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2. Information in this document

Original operating instructions

- Copyright.
- No part of these instructions may be reproduced without our prior approval.
- Subject to alterations in the interest of technical progress.
- All dimensions given in mm.
- The diagrams in this manual are not to scale.

Key to symbols



DANGER!

Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.



WARNING!

Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



CAUTION!

Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



NOTICE

Indicates an imminent danger of damage or destruction.



CHECK

Indicates a check to be performed.



REFERENCE

Reference to separate documents which must be complied with.

 Action request

- List, itemisation

→ Reference to other sections of this document


3. General safety instructions

GB



DANGER!

Failure to comply with the documentation could result in life-threatening danger!

 Be sure to follow all the safety instructions in this document.

Warranty

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 shall not be not liable for personal injury or damage to property if these occur as a result of the warnings and safety advice being disregarded. For damage that is caused by the use of spare parts and accessories not approved by us, any liability and warranty on the part of MFZ shall be excluded.

Using the equipment for its intended purpose

The CS 500 controls are designed exclusively for the control of gates and doors with digital or mechanical 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.
- The local protection regulations shall be observed.

Information concerning operation

- Children should not be allowed to play with permanently mounted adjusting or control devices.
- Keep remote controls beyond the reach of children.

Regulations and basis for testing

For connecting, programming and servicing, the following regulations must be observed (the list does not claim to be complete).

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 - Requirements and test methods)

EMC

- EN 55014-1 (Interference related to household appliances)
- EN 61000-3-2 (Effects on mains supplies - Harmonics)
- EN 61000-3-3 (Effects on mains supplies – Voltage variations)
- DIN EN 61000-6-2 (Electromagnetic compatibility (EMC) - Part 6-2: Generic standards – Immunity for industrial environments)
- DIN EN 61000-6-3 (Electromagnetic compatibility (EMC) - Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments)

Machinery Directive

- EN 60204-1 (Safety of machinery, electrical equipment of machines; Part 1: General requirements)
- EN ISO 12100 (Safety of machinery – General principles for design - Risk assessment and risk reduction)

General safety instructions

Low voltage

- DIN EN 60335-1 (Household and similar electrical appliances - Safety - Part 1: General requirements)
- DIN EN 60335-2-103 (Household and similar electrical appliances - Safety - Part 2-103: Particular requirements for drives for gates, doors and windows)

Committee for Workplaces (ASTA)

- ASR A1.7 (Technical rules for workplaces „Doors and gates“)

4. Overview of products

4.1 Various options

The following package options are available for the CS 500 controls:

- CS 500 control with contactor power module
- CS 500 control with frequency converter power module

The following options are available for the housing:

- Housing with OPEN-STOP-CLOSE button
- Housing with CS button
- Housing with key switch ON/OFF
- Housing with main switch
- Housing with emergency off switch

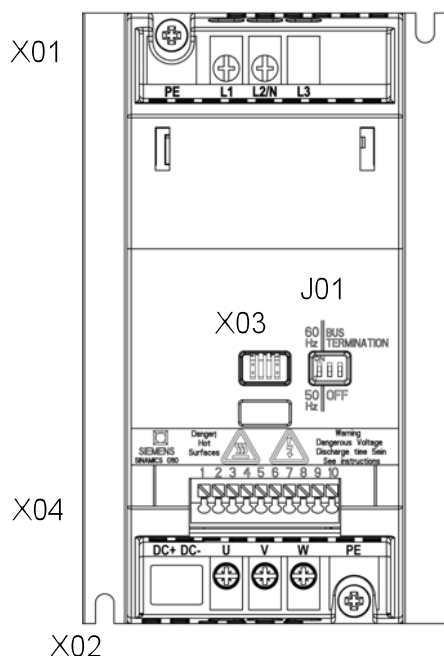
The operating instructions describe the connection possibilities and programming procedures for the different models:

- CS 500 control with LCD monitor
- CS 500 control with reverse contactor
- CS 500 control with frequency converter

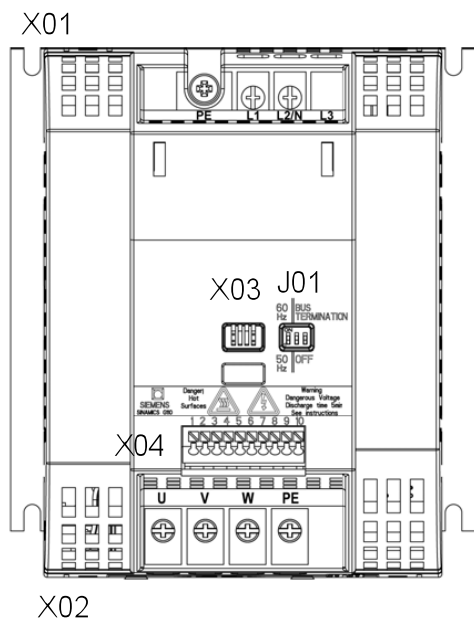
Overview of products

4.4 CS 500 FU power module

Version 1 to 0.75 kW



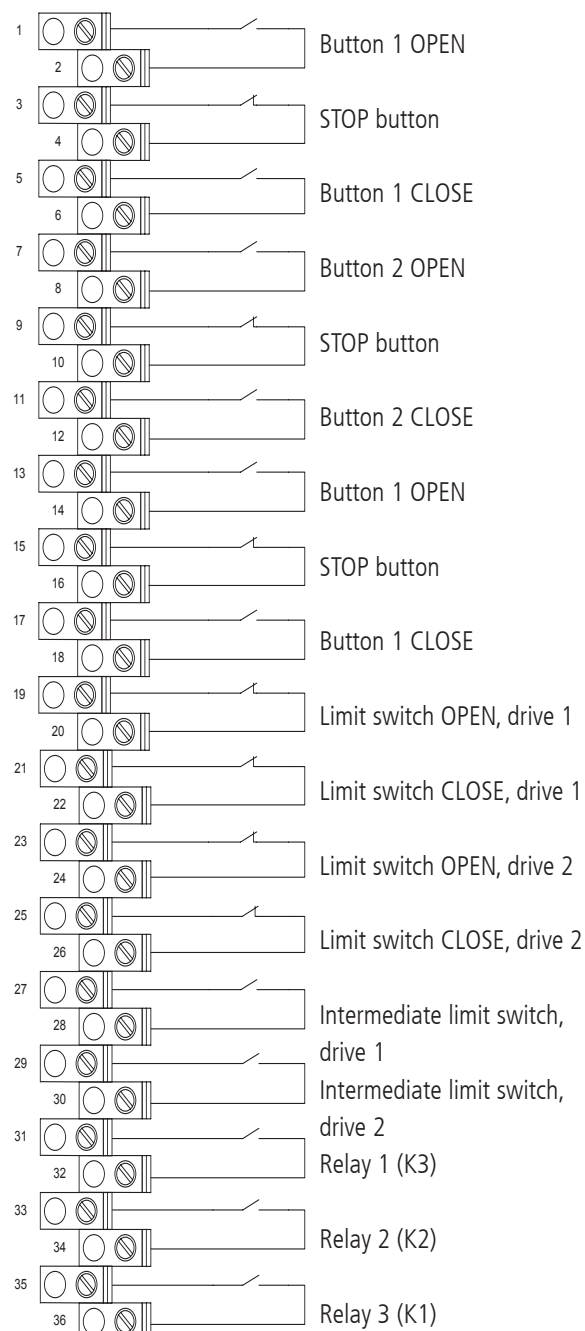
Version 2 to 1.5 kW

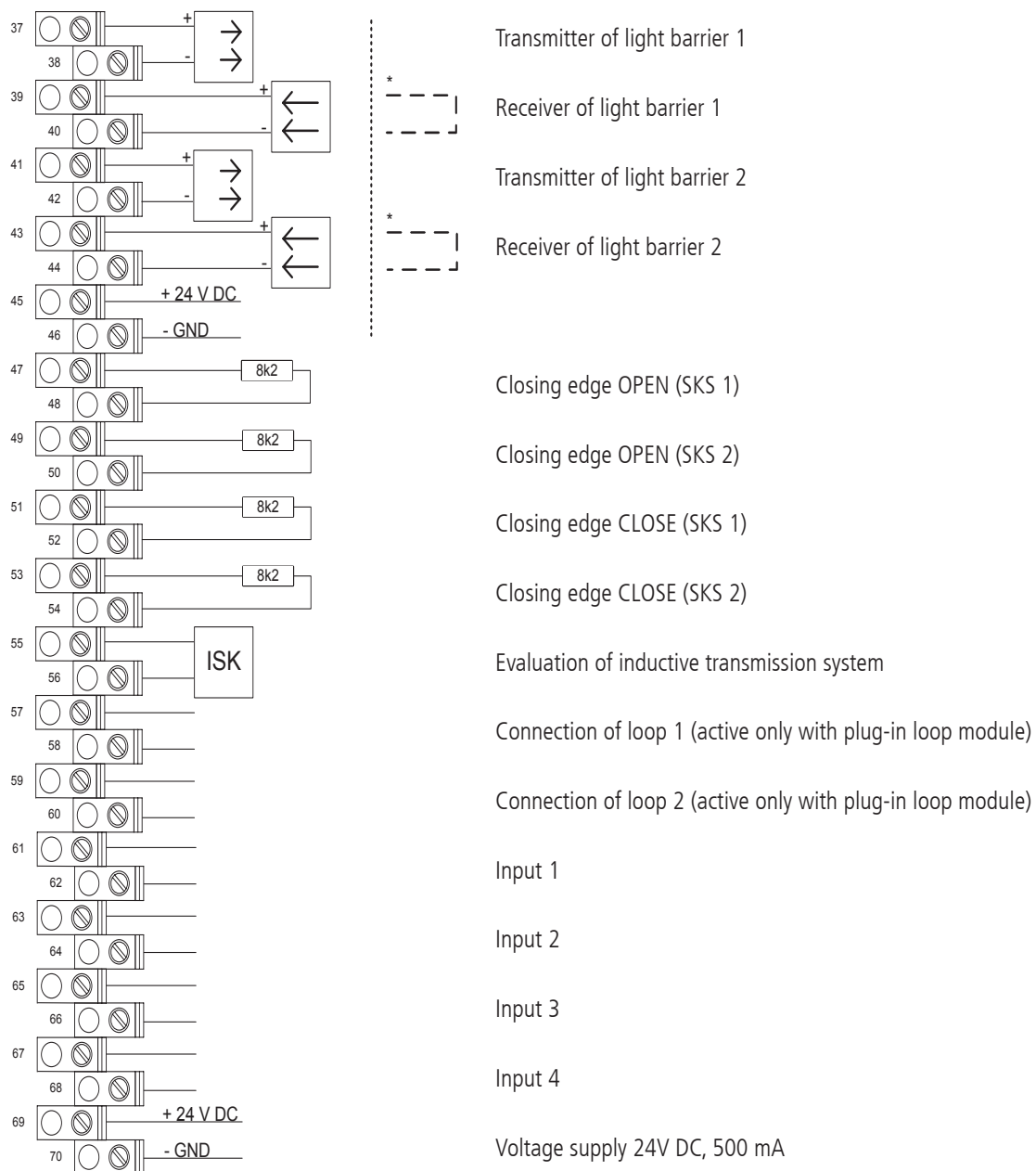


Key:

- X01: Supply line input
- X02: Motor connection
- X03: (BOP)z Siemens control module connection
- PE: PE connection
- X04: Control line
- J01: Bus connection

X100 connections





5. Frequency converter

5.1 General

The frequency control system allows the door speed to be adjusted separately for the OPEN and CLOSE directions. The acceleration and retardation times (SPEED UP / SLOW DOWN) ensure a gentle start and stop at the end positions. The frequency of the converter determines the operator speed.

5.2 Adjustable Values

The following values can be adjusted in the input menu.

T UPPER SW (J)

Time to be set related to the limit switch OPEN for the creep speed excluding „SPEED DOWN 1“ until the limit switch for the OPEN direction is reached.

→ „5.3 Operating diagrams“

T LOWER SW (K)

Time to be set related to the CLOSE limit switch for the creep speed excluding „SPEED DOWN 1“ until the limit switch for the CLOSE direction is reached.

→ „5.3 Operating diagrams“

FREQUENCY OPEN 1

Maximum speed in OPEN direction, if the central limit switch is not active, otherwise medium speed applies.

→ „5.3 Operating diagrams“

FREQUENCY CLOSE 1

Minimum speed in CLOSE direction, if the central limit switch is not active, otherwise medium speed applies.

→ „5.3 Operating diagrams“

FREQUENCY OPEN 2

Maximum speed in OPEN direction, if the central limit switch is active (rising edge).

→ „5.3 Operating diagrams“

FREQUENCY CLOSE 2

Maximum speed in CLOSE direction, if the central limit switch is active (falling edge).

→ „5.3 Operating diagrams“

FREQUENCY OPEN 3

Minimum speed in OPEN direction.

→ „5.3 Operating diagrams“

FREQUENCY CLOSE 3

Minimum speed in CLOSE direction.

→ „5.3 Operating diagrams“

SPEED UP 1

Acceleration time to „FREQUENCY OPEN 1“.

In OPEN and CLOSE direction.

→ „5.3 Operating diagrams“

SPEED DOWN 1

Delay time from „FREQUENCY CLOSE 1“ to „FREQUENCY CLOSE 3“. In OPEN and CLOSE direction.

→ „5.3 Operating diagrams“

SPEED UP 2

Acceleration time from „FREQUENCY OPEN 1“ to „FREQUENCY CLOSE 2“. In OPEN and CLOSE direction.

→ „5.3 Operating diagrams“

SPEED DOWN 2

Delay time from „FREQUENCY CLOSE 2“ to „FREQUENCY CLOSE 1“. In OPEN and CLOSE direction.

→ „5.3 Operating diagrams“

SPEED UP 3

The reversal time of the gate when activating the SKS consists of „Speed down 3“, „SKS reversal time“ and „Speed up 3“.

→ „5.3 Operating diagrams“

SPEED DOWN 3

→ See speed up 3

SPEED UP 4

The reversing time of the gate when activating the light barrier consists of „Speed down 4“, „Light barrier reversing time“ and „Speed up 4“.

→ „5.3 Operating diagrams“

SPEED DOWN 4

→ See speed up 4

SPEED DOWN 5

Delay time when activating the operating stop (Stop key / Impulse sequence).

FC RESET

The frequency converter is re-programmed.

MOTOR V

Rated voltage of motor.

MOTOR I

Rated current of motor.

MOTOR P

Rated output of motor.

MOTOR PHI

Cosinus Phi of motor.

MOTOR HZ

Rated frequency of motor.

MOTOR HZ MIN

Minimum frequency of motor.

MOTOR HZ MAX

Maximum frequency of motor.

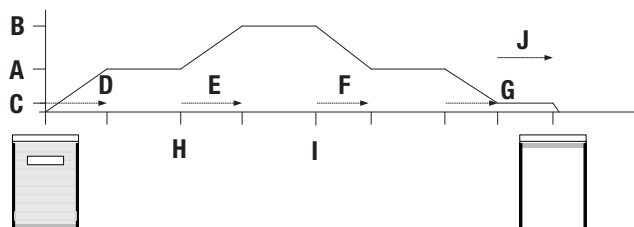
MOTOR RPM

Rated speed of motor.

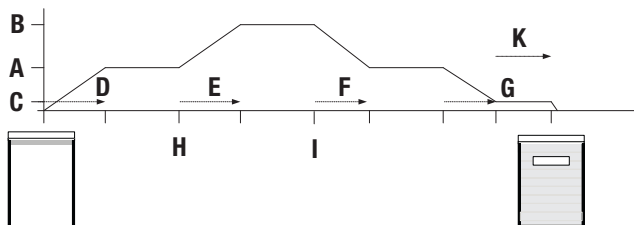
Frequency converter

5.3 Operating diagrams

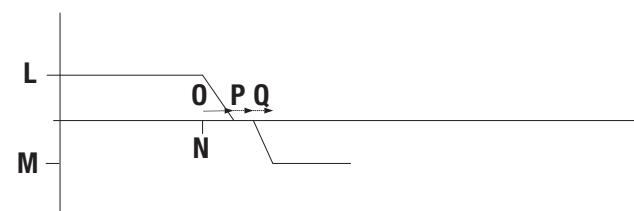
Opening run of the door/gate



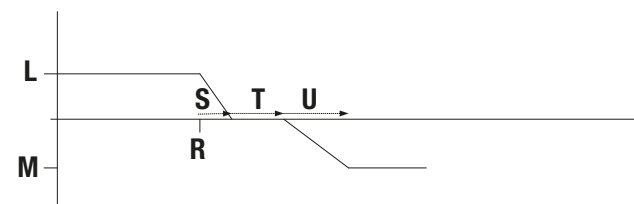
Closing run of the door/gate



SKS with reversal mode



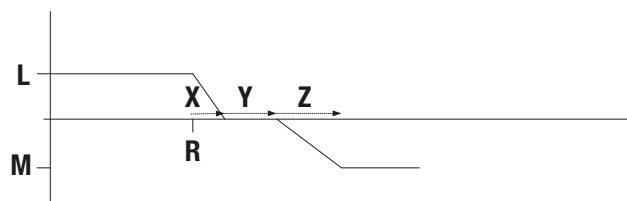
Reversal mode light barrier



Operating stop (stop key / Impulse sequence)



Reversal mode button



Legend

A	FREQUENCY OPEN 1
B	FREQUENCY OPEN 2
C	FREQUENCY OPEN 3
D	SPEED UP 1
E	SPEED UP 2
F	SPEED DOWN 2
G	SPEED DOWN 1
H	Central limit switch rising edge
I	Central limit switch falling edge
J	T UPPER SW
K	T LOWER SW
L	Current travel frequency
M	Travel frequency 1 OPEN / CLOSE
N	SKS activation
O	SPEED DOWN 3
P	SKS reversal time
Q	SPEED UP 3
R	Signal reversal direction
S	SPEED DOWN 4
T	reversal of light barrier
U	SPEED UP 4
V	Stop command
W	SPEED DOWN 5
X	SPEED UP 1 or 2
Y	reversal time (adjustable)
Z	SPEED UP 1 or 2

6. Initial operation

6.1 General

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

- The gate or door is installed and operational.
- 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 500 control is installed.

REFERENCE

The relevant manufacturer instructions must be adhered to for the installation of the door/gate, the MFZ operator motor, and the command and safety devices.

6.2 Mains connection

Preconditions

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

- The mains voltage must correspond with the information indicated 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 current, only triple block-type automatic fuses (10 A) may be used.

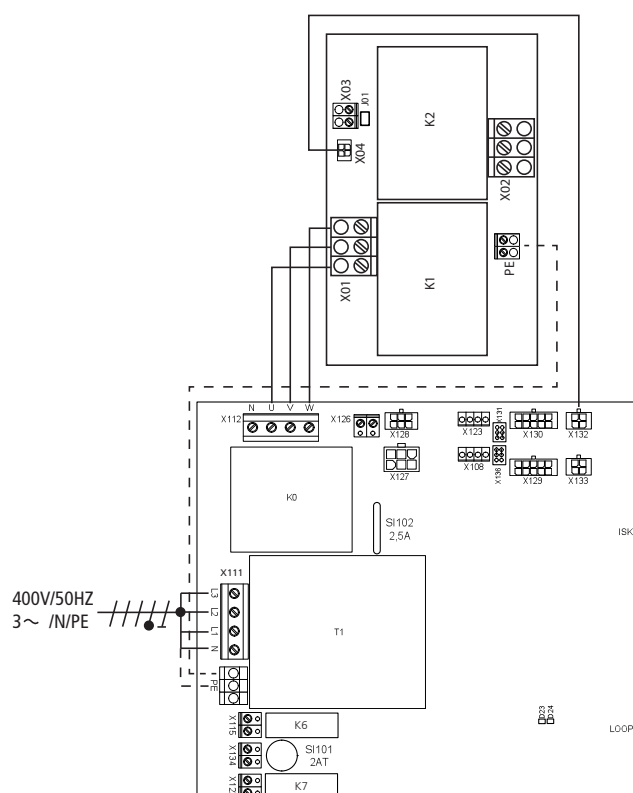
NOTICE

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

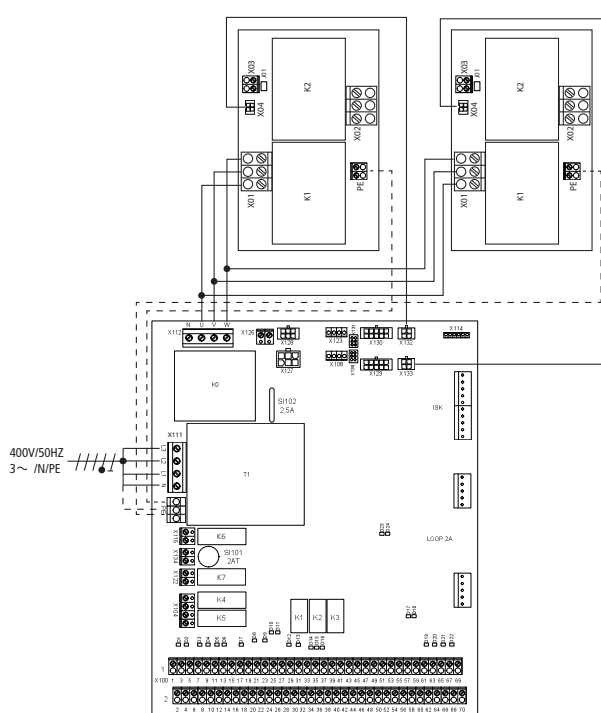
Prior to the first activation of the control, it must be checked after completion of the wiring, if all motor connections are tightened on the control and motor sides. All control voltage inputs are galvanically isolated from the power supply.

The mains voltage carrying cables must not be in contact with control lines (SELV circuit) without a further insulation. For the wiring of the mains voltage carrying lines of the power modules, only lines with a double insulation may be used.

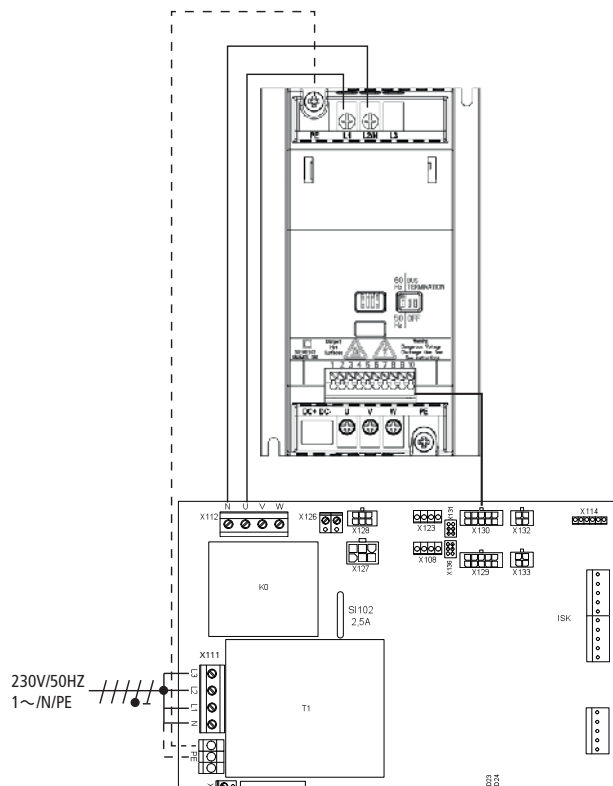
Switching plan with a contactor module



Switching plan with two contactor modules



Switching plan with a frequency converter



Key:

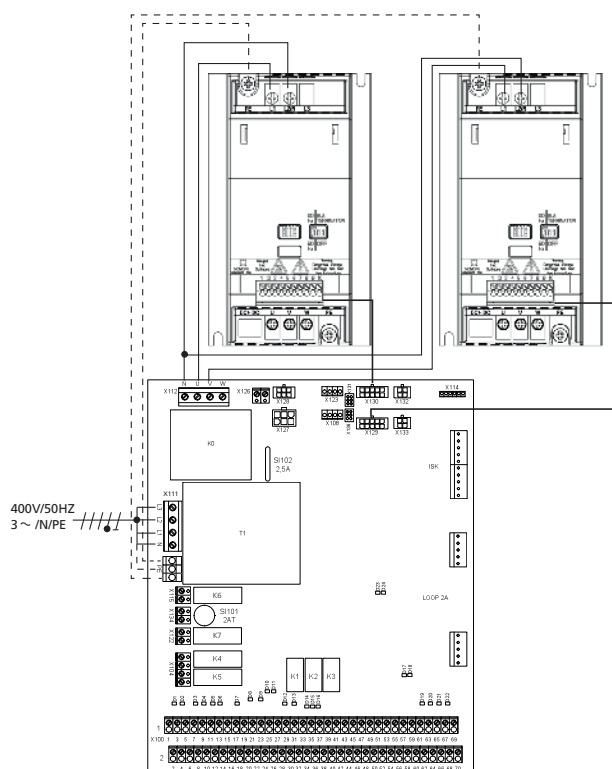
→ „4.2 CS 500 basic board“ see page 5

Connection:

- Connect digital end position system or mechanical limit switches to the control system.
- Connect control system to the motor.
- Connect control system to the mains.
- Connect control system to the motor.
- The cable groups are to be secured with a cable tie directly in front of the relevant terminal.

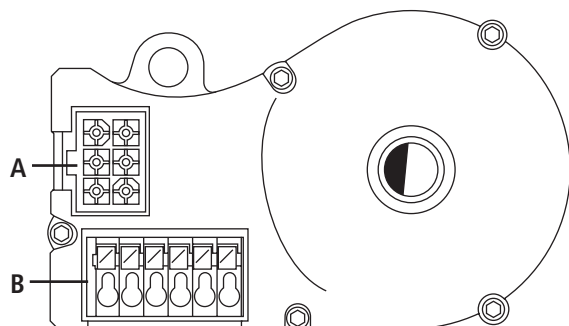
→ „12. Technical data“ see page 41

Switching plan with two frequency converters



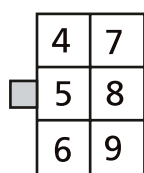
Initial operation

6.3 Connection assignment absolute value encoder (plug-in terminal X127)



- A: AWG plug
B: AWG plug-in terminal

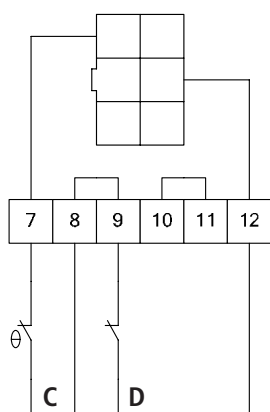
Plug-in terminal X127 (at connection A)



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}

Plug-in terminal B (only absolute value encoder)



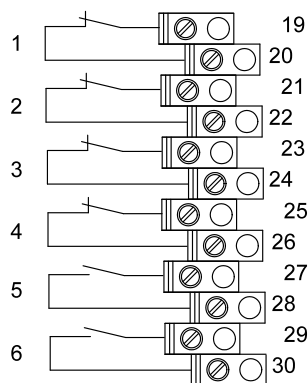
- C: Thermal element in the drive
D: Emergency manual operation (emergency crank or emergency chain)

During the first startup, the connection end position system is automatically detected. If the connection is changed at a later date, the relevant end position system must be selected in a parameter setting in INPUT mode.

6.4 Connection assignment of limit switch

The type of limit switches used is automatically detected.
The setting can be changed in the menu „input“.
Factory settings: Mechanical limit switch

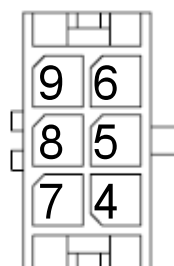
Mechanical limit switch – terminal block X100



- 1 Limit switch OPEN, drive 1
2 Limit switch CLOSE, drive 1
3 Limit switch OPEN, drive 2
4 Limit switch CLOSE, drive 2
5 Intermediate limit switch, drive 1
6 Intermediate limit switch, drive 2

Electronic limit switch – AWG

(if AWG is used, only one drive can be connected)

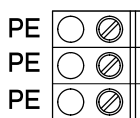
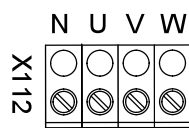


- 4 SK input
5 RS485 B
6 GND
7 RS 485 A
8 SK output
9 +12V DC

6.5 Connection assignment of power modules

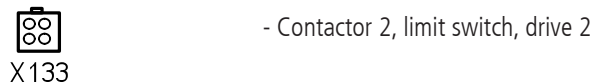
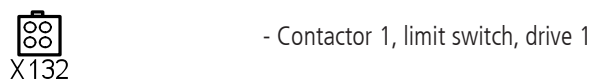
The power modules are factory pre-wired.

Mains connection for power modules



The mains connection for power modules is factory pre-wired.

Control line of contactor modules 1 and 2

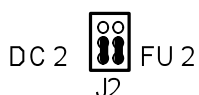
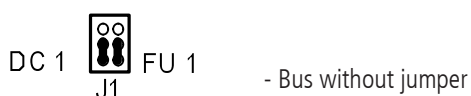
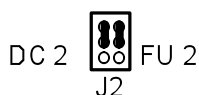
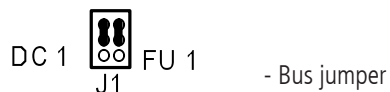


Power modules FU 1 and FU 2



Bus jumpers J 1 and J2

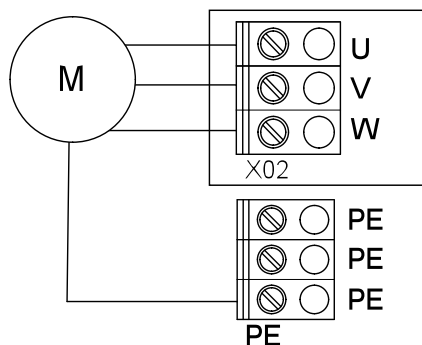
If bus modules are used, the bus lines must be connected through jumpers J1 or J2.



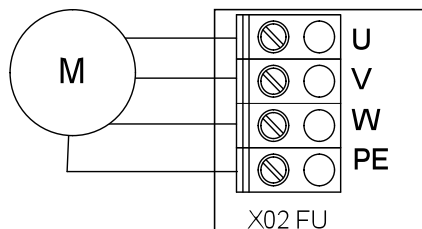
Initial Operation

6.6 Connection assignment of drive

Power module contactor



Power module FC



Change of sense of rotating field:

After connecting the drive, the sense of rotation must be checked with the keys OPEN and CLOSE.

If the operation direction does not correspond with the arrow on the pressed buttons, the terminals on connections U and V (or OPEN/CLOSE) must be changed.

Safety switch of drive:

If the electronic limit switch AWG is used, the safety switches of the drive are carried along with the AWG plug; this is the reason why a bridge must be inserted in X126.

Contactor:

Maximum line length: 20 m

FC:

If an FC is used, the drive line must be used in shielded design.

Maximum line length: 15 m

6.7 Connection assignment of control devices



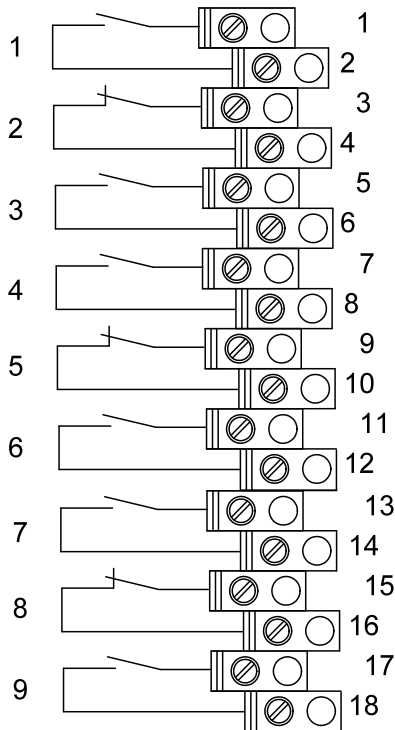
CAUTION!

Risk of injury due to uncontrolled door/gate movement!

- ☞ Mounting in a height of at least 1.5 m.
- ☞ Mounting at position which is not accessible to the public.

- If no stop is connected, the input must be bridged.
 - Buttons 1 and 2 are suitable for a maximum line length of 25 m.
 - Button 3 is suitable for an activation of the system from a distance (remote button) up to a cable length of 200 m.
- No deadman mode is possible through these buttons.

Triple button –X100



Button 1

- 1 OPEN
- 2 STOP
- 3 CLOSE

Button 2

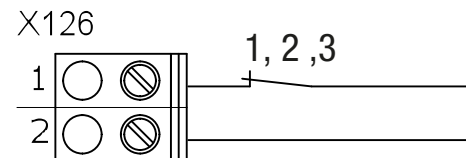
- 4 OPEN
- 5 STOP
- 6 CLOSE

Button 3 / remote button

- 7 OPEN
- 8 STOP
- 9 CLOSE

6.8 Connection assignment of safety devices

Emergency stop



- 1 Emergency stop
- 2 Safety circuit of door/gate
- 3 Safety limit switch

If no emergency stop is connected, the input must be bridged.
If several safety contacts are used, these must be connected in series.

Light barrier (level of protection D, DIN EN 12453)

Protective system according to Level D

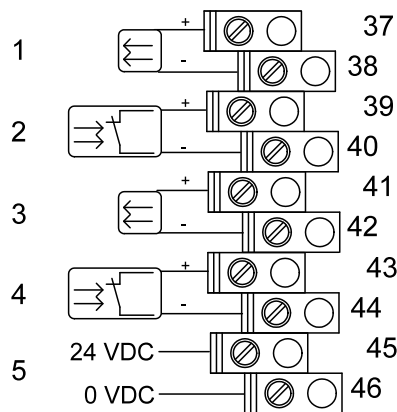
The type of the light barrier used must be defined in the input menu. As factory setting, the light barrier with relay (NC contact) is predefined.

For light barriers with NC contact, the test modus can be activated/deactivated. The light barrier is tested in the end position CLOSE.

If the test mode is not activated, the function must be checked regularly, at least within 6 months.

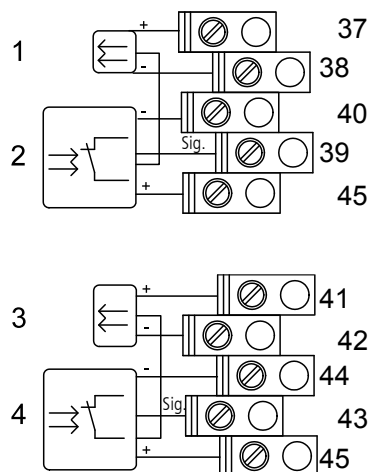
Initial Operation

a) NC contact



- 1 Transmitter of light barrier 1
- 2 Output of receiver of light barrier 1
- 3 Transmitter of light barrier 2
- 4 Output of receiver of light barrier 2
- 5 Output of receiver of light barrier 2

b) MFZ trap-in light barrier

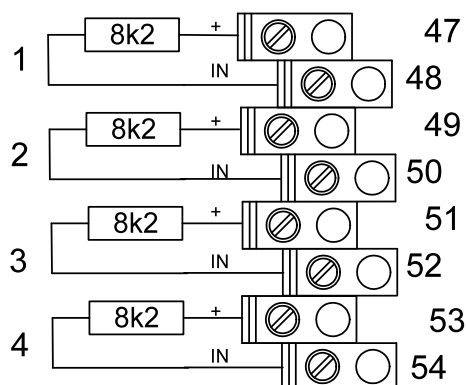


- 1 Transmitter of trap-in light barrier 1
- 2 Receiver of trap-in light barrier 1
- 3 Transmitter of trap-in light barrier 2
- 4 Receiver of trap-in light barrier 2

Safety edge (level of protection C, DIN EN 12453)

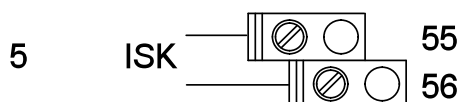
- The type of the safety edge used (8K2 or Opto) must be defined in the input menu.
- The type of reversal (short or complete) can be set in the input menu.
- The inputs SKS 2 and SKS 3 can be deactivated in the input menu.
- Only approved transmission systems manufactured by ASO may be connected to the input ISK. The input works only in combination with the plug-in module ISK and the slot ISK8.

a) Electrical safety edges 8K2 system



- 1 Closing edge OPEN (SKS 1)
- 2 Closing edge OPEN (SKS 2)
- 3 Closing edge CLOSE (SKS 1)
- 4 Closing edge CLOSE (SKS 2)

a) Electrical safety edges directly with evaluation module ISK




- 5 Closing edge (SKS 3) through ISK system

6.9 Connection assignment of relay outputs

DANGER!

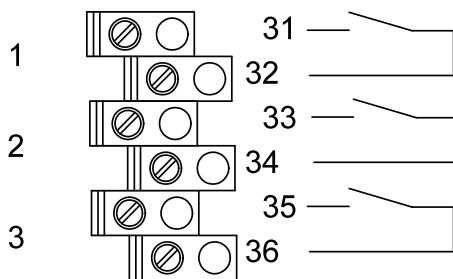
Danger of life due to electrical shock!

-  Prior to any cabling work, the drive system must be disconnected from the power supply. Make sure that the power supply remains disconnected during the cabling work.

Terminal block X100

Signal relays (max. 24 V DC)

- The relay mode is defined through the input menu.
- The output is potential-free.
- Maximum switching voltage: 24 VDC 500mA

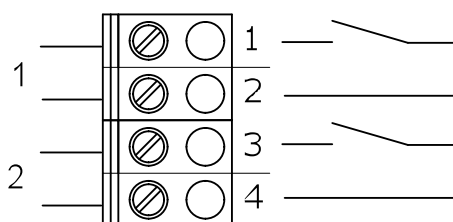


- 1 relay 1 (K1)
- 2 relay 2 (K2)
- 3 relay 3 (K3)

Terminal block X104

Signal relays (max. 230 V AC)

- The relay mode is defined through the input menu.
- The output is floating, the correspondingly required voltage must be introduced through the terminals X134 (230 VAC) or X100 69/70 (24 VDC). The outputs may only be operated with one voltage type each.
- Maximum switching voltage: 24 VDC 1A or 230 VAC 4 A.

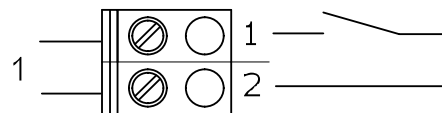


- 1 relay 5 (K5)
- 2 relay 4 (K4)

Terminal block X122

Braking relay

- The braking relay mode is defined in the input menu.
- The output is floating.
- Maximum switching voltage 24 VDC 1A or 230 VAC 4 A.

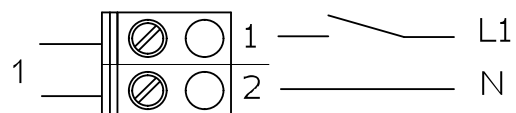


- 1 Brake (K7)

Terminal block X115

Signal relay (230 VAC)

- The output is voltage-loaded with 230 VAC.
- Fuse through F1, 1AT, slow.
- Maximum switching voltage 230 VAC 4 A.



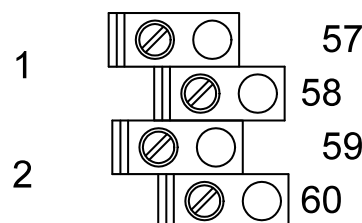
- 1 Signal relay (K6)

6.10 Input induction loop

Terminal block X100

Induction loop

- The function of the induction loops can be defined in the input menu.
- The use without the induction loop plug-in module is not possible.



- 1 Loop 1
- 2 Loop 2

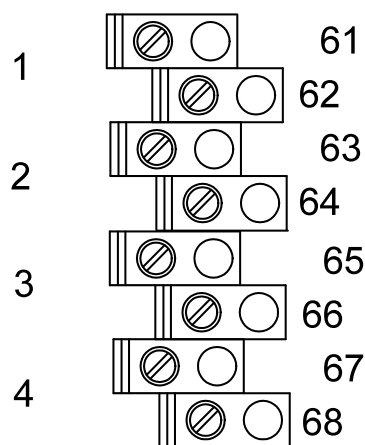
Initial Operation

6.11 Connection assignment of free inputs

Terminal block X100

Free inputs

- The function of the inputs can be defined in the input menu.

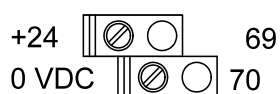


- 1 Input 1
- 2 Input 2
- 3 Input 3
- 4 Input 4

6.12 Voltage for external sensors – 24 V DC

Terminal block X100

Output 24 V DC, max. 500mA

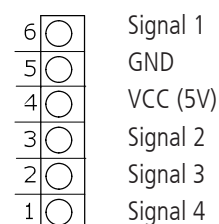


6.13 Connection assignment of plug-in modules (optional)

Terminal block X114

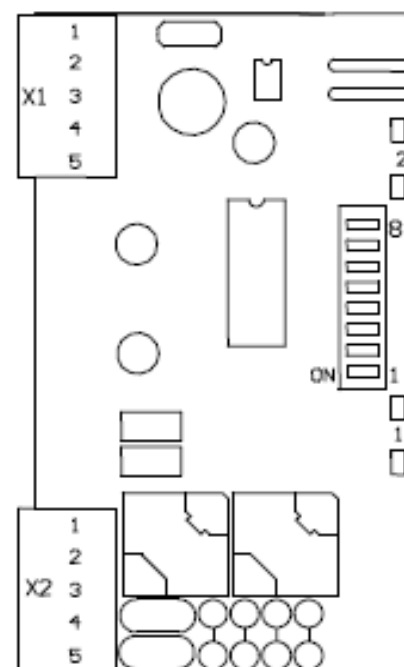
Radio module

- Function is only possible with the original MFZ radio receiver.
- The function of the radio inputs can be defined in the input menu.



LOOP 2a induction loop plug-in module

- Only the FEIG modules loop detector SVEK 1 or SVEK 2 may be used.
- The function of the loops can be defined in the input menu.



i REFERENCE

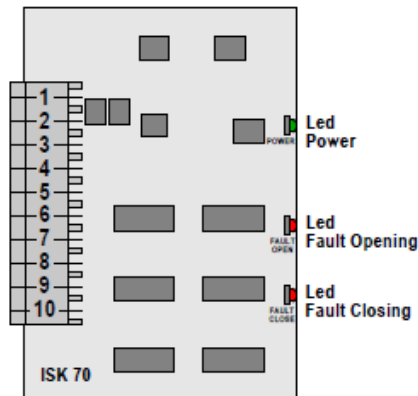
The setting of the DIP switches and the LED displays are described in the separate documentation of the detector.

7. Setting the end positions

GB

Plug-in module, ISK inductive transmission system

- Only the modules ISK 70-75 or ISK 70-755 from ASO may be used
- LED DISPLAYS:
 - LED Power green
Supply voltage
 - LED Fault open red
Fault, edge(s) accompanying Open movement
 - LED Fault close red
Fault, edge(s) accompanying Close movement
- The function of the SKS inputs can be defined in the input menu.



7.1 Adjustment of the electronic end position through the LCD display



NOTICE

Damage to property or irreparable damage due to incorrect installation!

The display must be inserted de-energized condition. Only a display from MFZ may be used:

RS 485 LCD display (X128 plug-in base)

Changeover to the adjustment mode

- ✎ Press the (P) button until ADJUSTMENT appears.

Setting of the OPEN end position

- ✎ Move the door/gate to the desired OPEN end position by pressing the (+/-) button.
- ✎ Save the end position by pressing simultaneously the (P) button and the (+) button.

Setting the CLOSE end position

- ✎ Move the door/gate to the desired CLOSE end position by pressing the (+/-) button.
- ✎ Save the end position by pressing and holding the (P) button and pressing the (-) button.

- ✎ Leave the adjustment mode by pressing the (P) button.

Please note

- During the first adjustment, the two end position need to be programmed, otherwise no normal operation is possible.
- If an end position is corrected, the adjustment menu can be left, after programming the special end position, by pressing the (P) button.
- After programming the limit switches, the system running time is automatically learnt. The display indicates TEACH IN RUN. The functions of the control systems are the same as in automatic operation.

Setting the end positions

7.2 Adjustment of the mechanical end position

Changeover to the adjustment mode

☞ Pressing of the (P) button.

Setting of the OPEN and CLOSE end positions

REFERENCE

The adjustment of the end positions is described in the separate documentation of the mechanical limit switches.

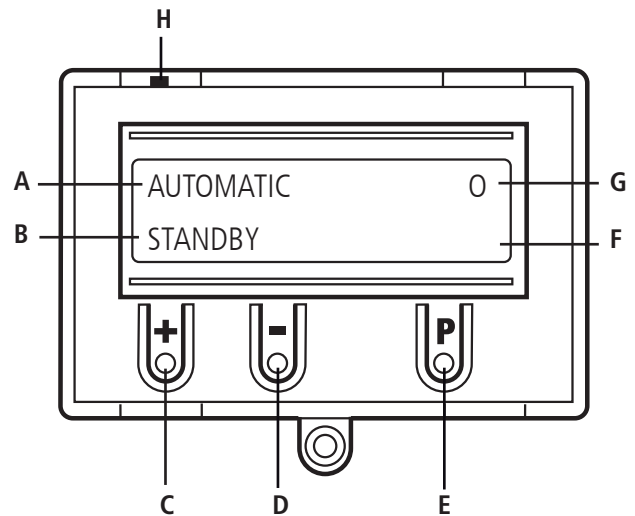
☞ Leave the adjustment mode by pressing the (P) button.

Please note

- The adjustment mode is not left automatically. In order to return to the normal mode, leave the adjustment mode by pressing the (p) button.
- If an intermediate end position is to be corrected, the learnt value can be changed in the INPUT menu or reset to A so that a new programming can be started.

8. Programming with the LCD monitor

8.1 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

8.2 LCD monitor, modes of operation

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

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

If the H jumper is withdrawn, the (+), (-) and (P) buttons are without function.

The display still functions.

If the control system is activated, it is in the initialization mode. The display shows INIT PHASE and the control system is not ready for operation. This phase lasts for approx. 5 seconds.

The operating modes ADJUSTMENT, INPUT and DIAGNOSIS are left automatically 20 seconds after the last button operation; the control systems goes to the AUTOMATIC mode.

Operating mode 1: AUTOMATIC

In the AUTOMATIC operating mode the door/gate 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.

Operating mode 2: ADJUSTMENT

In the ADJUSTMENT mode, the OPEN/CLOSE end position settings are adjusted.

NOTICE

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

In the ADJUSTMENT mode of operation, the operator does not switch off when the end position is reached.

The door/gate can be damaged if moved beyond the end position.

Fine adjustments can be made in the INPUT operating mode.

Display:

- Shows 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

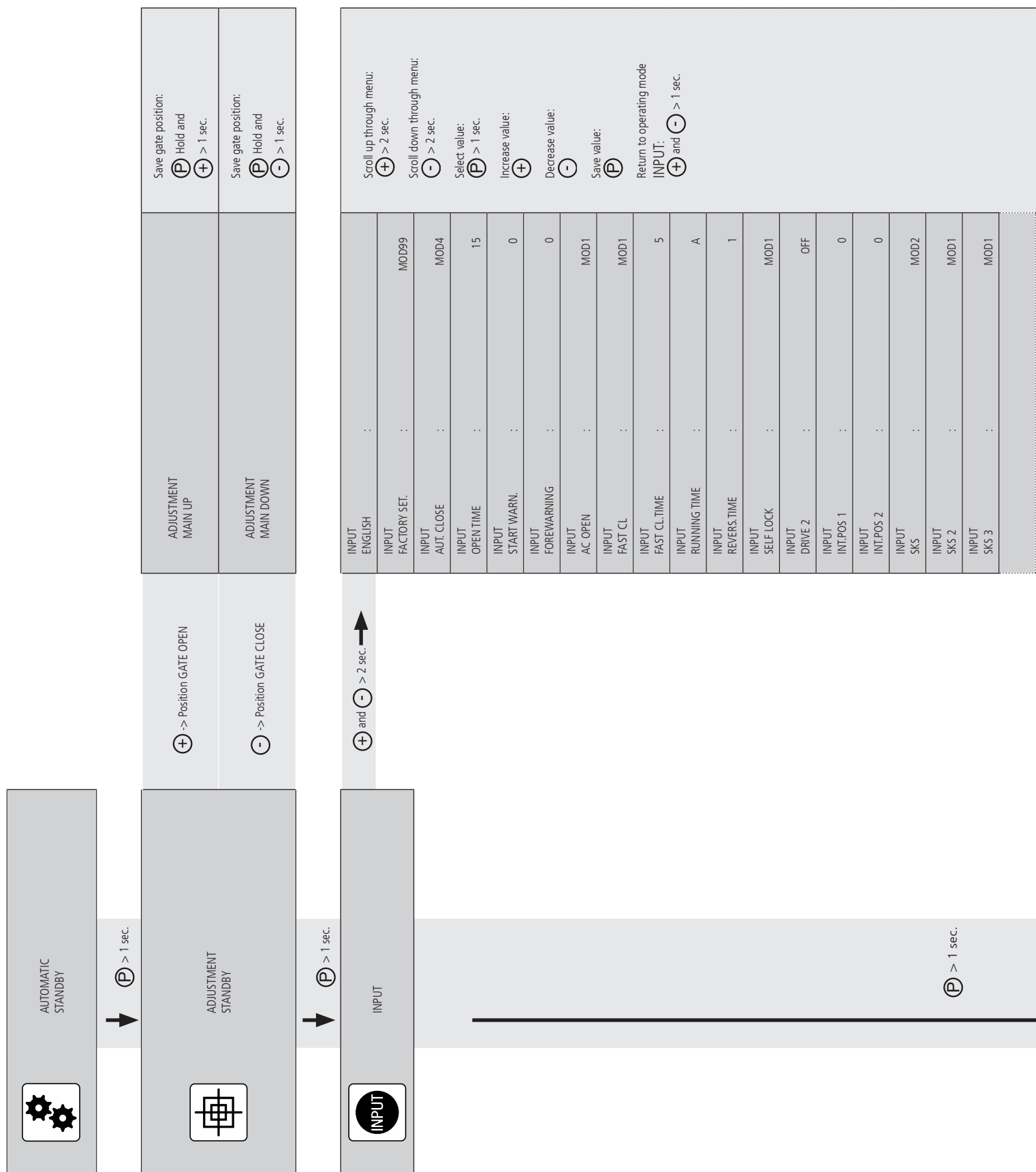
Operating mode 4: DIAGNOSIS

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

Display:


- Shows the check
- Shows the checking status


9. Navigator (LCD monitor only)




INPUT DUR. REV.	:	2
INPUT SKS CL. F.	:	MOD2
INPUT SKS OP. F.	:	MOD2
INPUT SKS REV	:	MOD3
INPUT LIGHT BARR	:	MOD2
INPUT LIGHT BARR 1	:	MOD2
INPUT LIGHT BARR 2	:	MOD2
INPUT LB FUNC.	:	MOD1
INPUT IMPULSE	:	MOD1
INPUT BRAKE	:	MOD5
INPUT TL REST	:	MOD1
INPUT RELAY (1 – 6)	:	MOD6
INPUT RADIO (1 – 4)	:	MOD2
INPUT INPUT (1 – 4)	:	MOD3
INPUT LOOP (1 – 2)	:	MOD1
INPUT CONVERTER *	:	MOD1

DIAGNOSIS


Scroll up through menu:
 > 2 sec.

Scroll down through menu:
 > 2 sec.

Return to operating mode
AUTOMATIC:


Only query is possible

UPPER SWITCH	:	ON
LOWER SWITCH	:	ON
UP BUTTON	:	OFF
DOWN BUTTON	:	OFF
SKS CLS. 1/2/3	:	OFF
SKS OPEN. 1/2/3	:	OFF
LIGHT BARR 1/2	:	ON
INPUT 1/2/3/4	:	ON
STOP CHAIN	:	ON
STOP	:	ON
CYCLE	:	4
AWG	:	2599
Fault memory	:	Fault
Fault memory	:	Count
Fault memory	:	Cycle

* If CONVERTER is set to MOD2, the parameter field extends.
→ „The following parameters are only visible for converters = MOD 2“ see page 32

10. Overview of functions

10.1 Automatic operating mode



Display		Description
AUTOMATIC TEACH IN RUN		The running time is learnt automatically
AUTOMATIC OPENING PHASE		The gate is driven to the OPEN end position
AUTOMATIC CLOSING PHASE		The gate is driven to the CLOSE end position
AUTOMATIC STANDBY		The gate stands between the end positions
AUTOMATIC STANDBY	O	The gate stands at the OPEN end position
AUTOMATIC STANDBY	o	The gate stands at the position PART OPEN („before-end position“ up)
AUTOMATIC STANDBY	U	The gate stands at the CLOSE end position
AUTOMATIC STANDBY	u	The gate stands at the position PART CLOSE („before-end position“ down)
AUTOMATIC STANDBY	r	The gate stands in the position where the reversing switches off

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

Display	Description
MANUAL MAIN UP	The gate is driven to the OPEN end position
MANUAL MAIN DOWN	The gate is driven to the CLOSE end position
MANUAL STANDBY	The gate stands between the end positions

10.2 Input operating mode



Function	Description	Setting options	Factory settings
ENGLISH	Select the menu language	DEUTSCH ENGLISH FRANCAIS NEDERLANDS DANSK	ENGLISH
FACTORY SET.	MOD99: MFZ	MOD99	MOD99
AUT. CLOSE	MOD1: AUTO CLOSE only from upper end position MOD2: AUTO CLOSE only from sect. switch position MOD3: AUTO CLOSE from all end positions MOD4: AUTO CLOSE from all gate positions	MOD1 MOD2 MOD3 MOD4	MOD4
OPEN TIME	After the gate has opened, it runs in the CLOSE direction again after the set time has elapsed. Open time > 0 = impulse function only in OPEN direction NOTICE: By pressing the CLOSE button during the open time, the closing movement starts immediately. By pressing the OPEN or STOP button during the open time, the time is restarted. If an automatic closing movement is interrupted by the SKS, the open time doubles. After 3 attempts, the automatic closing is interrupted.	0 – 3600 seconds 0 = Auto closing movement Off	15
START WARN.	The display lights and the rotating light are activated before every gate travel. The time adds up to the forewarning time.	0 – 10 seconds 0 = off	0
FORE-WARNING	The traffic lights and the rotating light are activated before the gate closes. The preset warning time is only active for an open time > 0 or for self-locking movements. NOTE: This time adds up to the start warning time.	0 – 120 seconds 0 = off	0 = off
AC OPEN	MOD1: The stop button during the open time resets the open time. MOD2: The stop button during the open time resets the open time. Stop for > 5 sec. during the open time prevents the automatic closing movement.	MOD1 MOD2	MOD1
FAST CL.	MOD1: The open time continues as usual MOD2: The open time was interrupted and the door/gate system closes once the FAST-CLOSEtime has elapsed, after the light barrier was activated. This function is also active if the open time = 0. MOD3: The open time was interrupted, after the light barrier was interrupted for a minimum time (2 sec.) (by a person). Once the fast-close time has elapsed, the gate closes. MOD4: as MOD2, only with an induction loop in the closing loop function MOD5: as MOD2, only with an induction loop in the closing loop function and LB MOD6: as MOD2, only with induction loop in the closing loop function or LB	MOD1 MOD2 MOD3 MOD4 MOD5 MOD6	MOD1
FAST CL.TIME	Time that passes after the FAST-CLOSE command before closing.	2 – 300 seconds	5 seconds
RUNNING TIME	Monitoring of the maximum running time of an OPEN or DOWN movement. During the teach in run, the gate running time is automatically learnt. In the case of a deviation of 20% (in both directions), a running time fault appears. After the automatic learning, the running time can be changed manually.	A = automatic 1 – 300 seconds	A

Overview of functions

Function	Description	Setting options	Factory settings
REVERS. TIME	Stoppage time for each direction change except for reversal after safety edge and light barrier activation.	100 – 2000 milliseconds	Depending on door/gate type
SELF-LOCK	MOD1: Automatic operation MOD2: Manual operation for OPEN and CLOSE MOD3: Manual operation for CLOSE MOD4: Manual operation for OPEN	MOD1 MOD2 MOD3 MOD4	MOD1
DRIVE 2	ON: Second drive available OFF: No second drive	ON / OFF	OFF
INT.POS 1	Setting of the intermediate position 1 switching point related to the saved OPEN end position	0 – 10 seconds	0 seconds
INT.POS 2	Setting of the intermediate position 2 switching point related to the saved CLOSE end position	0 – 10 seconds	0 seconds
SKS	Type of safety edges: MOD1: Opto-electronic SKS MOD2: electrical (8K2) SKS	MOD1 MOD2	MOD2
SKS 2	ON: The SKS2 input is active. OFF: The SKS2 input is not active.	ON / OFF	Depending on door/gate type
SKS 3	ON: The SKS3 input is active. OFF: The SKS3 input is not active. SKS 3 is the input for the inductive transmission system.	ON / OFF	Depending on door/gate type
DUR. REV.	Free movement time after reversal by closing edge protection (SKS) or LS	1 – 10 sec.	2 seconds
SKS CL. F.	MOD1: Complete reversal MOD2: Free movement	MOD1 MOD2	MOD2
SKS OP. F.	MOD1: Complete reversal MOD2: Free movement	MOD1 MOD2	MOD2
SKS REV	MOD1: Stop + reversal between upper end pos. and int. pos. 2, Stop between RP and lower end pos. MOD2: Stop + reversal between upper end pos. and int. pos. 2, no action between RP and lower end pos. MOD3: Reversed over the complete range	MOD1 MOD2 MOD3	MOD3
LIGHT BARR	Type of light barrier: MOD1: 2-wire light barrier MOD2: NC contact MOD3: NC contact without test MOD4: PNP with test MOD5: PNP without test	MOD1 MOD2 MOD3 MOD4 MOD5	MOD2
LIGHT BARR 1	ON: The light barrier input is active. OFF: The light barrier input is not active.	ON / OFF	Depending on door/gate type
LIGHT BARR 2	ON: The light barrier input is active. OFF: The light barrier input is not active.	ON / OFF	Depending on door/gate type

Function	Description	Setting options	Factory settings
LB FUNC.	<p>CLOSE gate movement</p> <p>MOD1: Stop + reversal MOD2: Stop an free movement MOD3: STOP MOD4: STOP MOD5: Stop + reversal</p> <p>OPEN gate movement</p> <p>No action No action No action STOP STOP if the gate is between CLOSE end position and int. pos. 2. Stop Stop and closing movement after QUICK CLOSE time</p> <p>MOD6: No reaction MOD7: Stop and reversal</p> <p>NOTICE: To be used only with AUTO CLOSE = MOD4 and active QUICK CLOSE mode.</p>	MOD1 – MOD7	Depending on door/gate type
IMPULSE	<p>Impulse function for free input or radio receiver</p> <p>MOD1: OPEN – Stop – CLOSE – Stop MOD2: Only OPEN MOD3: Only OPEN, stop with moving gate MOD4: Only OPEN, inactive during movement MOD5: CLOSE from OPEN gate end position, otherwise always OPEN</p>	MOD1 – MOD5	MOD1
BRAKE (RELAY K7)	<p>MOD1: Brake relay is not used MOD2: Failsafe brake: ON with running drive, otherwise OFF MOD3: Operating current brake: OFF with running drive, otherwise ON MOD4: Failsafe brake: ON with running drive and Open end position, otherwise OFF MOD5: Failsafe brake: Always ON, only OFF for quick braking MOD6: Operating current brake: Always OFF, only ON for quick braking MOD7: Failsafe brake: ON with running drive, otherwise OFF, additionally OFF for quick braking MOD8: Operating current brake: OFF with running drive, otherwise ON, additionally ON for quick braking MOD9: Failsafe brake: ON with running rive and Open end position, otherwise OFF, additionally OFF for quick braking</p>		
TL REST	<p>Traffic light switching</p> <p>MOD1: OFF in rest position MOD2: ON in rest position MOD3: off after 5 minutes in rest position</p>	MOD1 – MOD3	MOD1
RELAY 1	A relay module from 1 - 57 can be assigned to all 6 relays.	MOD1 – MOD57 MOD47	MOD6
RELAY 2	<p>MOD1: (Red traffic light 1) forewarning - flashing, gate travel- steady MOD2: (Red traffic light 2) forewarning - flashing, gate travel- flashing MOD3: (Red traffic light 3) forewarning - steady, gate travel- steady MOD4: Impulse signal when there is an OPEN command</p>	MOD1 – MOD57 MOD47	MOD7
RELAY 3	<p>MOD5: Error message MOD6: OPEN end position MOD7: CLOSE end position</p>	MOD1 – MOD57 MOD47	MOD5
RELAY 4	<p>MOD8: Final position OPEN denied MOD9: Final position CLOSE denied MOD10: Before-end position OPEN</p>	MOD1 – MOD57 MOD47	MOD1
RELAY 5	<p>MOD11: Before-end position CLOSE MOD12: Before-end position CLOSE to CLOSE end position MOD13: Magnetic lock function</p>	MOD1 – MOD57 MOD47	MOD23
RELAY 6	<p>MOD14: Brake MOD15: Brake negated MOD16: Brake also active in OPEN end position</p>	MOD1 – MOD57 MOD47	MOD36

Overview of functions

Function	Description	Setting options	Factory settings
	MOD17: SKS activated or test fault MOD18: (Red traffic light 4) forewarning - flashing, gate travel- off MOD19: Before-end position OPEN to OPEN end position MOD20: Activation of infrared transmission system MOD21: Test of trap-in protection before opening run (additional module required) MOD22: Test of external safety devices before closing run MOD23: (Green light) OPEN end position- steady, forewarning- OFF, gate travel- OFF MOD24: Capacitor circuit for 230V single phase drives MOD25: Yard light function 2 min. after OPEN command (also indirectly through Impulse) MOD26: Activation of radio transmission system MOD27: Impulse signal when OPEN end position is reached MOD28: Relay OFF MOD29: Gate OPENS MOD30: Gate CLOSES MOD31: Service MOD32: Auto CLOSE function active MOD33: Quick braking MOD34: Loop 1 assigned MOD35: Loop 2 assigned MOD36: Rotating light MOD37: Open movement signal (flashing) and OPEN end position (On) MOD38: Close movement signal (flashing) and CLOSE end position (On) MOD39: Radio mode 8 signal MOD40: Magnetic lock 2, relay for drive starting active for 3 seconds MOD41: Impulse during start for opening in self-locking mode MOD42: Impulse during start for closing in self-locking mode MOD43: Impulse during stop MOD44: Fault message: Closes with fault message MOD45: Motor running MOD46: Switch on rotating light with running drive as forewarning reason MOD47: (Red traffic light 5) forewarning - flashing, gate travel- flashing MOD48: One induction loop is assigned MOD49: All light barriers are OK MOD50: Light barrier 1 OK MOD51: Light barrier 2 OK MOD52: Mod 49 denied MOD53: Mod 50 denied MOD54: Mod 51 denied MOD55: All inductions loops are free MOD56: Induction loop 1 free MOD57: Induction loop 2 free		
RADIO (1 – 4)	MOD1: Not used MOD2: Impulse MOD3: Open MOD4: Close MOD5: Stop MOD6: Intermediate position 1 MOD7: Intermediate position 2 MOD8: Signal on relay mode 39	MOD1 – MOD8	RADIO 1: MOD2 RADIO 2: MOD3 RADIO 3: MOD5 RADIO 4: MOD4

Function	Description	Setting options	Factory settings
INPUT (1 – 4)	MOD1: Intermediate position 1 button MOD2: Intermediate position 1 switch MOD3: Auto Close switch MOD4: External CLOCK (permanently open) MOD5: Keep open/alarm switch MOD6: Fire alarm (BMA) switch, emergency closing NO MOD7: Fire alarm (BMA) switch, emergency closing NC MOD8: Fire alarm (BMA) switch emergency opening NO MOD9: Fire alarm (BMA) switch emergency opening NC MOD10: Switch opening loop MOD11: Automatic closing button MOD12: Impulse button MOD13: Highspeed closing MOD14: Interlocking MOD15: Intermediate position 2 switch MOD16: Intermediate position 2 button	MOD1 – MOD14	Input 1: MOD3 Input 2: MOD12 Input 3: MOD10 Input 4: MOD9
LOOP (1–2)	MOD1: Signal loop MOD2: Opening loop MOD3: Closing loop MOD4: Safety loop	MOD1 – MOD4	Loop 1: MOD1 Loop 2: MOD1
CONVERTER	MOD1: NO FU MOD2: FU	MOD1 – MOD2	Depending on door/gate type

Overview of functions

The following parameters are only visible for converters = MOD 2

Function	Description	Setting options	Factory settings
T UPPER SW	FU parameter, time for creep movement until the limit switch is reached	0 – 10 seconds	3 seconds
T LOWER SW	FU parameter, time for creep movement until the limit switch is reached	0 – 10 seconds	3 seconds
FRQ. OPEN 1	→ „5. Frequency converter“	10 – 100 Hz	50 Hz
FRQ. CLOSE 1	→ „5. Frequency converter“	10 – 100 Hz	50 Hz
FRQ. OPEN 2	→ „5. Frequency converter“	10 – 100 Hz	50 Hz
FRQ. CLOSE 2	→ „5. Frequency converter“	10 – 100 Hz	50 Hz
FRQ. OPEN 3	→ „5. Frequency converter“	10 – 50 Hz	25 Hz
FRQ. CLOSE 3	→ „5. Frequency converter“	10 – 50 Hz	25 Hz
SPEED UP 1	→ „5. Frequency converter“	0.1 – 10 seconds	2 seconds
SPEED DOWN 1	→ „5. Frequency converter“	0.1 – 10 seconds	2 seconds
SPEED UP 2	→ „5. Frequency converter“	0.1 – 5 seconds	2 seconds
SPEED DOWN 2	→ „5. Frequency converter“	0.1 – 5 seconds	2 seconds
SPEED UP 3	→ „5. Frequency converter“	0.1 – 1 seconds	0.5 seconds
SPEED DOWN 3	→ „5. Frequency converter“	0.1 – 1 seconds	0.3 seconds
SPEED UP 4	→ „5. Frequency converter“	0.1 – 5 seconds	0.5 seconds
SPEED DOWN 4	→ „5. Frequency converter“	0.1 – 5 seconds	0.5 seconds
SPEED DOWN 5	→ „5. Frequency converter“	0 – 3 seconds	0.5 seconds
ERROR INVERTER	Frequency converter is re-programmed.	ON / OFF	OFF
RESTART	Reset of the control system, if the value is set to ON.	ON / OFF	OFF
MOTOR V	Rated voltage of motor	100 – 500 V (10)	230 V
MOTOR I	Rated current of motor	1 – 9.9 A (0.1)	1.9 A
MOTOR P	Rated output of motor	100 – 5000 W (10)	370 W
MOTOR PHI	Cosinus Phi of motor	0 – 1 (0.01)	0.75
MOTOR HZ	Rated frequency of motor	10 – 100 Hz (10Hz)	50 Hz
MOT. HZ MIN	Minimum frequency of motor	0 – 50 Hz (1 Hz)	10 Hz
MOT. HZ MAX	Maximum frequency of motor	50 – 100 Hz (1 Hz)	100 Hz

Function	Description	Setting options	Factory settings
MOTOR RPM	Rated speed of motor	100 – 5000 (10)	1370
RESET PIN	Pin numbers can be reset to factory setting	ON / OFF	Depending on the gate type
PIN NO.	The pin number can be changed on Levels 2 and 3, however, only on the level itself.	0000 – 9999	xxxx
LIMIT SW.	MOD1: AWG MOD2: MEC	MOD1 – MOD2 (self-learning)	Depending on the limit switch

Explanations of the signal light functions

MOD	Description	Forewarning	Start warning	Gate operation	CLOSE end position	OPEN end position	SECT. SWITCH end position	Gate stoppage in non-end position
MOD1	Red traffic light 1	Flashing	Flashing	Steady	ON / OFF *	OFF	OFF	Steady
MOD2	Red traffic light 2	Flashing	Flashing	Flashing	ON / OFF *	OFF	OFF	Steady
MOD3	Red traffic light 3	Steady	ON	Steady	ON / OFF *	OFF	OFF	Steady
MOD18	Red traffic light 4	Flashing	Flashing	OFF	OFF	OFF	OFF	OFF
MOD23	Green traffic light	OFF	OFF	OFF	OFF	Steady	Steady	OFF
MOD47	Red traffic light 5	Flashing	Flashing	Flashing	OFF	OFF	OFF	OFF

* depending upon parameter TL REST

Overview of functions

Explanations of the inputs:

MOD	Description	Remarks
MOD1	Intermediate position 1 button	When the button is pressed, the gate opens as far as to intermediate position 1.
MOD2	Intermediate position 1 switch	<p>Closed: All OPEN commands lead to the intermediate position 1. When closing the switch, the gate opens as far as to intermediate position 1.</p> <p>Open: All OPEN commands lead to the position OPEN.</p> <p>In both positions, the CLOSE commands lead on the CLOSE end position.</p>
MOD3	Auto Close switch	<p>Open: No automatic closing of the gate</p> <p>Closed: Automatic closing of the gate is active</p>
MOD4	External CLOCK (permanently open)	The gate opens once the contact closes and remains in the OPEN position until the contact opens. The gate then closes automatically. This function can be aborted by pressing the CLOSE button. The gate CLOSES.
MOD5	Keep open/alarm switch	<p>Closed: The gate travels inherently to the PART OPEN position and remains there as long as the contact is closed.</p> <p>Open: Normal operation</p>
MOD 6	Switch CONTCLOSE (BMA) NO	<p>Open: Normal operation</p> <p>Closed: Gate closes sensors and buttons as follows</p> <p>BUTTON: No function</p> <p>P/E BARRIER: Gate stops and briefly reverses, try again after 30 seconds</p> <p>SKS: Gate stops and briefly reverses; try again after 30 seconds</p> <p>STOP: Gate stops, as long as Stop is active, then close</p>
MOD7	Switch CONTCLOSE (BMA) NC	as MOD6, with changed polarity
MOD8	Switch CONTCLOSE (BMA) NO	<p>Open: Normal operation</p> <p>Closed: Gate opens; sensors an buttons as follows</p> <p>BUTTON: No function</p> <p>P/E BARRIER: Gate stops and briefly reverses; try again after 30 seconds</p> <p>SKS: Gate stops and briefly reverses; try again after 30 seconds</p> <p>STOP: Gate stops, as long as Stop is active, then close</p>
MOD9	Switch CONTOPEN (BMA) NC	as MOD8, with changed polarity
MOD10	Switch opening loop	<p>Closed: Opening loop active</p> <p>Open: Opening loop not active</p>
MOD11	Automatic closing button	<p>1st activation no automatic closing movement</p> <p>2nd activation automatic closing movement is active</p> <p>etc.</p>
MOD12	Impulse button	Impulse button
MOD13	Highspeed closing	Special function of perimeter protection
MOD14	Interlocking	<p>Interlocking</p> <p>No OPEN and CLOSE commands are accepted.</p>

MOD	Description	Remarks
MOD15	Intermediate position 2 switch	Open: All CLOSE commands (also automatic closing) lead to the Partial CLOSE position. When closing the switch, the gate opens as far as to intermediate position 2. Closed: All CLOSE commands lead to the position CLOSE. In both positions, the OPEN commands lead to the OPEN end position.
MOD 16	Intermediate position 2 button	When the button is pressed, the gate opens as far as to intermediate position 2.

10.3 Diagnosis / fault memory mode



Display	Meaning	Status
UPPER SWITCH	OPEN end position	OFF: Activated ON: Not activated
LOWER SWITCH	CLOSE end position	OFF: Activated ON: Not activated
UP SWITCH	UP switch	ON: Activated OFF: Not activated
DOWN SWITCH	DOWN switch	ON: Activated OFF: Not activated
SKS CLS. 1	SKS 1 safety edge protection CLOSE	ON: System is closed OFF: System is interrupted (fault)
SKS OPEN 1	SKS 1 safety edge protection OPEN	ON: System is closed OFF: System is interrupted (fault)
SKS CLS. 2	SKS 2 safety edge protection CLOSE	ON: System is closed OFF: System is interrupted (fault) ---: System is deactivated
SKS OPEN 2	SKS 2 safety edge protection OPEN	ON: System is closed OFF: System is interrupted (fault) ---: System is deactivated
SKS CLS. 3	SKS 3 safety edge protection CLOSE	ON: System is closed OFF: System is interrupted (fault) ---: System is deactivated
SKS OPEN 3	SKS 3 safety edge protection OPEN	ON: System is closed OFF: System is interrupted (fault) ---: System is deactivated
LIGHT BARR 1	Drive-through barrier 1	ON: System is closed OFF: System is interrupted (fault) ---: System is deactivated
LIGHT BARR 2	Drive-through barrier 2	ON: System is closed OFF: System is interrupted (fault) ---: System is deactivated

Overview of functions

Display	Meaning	Status
INPUT 1	Free input 1	ON: Activated OFF: Not activated
INPUT 2	Free input 2	ON: Activated OFF: Not activated
INPUT 3	Free input 3	ON: Activated OFF: Not activated
INPUT 4	Free input 4	ON: Activated OFF: Not activated
STOP CHAIN	- EMERGENCY OFF of control system - Stop systems of drive	ON: Circuit closed OFF: Interrupted (fault)
STOP	Stop button of controls (keypad on cover)	ON: Circuit closed OFF: Interrupted (fault)
CYCLE	Gate cycle counter	Display of gate cycles
AWG	Absolute encoder	Display of the gate position value for electronic limit switches
Fault memory	Change of display in 2-second cycle	Fault Count Cycle

All faults displayed in the LCD are shown in the fault memory. For each fault, the number of occurrences and the last cycle when the fault occurred are displayed. If a fault has not occurred before, it is indicated with the number an cycle 0.

→ „11. Error messages and rectification“

Deletion of the fault memory

 Press the + and – key for 2 seconds at the same time.

Every error message must be individually deleted.

11. Error messages and rectification

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11.1 Fault signal on LCD display

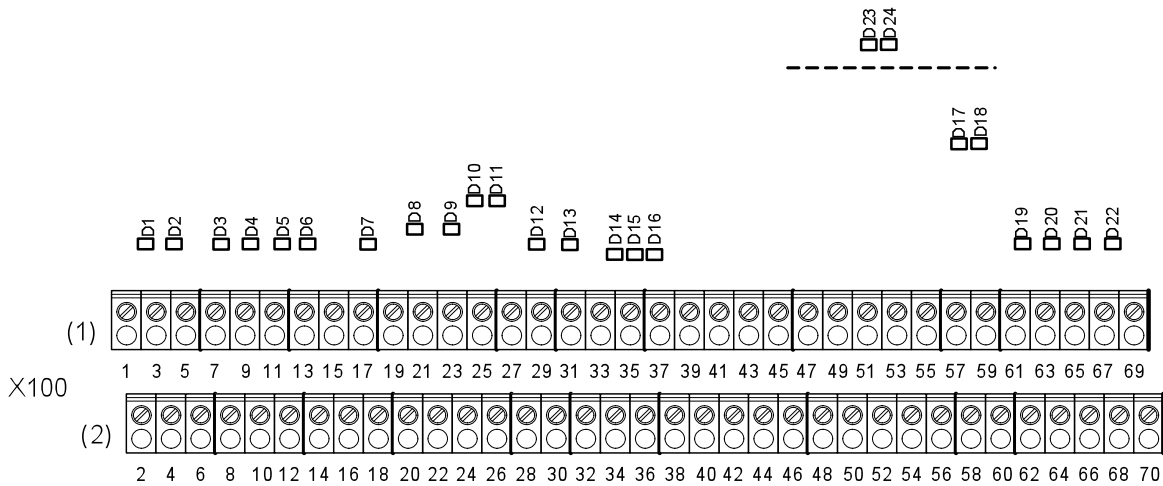
Fault / error message	Cause	Rectification
System does not respond	- No voltage present	- Check voltage supply to drive and control system
Gate travels to the CLOSE end position when the OPEN button is pressed Gate travels to the OPEN end position when the CLOSE button is pressed	- Rotating field has incorrect orientation	- Check rotating field and produce clockwise rotating field
FAULT – X	- Internal software or hardware fault	- Restart control system
STOP CHAIN	- The safety circuit is interrupted	- Check and then close the safety circuit
ERROR INVERTER 1	- Fault signal from converter 1	- Restart control system
ERROR INVERTER 2	- Fault signal from converter 2	- Restart control system
ERROR RUNTIME	- The programmed running time has been exceeded	- Check the path of the gate - Re-programme the running time
ERROR AWG	- Communication error between limit switch and control system	- Check the cable and socket connections
TERM SWITCH FAIL	- The gate 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 REVOLUTION	- Power transmission has responded (only possible with AWG)	- Check free movement of gate - Reset the power value
ERROR DIRECTION	- Rotating field of mains supply is incorrect (only possible with AWG)	- Ensure that a clockwise rotating field is connected
ERROR SKS OPEN 1	- The safety edge protection is faulty - Safety edge protection was triggered	- Check the safety edge protection and the spiral cable - Remove obstruction from path of gate
ERROR SKS CLS. 1	- The safety edge protection is faulty - Safety edge protection was triggered	- Check the safety edge protection and the spiral cable - Remove obstruction from path of gate
ERROR SKS OPEN 2	- The safety edge protection is faulty - Safety edge protection was triggered	- Check the safety edge protection and the spiral cable - Remove obstruction from path of gate
ERROR SKS CLS. 2	- The safety edge protection is faulty - Safety edge protection was triggered	- Check the safety edge protection and the spiral cable - Remove obstruction from path of gate

Error messages and rectification

Fault / error message	Cause	Rectification
ERROR SKS OPEN 3	- The safety edge protection is faulty - Safety edge protection was triggered	- Check the safety edge protection and the spiral cable - Remove obstruction from path of gate
ERROR SKS CLS. 3	- The safety edge protection is faulty - Safety edge protection was triggered	- Check the safety edge protection and the spiral cable - Remove obstruction from path of gate
ERROR SKS 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 LIGHT BAR.1	- The light barrier has responded	- Check alignment of light barrier an light path
ERROR LIGHT BAR.2	- The light barrier has responded	- Check alignment of light barrier an light path
ERROR LB TEST	- Testing of two-wire photoelectric barrier failed	- Check alignment of light barrier an light path - Check cabling
ERROR TRAPIN	- The trap-in protection test (RELAY MODE 21) was not successful	- Check alignment of light barrier an light path - Check cabling

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

11.2 Fault signal through LED



LED	Colour	Display	Remarks
D1	Green	Button 1 OPEN	If the LED is on, the relevant button has been activated (closed)
D2	Yellow	Button 1 CLOSE	If the LED is on, the relevant button has been activated (closed)
D3	Green	Button 2 OPEN	If the LED is on, the relevant button has been activated (closed)
D4	Yellow	Button 2 CLOSE	If the LED is on, the relevant button has been activated (closed)
D5	Green	Button 3 OPEN	If the LED is on, the relevant button has been activated (closed)
D6	Yellow	Button 3 CLOSE	If the LED is on, the relevant button has been activated (closed)
D7	Red	Stop buttons (1/2/3)	If the LED is on, a stop button has been activated (open)
D8	Green	Limit switch 1 OPEN	If the LED is on, the end position has been assigned (switch is open)
D9	Yellow	Limit switch 1 CLOSE	If the LED is on, the end position has been assigned (switch is open)
D10	Green	Limit switch 2 OPEN	If the LED is on, the end position has been assigned (switch is open)
D11	Yellow	Limit switch 2 CLOSE	If the LED is on, the end position has been assigned (switch is open)
D12	Yellow	Intermediate limit switch, motor 1	If the LED is on, the intermediate position has been assigned (switch is open)
D13	Yellow	Intermediate limit switch, motor 2	If the LED is on, the intermediate position has been assigned (switch is open)
D14	Yellow	Signal relay 1	If the LED is on, the relay output is closed
D15	Yellow	Signal relay 2	If the LED is on, the relay output is closed
D16	Yellow	Signal relay 3	If the LED is on, the relay output is closed
D17	Yellow	Induction loop 1	If the LED is on, the induction loop has been assigned

Error messages and rectification

LED	Colour	Display	Remarks
D18	Yellow	Induction loop 2	If the LED is on, the induction loop has been assigned
D19	Yellow	Input 1	If the LED is on, the input has been activated (closed)
D20	Yellow	Input 2	If the LED is on, the input has been activated (closed)
D21	Yellow	Input 3	If the LED is on, the input has been activated (closed)
D22	Yellow	Input 4	If the LED is on, the input has been activated (closed)
D23	Green	Supply voltage 24 VDC	ON: Ready for operation OFF: No supply voltage present Flashing: Hardware fault
D24	Red	Fault signal	→ Fault signal at LED 24 (red)

Fault signal at LED 24 (red)

Fault signal on LCD display	LED H6 display – red	Remarks
STOP	1x flashing	STOP chain must be closed, then movement is possible
ERROR RS485	2x flashing	Stop of the system, error in the transmission protocol, acknowledge error with stop, restart possible by pressing the button
TERM SWITCH FAIL	3x flashing	Stop of the system and no operation possible, check programming of the end positions and reset, if required
ERROR DIRECTION	4x flashing	Stop of the system and no operation possible, exchange rotating field → „6.6 Connection assignment of drive“
ERROR REVOLUTION	5x flashing	Stop of the system, acknowledge error with stop, restart possible by pressing the button
ERROR RUNTIME	6x flashing	Stop of the system, acknowledge error with stop, restart possible by pressing the button
ERROR SKS	On	Operation only possible in deadman CLOSE mode, check safety edge
ERROR LIGHT BAR	On	Operation only possible in deadman CLOSE mode, check safety edge

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

12. Technical data

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Dimensions of housing:	Combined housing: 455 x 245 x 200 mm Steel housing I: 400 x 300 x 210 mm Steel housing II: 600 x 400 x 210 mm Special dimensions on customer request	Display (LCD):	As a programming board LCD, only an original display from MFZ may be used.
Assembly:	vertically to wall; minimum height of 1,100 mm, the enclosed mounting angles must be used for wall fastening	Relay outputs:	If inductive loads are connected (e.g. further relays or brakes), they must be equipped with the corresponding fault clearance (freewheeling diode, varistors, RC elements). Floating working contact; min. 10 mA ; max. 230 V AC / 4A. <i>Contacts used once for power switch are not able to switch mini power any more.</i>
Supply through L1, L2, L3, N, PE	230 V/1Ph or 400 V/3Ph, 50 / 60 Hz	Temperature range:	Operation: -10 °C ... +50°C Storage: -25°C ... +70°C
Protection:	16 A K characteristic, provided by others	Air humidity:	to 80% non condensing
Own consumption of control:	max. 2500 mA	noise level:	< 70 db(A)
Control voltage:	24 V DC, max. 500 mA; protected by re-settable fuse (SI 1012) for external sensors; all control voltage inputs are galvanically isolated from the power supply	Vibrations:	Low-vibration assembly, e.g. on a brick wall
Voltage 230 V AC for external consumers X134/X125	230 V AC, max. 1 A Micro-fuse 2AT (SI101)	Type of protection	IP 54 optional IP 65
Control inputs:	24 V DC, all inputs are to be provided with a floating connection, min. signal duration for input control command >100 ms	Weight	max. 5.0 kg
Control outputs:	24 V DC, max. 150 mA		
Safety chain / Emergency shutdown:	Performance Level C (KAT1), provide floating connections for all inputs; if the safety circuit is interrupted, no further electrically powered movement of the drive is possible, not even in deadman mode.		
Safety edge input (level of protection C):	Performance Level C (KAT2) for suitable electrical safety edges with 8.2 kΩ terminating resistor, safety edges with testing and for dynamic optical systems.		
Dynamic optical safety edge	12 V supply voltage High level: >3V, low < 0.5V Frequency: min >200Hz, max. < 2kHz		
Light barrier input	Performance Level C (KAT2), for systems with relay output and systems with two-wire design. As two-wire light barrier, only the corresponding products from MFZ or Marantec may be used.		
Light barrier (Level of protection D):	If the light barrier is used as a protective system according to Level D, the function must be tested regularly, at least every 6 months. MFZ two-wire light barriers are self-testing; this requirement does not apply here.		

13. Service

The CS 500 control is maintenance-free.



DANGER!

Danger of life due to electrical shock!

⚠ Before maintenance activities on the control or the gate system, the control system must be disconnected from the power supply. Please make sure that the power supply remains disconnected during the activities.

For the maintenance of the door/gate system, the following must be observed:

- The maintenance of the door/gate system may only be performed by authorized personnel.
- Compliance with the ASR A1.7 regulations must be ensured.
- Worn out or defective parts must be replaced.
- Only approved parts may be installed.
- The maintenance must be documented.
- Replaced defective parts must be disposed of properly.

14. EC Declaration of Incorporation

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We hereby declare that the product described below

CS500 Gate Controls

is in conformity with all essential requirements of the Machinery Directive 2006/42/EC.

In addition, the partly completed machinery is in conformity with all the provisions of the EU Construction Products Regulation No. 305/2011, the Electromagnetic Compatibility Directive (2004/108/EC) and the Low Voltage Directive (2006/95/EC).

The following standards were applied:

EN 60204-1

(Safety of machinery, electrical equipment of machines; Part 1: General requirements) Part 1: General requirements

EN ISO 12100

Safety of machinery – general principles for design - risk assessment and risk reduction

DIN EN 12453

Safety in use of power operated doors - Requirements

DIN EN 61000-6-2

Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

DIN EN 61000-6-3

Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission - standard for residential, commercial and light-industrial environments

DIN EN 60335-1

Household and similar electrical appliances - Safety - Part 1: general requirements

DIN EN 60335-2-103

Household and similar electrical appliances - Safety - Part 2-103: Particular requirements for drives for gates, doors and windows

The relevant technical documentation is compiled in accordance with Annex VII(B) of the EU Machinery Directive 2006/42/EC. We undertake to transmit, in response to a reasoned request by the market surveillance authorities, this information in electronic form within a reasonable term.

The authorised agent for the preparation of the technical documentation is:

MFZ Antriebe GmbH & Co. KG, Neue Mühle 4, D-48739 Legden

The machinery is incomplete and must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the Machinery Directive 2006/42/EC.

Place / Date:

Legden, 01/02/2013

Manufacturer's signature



Dirk Wesseling

Position of signatory

Management

