MFZ OVITOR

Operating Instructions for Control CS 300

GB

MFZ OVITOR

1. Contents

2. Key to symbols

Danger of personal injury!
The safety instructions must be observed!

Warning! Danger to property!
The safety instructions must be observed!

Information
Special information
OR
Reference to other sources of information

3. General safety instructions

Guarantee

The function and safety of the equipment is only guaranteed if the warning and safety instructions included in these operating instructions are adhered to.
MFZ Antriebe GmbH + Co.KG is not liable for any personal injury or damage to property that occurs as a result of the warning and safety instructions being disregarded.

Using the equipment for its intended purpose

The CS 300 controls are designed only for controlling gates and doors with digital end position systems.

Target group

Only qualified and trained electricians may connect, programme and service the controls.
Qualified and trained electricians meet the following requirements:

- knowledge of the general and specific safety and accident prevention regulations,
- knowledge of the relevant electrical regulations,
- trained in the use and care of appropriate safety equipment,
- capable of recognising the dangers associated with electricity.

Instructions for installation and connection

- The controls must be disconnected from the electricity supply before carrying out electrical works. It must be ensured that the electricity supply remains disconnected during the works.
- Local protective regulations must be complied with.

Regulations and bases for testing
For connecting, programming and servicing, the following regulations must be observed (the list is not exhaustive).

Construction product standards
- EN 13241-1 (Products without fire resistance or smoke control characteristics)
- EN 12445 (Safety in use of power operated doors - Test methods)
- EN 12453 (Safety in use of power operated doors - Requirements)
- EN 12978 (Safety devices for power operated doors and gates - Requirements and test methods)

Electromagnetic compatibility
- EN 55014-1 (Radio disturbance, household appliances)
- EN 61000-3-2 (Disturbances in supply systems - harmonic currents)
- EN 61000-3-3 (Disturbances in supply systems - voltage fluctuations)
- EN 61000-6-2 (Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments)
- EN 61000-6-3 (Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments)

Machinery guidelines
- EN 60204-1 (Safety of machinery, electrical equipment of machines, part 1: general requirements)
- EN 12100-1 (Safety of machinery. Basic concepts, general principles for design. Basic terminology, methodology)

Low voltage
- EN 60335-1 (Household and similar electrical appliances - Safety)
- EN 60335-2-103 (Particular requirements for drives for gates, doors and windows)

Professional association (D)
- BGR 232 (Directive for Power-driven Windows, Doors and Gates)

4. Overview of products GB

4.1 Various options

The following package options are available for the CS 300 controls:
- CS 300 control with LCD monitor
- CS 300 control with LCD monitor in housing
- CS 300 control with LED module for setting the OPEN and CLOSED door positions (further adjustment settings are not possible)
- CS 300 control without LED module and without LCD monitor (module or monitor are required for adjusting the settings)

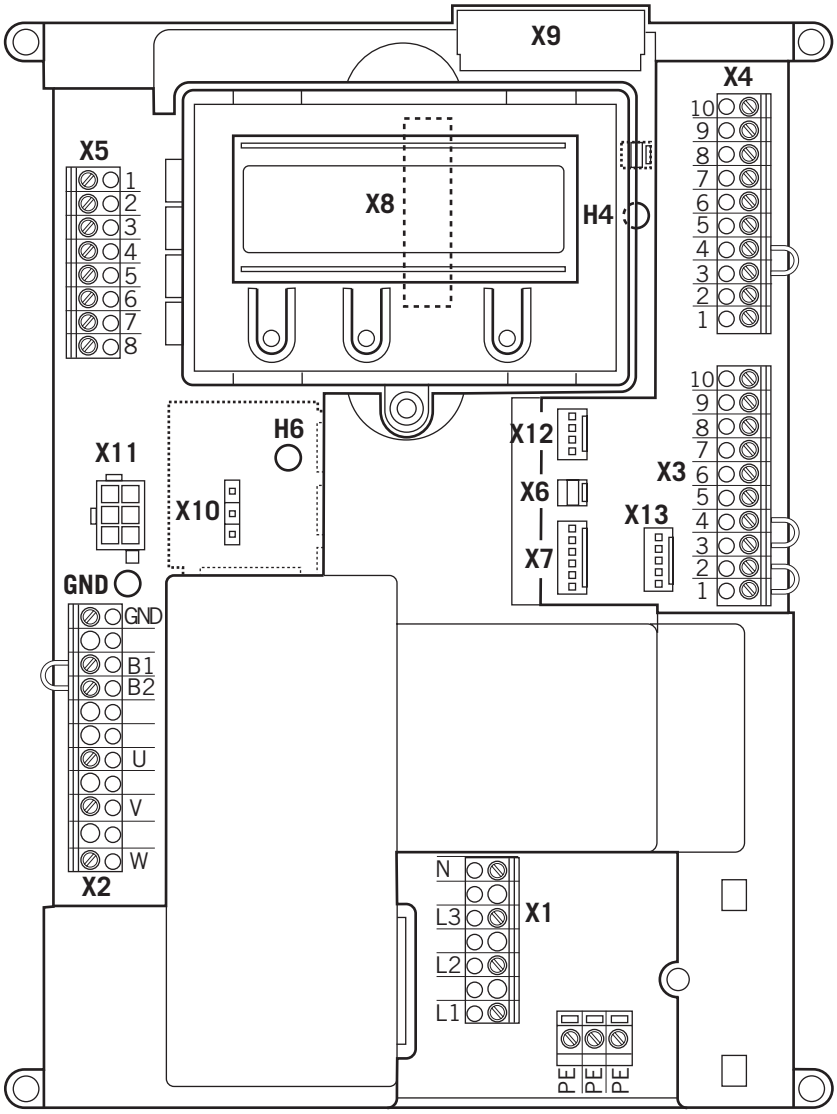
All the above options can be fitted with a plug-in weekly timer and a plug-in radio receiver.

The following options are available for the housing.
- Housing with CS three-button input unit
- Housing with KDT three-button input unit
- Housing with key switch ON/OFF
- Housing with main switch
- Housing with emergency off switch

The operating instructions describe the connection possibilities and programming procedures for the different models:
- CS 300 control with LED board
- CS 300 control with attached LCD display board

4. Overview of products

4.2 CS 300 basic board (with attached LCD display monitor)



Key:

X1: terminal block mains connection

X2 : terminal block motor

X3: terminal block command devices

X4: terminal block safety elements

X5: terminal block relay

X6: sockets for internal ON-OFF switch

X7: sockets for internal 3-button input unit

X8: socket for monitor (under monitor)

X9: sockets for radio receiver

X10: sockets for weekly timer

X11: sockets for digital end-position system

X12: socket for external radio receiver

X13: terminal block for CS three-button input unit

H4: status display for safety edge protection (SEP) - illuminated when SEP is working

H6: Safety circuit status message - lights up when the safety circuit is closed

5. Initial Operation

5.1 General

Warning!

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

- *The gate or door is installed and ope rational.*
- *The MFZ drive motor is installed and ready for operation.*
- *The command and safety devices are installed and ready for operation.*
- *The control housing with the CS 300 control is installed.*

Information:

For the installation of the gate/door, the MFZ drive motor and the command and safety devices, the relevant manufacturer's instructions are to be adhered to.

5.2 Mains connection

Danger!

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

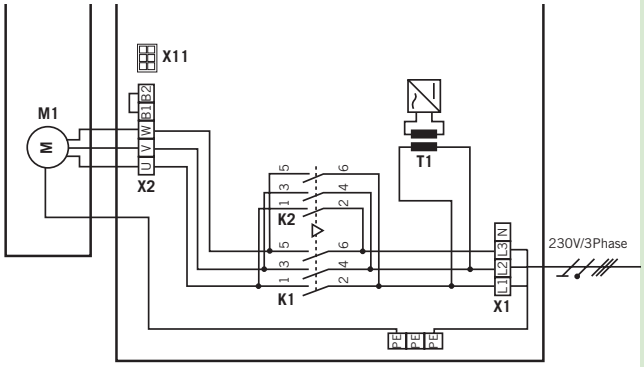
- *The mains voltage must correspond to the voltage stated on the type plate.*
- *The mains voltage must be the same as the voltage of the drive.*
- *For a three-phase current, a clockwise rotating field is required.*
- *For a permanent connection, an all-pole main switch must be used.*
- *For a three-phase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

Warning!

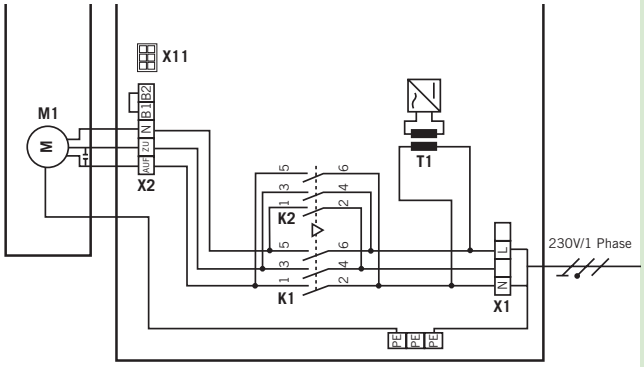
Before switching on the controls for the first time, a check must be carried out after completing the wiring to ensure that all the motor connections at the motor and at the controls are securely fixed. All control voltage inputs are galvanically isolated from the supply.

5. Initial Operation

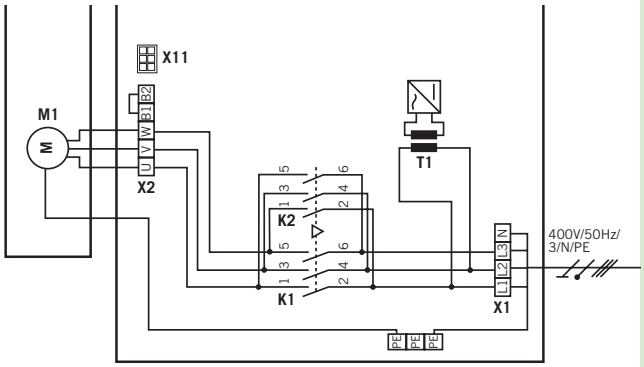
Detailed circuit diagram for mains connection and motor (230 V / three phase)



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:

K1: protection, CLOSE
K2: protection, OPEN
M1: motor
T1: transformer
X1: terminal block for mains connection
X2: terminal block for motor
X11: sockets for digital end position system with safety circuit (STOP CIRCUIT)

Connection:

☞ Connect the digital end-position system to the control.
☞ Connect the control to the mains.
☞ Connect the control to the motor.
☞ Short before the corresponding screw terminals, groups of cables should be make safe by means of straps

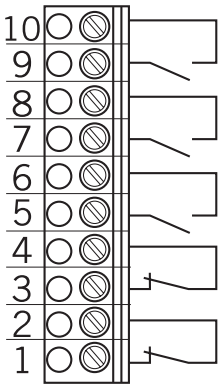
Information:

Technical data see page 23.

5.3 Allocation of connections for command and safety devices

Command and safety devices can be connected to terminals X3, X4 and X5.

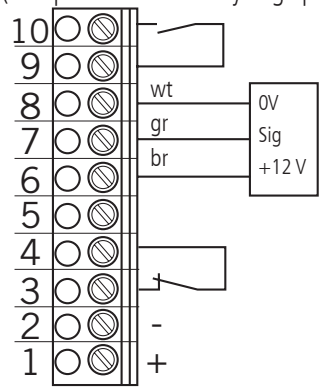
Terminal block X3



- CLOSE switch
- impulse switch[1]
- OPEN switch
- STOP switch
- emergency off, slack rope switch, wicket door contact, draw-in protection

Terminal block X4

(for optoelectronic safety edge protection)



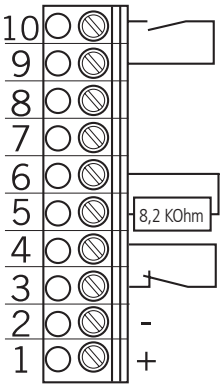
- PART – OPEN[2]
- safety edge protection OPTO
- photoelectric drive-through barrier[3]
- 24 V DC / 250 mA[4]

[1] sequence control
[2] button or selector switch
[3] effective in down direction
[4] for external switching devices (connection to terminals 1 and 2)

wt: white
gr: green
br: brown

Terminal block X4

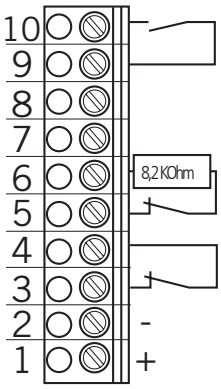
(for 8.2 kOhm safety edge protection)



- PART - OPEN[2]
- safety edge protection
- photoelectric drive-through barrier[3]
- 24 V DC / 250 mA[4]

Terminal block X4

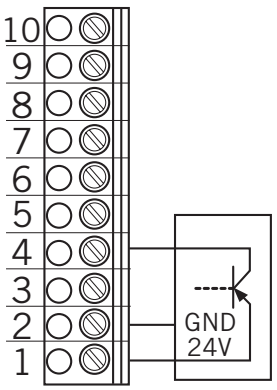
(for pneumatic safety edge protection – pressure sensor test:
- A 8.2 kOhm resistor must be connected in series
- The input parameter SEP TEST must be switched on)



- PART - OPEN[2]
- safety edge protection
- photoelectric drive-through barrier[3]
- 24 V DC / 250 mA[4]

Terminal block X4

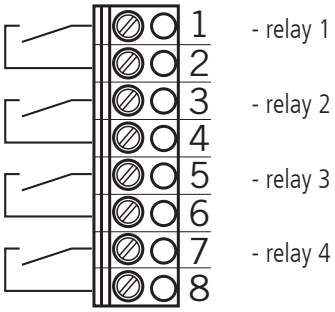
(for three-wire photoelectric barrier)



- Three-wire photoelectric barrier

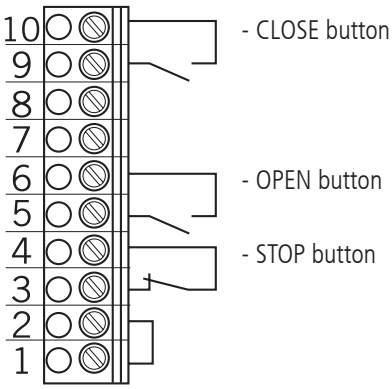
5. Initial Operation

Terminal block X5
(potential free switch contact)

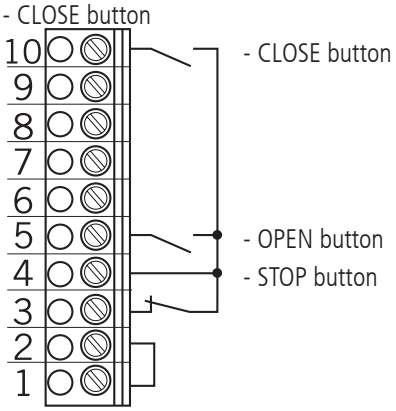


5.4 Connection examples for command and safety devices (terminal block X3)

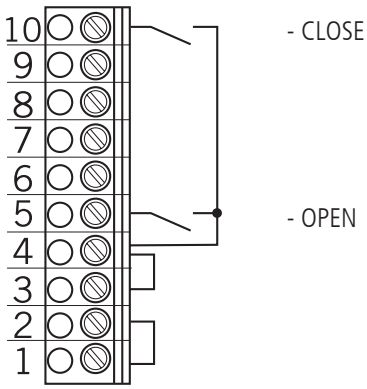
OPEN / STOP / CLOSE buttons
(6-lead solution)



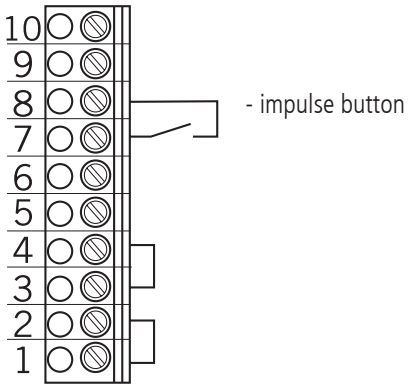
OPEN / STOP / CLOSE buttons
(4-lead solution)



Key switch OPEN / CLOSE



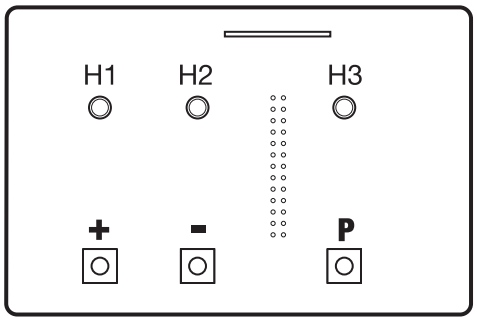
Impulse button
(sequence control)



Connection:
☞ Connect the command and safety devices to the control.

6. Programming with the LED module GB

6.1 Overview of LED module



Key:

- LED off
- LED illuminated
- LED flashing

6.2 LED module, modes of operation

With the LED module, the controls have two modes of operation:
1. AUTOMATIC
2. ADJUSTMENT

Information:
The current mode of operation of the control is shown via the LEDs.
- In the AUTOMATIC mode, no LEDs flash.
- In the ADJUSTMENT mode, at least one LED flashes.
Pressing the P button toggles between the modes of operation.

Operating mode 1: AUTOMATIC
In the AUTOMATIC operating mode the door system is operated.

LED displays:

H1	H2	Status
●	○	The door is open. The programmed OPEN end position has been reached.
○	●	The door is closed. The programmed CLOSED end position has been reached.
○	○	The door is between end positions. No end position has been reached.
●	●	The door has been moved beyond the CLOSED/OPEN end position.

6. Programming with the LED module

Operating mode 2: ADJUSTMENT
In the ADJUSTMENT mode, the OPEN/CLOSED end position settings are adjusted.

Warning!
In the ADJUSTMENT mode of operation, the drive does not switch off when the end position is reached. The door can be damaged if driven beyond the end position.

LED displays:

H1	H2	Status
●	◎	The OPEN end position is programmed at this door position.
◎	●	The CLOSED end position is programmed at this door position.
◎	◎	The CLOSED and OPEN end positions are not programmed at this door position.

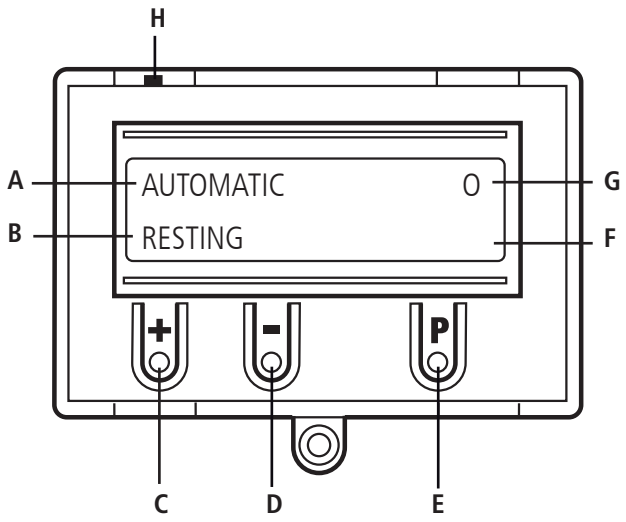
6.3 Setting the end positions

Setting the OPEN end position
☞ Change the mode of operation to ADJUSTMENT by pressing the (P) button.
☞ Drive the door into the desired OPEN end position by pressing the (+) button.
☞ Save the end position by pressing simultaneously the (P) button and the (+) button.
☞ Change to AUTOMATIC mode by pressing the P button.

Setting the CLOSED end position
☞ Change the mode of operation to ADJUSTMENT by pressing the (P) button.
☞ Drive the door into the desired CLOSED end position by pressing the (-) button.
☞ Save the end position by pressing simultaneously the (P) button and the (-) button.
☞ Change to AUTOMATIC mode by pressing the P button.

7. Programming with the LCD monitor

7.1 Overview of the LCD monitor



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

7.2 LCD monitor, modes of operation

The control has four modes of operation with the LCD monitor:
1. AUTOMATIC
2. ADJUSTMENT
3. INPUT
4. DIAGNOSIS

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

Operating mode 1: AUTOMATIC
In the AUTOMATIC operating mode the door system is operated.

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

If the "self locking" parameter is set to MOD2 or MOD3 in the input menu, the display changes from AUTOMATIC to MANUAL OPERATION.

Operating mode 2: ADJUSTMENT
In the ADJUSTMENT mode, the OPEN/CLOSED end position settings are adjusted.

Warning!
In the ADJUSTMENT mode of operation, the drive does not switch off when the end position is reached.
The door can be damaged if driven beyond the end position.

Fine adjustments can be made in the INPUT operating mode.

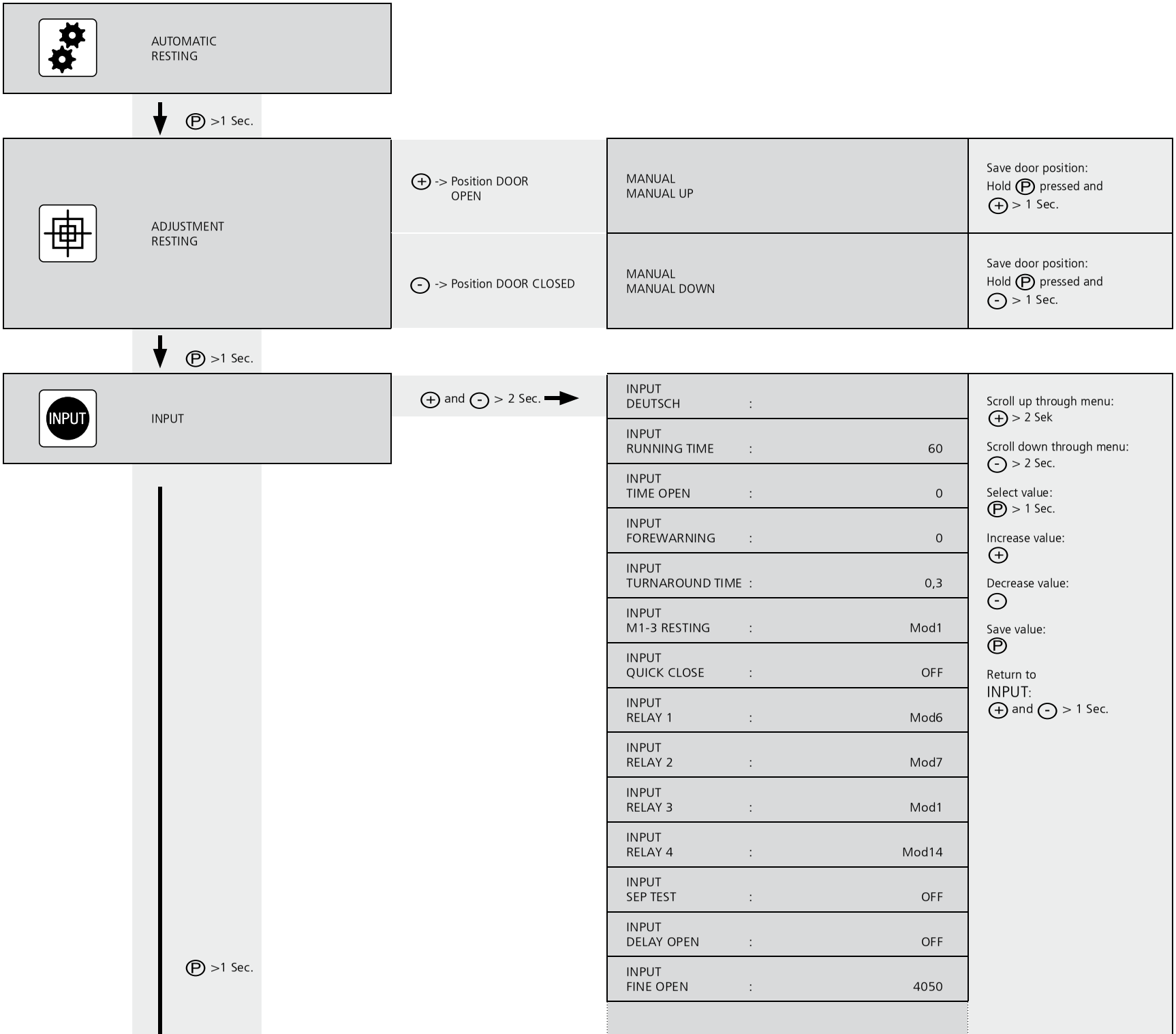
Display:
- displays the end position value

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


AUTOMATIC
RESTING
Ⓟ >1 Sec.
ADJUSTMENT
RESTING
⊕ -> Position DOOR OPEN
MANUAL
MANUAL UP
Save door position:
Hold Ⓟ pressed and
⊕ > 1 Sec.
⊖ -> Position DOOR CLOSED
MANUAL
MANUAL DOWN
Save door position:
Hold Ⓟ pressed and
⊖ > 1 Sec.
Ⓟ >1 Sec.
INPUT
INPUT
⊕ and ⊖ > 2 Sec.
INPUT DEUTSCH :
INPUT RUNNING TIME : 60
INPUT TIME OPEN : 0
INPUT FOREWARNING : 0
INPUT TURNAROUND TIME : 0,3
INPUT M1-3 RESTING : Mod1
INPUT QUICK CLOSE : OFF
INPUT RELAY 1 : Mod6
INPUT RELAY 2 : Mod7
INPUT RELAY 3 : Mod1
INPUT RELAY 4 : Mod14
INPUT SEP TEST : OFF
INPUT DELAY OPEN : OFF
INPUT FINE OPEN : 4050
Scroll up through menu:
⊕ > 2 Sek
Scroll down through menu:
⊖ > 2 Sec.
Select value:
Ⓟ > 1 Sec.
Increase value:
⊕
Decrease value:
⊖
Save value:
Ⓟ
Return to
INPUT:
⊕ and ⊖ > 1 Sec.
Ⓟ >1 Sec.

INPUT FINE CLOSE	:	3950
INPUT BES OPEN	:	4000
INPUT BES CLOSE	:	4000
INPUT ROTATING FIELD	:	RE
INPUT REVERSE OFF	:	50
INPUT POWER	:	0
INPUT AUTO LEVEL	:	OFF
INPUT SELF LOCK	:	ON
INPUT SU/WI	:	MOD1
INPUT P/E BARRIER OPEN	:	MOD2
INPUT P/E BARRIER CLOSED	:	MOD1
INPUT SEP LEADING	:	MOD1

DIAGNOSIS

ES OPEN ES CLOSE	: :	ON ON
OPEN BUTTON PART OPEN	: :	OFF OFF
CLOSE BUTTON SEP	: :	OFF ON
IMPULSE TIMER	: :	OFF OFF
P/E BARRIER STOP CIRCUIT	: :	ON ON
CYCLE AVE	: :	4 2599

Scroll up through menu:
⊕ > 2 Sek

Scroll down through menu:
⊖ > 2 Sec.

Return to AUTOMATIC operating mode:
Ⓟ

Only query is possible

9. Overview of functions

9.1 Automatic operating mode

Display		Description
AUTOMATIC OPENING		The door is driven to the OPEN* end position
AUTOMATIC CLOSING		The door is driven to the CLOSED* end position
AUTOMATIC RESTING		The door stands between the end positions
AUTOMATIC RESTING	O	The door stands at the OPEN end position
AUTOMATIC RESTING	o	The door stands at the position PART OPEN („before-end position" up)
AUTOMATIC RESTING	U	The door stands at the CLOSED end position
AUTOMATIC RESTING	u	The door stands at the position PART CLOSE („before-end position" down)
AUTOMATIC RESTING	r	The door stands in the position where the reversing switches off

Information:

If the "self locking" parameter is set to MOD2 or MOD3 in the input menu, the display changes from AUTOMATIC to MANUAL OPERATION.

Display	Description
MANUAL MANUAL UP	The door is driven to the OPEN* end position
MANUAL MANUAL DOWN	The door is driven to the CLOSED* end position
MANUAL RESTING	The door stands between the end positions

*When the gate is being driven OPEN, the power currently being used is displayed.

9.2 Input operating mode

Function	Description	Setting options	Factory setting
DEUTSCH	Select the menu language	DEUTSCH ENGLISH FRANCAIS ESPANOL NEDERLANDS POLSKI CESKY ITALIANO	DEUTSCH
RUNNING TIME	Monitoring the max. running time for an open and close movement. The running time must be set to be slightly greater than the effective running time of the door.	1 – 250 Seconds	60 Seconds
TIME OPEN	After the door has opened, it runs in the CLOSE direction again after the set time has elapsed. At a setting OPEN TIME > 0, the impulse function (X3 8/9) only generates commands in the OPEN direction.	0 – 600 Seconds	0 = Auto-close off
FOREWARN-ING	Before the door starts to move downwards, the traffic light flashes during the forewarning time if automatic closing is activated, or in the case of impulse operation.	0 - 120 Seconds	0 = Off
TURNA-ROUND TIME	Standing time at every change of direction	0,1 - 2,0 Seconds (in 1/10 Sec)	0,3 Seconds
M1-3 RESTING	MOD1: When resting relay OFF (door closed) MOD2: When resting relay ON (door closed)	MOD1 MOD2	MOD1
QUICK CLOSE	ON: The open time is cut short and the door closes immediately after the photoelectric barrier (X4 3/4) has been activated. This function is also active if the open time = 0. OFF: The open time continues as usual	ON OFF	OFF

9. Overview of functions

Function	Description	Setting options	Factory setting
RELAY 1	All 4 relays can be allocated to a relais mode of 1-28. The parameter M1-3 TRAFFIC LIGHT REST affects the red traffic light (MOD 1-3). MOD1: (Red light 1) flashes during forewarning and is on when door is running MOD2: (Red light 2) flashes during forewarning and when door is running	MOD1 - MOD28	MOD6
RELAY 2	MOD3: (Red light 3) is on during forewarning and when door is running MOD4: Impulse signal at OPEN command MOD5: Error message (In the case of stop messages and error messages, please refer to section 10) MOD6: OPEN end position MOD7: CLOSE end position MOD8: Final position OPEN denied	MOD1 - MOD28	MOD7
RELAY 3	MOD9: Final position CLOSED denied MOD10: Before-end position OPEN MOD11: Before-end position CLOSE MOD12: From before CLOSE position to CLOSE position MOD13: Magnetic locking function MOD14: Brake MOD15: Brake negated MOD16: Brake remains ON during open time MOD17: SEP activated	MOD1 - MOD28	MOD1
RELAY 4	MOD18: (Red light 4) flashes during forewarning and is off when door is running MOD19: From before-end position OPEN to OPEN end position MOD20: Activation of the optoelectronic transmission system MOD21: Test of draw-in protection before opening run (additional module required) MOD22: Test of external safety devices before closing run (additional module required) MOD23: (Green light) is on during OPEN end position and OFF during forewarning and OFF when door is running MOD24: Capacitor circuit for 230V single phase drives MOD25: Yard light function 2 minutes after OPEN command MOD26: Activation of radio transmission system MOD27: Impulse signal after attaining OPEN end position MOD28: Relay OFF	MOD1 - MOD28	MOD14
SEP TEST	ON: PS testing is active OFF: PS testing is inactive The testing of the PS switch takes place in the CLOSE end position. To achieve this, the airswitch contact must be activated briefly when the door comes to rest on the ground.	ON OFF	OFF
DELAY OPEN	ON: Forewarning also before opening OFF: Immediate opening Only active when the parameter FOREWARNING TIME is > 0.	ON OFF	OFF
FINE OPEN	Fine adjustment of OPEN end position	0 – 8190 (is set to programmed value after adjustment)	4050
FINE CLOSE	Fine adjustment of CLOSE end position	0 – 8190	3950
BES OPEN	Setting of cut-out point before-end position OPEN / PART OPEN	0 – 8190	4050

Function	Description	Setting options	Factory setting
BES CLOSE	Setting the before-end position switch point for the CLOSE direction	0 – 8190	3950
ROTATING FIELD	MOD1: Standard assembly (clockwise rotating field / increasing AVE values during opening run) MOD2: Special assembly (anticlockwise rotating field / increasing AVE values during opening run) This setting may only be altered in the case of a special customised drive installation!	MOD1 MOD2	MOD1
REVERSE OFF	The point where the reversing switch is activated before the CLOSE end position is reached. After going beyond the cut-out point, the door is stopped if the switching strip or photoelectric barrier is activated, but it is not reversed. The value must not exceed a maximum of 5 cm above the lower end position.	10 – 250	50
POWER	The power is displayed during the opening movement. If the power monitoring facility is activated, a value must be set, which is lower than the lowest value displayed during opening. The larger the difference, in comparison to the lowest value displayed, the less sensitive the reaction of the power monitoring. The power monitoring facility is only activated if the value is set to be > 0.	0 – 999	10
AUTO LEVEL	ON: Align with ground, ON OFF: Align with ground, OFF	ON OFF	OFF
SELF LOCK	MOD1: Automatic operation MOD2: Manual operation for OPEN and CLOSE MOD3: Manual operation for CLOSE	MOD1 - MOD3	MOD1
SU/WI	Connection to terminal strip X4 (9 + 10) MOD1: (SU/WI button 1) When the button is pressed, the door opens as far as the intermediate position PART OPEN. There is no automatic closing of the door from the position PART OPEN. MOD2: (SU/WI selector switch 1) Closed: all OPEN commands lead to the position PART OPEN. Open: all OPEN commands lead to the position OPEN. The door closes automatically from both positions. MOD3: (SU/WI selector switch 2) Closed: all OPEN commands lead to the position PART OPEN. Open: all OPEN commands lead to the position OPEN. The door closes automatically only from the position PART OPEN. MOD4: (SU/WI selector switch 3) Closed: all OPEN commands lead to the position PART OPEN. Open: all OPEN commands lead to the position OPEN. The door closes automatically only from the position OPEN. MOD5: (SU/WI button 2) When the button is pressed, the door opens as far as the intermediate position PART OPEN. Automatic closing of the door also occurs from the position PART OPEN. MOD6: Activation of automatic closing Closed: no automatic closing of the door Open: automatic closing of the door is active MOD7: External input for clock The door opens once the contact closes and remains in the position OPEN until the contact opens. The door then closes automatically. This function can be aborted by pressing the CLOSE button. The door then closes. MOD8: Selector switch: Keeping the door open / alarm Closed: The drive moves the door into the PART OPEN position. As long as the contact is closed, the door remains there. Open: normal operation	MOD1 - MOD7	MOD1

9. Overview of functions

Function	Description	Setting options	Factory setting
P/E BARRIER CLOSED	MOD1: Stop when activated MOD2: Stop and reverse when activated	MOD 1 MOD 2	MOD 2
P/E BARRIER OPEN	MOD1: Photoelectric barrier not active MOD2: When the photoelectric barrier is activated between the CLOSED end position and the pre-limit switch CLOSE, the door stops. The red light is on. The pre-limit switch CLOSE goes automatically to CLOSED end position + 600.	MOD 1 MOD 2	MOD 1
SEP LEADING	MOD1: No function MOD2: Leading photoelectric barrier (MFZ)	MOD 1 MOD 2	MOD 1

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	ON / OFF *	OFF	Flashing	ON
MOD 2	Red traffic light 2	ON / OFF *	OFF	Flashing	Flashing
MOD 3	Red traffic light 3	ON / OFF *	OFF	ON	ON
MOD 18	Red traffic light 4	OFF	OFF	Flashing	OFF
MOD 23	Green traffic light	OFF	ON	OFF	OFF

* depending upon parameter MOD1-3 RESTING

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	Before-end position OPEN / PART OPEN	The relay closes the contact when the door is in the before-end position OPEN / PART OPEN.
MOD 11	Before-end position CLOSED	The relay closes the contact when the door is in the before-end position CLOSED.

MOD	Description	Remarks
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 / PART OPEN.

C. Impulse signals

MOD	Description	Remarks
MOD 4	Impulse when there is an OPEN command	The relay closes the contact for 1 second when the door receives an OPEN command. 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 photoelectric barrier.

D. Brake functions

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 is not switched in the OPEN end position (OPEN TIME).

9. Overview of functions

E. Error messages

MOD	Description	Remarks
MOD 5	Error message	The relay closes the contact when a stop command is given or an error occurs. 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 the switching strip or an unsuccessful test is shown via MOD 5.

F. Functions for external accessories

MOD	Description	Remarks
MOD 13	Magnetic lock function	The relay is open in the CLOSED end position. If an OPEN command is received, the relay closes and remains closed until the CLOSED end position is reached again. If a time delay is required for opening the magnetic lock, this is realised through the parameter DELAY OPEN and forewarning.
MOD 20	Activation of optoelectronic transmission system	Before every CLOSE command, the optoelectronic transmission system is activated and remains active for the duration of the closing run. This activation results in a closing run delay of approx. 0.5 seconds.
MOD 21	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 safety circuit is activated.
MOD 22	Test of external safety devices	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 drive 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 transmission system	Before every CLOSE command the radio transmission system is activated by an impulse. The duration of the activation must be set in 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.

9.3 Diagnostic operating mode

Display	Meaning	Status
ES OPEN	OPEN end position	OFF: confirmed ON: not confirmed
ES CLOSE	CLOSE end position	OFF: confirmed ON: not confirmed
OPEN BUTTON	OPEN button	ON: confirmed OFF: not confirmed
PART OPEN	PART OPEN button (X4 / 9 + 10)	ON: confirmed OFF: not confirmed
CLOSE BUTTON	CLOSE button	ON: confirmed OFF: not confirmed
SEP	Safety edge protection	ON: system circuit is closed OFF: system is interrupted (fault)
IMPULSE	Impulse button	ON: confirmed OFF: not confirmed
TIMER	Weekly timer	ON: confirmed OFF: not confirmed
P/E BARRIER	Photoelectric drive-through barrier	ON: circuit closed OFF: interrupted (fault)
STOP CIRCUIT	- Stop button of controls - Stop systems of drive	ON: circuit closed OFF: interrupted (fault)
CYCLE	Gate-cycle counter	Displays the gate cycles
AVE	Absolute value encoder	Shows the gate position value

10. Error messages and rectification

Fault / error message	Cause	Rectification
System does not respond	- No voltage supply	- Check the voltage supply of the drive and the controls
Door travels to the CLOSE 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 clock-wise rotating field if necessary
STOP	- The safety circuit is interrupted. X3 1,2: Emergency off, slack rope switch, wicket door contact, draw-in protection X6 1,2: Internal On-Off switch X11 4,8: Safety circuit for door operator X2 B1/B2: Bridge X3 3,4: External stop button X7 1,2: Internal stop button	- Check and then close the safety circuit
ERROR END POSITION	- The door has travelled beyond one of the end positions - The end positions have not been programmed yet	- Check the programming of the end positions and reset them if necessary
ERROR RUN TIME	- The programmed running time has been exceeded	- Check the path of the door - Re-programme the running time
ERROR SEP	- The safety edge protection is faulty	- Check the safety edge protection and the spiral cable
	- Safety edge protection was triggered	- Remove obstruction from path of door
ERROR SEP TEST	- The PS switch is not activated at the CLOSE end position	- Check the PS switch, spiral cable and profile - Check the setting for the CLOSE end position
ERROR ROT. FIELD	- An incorrect rotating field is connected to terminal X1	- Ensure that a clockwise rotating field is connected
ERROR RS485	- Communications fault between the end position switch and the controls	- Check the cable and socket connections
ERROR POWER	- The power monitoring has been triggered	- Check that the door can move freely - Reset the power value

After rectifying the cause of the fault, the controls must be disconnected briefly from the mains!

11. Technical data

Dimensions of housing:	215 x 275 x 190
Assembling height:	vertically at the wall, min. at a height of 100 mm
Power supply via L1, L2, L3, N, PE:	400 V, 50 / 60 Hz; - max. power input 2200 W - 3.2 A; duty cycle 60% for a maximum running time of 120 s
Protection:	10 A K-characteristic
Own consumption of control:	max. 250 mA
Control voltage:	24 V DC, max. 250 mA; protected by self-resetting safety for external sensors
Control inputs:	24 V DC, all inputs are to be connected free of potential, min. signal time for incoming control command >100 ms.
Control outputs:	24 V DC, max. 250 mA
RS485 A and B	Only for electronic final switch. RS485 level, closed with 120 Ω
Safety chain / Emergency shutdown:	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.
Input safety bar:	For electrical safety bars with 8,2 kΩ, moving loads and dynamic optic systems.
Relays output:	If inductive loads are switched to (e.g.: relays or breaks), so these must be equipped with corresponding interference measures (recovery diode, varistores, RC modules). Operating contact free of potential, min. 10 mA; max. 230V AC / 4A *Contacts used once for power switch are not able to switch mini power anymore.*
Temperature range:	Operation: -10 °C ... +45 °C Storage: -25 °C ... +70 °C
Air humidity:	to 80% non condensing
Vibrations:	Assembling works with less vibration, e.g. at a masonned wall
Type of protection:	IP 65
Weight:	about 1,8 kg

12. EU Declaration of Conformity GB

Manufacturer:
MFZ Antriebe GmbH & Co. Kg, Neue Muehle 4,
48739 Legden, Germany

We hereby declare that, by virtue of their conceptual development and design, as well as their manufacture as we have brought them onto the market, the products cited below:
CS300 Door Controls
conform to the relevant basic health and safety regulations of the following EU guidelines and standards:

EU Construction Products Directive 89/106/EU
DIN EN 13241-1
DIN EN 12453
DIN EN 12445
DIN EN 12978

EU Electromagnetic Compatibility Directive 2004/108/EG
EN 55014-1
EN 61000-3-2
EN 61000-3-3
EN 61000-6-2
EN 61000-6-3

EU Machinery Directive 2006/42/EG
EN 60204-1
EN ISO 12100-1

EU Low Voltage Directive 2006/95/EG
EN 60335-1
EN 60335-2-103

BGR 232 - Directive for Power-driven Windows, Doors and Gates

Legden, 29 December 2009
Manufacturer's signature:

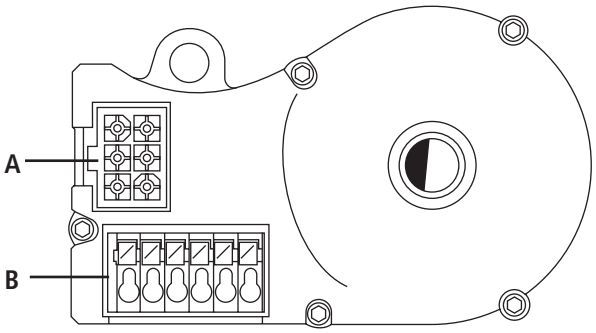
Hans-Joachim Molterer

Position of signatory:
Manager

13. Appendix

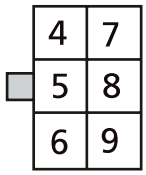
Limit switch and safety circuit for drive

Electronic interface



A: AVE plug (absolute value encoder plug)
B: AVE plug terminal (absolute value encoder plug terminal)

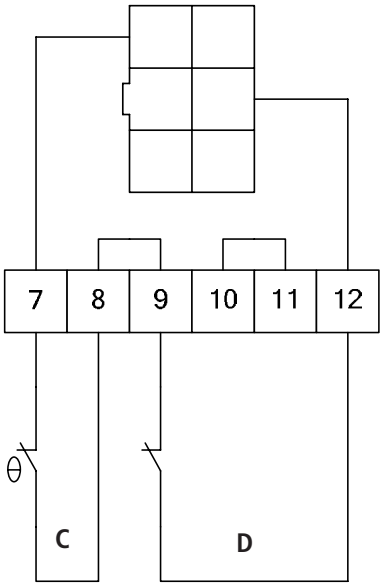
Wiring allocation, AVE (absolute value encoder) plug



The numbers on the plug are also the wire-numbers.

4: Safety circuit input
5: RS 485 B
6: GND
7: RS485 A
8: Safety circuit output
9: $12V_{DC}$

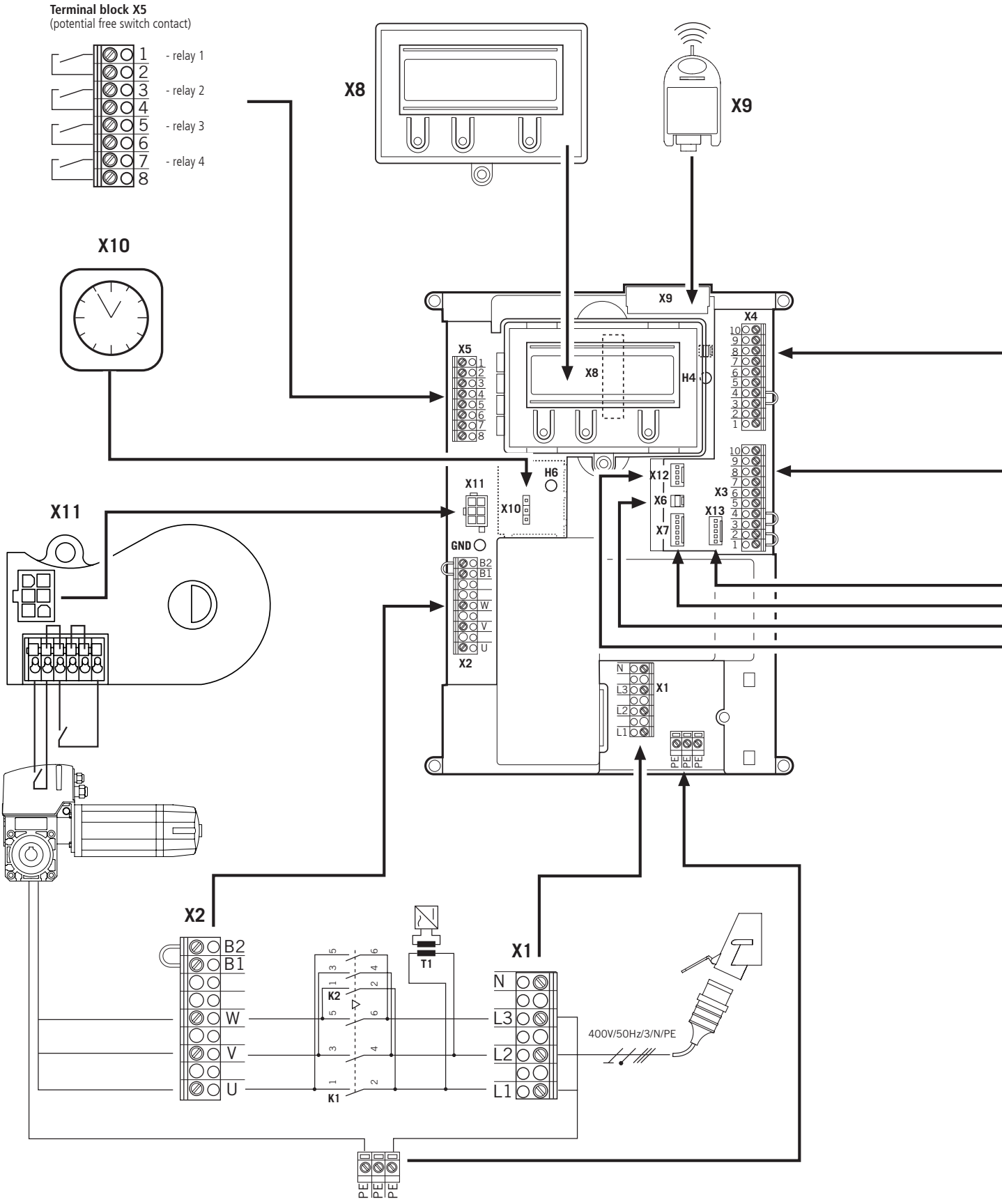
AVE (absolute value encoder) plug terminal (7-12)



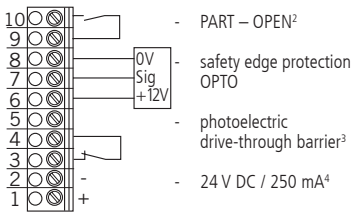
C: Thermal element in the drive
D: Manual emergency control (emergency crank or emergency chain)

13. Appendix

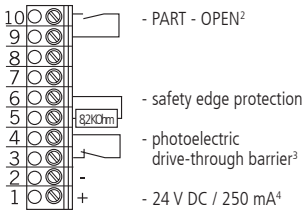
Overview of connections



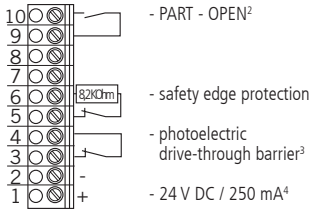
Terminal block X4
(for optoelectronic safety edge protection)



Terminal block X4
(for 8.2 kOhm safety edge protection)

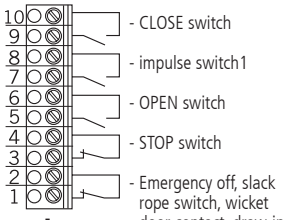


Terminal block X4
(for pneumatic safety edge protection – pressure sensor test) [5]

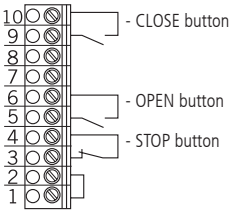


X4

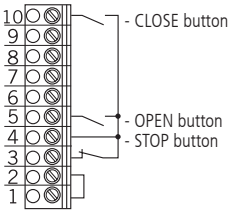
Terminal block X3
(assignment)



OPEN / STOP / CLOSE buttons
(6-lead solution)

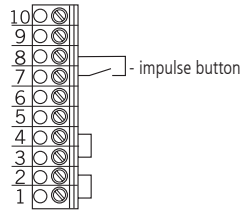


OPEN / STOP / CLOSE buttons
(4-lead solution)

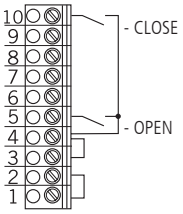


X3

Impulse button
(sequence control)

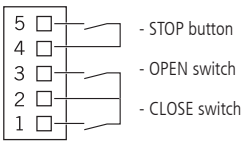


Key switch OPEN / CLOSE



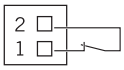
CS covered input unit

X13



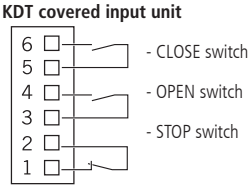
Internal ON/OFF switch

X6



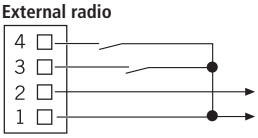
KDT covered input unit

X7



External radio

X12



[1] sequence control
[2] button or selector switch
[3] effective in down direction
[4] for external switching devices (connection to terminals 1 and 2)
[5] - A 8.2 kOhm resistor must be connected in series
- The input parameter SEP TEST must be switched on

wt:	white
gr:	green
br:	brown