# High Speed Door Prime

## Installation and maintenance manual

07-2017 R0

GANDHI Automations Pvt Ltd

**India's No.1 Entrance Automation & Loading Bay Equipment Company**

## INDEX

Caption

This symbol indicates instructions or notes regarding issues which require particular attention

This symbol indicates danger due to high tension

This symbol indicates information which are useful for correct product function

## 1 GENERAL SAFETY PRECAUTIONS

This installation manual is intended for professionally competent personnel only. The installation, the electrical connections and the settings must be completed in conformity with good workmanship and with the laws in force.

Read the instructions carefully before beginning to install the product. Incorrect installation may be a source of danger. Packaging materials (plastics, polystyrene, etc) must not be allowed to litter the environment and must be kept out of the reach of children for whom they may be a source of danger.

Before beginning the installation, check that the product is in perfect condition.

Do not install the product in explosive areas and atmospheres: the presence of flammable gas or fumes represents a serious threat to safety.

Before installing the door, make all the structural modifications necessary in order to create safety clearance and to guard or isolate all the compression, shearing, trapping and general danger areas.

Check that the existing structure has the necessary strength and stability. The safety devices must protect against compression, shearing, trapping and general danger areas of the motorized door.

Display the signs required by law to identify danger areas.

Each installation must bear a visible indication of the data identifying the motorized door.

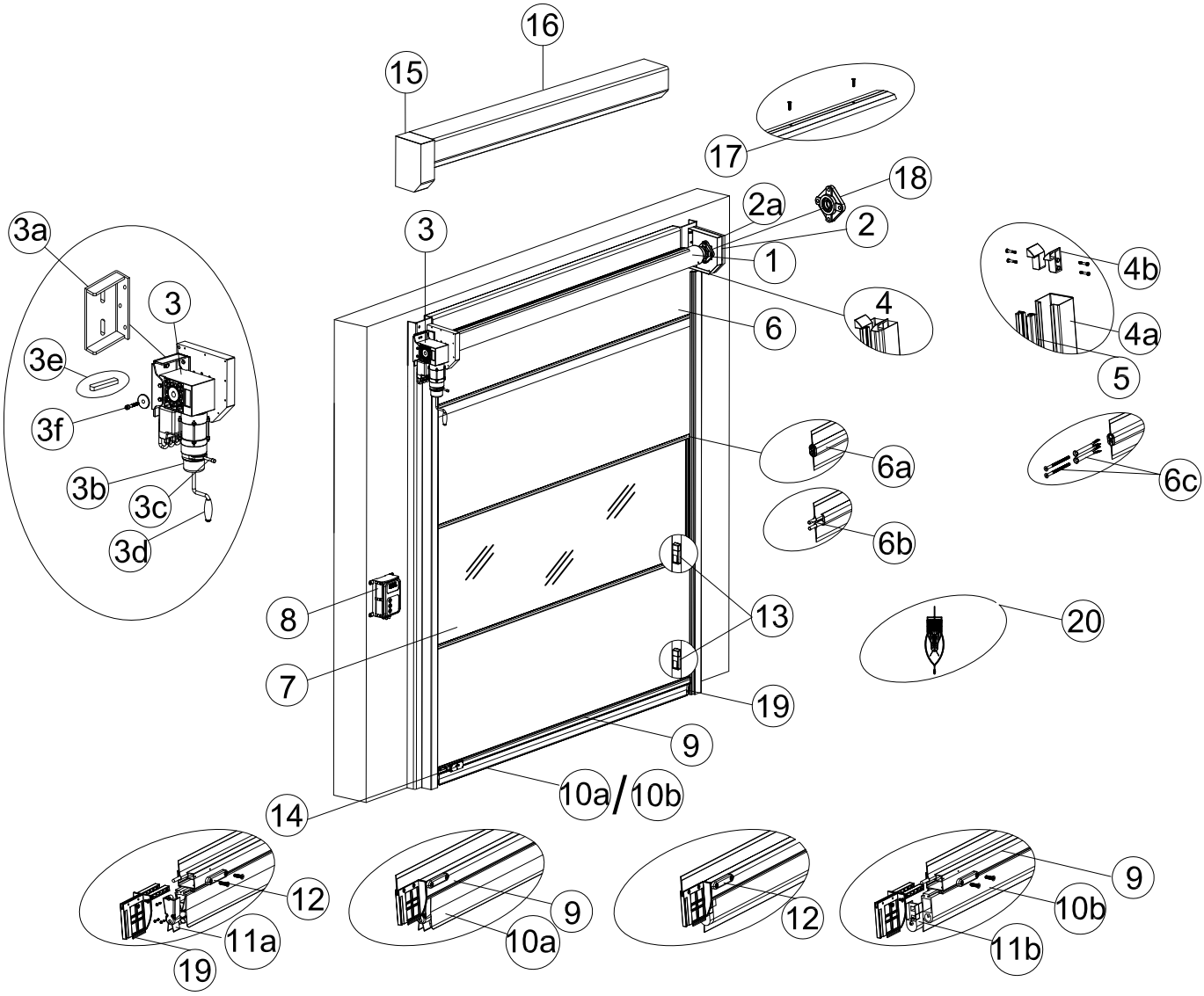
Before connecting to the mains check that the rating is correct for the destination power requirements. A multipolar isolation switch with minimum contact gaps of 3 mm must be included in the mains supply.

Check that upstream of the electrical installation there is an adequate differential switch and a suitable circuit breaker.

Ensure that the motorized door has an earth terminal in accordance with the safety adjustments in force.

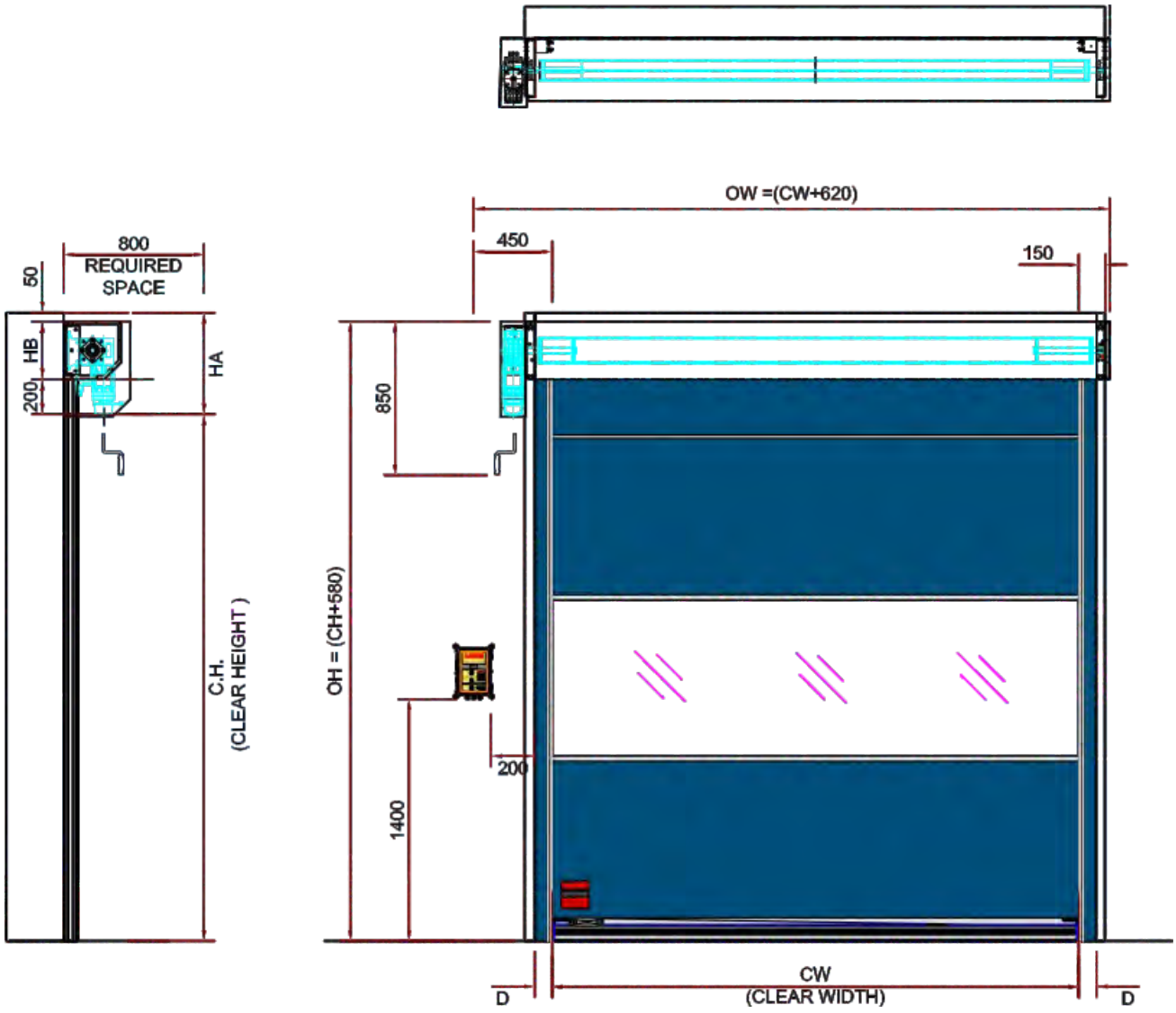
The manufacturer of the door declines all responsibility in cases where components which are incompatible with the safe and correct operation of the product only original spare parts must be used.

## 2. TECHNICAL SPECIFICATIONS




### PART DESCRIPTION

| | | |
|---|---|---|
| 1) Shaft assembly | 4b) Plastic slide with screw (LH/RH) | 11a) Safety bottom end cap (option-1) |
| 2) Angular bracket (LH/RH) | 5) Rubber seal for guide | 11b) Safety bottom end cap (option-2) |
| 2a) End cap | 6) Color curtain | 12) Plastic cap for safety shoe fitting |
| 3) Automation | 6a) Modular section | 13) External safety photocell |
| 3a) Motor | 6b) Kedor | 14) Transmitter |
| 3b) Motor mounting bracket | 6c) Fastener for modular section | 15) Motor cover |
| 3c) Manual brake release with knob | 7) PVC clear curtain | 16) Top cover |
| 3d) Manual release crank handle | 8) Control panel with push button | 17) Curtain locking strip |
| 3e) Motor shaft key | 9) Aluminium bottom bar | 18) Flange bearing |
| 3f) Bolt & washer for shaft locking | 10a) Safety edge (option-1) | 19) Plastic safety shoe |
| 4) Guide assembly | 10b) Safety edge (option-2) | 20) Bottom pocket (optional) |
| 4a) Guide section (LH/RH) | | |




All dimensions are in mm.

| | | | |
|---|---|---|---|
| OW | = Overall Width | HB | = Side Bracket Height = 330 mm |
| OH | = Overall Height | CH | = Clear Height |
| HA | = Headroom Area | D | = Guide Width |

| |
|---|
| Overall Width (OW) ..... (CW + 620) |
| Overall Height (OH) ..... (CH + 580) |
| Headroom Area (HA) ..... (HB + 250) |

## MOTOR AND CONTROL CARD SPECIFICATION :

**Motor**

| Parameter | Direct starter | | Frequency Inverter | |
|---|---|---|---|---|
| | **GAPL-S-2X-7-9X DLS** | **GAPL-S-3X-14-9X DLS** | **GAPL-I-2X-9-135** | **GAPL-I-3X-15-15X** |
| Motor Output | 0.75 kW | 1.5 kW | 1.5 kW | 3.0 kW |
| Motor Current | 1.8 A | 4.6 A | 3.3 A | 7.2 A |
| Motor duty cycle | 60% | 60 % | 60% | 60 % |
| Operating voltage | 400V, 3Ph, 50/60 Hz | 400V, 3Ph, 50/60 Hz | 400V, 3Ph, 50/60 Hz | 400V, 3Ph, 50/60 Hz |
| Control voltage | 24 V | 24 V | 24 V | 24 V |
| Driving torque | 70 Nm | 140 Nm | 90 Nm | 150 Nm |
| Driving motor speed | 90 RPM | 90 RPM | 134 RPM | 150 RPM |
| Type of protection | IP 54 | IP 54 | IP 54 | IP 54 |

**Control Card**

| Parameter | For direct starter GAPL 31X DLS | Frequency Inverter GAPL 31X IE 1.5 kW | GAPL 31X IE 3.0 kW |
|---|---|---|---|
| Dimensions of housing | 215 x 275 x 190 mm | 260 x 550 x 245 mm | |
| Installation | Vertically on wall; at height of 1400 mm | | |
| Voltage supply via L1, L2, L3, N, PE | 400V, 50 / 60 Hz: | | |
| Fuse protection | 10 A K Type | | |
| Consumption of the controls alone | Max. 750 mA | | |
| Control voltage | 24 VDC, max. 500mA; | | |
| Control Inputs | 24 VDC, all input connections must be potential-free | | |
| Control outputs | 24 VDC, max. 500mA | | |
| Safety circuit / emergency off | All input connections must be potential-free; if the safety circuit is interrupted, no further electrically powered movement of the drive is possible, not even in deadman mode | | |
| Temperature range | In operation : -10°C.....+45 °C<br>In storage : -25°C.....+70 °C | | |
| Air humidity | Up to 80% not condensing | | |
| Protection type | IP65 | | IP54 |

## 3. MATERIAL INSPECTION & TOOL KIT

**A) Inspection of received material**

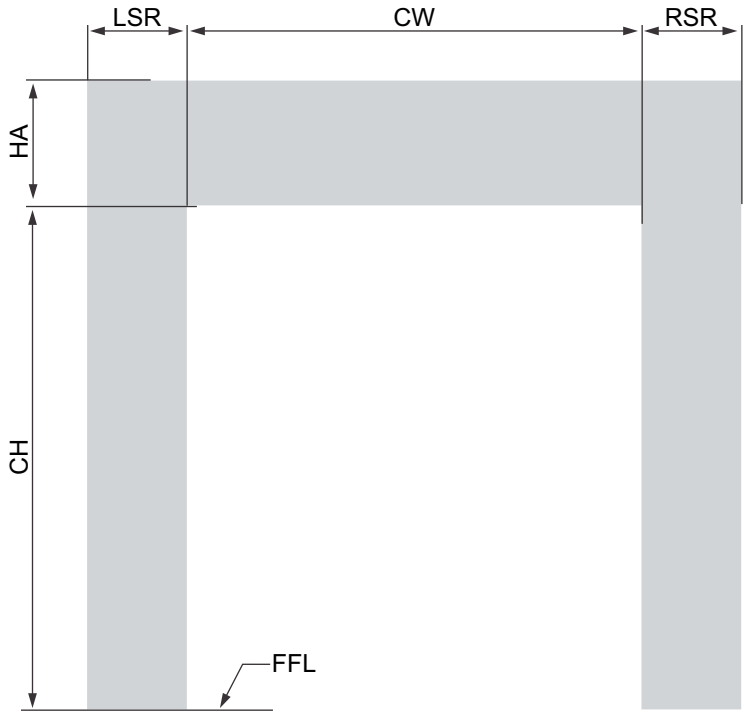
- Check whether all the material is received according to the packing list sent along with the material.
- Ensure that all materials received is in good condition.

**B) Tools required for installation**

Check availability of Tool Kit with the following tools:

- Electric drill machine
- Screwdriver set
- Tap set M8
- Spanner set
- Tommy spanner set
- Digital multimeter
- Touch up spray paint
- Masking tape
- Portable grinder
- Drill bits
- Wire cutter
- Allen key set
- Plier
- Tester
- Plumb
- Hammer
- Level pipe
- Spirit level

## 4. SITE CONDITION CHECK




CW - Clear width
CH - Clear height
HA - Headroom area
RSR - Right side room
LSR - Left side room
FFL - Finished floor level

- Check the dimensions CW, CH, HA, LSR and RSR with respect to the GA drawing provided to the client.
- Check that there is no pre-existing structures in HA, RSR & LSR that will obstruct the assembly of the rapid door.
- For the correct and smooth operation of the rapid door, it is important that the surface on which the side guides and the shaft box are to be mounted is on the same surface level.
- Check the solidity of the structure for the opening where the door has to be installed.
- Ensure secured anchorage to the structure by means of brackets or anchors bolts.
- In the case of insufficient or dubious solidity, it is necessary to create an adequate self-supporting metal frame.

## 5. SIDE GUIDE MARKING

- Remove the side guides from the packing carefully.
- Hold both the Guides near the structure / RCC wall such that after placing the Guides the inside distance between the two guides is equal to the CLEAR OPENING dimensions.
- Check the level of both guides using the plumb level.
- Once it is done, mark the TOP level of the Guide. (Shown as 'H' in the fig. 5a).
- Check the perpendicularity of the Side Guide marking done by measuring the diagonals as shown in fig. 5a.
- As shown in fig. 5a, ensure that dimensions X=Y(+/-5mm)
- Mark the fixing holes which are pre-drilled in the Side guide on the Structure / RCC.

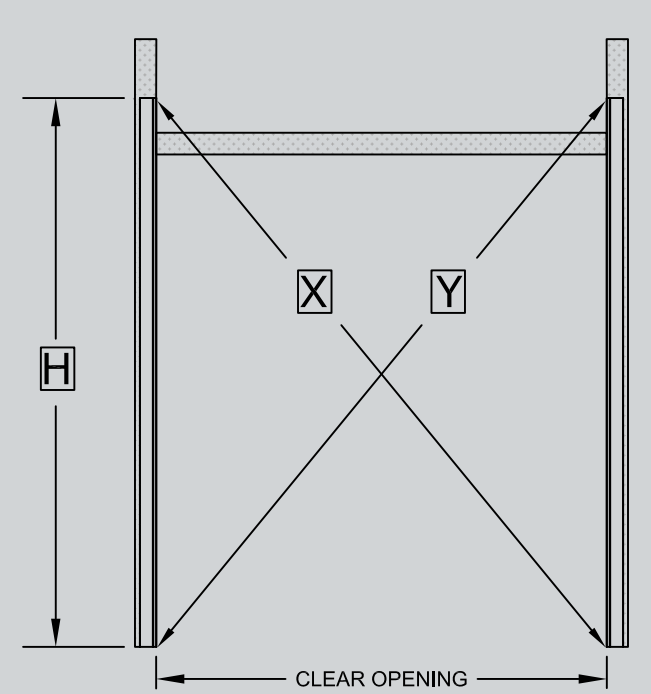


Fig. 5a

Guide Marking

CAUTION: Place the Side Guide on **Bubble wrap** or any other **Soft Material** after removing from the packing

## 6. SIDE GUIDE INSTALLATION

- Drill a hole of 6.5 mm diameter and do M8 tapping on steel structure as per marking done for fitting the guides. (In case of guides to be fixed on RCC wall, drill holes on RCC as per marking done for fixing guide)
- Now place the side guides in position and fix them to the structure using M8 x 25 bolts.
  (If drilling is done on RCC, use anchor fastener bolts for fixing the Side guides)
- Again check the perpendicularity of both the guides by measuring the diagonals before tightening of the guides

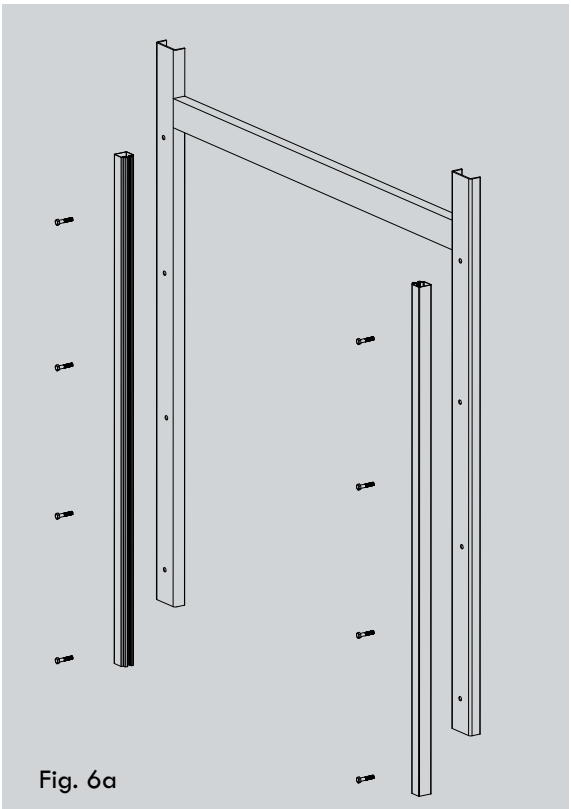


Fig. 6a

Guide Drilling

Check that the Anchor bolts / bolts are driven all the way through. If they are not then it might cause obstruction to the Curtain during the UP / DOWN motion.

## 7. SIDE BRACKET FITTING WITH SHAFT ASSEMBLY

- Place the side brackets on the top edge of the guide such that the distance between both bracket is (CW+300).
- Transfer the holes from the bracket to structure as shown in fig. 7a.
- Once marking is done ,drill the mounting holes. Do tapping of M10 bolt on structure and for RCC use Anchor bolt for side bracket fitting.
- Both brackets to be fitted with bearings using hardware before set up.
- Fit one side bracket on structure as shown in fig. 7d.

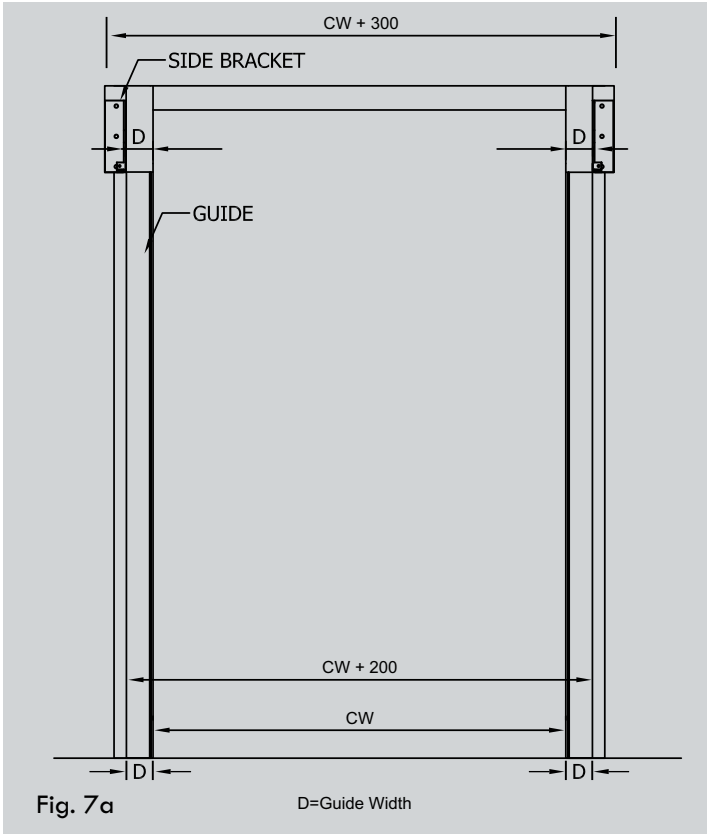



Fig. 7a

Side bracket marking

⚠ Carefully lift the shaft assembly using the Lift truck or other type of Lifting device making sure that it will not fall during lifting stage and the curtain is protected from getting damaged.

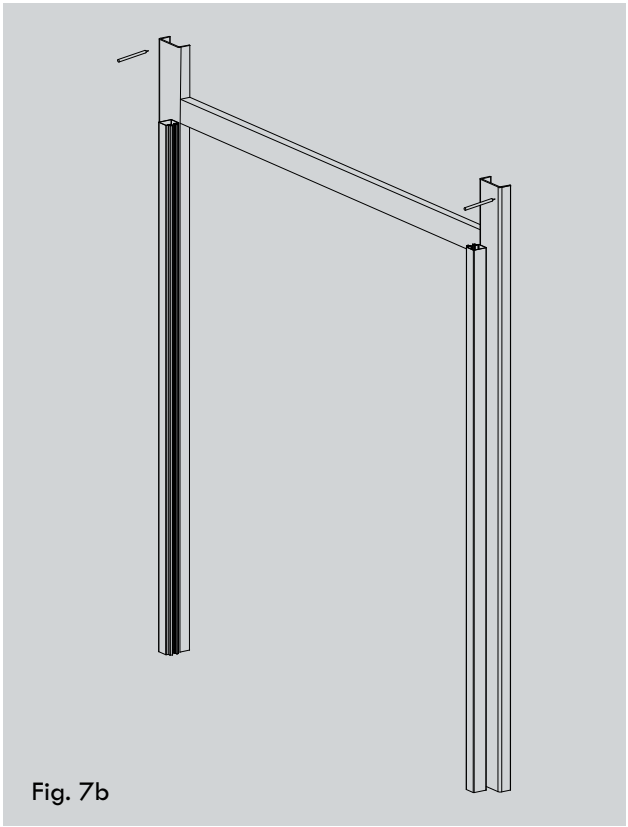


Fig. 7b

Side bracket marking

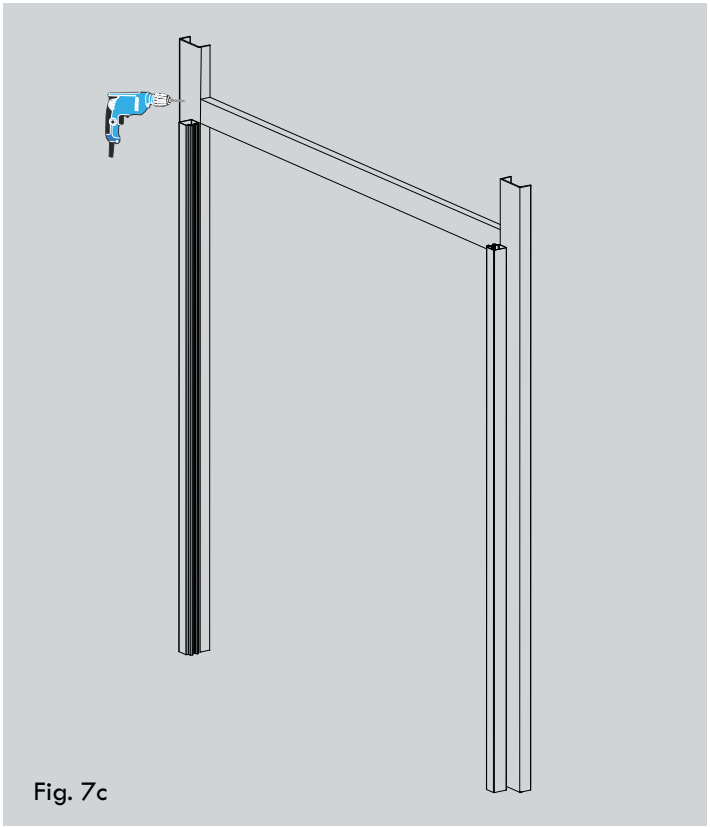


Fig. 7c

Side bracket drilling

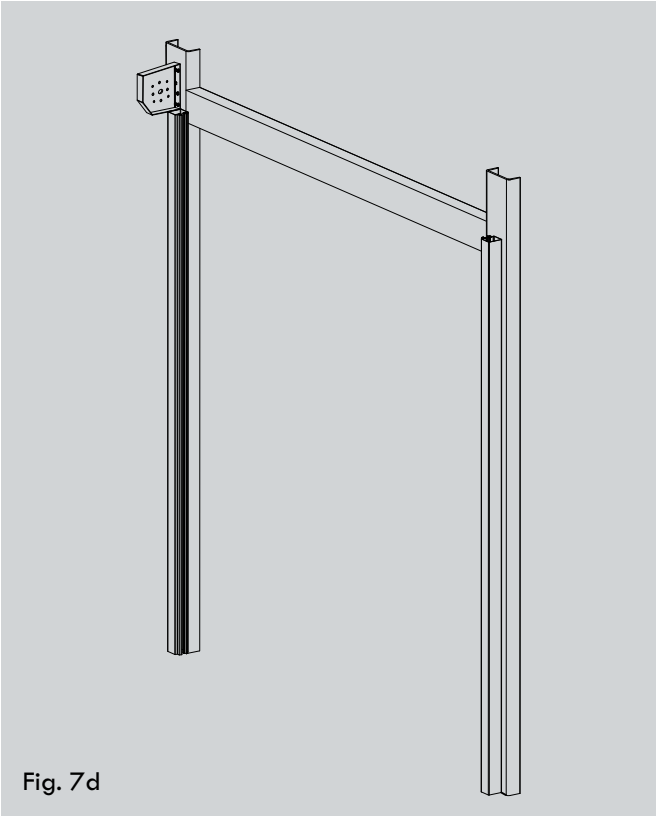


Fig. 7d

One side bracket fitting with bearing assembly

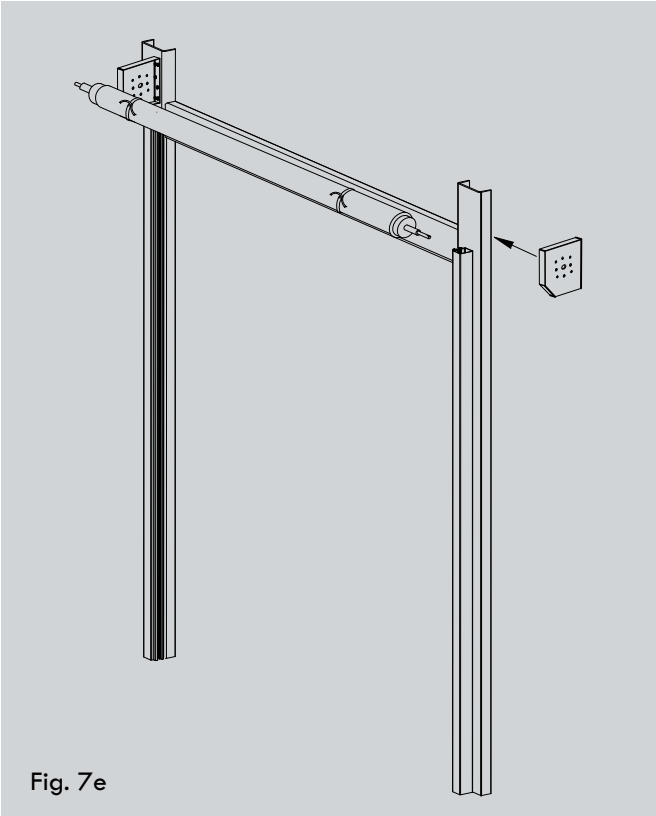


Fig. 7e

Other side bracket fitting with shaft assembly

- Lift the shaft assembly carefully and install it on one side bracket which is already fitted as shown in fig. 7e.
- Now fit the other side bracket and fasten it to the structure.
- Once again check bracket to bracket distance and do alignment of bracket as required.
- Check the distance of shaft barrel pipe to the inner end of the bracket at both sides.
- Align the shaft untill the distance measured is same at both ends.
- After alignment tighten screw provided on bearing so that shaft gets locked.

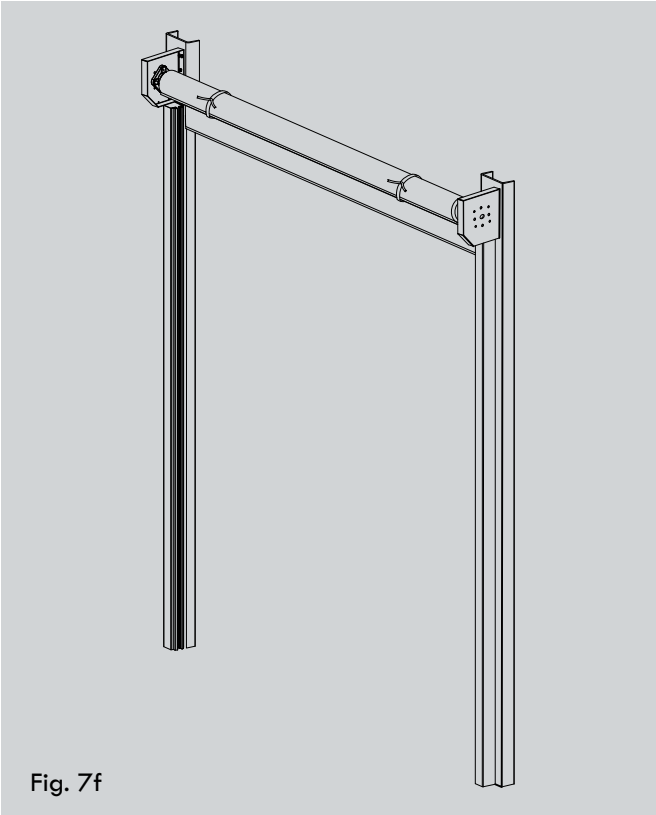


Fig. 7f

Shaft alignment

## 8 MOTOR INSTALLATION

- Fasten motor mounting plate on bracket as shown in fig. 8a.
- Now install Motor on motor mounting plate such that the shaft is completely inserted in the Motor and secure the assembly by inserting the motor shaft key.
- Bolt with locking nut is inserted in between motor and motor mounting plate and is bolted with nut from behind as shown in fig. 8b.
- Tighten all locking nuts to secure the assembly.
- Now fasten bolt and washer at both ends of shaft using M8 bolt as shown in fig. 8b.

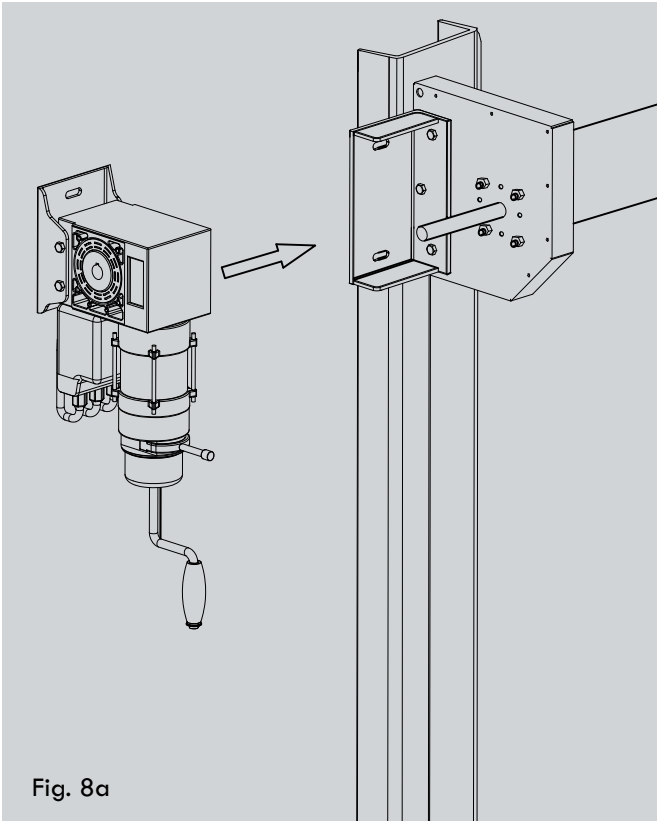


Fig. 8a

Motor Fitting

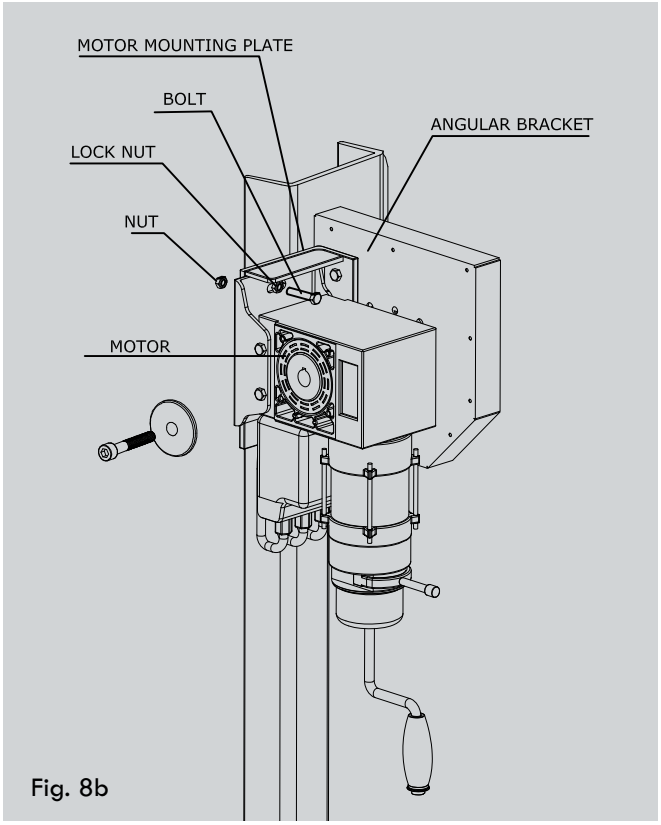



Fig. 8b

Motor Fitting Arrangement

## 9. BOTTOM BAR ASSEMBLY & INSTALLATION

Bottom bar assembly consist of bottom extrusion, rubber extrusion, rubber edge stopper attached at both the end and cable taken out from bottom bar for wireless transmitter of the safety edge.

Two holes are drilled for the Wireless transmitter module. Plastic mounting bracket used for fixing up safety shoes is also pre-drilled on bottom bar.

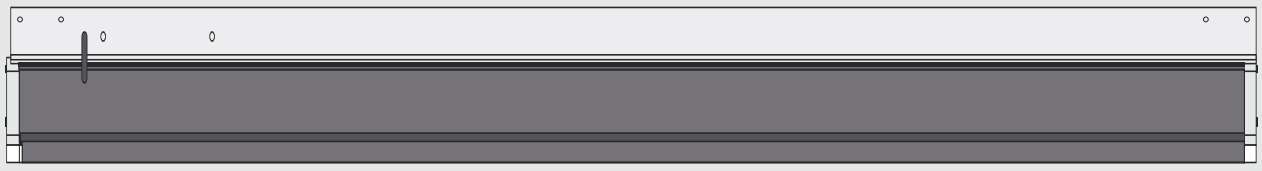


Fig. 9a

Bottom Bar Assembly

### a) Curtain Fixing to the Bottom bar:

- Remove the clamps on the curtain and roll down the curtain slowly up to the height of 1.5 meters approximately from the ground level as shown in fig. 9b using manual handle of motor.
- Now slide the Bottom Bar into the curtain from one side as shown in fig. 9c

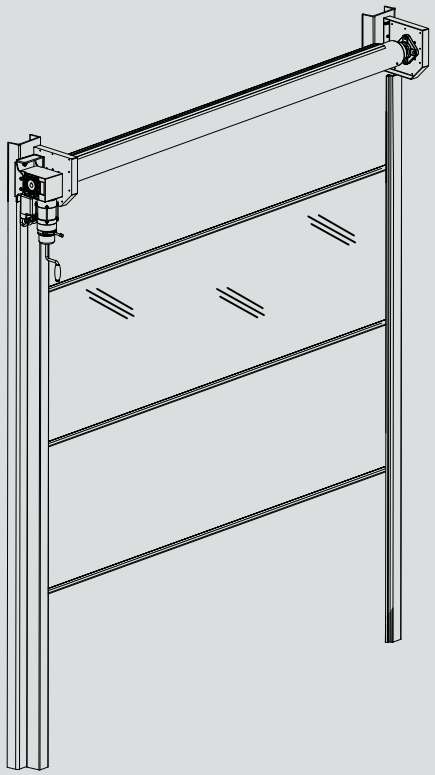


Fig. 9b

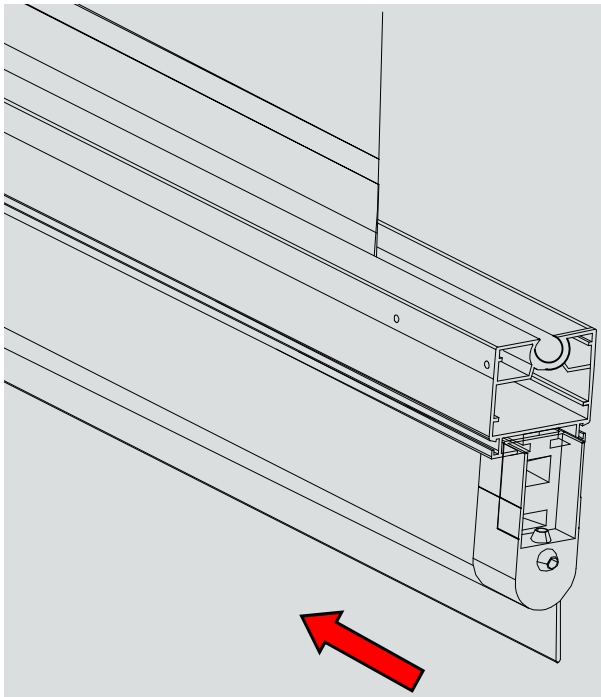



Fig. 9c

### b) Safety shoe fixing:

- Insert the Safety shoe in the Aluminum Bottom bar as shown in fig. 9d.
- Screw the Plastic mounting bracket of the safety shoe with the Safety shoe inserted in the Bottom bar from both the sides.
- Now the Bottom bar is ready with the Safety shoe inserted. The assembly will look as shown in fig. 9e

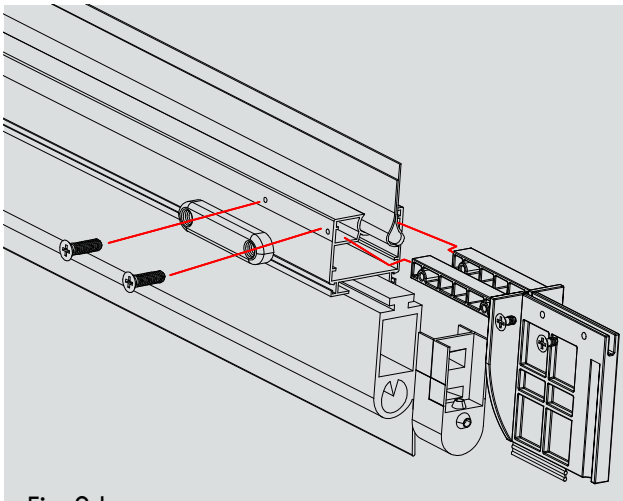


Fig. 9d

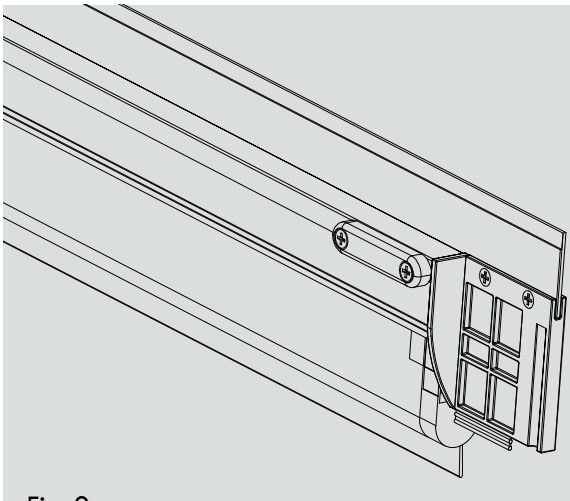


Fig. 9e

### c) Bottom bar Installation in Side guide:

- After the Bottom bar assembly is finished, lift the Bottom bar from one side slowly till the safety shoe is in line with side guide opening.
- Insert the Safety shoe of the bottom bar inside the Side guide opening safely and then again slowly release the curtain till its initial position.
- Repeat the above two steps for the opposite side of the Bottom bar also.
- Check that both the sides of the Safety shoe are inside the Side guide.

### d) Safety edge Wireless Transmitter Fixing:

- Strip the cable coming out of the Bottom bar shown in fig. 9f.
- Remove the Batteries from the cover provided in the Transmitter box.
- Insert the batteries in the Transmitter card. On correct insertion, Red LED will glow momentarily.
- Mount the Transmitter box on the bottom bar using the 2 mounting holes provided as shown in fig. 9f.
- Insert the stripped wire into the connector on the PCB.
- To check whether the transmitter is working press the Safety rubber edge. When the rubber edge is pressed the LED on the transmitter should glow till the safety edge is pressed. When the safety edge is released the LED will switch OFF.
- After checking of the Transmitter board, place the top cover of the transmitter Box and fix the screws tightly.
- After the transmitter box is closed the bottom bar assembly will look as shown in fig. 9g.

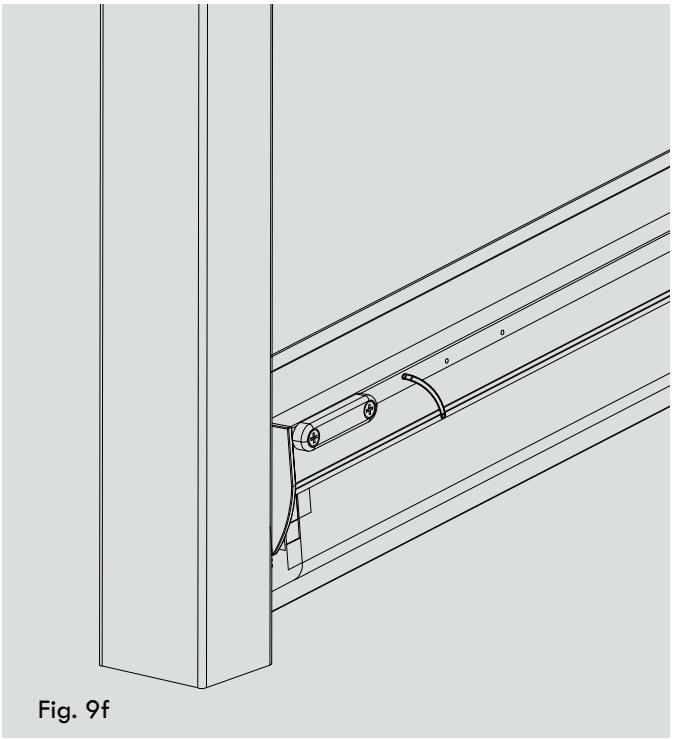


Fig. 9f

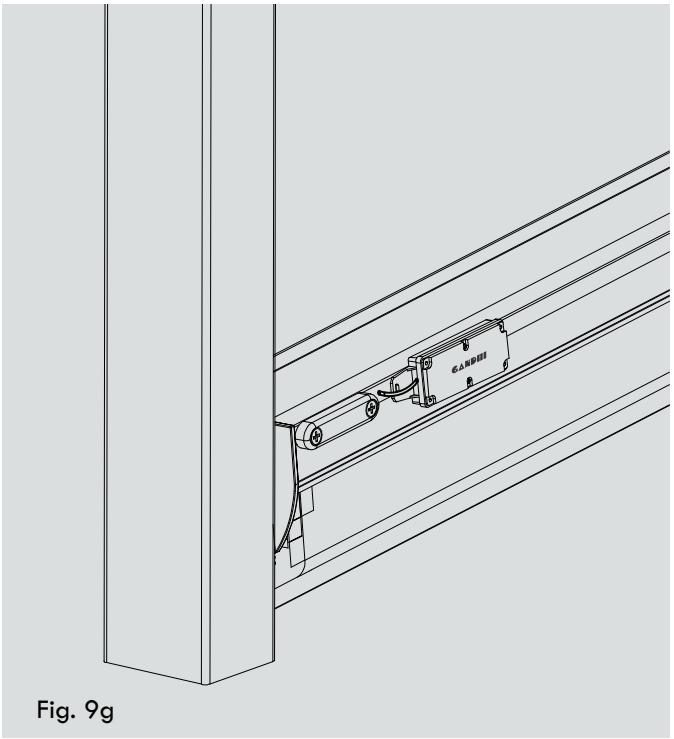
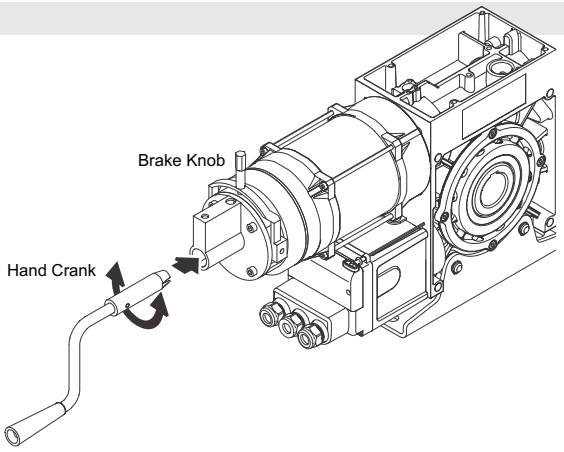


Fig. 9g

## 10. MANUAL CURTAIN ASSEMBLY CHECK

- Insert the manual hand crank provided with the motor in the slot provided.
- Insert the brake release knob provided separately with the motor.
- Pull the brake release knob to release the brake of the motor.
- Once the knob is released manually raise the curtain assembly using the Hand Crank.
- As the curtain moves in the side guide the curtain aligns itself properly into the side guide.
- Roll the curtain in the UP direction.




## 11. PHOTOCELL FIXING & WIRING

- Usually two pairs of photocells are provided. (2 transmitters & 2 receivers).
- Photocells are usually mounted on clamp which is mounted on guide as shown fig. 11a .
- Unscrew the top cover of the photocells provided.
- On one side of the door structure, fix a transmitter photocell such that the center of sensing area of the photocell is at 200mm from the ground level.
- Above that fix a receiver photocell such that the center of sensing area of the photocell is at 800mm from the ground level.
- Now on the other side fix the receiver photocell at the bottom and the transmitter photocell at the top.
- Fixing of photocell and connecting the wires to these photocells according to the fig. 11b.
- If photocell is fixed on structure then photocell cable "A" should be routed inside the structure as shown in fig. 11a.

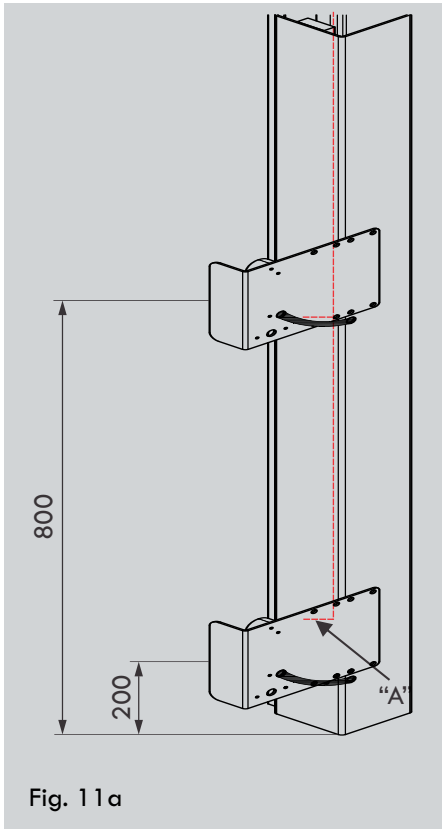


Fig. 11a

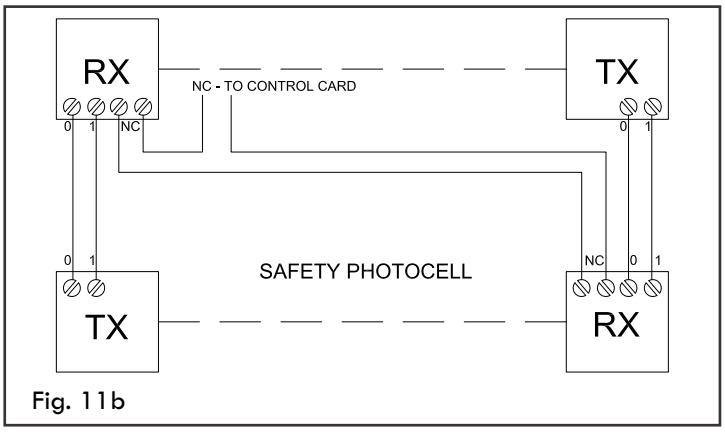


Fig. 11b

- Connect the common wires of the 2 transmitters together and the common wires of the 2 receivers together such that output from the photocells is only a single 4 core wire i.e. the photocell pairs are connected in series.
- Connect the 0 & 1 wires of the receivers to the transmitter as this is the GND & 24VDC supply.

## 12. MOTOR COVER, TOP COVER AND END CAP FITTING

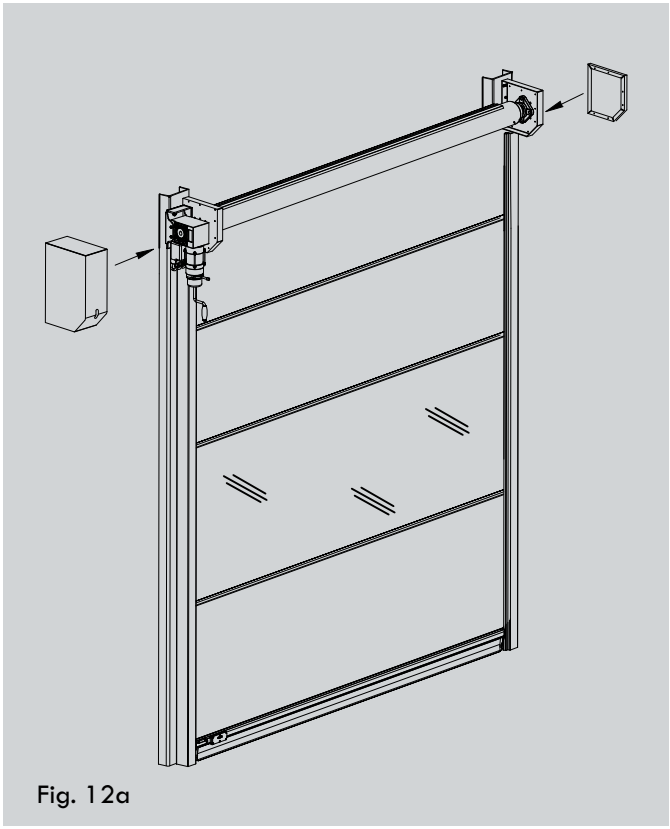


Fig. 12a

Motor Cover and End Cap Fitting

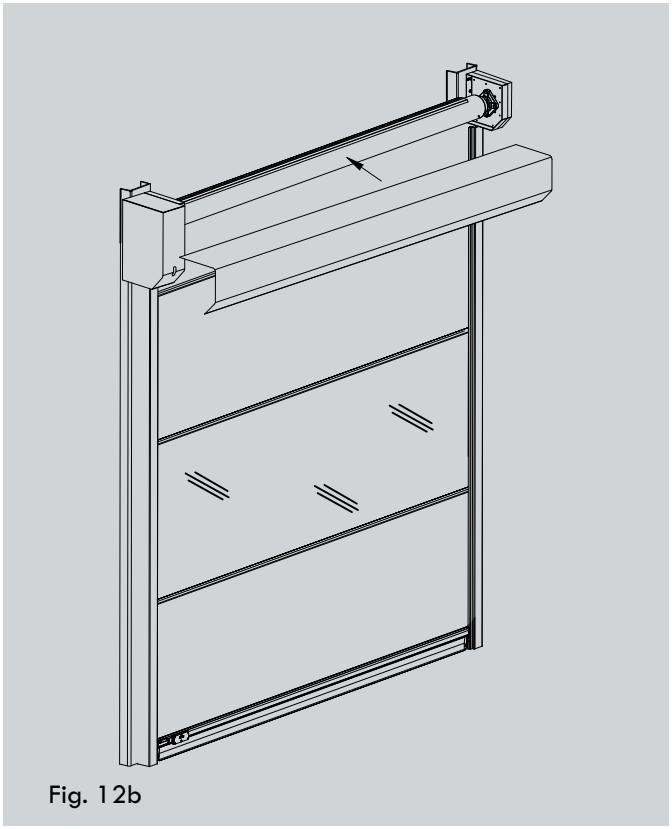


Fig. 12b

Top Cover Fitting

- After setting the limit of motor and checking all accessories fit the covers.
- Fit Motor Cover and End cap from both ends as shown in fig. 12a.
- Now fit top cover from front such that after fitting, motor cover, top cover and end cap are aligned with each other and there is no visible gap between them.
- Fig. 12c shows complete assembly of Prime door.

Fig. 12c

Prime Door Full Assembly

## 13. OPERATING INSTRUCTIONS FOR GAPL31X DLS CONTROL CARD

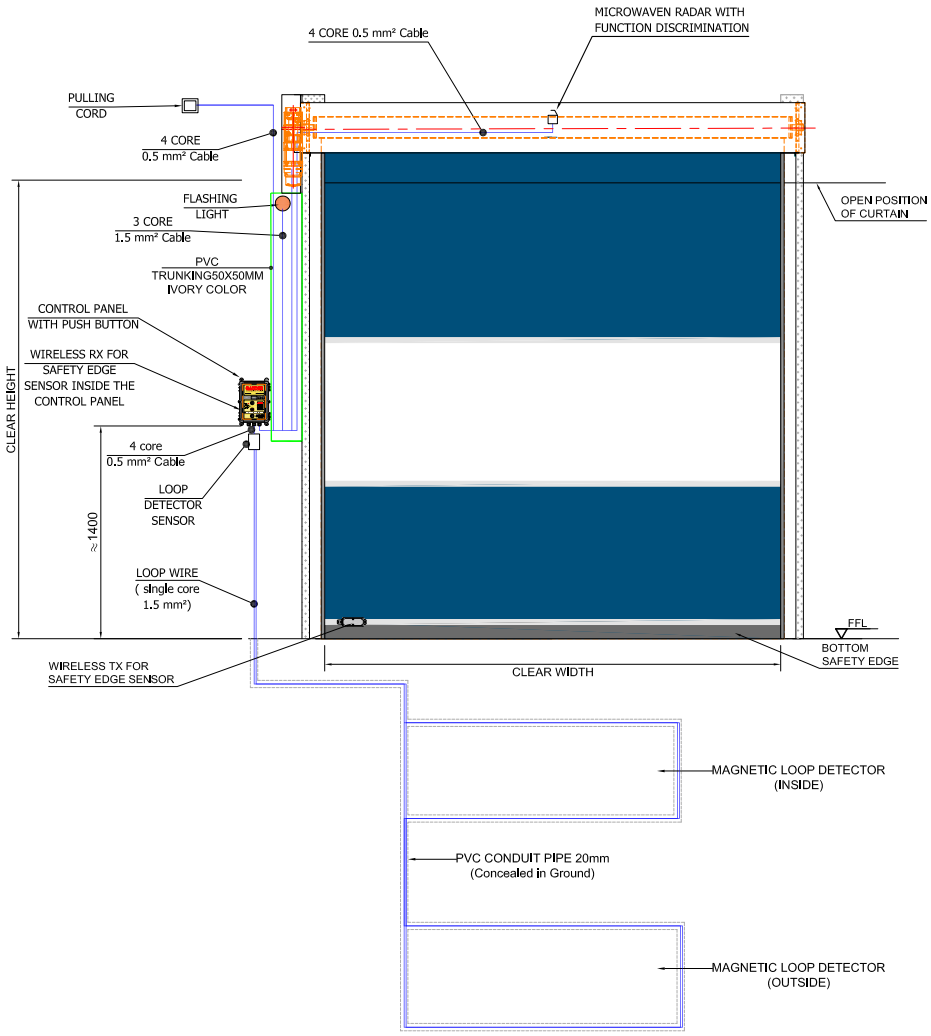



Fig. 13a

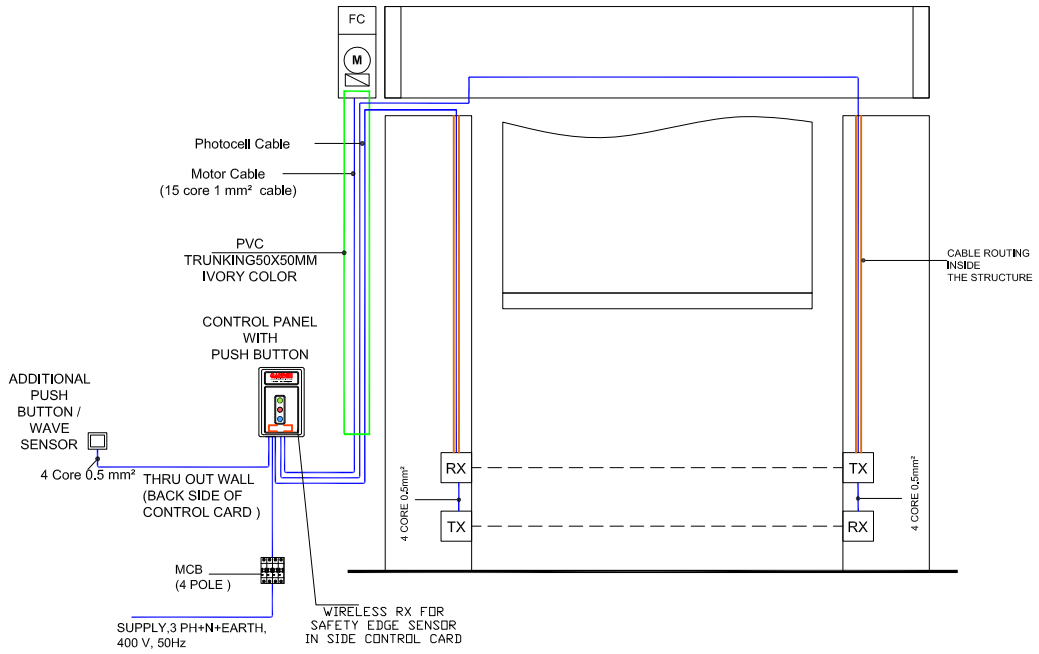
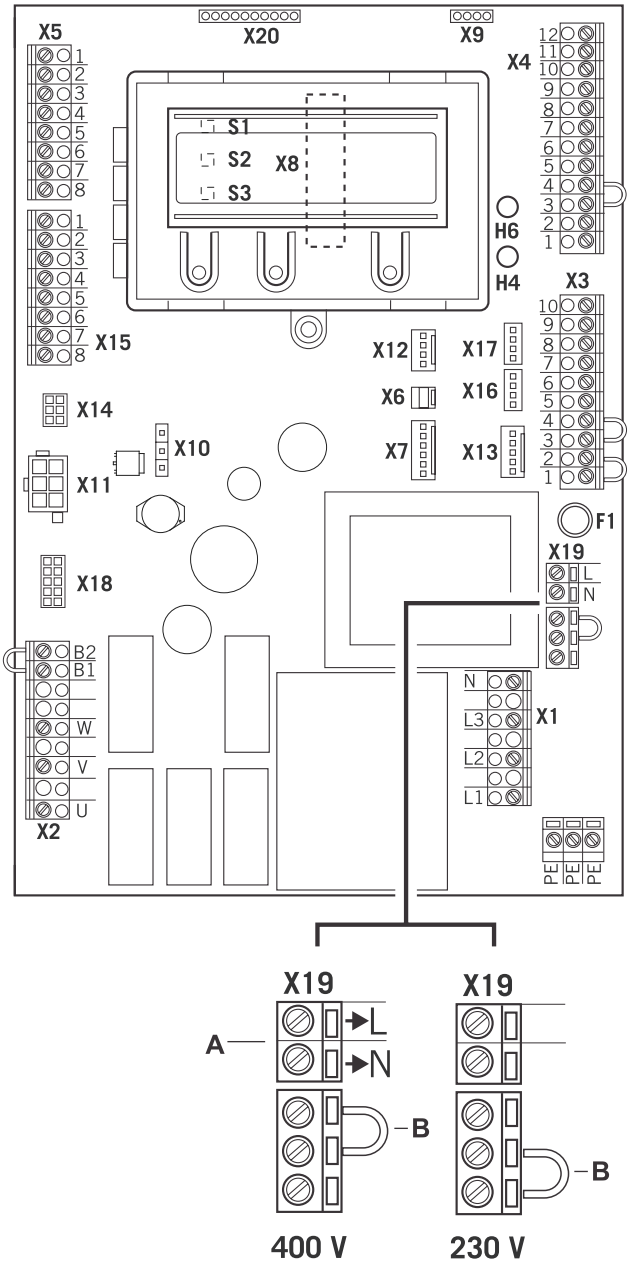



Fig. 13b

## Motherboard GAPL 31X DLS
## (with plugged-in LCD monitor)

Key:

X1 : Terminal block for mains connection
X2 : Terminal block for motor
X3 : Terminal block for command devices
X4 : Terminal block for safety elements
X5 : Terminal block for relay
X6 : Sockets for internal ON-OFF switch
X7 : Sockets for internal 3-button input unit
X8 : Sockets for LCD monitor
(under the LCD monitor)
X9 : Sockets for radio receiver
X10 : Sockets for weekly timer
X11 : Sockets for digital end position system
X12 : Sockets for external radio receiver
X13 : Sockets for CS three-button input unit
X14 : Interface RS 485
- Connection for CSI button input
- Connection for RS 485 display
X15 : Terminal block for mechanical end position system
X16 : Sockets for BUS system (MS BUS)
X17 : Sockets for BUS system (MS BUS)
X18 : Frequency converter interface
X19 : Power supply for external devices
230V / 50 Hz protected by F1 (1 A delay) fuse
X20 : Sockets for transmission system
H4 : Operational readiness
Lights up when power supply available.
H6 : Status message
Lights up when the safety devices are actuated or if an error occurs
S1 : Programming button (+)
(under the LCD monitor)
S2 : Programming button (-)
(under the LCD monitor)
S3 : Programming button (P)
(under the LCD monitor)




A Output: 230 V.
Power supply for external devices.
No power line entry for the control unit itself.

➔ "13.5.3 Power supply for external devices (only for 400 V / 3-phase connection)"

B The position of the jumper must take into account the power supply voltage and the motor voltage.

## 13.1 Initial operation

### 13.1.1 General

To guarantee that the equipment functions properly, it must be ensured that:

- The door is installed and operational.
- The GAPL operator motor is installed and ready for operation.
- The command and safety devices are installed and ready for operation.
- The control housing with the CS 310 control is installed.

REFERENCE
The relevant manufacturers' instructions must be adhered to for the installation of the door, the motor, and the command and safety devices.

### 13.1.2 Mains connection

**Preconditions**

To guarantee that the controls function properly, the following points must be ensured:

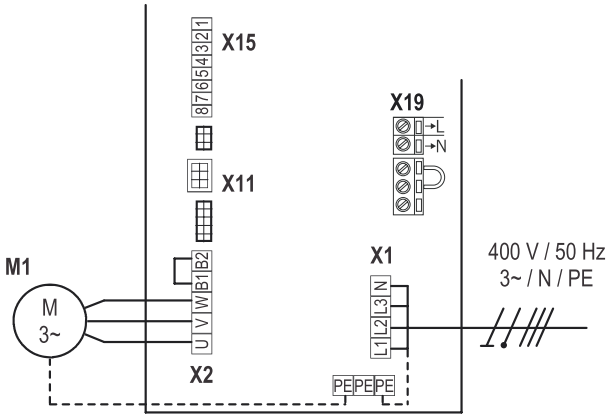
- The mains voltage must correspond to the voltage stated on the type plate.
- The mains voltage must be the same as the voltage of the operator.
- For three-phase current, a clockwise rotating field is required.
- For a permanent connection, an all-pole main switch must be used.
- For a three-phase connection, only 3-way automatic circuit breakers (10 A) may be used.

ATTENTION !
Malfunctions can occur as a result of incorrect installation of the control!
Before switching on the control for the first time, a check must be carried out after completing the wiring to ensure that all the motor connections at the motor and at the control is securely fixed. All control voltage inputs are galvanically isolated from the supply.

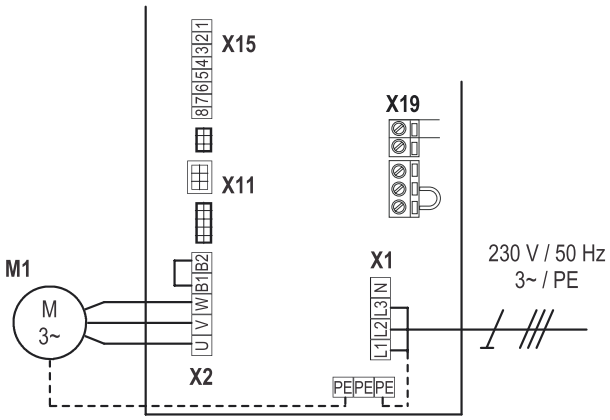
Key:

M1 : Motor
X1 : Terminal block for mains connection
X2 : Terminal block for motor
X11 : Sockets for digital end position system with safety circuit (SAFETY CIRC.)
X15 : Terminal block for mechanical limit switches (Safety circuit at X2 / B1-B2)
X19 : Power supply connection for external devices

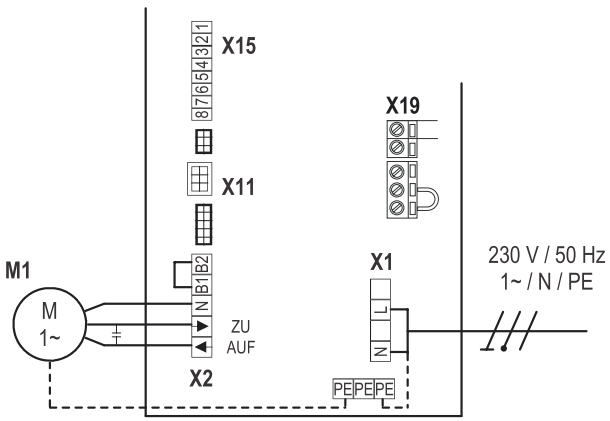
Detailed circuit diagram for mains connection and motor connection (400 V / three phase)




Detailed circuit diagram for mains connection and motor connection (230 V / three phase)




Detailed circuit diagram for mains connection and motor connection (230 V / single phase)

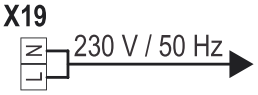


Connection

- Connect the digital end position system or mechanical limit switches to the control.
- Connect the control to the motor.
- Connect the control to the mains power supply.
- Cable groups must be secured close to their relevant terminals using a cable tie.

➔ “13.8. Technical data”

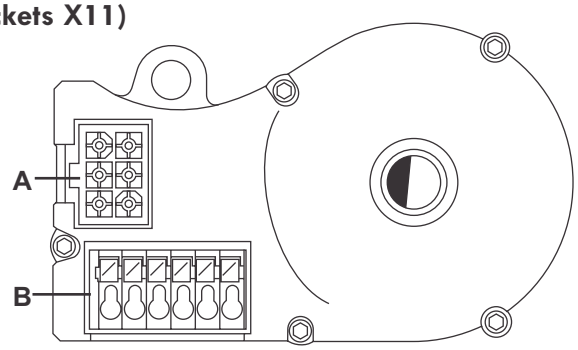
### 13.1.3 Power supply for external devices (only for 400 V / 3-phase connection)




NOTICE
The X19 connection can only be used with a 400 V / N / 3~ power supply.
Terminal X19 is protected with fuse block F1 (1 A-T).

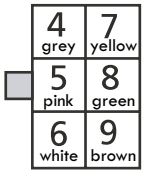
### Allocation of connections for absolute value encoder (sockets X11)

A : AWG plugs
B : AWG plug terminal



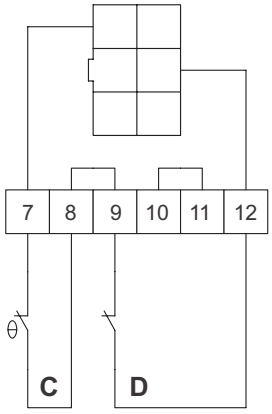

#### X11 sockets (at connection A)

Depending on the operator, cables with either numbered or coloured wires are used for the AWG:




| | | | | | |
|---|---|---|---|---|---|
| 4 (grey) | : | Safety circuit input | 7 (yellow) | : | RS485 A |
| 5 (pink) | : | RS 485 B | 8 (green) | : | Safety circuit output |
| 6 (white) | : | GROUND | 9 (brown) | : | 12VDC |

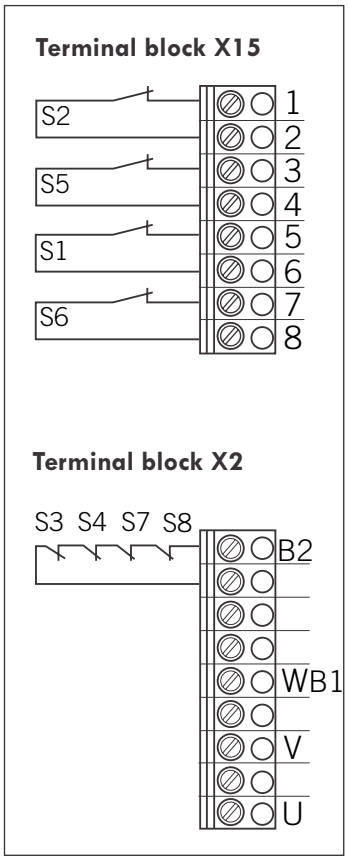
#### Sockets B (absolute value encoder only)

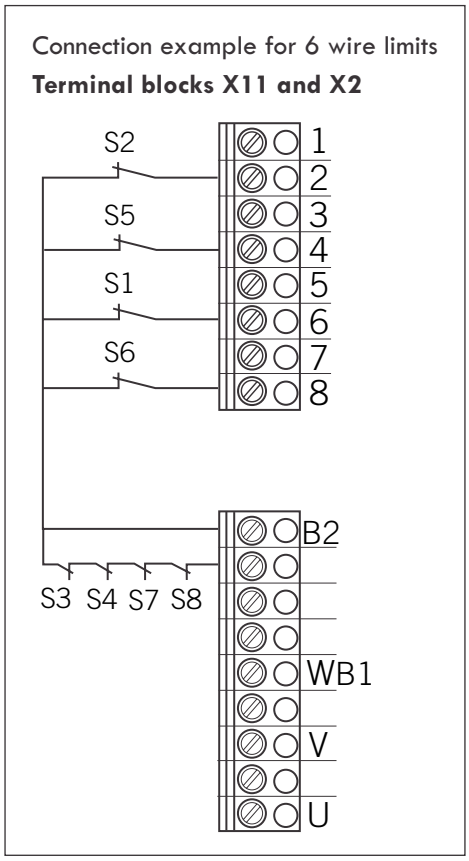



C : Thermal element in door operator
D : Emergency manual operation (emergency hand crank or emergency hand chain)

The end position system will be recognised automatically by the control during initial use. If a change is made at a later date, the relevant end position system must be selected via a parameter setting in INPUT mode.

### 13.1.5 Connection of mechanical limit switches (terminal blocks X15 and X2)




S1 Additional limit switch, OPEN
S2 Limit switch, OPEN
S3 Safety limit switch, OPEN
S4 Safety limit switch, CLOSED
S5 Limit switch, CLOSED
S6 Additional limit switch, CLOSED
S7 Thermal overload protection for motor
S8 Emergency operation (normally closed contact)

The end position system will be recognised automatically by the control during initial use and following a RESET. If a change is made at a later date, the relevant end position system must be selected via a parameter setting in INPUT mode.

➔ “13.6.2 Input operating mode”

### 13.1.6 Connection of command devices

**CAUTION!**

Danger of injury due to uncontrolled movement of the door!

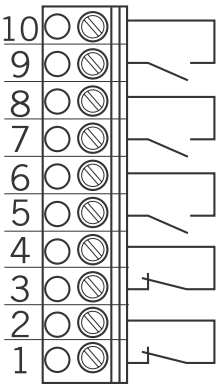
A CLOSE command for deadman mode without the door being in sight may be enabled only via Input 1 / MOD32 (X4 / 9–10).

- Install command devices for deadman in direct site of door, but outside the danger area for the user.

If the command device is not a key switch:

- Install it at a height of at least 1.5 m off the ground.
- Install it so as to make it inaccessible to the general public.

**Terminal block X3**



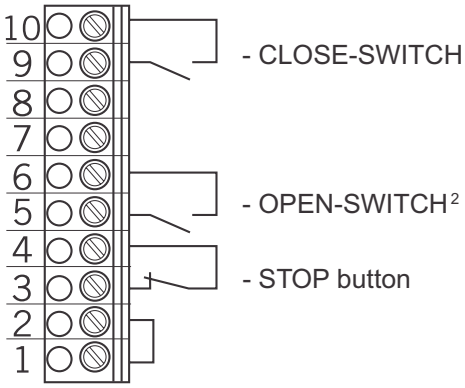

- CLOSE-SWITCH
- Impulse button
- OPEN-BUTTON[1]
- STOP button wicket door switch[1]
- Emergency off, slack rope switch

[1] Wicket door switch only possible as a contact with positive separation.

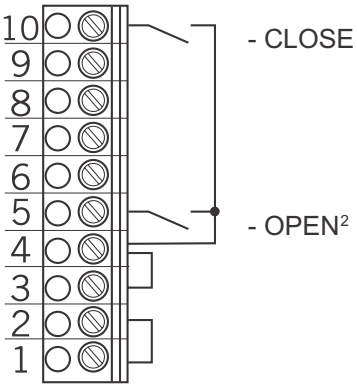
### 13.1.7 Connection examples for command devices (terminal block X3)

**OPEN / STOP / CLOSE buttons**

6-lead solution

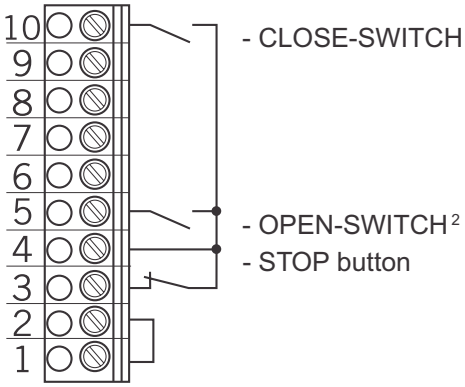



**Key switch OPEN / CLOSE**



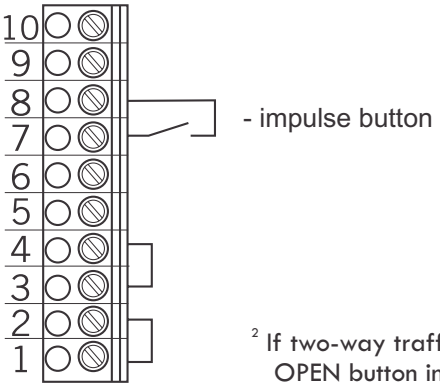

**OPEN-SWITCH / STOP / CLOSE-SWITCH**

4-lead solution




**Impulse button**

(sequence control)




[2] If two-way traffic control is activated: OPEN button inside

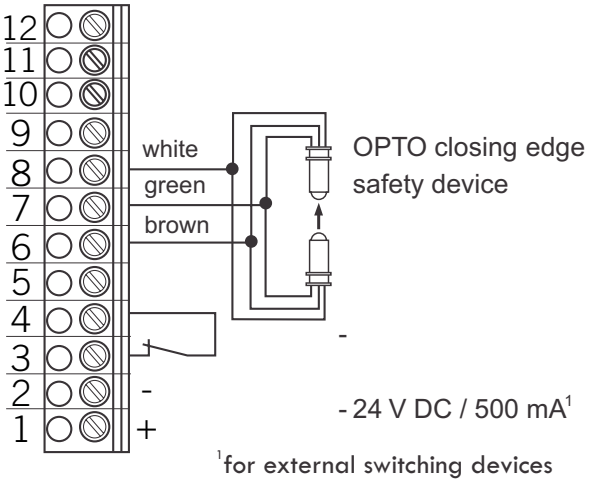
### 13.1.8 Allocation of connections for closing edge safety devices

The closing edge safety device will be recognised and programmed automatically during initial use and following a RESET. If a closing edge safety device is not connected, the input will be queried every time the power supply is switched on again, until a closing edge safety device is recognised. If a change is made at a later date, the relevant system must be selected via a parameter setting in INPUT mode.

➔ "13.6.2 Input operating mode"

**Terminal block X4**

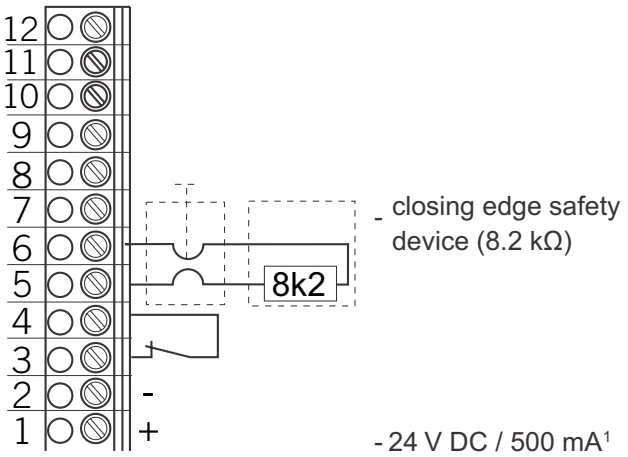
Opto-electronic closing safety edge device
"SKS" parameter setting = MOD 1




[1] for external switching devices (connection to terminals 1 and 2)

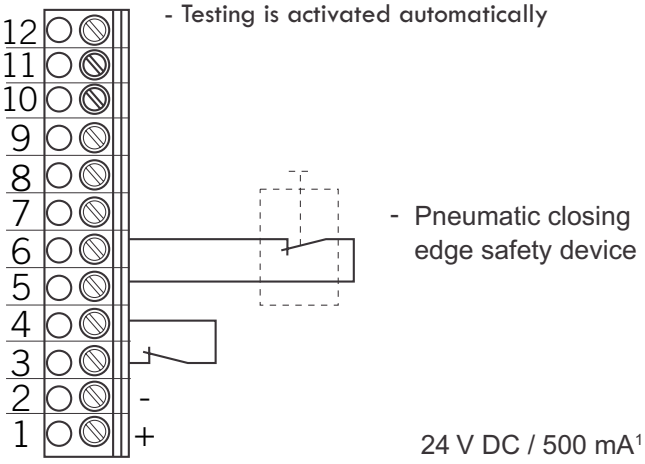
**Terminal block X4**

Electrical closing edge safety device (8.2 kΩ)
"SKS" parameter setting = MOD 2




**Terminal block X4**

Pneumatic closing edge safety device (pressure sensor test)
"SKS" parameter setting = MOD 3
- Testing is activated automatically




[1] For external switching devices (connection to terminals 1 and 2)

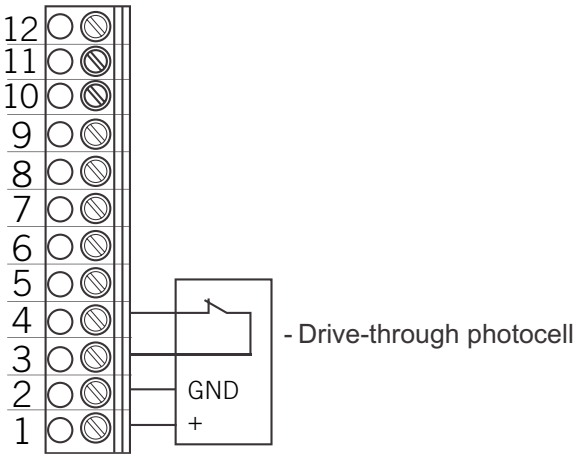
### 13.1.9 Allocation of connections for photocells

The photocell system will be recognised and programmed automatically during initial operation and following a RESET. If a photocell system is not connected, the input will be queried every time the power supply is switched on again, until a closing edge safety device is recognised. If a change is made at a later date, the relevant system must be selected via a parameter setting in INPUT mode.

➔ "13.6.2 Input operating mode"

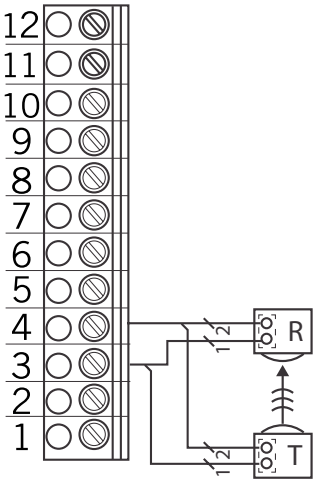
**Terminal block X4**

Photocell NC
Parameter LIGHT BARR. 1 = MOD 2




**Terminal block X4**

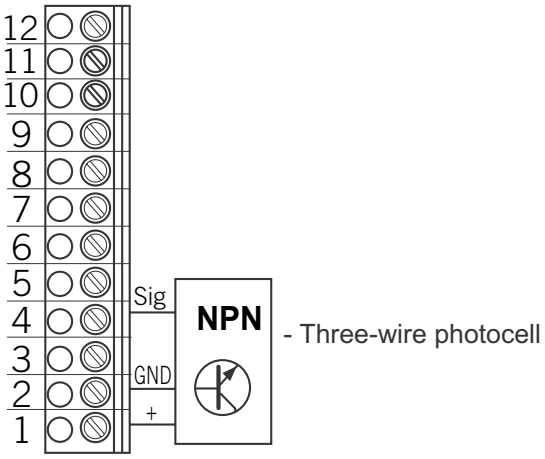
two-wire photocell Parameter
LIGHT BARR. 1 = MOD 1




R : Receiver
T : Transmitter

**Terminal block X4**

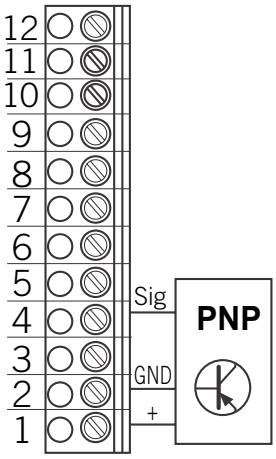
Three-wire NPN photocell
Parameter LIGHT BARR. 1 = MOD 2




- Three-wire photocell

**Terminal block X4**

Three-wire PNP photocell
Parameter LIGHT BARR. 1 = MOD 3




- Three-wire PNP photocell

NOTICE :
All photocells are active for the OPENING or CLOSING direction, depending on the setting.
➔ "13.6.2 Input operating mode"

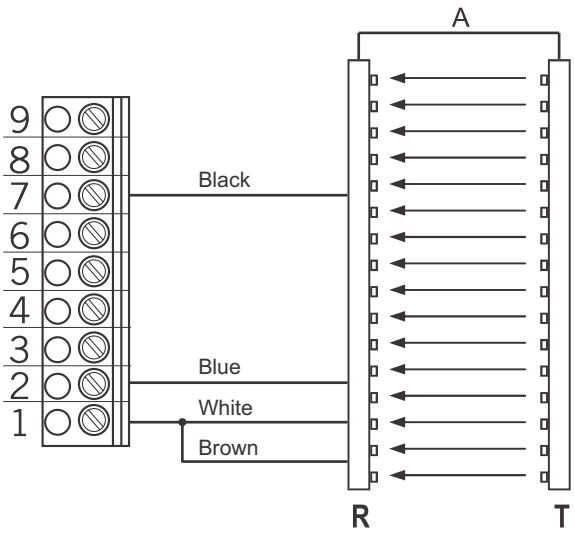
### 13.1.10 Light curtain connection

Up to two light curtains can be connected to the Control. Light curtain 1 is connected to the input of the closing edge safety device and can be either an OSE or PNP system.

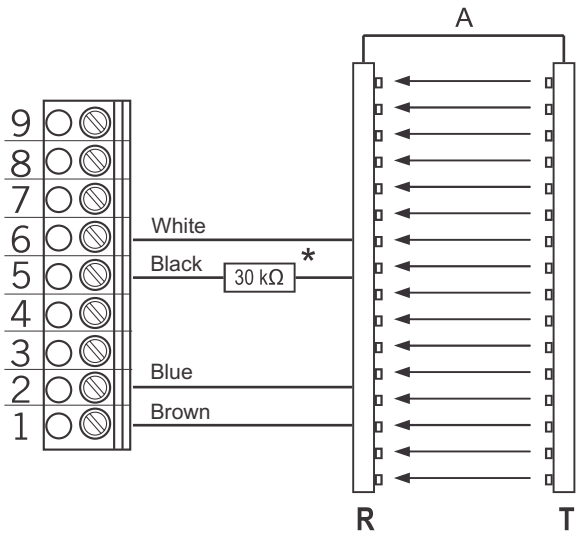
**Terminal block X4**

**Light curtain 1**

**Version A: OSE** (parameter SKS = MOD4)
The connecting cable (A) can be plugged in.




**Version B: PNP** (parameter SKS = MOD5) The connecting cable (A) can be plugged in.

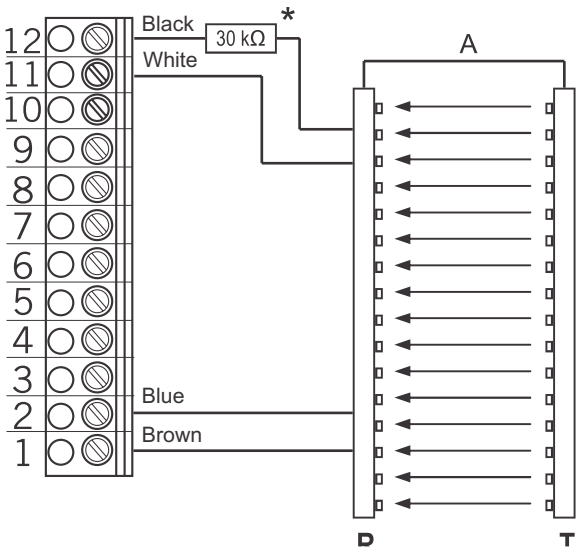



* The resistor (30kΩ) is included in the supply package.

**Light curtain 2** (parameter INPUT2 = MOD7)

Light curtain 2 is connected to the programmable INPUT 2 and must be a PNP system.

The connecting cable (A) can be plugged in.




NOTICE :

The light curtain shown as an example in these instructions is the RAY-LG, manufactured by FRABA / CEDES.

RAY-LG 25xx OSE
RAY-LG 15xx PNP

In the case of the PNP system, the resistor (30kΩ) is included in the supply package and must be wired into the system without fail.

Testing of the FRABA/CEDES RAY-LG 15xx PNP light curtain takes place cyclically at the upper end position and before every hazardous movement. No relay output is necessary in this case.
No testing is required for the RAY-LG 25xx OSE light curtain.

Drawings from other manufacturers are available on enquiry.

* The resistor (30kΩ) is included in the supply package.

## 13.1.11 Connection of programmable inputs

The CS 310 control has two programmable inputs, for which various functions can be selected.

➔ “13.6.2 Input operating mode”

ATTENTION !

Danger of damage to the circuit board due to incorrect connection!

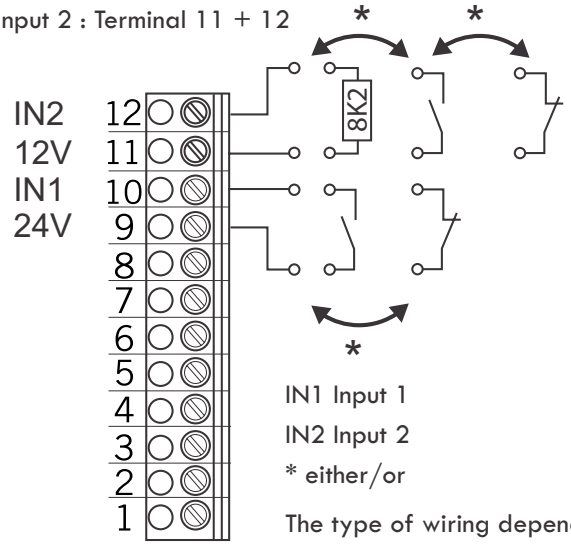
Inputs 1 and 2 have a different reference potential and they must NOT be operated from the same potential !

**Terminal block X4**

Programmable inputs

Input 1 : Terminal 9 + 10

Input 2 : Terminal 11 + 12




IN1 Input 1

IN2 Input 2

* either/or

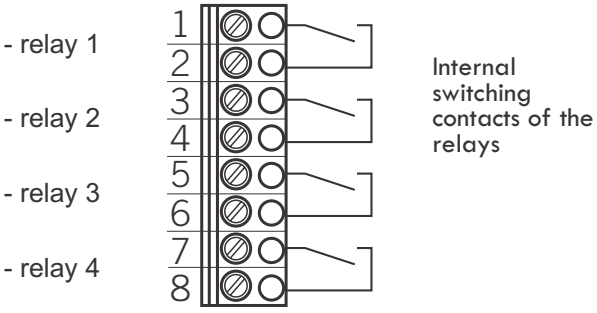
The type of wiring depends on the parameter settings for both inputs in INPUT mode.

## 13.1.12 Connection arrangement for relay outputs

Four potential-free relay outputs are available which can be programmed for various types of function.

➔ “13.6.2 Input operating mode”

**Terminal block X5**

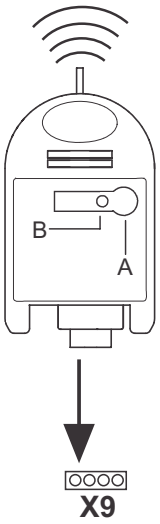



These four relay outputs are potential-free and have a maximum capacity of 4A at 230V/1~.

The type of function depends on the parameter setting for the corresponding relay output in INPUT mode.

### 13.1.13 CS radio

**Terminal block X9**




Connection

- Insert the plug-in receiver into plug-in socket X9.

Teaching-in the transmitter codes

- Press the programming button (A) and hold for more than 1.6 seconds. The programming mode is activated. The LED (B) flashes.
- Press the channel button on your transmitter.

  Once the remote control has saved the transmitter code, the LED lights up for approximately 4 seconds.

It is possible to teach-in up to 15 transmitter codes. If all memory spaces are full, the LED flashes rapidly.

**Selectively deleting a transmission code**

- Press the programming button (A) and hold for more than 1.6 seconds.
  The programming mode is activated. The LED (B) flashes.
- Keep pressing the programming button. The delete mode is activated.
  The LED flashes very fast.
- Press the required channel button on your transmitter. When the LED lights up for approximately 4 seconds, the transmitter code in question has been deleted.

The deletion procedure can be cancelled by briefly pressing the programming button.

**Reset (completely delete memory)**

- Press the programming button (A) and hold for more than 1.6 seconds.
  The programming mode is activated. The LED (B) flashes.
- Keep pressing the programming button.
  The delete mode is activated. The LED flashes very fast.
- Press the programming button again for more than 1.6 seconds.
  When the LED lights up for approximately 4 seconds, all of the memory spaces have been deleted.

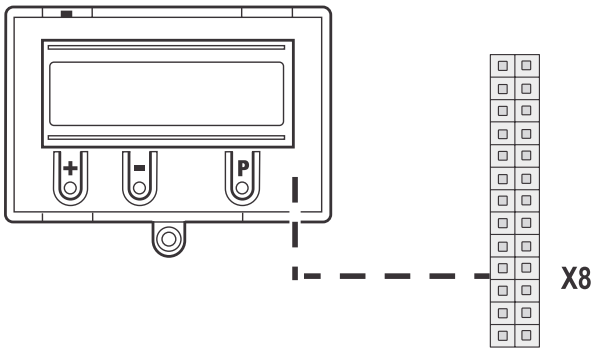
The deletion procedure can be cancelled by briefly pressing the programming button.

### 13.1.14 Connection of LCD monitor

With the LCD monitor, you have complete access to all of the menu settings and parameters of the control unit.

➔ “13.4 Programming”

**Plug-in socket X8**




ATTENTION !

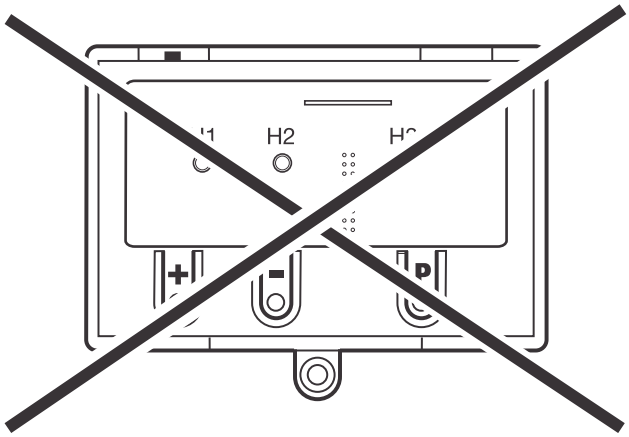
Damage can occur through improper installation!

The mains power supply must be switched off before connecting the LCD monitor. Only an LCD monitor (article number 91447) may be used.

ATTENTION !

Damage can occur through improper installation!

The LED module (article number 103239) cannotbe combined with the CS 310. Inserting this module and putting it into service can damage the CS 310 circuit board beyond repair.

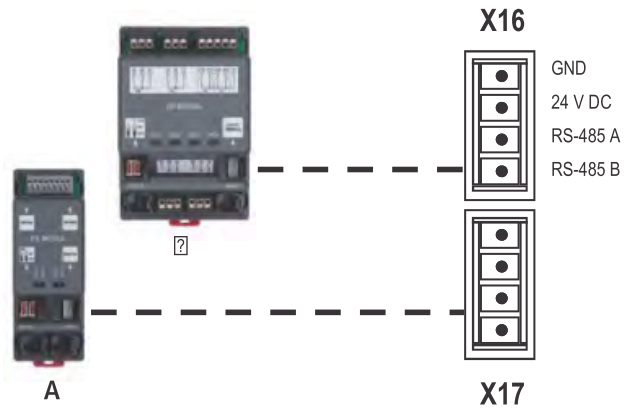


### 13.1.15 Connection of MS BUS modules

The MS BUS function modules allow you to expand the existing functions or add further functions.

- ES Module : Evaluation of draw in protection systems
- I/O Module : Input/Output expansion
- GV Module : Two-way traffic control

**X16 / X17 sockets**




A ES Module
B I/O Module / GV Module

REFERENCE
For a detailed description of the function and connection of the modules, see the separate documentation for the BUS modules.

NOTICE:
Sockets X16 and X17 can be used only once. Taking the power consumption into account, however, it is possible to connect several BUS modules by using special jumper cables.

## 13.2 Initialisation

The following components will be recognised and taught-in automatically during initial operation and following a RESET.

- End position system
- Closing edge safety device
- Photocell system
- Input 2 (wicket door sensor)

During this process (approximately 90 seconds) the green LED flashes and the top line of the display shows the message “PLEASE WAIT ...”.

It is not possible to operate the system during this process. The end position system must be installed before initial operation.

Components can be changed or added at a later date using the LCD display or by reinitialising the system.

If one of the components has not yet been connected, this will be indicated by “A“ in the display.

This component will be searched for if any further initialisation procedure is carried out. If this component is recognised, the system automatically switches to the appropriate adjustment mode.

Exception:

Input 2 remains inactive (MOD1) if no 8.2 kΩ resistance was recognised the first time that initialisation was carried out.

If an 8.2 kΩ resistance is detected at Input 2 during initial operation, it will be evaluated as a wicket door sensor and set in operation accordingly.

NOTICE:

In addition to “teaching in” the various system components, the initialisation process allows you to change the menu language directly.

The menu language pre-set in the factory (GERMAN) is displayed as a flashing text for approximately 60 seconds. The desired language can be selected using the [+] and [–] buttons and saved by pressing the [P] button. After this, all texts or messages displayed are shown in the language that you have selected.

## 13.3. Setting the end positions

### 13.3.1 Checking the direction of rotation/ direction of travel

Changing to adjustment mode

- Press button (P) until ADJUSTMENT appears.

Checking the direction of travel

- Press the (+) button. The door should open.
- Press the (–) button. The door should close.

If correct, continue with setting the end positions. If not, change the direction of travel.

Changing the direction of travel

- Press buttons (+) and (–) at the same time and hold for longer than 5 seconds. The display shows “ROT FIELD LEFT”. Any end positions that have been saved will be deleted. Continue with setting the end positions.

### 13.3.2 Setting the mechanical limit switches

**Changing to adjustment mode**

- Press button (P) until ADJUSTMENT appears.

Setting the OPEN and CLOSED end positions

REFERENCE
The procedure for setting the end positions is described in separate documentation for mechanical limit switches.

- Exit the ADJUSTMENT mode by pressing button (P).

**Please note**

ADJUSTMENT mode is not exited automatically. To return to normal operating mode, ADJUSTMENT mode must be exited by pressing button (P).

### 13.3.3 Setting the electronic end position system using the setting buttons on the circuit board

**Changing to adjustment mode**

- Press button (P) for approx. 5 seconds.
  The red LED flashes slowly.

**Set the OPEN end position**

- Press the (+/–) buttons to move the door/gate to the desired OPEN end position.
- Save the end position setting by pressing button (P) and by additionally pressing the (+) button.
  The red LED flashes rapidly for approx. 1 second.

**Set the CLOSED end position**

- Press the (+/–) buttons to move the door to the desired CLOSED end position.
- Save the end position setting by pressing button (P) and by additionally pressing the (–) button.
  The red LED flashes rapidly for approx. 1 second.

Adjustment mode is exited automatically. The red LED goes out.

**Please note**

- The adjustment mode will end automatically after approximately 7 seconds if no key is pressed.
- When carrying out adjustments for the first time, it is necessary to teach-in both end positions. Otherwise, normal operation will not be possible.
- If an end position is corrected, the ADJUSTMENT menu can be exited by pressing button (P) once the teaching-in of the special end position has been completed.
- After programming the limit switches, the teach-in of the system running time is carried out automatically. The functions of the control are the same as in automatic mode.

### 13.3.4 Setting the electronic end position system using the LCD monitor

ATTENTION!

Damage to property or irreparable damage due to incorrect installation!

The power supply must be switched off before connecting the monitor. Only an monitor may be used.

At plug-in socket X8 : LCD Monitor Standard (#91447)

At plug-in socket X14 : LCD Monitor RS 485 (#121246)

**Changing to adjustment mode**

- Press button (P) until ADJUSTMENT appears.

**Set the OPEN end position**

- Press the (+/–) buttons to move the door to the desired OPEN end position.
- Save the end position setting by pressing button (P) and by additionally pressing the (+) button.
  “STORAGE UP” appears in the display.

**Set the CLOSED end position**

- Press the (+/–) buttons to move the door to the desired CLOSED end position.
- Save the end position setting by pressing button (P) and by additionally pressing the (–) button.
  “STORAGE DOWN” appears in the display.

Adjustment mode is exited automatically.

**Please note**

- The adjustment mode will end automatically after approximately 7 seconds if no key is pressed.
- When carrying out adjustments for the first time, it is necessary to teach-in both end positions. Otherwise, normal operation not be possible.
- If an end position is corrected, the ADJUSTMENT menu can be exited by pressing button (P) once the teaching-in of the special end position has been completed.
- After programming the limit switches, the teach-in of the system running time is carried out automatically. The display shows TEACH IN RUN. The functions of the control are the same as in automatic mode.

### 13.3.5 Setting the intermediate positions of the electronic end position system using the LCD monitor

**In AUTOMATIC mode, move the door/gate to the desired position**

- Press the (+/–) button to drive the door to the desired intermediate position (INC.P.OP or INC.P.CL).

**Changing to Input mode**

- Press button (P) until INPUT appears.
- Press buttons (+) and (–) at the same time for longer than 2 seconds. The first parameter appears in the second line of the display.

**Saving the intermediate OPEN (INC.P.OP) or CLOSE (INC.P.CL) position**

- Press the (+/–) buttons until the parameter INC.P.OP or
  INC.P.CL appears.
  The current value is A.
- Press button (P) to adopt the current door/gate position as an intermediate position.
- Save the intermediate position by pressing button (P) again.

**Exiting Input mode**

- Press buttons (+) and (–) at the same time for approx. 1 seconds.
  Input mode is exited.

**Changing to automatic mode**

- Press button (P) until AUTOMATIC appears.

**Please note**

- If an intermediate position requires to be corrected, the teach-in value can be altered in the INPUT menu or set to A again to allow a new teach-in procedure to be carried out.

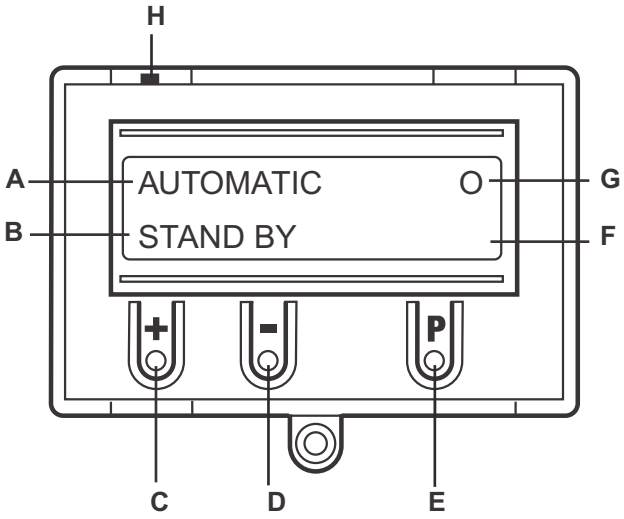
## 13.4 Programming

### 13.4.1 Overview of the LCD display

NOTICE

Damage can occur through improper installation!

The mains power supply must be switched off before connecting the display unit. Only an display unit (article number 121246) may be used.




Key:

A : Mode of operation / Diagnostic info
B : Parameters / Diagnostic info
C : Button (+)
D : Button (-)
E : Button (P)
F : Value / Status
G : Value / Status
H : Jumper

If jumper H is removed, the (+) button, the (–) button and the (P) button have no function.
The display still functions.

After the control has been switched on, it will be in the initialisation phase and “PLEASE WAIT ...” will appear in the display. The control system is not ready for use. After switching on for the first time, the initialisation phase takes approximately 60 seconds.

### 13.4.2 LCD monitor, modes of operation

The control have four modes of operation with the LCD monitor:

1. AUTOMATIC
2. ADJUSTMENT
3. INPUT
4. DIAGNOSIS

ADJUSTMENT, INPUT and DIAGNOSIS modes are exited automatically 7 seconds after the last button was pressed. The control then goes into AUTOMATIC mode.

**Operating mode 1: AUTOMATIC**

The door system is operated in the AUTOMATIC operating mode.

Display:

- Displays the action being carried out
- Displays any error messages

If the "PRESS/REL" parameter is set to MOD2–6 in the input menu, the display changes from AUTOMATIC to MANUAL.

**Operating mode 2: ADJUSTMENT**

ADJUSTMENT mode is used for setting the OPEN / CLOSED end positions.

ATTENTION!

**Malfunctions can occur as a result of incorrect operation of the control!**

**In ADJUSTMENT mode, the door will not stop automatically when it reaches the end position if an electronic end position system (AWG) is used. The door can be damaged if driven beyond the end position.**

Fine adjustments can be made in the INPUT operating mode.

Display:

- The current end position value is shown

**Operating mode 3: INPUT**

In the INPUT operating mode, the values of various parameters can be altered.

Display:

- displays the selected parameter
- Displays the programmed value / current status

**Operating mode 4: DIAGNOSIS**

In the DIAGNOSIS operating mode, door-specific checks can be queried.

Display:

- Displays the checks
- Displays the status of the checks

### 13.4.3 Expert menu

In the factory setting (standard), INPUT mode shows only a few parameters that can be set by the user. These settings parameters reflect the most commonly used requirements for a commercial door/gate system and are adequate for commissioning purposes in a standard situation.

The last item in this list is the parameter "EXPERT MENU". The default setting for this is OFF

OFF: Limited number of parameter settings:

- Menu language
- INC.P.OP
- OPEN TIME
- FOREWARNING
- FAST CL.
- REVERSPOINT.
- INPUT 1
- SELF LOCK
- EXPERT MENU

Setting the parameter EXPERT MENU to ON activates expert mode. In this mode, all parameters in the input menu can be called up and set.

➔ "13.6.2 Input operating mode"

**Please note**

- Expert mode is automatically closed after approx. 7 minutes if no buttons are pressed. In this case, only the limited choice of parameters is available unless the parameter EXPERT MENU is set to ON again.
- The same applies for switching the power off. In this case, too, the parameter EXPERT MODE is set to OFF again.

### 13.4.4 RESET

The RESET function allows you to return the control parameters to the original factory settings.

➔ “13.10.2 Input operating mode”

**FACTORY SET. parameter**

Selecting the set of parameters that you want to RESET to.

Different types of reset can be carried out, allowing you to reset more or fewer of the settings.

➔ “13.10.2 Input operating mode”

**RESET parameter**

Partial reset 1:

All of the parameter settings are reset except the settings for the frequency converter (applies only to CS310 FU).

Partial reset 2:

All of the parameter settings are reset except the settings for the end positions and the recognised end position system.

Complete reset:

Everything is returned to the factory default settings.

➔ “13.8.5 RESETTING the control using the LCD monitor”
➔ “13.8.6 RESETTING the control without an LCD monitor”

### 13.4.5 RESETTING the control using the LCD monitor

**Switch to INPUT mode.**

- Press the (P) button until “INPUT” appears in the display.
- Press buttons (+) and (–) for longer than 2 seconds to activate the Input.

**Reset the control**

- Press the (+/–) buttons until the “RESET” parameter appears in the display.
  The value is set to “OFF”.
- Press the (+) button until MOD4 appears in the display.
- Press button (P) to begin the RESET.

The initialisation phase takes place, and the end position system and all of the safety components that are connected are automatically taught in.

**Changing to adjustment mode**

➔ “13.7.4 Setting the electronic end position system using the LCD monitor”

**Changing to automatic mode**

- Press the (P) button until “AUTOMATIC” appears in the display.

### 13.4.6 RESETTING the control without an LCD monitor

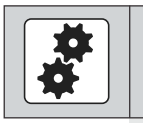
- Disconnect the system from the power supply.
- Press the circuit board buttons (P) and (–) at the same time and keep them pressed.
- Switch the power supply back on again.
- Press the circuit board buttons (P) and (–) at the same time and keep them pressed until the red LED (H6) flashes quickly.
- Release the circuit board buttons (P) and (–).

The initialisation phase will then take place (approximately 60 seconds).

While initialisation is being carried out, it is not possible to programme or operate the system.

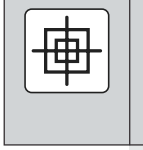
Once initialisation has been successfully completed, the end positions have then been deleted and all parameters have been reset to their factory default settings.

## 13.5 Navigator (LCD display only)



Automatic standby

Ⓟ > 1 Sec



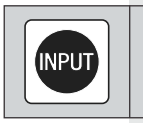
Adjustment standby

⊕ > Position DOOR OPEN

⊖ > Position DOOR CLOSED

| | |
|---|---|
| ADJUSTMENT MAIN UP | Save door position: Ⓟ Keep pressed and ⊕ > 1 sec |
| ADJUSTMENT MAIN DOWN | Save door position: Ⓟ Keep pressed and ⊕ > 1 sec |

Ⓟ > 1 Sec




INPUT

⊕ & ⊖ > 2 Sec →

| | |
|---|---|
| INPUT ENGLISH | |
| FINE-UP | : 0 |
| FINE-DOWN | : 0 |
| INC.P.OP | : A |
| INC.P.CL | : A |
| OPEN TIME | : OFF |
| START WARN. | : OFF |
| FOREWARNING | : OFF |
| AUT.CLOSE | : MOD1 |
| FAST CL. | : OFF |
| RELAY 1 | : MOD6 |
| RELAY 2 | : MOD7 |
| RELAY 3 | : MOD1 |
| RELAY 4 | : MOD14 |
| TL REST | : MOD1 |
| SKS | : A |
| SCS TEST | : MOD2 |
| DW-POINT | : 20 |
| SKS FKT. | : MOD1 |
| SKS REV | : MOD1 |
| REVERSPOINT.OFF | : 50 |
| LIGHT BARR. | : A |
| LB FUNC 1 | : MOD1 |
| LB FUNC 2 | : MOD1 |
| PEP POINT | : A |
| IMPULS | : MOD1 |
| INPUT 1 | : MOD1 |
| INPUT 2 | : A |
| SKS3 | : MOD1 |
| SKS4 | : MOD1 |
| RUNNING TIME | : A |
| AROUND TIME | : 300 |
| LIMIT SW. | : A |
| SELF LOCK | : MOD1 |
| POWER | : 10 |

Scroll up through menu:
⊕ > 2 Sec

Scroll down through menu:
⊖ > 2 Sec

Select value:
Ⓟ > 1 Sec

Increase value:
⊕

Decrease value:
⊖

Save value:
Ⓟ

Return to INPUT :
⊕ & ⊖ > 1 Sec

Ⓟ > 1 Sec

Ⓟ > 1 Sec

| | |
|---|---|
| RESET MBUS | : OFF |
| RESTART | : OFF |
| FACTORY SET. | : 99 |
| RESET | : OFF |
| PIN NO.2 | : 1111 |
| SERVICE | : OFF |
| INVERTER | : MOD1 |
| EXPERT MENU | : OFF |

**DIAGNOSIS**

| | |
|---|---|
| ES UP | : ON |
| ES DOWN | : OFF |
| OPEN BUTTON | : OFF |
| CLOSE BUTTON | : OFF |
| INPUT 1 | : OFF |
| INPUT 2 | : – / OFF |
| SKS | : ON |
| SKS 3 | : – / ON |
| SKS 4 | : – / ON |
| IMPULS | : OFF |
| SWITCH CLOCK | : OFF |
| LIGHT BARR. | : ON |
| LIGHT BARR. 2 | : ON |
| SAFETY CIRC. | : ON |
| STOP | : ON |
| ROT FIELD | : Right |
| CYCLE | : 000000 |
| SERVICE | : OFF |
| AWG | : 0000 |
| Error Memory | : Error ... |

Scroll up through menu:
⊕ > 2 Sec

Scroll down through menu:
⊖ > 2 Sec

Return to AUTOMATIC Operating mode:
(P)

Only query is possible

## 13.6 Overview of functions

### 13.6.1 Automatic operating mode

| Display | | Description |
|---|---|---|
| AUTOMATIC TEACH IN RUN | | Automatic teach-in of the running time |
| AUTOMATIC OPEN | | The door is in the opening phase. |
| AUTOMATIC CLOSE | | The door is in the closing phase. |
| AUTOMATIC STANDBY | | The door is at an intermediate position. |
| AUTOMATIC STANDBY | O | The door is at the OPEN end position. |
| AUTOMATIC STANDBY | o | The door is at the part OPEN position (“INC.P.OP” or “Intermediate OPEN position” parameter). |
| AUTOMATIC STANDBY | U | The door is at the CLOSED end position. |
| AUTOMATIC STANDBY | u | The door is at the part CLOSED position (“INC.P.CL.” or “Intermediate CLOSED position” parameter). |
| AUTOMATIC STANDBY | r | The door is in the reversing switch-off position. |
| AUTOMATIC PERMANENT INPUT | | A signal is permanently displayed. This can be a command device or a programmable input.<br>This constitutes an invalid state under any circumstances. This state is probably caused by a faulty component which needs to be replaced.<br>Exception: An exception to this is if the signal comes from the pluggable timer or the programmed input 1 when this is set to a timer function (MOD4) or fire alarm function (MOD5-9, 13). |
| AUTOMATIC CRASH-SENSOR | | The crash sensor for the door/gate system has been activated (connection to X4/9-10, programmable input 1 MOD 18). Possibly a vehicle (such as a forklift truck) has driven into the closed door. |

If the “PRESS/REL“ parameter is set to MOD2, 3, 4, 5 or MOD6 in the input menu, the display changes from AUTOMATIC to MANUAL.

| Display | Description |
|---|---|
| MANUAL MAIN UP | The door is in the opening phase. |
| MANUAL MAIN DOWN | The door is in the closing phase. |
| MANUAL STANDBY | The door is at an intermediate position. |

## 13.6.2 Input operating mode


| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| ENGLISH | Select the menu language<br>**Only possible using the LCD monitor:**<br>Alternatively, the menu language can also be selected during the initialisation phase (during initial operation or after a reset). The menu language pre-set in the factory (DEUTSCH) appears here for approximately 60 seconds as flashing text in the display. At this point, the menu language can still be changed during the initialisation procedure.<br>Pressing buttons [+] or [–] will allow you to scroll through and select a language. Save the language you have selected by pressing button [P].<br>After this, all texts or messages displayed are shown in the language that you have selected. | DEUTSCH<br>ENGLISH<br>FRANCAIS<br>NEDERLANDS<br>DANSK<br>ESPANOL<br>POLSKI<br>CESKY<br>ITALIANO<br>SUOMI<br>SVENSKA<br>TÜRKÇE<br>NORSK<br>MAGYARUL | ENGLISH |
| FINE-UP | Fine adjustment of the OPEN end position in relation to the saved OPEN end position (UPPER SWITCH).<br>Only visible if an electronic end position system is used. | -250 – 250 | 0 |
| FINE-DOWN | Fine adjustment of the CLOSED end position in relation to the saved CLOSED end position (LOWER SWITCH).<br>Only visible if an electronic end position system is used. | -250 – 250 | 0 |
| INC.P.OP | Setting the switching point for the intermediate OPEN position (Part OPEN) in relation to the saved OPEN end position. Displayed as a negative value.<br>Only visible if an electronic end position system is used.<br>Automatic teach-in of position:<br>➔ "13.7.5 Setting the intermediate positions of the electronic end position system using the LCD monitor" | A (teach-in) -1- LOWER SWITCH | A |
| INC.P.CL | Setting the switching point for the intermediate CLOSE position (Part CLOSED) in relation to the saved CLOSED end position. Displayed as a positive value.<br>Only visible if an electronic end position system is used.<br>Automatic teach-in of position:<br>➔ "13.7.5 Setting the intermediate positions of the electronic end position system using the LCD monitor" | A (teach-in) - 1 - UPPER SWITCH | A |
| OPEN TIME | After the door/gate has opened, it runs back automatically in the CLOSE direction after the set time has elapsed.<br>Please note:<br>If you press the CLOSE BUTTON during the open time, the closing run starts immediately.<br>If you press the OPEN or STOP button during the open time, the time starts counting from the beginning again.<br>If an automatic closing movement is interrupted by the SKS, the open time is added on with each new attempt. After 3 attempts, the automatic closing process will be aborted automatically. | OFF,<br>1 – 3600 seconds | OFF |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| START WARN. | The start warning is carried out before each run. | OFF,<br>1 – 10 seconds | OFF |
| FOREWARNING | The forewarning is activated before an automatic closing run starts and before closing in impulse mode<br>**Please note:** This time is added to the start warning. | OFF,<br>1 – 300 seconds | OFF |
| AUT.CLOSE | Automatic closing after the open time has elapsed.<br>MOD 1 : AUT.CLOSE from OPEN end position<br>MOD 2 : AUT.CLOSE from end position Part OPEN<br>MOD 3 : AUT.CLOSE from OPEN end position and Part OPEN end position<br>MOD 4 : AUT.CLOSE from all door positions | MOD1 – MOD4 | MOD1 |
| FAST CL. | Earlier closing after the photocell has been driven past.<br>**Requirements:** A photocell must be installed at passage height and an open time greater than 0 must have been programmed.<br>MOD2 : The open time is cut short after the photocell (door closes immediately). If the photocell is driven through during an opening run, the programmed open time is ignored and the door closes immediately.<br>MOD3 : The open time is cut short after the photocell beam has been interrupted for a minimum of 2 seconds (in order to discount pedestrian traffic). If the photocell is driven through during an opening run, the programmed open time is ignored and the door closes immediately.<br>MOD4 : As for MOD2, except that the photocell has no function during the opening run. | OFF,<br>MOD2 – MOD4 | OFF |
| RELAY 1 | A relay mode from 1 – 13, 17 – 19, 21 – 43 and 60 – 62 can be assigned to all four relays.<br>Relay 4 can also be programmed with MOD14 – 16.<br>Further explanations:<br>➔ "Explanation of the relay modes:"<br>MOD1 : (Red traffic light 1) flashes during forewarning and is ON during door run*<br>MOD2 : (Red traffic light 2) flashes during forewarning and during door run* | MOD1 – MOD13<br>MOD17 – MOD19<br>MOD21 – MOD43<br>MOD60 – MOD62 | MOD6 |
| RELAY 2 | MOD3 : (Red traffic light 3) is ON during forewarning and during door run*<br>MOD4 : Impulse signal when OPEN command is given from inside<br>MOD5 : Error message<br>MOD6 : OPEN end position<br>MOD7 : CLOSED end position<br>MOD8 : OPEN end position negated<br>MOD9 : CLOSED end position negated<br>MOD10 : Before-end position OPEN | MOD1 – MOD13<br>MOD17 – MOD19<br>MOD21 – MOD43<br>MOD60 – MOD62 | MOD7 |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| RELAY 3 | MOD11 : Before-end position CLOSED<br>MOD12 : Before-end position CLOSED to CLOSED end position<br>MOD13 : Magnetic lock function<br>MOD14 : Brake (normally energised mode)<br>MOD15 : Brake (normally de-energised mode)<br>MOD16 : Brake (normally energised mode) switched on in OPEN end position<br>MOD17 : SKS activated or test error<br>MOD18 : (Red traffic light 4) flashes during forewarning and is OFF during door run<br>MOD19 : Before-end position OPEN to OPEN end position | MOD1 – MOD13<br>MOD17 – MOD19<br>MOD21 – MOD43<br>MOD60 – MOD62 | MOD1 |
| RELAY 4 | MOD21 : Test of draw-in protection before opening run (additional module required)<br>MOD22 : Activation of radio transmission systems 1 and 3 and/or light curtain testing<br>MOD23 : (Green traffic light) is ON at OPEN end position, OFF during forewarning and OFF during door run*<br>MOD24 : Capacitor switching for 230 V/1~ sectional-door operators<br>MOD25 : Yard light function, light stays on for 2 minutes after OPEN impulse/command<br>MOD26 : Activation of radio 2 transmission system<br>MOD27 : Impulse signal when OPEN end position is reached<br>MOD28 : Relay generally OFF<br>MOD29 : Door opens<br>MOD30 : Door closes<br>MOD31 : Service, continuous signal once the pre-set maintenance interval is reached<br>MOD32 : Battery mode<br>MOD33 : Battery operation not possible<br>MOD34 : Fire alarm signal (fire detection and alarm system (BMA) active)<br>MOD35 : Photocell operative<br>MOD36 : Wicket door locking cylinder<br>MOD37 : Testing of stop signal through radio transmission systems 1 and 3<br>MOD38 : Testing of light curtain 2 (input 2)<br>MOD39 : LED error<br>MOD40 : Impulse signal when OPEN command is given from outside<br>MOD41 : Test of radio transmission system 4 in OPEN direction<br>MOD43 : Operator in motion<br>MOD60 : (Red traffic light, outside) flashes during forewarning and is ON during door run<br>MOD61 : (Red traffic light outside) flashes during forewarning and during door run<br>MOD62 : (Green traffic light outside) ON at OPEN end position, OFF during forewarning, and OFF during door run)<br>* If two-way traffic control is activated: Traffic light INSIDE | MOD1 – MOD19<br>MOD21 – MOD43<br>MOD60 – MOD62 | MOD14 |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| T-LI. REST | Switches traffic lights<br>MOD1 : OFF in standby mode<br>MOD2 : ON in standby mode<br>MOD3 : In standby OFF after 5 minutes | MOD1 – MOD3 | MOD1 |
| SKS | MOD1 : OSE (optosensor)<br>MOD2 : 8.2 kΩ (electrical contact strip)<br>MOD3 : DW Pressure sensor (airwave bar) as NC with testing<br>MOD4 : Optosensor (OSE) light curtain without testing<br>MOD5 : PNP light curtain with testing<br>MOD6 : PNP light curtain without testing<br>NOTICE :<br>MOD4, MOD5 and MOD6 must be set manually if a light curtain is used.<br>– Without any addition to the open time (if programmed) after the light curtain has been interrupted during automatic closing.<br>– Without switching off "Automatic closing" after 3 interruptions in a row. | A – self teach-in<br>MOD1 – MOD6 | A |
| DW TEST | Activation and deactivation of testing function for the attached DW airwave bar.<br>Only appears if parameter setting SKS = MOD3.<br>MOD1 : Test OFF<br>MOD2 : Test ON | MOD1 – MOD2 | MOD2 |
| DW-POINT | Point at which the DW airwave bar attached is tested (X4 / 5+6).<br>Only appears if parameter setting SKS = MOD3.<br>Setting is done in increments (only AWG), starting from the lower travel cut-out point.<br>In systems with mechanical limit switches, the additional CLOSE limit switch serves as the PS-POINT. | 0 – 1000 | 20 |
| SKS FUNC | MOD1 : Stop + reverse<br>MOD2 : Stop + 2-second reversing movement | MOD1 - MOD2 | MOD1 |
| SKS REV | MOD1 : Stop + reverse between OPEN end position and reversing point<br>Stop between reversing point and CLOSED end position<br>➜ for vertically closing doors<br>MOD2 : Stop + reverse between OPEN end position and reversing point<br>No action between reversing point and CLOSED end position<br>➜ for vertically closing doors with leading photocell<br>MOD3 : Stop + reverse between OPEN end position and CLOSED end position<br>➜ for horizontally closing doors and systems with mechanical limit switches without pre-limit switch<br>**NOTICE :**<br>In systems with mechanical limit switches, the additional CLOSE limit switch serves as the reversing point. | MOD1 - MOD3 | MOD1 |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| REVERS POINT. OFF | Reversing point. Point at which the reversing movement of the door is switched off. Appears only for systems with an electronic end position system (AWG). Setting is done in increments, starting from the lower travel cut-out point. In systems with mechanical limit switches, the additional CLOSE limit switch serves as the reversing point. | A – self teach-in<br>1 – 1000 | 50 |
| LIGHT BARR. 1 | Photocell 1, installed in the drive-through area of the door.<br>Connection to X4 / 1-4<br>MOD1 : 2-wire<br>MOD2 : NC contact / NPN<br>MOD3 : PNP | A - self teach-in<br>MOD1 – MOD3 | A |
| LB FUNC 1 | Function of photocell 1 in the drive-through area of the door.<br>**CLOSING door movement** / **OPENING door movement**<br>MOD1 : Stop + reverse / No action<br>MOD2 : Stop + short reversal / No action<br>MOD3 : STOP / No action<br>MOD4 : STOP / STOP<br>MOD5 : Stop + reverse / Dragging up suppression (Door OPENING movement not possible until the photocell is no longer interrupted).<br>MOD6 : No action / No action<br>MOD7 : No action / Stop + short reversal<br>MOD8 : No action / Stop<br>MOD9 : Dragging up suppression / Stop + reverse (Door CLOSING movement not possible until the photocell is no longer interrupted). | MOD1 – MOD5 | MOD1 |
| LB FUNC 2 | Function of photocell 2 in the drive-through area of the door.<br>Only appears if parameter setting INPUT 1 = MOD15.<br>Connection only possible as an NC contact at programmable Input 1 (X4 / 9+10).<br>Selection mode similar to the settings under LB FUNC. 1 | MOD1 – MOD9 | MOD1 |
| PEP POINT | Photocell 1 (X4 / 1-4) is not evaluated between the CLOSED end position and the PEB POINT. Setting is done in increments, starting from the lower travel cut-out point. Only visible in systems with electronic limit switch.<br>**Please note:** When adjusting, this point will be automatically recognised during the first closing run, provided that Photocell 1 is installed in the door frame and the photocell remains interrupted during the closing operation from this point through to the CLOSED end position. | A – teach-in 1 – UPPER SWITCH | A |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| IMPULSE | Select a function to be assigned to the impulse button (X3 / 7+8).<br>MOD1 : OPEN - STOP - CLOSE - STOP - OPEN - ... (sequence control)<br>MOD2 : OPEN if door is stationary / No action if door is opening Stop and OPEN if door is closing 8K2 Stop in case of deviation<br>MOD3 : OPEN if door is stationary / STOP if door is moving<br>MOD4 : OPEN if door is stationary / No action if door is moving<br>MOD5 : OPEN if door is stationary / CLOSE if door is at the OPEN end position | MOD1 – MOD5 | MOD1 |
| INPUT 1 | Select a function to be assigned to Input 1 (X4 / 9+10).<br>MOD1 : Part OPEN button<br>MOD2 : Part OPEN switch<br>MOD3 : AUTO CLOSE switch<br>MOD4 : External CLOCK (permanently open)<br>MOD5 : Fire alarm (BMA) switch 3 (partial opening) NO<br>MOD6 : Fire alarm (BMA) switch 1 (emergency closing) NO<br>MOD7 : Fire alarm (BMA) switch 1 (emergency closing) NC<br>MOD8 : Fire alarm (BMA) switch 2 (emergency opening) NO<br>MOD9 : Fire alarm (BMA) switch 2 (emergency opening) NC<br>MOD10 : Ventilation button (partial opening) NO<br>MOD11 : Automatic closing button<br>MOD12 : Laser scanner (special solution)<br>MOD13 : Fire alarm (BMA) switch 3 (partial opening) NC<br>MOD14 : Wicket door lock<br>MOD15 : Photocell 2 NC<br>MOD16 : Forewarning switch<br>MOD17 : Impulse button<br>MOD18 : Crash sensor NC<br>MOD30 : OPEN button inside<br>MOD31 : OPEN button outside<br>MOD32 : CLOSE button (Only active with operational closing edge safety device and operational Photocell 1. No function in deadman mode.) | MOD1 – MOD18<br>MOD30 – MOD32 | MOD1 |
| INPUT 2 | Select a function to be assigned to Input 2 (X4 / 11+12).<br>OFF : NOT active<br>MOD2 : Wicket door switch 8.2 kΩ Stop if there is deviation<br>MOD3 : Closing edge safety device OPEN 8.2 kΩ, active in the OPEN direction Stop and reverse when triggered<br>MOD4 : Closing edge safety device 8.2 kΩ, active in the OPEN direction Stop and short reversal when triggered<br>MOD5 : Battery mode<br>MOD6 : Radar motion detectors (special solution)<br>MOD7 : Light curtain 2 (PNP)<br>During initial operation and after a reset, Input 2 will be set once to A – self teach-in. If no connected components are recognised, the input will be automatically deactivated. OFF appears in the display and the input must be manually activated. | A – self teach-in<br>OFF<br>MOD2 – MOD7 | A |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| SKS3 | Setting for Channel 1 of the plug-in signal transmission system (X20).<br>OFF : not active<br>MOD2 : Activated as closing edge safety device in the CLOSE direction.<br>MOD3 : Activated as closing edge safety device in the OPEN direction.<br>MOD4 : Activated as safety device (internal safety circuit) | OFF<br>MOD2 – MOD4 | OFF |
| SKS4 | Setting for Channel 2 of the plug-in signal transmission system (X20).<br>Selection mode similar to the settings under SKS 3. | OFF<br>MOD2 – MOD4 | OFF |
| RUNNING-TIME | Monitoring the maximum running time for an OPEN or CLOSE movement.<br>The running time is determined automatically during the teach-in run. In the event of a 20% deviation (in both directions) an ERROR RUNTIME appears.<br>After the automatic teach-in, the running time can be manually changed. | A – self teach-in<br>OFF<br>1 – 300 seconds | A |
| AROUNDTIME | Motor stoppage time each time the door changes direction.<br>When the closing edge safety device is triggered during the closing movement, the turnaround time amounts to a quarter of the programmed time. | 100 –<br>5000 milliseconds | 300 |
| LIMIT SW. | Select the end position system to be evaluated.<br>MOD1 : Absolute value encoder (AWG)<br>MOD2 : Mechanical limit switch (MEC)<br>MOD3 : Without function<br>MOD4 : Only for operation with frequency converter (FU)<br>MOD5 : Absolute value encoder (AWG) + CLOSED mechanical limit switch (NC) in standard installation<br>MOD6 : Absolute value encoder (AWG) + CLOSED mechanical limit switch (NC) in special installation with an anti clockwise rotating field (only for frequency converter operation with anticlockwise rotating field)<br>MOD 5+6 (optional):<br>In this case, an additional external mechanical limit switch is set for querying the lower end point in order to balance out any tolerances caused by the door mechanics and/or the door curtain. Once the mechanical limit switch has been activated, the lower end position is deemed to have been reached, no matter what information is received from the absolute value encoder. | A – self teach-in<br>MOD1 – MOD6 | A |
| SELF LOCK | Choose between impulse and manual operation, with or without evaluation of closing edge safety device (CESD) and photocell system (LB).<br>MOD1 : Impulse operation for OPEN + CLOSE with SKS and LB<br>MOD2 : Manual operation for OPEN + CLOSE with SKS and LB<br>MOD3 : Manual operation for CLOSE with SKS and LB<br>MOD4 : Manual operation for OPEN with SKS and LB<br>MOD5 : Manual operation for OPEN + CLOSE without SKS and LB<br>MOD6 : Manual operation for CLOSE without SKS and LB | MOD1 – MOD6 | MOD1 |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| POWER CHECK | Automatic power monitoring<br>(monitoring the rotational speed)<br>Error message if the door/gate is unable to move freely or is obstructed.<br>Setting the sensitivity for both directions of travel.<br>A reading giving the power value (rotational speed) is shown during opening and closing runs. If the power monitoring facility is activated, a value must be set that is lower than the lowest value displayed during door/gate travel. The larger the difference compared to the lowest value displayed, the less sensitively the power monitoring reacts.<br>The power monitoring facility is only activated if a value has been set. | OFF<br>1 – 999 | 10 |
| RESET MSBUS | All MSBUS addresses assigned will be reset.<br>After restarting the control, all MSBUS devices connected will be re-addressed.<br>➔ Refer to the instruction manual for the MSBUS device for detailed information. | ON<br>OFF | OFF |
| RESTART | Control is restarted if function is activated. | ON<br>OFF | OFF |
| FACTORY SET. | Selecting the set of parameters that you want to reset to.<br>MOD5 : MTZ S ➔ Operators in deadman operation<br>MOD6 : MTZ FU ➔ Operators of the MDF-U range (integrated UPS)<br>MOD7 : MTZ S ➔ Operators of the STAW range with increased duty cycle<br>MOD8 : MTZ FU ➔ Operators of the MTZ 05 range (230V)<br>MOD9 : MTZ FU ➔ Operators of the STA range<br>MOD14 : MTZ FU ➔ Operators of the MTZ 05 range (400V)<br>MOD99 : MTZ S ➔ Standard<br>MOD10 – MOD 98 : Customer-specific parameter sets | MOD5 – MOD14<br>MOD10 – MOD98<br>MOD99 | MOD99 |
| RESET | Reset the control parameters to the pre-set factory settings<br>MOD2 : Partial reset 1 (everything except the frequency converter settings)<br>MOD3 : Partial reset 2 (everything except the end positions / end position system)<br>MOD4 : Total reset (everything is returned to factory default setting) | OFF<br>MOD2 – MOD4 | OFF |
| PIN NO. 2 | Input and selection of a PIN code for programming a maintenance interval.<br>After entering the PIN code, the second programming level is opened. A maintenance interval can now be input at the parameter SERVICE. Input level 2 goes off again after the power has been switched off, or goes off automatically after 10 minutes. The PIN code can only be changed at the second programming level. | 0 – 9999 | 1111 |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| SERVICE | OFF : Maintenance indicator not activated<br>Setting a maintenance interval. After the pre-set number of door cycles has been carried out, a maintenance message (LED / LCD) is given. If a relay output is programmed to MOD31, the relay concerned is triggered (continuous signal). Only appears after input level 2 has been activated via parameter PIN NO. 2. | OFF<br>0 – 99999 | OFF |
| INVERTER | Activates or deactivates a connected frequency converter. If a frequency converter is connected at the X18 interface, the control becomes a CS 310 FU control.<br>➔ Refer to the CS310 FU instruction manual for detailed information.<br>MOD1 : Operation without frequency converter<br>MOD2 : Operation with frequency converter<br>MOD3 : Operation with frequency converter (effective ramp times) | MOD1 – MOD3 | MOD1 |
| EXPERT | Activation and deactivation of expert setting.<br>In the factory setting OFF, only a limited choice of parameters appears in INPUT mode.<br>If this parameter is set to ON, all parameters in the input menu can be called up and set.<br>OFF: Limited number of parameter settings:<br>— Menu language<br>— INC.P.OP<br>— OPEN TIME<br>— FOREWARNING<br>— FAST CL.<br>— REVERS- POINT.<br>— INPUT 1<br>— SELF LOCK<br>— EXPERT MENU<br>ON: Access to all parameters as listed in Chapter 13.10.2. | ON – OFF | OFF |

**Overview of functions**

**Explanation of the relay modes:**

**A. Traffic light functions**

| MOD | Description | CLOSED end position | OPEN end position | Forewarning | Door run |
|---|---|---|---|---|---|
| MOD 1 | Red traffic light 1 [3] | ON / OFF [1] | OFF [2] | Flashing | Lit Up |
| MOD 2 | Red traffic light 2 [3] | ON / OFF [1] | OFF [2] | Flashing | Flashing |
| MOD 3 | Red traffic light 3 [3] | ON / OFF [1] | OFF [2] | Lit up | Lit up |
| MOD 18 | Red traffic light 4 [3] | OFF | OFF | Flashing | OFF |
| MOD 23 | Green traffic light [3] | OFF | ON [2] | OFF | OFF |
| MOD 60 | Red traffic light 1 [4] | ON / OFF [1] | OFF [2] | Flashing | Lit up |
| MOD 61 | Red traffic light 2 [4] | ON / OFF [1] | OFF [2] | Flashing | Flashing |
| MOD 62 | Green traffic light [4] | OFF | ON [2] | OFF | OFF |

[1] Depending upon parameter T-LI. REST

[2] If two-way traffic control is activated: dependent on inside or outside OPEN command

[3] If two-way traffic control is activated: traffic light inside

[4] If two-way traffic control is activated: traffic light outside

**B. Position messages**

| MOD | Description | Remarks |
|---|---|---|
| MOD 6 | OPEN end position | The relay closes the contact when the door is in the OPEN end position. |
| MOD 7 | CLOSED end position | The relay closes the contact when the door is in the CLOSED end position. |
| MOD 8 | Not OPEN end position | The relay closes the contact when the door is not in the OPEN end position. |
| MOD 9 | Not CLOSED end position | The relay closes the contact when the door is not in the CLOSED end position. |
| MOD 10 | Intermediate OPEN position (Part OPEN) | The relay closes the contact when the door is at the intermediate OPEN position (part OPEN). |
| MOD 11 | Intermediate CLOSE position (Part CLOSED) | The relay closes the contact when the door is at the intermediate CLOSE position (Part CLOSED). |
| MOD 12 | Intermediate CLOSE position to CLOSED end position | The relay closes the contact when the door is in the area between the CLOSED end position and the intermediate CLOSE position (Part CLOSED). |
| MOD 19 | Intermediate OPEN position to OPEN end position | The relay closes the contact when the door is in the area between the OPEN end position and the intermediate OPEN position (Part OPEN). |

### C. Impulse signals

| MOD | Description | Remarks |
|---|---|---|
| MOD 4 | Impulse when OPEN command is given from inside | The relay closes the contact for 1 second when the door receives an OPEN command from inside. This impulse can be used to control lights, for instance. |
| MOD 27 | Impulse when OPEN end position is reached | The relay closes the contact for 2 seconds when the door reaches the OPEN end position. This impulse can be used, for instance, to open a following photocell. |
| MOD 40 | Impulse when OPEN command is given from outside | The relay closes the contact for 1 second when the door receives an OPEN command from outside. This impulse can be used to control lights, for instance. |

### D. Brake functions (only adjustable on relay 4)

| MOD | Description | Remarks |
|---|---|---|
| MOD 14 | Brake<br>(normally energised mode) | The switching contact of the brake rectifier is activated via the relay to achieve a faster brake function. As soon as the door starts to move, the contact closes and the brake is released (normally energised mode). |
| MOD15 | Brake<br>(normally de-energised mode) | The switching contact of the brake rectifier is activated via the relay to achieve a faster brake function. As soon as the door starts to move, the contact opens and the brake is released (normally de-energised mode). |
| MOD16 | Brake<br>(normally energised mode)<br>switched on in OPEN end position | The switching contact of the brake rectifier is activated via the relay to achieve a faster brake function. As soon as the door starts to move, the contact closes and the brake is released (normally energised mode). In order to stop the door/gate more smoothly at the OPEN END POSITION, the switching contact is not switched at the OPEN end position (OPEN TIME). |

### E. Error messages

| MOD | Description | Remarks |
|---|---|---|
| MOD5 | Error message | The relay opens the contact when a STOP command is given or an error occurs. All errors described in Section 10 result in actuation of the relay. |
| MOD17 | Closing edge safety device actuated | The relay opens the contact when the closing edge safety device is actuated. An error in the closing edge safety device or an unsuccessful test is shown via MOD5. |
| MOD35 | Photocell | As with photocell input X4 (3/4), the signal received is passed on in the form of a message.<br>Relay ON : Photocell signal is OK<br>Relay OFF : Light beam interrupted or fault in photocell |
| MOD39<br>error | LED error | The relay always closes the contact when the internal LED 2 (red) lights up. |

### F. Movement signal

| MOD | Description | Remarks |
|---|---|---|
| MOD 29 | Door OPENS. | Active during OPENING movements. |
| MOD30 | Door CLOSES. | Active during CLOSING movements. |
| MOD43 | Door opens or closes. | Active during every movement. |

### G. Functions for external accessories

| MOD | Description | Remarks |
|---|---|---|
| MOD13 | Magnetic lock function | The relay closes before each door movement. The relay is normally open.<br>A delay of 0.5 seconds is programmed to elapse before each door movement takes place. |
| MOD21 | Test of draw-in protection | The relay generates a test signal when the CLOSED end position is reached and expects, as a reaction to the test signal, that the stop circuit is actuated. |
| MOD22 | Activation of radio transmission systems 1 and 4, testing of light curtain 1 | The relay generates a test signal when the OPEN end position is reached and expects, as a reaction to the test signal, that the closing edge safety device input is actuated. |
| MOD 24 | Capacitor | Whenever a door movement command is given, the relay closes for approximately 1 second. With the aid of this relay, an additional starting capacitor that is required for AC applications is switched on, to ensure safe starting of the motor. For operators of the STAW range with increased duty cycle. |
| MOD 25 | Yard light function | At every OPEN command, the relay is closed for 2 minutes and can therefore be used to control a light. |
| MOD 26 | Activation of radio transmission systems 2 and 4 | Before every CLOSE command, the radio transmission system is activated by an impulse. The duration of the activation must be set on the transmission system.<br>This activation results in a 0.5 second delay in starting. |
| MOD 28 | Relay OFF | The relay is generally switched off; the contact is always open. |
| MOD36 | Pneumatic cylinder for locking the wicket door<br>(threshold-less door system). | Every time an OPEN command is given, the relay is activated and controls a pneumatic cylinder which mechanically locks the wicket door that is incorporated in the door. The locking position of the cylinder is queried through a limit switch. The door starts moving only after this limit switch has been released. The relay remains activated until the lower end position has been reached again. |
| MOD37 | Testing of the stop signal via radio transmission systems 1 and 3 | The relay generates a test signal when the OPEN end position is reached and expects, as a reaction to the test signal, that the stop circuit is interrupted. |
| MOD38 | Testing light curtain 2 (8.2 kΩ)<br>Connection to input 2 (X4 /11+12) | The relay generates a test signal when the OPEN end position is reached and expects, as a reaction to the test signal, that there is an interruption to Input 2. |
| MOD 41 | Activation of radio transmission system 4 in the OPEN direction | The relay generates a test signal when the CLOSED end position is reached and expects, as a reaction to the test signal, that there is an interruption to Input 2. |

## H. Input-dependent messages

| MOD | Description | Remarks |
|---|---|---|
| MOD 32 | Battery mode | Active during battery operation. Input 2 bridged (setting MOD5). |
| MOD 33 | Not in battery mode | Active during mains operation. Input 2 open (setting MOD5)<br>When programmed with MOD32/33, the relays work as delayed change-over contacts and follow the signal at input 2 if set to MOD5.<br>In this case, input 2 is supplied with a control signal from the uninterruptable power supply (UPS) system which is responsible for switching between mains power and the UPS power supply. |
| MOD 34 | BMA signal | Triggered if fire alarm system (BMA) active.<br>Follows the signal at input 1 if set to MOD5-9 / 13.<br>In this case, input 1 is supplied with a control signal from the fire alarm system, and depending on the setting, opens or closes the door to an end position or an intermediate position |

**Key to inputs:**

## A. Input 1 functions

| MOD | Description | Remarks |
|---|---|---|
| MOD 1 | PART OPEN button | When the button is pressed (input 1), the door opens as far as the intermediate OPEN position (PART OPEN). |
| MOD 2 | PART OPEN switch | Closed : All OPEN commands lead to the intermediate OPEN position (PART OPEN).<br>Open : All OPEN commands lead to the OPEN end position. |
| MOD 3 | AUTO CLOSE switch | Closed : No automatic closing (open time continues, if open time > 0)<br>Open : Automatic closing run is activated (if open time > 0) |
| MOD 4 | External CLOCK (Continuous OPEN) | The door opens once the contact closes and remains in the OPEN position (open time continues) until the contact opens. The door then closes automatically (only if open time > 0) This function can be aborted by pressing the CLOSE button. The door CLOSES. |
| MOD5 | Fire alarm (BMA) switch 3 (partial opening) NO | Control function if fire alarm system is active.<br>Open : Normal operation<br>Closed : Partial opening of the door. The intermediate OPEN position (Part OPEN) is approached from either direction, irrespective of the current door position.<br>BUTTON : No function<br>LIGHT BARR/ SKS : Door stops and briefly reverses (only in CLOSING direction), and closes again after 5 seconds<br>STOP : Emergency closing interrupted as long as this is activated |

| MOD | Description | Remarks |
|---|---|---|
| MOD6 | Fire alarm (BMA) switch 1 (emergency closing) NO | Control function if fire alarm system is active.<br>Open : Normal operation<br>Closed : Emergency closing of door<br>BUTTON : No function<br>LIGHT BARR / SKS : Door stops and briefly reverses; emergency closing again after 5 seconds<br>STOP : Emergency closing interrupted as long as this is activated |
| MOD7 | Fire alarm (BMA) switch 1 (emergency closing) NC | Control function if fire alarm system is active.<br>Closed : Normal operation<br>Open : Emergency closing of door<br>BUTTON : No function<br>LIGHT BARR/SKS : Door stops and briefly reverses; emergency closing again after 5 seconds<br>STOP : Emergency closing Interrupted as long as this is activated |
| MOD8 | Fire alarm (BMA) switch 2 (emergency opening) NO | Control function if fire alarm system is active.<br>Open : Normal operation<br>Closed : Emergency opening of door<br>BUTTON : No function<br>LIGHT BARR/SKS : No function<br>STOP : Emergency closing interrupted as long as this is activated.<br>No automatic closing after deactivation fire alarm signal. |
| MOD9 | Fire alarm (BMA) switch 2 (emergency opening) NC | Control function if fire alarm system is active.<br>Closed : Normal operation<br>Open : Emergency opening of door<br>BUTTON : No function<br>LIGHT BARR/SKS : No function<br>STOP : Emergency closing interrupted as long as this is activated.<br>No automatic closing after deactivation of fire alarm signal. |
| MOD10 | Ventilation button NO | Partial opening of the door. When an additional button at Input 1 is pressed, the intermediate CLOSE position (Part CLOSED) is approached from either direction, irrespective of the current door position. |
| MOD11 | “Automatic closing” button | 1. Operation : No automatic closing; the open time continues.<br>2. Operation : Automatic closing of the door is active again, if the open time is > 0.<br>3. Operation : No automatic closing; the open time continues.<br>... |
| MOD12 | Laser scanner (height detection) | Only in conjunction with Input 2 (MOD 6).<br>➔ See explanation regarding Input 2. |

| MOD | Description | Remarks |
|---|---|---|
| MOD13 | Fire alarm (BMA) switch 3 (partial opening) NC | Control function if fire alarm system is active.<br>Closed : Normal operation<br>Open : Partial opening of the door. The intermediate OPEN position (PART OPEN) is approached from either direction, irrespective of the current door position.<br>BUTTON : No function<br>LIGHT BARR / SKS : Door stops and briefly reverses (only in CLOSING direction), and closes again after 5 seconds<br>STOP : Emergency closing interrupted as long as this is activated. |
| MOD14 | Wicket door lock | Monitoring limit switch for the pneumatic lock system for wicket doors. The limit switch must confirm correct locking within 10 seconds of an OPEN command being given, otherwise the door remains stationary and an error message is given.<br>This function affects relay mode 36. |
| MOD15 | Photocell 2 NC | If a second photocell is installed in the drive-through area of the door, this system can be program-med via the LB FUNC 2 parameter in INPUT mode.<br>Only photocells with a potential-free NC contact may be connected. |
| MOD16 | Forewarning switch | Closed : Start-up warning and forewarning are inactive (even if both times are > 0).<br>Open : Start-up warning and forewarning are active (only when both times are > 0). |
| MOD17 | Impulse button outside | Pressing the button moves or stops the door.<br>– The function and direction of the movement depend on the IMPULS parameter setting in the Input menu.<br>– If two-way traffic control is activated, this impulse command is treated as a signal from outside. |
| MOD18 | Crash sensor (NC) | Querying a crash sensor as a NC contact. If the crash sensor has been activated before, door operation is only possible again<br>– if the STOP button has been pressed for longer than 5 seconds or<br>– the supply voltage has been turned off and then on again. |
| MOD 30 | OPEN button inside | When the button is pressed, the door opens as far as the OPEN end position.<br>The traffic light inside changes to green. |
| MOD 31 | OPEN button outside | When the button is pressed, the door opens as far as the OPEN end position.<br>The traffic light outside changes to green. |
| MOD 32 | CLOSE button | When the button is pressed, the door closes as far as the CLOSED end position. Only active with operational closing edge safety device and operational photocell 1. No function in deadman mode. |

## B. Input 2 functions

| MOD | Description | Remarks |
|---|---|---|
| OFF | | not active |
| MOD2 | Wicket door switch (8.2 kΩ)) | Generally active<br>Stops the system when actuated. |
| MOD3 | Closing edge safety device OPEN (8.2 kΩ) | Closing edge safety device active in the OPEN direction<br>Door stops and reverses to the CLOSED end position when the closing edge safety device is triggered. |
| MOD4 | Closing edge safety device OPEN (8.2 kΩ) | Closing edge safety device active in the OPEN direction<br>Door stops and moves in the CLOSE direction for 2 seconds (short reverse) when the closing edge safety device is triggered. |
| MOD5 | Battery operation<br>(MDFU special solution) n.o. | Active if power supplied by battery.<br>Relay switching MOD32 / MOD33. |
| MOD6 | Radar motion detector<br>(height detection) NO | The function is coupled to Input 1 (MOD12 – laser scanner).<br>The preceding laser scanner detects the height of the vehicle.<br>The installed radar motion detector generates an OPEN command when actuated.<br>– A tall vehicle (lorry) will be detected by the laser scanner.<br>The laser scanner switches Input 1 (MOD12) to ON.<br>The radar motion detector evaluates the vehicle and triggers the door movement.<br>The door is moved to the OPEN end position.<br>– A lower vehicle (car) is recognised by the laser scanner.<br>The laser scanner switches Input 1 (MOD12) to OFF.<br>The radar motion detector evaluates the vehicle and triggers the door movement.<br>The door is moved to the intermediate OPEN position (Part OPEN).<br>All other OPEN commands (via X3, X7, X9, X13) always move the door to the OPEN end position. The Input 1 function (MOD12) then has no effect. |
| MOD7 | Light curtain 2 (PNP) | Acts in same way as light curtain 1 (SKS MOD 4 – 6)<br>– Light curtain active in the CLOSE direction.<br>– Stop and reverse when the light curtain is triggered.<br>The type of reversing (reverse / short reversal) is also adopted. |

### 13.6.3 Diagnosis / error memory operating mode

| Display | Meaning | Status |
|---|---|---|
| UPPER SWITCH | OPEN end position | OFF : End position reached<br>ON : End position not reached |
| LOWER SWITCH | CLOSED end position | OFF : End position reached<br>ON : End position not reached |
| OPEN BUTTON | Command button / OPEN input | ON : Button activated / input active<br>OFF : Button not activated / input not active |
| CLOSE BUTTON | Command button / CLOSE input | ON : Button activated / input active<br>OFF : Button not activated / input not active |
| INPUT 1 | INPUT 1 (X4 / 9 + 10) | ON : Input 1 active<br>OFF : Input 1 not active |
| INPUT 2 | INPUT 2 (X4 / 11 + 12) | ON : Input 2 active<br>OFF : Input 2 not active<br>— : Not activated |
| SKS | Closing edge safety device 1<br>(PS switch, 8.2kΩ or optosensor)<br>or light curtain 1(PNP or optosensor)<br>(X4 / 5-8) CLOSING direction | ON : System closed<br>OFF : System interrupted (fault) |
| SKS 3 | Closing edge safety device 3<br>(8.2 kΩ or optosensor)<br>Radio transmission system channel 1<br>OPEN or CLOSE direction | ON : System closed<br>OFF : System interrupted (fault)<br>— : Not activated |
| SKS 4 | Closing edge safety device 4<br>(8.2 kΩ or optosensor)<br>Radio transmission system channel 2<br>OPEN or CLOSE direction | ON : System closed<br>OFF : System interrupted (fault)<br>— : Not activated |
| IMPULS | Command button / IMPULSE input<br>(X3 / 7+8) | ON : Button activated / input active<br>OFF : Button not activated / input not active |
| SWITCH CLOCK | Weekly timer (pluggable) | ON : Timer activated<br>OFF : Timer not activated |
| LIGHT BARR. | Drive-through photocell 1<br>(X4 / 1-4) | ON : Photocell signal is OK<br>OFF : Light beam interrupted or fault in photocell |
| LIGHT BARR. 2 | Drive-through photocell 2<br>Connection to Input 1<br>(X4 / 9+10) | ON : Photocell signal is OK<br>OFF : Light beam interrupted or fault in photocell |
| SAFETY CIRC | Safety circuit 1Emergency stop systems of door system. | ON : Safety circuit closed<br>OFF : Safety circuit interrupted |
| STOP | STOP command button<br>(keypad on cover) | ON : Button not activated<br>OFF : Button activated |
| ROT FIELD | Shows currently set rotational direction of door operator | RIGHT : Setting for clockwise rotating field<br>LEFT : Setting for anticlockwise rotating field |

| Display | Meaning | Status |
|---|---|---|
| CYCLE | Door cycle counter | Displays number of door cycles run up so far<br>1 x OPEN + 1 x CLOSE = 1 cycle<br>Counts only if the travel cut-out points are reached. |
| SERVICE | Service alarm function<br>Service alarm function parameters<br>SERVICE and PIN NO. 2 | OFF : Maintenance indicator not activated<br>0 - 9999 : Maintenance indicator activated<br>Displays the number of door cycles left until a maintenance message is sent |
| AWG | Shows position of absolute value encoder | Displays the current transmitted value. |
| ERROR …<br>COUNT<br>CYCLE | Control unit error memory<br>Error messages from the control unit can be read out here with information on the frequency and cycle.<br>The list of error messages can be scrolled through using buttons [+] and [–] on the LCD monitor.<br>Deleting the error log:<br>Press buttons [+] and [-] at the same time for approx. 2 seconds.<br>Every error message must be individually deleted. | The display changes every 2 seconds to show the following in turn:<br>– the error description,<br>– the frequency of occurrence and<br>– the cycle in which the error last occurred.<br>The list contains only errors which have already occurred before. |

## 13.7 Error messages and rectification

### 13.7.1 Error message shown on LCD display

| Fault / error message | Cause | Rectification |
|---|---|---|
| System does not respond. | – No voltage supply. | – Check the voltage supply to the door operator and the control. |
| Door travels to the CLOSED end position when the OPEN button is pressed<br>Door travels to the OPEN end position when the CLOSE button is pressed | – Rotating field is connected wrongly. | – Check the rotating field and set direction to clockwise, if necessary. |
| FAULT – X | – Internal software or hardware fault. | – RESET using the circuit board buttons:<br>➔ “13.8.6 RESETTING the control without an LCD monitor” |
| SAFETY CIRC. | – The safety circuit is interrupted.<br>X3 / 1+2 Control safety circuit EMERGENCY STOP, slack rope switch<br>X6 / 1+2 Safety circuit of door operator AWG<br>X11 / 4+8 Interface RS485<br>X2 / B1+B2 Safety circuit of door operator MEC<br>X3 / 3+4 External stop button<br>X7 / 1+2 Internal stop button | – Check safety circuit, localise interruption and rectify problem. |

| Fault / error message | Cause | Rectification |
|---|---|---|
| ERROR RUNTIME | – The programmed running time has been exceeded. | – Check the path of the door and the running time.<br>– Re-programme the running time, if necessary. |
| ERROR AWG | – Signal transmission between absolute value encoder and control interrupted and/or broken down. | – Check the cable and socket connections and replace, if necessary. |
| TERM SWITCH FAIL | – The door has travelled beyond the programmed end position area. | – Move the door back into the programmed area using the emergency operation facility. |
| | – The end positions have not yet been programmed. | – First, programme the end positions. |
| ERROR REVOLUTION | – The power monitoring has been triggered. | – Check the door for any mechanical impairment or damage. |
| ERROR DIRECTION | – The rotating field present is not a clockwise rotating field. | – Check the rotating field and change the direction, if necessary.<br>➔ 13.7.1 Checking the direction of rotation / direction of travel” |
| ERROR SKS CLS. | – Closing edge safety device 1 is faulty in the CLOSING direction –> (X4 / 5-8). | – Check the closing edge safety device and the spiral cable. |
| ERROR SKS OPEN 2 | – Closing edge safety device 2 is faulty in the OPENING direction direction –> (X4 / 11+12) input 2 | – Check the closing edge safety device and the spiral cable. |
| ERROR STOP 2 | – Safety circuit 2 is interrupted. wicket door switch 8.2 kΩ –> (X4 / 11+12) input 2 | – Check wicket door switch. |
| ERROR SKS CLS. 3 | – Closing edge safety device 3 is faulty in the CLOSING direction –> (X20) Plug-in RADIO transmission system channel 1 | – Check closing edge safety device.<br>– Test the RADIO transmission system. |
| ERROR SKS OPEN 3 | – Closing edge safety device 3 is faulty in the Open direction –> (X20) Plug-in RADIO transmission system channel 1 | – Check closing edge safety device.<br>– Test the RADIO transmission system. |
| ERROR STOP 3 | – Safety circuit 3 is interrupted. –> (X20) Plug-in RADIO transmission system channel 1 | – Check the safety circuit.<br>– Check the RADIO transmission system.. |
| ERROR SKS CLS. 4 | – Closing edge safety device 4 is faulty in the CLOSING direction –> (X20) Plug-in RADIO transmission system channel 2 | – Check closing edge safety device.<br>– Check the RADIO transmission system. |
| ERROR SKS OPEN 4 | – Closing edge safety device 4 is faulty in the OPEN direction –> (X20) Plug-in RADIO transmission system channel 2 | – Check closing edge safety device.<br>– Check the RADIO transmission system. |
| ERROR STOP 4 | – Safety circuit 4 is interrupted. –> (X20) Plug-in RADIO transmission system channel 2 | – Check the safety circuit.<br>– Check the RADIO transmission system. |

| Fault / error message | Cause | Rectification |
|---|---|---|
| ERROR SKS-TEST | – Testing of attached airwave bar unsuccessful. | – Check the PS pressure switch, spiral cable and rubber profile.<br>– Check the PS POINT setting. |
| | – Test of RADIO transmission systems 1 – 4 failed. | – Check the RADIO transmission system.<br>– Check whether the right relay MOD was selected for the transmission system.<br>➔ "G. Functions for external accessories" |
| ERROR LIGHT BAR | – The installed photocell indicates a permanent fault. –> (X4 / 9+10) input 1 | – Check photocell (function & alignment).<br>– Check cabling. |
| ERROR LIGHT BAR 2 | – he installed photocell indicates a permanent fault. –> (X4 / 1-4) | – Check photocell (function & alignment).<br>– Check cabling. |
| ERROR LB TEST | – Test of two-wire photocell failed. | – Check photocell (function & alignment).<br>– Check cabling. |
| ERROR STOP-TEST | – Test of wicket door switch (8.2 kΩ) failed. –> Input 2 | – Check wicket door switch. |
| ERROR TRAPIN | – Draw-in protection testing (additional module) failed. –> Relay MOD21 | – Check photocell (function & alignment).<br>– Check cabling. |
| ERROR CYLINDER | – The monitoring limit switch for the lock system for threshold-less wicket doors has failed to trigger within 10 seconds of entering an OPEN command. | – Check limit switch for the cylinder. |
| ERROR MSBUS | – Communication between the control & the MS BUS module attached is interrupted. | – Check the cable and socket connections and replace, if necessary. |

**After rectifying the cause of the error, the power supply to the control must be turned off once and/or the control must be restarted (> INPUT menu > parameter RESTART > ON) in the event of the following errors:**

– ERROR DIRECTION
– ERROR RUNTIME
– TERM SWITCH FAIL

### 13.7.2 Error message via LED indicator

**LED H4 (green, main circuit board)**

| Fault / error message | LED Display | Remarks |
|---|---|---|
| No operating voltage | Off | No power supply present. |

**LED H6 (red, main circuit board)**

| Fault / error message | LED Display | Remarks |
|---|---|---|
| SAFETY CIRC. | Flashes 1x | Safety circuit is interrupted.<br>– Check safety circuit, localise interruption and rectify problem. |
| ERROR AWG | Flashes 2x | Signal transmission between absolute value encoder and control interrupted and/or broken down.<br>– Check the cable and socket connections and replace, if necessary. |
| TERM SWITCH FAIL | Flashes 3x | The door has travelled beyond the programmed end position area or the end positions have not yet been programmed.<br>– First, programme the end positions.<br>– Move the door back into the programmed area using the emergency operation facility. |
| ERROR DIRECTION | Flashes 4x | The rotating field present is not a clockwise rotating field.<br>– Check the rotating field and change the direction, if necessary.<br>➔ "13.7.1 Checking the direction of rotation / direction of travel" |
| ERROR REVOLUTION | Flashes 5x | The power monitoring has been triggered.<br>– Check the door for any mechanical impairment or damage. |
| ERROR RUNTIME | Flashes 6x | The programmed running time has been exceeded.<br>– Check the path of the door and the running time.<br>– Re-programme the running time, if necessary. |
| ERROR MSBUS | Flashes 9x | Communication error between the control and the installed MS BUS end device.<br>– Check the cable and socket connections and replace, if necessary. |
| ERROR SKS | Continuous light<br>Travel only possible in deadman mode | Closing edge safety device faulty in OPENING or CLOSING direction.<br>– Check the closing edge safety device and the spiral cable and, if necessary, Check the RADIO transmission system. |
| ERROR LIGHT BAR | Continuous light<br>Travel in CLOSING direction only possible in deadman mode | The installed photocell indicates a permanent fault.<br>– Check photocell (function and alignment).<br>– Check cabling. |

## 13.8 Technical data

### 13.8.1 Mechanical and electrical data

| | | |
|---|---|---|
| Housing dimensions (W x H x D) | : | 215 x 275 x 190 mm |
| Installation | : | Fix vertically to the wall at a minimum height of 1,100 mm |
| Power supply via<br>L1, L2, L3, N, PE | :<br>: | <br>400V/3~ , 50/60Hz<br>230V/3~ , 50/60Hz |
| L1, N, PE | : | 230V/1~ , 50/60Hz<br>Power input max. 2,200W for power supply 400V/3~ |
| Fuse protection | : | 10 A K type |
| Internal consumption of control | : | max. 750 mA |
| Control voltage | : | 24 V DC, max. 500 mA; protected by self-resetting fuse for external sensor systems. |
| Control inputs | : | 24 VDC all inputs must be connected so that they are potential-free.<br>Minimum signal duration for input control command > 100 ms |
| Control outputs | : | 24 VDC, max. 500 mA |
| RS485 A and B | : | Only for electronic limit switches RS485 level, terminated with 120Ω |
| Safety circuit / emergency off | : | All input connections MUST be potential-free; if the safety circuit is interrupted, no further electrically powered movement of the operator is possible, not even in deadman mode |
| Closing edge safety device input (performance level C) | : | Performance level C<br>for electrical closing edge safety devices with 8.2 kΩ terminating resistor and for dynamic optical systems |
| Photocell (performance level D) | : | If the photocell is used as a D performance level protection system, it must be checked at regular intervals – at least every 6 months – to ensure that the system is working properly.<br>two-wire photocells have a self-test facility, so this requirement does not apply in this case. |
| Display (LCD) | : | Only an original LCD monitor may be used. |
| Relay outputs | : | If inductive loads are connected (e.g. further relays or brakes), these must be equipped with suitable interference suppression (such as recovery diode, varistors or RC circuits). Potential-free normally open contact; min. 10 mA; max. 230 V AC / 4A.Once contacts have been used for power circuits, they can no longer be used for extra-low current circuits. |
| Temperature range | : | Operation -10°C ... +45°C<br>Storage : -25°C ... +70°C |
| Air humidity | : | Up to 80% with no condensation |
| Vibrations | : | Low-vibration mounting, e.g. on a masonry wall |
| Protection grade | : | IP 65 |
| Weight approx. | : | 1.8 kg |

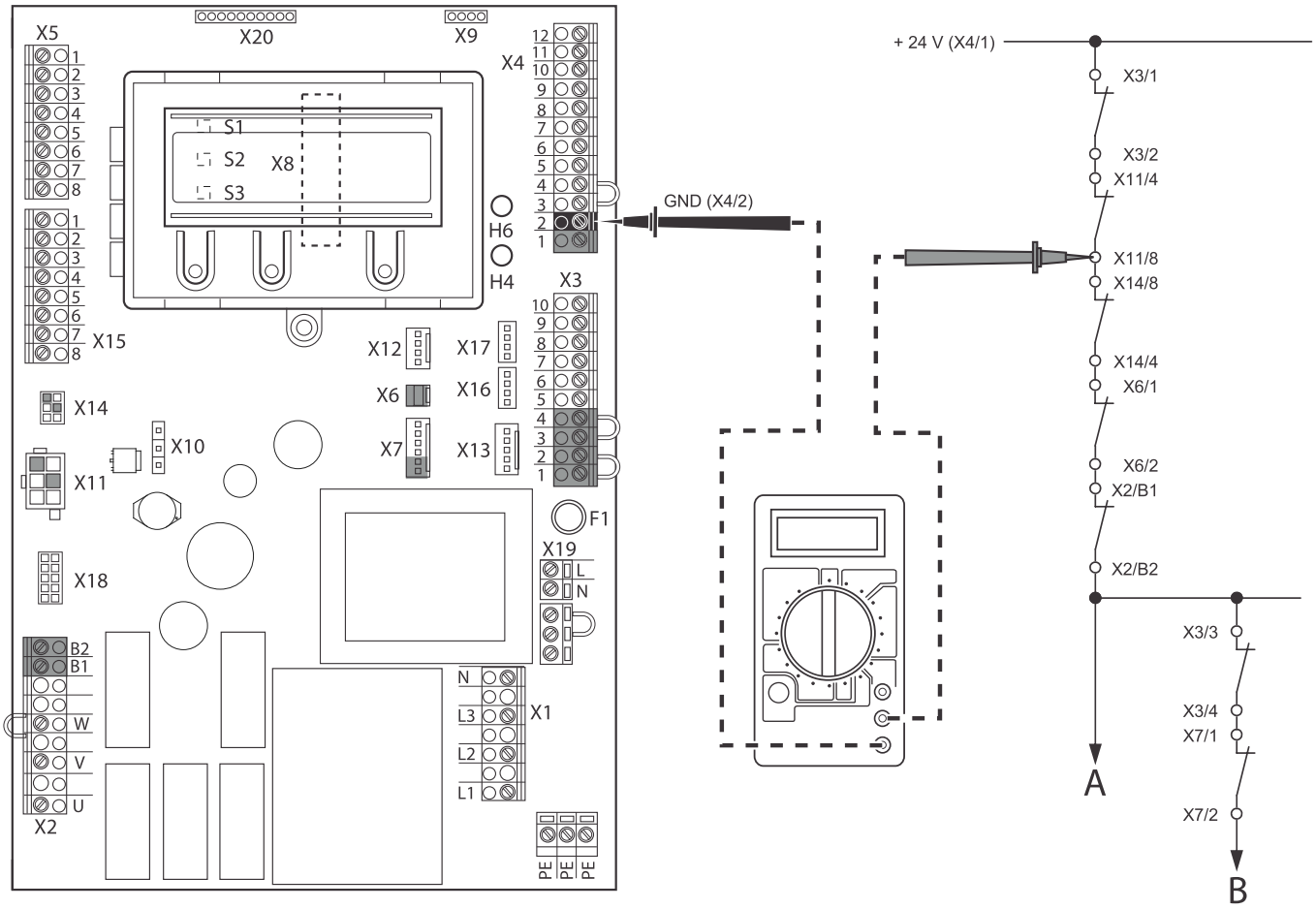
### 13.8.2 Functional safety category and performance level according to EN ISO 13849-1

| Function | Implementation | $MTTF_D$ electronics | $MTTF_D$ total with output contactor (1) | $DC_{avg}$ | Category | Performance level |
|---|---|---|---|---|---|---|
| Emergency stop button | Input terminal X3, X6, X7, X11 Interrupts voltage supply to the output relays and main contactor, independently of the CPU. Signal received by CPU. | 1175 years | 191 years | 85.3% | 3 | GB |
| Stop circuit | Input terminal X3, X7 Interrupts the power supply to the main contactor. Signal to CPU. | 1175 years | 191 years | - | B | B |
| End position recognised by absolute value encoder (2) | Input terminal X11 For determining the position, and end position detection. Safety through checking plausibility of drive commands with signals received. | 1062 years | 188 years | 85.6% | 2 | GB |
| End position recognised by end position switch (2) | Input terminal X15 Safeguarded through excess travel stop. Inputs are evaluated by the CPU. | 1248 years | 193 years | 85.5% | 2 | GB |
| Photocell evaluation | Input terminal X4 Impulse evaluation through CPU. Faults are detected through plausibility check in the CPU. The frequency must lie between 130 and 190 Hz. The function is tested by switching on the supply voltage (T117, IC111) of the photocell before every run and every two minutes in standby. If activated in the CLOSING direction, the door stops or reverses. | 1000 years | 186 years | 85.7% | 2 | GB |

$DC_{avg}$ : Average diagnostic coverage | $MTTF_D$ : Mean time to dangerous failure

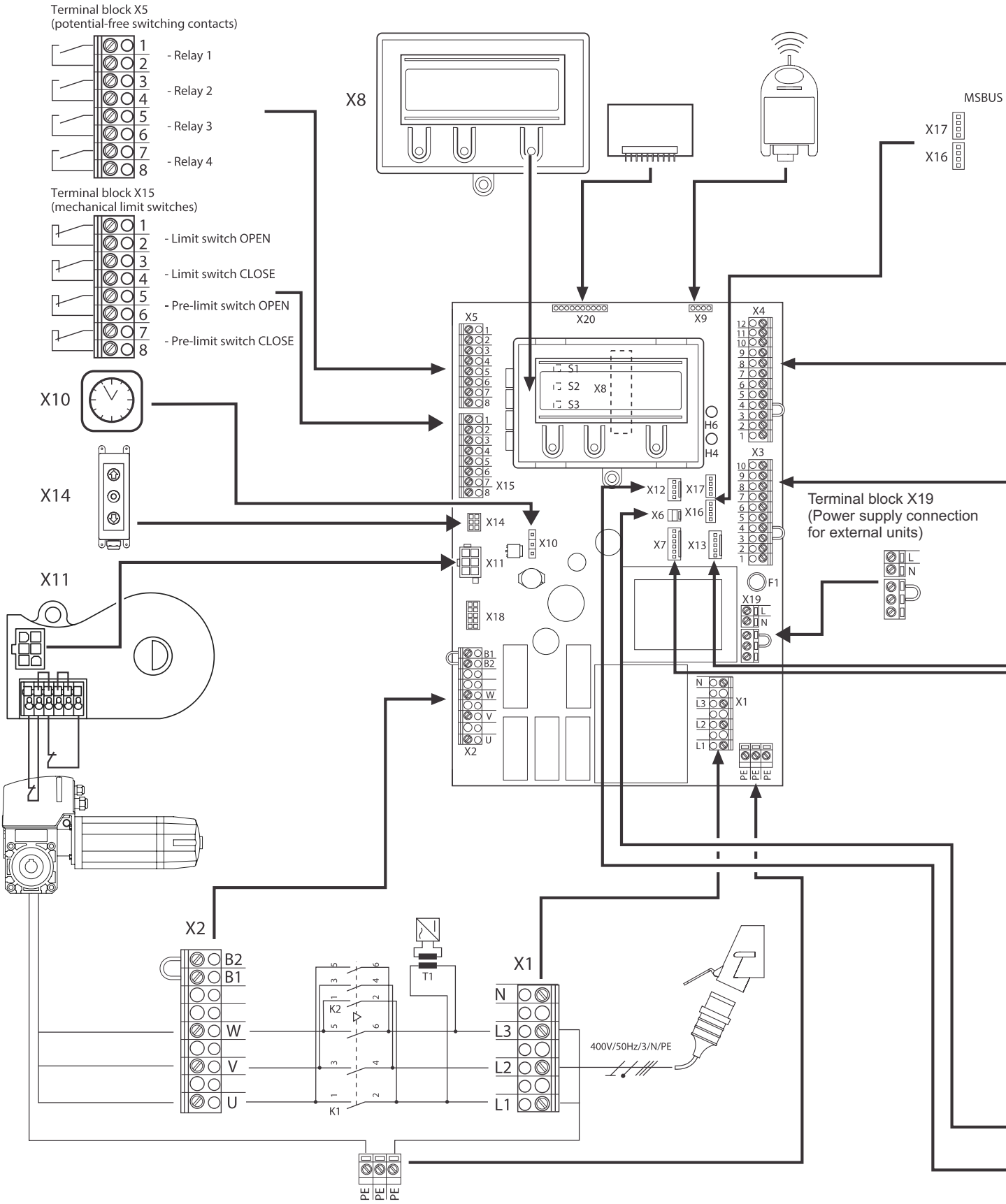
## 13.9 Appendix

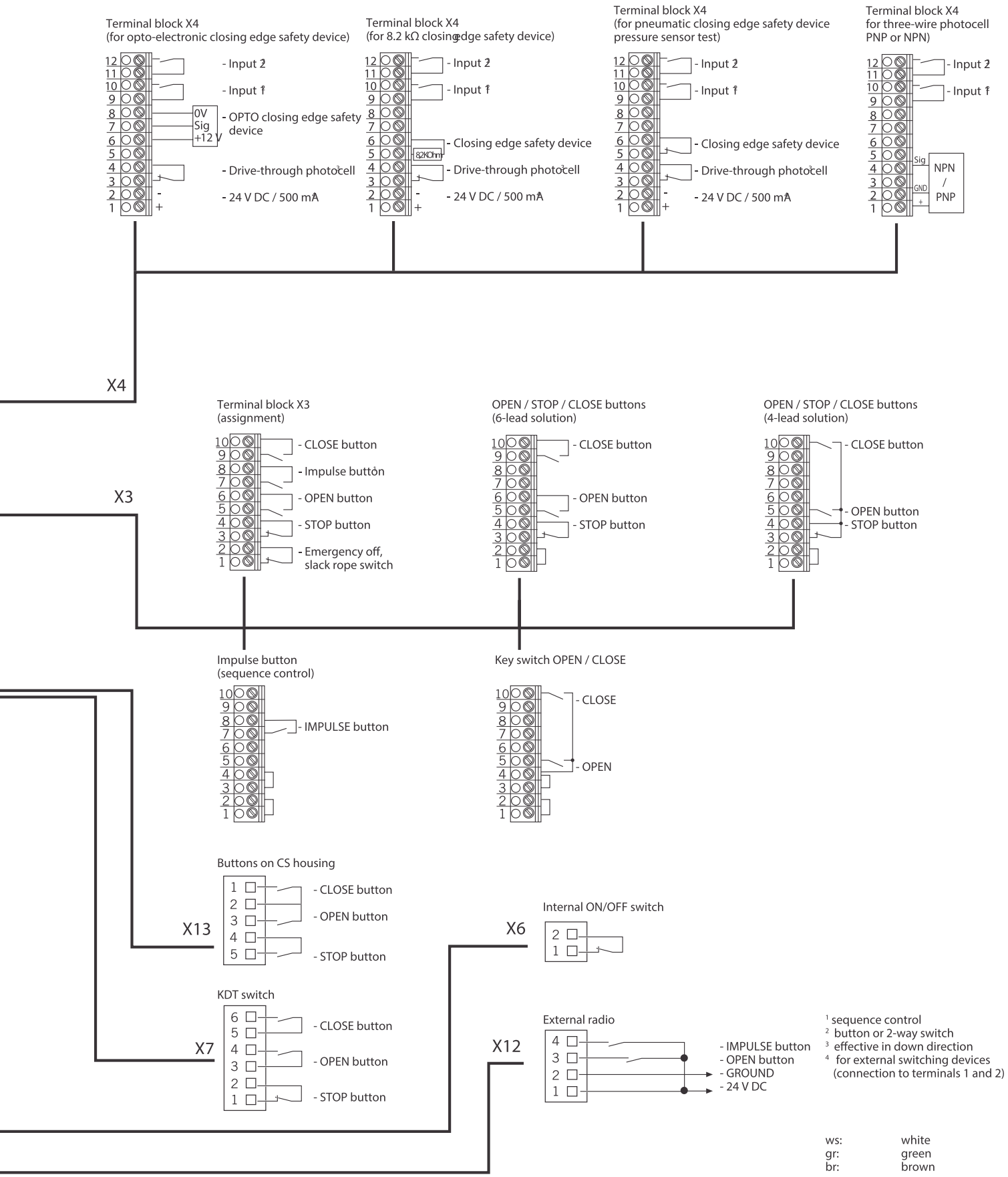
### 13.9.1 Measuring points, safety circuit




NOTICE :
The measurement range must be set for 24 V-DC.
A Emergency Stop
B Stop
Measure at all measuring points on the diagram in order to locate the interruption.

## 13.9.2 Overview of connections




Terminal block X4
(for opto-electronic closing edge safety device)
- Input 2
- Input 1
0V
Sig
+12 V
- OPTO closing edge safety device
- Drive-through photocell
- 24 V DC / 500 mA
Terminal block X4
(for 8.2 kΩ closing edge safety device)
- Input 2
- Input 1
8.2KOhm
- Closing edge safety device
- Drive-through photocell
- 24 V DC / 500 mA
Terminal block X4
(for pneumatic closing edge safety device
pressure sensor test)
- Input 2
- Input 1
- Closing edge safety device
- Drive-through photocell
- 24 V DC / 500 mA
Terminal block X4
for three-wire photocell
PNP or NPN)
- Input 2
- Input 1
Sig
GND
+
NPN
/
PNP
X4
Terminal block X3
(assignment)
- CLOSE button
- Impulse button
- OPEN button
- STOP button
- Emergency off,
slack rope switch
X3
OPEN / STOP / CLOSE buttons
(6-lead solution)
- CLOSE button
- OPEN button
- STOP button
OPEN / STOP / CLOSE buttons
(4-lead solution)
- CLOSE button
- OPEN button
- STOP button
Impulse button
(sequence control)
- IMPULSE button
Key switch OPEN / CLOSE
- CLOSE
- OPEN
Buttons on CS housing
X13
- CLOSE button
- OPEN button
- STOP button
Internal ON/OFF switch
X6
KDT switch
X7
- CLOSE button
- OPEN button
- STOP button
External radio
X12
- IMPULSE button
- OPEN button
- GROUND
- 24 V DC
[1] sequence control
[2] button or 2-way switch
[3] effective in down direction
[4] for external switching devices
(connection to terminals 1 and 2)
ws: white
gr: green
br: brown

## 14 OPERATING INSTRUCTIONS FOR GAPL31X IE INVERTER CONTROL CARD

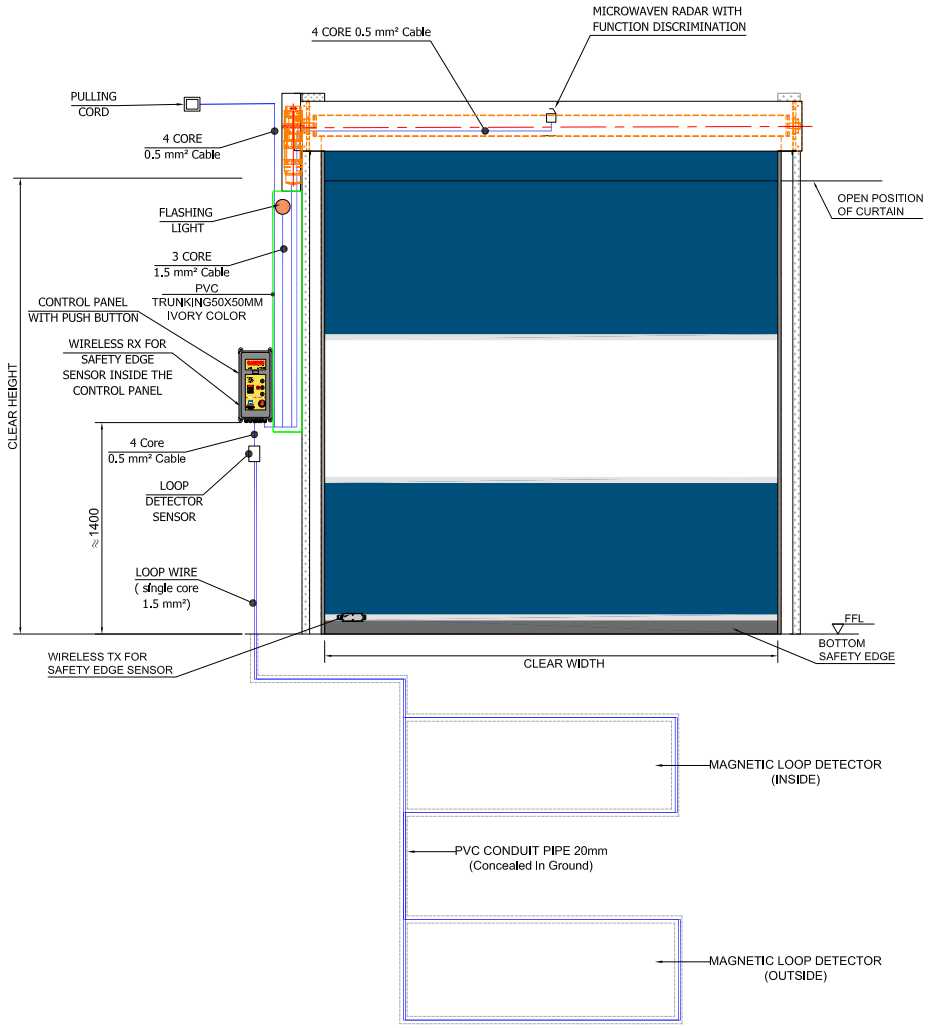



Fig. 14a

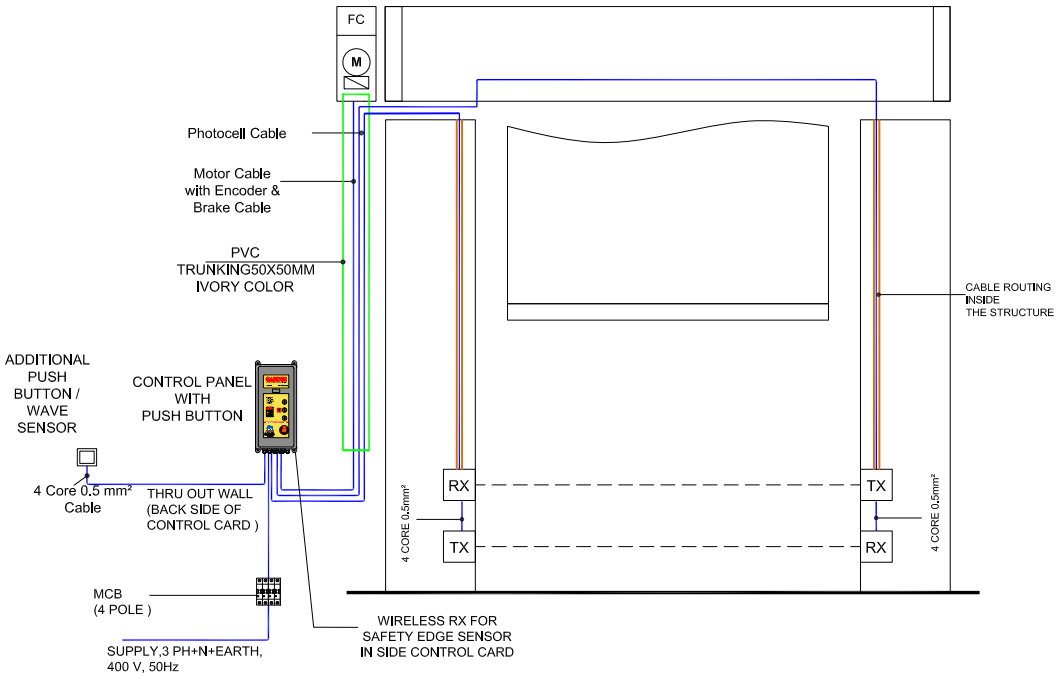
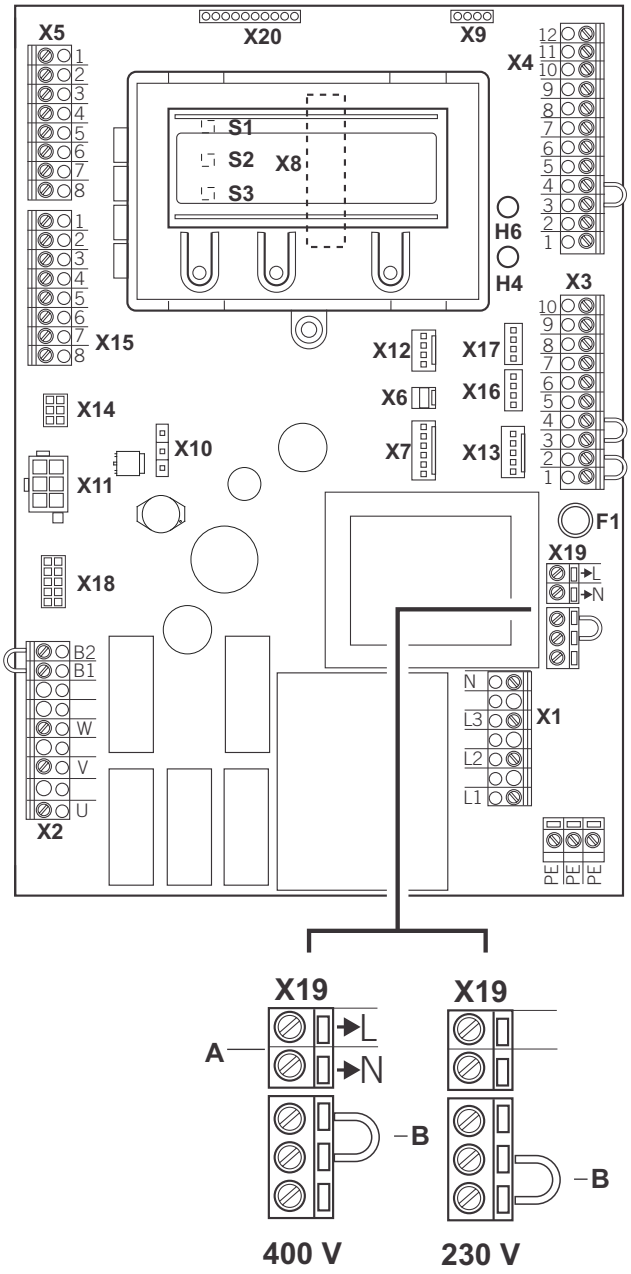



Fig. 14b

**GAPL 31X IE CONTROL BOARD**
(with attached LCD display monitor)

Key:

X1 : Terminal block for mains connection
X2 : Terminal block for motor
X3 : Terminal block for command devices
X4 : Terminal block for safety elements
X5 : Terminal block for relay
X6 : Sockets for internal ON-OFF switch
X7 : Sockets for internal 3-button input unit
X8 : Socket for display (under display)
X9 : Sockets for radio receiver
X10 : Sockets for weekly timer
X11 : Sockets for digital limit switch system
X12 : Socket for external radio receiver
X13 : Sockets for CS three-button input unit
X14 : Interface RS 485
- Connection for CSI 3-button input unit
- Connection for RS 485 display
X15 : Connection for mechanical limit switch system
X16 : Connection for BUS system (MS BUS)
X17 : Connection for BUS system (MS BUS)
X18 : Frequency converter interface
X19 : Power supply for external devices
230V / 50 Hz protected by F1 (1 A delay) fuse
X20 : Sockets for wireless safety system
H4 : Operational readiness illuminated when control is working
H6 : status message lights up when the safety devices are activated or in the case of errors
S1 : Programming button (+) (under display)
S2 : Programming button (-) (under display)
S3 : Programming button (P) (under display)




A Output 230 V.
Power supply for external devices.
Not a connection for mains incoming supply.

➔ "14.5.3 Power supply for external devices (only for 400 V / 3-phase connection)"

B The position of the jumper must take into account the power supply and the motor voltage.

## 14.1 Initial operation

### 14.1.1 General

To guarantee that the equipment functions properly, it must be ensured that:

- The door is installed and operational.
- The operator motor is installed and ready for operation.
- The command and safety devices are installed and ready for operation.

REFERENCE
The relevant manufacturers' instructions must be adhered to for the installation of the door, the operator motor, and the command and safety devices

### 14.1.2 Mains connection

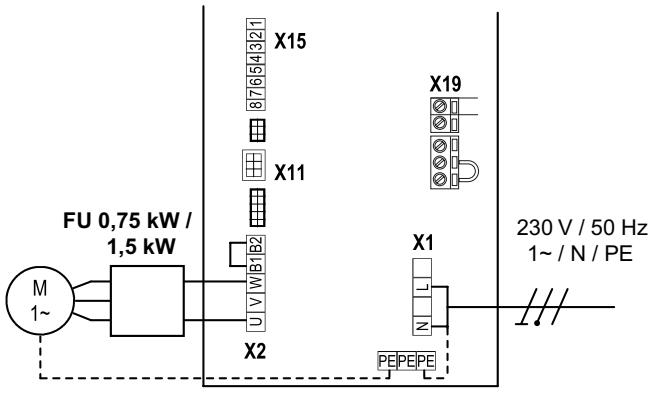
**Preconditions**

To guarantee that the controls function properly, the following points must be ensured:

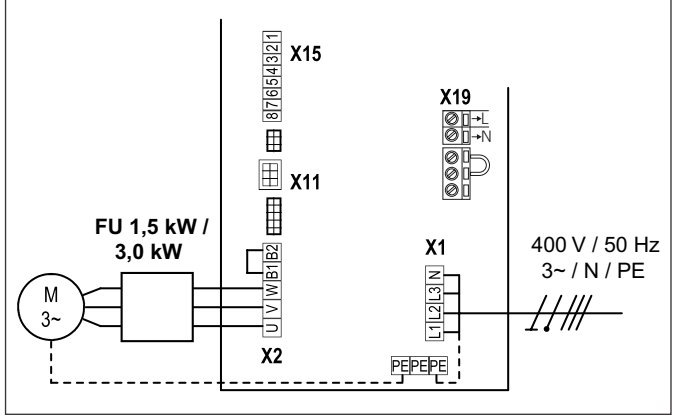
- The mains voltage must correspond to the voltage stated on the type plate.
- The mains voltage must be the same as the voltage of the frequency converter.
- The output voltage of the frequency converter must be the same as the mains voltage of the opener.
- For a permanent connection, an all-pole main switch must be used.
- For a three-phase connection, only 3-way automatic circuit breakers may be used.

NOTICE
Malfunctions can occur as a result of incorrect installation of the control!
Before switching on the control for the first time, a check must be carried out after completing the wiring to ensure that all the motor connections at the motor and at the control are securely fixed. All control voltage inputs are galvanically isolated from the supply.

Detailed circuit diagram for mains connection and motor (230 V / single phase)




Detailed circuit diagram for mains connection and motor (400 V / three phase)




Key:

X1 : Terminal block for mains connection

X2 : Terminal block for frequency converter

X11 : Sockets for digital limit switch system with safety circuit (STOP CHAIN)

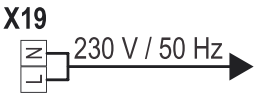
X15 : Terminal block for mechanical limit switches (stop circuit at X2 / B1-B2)

X19 : Power supply connection for external devices

Connection:

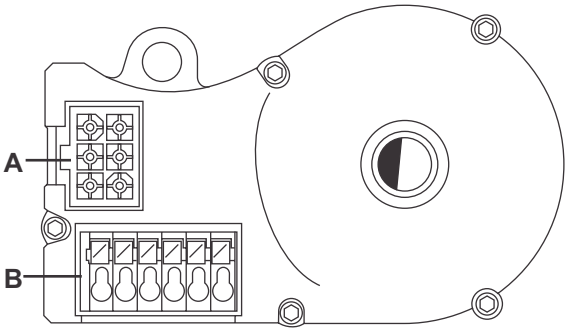
- Connect the digital limit switch system or mechanical limit switches to the control.
- Connect the control to the motor.
- Connect the control to the mains power supply.
- Connect the control to the motor.
- Cable groups must be secured close to their relevant terminals using a cable tie.

### 14.1.3 Power supply for external devices (only for 400 V / 3-phase connection)




NOTICE
Damage to property or irreparable damage due to incorrect installation!
Using terminal X19 if the control is connected to a 230 V power supply will destroy the circuit board.
Terminal X19 is protected with fuse block F1 (1 A-T).

### 14.1.4 Allocation of connections for absolute value encoder (plug terminal X11)

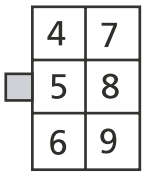



A : AWG plugs

B : AWG plug terminal

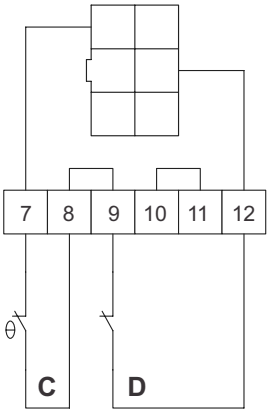
**Plug terminal X11 (at connection A)**

Depending upon the opener, either cables with numbered or coloured leads are used for the absolute value encoder (AWG).




| | | | | | |
|---|---|---|---|---|---|
| 4 (grey) | : | Safety circuit input | 7 (yellow) | : | RS485 A |
| 5 (pink) | : | RS 485 B | 8 (green) | : | Safety chain output |
| 6 (white) | : | GROUND | 9 (brown) | : | 12VDC |

**Plug terminal B (absolute value encoder only)**




C : Thermal element in door operator

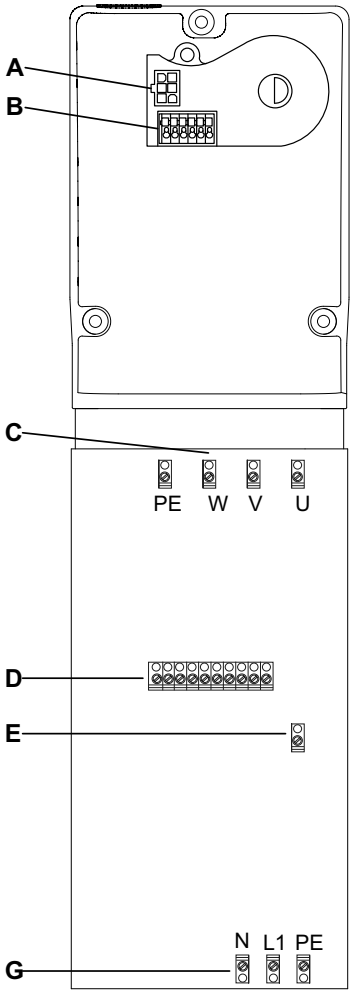
D : Emergency hand operation (emergency hand crank or emergency hand chain)

The limit switch system will be recognised automatically by the control during initial use. If replaced at a later date, the relevant limit switch system must be selected in a parameter setting in the INPUT operating mode.

## Initial operation

### 14.1.5 Connection of Drive - Controls

Frequency converter module
integrated in drive




A : AVE plug

B : AVE plug terminal

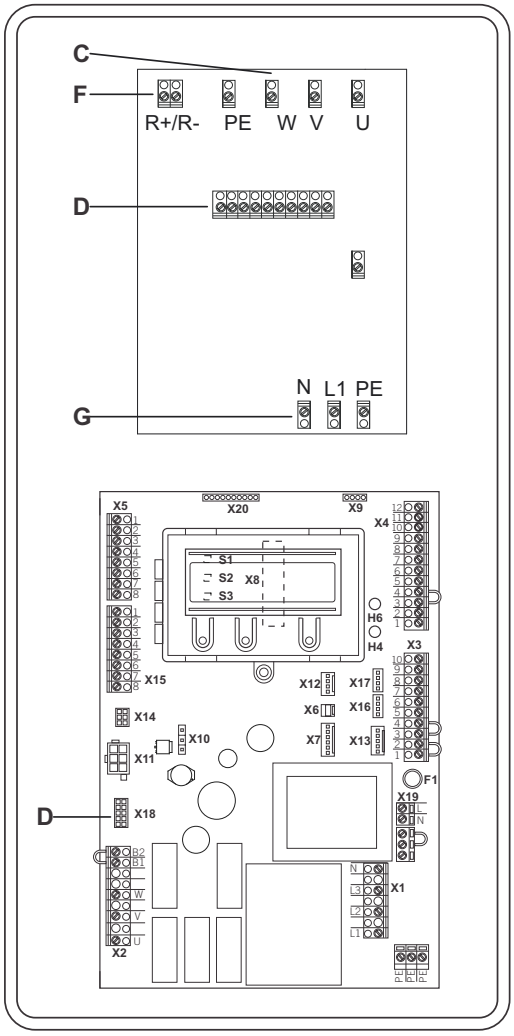
C : Motor output FU (U, V, W),
Temperature sensor, optional

D : Plug connection for data cable FU

E : LED operation FU

G : Power supply FU, 230V (N, L1, PE)

External frequency converter module, ,
0,75 kW / 1,5 kW




C : Motor output FU (U, V, W)

D : Connection for data cable FU

F : Connection of brake resistance (R-, R+)

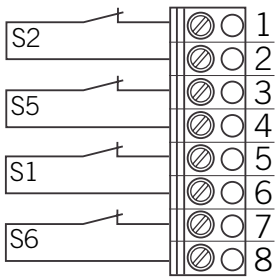
G : Power supply FU, 230V (N, L1, PE)

Connection

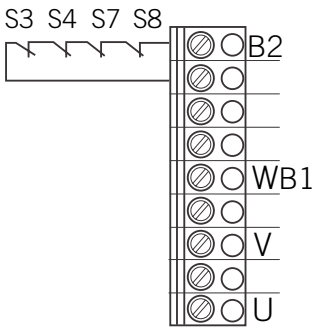
- Connect power supply FU (G) at terminal X1.
- Connect AVE plug (A) at terminal X11.
- Connect data cable FU (D) at terminal X18.

### 14.1.6 Connection arrangement for mechanical limit switches (terminals X15 and X2)

**Terminal block X15**

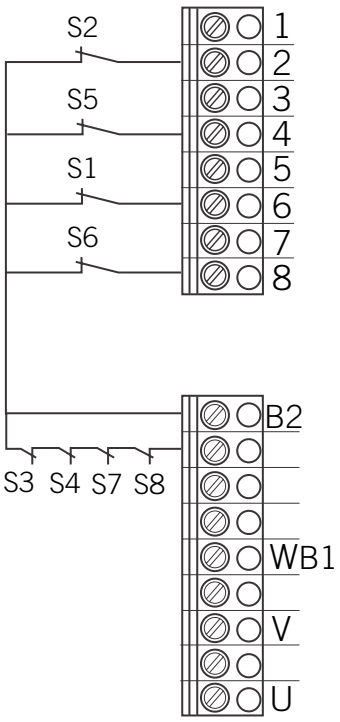



**Terminal block X2**




Connection example for 6 wire limits

**Terminal blocks X11 and X2**




| | |
|---|---|
| S1 | Additional limit switch, OPEN |
| S2 | Limit switch, OPEN |
| S3 | Safety limit switch, OPEN |
| S4 | Safety limit switch, CLOSED |
| S5 | Limit switch, CLOSED |
| S6 | Additional limit switch, CLOSED |
| F2 | Thermal overload protection for motor |
| S8 | Emergency operation (normally closed contact) |

The limit switch system will be recognised automatically by the control during initial use and following a reset. If the connection is changed at a later date, the relevant limit switch system must be selected in a parameter setting in the INPUT operating mode.

### 14.1.7 Connection arrangement for command devices

**CAUTION!**

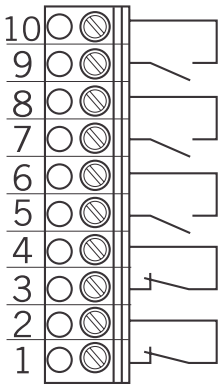
Danger of injury due to uncontrolled movement of the door!

- Install command devices for deadman operation within site of the door, but beyond the danger zone for the user.

If the command device is not a key switch:

- Install it at a height of at least 1.5 m off the ground.
- Install it so as to make it inaccessible to the general public.

**Terminal block X3**



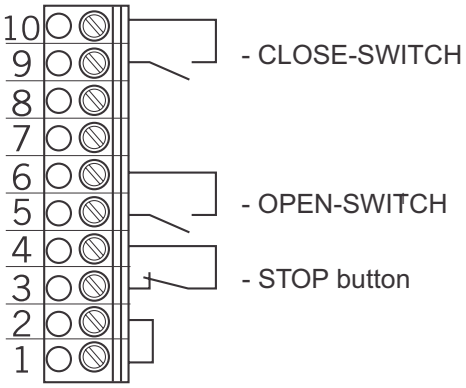

- CLOSE-SWITCH
- Impulse button
- OPEN-SWITCH [1]
- STOP button
- Emergency off, slack rope switch

[1] Wicket door switch only possible as a contact with position separation

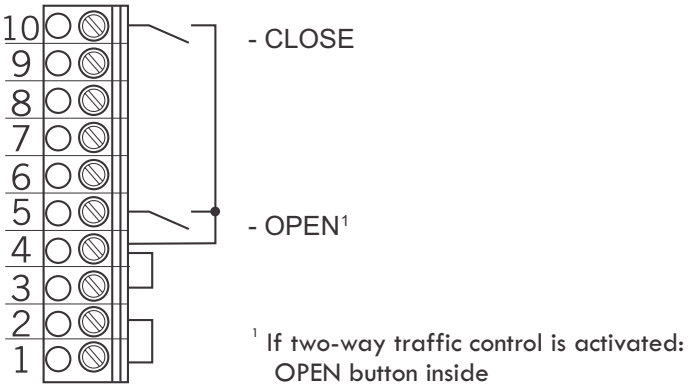
### 14.1.8 Connection examples for command devices (terminal block X3)

**OPEN / STOP / CLOSE buttons**

6-wire solution



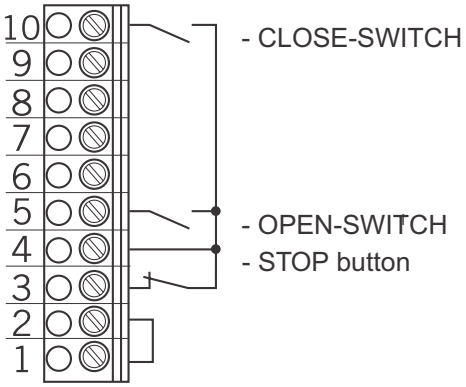

**Key switch OPEN / CLOSE**




[1] If two-way traffic control is activated: OPEN button inside

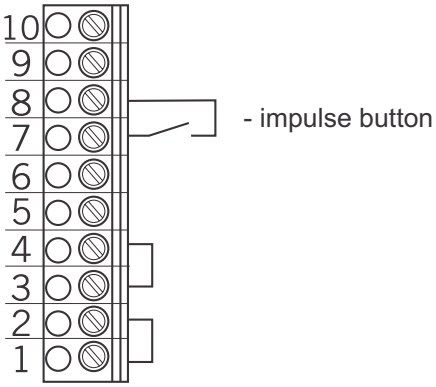
**OPEN-SWITCH / STOP / CLOSE-SWITCH**

4-wire solution




**Impulse button**

(sequence control)



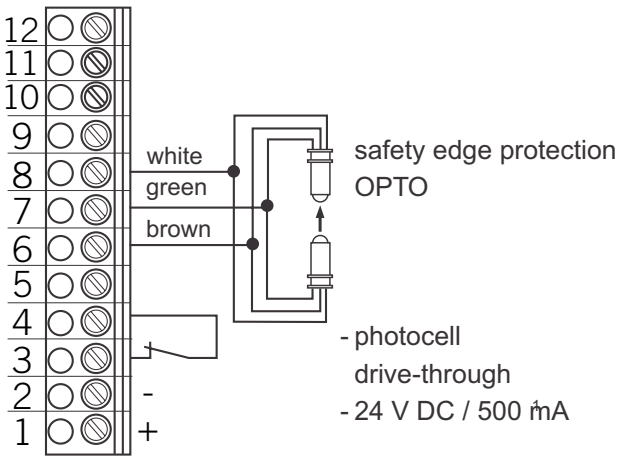

### 14.1.9 Allocation of connections for closing edge safety devices

The closing edge safety device will be recognised and programmed automatically during initial use and following a reset. If a closing edge safety device is not connected, the input will be queried every time the power supply is switched on again, until a closing edge safety device is recognised. If a change is made at a later date, the appropriate system must be selected in a parameter setting in INPUT mode.

➔ “14.7.3 Initialisation / resetting”

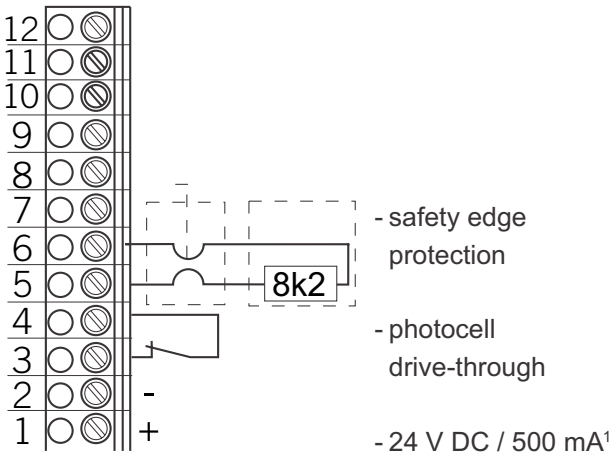
**Terminal block X4**

for optoelectronic safety edge protection



**Terminal block X4**

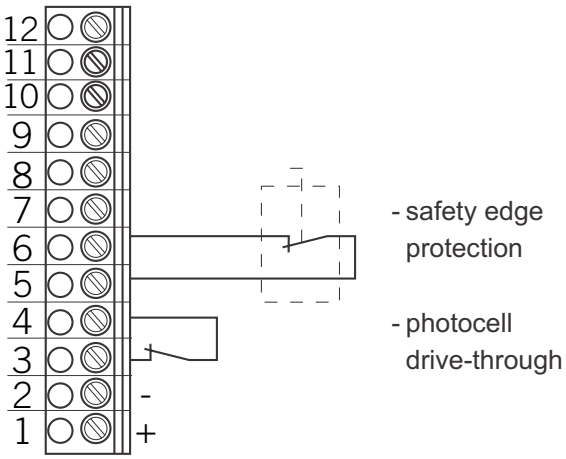
for 8.2 kΩ safety edge protection




[1] For external switching devices (connection to terminals 1 and 2)

**Terminal block X4**

For pneumatic safety edge protection - pressure switch test:
- testing automatically active



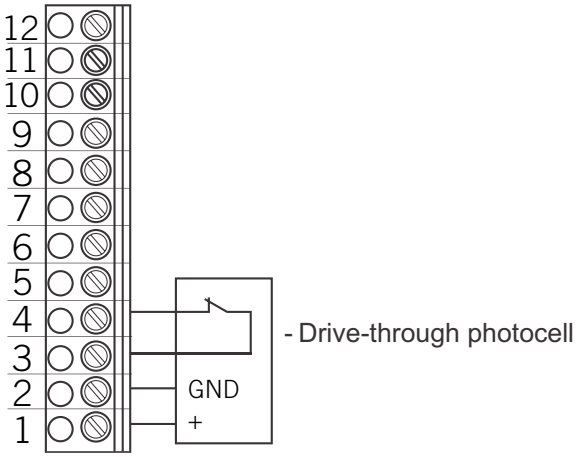

### 14.1.10 Allocation of connections for photocells

The photocell system will be recognised and programmed automatically during initial operation and following a reset. If a photocell system is not connected, the input will be queried every time the power supply is switched on again, until a closing edge safety device is recognised. If a change is made at a later date, the appropriate system must be selected in a parameter setting in INPUT mode.

➔ “14.7.3 Initialisation / resetting”

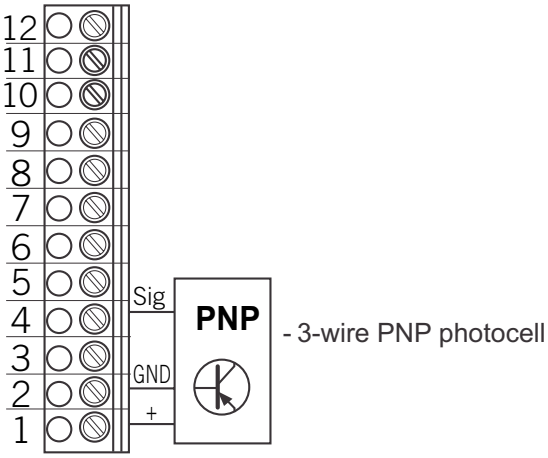
**Terminal block X4**

for drive-through photocell NC 24 V DC



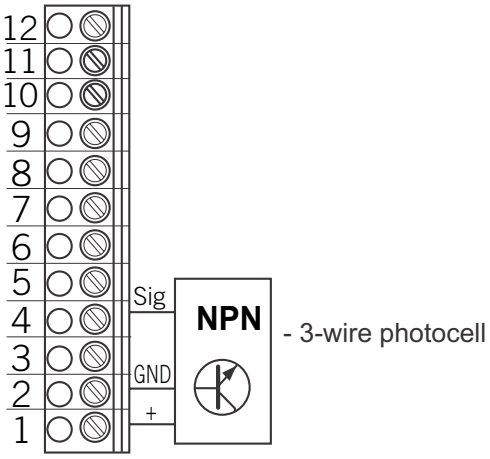

**Terminal block X4**

for 3-wire PNP photocell



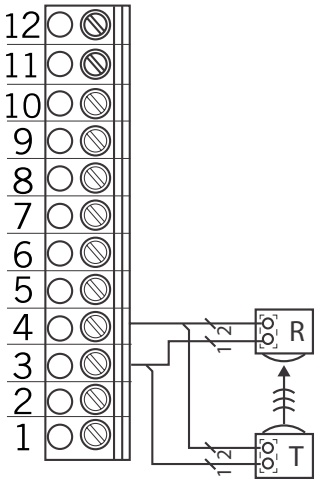
**Terminal block X4**

for 3-wire photocell




**Terminal block X4**

for wire photocell




R : Receiver

T : Transmitter

### 14.1.11 Connection arrangement for programmable inputs

**Terminal block X4**

Programmable inputs

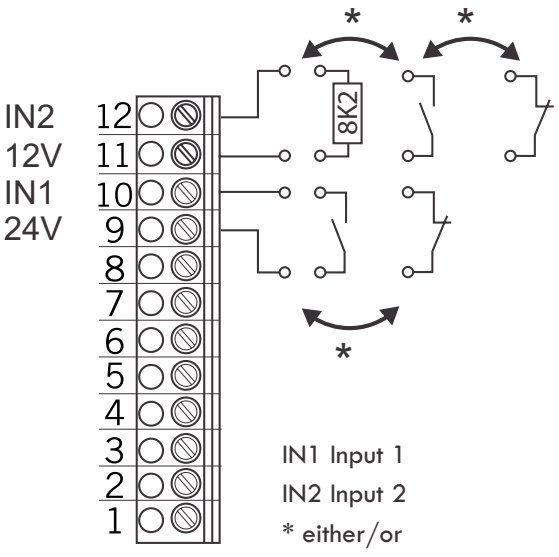
Input 1 : Terminal 9 + 10

Input 2 : Terminal 11 + 12

NOTICE

Danger of damage to the circuit board due to incorrect connection!

Inputs 1 and 2 have different voltages and they must NOT be connected together!




IN1 Input 1

IN2 Input 2

* either/or

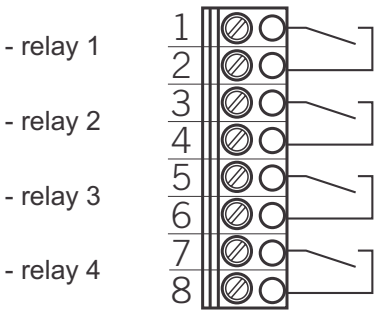
The type of wiring depends on the parameter settings for both inputs in INPUT mode.

### 14.1.12 Connection arrangement for relay outputs

**Terminal block X5**

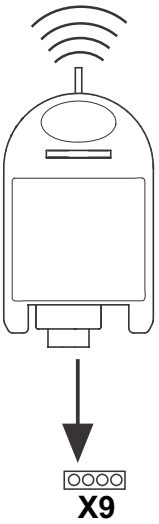
(voltage-free switching contacts)

- Assignment of functions in INPUT mode
- Setting for each single relay



### 14.1.13 CS radio

**Terminal block X9**




Connection

- Insert the plug-in receiver into plug-in socket X9.

Teaching-in the transmitter codes

- Press the programming button on the receiver briefly (<1.6 seconds). The programming mode is activated. The LED flashes.
- Press the required channel button on your transmitter.
  Once the remote control has saved the transmission code, the LED lights up to approx. 4 seconds.

It is possible to teach-in up to 15 transmission codes. If all memory spaces are full, the LED flashes rapidly.

**Selectively deleting a transmission code**

- Press the programming button on the receiver briefly (<1.6 seconds).
  The programming mode is activated. The LED flashes.
- Keep the programming button pressed for longer than 1.6 seconds. The delete mode is activated.
  The LED flashes very fast.
- Press the required channel button on your transmitter.
- The LED lights up for approx. 4 seconds if the appropriate transmission code has been deleted.
- The deletion procedure can be cancelled by briefly pressing the programming button.

**Reset (completely delete memory)**

- Press the programming button on the receiver briefly (<1.6 seconds).
  The programming mode is activated. The LED flashes.
- Keep the programming button pressed for longer than 1.6 seconds.
  The delete mode is activated. The LED flashes very fast.
- Press the programming button again for more than 1.6 seconds.
  The LED lights up for approx. 4 seconds if all memory spaces have been deleted.

The deletion procedure can be cancelled by briefly pressing the programming button.

## 14.2 Setting the end positions

### 14.2.1 Checking the direction of rotation / direction of travel

**Changing to ADJUSTMENT mode**

- Press button (P) until ADJUSTMENT appears.

**Checking the direction of travel**

- If you press button (+), the door should open; if you press button (-), the door should close.
  If it is correct, continue with setting the end positions.

**Changing the direction of rotation**

- If the direction of rotation needs to be changed, proceed as follows. Press buttons (+) and (-) at the same time for > 5 seconds. The display shows ROT FIELD. Any end positions that have been saved will be deleted. Continue with setting the end positions.

☑ CHECK

Checking and, if necessary, correcting is only necessary when using the system for the first time.

If there is a change in the rotating field, it is not necessary to make any readjustments if a frequency converter is connected.

The error message “ERROR DIRECTION“ can then only be generated by interchanging two phases between the frequency converter and the motor. This can also be acknowledged, however, by changing the direction of rotation (see above).

### 14.2.2 Setting the electronic end position using the programming button on the circuit board

**Changing to ADJUSTMENT mode**

- Press button (P) for approx. 5 seconds.
  The red LED flashes slowly.

**Setting the OPEN end position**

- Press the (+) button to move the door to the OPEN end position.
- Save the end position setting by pressing button (P) and by additionally pressing the (OPEN) button.
  The red LED flashes rapidly for approx. 1 second.

**Setting the CLOSED end position**

- Press the (OPEN/CLOSE) button to move the door to the CLOSED end position.
- Save the end position setting by pressing button (P) and by additionally pressing the (CLOSE) button.
  The red LED flashes rapidly for approx. 1 second.

ADJUSTMENT mode is automatically exited.
The red LED goes out.

**N.B.**

- The adjustment mode will end automatically after 7 minutes unless a button is pressed.
- When carrying out adjustments for the first time, it is necessary to teach-in both end positions, as otherwise normal operation is not possible.
- If an end position is corrected, the ADJUSTMENT menu can be exited by pressing button (P) once the teaching-in of the special end position has been completed.
- After programming the limit switches, the teach-in of the system running time is carried out automatically. The functions of the control are the same as in automatic mode.

### 14.2.3 Setting the electronic end position using the CSI 3-button input unit

Setting the electronic end position using the CSI 3- button input unit is only possible if an LCD display unit is not connected at plug-in socket X8.

**Change to ADJUSTMENT mode**

- Press the (STOP) button for approx. 5 seconds. The red LED flashes rapidly.
- Let go of the STOP button briefly. The red LED lights up for 2 seconds.
- Keep the (STOP) button pressed for approx. 5 seconds during this time. The red LED flashes slowly.
- Let go of the (STOP) button.

**Setting the OPEN end position**

- Press the (+) button to move the door to the OPEN end position.
- Save the end position setting by pressing the (STOP) button and by additionally pressing the (OPEN) button. The red LED flashes rapidly for approx. 1 second.

**Set the CLOSED end position**

- Press the (OPEN/CLOSE) button to move the door to the CLOSED end position.
- Save the end position setting by pressing the (STOP) button and by additionally pressing the (CLOSE) button. The red LED flashes rapidly for approx.1 second.

ADJUSTMENT mode is exited automatically.
The red LED goes out.

**N.B.**

- The adjustment mode will end automatically after 7 minutes unless a button is pressed.
- When carrying out adjustments for the first time, it is necessary to teach-in both end positions, as otherwise normal operation is not possible.
- If an end position is corrected, the ADJUSTMENT menu can be exited by pressing the (STOP) button once the teaching-in of the special end position has been completed.
- After programming the limit switches, the teach-in of the system running time is carried out automatically.

### 18.2.4 Setting the electronic end position using the LCD display

NOTICE

Damage to property or irreparable damage due to incorrect installation!

The display must be plugged in only if it is disconnected from the power supply and at zero voltage. Only one display must be used:

At plug-in socket X8 : LCD Display Standard
At plug-in socket X14 : LCD Display RS 485

**Changing to ADJUSTMENT mode**

- Press button (P) until ADJUSTMENT appears.

**Setting the OPEN end position**

- Press the (+/-) button to move the door to the desired OPEN end position.
- Save the end position setting by pressing button (P) and by additionally pressing the (+) button.

**Setting the CLOSED end position**

- Press the (+/-) button to move the door to the desired CLOSE end position
- Save the end position setting by pressing button (P) and by additionally pressing the (-) button.
- Exit the ADJUSTMENT mode by pressing button (P).

**N.B.**

- When carrying out adjustments for the first time, it is necessary to teach-in both end positions, as otherwise normal operation is not possible.
- If an end position is corrected, the ADJUSTMENT menu can be exited by pressing button (P) once the teaching-in of the special end position has been completed.
- After programming the limit switches, the teach-in of the system running time is carried out automatically. The display shows TEACH IN RUN. The functions of the control are the same as in automatic mode.

### 14.2.5 Setting the electronic intermediate end position using the LCD display

**In AUTOMATIC mode, move the door to the desired position**

- Press the (+/-) button to move the door to the desired position (e.g. before-end switch OPEN).

**Changing to INPUT mode**

- Press button (P) until INPUT appears.
- Press buttons (+ and -) > 2 seconds to activate INPUT.

**Saving the intermediate end position OPEN-BES-OPEN**

- Press buttons (+/-) until BES OPEN appears. The value stands at A.
- Press button (P) to save the current door position as an intermediate end position.
- Saving the intermediate end position by pressing button (P) again.

**Exiting INPUT mode**

- Press buttons (+ and -) > 1 second to exit INPUT mode.

**Changing to AUTOMATIC mode**

- Press button (P) until AUTOMATIC appears.

### 14.2.6 Setting the mechanical end position

**Changing to ADJUSTMENT mode**

- Press button (P).

**Setting the OPEN and CLOSED end position**

REFERENCE

The procedure for setting the end positions is described in separate documentation for mechanical limit switches.

- Exit the ADJUSTMENT mode by pressing button (P).

**N.B.**

- ADJUSTMENT mode is not exited automatically. To return to normal operating mode, ADJUSTMENT mode must be exited by pressing button (P).
- If an intermediate end position requires to be corrected, the teach-in value can be altered in the INPUT menu or set to A again to allow a new teach-in procedure to be carried out.

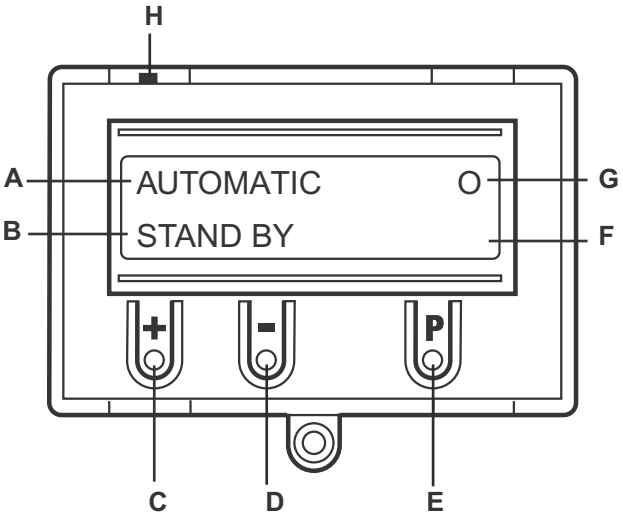
## 14.3. Setting the end positions

### 14.3.1 Overview of the LCD display

NOTICE

Damage can occur through improper installation!

The mains power supply must be switched off before connecting the display unit.




Key:

A : mode of operation / diagnostic info
B : parameter / diagnostic info
C : (+) button
D : (-) button
E : (P) button
F : value / status
G : value / status
H : jumper

### 14.3.2 LCD display, modes of operation

The controls have four modes of operation with the LCD display:

1. AUTOMATIC
2. ADJUSTMENT
3. INPUT
4. DIAGNOSIS

If the jumper H is removed, the (+) button, the (-) button and the (P) button have no function. The display still functions.

After switching on the control, it is in INITIALISATION mode.

The display shows INIT PHASE and the control is not yet ready for use. This phase lasts approx. 5 seconds.

ADJUSTMENT, INPUT and DIAGNOSIS modes are exited automatically 7 minutes after the last button was pressed, and the control then goes into AUTOMATIC mode.

**Operating mode 1: AUTOMATIC**

The door system is operated in the AUTOMATIC operating mode.

Display:

- displays the function being carried out
- displays any error messages

If the “SELF LOCK“ parameter is set to MOD2 or MOD3 in the input menu, the display changes from AUTOMATIC to MANUAL.

**Operating mode 2: ADJUSTMENT**

In the ADJUSTMENT mode, the OPEN/CLOSED end positions are set.

NOTICE

Malfunctions can occur as a result of incorrect operation of the control!

In ADJUSTMENT mode, the door will not stop automatically when it reaches the travel limit position if electronic end positions (AWG – absolute value encoders) are used.The door can be damaged if driven beyond the end position.

Fine adjustments can be made in the INPUT operating mode.

Display:

- displays the end position value

**Operating mode 3: INPUT**

In the INPUT operating mode, the values of various parameters can be altered.

Display:

- displays the selected parameter
- displays the programmed value /status

**Operating mode 4: DIAGNOSIS**

In the DIAGNOSIS operating mode, door-specific checks can be queried.

Display:

- displays the check
- displays the checking status

### 14.3.3 Initialisation / resetting

The following components will be recognised and taught-in automatically during initial operation and following a RESET.

- End position system
- Closing edge safety device
- Photocell system
- Input 2 (8.2 kΩ wicket door sensor)

During this process (approx. 60 seconds), the green LED lights up and the top line of the display indicates “INIT. PHASE”.

It is not possible to operate the system during this process.

Components can be changed or added at a later date using the LCD display or by reinitialising the system.

If one of the components has not yet been connected, this will be indicated by “A” in the display.

This component will be searched for if any further initialisation procedure is carried out. If this component is recognised, the system automatically switches to the appropriate adjustment mode.

Exception:

Input 2 remains inactive (MOD1) if 8.2 kΩ was not recognised the first time that initialisation was carried

### 14.3.4 RESETTING the control using the LCD display unit

**Switch to INPUT mode**

- Press the (P) button until INPUT appears in the display.
- Press buttons (+ and -) for at least 2 seconds to activate the INPUT

**Resetting the controls**

- Press the buttons (+/–) until FACTORY SET. appears in the display. The setting indicated is MOD1.
- Press the (+) button until MOD4 appears in the display.
- Press button (P) to begin the reset.

The initialisation phase is run through, and all safety components that are connected, as well as the end position system, are automatically taught-in.

**Switching to adjustment mode**

➔ “14.6.4 Setting the electronic end position using the LCD display.

**Switching to automatic mode**

- Press the (P) button until AUTOMATIC appears in the display.

### 14.3.5 RESETTING the control without the LCD display unit

- Disconnect the system from the power supply.
- Press the circuit board buttons (P and –) at the same time, and keep them pressed.
- Switch the power supply back on again.
- Press the circuit board buttons (P and –) at the same time, and keep them pressed until the red LED (H6) flashes quickly.
- Let go of the circuit board buttons (P and –).

The initialisation phase is run through (approx. 60 seconds).

While initialisation is being carried out, it is not possible to programme or operate the system.

After initialisation has been completed, the end positions are deleted and all parameters are reset to the factory default setting.

## 14.4 Frequency Converter

### 14.4.1 General

The frequency converter control allows the door speed to be adjusted separately for the OPEN and CLOSE directions.

The frequency of the converter determines the opener speed.

This speed-independent controlling of the door system makes the door run smoothly and protects the door mechanism, resulting in benefits such as

- faster response times,
- reduced draughts, and
- minimised heating costs.

The acceleration and delay times (SPEED UP / SLOW DOWN) ensure soft starting and stopping at the end positions.

### 14.4.2 Adjustable values

The following is a list of parameter settings that are directly related to speed regulation through the frequency converter module.

Various graphs showing the process that takes place at the various settings are given by way of illustration.

➔ “8.3 Travel graphs“

**BRAKE P OP** (Brake point OPEN)

Initiates the SLOW DOWN delay 1. The door then continues at minimum speed $f_{OPEN3}$.

This parameter only appears in the menu when the end positions have been programmed, and it then appears as a negative value referred to the upper cut-out point

This can only be set in the menu in conjunction with an absolute value encoder.

If mechanical limit switches are used, the before-end switch OPEN is used as a position marker for speed reduction.

Only applies for OPENING door direction of travel

**BRAKE P CL** (Brake point CLOSED)

Initiates the SLOW DOWN delay 1. The door then continues at minimum speed $f_{CLOSE3}$.

This parameter only appears in the menu when the end positions have been programmed, and it then appears as a positive value referred to the lower cut-out point.

This can only be set in the menu in conjunction with an absolute value encoder.

If mechanical limit switches are used, the before-end switch CLOSE is used as a position marker for speed reduction.

Only applies for CLOSING door direction of travel

**BRAKE P CL 2** (Brake point CL 2)

Allows the door to close at 3 different speeds. The Brake point CLOSED 2 initiates the SLOW DOWN delay 2. The door movement then continues at a fast speed $f_{CLOSE1}$.

This parameter only appears in the menu when the end positions have been programmed, and it then appears as a positive value referred to the lower cut-out point.

This can only be set in the menu in conjunction with an absolute value encoder.

This function is not available if mechanical limit switches are used.

Only applies for CLOSING door direction of travel

**FRQ. OPEN 1** (Frequency OPEN 1)

The maximum speed for OPEN door movement can be set here. Speed of travel $f_{OPEN1}$.

Only applies for OPEN door direction of travel

**FRQ. CLOSE 1** (Frequency CLOSE 1)

The maximum speed for CLOSING door movement can be set here. Speed of travel $f_{CLOSE1}$.

Only applies for CLOSING door direction of travel

**FRQ. CLOSE 2** (Frequency CLOSE 2)

The maximum speed 2 for CLOSING door movement can be set here. Speed of travel $f_{CLOSE2}$.

This parameter only appears in the menu when the brake point 2 has been programmed, and it then appears as an option. This allows two different fast speeds and one slow speed to be set in the CLOSING direction.

Only applies for CLOSING door direction of travel

**FRQ. OPEN 3** (Frequency OPEN 3)

The minimum speed for OPEN door movement can be set here. Speed of travel $f_{OPEN3}$.

Only applies for OPEN door direction of travel

**FRQ. CLOSE 3** (Frequency CLOSE 3)

The minimum speed for CLOSING door movement can be set here. Speed of travel $f_{CLOSE3}$.

Only applies for CLOSING door direction of travel

**SPEED UP 1** (Speed up acceleration 1)

Sets the time that elapses between the starting command and reaching the maximum speed $f_{OPEN/CLOSE1}$.

Applies for both door directions of travel

**SPEED UP 2** (speed up acceleration 2)

Sets the time that elapses between the starting command and reaching the maximum speed $f_{CLOSE2}$.

This parameter only appears in the menu when the Brake point 2 has been programmed, and it then appears as an option. This allows acceleration to a second (optional) fast speed to be set in the CLOSING direction.

Only applies for CLOSING door direction of travel

**SLOW DOWN 2** (Slow down / delay 2)

Sets the time that elapses between Brake point CLOSED 2 and reaching the fast speed $f_{CLOSE1}$.

This parameter only appears in the menu when Brake point 2 has been programmed, and it then appears as an option. This allows deceleration from the second (optional) fast speed to the fast speed $f_{CLOSE1}$ to be set in the CLOSING direction.

Only applies for CLOSING door direction of travel

**Reversal of direction by pressing the OPEN or CLOSE button**

Reversing the direction by directly pressing the OPEN or CLOSE buttons, will result in SLOW DOWN 1 or 2 or SPEED UP 1 or 2 being run through, depending on the current speed and direction of travel.

The total time for reversing the direction is made up of SLOW DOWN 1 or 2, the reversal time (INPUT menu) and SPEED UP 1 or 2.

**Reversal of direction by triggering the closing edge safety device**

Parameters SLOW DOWN / SPEED UP 3 describe the procedures after triggering the closing edge safety device and the associated direct reversal of direction.

The total time for reversing the direction is made up of SLOW DOWN 3, the reversal time (INPUT menu) and SPEED UP 3.

**SLOW DOWN 3** (Slow down / delay 3)

Sets the time that elapses between triggering the closing edge safety device and stopping the door system.

The countdown for the pre-set reversal time then begins.

Applies for both door directions of travel

**SPEED UP 3** (Speed up acceleration 3)

Sets the time that elapses between expiry of the reversal time and reaching the maximum speed $f_{OPEN/CLOSE1}$.

The countdown for the pre-set reversal time then begins.

Applies for both door directions of travel

**Reversal of direction by triggering the photocell (drive-through)**

Parameters SLOW DOWN / SPEED UP 4 describe the procedures after triggering the photocell system and the associated direct reversal of direction.

The total time for reversing the direction is made up of SLOW DOWN 4, the reversal time (INPUT menu) and SPEED UP 4.

**SLOW DOWN 4** (Slow down / delay 4)

Sets the time that elapses between triggering the closing edge safety device and stopping the door system.

The countdown for the pre-set reversal time then begins.

Applies for both door directions of travel.

**SPEED UP 4** (Speed up acceleration 4)

Sets the time that elapses between expiry of the reversal time and reaching the maximum speed $f_{OPEN/CLOSE1}$.

Applies for both door directions of travel

**Stopping the door system with the stop button or the impulse sequence**

**SLOW DOWN 5** (Slow down / delay 5)

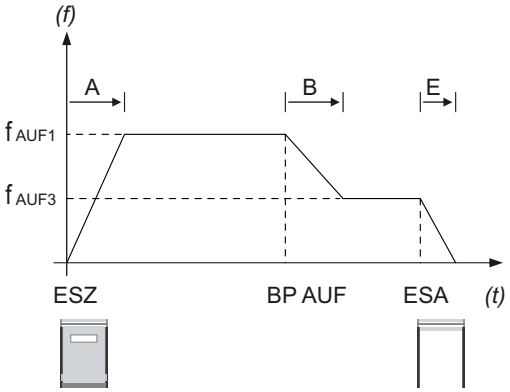
Sets the time that elapses between pressing the stop button or the impulse sequence and stopping the door system.

Applies for both door directions of travel

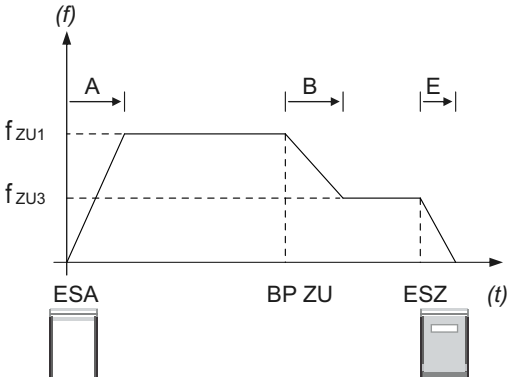
## Frequency Converter

### 14.4.3 Travel graphs

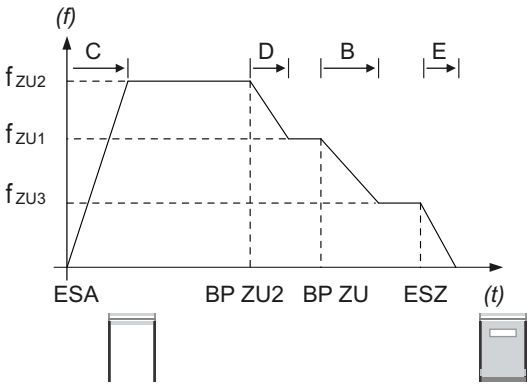
**Door opening run with two speeds**



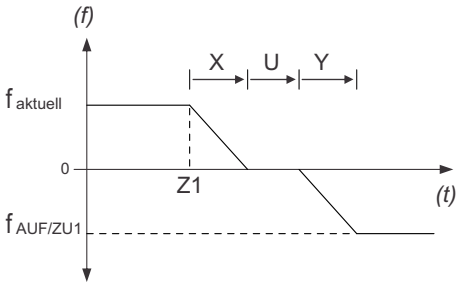

**Door closing run with two speeds**



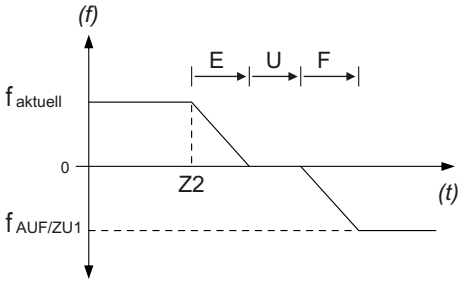

**Door closing run with three speeds**



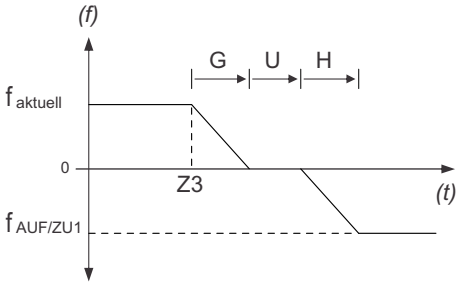

**Reversal of direction with OPEN / CLOSE button**



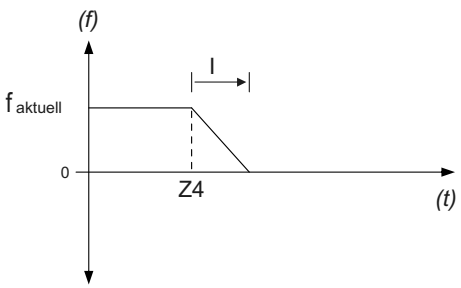

**Reversal of direction with closing edge safety device**




**Reversal of direction with photocell**




**Operating stop with stop button or impulse sequence**



Key

| | |
|---|---|
| (f) | Frequency |
| (t) | Time |
| ESA | Upper limit switch |
| ESZ | Lower limit switch |
| BP | AUF Brake point OPEN |
| BP ZU | Brake point CLOSED |
| BP ZU 2 | Brake point CLOSED 2 |
| $f_{AUF1}$ | Frequency OPEN 1 |
| $f_{AUF3}$ | Frequency OPEN 3 |
| $f_{ZU1}$ | Frequency CLOSE 1 |
| $f_{ZU2}$ | Frequency CLOSE 2 |
| $f_{ZU1}$ | Frequency CLOSE 3 |
| $f_{aktuell}$ | Current travel frequency |
| $f_{AUF\ /\ ZU1}$ | Frequency OPEN 1 or CLOSE 1 |
| A | Speed up 1 (start-up curve 1) |
| B | Slow down 1 (braking curve 1) |
| C | Speed up 2 (start-up curve 2) |
| D | Slow down 2 (braking curve 2) |
| E | Slow down 3 (braking curve 3) |
| F | Speed up 3 (start-up curve 3) |
| G | Slow down 4 (braking curve 4) |
| H | Speed Up 4 (start-up curve 4) |
| I | Slow down 5 (braking curve 5) |
| U | Reversal time<br>The reversal time can be set in the INPUT menu item |
| X | Slow down 1 or 2 |
| Y | Speed up 1 or 2 |
| | The current travel frequency determines whether slow down/speed up 1 or 2 applies. |
| Z1 | Button pressed |
| Z2 | SKS closing edge safety device triggered |
| Z3 | Photocell triggered |
| Z4 | Stop triggered |

### 14.4.4 Nominal values for motor

In INPUT operating mode, certain motor ratings can be set. It is essential that these settings agree with the information given on the motor rating plate. Although these are factory pre-set when supplied in combination with a door opener, it must be checked before using them for the first time whether the settings comply with the information given on the rating plate. It is essential that the following data are checked and set:

| | |
|---|---|
| MOTOR V | Rated voltage of motor |
| MOTOR I | Rated current of motor |
| MOTOR P | Rated power of motor |
| MOTOR PHI | Power factor of motor |
| MOTOR I | Rated frequency of motor |
| MOTOR U/MIN | Rated speed of motor |

In addition, it is possible to set the limits for the minimum and maximum travel frequency of the motor. The parameters required for this purpose can also be found in INPUT operating mode.

| | |
|---|---|
| MOT.HZ MIN | Lowest programmable travel frequency |
| MOT.HZ MAX | Highest programmable travel frequency |

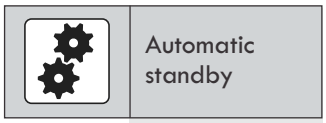
The maximum programmable travel frequency of a motor is determined by the manufacturer and must be individually checked and set.

NOTICE

Damage can occur through improper installation !

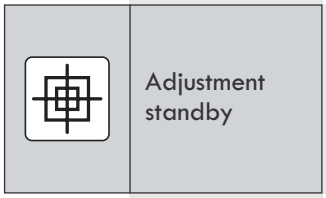
Incorrectly entering the parameter settings described can result in considerable damage occurring to the control unit and motor.

## 14.5 Navigator (LCD display only)



Automatic standby

Ⓟ > 1 Sec



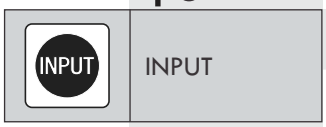
Adjustment standby

⊕ > Position DOOR OPEN

⊖ > Position DOOR CLOSED

| | |
|---|---|
| ADJUSTMENT MAIN UP | Save door position: Ⓟ Hold P pressed and ⊕ > 1 sec |
| ADJUSTMENT MAIN DOWN | Save door position: Ⓟ Hold P pressed and ⊕ > 1 sec |

Ⓟ > 1 Sec




INPUT

⊕ & ⊖ > 2 Sec →

| | |
|---|---|
| INPUT ENGLISH | |
| FINE-UP | : 0 |
| FINE-DOWN | : 0 |
| BES-OPEN | : A |
| BES-CLOSE | : A |
| OPEN TIME | : 0 |
| START WARN. | : 0 |
| FOREWARNING | : 0 |
| AUT.CLOSE | : MOD1 |
| FAST CL. | : MOD1 |
| RELAY 1 | : MOD6 |
| RELAY 2 | : MOD7 |
| RELAY 3 | : MOD1 |
| RELAY 4 | : MOD14 |
| TL REST | : MOD1 |
| SKS | : A |
| SCS TEST* | : MOD2 |
| DW-POINT* | : 20 |
| SKS FUNC | : MOD1 |
| SKS REV | : MOD1 |
| REVERSPOINT | : ES-CLOSE + 50 |
| LIGHT BARR. | : A |
| LB FUNC | : MOD1 |
| PEB POINT | : A |
| IMPULS INPUT | : MOD1 |
| Input 1 | : MOD1 |
| Input 2 | : MOD1 |
| SKS3 | : MOD1 |
| SKS4 | : MOD1 |
| RUNNING TIME | : A |
| REVERS. TIME | : 300 |
| LIMIT SW. | : A |
| SELF LOCK | : MOD1 |
| POWER | : 10 |
| BRAKE P OPEN** | : –250 |
| BRAKE P CL** | : 250 |
| BRAKE P CL2** | : A |
| INVERTER | : MOD1 |
| FRQ. OPEN 1 | : 50 |

Scroll up through menu:
⊕ > 2 Sec

Scroll down through menu:
⊖ > 2 Sec

Select value:
Ⓟ > 1 Sec

Increase value:
⊕

Decrease value:
⊖

Save value:
Ⓟ

Return to INPUT :
⊕ & ⊖ > 1 Sec

Ⓟ > 1 Sec

Ⓟ > 1 Sec

| | |
|---|---|
| FRQ. CLOSE 1 | : 50 |
| FRQ. CLOSE 2*** | : 50 |
| FRQ. OPEN 3 | : 25 |
| FRQ. CLOSE 3 | : 25 |
| SPEED UP 1 | : 2,0 |
| SLOW DOWN 1 | : 2,0 |
| SPEED UP 2*** | : 2,0 |
| SLOW DOWN 2*** | : 2,0 |
| SPEED UP 3 | : 0,5 |
| SLOW DOWN 3 | : 0,1 |
| SPEED UP 4 | : 0,5 |
| SLOW DOWN 4 | : 0,5 |
| SLOW DOWN 5 | : 0,5 |
| RES. INVERTER | : OFF |
| MOTOR V | : 230 |
| MOTOR I | : 5.1 |
| MOTOR P | : 550 |
| MOTOR PHI | : 0.69 |
| MOTOR | : HZ 50 |
| MOT.HZ | : MIN 10 |
| MOT.HZ MAX | : 87 |
| MOTOR RPM | : 1370 |
| BRAKE DELAY | : 50 |
| SERVICE**** | : OFF |
| RESET MSBUS | : OFF |
| RESTART | : OFF |
| PIN NO.2 | : 1111 |

**DIAGNOSIS**

| | |
|---|---|
| UPPER SWITCH | : ON |
| LOWER SWITCH | : ON |
| UP-SWITCH | : OFF |
| DOWN-SWITCH | : OFF |
| INPUT 1 | : OFF |
| INPUT 2 | : – / OFF |
| SKS ON | |
| SKS 2 | : – / ON |
| STOP 2 | : – / ON |
| SKS 3 | : – / ON |
| STOP 3 | : – / ON |
| SKS 4 | : – / ON |
| STOP 4 | : – / ON |
| IMPULS INPUT | : OFF |
| SWITCH CLOCK | : OFF |
| LIGHT BARR. | : ON |
| SAFETY CIRC. | : ON |
| STOP | : ON |
| ROT FIELD | : right |
| CYCLE | : 000000 |
| SERVICE | : OFF |
| AWG | : 0000 |
| Error Memory | : Error ... |

Scroll up through menu:
⊕ > 2 Sec
Scroll down through menu:
⊖ > 2 Sec

Return to AUTOMATIC Operating mode: (P)

Only query is possible

*If SKS = MOD3

** Only visible if the end points are set

*** Only visible if “BRAKE P CL 2“ is set

**** Only visible if ”PIN NO. 2” was correctly entered

## 14.6 Overview of functions

### 14.6.1 Automatic operating mode

| Display | Description |
|---|---|
| AUTOMATIC TEACH IN RUN | Automatic teach-in of the running time |
| AUTOMATIC OPENING PHASE | The door is driven to the OPEN end position |
| AUTOMATIC CLOSING PHASE | The door is driven to the CLOSED end position |
| AUTOMATIC STANDBY | The door stands between the end positions |
| AUTOMATIC STANDBY O | The door stands at the OPEN end position |
| AUTOMATIC STANDBY o | The door stands at the PART OPEN position (“before-end position“ top) |
| AUTOMATIC STANDBY U | The door stands at the CLOSED end position |
| AUTOMATIC STANDBY u | The door stands at the PART CLOSED position (“before-end position“ bottom) |
| AUTOMATIC STANDBY r | The door is in the PART OPEN position (“before end position” OPEN). |

**If the “SELF LOCK“ parameter is set to MOD2, 3, 4, 5 or MOD6 in the input menu, the display changes from AUTOMATIC to MANUAL.**

| | |
|---|---|
| MANUAL MAIN UP | The door is driven to the OPEN end position |
| MANUAL MAIN DOWN | The door is driven to the CLOSED end position |
| MANUAL STANDBY | The door stands between the end positions |

### 14.6.2 Input operating mode

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| ENGLISH | Select the menu language<br>Only possible using the LCD display:<br>Alternatively, the menu language can also be selected during the initialisation phase (during initial operation or after a reset). The menu language preset in the factory (ENGLISH) is then displayed as a flashing text for approximately 10 seconds. At this point, the menu language can still be changed during the initialisation procedure. Pressing buttons [+] or [-] will allow you to scroll through and select a language. Save the language you have selected by pressing button [P]. After this, all texts or messages displayed are shown in the language that you have selected. | DEUTSCH<br>ENGLISH<br>FRANCAIS<br>NEDERLANDS<br>DANSK<br>ESPANOL<br>POLSKI<br>CESKY<br>ITALIANO<br>SUOMI<br>SVENSKA<br>TÜRKÇE<br>NORSK<br>MAGYARUL | ENGLISH |
| FINE-UP | Fine adjustment of OPEN end position to the programmed OPEN end position. Only visible in systems with electronic limit switch. | -250 – 250 | 0 |
| FINE-DOWN | Fine adjustment of CLOSED end position to the programmed CLOSED end position.<br>Only visible in systems with electronic limit switch. | -250 – 250 | 0 |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| BES-OPEN | Setting the before-end position switch point for the OPEN direction (referred to the programmed OPEN end position).<br>Only visible in systems with electronic limit switch.<br>Automatic teach-in of position:<br>➔ "14.6.5 Setting the electronic intermediate end position using the LCD display" | A - teach-in<br>0 = ES-CLOSE – ES-OPEN | A - teach-in |
| BES-CLOSE | Setting the before-end position switch point for the CLOSED end position to the programmed CLOSED end position.<br>Only visible in systems with electronic limit switch.<br>Automatic teach-in of position:<br>➔ "14.6.5 Setting the electronic intermediate end position using the LCD display" | A - teach-in<br>0 = ES-CLOSE – ES-OPEN | A - teach-in |
| OPEN TIME | After the door has opened, the door will attempt to close, when OPEN TIME has empired.<br>Notice:<br>By pressing the CLOSE-SWITCH during the open time, the closing run is started.<br>By pressing the OPEN-SWITCH or STOP button during the open time, the opening time is restarted.<br>If an automatic closing run is interrupted by the closing edge contacts (SCS) the open time is doubled, and after 3 attempts, automatic closing (AC) is aborted. | 0 - 3600 seconds<br>0 = AC off | 0 = AC off |
| START WARN. | The start warning is carried out before each run. | 0 - 10 seconds<br>0 = off | 0 |
| FOREWARNING | The forewarning is activated before carrying out an automatic closing run or closing in impulse mode.<br>Notice: This time is added to the start warning. | 0 - 120 seconds | 0 = Off |
| AUT. CLOSE | MOD 1 : AUT.CLOSE from UPPER end position<br>MOD 2 : AUT.CLOSE from SECT. SWITCH<br>MOD 3 : AUT.CLOSE from UPPER end position and part open (SECT. SWITCH)<br>MOD 4 : AUT.CLOSE from all door positions | MOD1<br>MOD2<br>MOD3<br>MOD4 | MOD1 |
| FAST CL. | MOD1 : The open time proceeds as usual.<br>MOD2 : The open time is cut short after the photocell has been passed (door closes immediately).<br>MOD3 : The open time is aborted after the photocell is interrupted for a minimum period (2 sec.) (suppression through persons). | MOD1<br>MOD2<br>MOD3 | MOD1 |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| RELAY 1 | A relay mode from 1 - 13, 17 - 38 and 60 - 62 can be assigned to all four relays.<br>Relay 4 can also be programmed with MOD14 - 16.<br>MOD1 : (Red light 1) flashes during forewarning and is ON during door run*<br>MOD2 : (Red light 2) flashes during forewarning and during door run*<br>MOD3 : (Red light 3) is ON during forewarning and during door run*<br>MOD4 : Impulse signal when there is an UP command<br>MOD5 : Error message | MOD1 - MOD13<br>MOD17 - MOD38<br>MOD60 - MOD62 | MOD6 |
| RELAY 2 | MOD6 : OPEN end position<br>MOD7 : CLOSED end position<br>MOD8 : OPEN end position negated<br>MOD9 : CLOSED end position negated<br>MOD10 : Before-end position OPEN<br>MOD11 : Before-end position CLOSED<br>MOD12 : Before-end position CLOSED to CLOSED end position<br>MOD13 : Magnetic lock function | MOD1 - MOD13<br>MOD17 - MOD38<br>MOD60 - MOD62 | MOD7 |
| RELAY 3 | MOD14 : Brake<br>MOD15 : Brake negated<br>MOD16 : Brake also remains ON during open time<br>MOD17 : SCS activated or test error<br>MOD18 : (Red light 4) flashes during forewarning and is OFF during door run<br>MOD19 : Before-end position OPEN to OPEN end position<br>MOD20 : Activation of infrared transmission system | MOD1 - MOD13<br>MOD17 - MOD38<br>MOD60 - MOD62 | MOD7 |
| RELAY 4 | MOD21 : Test of draw-in protection before opening run (additional module required)<br>MOD22 : Activation of radio transmission systems 1 and 3 and/or light curtain testing<br>MOD23 : (green traffic light inside) is ON during OPEN end position, OFF during forewarning and OFF during door run*<br>MOD24 : Capacitor circuit for 230V 1 phase operators<br>MOD25 : Yard light function 2 minutes after OPEN command (including indirectly through impulse)<br>MOD26 : Activation of radio transmission system<br>MOD27 : Impulse when OPEN end position is reached<br>MOD28 : Relay OFF<br>MOD29 : door moves to OPEN<br>MOD30 : Door CLOSES<br>MOD31 : Service, continuous signal once the preset maintenance interval is reached<br>MOD32 : Battery operation<br>MOD33 : Battery operation not possible<br>MOD34 : Fire alarm system signal (BMA signal) | MOD1 - MOD38<br>MOD60 - MOD62 | MOD14 |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| | MOD35 : Photocell activated<br>MOD36 : Wicket door locking cylinder<br>MOD37 : Testing of stop signal through radio transmission systems 1 and 3<br>MOD38 : Testing of light curtain 2 (input 2)<br>MOD60 : Red traffic light outside 1 (forewarning - flashing, door travel - on)<br>MOD61 : Red traffic light outside 2 (forewarning - flashing, door travel - flashing)<br>MOD62 : Green light outside (ON during OPEN end position, OFF during forewarning, and OFF during door run)<br>* If two-way traffic control is activated: traffic light inside | | |
| TL REST | Switches traffic lights<br>MOD1 : In standby mode: OFF<br>MOD2 : In standby mode: ON<br>MOD3 : In standby if OFF for 5 minutes | MOD1 - MOD3 | MOD1 |
| SKS | MOD1 : OSE<br>MOD2 : 8K2<br>MOD3 : SCS as NC with testing<br>MOD4 : OSE switching strips as a light curtain (without switching off automatic closing)<br>MOD5 : 8K2 as a light curtain (without switching off automatic closing) | A - self teach-in<br>MOD1 – MOD5 | A - self teach-in |
| DW TEST | Activation and deactivation of testing function for the pneumatic safety edge.<br>Only visible if parameter setting SCS = MOD3.<br>MOD1 : Test OFF<br>MOD2 : Test ON | MOD1 - MOD2 | MOD2 |
| DW-POINT | Point at which the pneumatic safety edge is tested (X4 / 5+6).<br>Only indicated if parameter setting SKS = MOD3.<br>Setting is done in increments (only AWG), starting from the lower travel cut-out point.<br>In systems with mechanical limit switches, the BES-CLOSE before-end closed position serves as the DW-POINT. | 0 – 1000 | 20 |
| SKS FUNC | MOD1 : Stop + reverse<br>MOD2 : Stop + 2-second reversing movement | MOD1 - MOD2 | MOD1 |
| SKS REV | MOD1 : Stop + reverse between upper end position (EO) and RP, stop between reverse point (RP) and lower end position (EU)<br>MOD2 : Stop + reverse between upper end position (EO) and RP, no action between reverse point (RP) and lower end position (EU)<br>MOD3 : Stop + reverse between upper end position (EO) and lower end position (EU)<br>Notice:<br>In systems with mechanical limit switches the before-end position CLOSED serves as the reverse point (RP). | MOD1 - MOD3 | MOD1 |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| REVERSPOINT | Reverse point (RP) before the CLOSED end position is reached.<br>Only visible in systems with electronic limit switch. | A - self teach-in<br>ES-CLOSE +<br>0 – 1000 | ES-CLOSE +<br>50 |
| LIGHT BARR. | MOD1 : 2-wire<br>MOD2 : NC contact / NPN<br>MOD3 : PNP | A - self teach-in<br>MOD1 – MOD3 | A - self teach-in |
| LB FUNC | CLOSING door movement / OPENING door movement<br>MOD1 : Stop + reverse / No action<br>MOD2 : Stop + reversing movement / No action<br>MOD3 : STOP / No action<br>MOD4 : STOP / STOP<br>MOD5 : Stop + reverse / Travel suppression | MOD1 – MOD5 | MOD1 |
| PEP POINT | The photocell is not evaluated between the ES-CLOSE and the PEB POINT. (Door frame function).<br>Only visible in systems with electronic limit switch. | A - self teach-in<br>ES-CLOSE +<br>0 – 1000 | A - self teach-in |
| IMPULS INPUT | MOD1 : OPEN – Stop – Close – Stop<br>MOD2 : OPEN only<br>MOD3 : OPEN only, Stop when door moving<br>MOD4 : OPEN only, inactive during door movement<br>MOD5 : CLOSE from upper end position (EO), otherwise OPEN | MOD1 - MOD5 | MOD1 |
| INPUT 1 | MOD1 : Sect. switch button<br>MOD2 : PART OPEN switch (SECT. SWITCH)<br>MOD3 : AUT.CLOSE switch<br>MOD4 : External CLOCK (permanently open)<br>MOD5 : Fire alarm (BMA) switch 3 (partial opening) NO<br>MOD6 : Fire alarm (BMA) switch 1 (emergency closing) NO<br>MOD7 : Fire alarm (BMA) switch 1 (emergency closing) NC<br>MOD8 : Fire alarm (BMA) switch 2 (emergency opening) NO<br>MOD9 : Fire alarm (BMA) switch 2 (emergency opening) NC<br>MOD10 : Ventilation button (partial opening) NO<br>MOD11 : Automatic closing button<br>MOD12 : Laser scanner (special solution)<br>MOD13 : Fire alarm (BMA) switch 3 (partial opening) NC<br>MOD30 : OPEN button inside<br>MOD31 : OPEN button outside<br>MOD32 : CLOSE button | MOD1 - MOD13<br>MOD30 - MOD32 | MOD1 |
| Input 2<br>(SKS2) | MOD1 : NOT active<br>MOD2 : Wicket door switch<br>8K2 Stop in case of deviation<br>MOD3 : Switching strip OPEN<br>8K2 Stop and reverse<br>MOD4 : Switching strip OPEN<br>8K2 Stop and reversing movement<br>MOD5 : Battery operation<br>MOD6 : Radar motion detectors (special solution)<br>MOD7 : Light curtain 2<br>8.2 kΩ stop and reverse / reversing movement | MOD1 - MOD7 | MOD1 |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| SKS3 | MOD 1 : Not in use<br>MOD 2 : SCS CLS.<br>MOD 3 : SCS OPEN<br>MOD 4 : Stop<br>Only to be used in conjunction with the wireless signal transmission plug-in circuit card in terminal X20. | MOD1 - MOD4 | MOD1 |
| SKS4 | MOD 1 : Not in use<br>MOD 2 : SCS CLS.<br>MOD 3 : SCS OPEN<br>MOD 4 : Stop<br>Only to be used in conjunction with the wireless signal transmission plug-in circuit card in terminal X20. | MOD1 - MOD4 | MOD1 |
| RUNNING TIME | Monitoring the maximum running time for an open and close movement.<br>After programming the limit switches, the teach-in of the system running time is carried out automatically. In the event of a 20% deviation (in both directions) anERROR RUNTIME appears.<br>After the automatic teach-in, the running time can be manually changed. | A = Automatic<br>1 - 300 seconds | A |
| REVERS. TIME | Standing time at every change of direction. The reversal time when the switching strip or the photocell is activated during the closing movement amounts to a third of the programmed time. | 100 - 2000 milliseconds | 300 milliseconds |
| LIMIT SW. | MOD1 : AWG<br>MOD2 : Mechanical limit switches<br>MOD3 : Not active<br>MOD4 : AWG with negative impulses<br>(only for frequency converter operation with anticlockwise rotating field) | | |
| SELF LOCK | MOD1 : Automatic operation<br>MOD2 : Manual operation for OPEN + CLOSE with CESD evaluation<br>MOD3 : Manual operation for CLOSE with SKS evaluation<br>MOD4 : Manual operation for OPEN with SKS evaluation<br>MOD5 : Manual operation for OPEN + CLOSE without SKS evaluation<br>MOD6 : Manual operation for CLOSE without SKS evaluation | MOD1 – MOD6 | MOD1 |
| POWER | Automatic power monitoring<br>(monitoring the rotational speed)<br>Error message is displayed if the door cannot move freely or is obstructed.<br>Setting the sensitivity for both directions of travel.<br>A reading giving the power value (rotational speed) is shown during opening and closing runs. If the power monitoring facility is activated, a value must be set that is lower than the lowest value displayed during door travel. The larger the difference, the less sensitively the power monitoring reacts.<br>The power monitoring facility is only activated if the value is set to > 0. | 0 – 9999 | 10 |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| BRAKE P OPEN* | Initiates the SLOW DOWN 1 delay time. Displayed in absolute value encoder (AWG) increments as a negative value referred to the upper cut-out point. Only applies for OPENING direction of door. | -999 – 0 | -250 |
| BRAKE P CL* | Initiates the SLOW DOWN 1 delay time. Displayed in absolute value encoder (AWG) increments as a positive value referred to the lower cut-out point. Only applies for CLOSING direction of door. | 0 – 999 | 250 |
| BRAKE P CL* | Initiates the SLOW DOWN 2 delay time. Displayed in absolute value encoder increments as a positive value referred to the lower cut-out point. If the end positions are changed again (e.g. fine tuning), PB2 (Brake point 2) will be deactivated (display A) and must be reprogrammed. Only applies for CLOSING direction of door. * Parameters appear only after the end positions have been programmed | 0 - ES-OPEN (0 = ES-CLOSE) | A |
| INVERTER | Frequency converter connected ON / OFF MOD1 : NO FU MOD2 : FU After a complete reset of the control unit (parameter RESET MOD4) this parameter must first of all be set to MOD2 again. | MOD1 – MOD2 | MOD1 |
| FRQ. OPEN 1 | Maximum speed of the door movement OPEN. | MOT.HZ MIN-MAX | 50 Hz |
| FRQ. CLOSE 1 | Maximum speed of the door movement CLOSE. | MOT.HZ MIN-MAX | 50 Hz |
| FRQ. CLOSE 2 | Maximum speed 2 of the door movement CLOSE (optional). Parameter appears only after BRAKE P CL2 has been programmed. | MOT.HZ MIN-MAX | 50 Hz |
| FRQ. OPEN 3 | Minimum speed of the door movement OPEN. | MOT.HZ MIN-50 Hz | 25 Hz |
| FRQ. CLOSE 3 | Minimum speed of the door movement CLOSE. | MOT.HZ MIN-50 Hz | 25 Hz |
| SPEED UP 1 | Acceleration time between starting command and Frequency OPEN/CLOSE 1. Applies for both door directions of travel. | 0.1 – 9.9 seconds | 2.0 seconds |
| SLOW DOWN 1 | Time delay between Brake point OPEN/CLOSE 1 and Frequency OPEN/CLOSE 3. Applies for both door directions of travel. | 0.1 – 9.9 seconds | 2.0 seconds |
| SPEED UP 2* | Acceleration time between starting command & Frequency OPEN 2. Only applies for CLOSING direction of door. | 0.1 – 5 seconds | 2.0 seconds |
| SLOW DOWN 2* | Time delay between Brake point CLOSED 2 & Frequency CLOSE 1. Only applies for CLOSING direction of door. * Parameters appear only after Brake point CLOSED has been programmed | 0.1 – 5 seconds | 2.0 seconds |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| SPEED UP 3 | Acceleration time after reversal of direction up to Frequency OPEN/CLOSE 1.<br>Applies for both door directions of travel and triggering of the SKS. | 0.1 – 1 seconds | 0.5 seconds |
| SLOW DOWN 3 | Delay time between triggering the closing edge safety device (SKS) and stopping the system.<br>Applies for both door directions of travel and triggering of the SKS. | 0.1 – 1 seconds | 0.1 seconds |
| SPEED UP 4 | Acceleration time after reversal of direction until Frequency OPEN/CLOSE 1.<br>Applies for both door directions of travel and triggering of the photocell. | 0.1 – 5 seconds | 0.5 seconds |
| SLOW DOWN 4 | Delay time between triggering the closing edge safety device (SKS) and stopping the system.<br>Applies for both door directions of travel and triggering of the photocell. | 0.1 – 5 seconds | 0.5 seconds |
| SLOW DOWN 5 | Delay time between the stop command and stopping the system.<br>Applies for both door directions of travel. | 0,0 – 5 seconds | 0.5 seconds |
| RES.UMRICHT. | Resets all parameters of the frequency converter to factory settings. | ON<br>OFF | OFF |
| MOTOR V | Rated voltage of motor. | 100 – 500 V | 230 V |
| MOTOR I | Rated current of motor. | 1 – 9.9 A | 5.1 A |
| MOTOR P | Rated power of motor. | 100 – 5000 W | 550 W |
| MOTOR PHI | Cosine phi of motor. | 0 – 1 | 0,69 |
| MOTOR HZ | Rated frequency of motor. | 10 – 100 Hz | 50 Hz |
| MOT.HZ MIN | Minimum travel frequency value to which the motor can be set. | 10 – 50 Hz | 10 Hz |
| MOT.HZ MAX | Maximum travel frequency value to which the motor can be set. | 50 – 100 Hz | 87 Hz |
| MOTOR RPM | Rated speed of motor. | 100 – 5000 | 1370 |
| BRAKE DELAY | Delays the release of the brake following a starting command.<br>This prevents the door from dropping too far when it starts moving from an intermediate position. | 0 - 500 ms | 50 ms |
| SERVICE | OFF: Maintenance indicator not activated<br>Setting a maintenance interval. After the preset door cycle has expired, a maintenance message (LED / LCD) is given. If a relay output is programmed to MOD31, the relay concerned is triggered (continuous signal).<br>Only visible after input level 2 is activated with the parameter PIN NO. 2. | OFF<br>0 – 9999 | OFF |
| RESET MSBUS | All MSBUS addresses assigned will be reset.<br>After restarting the control, all MSBUS devices connected will be re-addressed.<br>Refer to the instruction manual for the MSBUS device for detailed information. | ON<br>OFF | OFF |
| RESTART | Control is restarted if function is activated. | ON<br>OFF | OFF |

| Function | Description | Setting options | Factory setting |
|---|---|---|---|
| RESET | Resets all parameters of the control to the factory settings.<br>MOD 1 = No RESET<br>MOD 2 = Partial reset 1 (without FU parameters)<br>MOD 3 = Partial reset 2 (everything except end positions / recognised limit switch system)<br>MOD 4 = Total reset 2 (everything returned to factory default setting) | MOD1 – MOD4 | MOD1 |
| FACTORY SET. | Resets all parameters of the control to the factory settings.<br>MOD 7 MFZ S = Operator of STAW with increased duty Cycle<br>MOD 8 MFZ FU = Operator of the MTZ 05 range<br>MOD 9 MFZ FU = Operator of the STA range<br>MOD 99 MFZ S = Standard<br>MOD 10 - MOD 98 Customer-specific parameter sets. | MOD7 – MOD9<br>MOD10 – MOD98<br>MOD99 | MOD9 |
| PIN NO. 2 | Input and selection of a PIN code for programming a maintenance interval.<br>After entering the PIN code, the second programming level is opened.<br>A maintenance interval can now be input at the parameter SERVICE. Input level 2 goes off again after the power has been switched off, or goes off automatically after 10 minutes. The PIN code can only be changed at the second programming level. | 0 – 9999 | 1111 |

**Overview of functions**

**Explanation of the relay modes:**

**A. Traffic light functions**

| MOD | Description | CLOSED end position | OPEN end position | Forewarning | Door run |
|---|---|---|---|---|---|
| MOD 1 | Red traffic light 1 [3] | ON / OFF [1] | OFF [2] | Flashing | ON |
| MOD 2 | Red traffic light 2 [3] | ON / OFF [1] | OFF [2] | Flashing | Flashing |
| MOD 3 | Red traffic light 3 [3] | ON / OFF [1] | OFF [2] | ON | ON |
| MOD 18 | Red traffic light 4 [3] | OFF | OFF | Flashing | OFF |
| MOD 23 | Green traffic light [3] | OFF | ON [2] | OFF | OFF |
| MOD 60 | Red traffic light 1 [4] | ON / OFF [1] | OFF [2] | Flashing | ON |
| MOD 61 | Red traffic light 2 [4] | ON / OFF [1] | OFF [2] | Flashing | Flashing |
| MOD 62 | Green traffic light [4] | OFF | ON [2] | OFF | OFF |

[1] Depending upon parameter T-LI. REST

[2] If two-way traffic control is activated: dependent on inside or outside OPEN command

[3] If two-way traffic control is activated: traffic light inside

[4] If two-way traffic control is activated: traffic light outside

## B. Position messages

| MOD | Description | Remarks |
|---|---|---|
| MOD 6 | OPEN end position | The relay closes the contact when the door is in the OPEN end position. |
| MOD 7 | CLOSED end position | The relay closes the contact when the door is in the CLOSED end position. |
| MOD 8 | Not OPEN end position | The relay closes the contact when the door is not in the OPEN end position. |
| MOD 9 | Not CLOSED end position | The relay closes the contact when the door is not in the CLOSED end position. |
| MOD 10 OPEN | Before-end position OPEN / PART before-end position | The relay closes the contact when the door is in the OPEN / part OPEN. |
| MOD 11 | Before-end position CLOSED before-end position CLOSED. | The relay closes the contact when the door is in the |
| MOD 12 | Before-end position CLOSED to CLOSED end position | The relay closes the contact when the door is in the area between the end position CLOSED and the before-end position CLOSED. |
| MOD 19 | Before-end position OPEN to OPEN end position | The relay closes the contact when the door is in the area between the OPEN end position and the before-end position OPEN. |

## C. Impulse signals

| MOD | Description | Remarks |
|---|---|---|
| MOD 4 | Impulse when there is an OPEN command<br>used to control lights, for instance. | The relay closes the contact for 1 second when the door receives an OPEN command. This impulse can be |
| MOD 27 | Impulse when OPEN end position is reached | The relay closes the contact for 2 seconds when the door reaches the OPEN end position.<br>This impulse can be used, for instance, to open a following photocell. |

### D. Brake functions (only adjustable on relay 4)

| MOD | Description | Remarks |
|---|---|---|
| MOD 14 | Brake | The switching contact of the brake rectifiers is activated via the relay to achieve a quicker brake function. The contact is closed, and the brake released as a result, as soon as the door moves (zero current brake). |
| MOD 15 | Brake negated | The switching contact of the brake rectifiers is activated via the relay to achieve a quicker brake function. The contact is opened, and the brake released as a result, as soon as the door moves (operating current brake). |
| MOD 16 | Brake remains ON during open time | The switching contact of the brake rectifiers is activated via the relay to achieve a quicker brake function. The contact is closed, and the brake released as a result, as soon as the door moves (zero current brake). To obtain a smoother stop by the door in the upper end position, the switching contact remains in the OPEN end position (OPEN TIME). |

### E. Error messages

| MOD | Description | Remarks |
|---|---|---|
| MOD 5 | Error message | The relay opens the contact when a stop command is given or an error occurs.<br>All errors described in Section 10 result in activation of the relay. |
| MOD 17 | SEP activated | The relay opens the contact when the switching strip is activated. An error in switching strip or an unsuccessful test is shown via MOD 5. |
| MOD35 | Photocell | As with photocell light barrier input X4 (3/4), the signal received is passed on in the form of a message.<br>Relay ON : Photocell signal is OK<br>Relay OFF : Light beam interrupted or fault in photocell |

### F. Movement signal

| MOD | Description | Remarks |
|---|---|---|
| MOD 29 | Door OPENS | Active during movement |
| MOD 30 | Door CLOSES | Active during movement |

## G. Functions for external accessories

| MOD | Description | Remarks |
|---|---|---|
| MOD13 | Magnetic lock function | The relay closes before every door movement. When the door is stationary, the relay is open.<br>A delay of 0.5 seconds is programmed to elapse before each door movement. |
| MOD20 | Activation of infrared transmission system | Before every CLOSE command, the infrared transmission system is activated and remains active for the duration of the closing run.<br>This activation results in a closing run delay of approx. 0.5 seconds. |
| MOD21 | Test of draw-in protection | The relay generates a test signal when the CLOSED end position is reached and expects, as a reaction to the test signal, that the stop circuit is activated. |
| MOD22 | Activation of radio 1 transmission system,<br>Testing light curtain 1 (8.2 kΩ or optosensor) | The relay generates a test signal when the OPEN end position is reached and expects, as a reaction to the test signal, that the switching strip input circuit is activated. |
| MOD 24 | Capacitor | At every operator command the relay closes for approx. 1 second. With the aid of this relay, an additional starting capacitor that is required for AC applications is switched on in addition, to ensure safe starting of the motor. |
| MOD 25 | Yard light function | At every OPEN command, the relay is closed for 2 minutes and can therefore be used to control a light. |
| MOD 26 | Activation of radio 2 transmission system | Before every CLOSE command the radio transmission system is activated by an impulse. The duration of the activation must be set on the transmission system. This activation results in a closing run delay of approx. 0.5 seconds. |
| MOD 28 | Relay OFF | The relay is always open. |
| MOD36 | Pneumatic cylinder for locking wicket door<br>(thresholdless door system). | Every time an OPEN command is given, the relay is activated and controls a pneumatic cylinder which mechanically locks the wicket door that is incorporated in the door. The locking position of the cylinder is queried through a limit switch. The door only starts moving after this limit switch has been released. The relay remains activated until the lower end position has been reached again. |
| MOD37 | Testing the stop signal through radio transmission systems 1 and 3 | The relay generates a test signal when the OPEN end position is reached and expects, as a reaction to the test signal, that the stop circuit is interrupted. |
| MOD38 | Testing light curtain 2 (8.2 kΩ)<br>Connection to input 2 (X4/11+12) | The relay generates a test signal when the OPEN end position is reached and expects, as a reaction to the test signal, that there is an interruption to input 2. |

### H. Input-dependent messages

| MOD | Description | Remarks |
|---|---|---|
| MOD 32 | Battery mode | Active during battery operation. Input 2 bridged (setting MOD5). |
| MOD 33 | Not in battery mode | Active during mains operation. Input 2 open (setting MOD5)<br>When programmed with MOD32/33, the relays work as delayed change-over contacts and follow the signal at input 2 if set to MOD5.<br>In this case, input 2 is supplied with a control signal from the uninterruptable power supply (UPS) system which is responsible for switching between mains power and the UPS power supply. |
| MOD 34 | BMA signal | Triggered if BMA (fire alarm system) active.<br>Follows the signal at input 1 if set to MOD5-9 / 13.<br>In this case, input 1 is supplied with a control signal from the fire alarm system, and depending on the setting, opens or closes the door to an end position or an intermediate position |

### Key to inputs:
### A. Input 1 functions

| MOD | Description | Remarks |
|---|---|---|
| MOD 1 | PART OPEN button | When the button is pressed (input 1), the door opens as far as the PART OPEN intermediate position. |
| MOD 2 | PART OPEN switch | Closed : All OPEN commands lead to the PART OPEN position.<br>Open : All OPEN commands lead to the OPEN position. |
| MOD 3 | AUTO CLOSE switch | Closed : No automatic CLOSING runs (open time continues)<br>Open : Automatic CLOSING run is activated (only if open time > 0) |
| MOD 4 | External CLOCK (permanently open) | The door opens once the contact closes and remains in the OPEN position (open time continues) until the contact opens. The door then closes automatically (only if open time > 0). This function can be aborted by pressing the CLOSE button. The door CLOSES. |
| MOD5 | Fire alarm (BMA) switch 3 (partial opening) NO | Open : Normal operation<br>Closed : Partial opening of the door. The BES-OPEN position is approached from both directions, irrespective of the current door position.<br>BUTTON : No function<br>PHOTOCELL / SKS : Door stops and briefly reverses (only in CLOSING direction), and closes again after 5 seconds<br>STOP : Emergency closing interrupted as long as this is activated |

| MOD | Description | Remarks |
|---|---|---|
| MOD6 | Fire alarm (BMA) switch 1<br>(emergency closing) NO | Open : Normal operation<br>Closed : Emergency closing of door<br>BUTTON : No function<br>PHOTOCELL / SKS : Door stops and briefly reverses; emergency closing again after 5 seconds<br>STOP : closing interrupted as long as this is activated |
| MOD7 | Fire alarm (BMA) switch 1<br>(emergency closing) NC | Closed : Normal operation<br>Open : Emergency closing of door<br>BUTTON : No function<br>PHOTOCELL / SKS : Door stops and briefly reverses; emergency closing again after 5 seconds<br>STOP : Emergency closing interrupted as long as this is activated |
| MOD8 | Fire alarm (BMA) switch 2<br>(emergency opening) NO | Open : Normal operation<br>Closed : Emergency opening of door<br>BUTTON : No function<br>PHOTOCELL / SKS : No function<br>STOP : Emergency closing interrupted as long as this is activated.<br>No automatic closing after deactivation through fire alarm system (BMA). |
| MOD9 | Fire alarm (BMA) switch 2<br>(emergency opening) NC | Closed : Normal operation<br>Open : Emergency opening of door<br>BUTTON : No function<br>PHOTOCELL / SKS : No function<br>STOP : Emergency closing interrupted as long as this is activated.<br>No automatic closing after deactivation through fire alarm system (BMA). |
| MOD10 | Ventilation button NO | Open : Normal operation<br>Closed : Partial opening of the door.<br>The BES-CLOSE position is approached from both directions, irrespective of the current door position. |
| MOD11 | Automatic closing button | 1st activation : No automatic CLOSING run (open time continues)<br>2nd activation : Automatic CLOSING run is activated (only if open time > 0)<br>3rd activation : No automatic CLOSING run (open time continues)<br>... |

| MOD | Description | Remarks |
|---|---|---|
| MOD12 | Laser scanner (special solution) | in conjunction with input 2 (MOD6). See key to input 2. |
| MOD13 | Fire alarm (BMA) switch 3 (partial opening) NC | Open : Normal operation<br>Closed : Partial opening of the door. The BES-OPEN position is approached from both directions, irrespective of the current door position.<br>BUTTON : No function<br>PHOTOCELL / SKS : Door stops and briefly reverses (only in CLOSING direction), and closes again after 5 seconds<br>STOP : Emergency closing interrupted as long as this is activated. |
| MOD 30 | OPEN button inside | When the button is pressed, the door opens as far as the OPEN end position.<br>The traffic light inside changes to green. |
| MOD 31 | OPEN button outside | When the button is pressed, the door opens as far as the OPEN end position.<br>The traffic light inside changes to green. |
| MOD 32 | CLOSE button | When the button is pressed, the door opens as far as the CLOSED end position. |

**B. Functions of input 2**

| MOD | Description | Remarks |
|---|---|---|
| MOD1 | | Not active |
| MOD2 | Wicket door switch (8,2 kΩ) | Stop in case of deviation |
| MOD3 | OPEN switching strip (8,2 kΩ) | Stop + reverse |
| MOD4 | OPEN switching strip (8,2 kΩ) | Stop + brief reverse |
| MOD5 | Battery operation (MDFU special solution) NO | Active if power supplied by battery.<br>Relay switchover MOD 32 / MOD 33. |
| MOD6 | Radar movement (special solution) NO | OPEN commands from input 2 lead to the OPEN end position if input 1 (MOD 12) is ON.<br>OPEN commands from input 2 lead to the OPEN end position if input 1 (MOD 12) is OFF.<br>All OPEN commands from X3, X7, X13 and X9 always lead to the OPEN end position.<br>Input 1 is of no significance here. |
| MOD7 | Light curtain 2 (8.2 kΩ) | Acts in same way as light curtain 1 (SKS MOD4): Stop + reverse Type of reversing (reverse / reversing movement) is also adopted. |

### 14.6.3 Diagnosis / error memory operating mode

| Display | Meaning | Status |
|---|---|---|
| UPPER SWITCH | UPPER end position | OFF : End position reached<br>ON : End position not reached |
| LOWER SWITCH | LOWER end position | OFF : End position reached<br>ON : End position not reached |
| UP-SWITCH | Command button / OPEN input | ON : Button activated / input active<br>OFF : Button not activated / input not active |
| DOWN-SWITCH | Command button / CLOSE input | ON : Button activated / input active<br>OFF : Button not activated / input not active |
| INPUT 1 | INPUT 1 (X4 / 9 + 10) | ON : Input 1 active<br>OFF : Input 1 not active |
| INPUT 2 | INPUT 2 (X4 / 11 + 12) | ON : Input 2 active<br>OFF : Input 2 not active<br>Display ON / OFF only if set to MOD5 / MOD6. |
| SKS | Closing edge safety device 1<br>(PS switch (DW), 8.2kΩ or optosensor)<br>(X4 / 5-8) CLOSING direction | ON : System closed<br>OFF : System interrupted (fault) |
| SKS 2 | Closing edge safety device 2 (8.2 kΩ)<br>Connection to INPUT 2<br>(X4 / 11+12) OPEN direction | ON : System closed<br>OFF : System interrupted (fault)<br>Display ON / OFF only if set to MOD3 / MOD4. |
| STOP 2 | Safety circuit 2<br>Wicket door switch (8.2 kΩ)<br>Connection to INPUT 2 (X4 / 11+12) | ON : Safety circuit closed<br>OFF : Safety circuit interrupted (fault)<br>Display ON / OFF only if set to MOD2 in INPUT parameter INPUT 2. |
| SKS 3 | Closing edge safety device 3<br>(8.2 kΩ or optosensor)<br>Radio transmission system channel 1<br>OPENING or CLOSING direction | ON : System closed<br>OFF : System interrupted (fault)<br>Display ON / OFF only if set to MOD2 / MOD3 in INPUT parameter SKS 3. |
| STOP 3 | Safety circuit 3<br>Radio transmission system channel 1 | ON : Safety circuit closed<br>OFF : Safety circuit interrupted (fault)<br>Display ON / OFF only if set to MOD4 in INPUT parameter SKS 3. |
| SKS 4 | Closing edge safety device 4<br>(8.2 kΩ or optosensor)<br>Radio transmission system channel 2<br>OPENING or CLOSING direction | ON : System closed<br>OFF : System interrupted (fault)<br>Display ON / OFF only if set to MOD2 / MOD3 in INPUT parameter SKS 4. |
| STOP 4 | Safety circuit 4<br>Radio transmission system channel 2 | ON : Safety circuit closed<br>OFF : Safety circuit interrupted (fault)<br>Display ON / OFF only if set to MOD4 in INPUT parameter SKS 4. |
| IMPULS INPUT | Command button / IMPULSE input | ON : Button activated / input active<br>OFF : Button not activated / input not active |
| SWITCH CLOCK | Weekly timer (pluggable) | ON : Timer activated<br>OFF : Timer not activated |

| Display | Meaning | Status |
|---|---|---|
| LIGHT BARR. | Photocell | ON : Photocell signal OK<br>OFF : Light beam interrupted or fault in photocell |
| SAFETY CIRC. | Safety circuit 1<br>Emergency stop systems of door system | ON : Safety circuit closed<br>OFF : Safety circuit interrupted |
| STOP | STOP command button<br>(keypad on cover) | ON : Button not activated<br>OFF : Button activated |
| ROT FIELD | Shows currently set rotational direction of operator. | RIGHT : Setting for clockwise rotating field<br>LEFT : Setting for anticlockwise rotating field |
| CYCLE | Door cycle counter<br>(1 x OPEN + 1 x CLOSE = 1 cycle)<br>Counts only if the limits are reached. | Displays number of door cycles run up so far |
| SERVICE | Service alarm function<br>Set via INPUT parameter SERVICE and PIN NO. 2 | OFF : Maintenance indicator not activated<br>0 - 9999 : Maintenance indicator activated<br>Displays the number of door cycles left until a maintenance message is sent |
| AWG | Shows position of absolute value encoder | Displays the current transmitted value. |
| ERROR …<br>COUNT<br>CYCLE | Error messages from the control unit can be read out here with information on the frequency and cycle.<br>The list of error messages can be scrolled through using buttons [+] and [–] on the LCD display.<br>➔“14.7.1 Error message shown on LCD display”<br>Deleting the error log:<br>Press buttons [+] and [-] at the same time for approx. 2 seconds.<br>Every error message must be individually deleted. | Display changes at 2-second intervals between<br>– error designation,<br>– frequency of occurrence, and<br>– indication of cycle in which error last occurred.<br>If the quantity given under ”Count“ is 0, this means that this particular fault has never occurred before. |

## 14.7 Error messages and rectification

### 14.7.1 Error message shown on LCD display

| Fault / error message | Cause | Rectification |
|---|---|---|
| System does not respond. | – No voltage supply. | – Check the voltage supply of the operator and the controls. |
| Door travels to the CLOSED clockwise rotating field end position when the OPEN button is pressed door travels to the OPEN end position when the CLOSE button is pressed. | – Rotating field is connected wrongly. | – Check the rotating field and establish if necessary. |

| Fault / error message | Cause | Rectification |
|---|---|---|
| FAULT – X | – Internal software or hardware fault. | – Restart control.<br>– Resetting the controls, if necessary. |
| SAFETY CIRC. | – The safety circuit is interrupted.<br>X3 / 1+2 Safety circuit for control of emergency OFF, slack rope switch, draw-in protection<br>X6 / 1+2 Internal ON / OFF switch<br>X11 / 4+8 Safety circuit for operator<br>X2 / B1+B2 Jumper<br>X3 / 3+4 External stop button<br>X7 / 1+2 Internal stop button | – Check safety circuit, localise interruption and rectify problem. |
| ERROR INVERTER | – A problem has arisen in the frequency converter connected. | – Identify cause.<br>– Acknowledge with STOP.<br>– Turn power on and off. |
| ERROR RUNTIME | – The programmed running time has been exceeded. | – Check the path of the door and the running time.<br>– Re-programme the running time, if necessary. |
| ERROR AWG | – Communication between absolute value encoder and control is interrupted and/or has broken down. | – Check the cable and socket connections and replace, if necessary. |
| TERM SWITCH FAIL | – The door has travelled beyond the programmed end position area. | – Move the door back into the programmed area using the emergency operation facility. |
| | – The end positions have not yet been programmed. | – Program the end positions first. |
| ERROR REVOLUTION | – The power monitoring has been triggered. | – Check the door for any mechanical impairment or damage. |
| ERROR DIRECTION | – The rotating field present is not a clockwise rotating field. | – Check the rotating field and change the direction, if necessary.<br>➔ “6.1 Checking the direction of rotation / direction of travel“ |
| ERROR POSITION | – The rotational speed of the absolute value encoder (AWG) deviates from the taught-in rated speed. | – Disconnect from the power supply and inspect the control shaft of the AWG. |
| ERROR SKS CLS. | – Closing edge safety device 1 is faulty in the CLOSING direction –> (X4 / 5-8). | – Check the closing edge safety device and the spiral cable. |
| ERROR SKS OPEN 2 | – Closing edge safety device 2 is faulty in the OPENING direction –> (X4 / 11+12) input 2 | – Check the closing edge safety device and the spiral cable. |
| ERROR STOP 2 | – Safety circuit 2 is interrupted. wicket door switch 8.2 kΩ –> (X4 / 11+12) input 2 | – Check wicket door switch. |
| ERROR SKS CLS. 3 | – Closing edge safety device 3 is faulty in the CLOSING direction –> RADIO transmission system | – Check closing edge safety device.<br>– Test the RADIO transmission system. |

| Fault / error message | Cause | Rectification |
|---|---|---|
| ERROR SKS OPEN 3 | – Closing edge safety device 3 is faulty in the OPENING direction –> RADIO transmission system | – Check closing edge safety device.<br>– Test the RADIO transmission system. |
| ERROR STOP 3 | – Safety circuit 3 is interrupted. –> RADIO transmission system | – Test the safety circuit.<br>– Test the RADIO transmission system. |
| ERROR SKS CLS. 4 | – Closing edge safety device 4 is faulty in the CLOSING direction –> RADIO transmission system | – Check closing edge safety device.<br>– Test the RADIO transmission system. |
| ERROR SKS OPEN 4 | – Closing edge safety device 4 is faulty in the OPENING direction –> RADIO transmission system | – Check closing edge safety device.<br>– Test the RADIO transmission system. |
| ERROR STOP 4 | – Safety circuit 4 is interrupted. –> RADIO transmission system | – Test the safety circuit.<br>– Test the RADIO transmission system. |
| ERROR SKS TEST | – Testing of attached DW airwave bar unsuccessful.<br>– Testing of RADIO 1 or RADIO 2 transmission system failed. | – Check the pneumatic safety edge, spiral cable and rubber profile.<br>– Test the RADIO transmission system.<br>– Check whether the right relay MOD was selected for the transmission system.<br>➔“G. Functions for external accessories“ |
| ERROR LIGHT BAR | – The photocell attached shows a permanent fault. | – Check photocell (function & alignment).<br>– Check cabling. |
| ERROR LB TEST | – Testing of two-wire photocell failed. | – Check photocell (function & alignment).<br>– Check cabling. |
| ERROR STOP TEST | – Testing of wicket door switch (8.2 kΩ) failed. –> Input 2 | – Check wicket door switch. |
| ERROR TRAPIN | – Draw-in protection testing (additional module) failed. –> Relay MOD21 | – Check photocell (function & alignment).<br>– Check cabling. |
| ERROR CYLINDER | – The monitoring limit switch for the lock system for threshold-less wicket doors has failed to trigger within 10 seconds of entering an OPEN command. | – Check limit switch for the cylinder. |
| ERROR MSBUS | – Communication between the control & the MS BUS module attached is interrupted. | – Check the cable and socket connections and replace, if necessary. |

**After rectifying the cause of the error, the power supply to the control must be turned off once and/or the control restarted (> INPUT menu > parameter RESTART > ON) in the event of the following errors**

– ERROR DIRECTION
– ERROR RUNTIME
– TERM SWITCH FAIL

### 14.7.2 Error message through LED indicator

**LED H4 (Green, main circuit board or CSI button unit)**

| Fault / error message | LED Display | Remarks |
|---|---|---|
| No operating voltage | Off | No voltage supply |

**LED H6 (Red, main circuit board or CSI button unit)**

| Fault / error message | LED Display | Remarks |
|---|---|---|
| SAFETY CIRC. | Flashes 1x | Safety circuit is interrupted.<br>– Check safety circuit, localise interruption and rectify problem. |
| ERROR AWG | Flashes 2x | Signal transmission between absolute value encoder and control interrupted and/or broken down.<br>– Check the cable and socket connections and replace, if necessary. |
| TERM SWITCH FAIL | Flashes 3x | The door has travelled beyond the programmed end position area or the end positions have not yet been programmed.<br>– Program the end positions first.<br>– Move the door back into the programmed area using the emergency operation facility. |
| ERROR DIRECTION | Flashes 4x | The rotating field present is not a clockwise rotating field.<br>– Check the rotating field and change the direction, if necessary.<br>➔“14.6.1 Checking the direction of rotation / direction of travel“ |
| ERROR REVOLUTION | Flashes 5x | The power monitoring has been triggered.<br>– Check that the door for any mechanical damage. |
| ERROR RUNTIME | Flashes 6x | The programmed running time has been exceeded.<br>– Check the path of the door and the running time.<br>– Re-programme the running time, if necessary. |
| ERROR INVERTER | Flashes 7x | A problem has arisen in the frequency converter connected.<br>– Identify cause, and acknowledge with STOP.<br>– Turn power supply on and off. |
| ERROR MSBUS | Flashes 9x | Communication error between the control and the MS BUS end device connected.<br>– Check the cable and socket connections and replace, if necessary. |
| ERROR SKS | Continuous light<br>Travel in CLOSING direction only possible in deadman mode | Closing edge safety device faulty in OPENING or CLOSING direction.<br>– Check closing edge safety device and spiral cable, check RADIO transmission system, if necessary. |
| ERROR LIGHT BAR | Continuous light<br>Travel in CLOSING direction only possible in deadman mode | The photocell connected shows a permanent fault.<br>– Check photocell (function and alignment).<br>– Check cabling. |

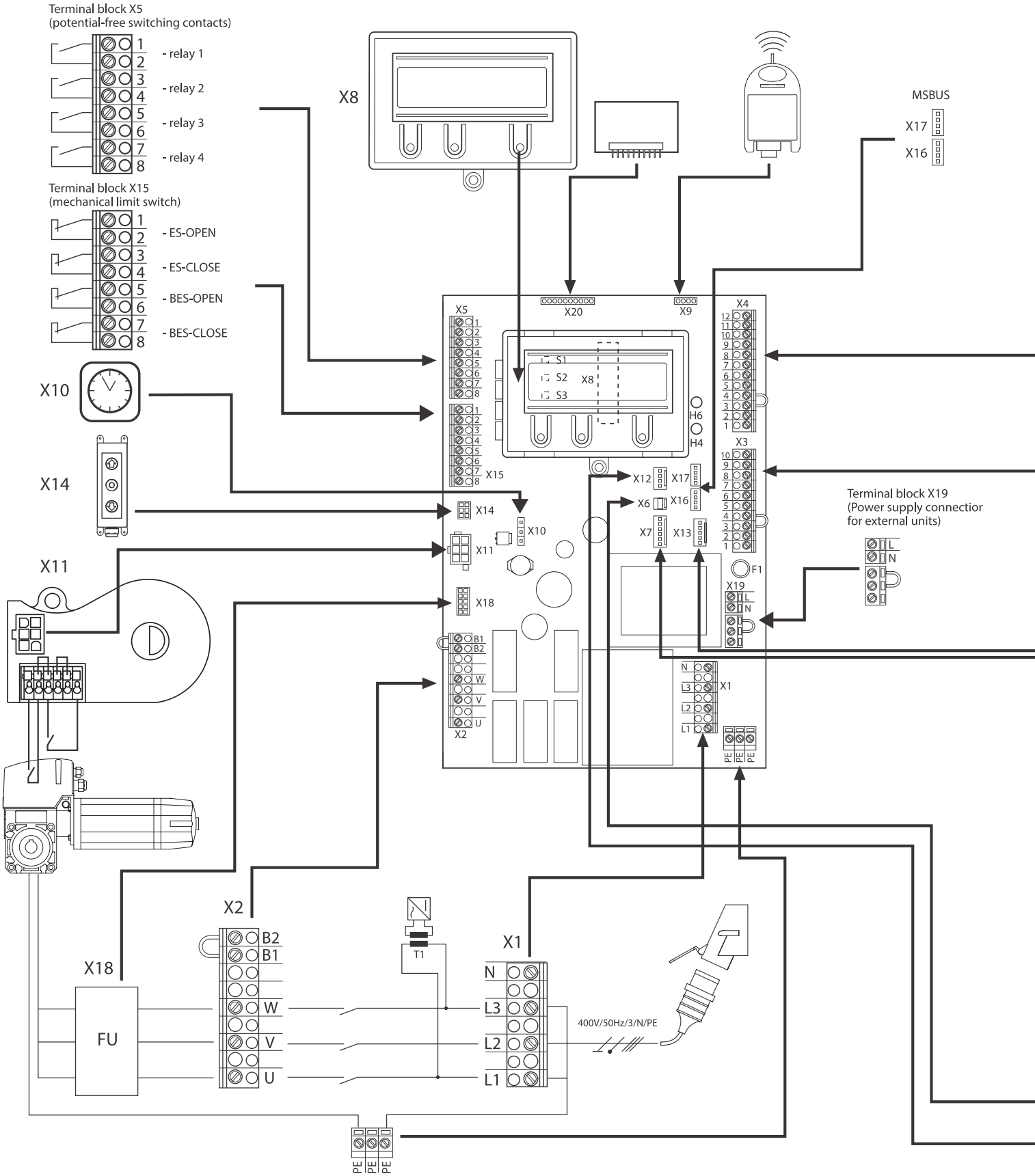
## 14.9 Technical data

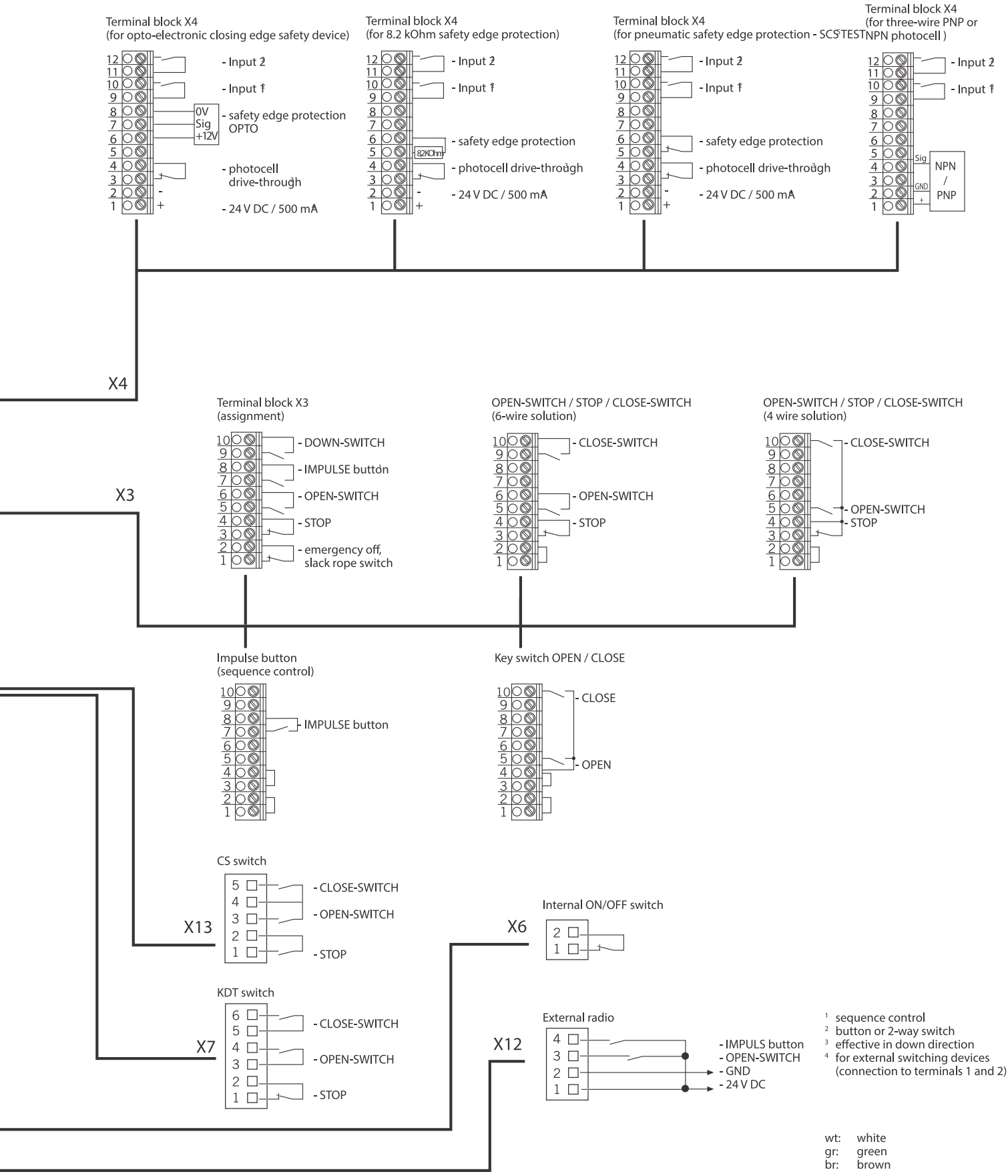
### 14.9.1 Mechanical and electrical data

| | | |
|---|---|---|
| Housing dimensions (W x H x D) | : | 245 x 455 x 190 mm |
| Power supply via L1, N, PE | : | 230V/1~ , 50/60Hz (0.75 kW / 1.5 kW) |
| Rated motor current | : | 230V/1~ / 0.75 kW –> 3.9 A |
| Fuse protection | : | 16 A K type<br>For a three-phase connection, only 3-way automatic circuit breakers may be used. |
| Internal consumption of control | : | max. 750 mA |
| Control voltage | : | 24 V DC, max. 500 mA; protected by self resetting fuse for external sensor systems. |
| Control inputs | : | 24 VDC, all input connections must be potential-free; minimum signal duration for input control command >100 ms |
| Control outputs | : | 24 VDC max. 500 mA |
| RS485 A and B | : | Only for electronic limit switches RS485 level, terminated with a 120Ω |
| Safety circuit / emergency off | : | All input connections must be potential-free; if the safety circuit is interrupted, no further electrically powered movement of the operator is possible, not even in deadman mode |
| Closing edge safety bar input (performance level C) | : | Performance level C<br>For 8.2 k electrical safety bars with 8.2 kΩ terminating resistor and for dynamic optical systems |
| Photocell (performance level D) | : | If the photocell is used as a D performance level system, it must be checked at regular intervals, but at least every 6 months, to ensure that the system functions properly.<br>two-wire photocell barriers have a self teach-in facility, and so this requirement does not apply in this case. |
| Display (LCD) | : | Only an original display must be used as an LCD programming circuit board. |
| Relay outputs | : | If inductive loads are connected (e.g. further relays or brakes), these must be fitted with appropriate suppressor elements (recovery diodes, varistors, RC circuits). Potential-free normally open contact; min. 10 mA ;<br>max. 230 V AC = 4A.<br>Once contacts have been used for power circuits, they can no longer be used for extra low current circuits. |
| Temperature range | : | Operation -10°C ... +45°C<br>Storage : -25°C ... +70°C |
| Air humidity | : | Up to 80% with no condensation |
| Vibrations | : | Low-vibration mounting, e.g. on a masonry wall |
| Type of enclosure | : | IP 54 |
| Weight approx. | : | 1.8 kg |

## 14.9 Appendix

### 14.9.1 Overview of connections




Terminal block X4
(for opto-electronic closing edge safety device)
- Input 2
- Input 1
0V
Sig
+12V
- safety edge protection OPTO
- photocell drive-through
- 24 V DC / 500 mA
Terminal block X4
(for 8.2 kOhm safety edge protection)
- Input 2
- Input 1
82KOhm
- safety edge protection
- photocell drive-through
- 24 V DC / 500 mA
Terminal block X4
(for pneumatic safety edge protection - SCS TEST)
- Input 2
- Input 1
- safety edge protection
- photocell drive-through
- 24 V DC / 500 mA
Terminal block X4
(for three-wire PNP or NPN photocell )
- Input 2
- Input 1
Sig
GND
NPN / PNP
X4
X3
Terminal block X3
(assignment)
- DOWN-SWITCH
- IMPULSE button
- OPEN-SWITCH
- STOP
- emergency off, slack rope switch
OPEN-SWITCH / STOP / CLOSE-SWITCH
(6-wire solution)
- CLOSE-SWITCH
- OPEN-SWITCH
- STOP
OPEN-SWITCH / STOP / CLOSE-SWITCH
(4 wire solution)
- CLOSE-SWITCH
- OPEN-SWITCH
- STOP
Impulse button
(sequence control)
- IMPULSE button
Key switch OPEN / CLOSE
- CLOSE
- OPEN
CS switch
X13
- CLOSE-SWITCH
- OPEN-SWITCH
- STOP
Internal ON/OFF switch
X6
KDT switch
X7
- CLOSE-SWITCH
- OPEN-SWITCH
- STOP
External radio
X12
- IMPULS button
- OPEN-SWITCH
- GND
- 24 V DC
1 sequence control
2 button or 2-way switch
3 effective in down direction
4 for external switching devices (connection to terminals 1 and 2)
wt: white
gr: green
br: brown

### 14.9.2 Functional safety category and performance level according to EN ISO 13849-1

| Function | Implementation | $MTTF_D$ electronics | $MTTF_D$ total with output contactor (1) | $DC_{avg}$ | Category | Performance level |
|---|---|---|---|---|---|---|
| Emergency stop button | Input terminal X3, X6, X7, X11 Interrupts voltage supply to the output relay and main contactor, independently of the CPU. Signal received by CPU. | 1175 years | 191 years | 85,3% | 3 | D |
| Stop circuit | Input terminal X3, X7 Interrupts the power supply to the main contactor. Signal to CPU. | 1175 years | 191 years | - | B | B |
| End position detection by AWG (absolute value encoder) (2) | Input terminal X11 For determining the position, and end position detection. Safety through checking plausibility of commands with signals received. | 1062 years | 188 years | 85,6% | 2 | D |
| End position detection through limit switches (2) | Input terminal X15 Safeguarded through excess travel stop. Inputs are evaluated by the CPU. | 1248 years | 193 years | 85,5% | 2 | D |
| Photocell evaluation | Input terminal X4 Impulse evaluation through CPU. Faults are detected through plausibility check in the CPU. The frequency must lie between 130 Hz and 190 Hz. The function is tested by switching on the supply voltage (T117, IC111) of the photocell before every run and every two minutes in standby. If activated in the CLOSING direction, the door stops or reverses. | 1000 years | 186 years | 85,7% | 2 | D |

$DC_{avg}$ : Average diagnostic coverage | $MTTF_D$ : Mean time to dangerous failure

## 14.10 Maintenance

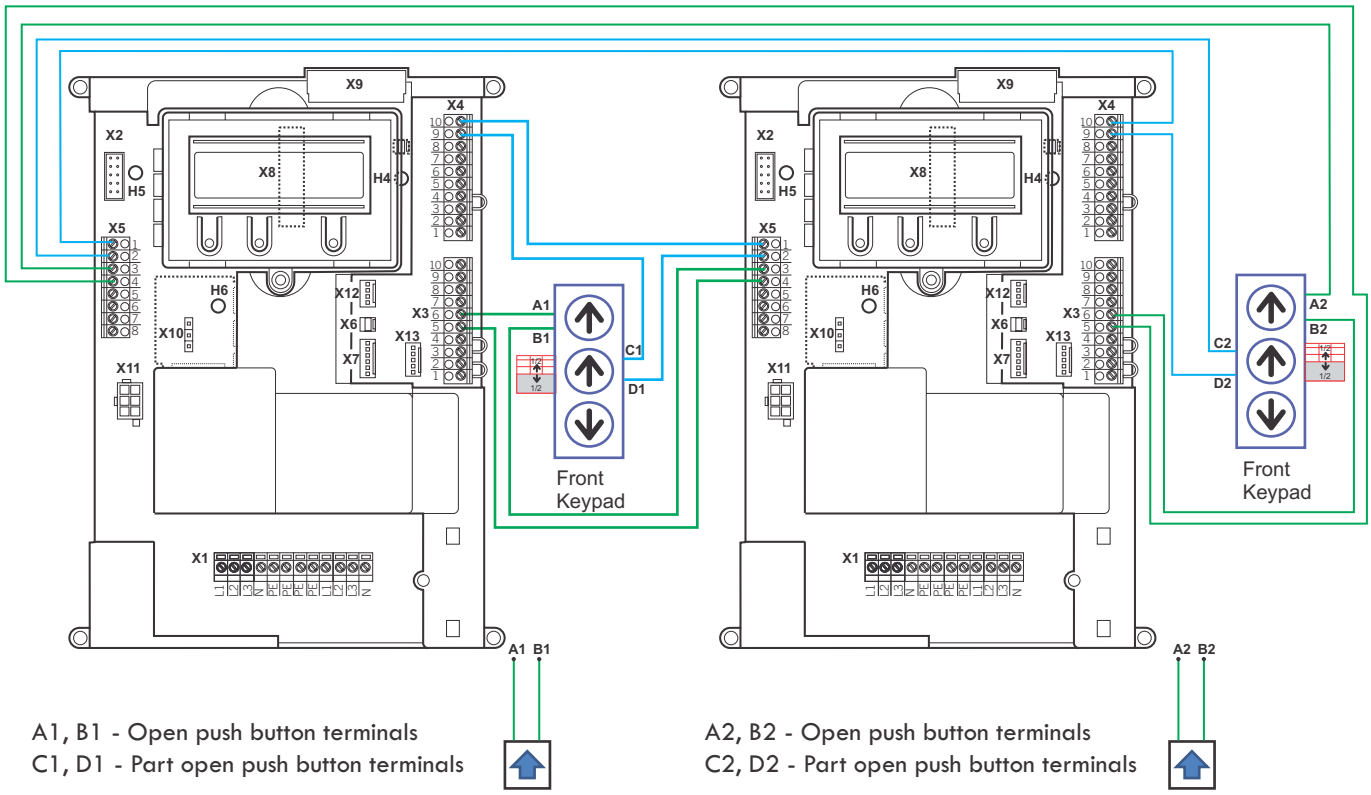
DANGER!
Life-threatening danger due to electric shock!

- The control unit or door system MUST be disconnected from the electricity supply before carrying out any electrical work. Take measures to ensure that the power supply remains disconnected for the duration of the work.

The following points must be taken into account when carrying out maintenance on the door system :

- Maintenance must only be carried out by authorized persons.
- Directive ASR A1.7 must be complied with.
- Worn or faulty parts must be replaced.
- Only approved parts may be installed.
- All maintenance work must be documented.
- Replaced fault parts must be disposed of properly in accordance with the materials they contain & local regulations.

### 14.10.2 Control Panel Wiring for Interlocking of Two doors:




A1, B1 - Open push button terminals
C1, D1 - Part open push button terminals

Door 1 Control card

A2, B2 - Open push button terminals
C2, D2 - Part open push button terminals

Door 2 Control card

### Additional opening command connection:

- Connect the additional opening command connection as shown in above figure.

Note: Connections marked with symbol in above figure is for additional accessories like push button, radar, magnetic loop detector, pulling cord system and other opening commands / sensors should be connect to open push button terminals A1, B1for Door1 & A2, B2 for Door2 respectively

Do not connect additional opening command to port 5 & 6 of terminal X3 of any of the door's control card while using interlock system.

### Operating principle:

In the normal position both doors are closed. When the first doors receives an open command, it opens locking the second door. While the door is opening, the second door is locked and cannot be opened. When the first door returns to the closed position the second door is unlocked and can now be opened.

### Procedure:

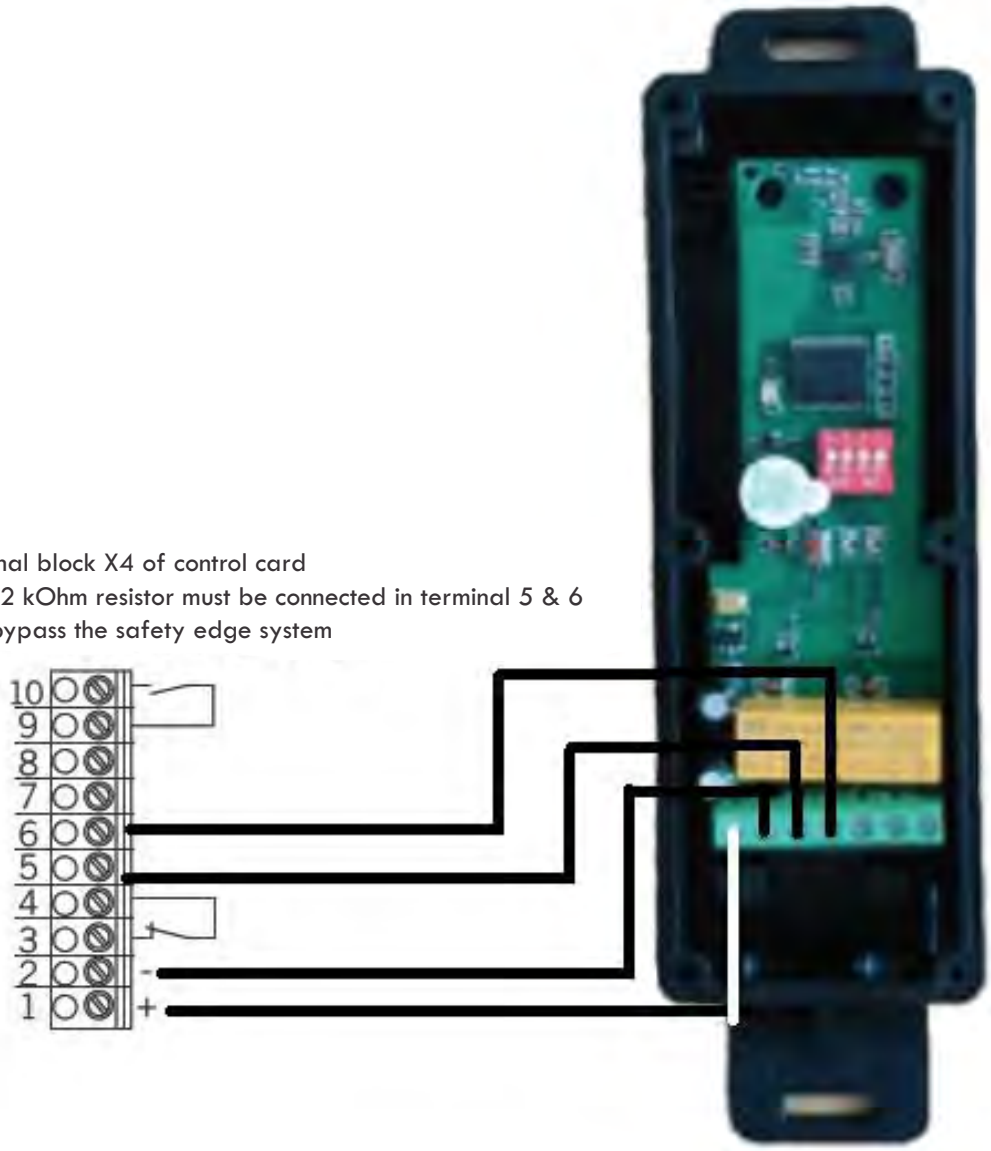
1. Connect A1 to terminal 6 of X3 in control card of Door1, B1 to terminal 3 of X5 in control card of Door2 and terminal 5 of X3 in control card of Door1 to terminal 4 of X5 in control card of Door2
2. Connect C1 to terminal 9 of X4 in control card of Door1, D1 to terminal 2 of X5 in control card of Door2 and terminal 10 of X4 in control card of Door1 to terminal 1 of X5 in control card of Door2
3. Connect A2 to terminal 3 of X5 in control card of Door1, B2 to terminal 6 of X3 in control card of Door2 and terminal 4 of X5 in control card of Door1 to terminal 5 of X3 in control card of Door2
4. Connect C2 to terminal 2 of X5 in control card of Door1, D2 to terminal 9 of X4 in control card of Door2 and terminal 1 of X5 in control card of Door1 to terminal 10 of X4 in control card of Door2
5. Set the parameter MOD 7 in the input menu to “relay 1” & “relay 2” in both controls

Set the door always on AUTOMATIC CLOSING mode

## 15. AUTOMATION ACCESSORIES

### 15.1 Control card wiring with Wireless safety edge system HSRF

Terminal block X4 of control card
- A8.2 kOhm resistor must be connected in terminal 5 & 6 to bypass the safety edge system



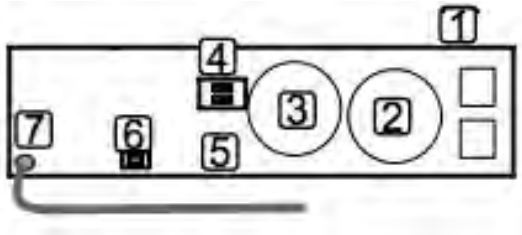

Wireless transmission system for resistive and mechanical safety edges. The system consists of one transmitter and one receiver.

Important: Insert battery 1first and then battery 2. Without this order, correct function is not guaranteed. Batteries must be suitable for use at temperatures of 20ºC and above.

Safety instructions

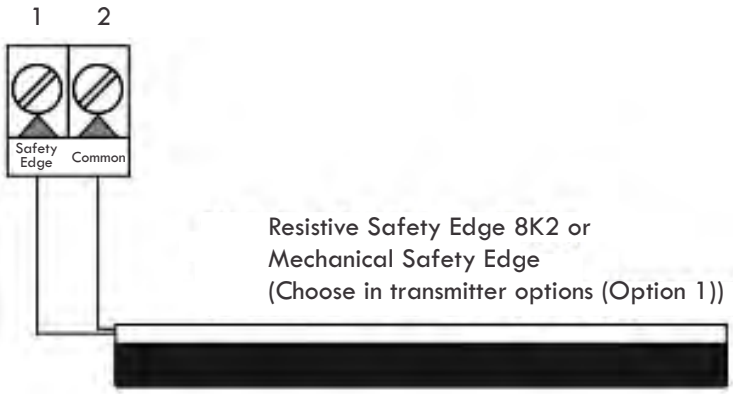
- Reaction time <60ms
- EN13849-1
- Device with SELV/PELV power supply

**Transmitter**

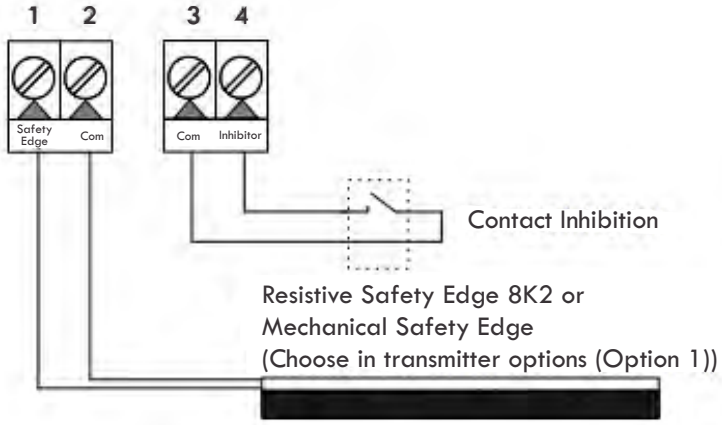



1 - Terminals
2 - Battery1 CR2032
3 - Battery2 CR2032
4 - LED
5 - DIP - Switch
6 - Push button
7 - Antenna

**Transmitter typical connection**

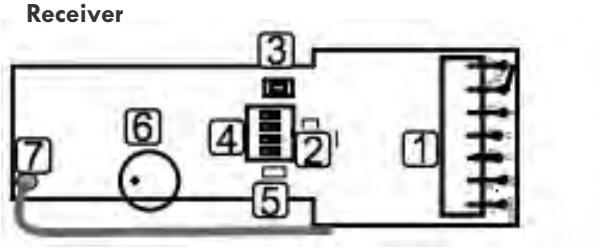



**Other transmitter connections**



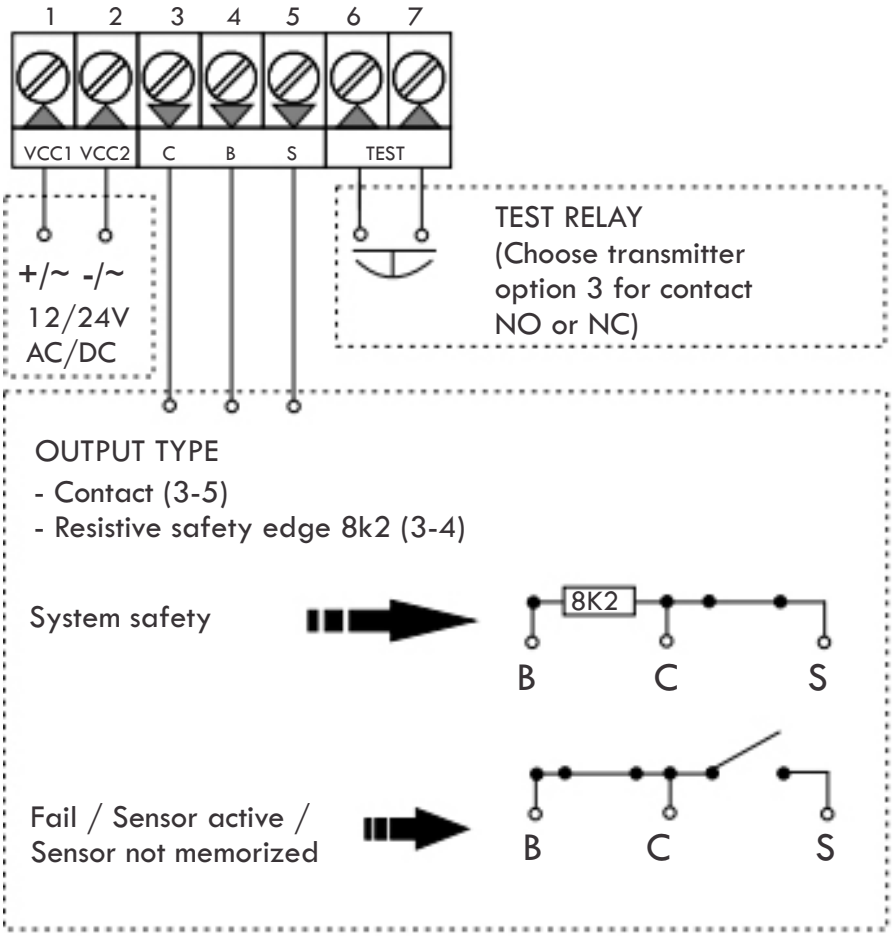

**Transmitter option selector**

**Receiver**



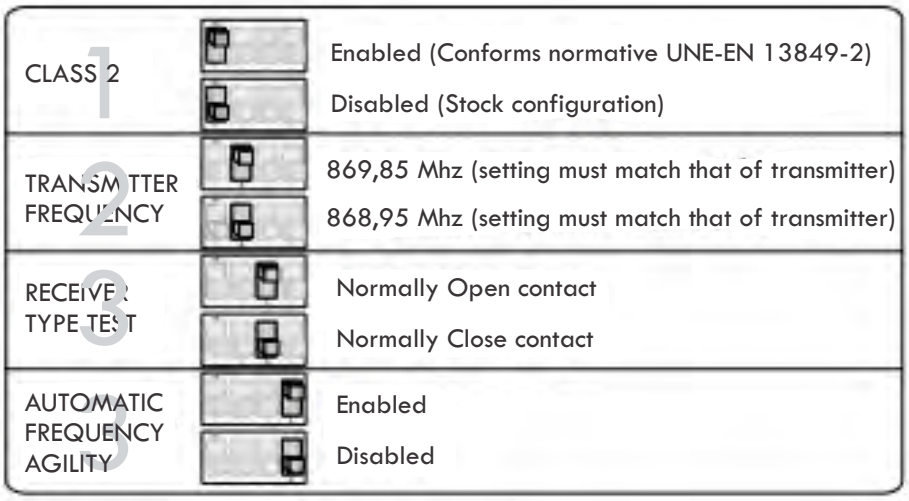

1 - Terminals
2 - LED 1
3 - Push button
4 - DIP - Switch
5 - LED 2
6 - Buzzer
7 - Antenna

**Receiver connections**




LED indicator
LED ON – Security OK
LED OFF – Obstacle detected

**Receiver option selector**




**Memory full indicator**

In case of full memory you will hear several acoustic signals for 10 seconds upon trying to memorize a new transmitter.

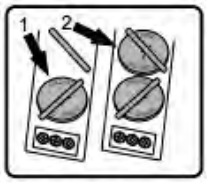
**Low battery indicator**

Low battery indication consists on 4 acoustic sounds each time a message is received from a programmed transmitter. Both, warning LED and buzzer are set on simultaneously.

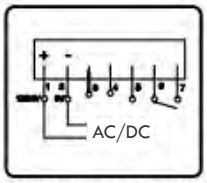
**Warning**

- Switch off the operating voltage before working on the system.
- The system doesn't have fuse protection. It is recommended include exterior protection minimum 100mA and maximum 250mA.

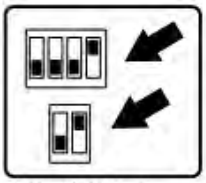
**How it works**

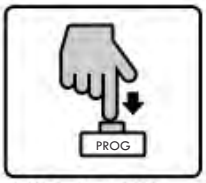


1. INSERT BATTERIES

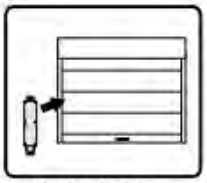


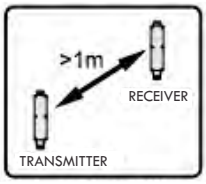
2. CONNECT RECEIVER POWER SUPPLY


3. CHECK OPTION SELECTORS

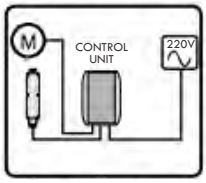


4. CARRY OUT CODE MEMORIZATION (POINT. 4)

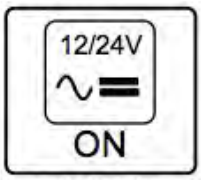

5. INSTALL AND WIRE TRANSMITTER ON DOOR



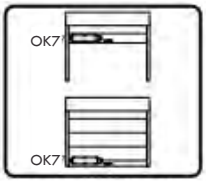
6. MINIMUM DISTANCE 1m



7. INSTALL AND WIRE RECEIVER



8. TURN ON POWER SUPPLY



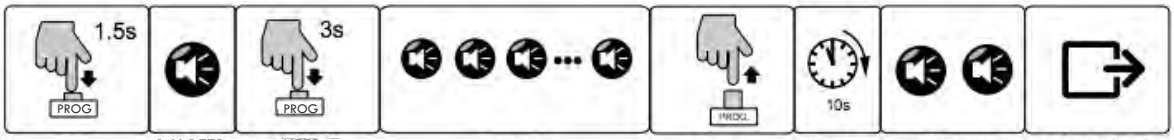
9. TEST SAFETY EDGE ON DOOR

**Programming process**

Code memorization

PRESS RECEIVER | 1 X BEEP | RELEASE | PRESS TRANSMITTER BUTTON | 1 X BEEP | WAIT | 2 X BEEP | SAVE & EXIT

MEMORY RESET



PRESS RECEIVER | 1 X BEEP | KEEP PRESSED | # BEEPS | RELEASE | WAIT | 2 X BEEP | SAVE & EXIT

## 15.2 Loop detectors

### Controls and Indicators

SENSITIVITY SETTING

| | Position 0…….9 |
|---|---|
| Sensitivity | Low…….high |

DETECT / FREQUENCY COUNT

| | Red LED |
|---|---|
| Presence detected | on |
| No presence | off |
| Frequency count | flashing |

POWER / LOOP FAULT INDICATOR

| | Green LED |
|---|---|
| Normal operation | on |
| Shorted loop | 1 fast flash |
| Open loop | 2 fast flashes |
| Abrupt change (>20%) | 3 fast flashes |
| Previous loop fault | 2 slow flashes |

ULTRAMETER™ DISPLAY
Indicates sensitivity setting required to detect vehicle

FREQUENCY COUNT / RESET
Press to start frequency count, re-initializes after count


AUTOMATIC SENSITIVITY BOOST

| | DIP switch position 1 |
|---|---|
| ASB enabled | on |

PRESENCE

| | DIP switch position 2 |
|---|---|
| NORMAL (5 min.) | on |
| INFINITE | off |

DELAY (2 seconds)

| | DIP switch position 3 |
|---|---|
| DELAY | on |

OUTPUT B

| | DIP switch position | |
|---|---|---|
| MODE | 5 | 4 |
| Pulse on Entry | on | on |
| Pulse on Exit | off | on |
| Detect -On-Stop (DOS®) | on | off |
| Loop Fault | off | off |

FAIL SAFE / SECURE

| | DIP switch position 6 |
|---|---|
| Fail Secure | on |
| Fail Safe | off |

FREQUENCY SETTINGS

| | DIP switch position | |
|---|---|---|
| FREQUENCY | 7 | 8 |
| Low | on | on |
| Medium low | on | off |
| Medium high | off | on |
| High | off | off |

**Description**
Loop
Loop
Shield – EARTH GROUND
Power (12VDC…24VAC/DC)
Power (12VDC…24VAC/DC)
Presence - Output A – N.O.
Presence - Output A - COM
Presence - Output A – N.C.
Output B – N.O
Output B - COM


**Troubleshooting**

| Symptom | Possible cause | Solution |
|---|---|---|
| Green LED flashes pins | Loop wire shorted or open | Check loop resistance on the appropriate loop on the control board connector, between .5 ohms and 5 ohms. |
| Green LED flashes, 2 fast | Loop was previously shorted or open | Check loop resistance on the appropriate loop pins on the control board connector. |
| Detector remains in detect after vehicle has left loop | 1. Faulty loop<br>2. Poorly crimped terminals<br>3. Loose connections | 1. Perform megger test from loop lead to ground, should be >100 megohms<br>2. Check loop connections to terminals<br>3. Check splices are properly soldered and sealed against moisture<br>4. Observe ULTRAMETER display, level indicated on display indicates residual frequency shift from vacant loop to vehicle presence, press Frequency Count switch to reinitialize the detector |
| Intermittent detection | 1. Faulty loop<br>2. Poorly crimped terminals<br>3. Loose connections<br>4. Cross-talk between adjacent loops | 1. Perform megger test from loop lead to ground, should be >100 megohms<br>2. Check loop connections to terminals<br>3. Check splices are properly soldered and sealed against moisture<br>4. Set adjacent loops to different frequencies (see Frequency Setting) |
| No detection | 1. Loop wire shorted or open<br>2. Loop sensitivity set too low | 1. Check loop resistance on the appropriate loop pins on the control board connector, between .5 ohms and 5 ohms.<br>2. With vehicle on loop, observe ULTRAMETER display, set sensitivity to the level indicated on the display |

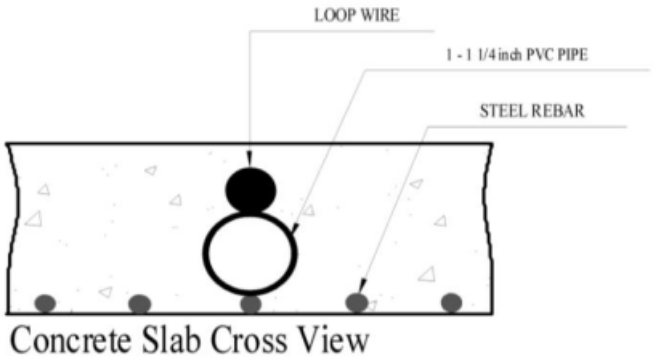
**Loop Installation**

NEW SLAB POUR

Ty-wrap 1-1/4" PVC pipe to the top of the rebar in the size and configuration of the loop (ex. 4' x 8').

Then ty-wrap the loop to the top of the PVC frame.

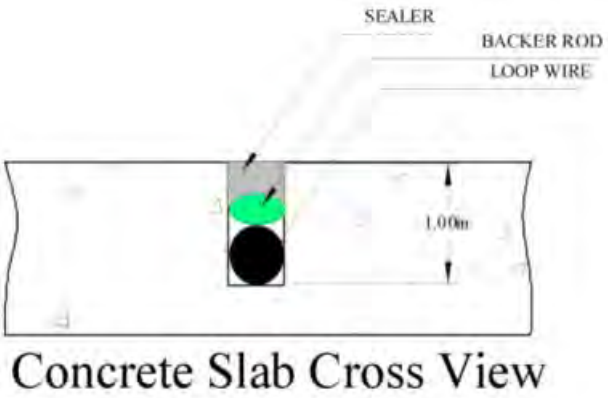
This stabilizes the loop during the pour and separates it from the rebar.




SAW CUT EXISTING SURFACE

Cut 1" deep into the existing surface, place a 45° cut at the corners to prevent sharp edges from damaging the loop wire. Notch out for the "T" connection where the lead wire connects to the loop. Remove all debris from the finished cut with compressed air. Place the loop into the saw cut.

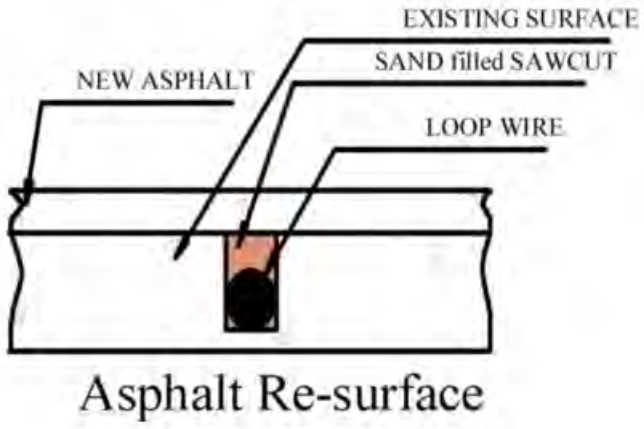
Place backer material into the saw cut over the loop wire and pack tightly. Place a high-quality sealer over the saw cut to seal the surface.




RESURFACE ASPHALT

Saw cut the existing surface ¾" deep and place a 45° cut at the corners to prevent sharp edges from damaging the loop wire. Remove all debris from the finished cut with compressed air. Place sand over the loop wire to the surface and pack tightly.

Lay new asphalt.




General Installation Guidelines

- Lead-in wire (wire from loop to detector) must be must be twisted a minimum of 6 turns/ foot to avoid the effects of noise or other interference.
- Detection height is approximately 70% of the shortest side of the loop. Example: detection height for an 4' x 8' loop = 48" x .7 = 33.6"

**Loop Sizes and Loop Characteristics**

| Loop size Length B | Loop size width | L Inductance | A Turns | Detection Height Feet |
|---|---|---|---|---|
| 2 (0.61m) | 2 (0.61m) | 60 | 5 | 1.6 (0.488m) |
| 2 (0.61m) | 4 (1.22m) | 60 | 4 | 1.6 (0.488m) |
| 2 (0.61m) | 6 (1.83m) | 80 | 4 | 1.6 (0.488m) |
| 2 (0.61m) | 8 (2.44m) | 60 | 3 | 1.6 (0.488m) |
| 2 (0.61m) | 10 (3.05m) | 72 | 3 | 1.6 (0.488m) |
| 2 (0.61m) | 12 (3.66m) | 84 | 3 | 1.6 (0.488m) |
| 2 (0.61m) | 14 (4.27m) | 96 | 3 | 1.6 (0.488m) |
| 2 (0.61m) | 16 (4.88m) | 108 | 3 | 1.6 (0.488m) |
| 2 (0.61m) | 18 (5.49m) | 120 | 3 | 1.6 (0.488m) |
| 2 (0.61m) | 20 (6.10m) | 132 | 3 | 1.6 (0.488m) |
| 4 (1.22m) | 4 (1.22m) | 80 | 4 | 3.2 (0.975m) |
| 4 (1.22m) | 6 (1.83m) | 100 | 4 | 3.2 (0.975m) |
| 4 (1.22m) | 8 (2.44m) | 72 | 3 | 3.2 (0.975m) |
| 4 (1.22m) | 10 (3.05m) | 84 | 3 | 3.2 (0.975m) |
| 4 (1.22m) | 12 (3.66m) | 96 | 3 | 3.2 (0.975m) |
| 4 (1.22m) | 14 (4.27m) | 108 | 3 | 3.2 (0.975m) |
| 4 (1.22m) | 16 (4.88m) | 120 | 3 | 3.2 (0.975m) |
| 4 (1.22m) | 18 (5.49m) | 132 | 3 | 3.2 (0.975m) |
| 4 (1.22m) | 20 (6.10m) | 144 | 3 | 3.2 (0.975m) |
| 4 (1.22m) | 22 (6.71m) | 156 | 3 | 3.2 (0.975m) |
| 4 (1.22m) | 24 (7.32m) | 168 | 3 | 3.2 (0.975m) |
| 4 (1.22m) | 26 (7.93m) | 180 | 3 | 3.2 (0.975m) |
| 4 (1.22m) | 28 (8.54m) | 192 | 3 | 3.2 (0.975m) |
| 4 (1.22m) | 30 (9.14m) | 102 | 2 | 3.2 (0.975m) |
| 4 (1.22m) | 32 (9.75m) | 108 | 2 | 3.2 (0.975m) |
| 4 (1.22m) | 33 (10.06m) | 111 | 2 | 3.2 (0.975m) |
| 4 (1.22m) | 34 (10.36m) | 114 | 2 | 3.2 (0.975m) |
| 4 (1.22m) | 36 (10.97m) | 120 | 2 | 3.2 (0.975m) |
| 4 (1.22m) | 38 (11.58m) | 126 | 2 | 3.2 (0.975m) |
| 4 (1.22m) | 40 (12.20m) | 132 | 2 | 3.2 (0.975m) |

All the figures are approximate, actual results may vary

Serial resistance: Between leads is to be less than 5 Ohms

Leakage to ground : Between one lead wire and the ground should be more than 10 mega ohm at 500 VDC for one minute. Use DI 6200 insulation tester or equivalent. (older loops may be to 1 mega ohm)

Lead wires should be twisted at least 6 turns per foot (0.305m)

**Loop Sizes and Loop Characteristics**

| Loop size Length B | Loop size width | L Inductance | A Turns | Detection Height Feet |
|---|---|---|---|---|
| 6 (1.83m) | 6 (1.83m) | 120 | 4 | 4.8 (1.463m) |
| 6 (1.83m) | 8 (2.44m) | 84 | 3 | 4.8 (1.463m) |
| 6 (1.83m) | 10 (3.05m) | 96 | 3 | 4.8 (1.463m) |
| 6 (1.83m) | 12 (3.66m) | 108 | 3 | 4.8 (1.463m) |
| 6 (1.83m) | 14 (4.27m) | 120 | 3 | 4.8 (1.463m) |
| 6 (1.83m) | 16 (4.88m) | 132 | 3 | 4.8 (1.463m) |
| 6 (1.83m) | 18 (5.49m) | 144 | 3 | 4.8 (1.463m) |
| 6 (1.83m) | 20 (6.10m) | 78 | 2 | 4.8 (1.463m) |
| 6 (1.83m) | 22 (6.71m) | 84 | 2 | 4.8 (1.463m) |
| 6 (1.83m) | 24 (7.32m) | 90 | 2 | 4.8 (1.463m) |
| 6 (1.83m) | 26 (7.93m) | 96 | 2 | 4.8 (1.463m) |
| 6 (1.83m) | 28 (8.54m) | 102 | 2 | 4.8 (1.463m) |
| 6 (1.83m) | 30 (9.14m) | 108 | 2 | 4.8 (1.463m) |
| 6 (1.83m) | 32 (9.75m) | 114 | 2 | 4.8 (1.463m) |
| 6 (1.83m) | 33 (10.06m) | 117 | 2 | 4.8 (1.463m) |
| 6 (1.83m) | 34 (10.36m) | 120 | 2 | 4.8 (1.463m) |
| 6 (1.83m) | 36 (10.97m) | 126 | 2 | 4.8 (1.463m) |
| 6 (1.83m) | 38 (11.58m) | 132 | 2 | 4.8 (1.463m) |
| 6 (1.83m) | 40 (12.20m) | 138 | 2 | 4.8 (1.463m) |
| 8 (2.44m) | 4 (1.22m) | 120 | 4 | 3.2 (0.975m) |
| 8 (2.44m) | 6 (1.83m) | 140 | 4 | 4.8 (1.463m) |
| 8 (2.44m) | 8 (2.44m) | 96 | 3 | 5.6 (1.71m) |
| 8 (2.44m) | 10 (3.05m) | 108 | 3 | 5.6 (1.71m) |
| 8 (2.44m) | 12 (3.66m) | 120 | 3 | 5.6 (1.71m) |
| 8 (2.44m) | 14 (4.27m) | 132 | 3 | 5.6 (1.71m) |
| 8 (2.44m) | 16 (4.88m) | 144 | 3 | 5.6 (1.71m) |
| 8 (2.44m) | 18 (5.49m) | 78 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 20 (6.10m) | 84 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 22 (6.71m) | 90 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 24 (7.32m) | 96 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 26 (7.93m) | 102 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 28 (8.54m) | 108 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 30 (9.14m) | 114 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 32 (9.75m) | 120 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 33 (10.06m) | 123 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 34 (10.36m) | 126 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 36 (10.97m) | 132 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 38 (11.58m) | 138 | 2 | 5.6 (1.71m) |
| 8 (2.44m) | 40 (12.20m) | 144 | 2 | 5.6 (1.71m) |

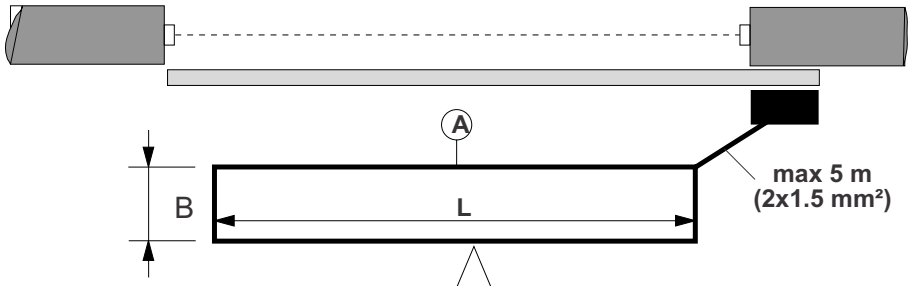



FIG 1

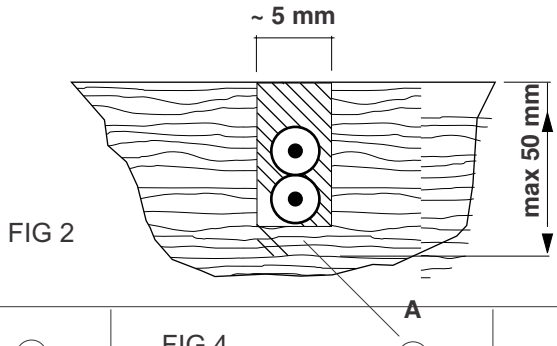
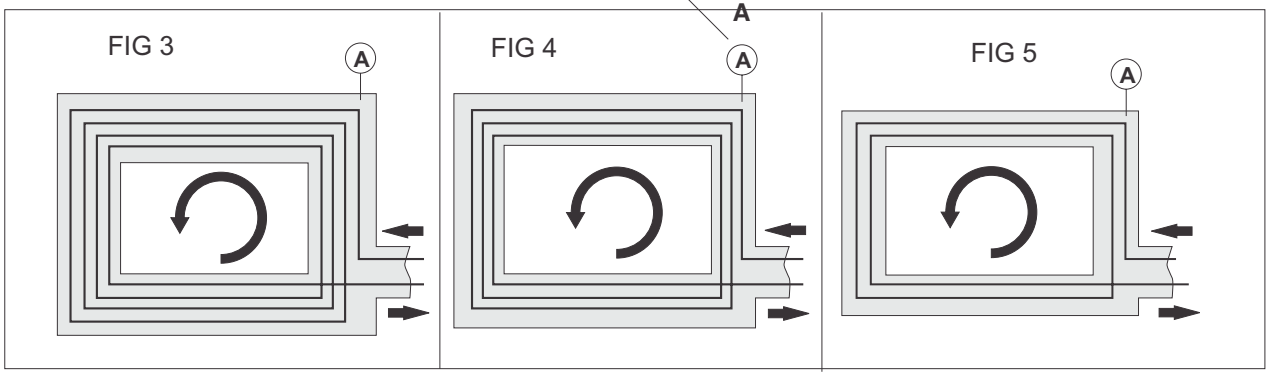



FIG 2



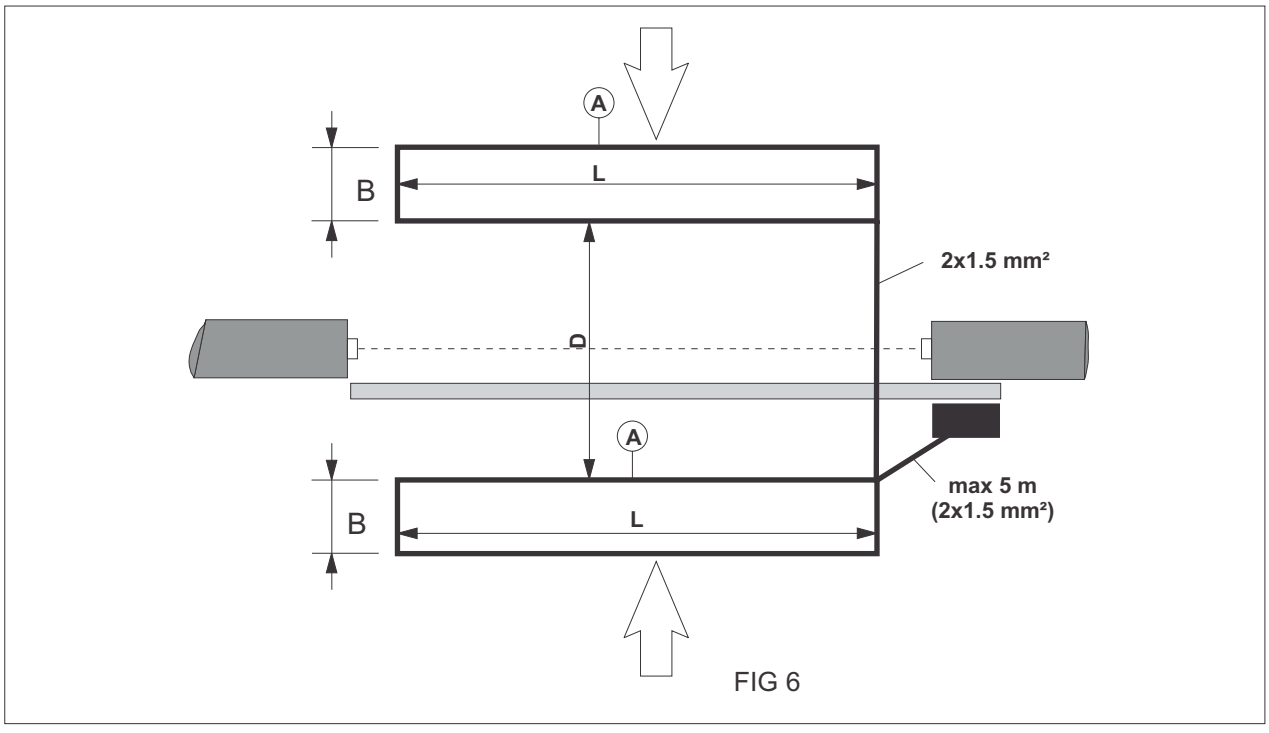




FIG 6

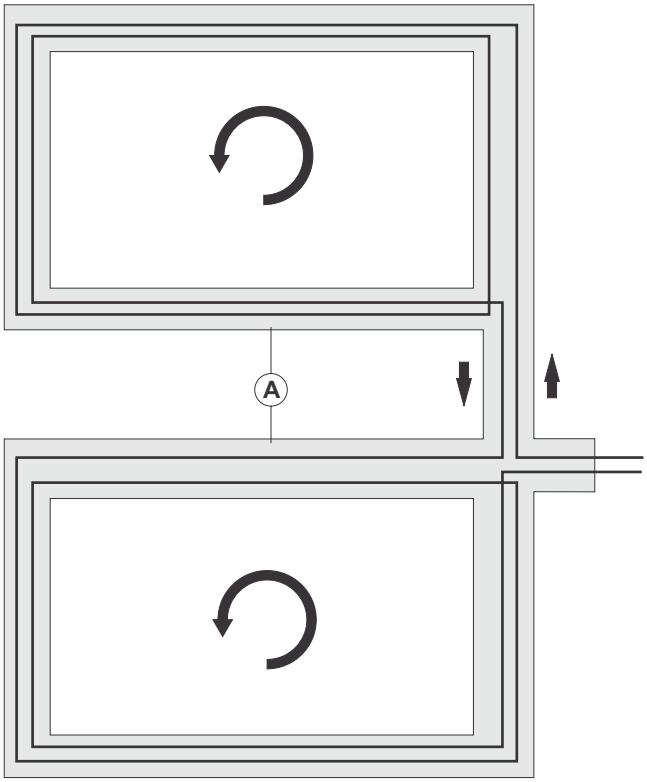



FIG 7

- Create the loop by means of a 1.5 sqmm unipolar cord.
- Loop [A] should be secured firmly to the ground and can be laid underground at a maximum depth of 50mm, as indicated in fig.2
- The dimensions of the loops are indicated in fig.1 & in tables mentioned above.
- The loop have to be designed in such a way that the current always flows in the same direction (clockwise & anticlockwise) as show by the arrows in fig. 3 , 4 , 5 and 7.
- The complete loop must be at least 5 m. if possible, the single pole wires should be transposed with each other.

### 15.3 RMS - Radar with function discrimination

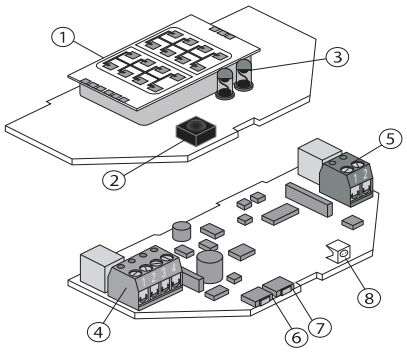
Radar motion sensor for approach detection at industrial doors

**Safety Information**

In order to satisfy the safety requirements specified in EN60950-1 and UL508, the sensor must be operated from an SELV supply where output is limited to 100 W. The output can be limited using a T2.5Afuse. This device must be installed and maintained only by qualified, trained personnel.

Product Information

1. Antenna
2. IR receiver
3. IR transmitter
4. Terminals (power supply/main relay)
5. Terminals (vehicle relay)
6. Push button / Menu
7. Pushbutton / Value
8. LED (red/ green)




**Connecting the sensor**

Connect the cable to the terminals as follows:

Power supply / main relay

① AC/DC supply (brown)
② AC/DC supply (green)
③ Main relay (white)
④ Main relay (yellow)

Vehicle relay

① Vehicle relay (gray)
② Vehicle relay (pink)

**Commissioning**

Before switching on the device, remove all objects from the door area that do not normally belong there.

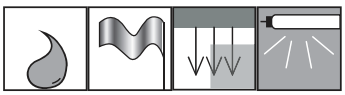
The hardware and software are initialized when the operating voltage is connected.

This initialization period lasts approx. 10 seconds.

The red/green LED will flash.

Then set the sensor. Check the settings by walking the sensing area

**Installation information**



- Protect the sensor from the rain*.
- Avoid placing moving objects In the detection area (fans. plants. trees, etc.).
- Do not cover the sensor. Mechanically moving drive components could affect the sensor.
- There should be no fluorescent lights within the detection area.

## Setting detection area

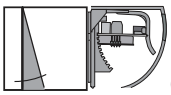
**Antenna characteristics**

Installation
Height : 5.00 m
Width : 6.00 m
Depth : 7.00 m

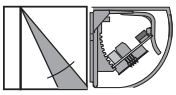
Installation
Height : 7.00 m
Width : 5.00 m
Depth : 8.00 m

Inclination angle 30°
Detection area size Max

**Inclination angle**



0 degrees



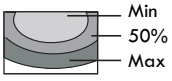
40 degrees

You can change the position in 5° increments. Holding the sensor's base plate by the side, move it forward and position it as required. Default setting is 15°.

**Oblique detection area**

The sensor's base plate can also be inserted at an angle, i.e. up to 3 notches to the right or left. Notches can also be removed.

**Detection area size**




Use the push-buttons or remote control to set the sensitivity and change the size of the detection area.

## Detection capabilities

**Direction detection**

No direction detection

With forward direction detection (towards the sensor)

With backward direction detection (away from the sensor)

## Detection capabilities

| Calor indicators | Status |
|---|---|
| G Green | Device ready for operation |
| R Red | Detection active |
| G Green flashing | Command received |
| R Red flashing | Fault |
| R/G Red/Green flashing in quick succession. | Vehicle relay is activated |
| R/G Red/Green flashing slowly. | Initialization after switching on |

Some installation situations may limit the setting options and the functions of the sensor.

## Vehicle detection

The sensor evaluates movements of people or vehicles in different ways and switches the relay.

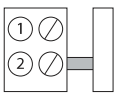
**Relay function**

The sensor always switches the main relay when sensing both people and vehicles.

The sensor only activates the vehicle relay if vehicle detection is activated, a vehicle is detected, and there are no people in the detection area.

Application example: Door with separate entry for personnel

Door controller with one switch input. Vehicle detection is activated. Only the vehicle relay is connected.



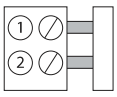

① Main relay
② Vehicle relay

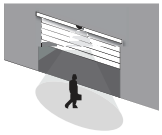
Person approaches:
Vehicle relay is not activated
Door remains closed
Person uses side entrance

Vehicle approaches:
Vehicle re lay is activated
The LED flashes red/green in quick succession.
The door opens

Application example: Door with no separate entry for personnel

Door controller with two switch inputs. Vehicle detection is activated. Main relay and vehicle relay are connected.



① Main relay
② Vehicle relay

Person approaches:
Main relay is activated
LED lights up red
The door opens half-way

Vehicle approaches:
Vehicle relay is activated
The LED flashes red/green in quick succession.

## Programming mode

Program the sensor with the MENU and VALUE buttons. If a button is pressed, the flash sequence is interrupted. The set value is displayed according to the table below. When the last table entry (7) has been reached, the next press of a button reverts to the first table entry (1}. The setting is automatically saved each time the button is pressed.

Programming mode automatically ends if there is no setting made for 10 minutes. The set values are stored.

### Starting programming


2s Press the MENU button for about two seconds. Programming mode will be activated.


The LED displays the settings by flashing: flashing red indicates the function, flashing green indicates the setting (value) while no flash means: function is deactivated

### Setting the function and value


1x Press the MENU button once. The next function is selected.


1x Press the VALUE button once. The value is incremented by 1.

### Stopping programming


2s Press the MENU button for about two seconds. Programming mode is closed. The settings are saved.

Programming example: Changing the relay off-delay time from 1.0 s to 3.0 s

| Function/Setting | Action | LED |
|---|---|---|
|  2s | Press the MENU button for two seconds. Programming starts | |
| LED flashes. | The current value is displayed, e.g. 1 x red for function: Sensitivity 8x green for value: 8 |  1x 8x |
|  3x | Set the function: Press the MENU button three times. | |
| LED flashes. | 4x red for function: Off-delay time output 3x green for value: 1.0 s. |  4x 3x |
|  3x | Set value: Press the VALUE button three times. | |
| LED flashes. | 4x red for function: Off-delay time output 6x green for value: 3.0 s. |  4x 6x |
|  2s | Press the MENU button for two seconds. Programming is stopped The settings are saved. | |

**Pushbutton settings** — Check the settings by walking the sensing area

| Function (MENU) | R | Setting (VALUE) | G | Description |
|---|---|---|---|---|
| Detection area size | 1x | 1-16 | 1-16x | 1 : Small detection area<br>16: Large detection area |
| Detection mode | 2x | Off<br>Forward<br>Backward | 0x<br>1x<br>2x<br>3x | No detection<br>Direction detection: Detects movements in the direction of the sensor<br>Direction detection: Detects movements away from the sensor<br>No direction detection: Detects both forward and backward movements |
| Vehicle detection | 2x | Off<br>Low<br>Medium<br>High | 0x<br>1x<br>2x<br>3x | No detection; the vehicle relay is not switching<br>Low vehicle detection<br>Medium vehicle detection<br>High vehicle detection |
| Off-delay time, output | 4x | Off<br>0.2 s<br>0.5 s<br>1.0 s<br>1.5 s<br>2.0 s<br>3.0 s<br>4.0 s<br>5.0 s | 0x<br>1x<br>2x<br>3x<br>4x<br>5x<br>6x<br>7x<br>8x | Off: Relay does not switch<br>0.2 s: Shortest off-delay time<br>5.0 s: Longest off-delay time |
| Relay contact | 5x | Normally Closed:,<br>Normally Open | 1x<br>2x | Relay contact closes on detection (N. 0 .)<br>Relay contact opens on detection (N. C.) |

| Function MENU | R | Setting VALUE | G | Description |
|---|---|---|---|---|
| Cross-traffic suppression | 6x | Off<br>Low<br>Medium<br>High | 0x<br>1x<br>2x<br>3x | No cross-traffic suppression<br>Low cross-traffic suppression<br>Medium cross-traffic suppression<br>High cross-traffic suppression |
| Device addresses | 7x | 1-16 | 1-16x | Device addresses for programming with remote control |
| Reset | 2s MENU 2s VALUE | Press the VALUE and MENU buttons together for about 2 seconds. | | Reset to default settings<br>The LED flashes green/red alternately for about 10 seconds |

## Technical data

| | |
|---|---|
| Operating principle | Microwave module |
| Detection speed | Min. 0.1 m/s |
| Approvals | CE |
| Inclination angle | 0 - 40° in 5° steps |
| Sensing range | 6000 x 7000 mm (w x d) at installation height of 5000 mm and 30° inclination angle<br>5000 x 8000 mm (w x d) at installation height of 7000 mm and 30° inclination angle |
| Operating frequency | 24.15 GHz- 24.25 GHz K band<br>FCC (NA version): 24.075 GHz- 24.175 GHz Kband |
| Operating mode | Microwave motion sensor |
| Function display | Red/ green LED |
| Operating elements | 2 pushbuttons for selection of operating modes: direction detection, vehicle detection, output mode, adjustments for detection area size and off-delay time |
| Operating voltage | 12 - 36 V DC/12 - 28 V AC |
| Current consumption | < 50 mA at 24 V DC |
| Power consumption | <1 w |
| Switching type | Normally open/normally closed |
| Signal output | 2 relay outputs/ NO I NC contacts |
| Switching voltage | Max. 48 V AC I 48 V DC |
| Nominal power | Max. 0.5 A AC/1 A DC |
| Max. switching current | 1 A |
| Switch power | Max. 24 W/60 VA |
| Off-delay time | 0.2 s - 5 s, adjustable |
| Ambient temperature | -20° C to 60° C / 253 - 333 K |
| Relative humidity | Max. 90 %, not condensing |
| Installation height | Max. 7000 mm |
| Degree of protection | IP 54 |
| Connection | 4-pin plug-in screw terminals, 8 m connecting cable supplied |
| Housing material | polycarbonate (PC), ABS |
| Weight | 120 g |
| Transmitter radiated power | < 20 dBm |
| Dimensions without mounting brackets | 123 mm (w) x 65 mm (h) x 57 mm (d) |

## Troubleshooting

| Problem | Corrective Action |
|---|---|
| Door is detected. | Decrease size of detection area. Adjust the inclination angle. |
| LED not lit up. | No power supply, device not functioning. |
| Remote control does not respond | Device is disabled. Switch the operating voltage off and on again. Sensor can be configured for 30 minutes without code. Check the remote control battery. |

## Default settings

| Function | Setting |
|---|---|
| Detection area size | Remote control operation: 8 |
| Inclination angle | 15° |
| Direction detection | Forward |
| Off-delay time | 1 s |
| Relay contact | Contact, active |
| Cross-traffic suppression | Remote control operation: Medium |
| Vehicle detection | Medium |

## 16. COMPLETE INSTALLATION CHECK

- **Installation checks**

  At every stage of the Installation please check the installation done according to the NOTES mentioned in the Manual.

- **Manual operational checks**

**ATTENTION!**

Before manually operate the door, disconnect the main power supply. This provision must be followed even if the manual operation is equipped with an electrical safety. Remember to re-connect the power supply after the emergency operation.

Check the Manual Operation of the Curtain by using the Hand Crank Provided.
Refer section Manual Operation by Hand Crank as given on page 13.

**ATTENTION**

The door, moved manually through above described procedures, should never overcome the up or down limit switches. This is to avoid any damage to the door itself and the intervention of the safety micros, a safety device which cuts off the power supply and once activated, can be deactivated only by a technician.

- **Automatic operation through control card**

**UP movement check:**

Before checking the UP operation, ensure that the Rapid door is completely closed.

Press the Up button on the Control Panel and observe the UP motion of the Rapid door. The Rapid door should continue to go UP until the upper limit is reached. Once the limit is reached the Rapid door should stop the upward motion automatically.

Again press the UP button with the Rapid door at the Upper limit.

There shouldn't be any movement of the Rapid door.

NOTE: If there is any further upward movement of the Rapid Door then the limit switch has not been adjusted correctly and the UPPER limit switch needs to be readjusted.

**DOWN movement check:**

Before checking the Down Operation, ensure that the Rapid Door is Open.

Press the Down button on the Control Panel and observe the DOWN motion of the Rapid door. The Rapid door should continue to go DOWN smoothly until the lower limit is reached. Once the limit is reached the Rapid door should stop the down motion automatically.

Again press the DOWN button with the Rapid door at the Lower limit.

There shouldn't be any movement of the Rapid door.

If there is any further downward movement of the Rapid door then the limit switch has not been adjusted correctly and the LOWER limit switch needs to be readjusted.

**STOP Button check:**

Before checking the STOP button functionality of the Control Panel Place the Rapid door Half open.

Press the UP button on the Control panel and observe the upward motion of the Rapid door.

When the UP motion is taking place press the STOP button on the Control Panel.

On pressing the STOP button the UP motion of the Rapid door should STOP immediately.

On again pressing the STOP button no Action should happen.

The Rapid door should remain in the STOP position till the UP or the DOWN button is pressed from the control panel.

NOTE: If the Rapid door UP motion doesn't stop after the STOP button on the control panel is pressed then we need to check the wiring of the STOP button to the Control card.

- **Functional Check of Safety Edge of Rapid Door**

  Keep the Rapid Door at the Upper limit i.e. open.

  Now press the Down button on the control panel. The Rapid door will start to come down.

  Place your hand in the door closing way and press the Safety rubber edge as it reaches your hand height.

  As soon as the Safety rubber edge is pressed the door will stop the down motion and will start the Up motion.

  NOTE: If the Door doesn't reverse the Down motion then the Safety Rubber edge connections need to be rechecked. Need to recheck the Wireless Transmitter & Receiver connections

- **Functional Check of Photocells**

  Keep the Rapid Door at the Upper limit i.e. open.

  Now press the Down button on the Control Panel. The rapid door will come down.

  Place your hand in between the Transmitter and Receiver Photocells that are placed.

  The photocells light beam will be interrupted and the door down motion will be stopped and the door will move in the UP direction.

  Check this for both the pairs of Photocell Transmitters and Receivers.

- **Cleaning & Touchup of the Rapid Door**

  After the Installation checks & Operational checks are done for the Rapid Door check for the Finish of the Rapid Door.

  During Installation of the Side guides check if there are any scratches on the guides.

  If any scratches are found use the Spray Paint can of the same color to do the touchup at these locations.

  NOTE: If the Door doesn't reverse the Down motion then the Photocells connections need to be rechecked.

## 17. MAINTENANCE

Improper maintenance of the drive can result in property damage!

To avoid damage to the drive and door, the following points must be observed:-

- Maintenance must only be carried out by authorized persons.
- Directive ASR A1.7 must be complied with.
- Worn or faulty parts must be replaced.
- Only approved parts must be installed.
- All maintenance work must be documented.
- The drive unit has lifetime lubrication and is maintenance-free.
- The hollow shaft must be kept rust-free.
- Check that all mountings have been securely tightened.
- Check the brake (if available).
- Check the limit switches and safety switches.
- Check for noises and oil leaks.
- Check the mounting of the drive for corrosion.
- Check the housing for damage.
- Faulty parts that have been replaced must be disposed of properly in accordance with the regulations.

**POINT TO REMEMBER BEFORE HANDOVER :**

- **Check all mechanical & electrical working properly with all accessories.**
- **Properly clean all parts of door (which are seen in open) with clean duster, also clean the photocell & other accessories.**
- **Make the product to look good in aesthetically as well as operationally.**

## 18 USER INSTRUCTIONS

### General safety precautions

This user handbook is an integral and essential part of the product and must be delivered to users. Keep this document and pass it on to any future users. This automation is a "vertical-roll door"; it must be used for the specific purpose for which it was designed. Any other use is to be considered inappropriate and so dangerous. GAPL declines all responsibility for damage caused by improper, incorrect or unreasonable use.

### User precautions

- Do not enter the door action area while the door is moving.
- Do not lean obstacles against the door, the guides, or the casing.
- In the event of a fault / malfunctioning / accident / misalign / hit by vehicles etc., turn off the main switch, leave a warning notice on the door and ensure that a qualified person inspects the door.
- The operations of maintenance, adjustment and repair must be carried out by GAPL trained and qualified Engineers.
- Each Product has its own "Installation and Maintenance handbook", reporting the periodical maintenance.
- Please take care to check all the safety devices.

### Buttons

**Note: The operator must be in front of the door, when it is in motion.**

OPEN : the door opens completely. The stroke can be fixed via the open end stop micro-switch.

PART OPEN : the door opens partially. The stroke can be fixed via the close end stop micro-switch.

CLOSE : the door closes completely. The stroke can be fixed via end stop micro-switch.

STOP. : the door stop immediately

### Manual operation (only for emergency reopening)

- In the event of a power failure, the door is supplied with a manual over ride system. This is via a motor hand crank mechanism. To engage the manual over ride system, disconnect the power supply, fit the hand crank with motor, release the brake of the motor and turn in desired direction.
- Remember to re-connect the power supply after the Emergency operation.
- Manual operation is carried out by trained personnel's only.
- In case of manual operation, excessive force is not required to operate the door. The speed of the door should be same or lesser than the speed of motorised door and should not exceed under any circumstances.
- Manual operation should be strictly carried out only in case of emergency and not as a routine practice, which may lead to fatal accidents. GAPL shall not be held responsible in such an event.

### Maintenance

Regular inspections should be made according to national regulations and product documentation by GAPL trained and qualified Engineers. The number of service occasions should be in accordance with national requirements and with the product documentation.

### Installation / Fitting

- Tighten the fitting screws of the uprights with the crosspiece and Check the anchoring of the door to the door frame.

### Motor

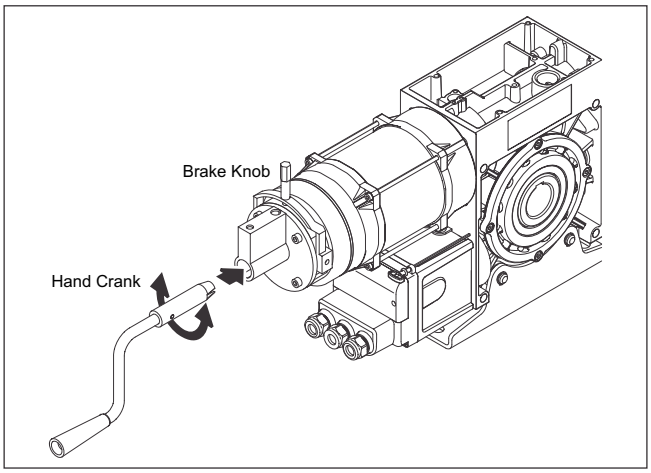
- Check the fixing of the motor to the relevant support.
- Check the limit switches functioning and the good alignment with cams. Check the belt tension.
- Check the brake disc wearing. If necessary replace the disc.
- Check the silent block positioning and the rubber wearing.

### Main Shaft

- Check the bearing supports fixing and Lubricate the support of the bearing by suitable grease inlet.

### Safety Devices

- Check the good safety bar functioning and Check the good conditions of the safety bar rubber profile.
- Check the adjusting and the eventual wearing of the steel cable of the electromechanical safety edge.
- Check the wearing of the mobile cable and side plastic safety edge shoes.
- Check the correct operation of the safety photocells.




**If you have any problem related to our products, please feel free to contact us at:**

**Gandhi Automations Pvt Ltd**

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TOLL FREE
1800 209 0200
From Anywhere in India

Prepared by :
SA / KM

Indian Green Building Council
M E M B E R

An ISO 9001 : 2008 Company

Gandhi Automations operates a policy of continuous development and reserves the right to make appropriate technical modifications / replacements without prior notice.

# GANDHI
Automations Pvt Ltd

## India's No.1 Entrance Automation & Loading Bay Equipment Company


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