

EntreMatic Swing Door Operator EMSW EMO

Installation and Service Manual



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The following pages have been revised:

| Page | Revision version $2.0 \rightarrow 4.0$ | | | | | |
|------|---|--|--|--|--|--|
| 5 | Environment text updated | | | | | |
| 6 | Introduction last part of the text added | | | | | |
| 7 | The text about the approvals changed | | | | | |
| 10 | Last paragraph of text under subheading "Kill function" added | | | | | |
| 13 | Illustration corrected | | | | | |
| 17 | Article no PULL-P changed | | | | | |
| 20 | Last paragraph of text under "Note" added | | | | | |
| 22 | Label kit and EntreMatic door sticker added | | | | | |
| 47 | Instruction changed and new illustration for alt. 2 under subheading "Mains connection" added | | | | | |
| 57 | Group 9 & 10 and KILL impulse added in parameter table | | | | | |
| 58 | New chapter | | | | | |
| 59 | New chapter | | | | | |
| 60 | New heading | | | | | |
| 62 | Text about product label added | | | | | |
| 63 | Illustration for signage updated Text added and updated | | | | | |
| 66 | Number 8 and 9 changed places | | | | | |
| 68 | Text about regular inspections changed | | | | | |

2.1 Important notice

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

2.2 Electronic equipment reception interference

This equipment may generate and use radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, it may cause interference to radio, television reception or other radio frequency type systems. It has been designed to comply with the emission limits in accordance with EN 61000-6-3 (US market FCC Part 15), which are designed to provide reasonable protection against such interference in a residential installation.

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

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

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

2.3 Environmental requirements

Entrematic products are equipped with electronics and may also be equipped with batteries containing materials which are hazardous to the environment. Remove this material from the operator before it is scrapped and make sure that it is disposed of safely as was done with the packaging.

This manual contains the necessary details and instructions for the installation, maintenance and service of the swing door operator EMSW EMO, a universal electro-mechanical operator also suitable for all low energy applications of swing doors.

The EMSW EMO can be mounted on either side of the door header for pull or push action, and is suitable for single or double doors fitted with butt hinges, offset or center pivots.

The EMSW EMO ensures all-around safety. The operator can be combined with a full range of sensor products providing swing door safety, but meets also the requirements for a low energy operator without any sensors.

Each installation is, however, unique and must therefore be equipped and adjusted for the application-relevant safety requirements. Preventative maintenance must be performed as specified for the selected product in a given environment.

| Power supply: | 100-240 V AC +10/-15%, 50/60 Hz |
|--|--|
| Power consumption: | max. 75 W |
| Auxiliary voltage: | 24 V DC, max. 400 mA |
| Internal control fuse: | 2 x T 6,3 AH 250 V |
| Door width: | max. 1200 mm |
| Electro-mechanical locking device | Selectable: 12V DC, max. 500 mA / 24 V DC, max. 250 mA |
| Door weight: | 45-90 kg |
| Door opening angle: | Push arm: 80° - 110°, with reveal 0 - 100 mm (300 mm with longer telescopic part) |
| | Pull arm: 80° - 110° , with reveal 0 - 130 mm |
| Opening time $(0^{\circ} - 80^{\circ})$: | variable between 3 - 6 seconds |
| Closing time $(90^{\circ} - 10^{\circ})$: | variable between 3 - 6 seconds |
| Hold open time: | 1,5-30 seconds |
| Ambient temperature: | -20 °C to +45 °C |
| Relative humidity (non-condensing) | Max. 85% |

This product is to be installed internally or externally with suitable weather protection.

Class of protection IP 20.

Approvals: Third party approvals from established certification organizations valid for safety in use and escape route safety. For details see Declaration of conformity.



The swing door operator 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).

- When stalling the door will continue to try to open during the hold open time.
- When stopping 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 extended closing force by the motor.

5.3 Functions on the basic control unit CU-ESD (see also page 48)

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 (see also page 50)

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 57).
- 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.
- If a Multi Strike of type Solid 75, Solid 575, Robust 280 or Robust 281D is used, an adapter board (MUL) is needed. The board shall be connected between the ordinary Lock output on the EXU-SI board and the strike. The function switch for lock voltage must be in the 12V position.

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 57). 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 AIU. It is connected to the 24 VDC and plugged into the EXU-SA relay output terminal.
- During "power failure mode" the operator will finish the actual operating cycle and then switch of the battery supply. The battery powered operator can be reactivated to achieve a new operating cycle by an impulse on the KEY input.
- The operating mode during battery power can be changed from "power save" to "convenience" (see page 57). 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.

5.5 Functions on the extension unit EXU-SA (see also page 51) – optional

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 57). 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 67).

Three main models of the EntreMatic EMSW EMO are available:

- EMSW EMO, standard cover
- EMSW EMO-SPEC, cover with optional length
- EMSW EMO-2, double door operators

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

6.1 EMSW EMO, standard cover (wall mounted)

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.



6.2 EMSW EMO-SPEC, cover with optional length (wall mounted)

The EMSW EMO-SPEC carries a cover with optional length e.g. with the same width as the frame. The cover length L and the measurement R must be specified in the order.

Pushing arm system shown.



6.3 EMSW EMO-2, double door operators (wall mounted)

The EMSW EMO-2 consists of two operators that are mounted under the same cover to open one door each. The cover length L and the measurements R and S must be specified in the order.

Pushing and pulling arm system shown. It is also possible to use two pushing or two pulling arm systems.





| Item No. | Art. No. | Description |
|----------|-----------|--|
| 1 | 331004436 | Back plate |
| 2 | 331003498 | Transmission unit/operator |
| 3 | 331003532 | Control unit CU-ESD |
| | 331003554 | EXU-SI (Kit to extend the security functions) – optional |
| | 331003557 | EXU-SA (Kit to extend the safety functions) – optional |
| 4 | 331700607 | Mains contact |
| 5 | 331003540 | Door stop body |
| 6* | 331003542 | Top end plate |
| 7 | 331003543 | Bottom end plate |
| 8 | 331004435 | Cover |
| 9* | 331003581 | Power On/Off switch |
| | 331003582 | On/Off/Hold open switch – optional |
| 10* | 331003578 | Cable holder (50 pcs) |
| 11 | - | Knockouts for cable inlet |
| 12 | _ | Belt tension device |
| 13* | 1003545 | Fill cover (output shaft) |
| 14 | 331003567 | Battery backup unit – optional |
| _ | 331003583 | Sync cable – optional |

*Included in Mounting Kit 331005081

8.1 Arm systems

8.1.1 Arm system, PUSH Art.No. 1003576

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



8.1.2 PUSH-arm extensions

| Reveal = A | Extension | | |
|------------|---------------------|--|--|
| 0-100 mm | None (standard arm) | | |
| 100-210 mm | 345 mm | | |
| 210-300 mm | 230 mm + Joint part | | |

345 mm extension Art. No. 173005

230 mm extension Art. No. 173004

Joint part Art. No. 173191





This arm system is delivered with drive arm, guide shoe and door fitting. It is used if the operator is installed on the wall on the same side as the door swing.



8.1.4 Arm system, PULL-P Art. No. 1005273BK



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

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.

8.1.5 Reveal spacer: PULL / PULL-P





8.1.7 Arm system, ST-V / ST-H



This arm system is delivered with drive arm and guide roller. **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.

8.1.8 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



8.2.1 Power On/Off switch (enclosed with the operator)



Art. No. 1003581

8.2.2 On/Off/Hold open switch (will not operate electric lock)



Art. No. 1003582

| Function | Program |
|----------|---|
| ON | Impulses from activation units connected to XIMP are forwarded into inner impulse (see page 48). |
| OFF | Impulses from activation units connected to XIMP are not forwarded into inner impulse. These units cannot open the door. |
| HOLD | The door is held permanently open. |

8.2.3 4-position switch PS-4C (operates the electric lock)

| 0 | Pos | sition | Function |
|-------------------------|----------------|------------------------------|--|
| | | "Off" | The door is closed. The door cannot be opened with inner and outer activation units. The door is locked if an electromechanical locking device has been fitted. The door can be opened with a key switch (if fitted). |
| • Art. No. 655845 | ₀↓↑₀ | "Exit" | Passage from inside only. The door is normally locked if an electromechanical locking device has been fitted. The door can only be opened with the inner activation unit and with a key switch (if fitted). |
| | ₀ ↓ †↓₀ | "Auto" Normal position | The door can be opened with the inner and outer man- ual and/or automatic activators. The electric strike, if fitted, is open. |
| | | "Open" | The door is held permanently open by the motor. |

Sync cable for double doors (synchronizing of 2 operators) 8.3



Note: The connection/marking of the sync cable determines which of the operators is the master and slave.

```
Art. No. 1003583
```

How to cut the jumper for double doors

| Func | ction | Door | design | Cut the jumper with color | | |
|-----------------|--------------|------------------|--------|---------------------------|------------|--|
| Opening Closing | | Astragal Jamming | | Master side Slave sid | | |
| Synchronous | Synchronous | No | No | No cutting | No cutting | |
| Synchronous | Asynchronous | Yes | No | Cut black | No cutting | |
| Asynchronous | Asynchronous | Yes | Yes | No cutting | Cut red | |
| Double | egress | — | | Cut black | Cut red | |
| Astraga | 1 | Jamm | ing | No ja | mming | |
| | <u> </u> | | | | | |
| | | | | | | |



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

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.

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



AIU (Audible warning signal) Art. No. 656083



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



MUL (for Multi-strikes) Art. No. 1005736



ILL-01889

8.5 Battery backup unit



Art. No. 1003567



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

ILL-01624

Pre-installation

9.1 General tips/Safety concerns

- For enhanced security and vandalism protection, always mount the operator access in the interior of a building whenever possible.
- 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.
- Inspect the door hinges before installation to ensure that they are in good repair.
- Unpack the operator and make sure that all parts are delivered in accordance with the packing note.

9.2 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.





ILL-01625









- 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)

9.4 Fastening requirements

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

^k EntreMatic minimum recommended requirements. Building Codes may give different specifications. Refer to AHJ (Authority Having Jurisdiction).

** Thinner wall profiles must be reinforced with rivnuts.

9.5 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)

9.6 Installation on double doors

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

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

For installation, follow the instructions for the applicable arm system.

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

10.1 Operator with PUSH arm system













Operator should be attached using the top/centered bolt first, then follow pattern

(b

ILL-01662

É 1

£ 2

С



ILL-01590

10.2 Operator with PULL arm system





































Cont. "Installation of operator with arm system ST"







- During any work with the electrical connections the mains power must be disconnected.
- 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.

11.1 Mains connection

- 1. Switch off the mains power
- 2. Assemble the bottom end plate and tighten the two screws firmly.
- 3. 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.
- 4. Connect the mains contact to the operator

Mains power:100-240 V AC - 50/60 Hz

Alt. 1



11.2.1 CU-ESD

The CU-ESD can be equipped with extension units, EXU-SI and/or EXU-SA, depending on the functions required (see page 10).



11.2.2 Arm system selection

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

- 1. Switch power OFF
- 2. Select arm configuration
- 3. Switch power ON

Installation

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



Functions

This extension unit has inputs for electro-mechanical lock, program selector, batteries, kill function, open/close, key opening and outer impulse.



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.

11.2.5 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 or door indication is also integrated.

Functions



¹⁾ If not used strap to "Ground".

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

The spring pre-tension is **factory set to 210^{\circ}** and is normally not necessary to adjust. If adjustment has to be carried out (see page 55).

12.1 Adjusting the door stop

1. Close the door.



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



3. Switch on the mains power (the operator will find its closed position).



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





5. Loosen the door stop arm.



6. Mount the door stop arm on the splines a), as close as possible to the stop block b). Fine-adjust if necessary with the screw on the stop block c).



 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. Door stop arm
- 2. Fixing screw
- 3. Stop block
- 4. Fine-adjustment screw

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

This learning is performed by pushing the Learn button (LRN).

- Note: 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.



12.2.1 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.



12.2.2 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.

12.3 General adjustment

- 1. Set the hold open time with the potentiometer on the control unit.
- 2. Adjust the opening speed (OPSP). Turning clockwise increases the speed.
- 3. Adjust the closing speed (CLSP). Turning counter-clockwise decreases the speed.
- 4. Connect the required activation units.
- 5. Check that the installation complies with "Guide for installation and adjustments" on page 64.

12.4 Connection of activation units and accessories





3 10 11 12

EXU-SI

1005088-EMEI-4.0

- 1. Disconnect batteries if any.
- 2. Disconnect the mains contact.
- 3. Press the "Learn button (LRN)" and keep it depressed.
- 4. Connect the mains contact.
- 5. Watch the "Error LED".



- 6. Release the "Learn Button" after the 5 seconds (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.
- 7. 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.
- 8. Push the button until you get the requested parameter group.
- 9. Disconnect the mains contact.
- 10.Next time the mains is connected, the operator will use the new group of parameters.

| Parameter/ Group | 1 (default) | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|---|-----------------------------------|---------------------------------|-----------------------------------|-----------------------------------|---|-----------------------------------|
| Open/Close Hold Open Time | 15 minutes | Infinite | 15 minutes | 15 minutes | 15 minutes | 15 minutes | 15 minutes | 15 minutes | 15 minutes | 15 minutes |
| Battery mode | Power Save | Power Save | Convenience | Power Save | Power Save | Power Save | Power Save | Power Save | Power Save | Convenience |
| KILL mode | Locked during KILL | Locked during KILL | Locked during KILL | Lock follows program selector during KILL | Locked during KILL | Locked during KILL | Locked during KILL | Locked during KILL | Lock follows program selector during KILL | Locked during KILL |
| Obstruction mode ¹⁾ | Door closer | Door closer | Door closer | Door closer | Reverses when obstructed | Door closer | Door closer | Door closer | Door closer | Reverses when obstructed |
| Double egress mode | Separate presence detection | Separate presence detection | Separate presence detection | Separate presence detection | Separate presence detection | Common presence detection | Separate presence detection | Separate presence detection | Separate presence detection | Separate presence detection |
| Lock retry | On | On | On | On | On | On | Off | On | On | On |
| Open/Close impulse | In AUTO mode | In AUTO mode | In AUTO mode | In AUTO mode | In AUTO mode | In AUTO mode | In AUTO mode | In OFF, EXIT and AUTO mode | In AUTO mode | In AUTO mode |
| KILL Impulse Configuration | Normally Open | Normally Open | Normally Open | Normally Open | Normally Open | Normally Open | Normally Open | Normally Open | Normally Closed | Normally Open |

- ¹⁾ 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.

14.1 Entering the program mode (classification)

If the operator is equipped with batteries, they must be disconnected before the following procedure is preformed.

- Disconnect the mains plug
- Press the learn button while connecting the mains plug
- Watch the error LED



• Release the learn button after the second 5 s has passed

14.2 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 repeated the classification number and so on.

14.3 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 plug

Next time you connect the mains the operator will use the new classification.

14.4 Classification table

| Classification | 1 (Default) | 2 |
|----------------|-------------|--|
| Opening speed | 3-6 s | Automatic limitation according to DIN 18650-2 (and ANSI 156.19) |
| Closing speed | 3-6 s | Automatic limitation according to DIN 18650-2 (and ANSI 156.19) |

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

If this classification is used the operator will automatically follow the speed limitation in DIN 18650-2 (and ANSI 156.19).

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

14

Speed settings

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

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

15.1 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 54.

- 1. Push the button once or twice as for auto-setting.
- 2. Stop the door at required back-check.
- 3. The door reverts towards closed position.
- 4. Remove the stop.
- 5. Stop the door at required latch-check.
- 6. The door reverts to learn the fully open position.
- 7. Remove the stop.
- 8. The door reverts to closed position.

15.2 Revert to default values for "back- and latch-check"

- 1. Disconnect batteries if any.
- 2. Disconnect the mains contact.
- 3. Press the "Learn button" and keep it depressed.
- 4. Connect the mains contact.
- 5. Watch the "Error LED".



- 6. Release the "Learn button" after 3 seconds (LED is out).
- 7. The "Back check", "Latch check" and "Open position" have now reverted to default values.
- 8. Disconnect the mains contact.
- 9. Next time the mains is connected, the operator will use the default values.

15.3 Reducing / Increasing the "Spring pre-tension" (SPTE)

The spring pre-tension is **factory set to 210^{\circ}** and is normally not necessary to adjust. If adjustment has to be carried out see below.

- 1. Loosen the door stop arm. Remove if fitted on the topside, slide down if fitted on the bottom.
- 2. Turn the potentiometer for spring pre-tension (SPTE) clockwise until the door opens to 45°.
- 3. Loosen the drive arm fixing screw.
- 4. Moving the door **towards open position**, reduces the tension, or: Moving the door **towards closed position**, increases the tension.
- 5. Tighten the drive arm.
- 6. Turn the potentiometer SPTE to 0° .
- 7. Open the door to required open position, plus approx. 15 mm, by turning the potentiometer SPTE clockwise.
- 8. Mount the door stop arm as close as possible to the open door stop block, fineadjust with the screw if necessary.
- 9. Turn the potentiometer SPTE to 0° .
- 10.Push the learn button.
- 11. 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.

SPTE



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

16.1 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.

Stick the EntreMatic logotype to the cover – see below.

If properly installed and adjusted, attach the product label, which includes the CE mark.



Signage



Action

Check that all required signage is applied and intact. Mandatory indicates that the signage is required by European directives and equivalent national legislation outside the European Union.

- A Product label: Mandatory
- (B) Emergency break-out: Mandatory, if applicable
- © EntreMatic Door sticker: Mandatory according to brand instructions, European directives and equivalent national legislation outside the European Union, to highlight the presence of the glass
- D 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.
- (E) Operator designed for disabled people: Recommended, if applicable (applied to both sides of the door)
- (F) Activation by disabled people: Recommended, if applicable
- (G) No entry, identifying one-way traffic: Mandatory in GB and US, if applicable
- (H) Automatic door: Only mandatory in GB
- (J) Keep clear: Only mandatory in GB

18.1 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.

18.2 Swing Doors Opening and Closing Time

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

18.2.1 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.



1005088-EMEI-4.0

18.3 Diagrams for Door weight

- 1. Measure the door width (DW) and the door height (DH) in metres for one door leaf only.
- 2. Calculate the area DW x DH
- 3. 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 $1.5 \text{ x } 2 = 3 \text{ m}^2$. Look into the first diagram for "Aluminium Frame with glass". Start with the area and follow the line up to the 12 mm glass, go left to receive the door weight 95 kg.

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

18.3.1 Aluminium frame with glass



| Fault | Possible reasons why | Remedies/Explanations | | |
|--|-------------------------------------|---|--|--|
| The door does not open | Control switch is set to OFF | Change the setting of the control switch | | |
| - The motor does not start | Mains power is missing | Check the mains power switch | | |
| | Activation unit does not function | Strap impulse inputs | | |
| | Presence detection is activated | Check that there are no objects in the detection zone | | |
| | Kill activated | Deactivate Kill | | |
| | Potentiometer SPTE not turned to 0° | Turn SPTE to 0° | | |
| - The motor starts | Mechanical lock is locked | Unlock the lock | | |
| | Something jammed beneath the door | Remove object | | |
| | Electric striking plate is binding | Select lock release | | |
| | | Adjust striking | | |
| | Arm system has come loose | Turn potentiometer SPTE until the door-stop hits the stop-block. Put the door in required open position. Tighten the arm system. Turn SPTE to 0° | | |
| The door does not close | Control switch is set to HOLD | Change the setting of the control switch | | |
| | Presence impulse is activated | Remove objects in the detection zone | | |
| | Something jammed beneath the door | Remove object | | |
| The operator has unknown spring pre- tension | Too many adjustments carried out | Turn up the potentiometer SPTE until it is possible to loosen the door stop Remove the door stop and the arm system Unplug the mains and let spring close Unplug the motor plug Mount the drive arm from the arm system and find the o-pre-tension by moving back and forth Loosen the arm Connect the motor plug Connect the mains Adjust the SPTE to 210° Mount the door stop against the closing stop block Turn down SPTE to 0° - operator is now fac- tory set | | |

19.1 Error indication

- During normal operation the "Error LED" on the control unit is illuminated.
- An extinguished LED indicates that there is no mains power.
- 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.

| LED flash frequency | Reason | Remedy | | |
|---------------------------------|--|--|--|--|
| One 0.3 s flash, pause etc. | + 24 V DC external error or sensor monitoring error | Check for short circuit or broken monitored sensor | | |
| Two 0.3 s flashes, pause etc. | Battery defective | Replace battery (normal operation with mains power) | | |
| Three 0.3 s flashes, pause etc. | Control unit defective | Replace control unit | | |
| Four 0.3 s flashes, pause etc. | Encoder error | Check the encoder cable. Open and close the door manually and thereafter check the automatic function. If the operator is still out of function replace the drive unit. | | |
| Five 0.3 s flashes, pause etc. | Locking device defective | Check for e.g. short circuit in the locking device | | |
| | | Replace locking device | | |
| | EXU-SI board defective | Replace EXU-SI board | | |
| Six 0.3 s flashes, pause etc. | Sync cable not connected or | Connect the sync cable | | |
| | defective (double door only) | Replace the sync cable | | |
| Seven 0.3 s flashes, pause etc. | Slave control unit defective (double door only) | Check the flash frequency on the Slave LED and take necessary measures in accordance with this table. | | |
| Eight 0.3 s flashes, pause etc. | Motor overheated | Wait for the motor to cool down | | |
| Nine 0.3 s flashes, pause etc. | Blocked door and constant impulse | Toggle impulse | | |

HAZARD WARNING



Failure to observe this information may result in minor personal injury or damage to equipment.

Regular inspections shall be made according to national regulations by a trained and qualified person. The number of service occasions shall be in accordance with national requirements. 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 table below shows the recommended interval, in months, when to replace parts during preventive maintenance.

| | Part Number | Cycles/hour in operation | | | |
|-------------------------|-------------|--------------------------|-------------------|-----------------|--------------|
| Part | | <10 | <100 | >100 | Abusive |
| | | Low Traffic | Medium Traffic | High Traffic | LIIVITONMENI |
| SAS-F service kit | 331003888 | 24 | 12 | 6 | 6 |
| PULL/PULL-P service kit | 331003886 | 24 | 12 | 6 | 6 |
| ST-V/H service kit | 331003887 | 24 | 12 | 6 | 6 |
| Battery backup unit * | 1003567 | 24 | 24 | 24 | 24 |
| CU-ESD control unit | 331003532 | 60 | 60 | 60 | 60 |

* Mains must be switched off when replacing battery



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