&lt;br&gt;c) Unplug the mains and let spring close&lt;br&gt;d) Unplug the motor plug&lt;br&gt;e) Mount the drive arm from the arm system and find the o-pre-tension by moving back and forth&lt;br&gt;f) Loosen the arm&lt;br&gt;g) Connect the motor plug&lt;br&gt;h) Connect the mains&lt;br&gt;i) Turn the SPTE pot to 210° and wait until the spindle stops turning&lt;br&gt;j) Mount the door stop against the closing stop block&lt;br&gt;k) Turn down SPTE to 0° - operator is now factory set&lt;br&gt;l) Turn to section 11 to adjust open stop position</td>
</tr>
</tbody>
</table>
17.1 Error indication

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

<table>
<thead>
<tr>
<th>LED flash frequency</th>
<th>Reason</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>One 0.3 s flash, pause etc.</td>
<td>+ 24 V DC external error or sensor monitoring error</td>
<td>Check for short circuit or broken monitored sensor</td>
</tr>
<tr>
<td>Two 0.3 s flashes, pause etc.</td>
<td>Battery defective</td>
<td>Replace battery (normal operation with mains)</td>
</tr>
<tr>
<td>Three 0.3 s flashes, pause etc.</td>
<td>Control unit defective</td>
<td>Replace control unit</td>
</tr>
<tr>
<td>Four 0.3 s flashes, pause etc.</td>
<td>Encoder error</td>
<td>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.</td>
</tr>
<tr>
<td>Five 0.3 s flashes, pause etc.</td>
<td>Locking device defective</td>
<td>Check for e.g. short circuit in the locking device</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replace locking device</td>
</tr>
<tr>
<td></td>
<td>EXU-SI board defective</td>
<td>Replace EXU-SI board</td>
</tr>
<tr>
<td>Six 0.3 s flashes, pause etc.</td>
<td>Sync cable not connected or defective (double door only)</td>
<td>Connect the sync cable</td>
</tr>
<tr>
<td>Seven 0.3 s flashes, pause etc.</td>
<td>SLAVE control unit defective (double door only)</td>
<td>Check the flash frequency on the SLAVE LED and take necessary measures in accordance with this table.</td>
</tr>
<tr>
<td>Eight 0.3 s flashes, pause etc.</td>
<td>Motor overheated</td>
<td>Wait for the motor to cool down</td>
</tr>
<tr>
<td>Nine 0.3 s flashes, pause etc.</td>
<td>Blocked door and constant impulse</td>
<td>Toggle impulse</td>
</tr>
</tbody>
</table>
18 Service / Maintenance

Regular inspections shall be made according to national regulations and product documentation by an 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>Transmission unit</td>
<td>331003498</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>PUSH/PUSH-335 service kit</td>
<td>330000485BK/SI</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>PULL/PULL-220 service kit</td>
<td>330000486BK/SI</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>Adaptor kit</td>
<td>330000484BK/SI</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>Door stop (transmission unit until w.1927)</td>
<td>330000230</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>Stop arm kit (transmission unit from w.1927)</td>
<td>331019378</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>ST-V/H service kit</td>
<td>331003887</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>Micro switch kit</td>
<td>331019159</td>
<td>24</td>
<td>6</td>
</tr>
<tr>
<td>Battery backup unit *</td>
<td>331003567</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>CU-ESD control unit</td>
<td>331003532</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

* 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 section 5.4.6.