

DCM31

Assembly and operating manual

(Translation of original operating manual)



1 **Data summary and functions**

General

- 1 or 2-motor door control system for 24V DC motors until each 11A 25% ED
- For turning, sliding, folding, rolling, tilting and swing doors in residential and industrial areas
- Motors / tubular motors with integrated limit switches cannot be operated or can only be operated with certain settings. For details, see point 13.5 "Tubular motor operation".

Inputs

- Operating voltage
- Impulse or OPEN operation (OPEN - STOP - CLOSE)
- Part opening / inactive leaf or CLOSE operation (OPEN - STOP - CLOSE)
- Emergency stop (safety input cat. 1)
- Limit switch M1 / M2 (safety input cat. 1)
- Light barriers (safety input cat 2 / PL C)
- 1 x closing edge protection (optical bar OSE or 8k2) (safety input cat 2 / PL C)

Outputs

- Motor M1 / M2
- Light or warning light
- Universal "Out", e.g. for e-lock or LB test or transmission of open command
- 12V DC 40mA
- 24V DC 200mA

Functions

- Door type adjustable in advance
- Obstacle detection / force shutdown / power stop
- Gentle start-up
- Gentle stop
- Inactive leaf
- Part opening
- Automatic closing
- Open propagation delay M2
- Closed propagation delay M1
- Runtime shutdown
- Block control panel
- Trip counter
- Radio over plug-in card (optional)

Operating modes / type of end position detection

- Run-time operation (without limit switch)
- Limit switch operation
- Obstacle detection / force shutdown / power stop (cat 2 / PL C)

Plug-in cards (optional)

- Radio module
- Radio receiver

2 Table of contents:

1	Data summary and functions	2
2	Table of contents:	3
3	Safety notes	5
3.1.	Symbols used.....	5
3.2.	Basic safety notes	5
3.3.	Safety regulations	6
3.4.	Storage / Shipping / Packaging.....	6
3.5.	Use of wireless remote control units (optional)	6
4	Intended use	6
4.1.	Assembler / installer	6
4.2.	CE marking	6
4.3.	Legal requirements	7
5	Improper use	7
6	Terms used	7
6.1.	Obstacle detection / force shutdown / power stop	7
6.2.	OSD.....	7
6.3.	8k2 safety bar.....	7
6.4.	Release / release time	7
6.5.	Reversing	7
6.6.	Panic function.....	7
6.7.	Gentle start-up / gentle stop.....	7
6.8.	Inactive leaf	7
6.9.	Part opening.....	7
7	Abbreviations used	8
8	Assembly	8
8.1.	Assembly screws	8
8.2.	Assembly location	8
8.3.	Assembly.....	8
9	Connection / Commissioning / Programming / Reset	8
9.1.	1. Step: Connection.....	9
9.2.	2. Step: Door position.....	9
9.3.	3. Step: Turn on operation voltage.....	9
9.4.	4. Step: Select door type.....	9
9.5.	5. Step: Check motor movement directions	9
9.6.	7. Step: Programming	10
9.7.	8. Step: Perform learn trips / teach force values.....	10
9.8.	9. Step: Other control devices / safety devices / plug-in cards	10
9.9.	10. Step: Back up tests / settings.....	10
9.10.	11. Step: Reset / default setting.....	11
10	Operating elements & functions / display	12
10.1.	General.....	12
10.2.	Function of the keys	12
10.3.	Set menu point / menu value according to menu table (point 11)	12
10.4.	Display "door status"	12
10.5.	Display "Status of inputs"	13
10.6.	Display "learn trips"	13
10.7.	Display "Error messages".....	13
10.8.	Display "radio"	13
10.9.	LEDs beside display (Image [X4]).....	13
10.10.	LEDs behind terminals (image [X7])	14
10.11.	Jumper [J1] (Image[X5]).....	14
11	Menu table	15
12	Connections & functions	19
12.1.	General.....	19
12.2.	Operating voltage / mains voltage	19
12.3.	Light / warning light	19
12.4.	24V DC Motor M1	19
12.5.	24V DC Motor M2	20
12.6.	Limit switch ES to M1	20

12.7.	Limit switch ES2 to M2.....	20
12.8.	Input A (impulse /OPEN / dead man).....	20
12.9.	Input B (part opening / inactive leaf /CLOSED / dead man)	21
12.10.	Emergency stop (safety input)	21
12.11.	Light barrier (LB / safety input).....	21
12.12.	Safety input (SE) (8K2 / OSD)	22
12.13.	24V DC output (unstable).....	22
12.14.	12V DC output (stabilised)	22
12.15.	Output OUT	23
12.16.	Transformer connection	23
13	Functional description	23
13.1.	Type of end position detection over limit switch or power stop.....	23
13.2.	Obstacle detection / force shutdown / power stop	24
13.3.	Release / release time (with detected obstacle)	24
13.4.	Runtime limit	24
13.5.	Tubular motor operation.....	25
13.6.	1 / 2-motor operation.....	25
13.7.	Closing delay (2-motor operation).....	25
13.8.	Opening delay (2-motor operation)	25
13.9.	Gentle start-up / start-up time	25
13.10.	Gentle stop	25
13.11.	Gentle stop	26
13.12.	Motor voltage on path	26
13.13.	Automatic closing	26
13.14.	Part opening	26
13.15.	Inactive leaf	27
13.16.	Block / release control panel	27
13.17.	Trip counter	27
14	Plug-in cards / slots	27
14.1.	Radio module (optional)	27
14.2.	Radio receiver (optional)	28
15	Regular inspections	29
15.1.	LB input	29
15.2.	SE input.....	29
15.3.	Emergency stop	29
15.4.	Obstacle detection / force shutdown / power stop	29
15.5.	Dead man operation.....	30
15.6.	Malfunction.....	30
16	Images	31
17	Block diagram / pin layout.....	32
18	EC Declaration of Conformity	33
19	Environmental protection / disposal	33
20	Error messages	33
21	Technical data.....	36
22	Document change history	37
23	Notes.....	37

3 Safety notes

3.1. Symbols used



BEWARE!

Risk of personal injury!

The following important safety instructions must absolutely be observed to prevent personal injury!



CAUTION!

Risk of property damage!

Here are important instructions which must be followed to avoid property damage.



Information / note

In the following is information and instructions for the control unit and its operation.



ESD hazard

Instructions for possible failure due to static electricity.

3.2. Basic safety notes

- This control system is build according to
 - EN 12453 (Safety in the use of power operated doors, requirements)
 - EN 12978 (Safety devices for power operated doors, requirements and test methods)
 - Low Voltage Directive 2006/95/EC
 - EMC Directive 2004/108/EC
 - EN 13849-1 / 2008 (safety of machinery)
 and left the factory in safe and sound condition.
- These installation and operating instructions must be read, understood and followed by the person who installs, connects, operates and services this control system. The manufacturer is not liable for damages, consequential damages or operational errors arising due to non-observance of these installation and operating instructions.
- The accident prevention regulations and relevant standards in force must be observed at the installation site.
- Before working on the controller, disconnect the controller from the power supply and secure it against reconnection.
- Following installation and commissioning, all users must be trained in the functions and operation of the system. All users are to be informed of the hazards and risks posed by the system and their user and testing obligations. Documentation of these points is recommended.
- Do not allow children or non-authorised persons to operate the door control.
- When opening or closing the door, no persons, animals or objects may be present in the operating range of the door.
- Operation of the control is only safe if used as directed and in compliance with the limits specified in the “technical data”!
- During the learn trips, the force shutdown (power stop) is only partially effective and there is an increased risk of property damage and personal injury!
- After installation, the fitter who has final responsibility for the door drive must check whether the maximum closing force is in accordance with the standards EN 12445 (Safety in use of power operated doors, test methods) and EN 12453 Safety in use of power operated doors, requirements) and the standards, regulations and guidelines which are applicable at each installation site!
- Due to the various setting options, settings for the operated machine can also be adopted which could clearly be illogical, unreliable or dangerous. This is not a matter of an error or shortcoming in the controller. The fitter / plant manager must carefully check the adopted settings for this and change them if necessary.

3.3. Safety regulations

During assembly, installation, commissioning, testing and maintenance of the controller, the safety and accident prevention regulations for the specific application must be observed. Particularly the following regulations (not exhaustive):

- Machine Directive 2006/42/EC
- EN 12453 (Safety in the use of power operated doors, requirements)
- EN 12445 (Safety in the use of power operated doors, test methods)
- EN 12978 (Safety devices for power operated doors, requirements and test methods)
- EN 60335 (Safety of electrical appliances for household use and similar purposes)
- Fire prevention regulations
- Accident prevention regulations ASR A1.7 (power-operated windows, doors and gates) (previously BGR232 and ZH1/494)

3.4. Storage / Shipping / Packaging

- Storage conditions: -25°C to + 80°C at 20 to 90% relative humidity, non-condensing.
- The existing packaging is only used as a surface protection and is not permitted for direct further shipping. Shipping must only be done in a sufficiently padded additional package. Damages due to non-compliance are not covered in the manufacturer's liability.

3.5. Use of wireless remote control units (optional)

- These remote control units are only approved for use with devices and systems where a functional problem in the transmitter or receiver does not result in a hazard for people, animals or property hazard or this risk is covered by other safety equipment.
- The user must be informed that the wireless remote control of doors systems with a risk of accidents is only permissible, if at all, with direct eye contact to the door system and when the motion range must be free of people, animals and objects.
- Store the transmitter so that unwanted activation, e.g. by children or animals, is impossible.
- The wireless remote control units in use work on generally-approved frequencies (ISM bands). The operator of such wireless remote control units is not protected from faults caused by other wireless systems or devices (e.g., wireless systems being operated in the same frequency range such as baby phones, intercoms, etc.).

4 Intended use

- This motor controller is designed for 24V DC drives in one or two-engine door systems, such as turning, sliding, folding, rolling, tilting and swing doors in residential and industrial areas.
- In accordance with the legal requirements and guidelines in this manual.
- Only motors, control devices and sensors which are in good working condition may be connected and used for their intended purpose, safely and risk-aware, according to these instructions.

4.1. Assembler / installer

- These instructions require knowledge from electrical technicians who can evaluate the work required from you, detect possible sources of danger and take the suitable safety measures.
- This manual is designed for the fitter /installer of the control system as well as the further processing industry, but not for submission to the operator of the door system.
- This manual is to be kept with the technical documentation of the system.
- The fitter / installer is to create a manual which is tailored to the complete door system.

4.2. CE marking

- The motor controller is only considered as a "complete machine" within the meaning of the machinery directive when it is complete with the motor, control devices, sensors and the door system.
- The manufacturer of the "ready-to-use door system" is responsible for compliance and the declaration of CE conformity. This is usually the assembler / installer who is responsible.



Information / note

For the complete system (machine), an EC declaration of conformity in accordance with the Machinery Directive 2006/42/EC must be issued and the CE label and nameplate must be attached. This also applies to residential areas, where a previously manually operated door system has been automated by means of retooling.

4.3. Legal requirements

The control meets the requirements according to:

- **DIN EN 50081 T1/2** and **EN 55011** and **EN 55014**. (conformity assessment according to EMC Directive)
- **VDE 0700 Part 95** (version 02/98; IEC 60335-2-95)
EN 12445 and **EN 12453** (Requirements on motor control systems for “power operated doors and gates”, previously ZH 1/494)
- **DIN EN 60335-1**. (Declaration of Conformity according to the “Low Voltage Directive”)
- **EN ISO 13849-1**, Cat.2, PL d, Functional safety of the functions force limit, light barrier evaluation and safety switch strip evaluation.

5 Improper use

Any use other than the intended use shall be considered improper use for which the manufacturer is not liable. The fitter, electrician or operating organisation bears the risk and the liability here.

6 Terms used

In this manual, the following non-everyday terms are used:

6.1. Obstacle detection / force shutdown / power stop

The controller monitors the running of the motor. When an obstacle is hit, there is force shutdown.

6.2. OSD

Self-monitoring Optical Safety Device as a light barrier or closing edge protection / contact strip.

6.3. 8k2 safety bar

Closing edge protection / contact bar

6.4. Release / release time

The door only moves in the “opposite direction” for the set release time, in order to release an obstacle.

6.5. Reversing

The door travels in the “opposite direction” until reaching the end position.

6.6. Panic function

With the panic function, a “targeted” Open / Close command always leads to a stop during a door movement. Only a further actuation starts the door in the desired direction of movement.

6.7. Gentle start-up / gentle stop

Gentle start-up: The motor starts at reduced speed.

Gentle stop: The motor runs to the end position at reduced speed.

6.8. Inactive leaf

With 2-wing door systems, one wing can be selected as an “inactive leaf”. This can then be opened separately (e.g.: clearance for persons).

6.9. Part opening

The gate can be specifically moved to a pre-selected position between the limit switches (e.g.: clearance for persons).

7 Abbreviations used

[BL.1]	= 15-pin slot for radio module
[BL.2]	= 2 x 10-pole slot for 1 or 4-channel radio receiver
[J1]	= Jumper for safety device input
[Kl.1] .. [Kl.33]	= Reference to connecting terminals
M1, M2	= motor 1 and motor 2
[M.A0]..[M.d9]	= menu tables, menu items "A0" to "d9"
[Ta.+]	= Button "+" in control panel
[Ta.-]	= Button "-" in control panel
[Ta.F]	= Button "Radio" in control panel
[Ta.M]	= Button "Menu" in control panel
[X1]..[X6]	= Reference to image
{F0}..{F9}	= Radio module function, shown on the display
{Er.00}..{Er.28}	= Error / fault message, shown in display

8 Assembly

8.1. Assembly screws

This needs 4 screws with a shaft diameter of max. 4mm and a head diameter of max. 8mm.

8.2. Assembly location

- Please refer to the technical data for the environmental conditions; see point 21
- Do not select any assembly location which is exposed to electromagnetic fields. That is, not directly next to contactors, power transformers, fluorescent lights, etc or their connection wires.
- Safe protection from direct sunlight and driving rain must be guaranteed.
- When the design is used with an integrated membrane keyboard, then the assembly location should, just like external controls, be situated in a secure server area and within sight of the main closing edge.



Information / note

An installation site (indoor area, north side, etc.) with protection from direct sun increases the service life of the controller about tenfold!

8.3. Assembly

- The internal temperature measurement is designed for vertical mounting.
The image [X3] point 16 shows the assembly drill-holes for mounting. The lines are to be entered from below and sealed with the accompanying plugs / screws, to prevent the entrance of moisture and insects.
- Consider the weight of the control system when choosing the type of mounting (technical data point 21).
- Mount the control box properly at the suitable location.



Information / note

- The housing may not be tensioned during screwing (uneven surface). There is the risk that the cover is not properly sealed, that water enters and the controller fails.
- During assembly, no moisture may get into the controller! This could result in corrosion, defects, failure of the controller and risk to people and property!

9 Connection / Commissioning / Programming / Reset



BEWARE!

- Read the safety instructions under point 3 again and follow them exactly!
- During first installation / commissioning, the safety devices are only partly connected or are not yet effective! This, therefore, requires caution to avoid personal injury and damage to property!
- After a successful commissioning all further specifications of this manual must be checked and completely implemented!

9.1. 1. Step: Connection

- Connect operating voltage according to point 12.2
- Connect motor M1 according to point 12.4
- Connect limit switch LS1 according to point 12.6 (In operation without LS, [M.C6] = 02 must be set)
- Connect motor M2 (if available) according to point 12.5
- Connect limit switch LS2 (if available) according to point 12.7. (In operation without LS, [M.C6] = 02 must be set)
- At first, connect no control devices and insert no plug-in cards!

9.2. 2. Step: Door position

- Manually set the door to the half path and lock the drive. (Both leafs with a 2-leaf system)
- In this way, there is sufficient time to shut down, in the case of malfunction upon first start-up, over the key [Ta.+] or [Ta.-].

9.3. 3. Step: Turn on operation voltage

- Check again that all connections are correct.
- Now turn on the operating voltage (230V AC)
- The controller carries out a self-test. CH = appears briefly once on the display = check and relay are controlled audibly.
- On the display, the middle segments flash alternately with display 44. The segments show that M1 and M2 are on the path (not in the end position), and that 4 learn trips are still to be made each for M1 and M2.



Information / note

Should LEDs behind the terminals light up, then the bridges in the corresponding inputs are missing. It can be determined which bridges are missing over point 10.10 "LEDs behind the terminals" and over the point 12 "Connections & functions".

9.4. 4. Step: Select door type

- Now familiarise yourself with the "operating elements & functions / displays" according to point 10.
 - Select door type
 - In the factory, proven or typical settings (basic settings according to the menu table) are preconfigured for usual door types (rotating door, sliding door, rolling door). [M.A0] = 00
 - By selecting the door type, the "basic values" shown in the menu table (point 11) are adopted as the presetting.
 - Now set the door type following completion of point 10.3 and in accordance with the menu table (point 13.6) or proceed as follows:
 - > Press [Ta.M] and hold until A0 ..d9 is displayed
 - > Press [Ta.-] several times until A0 is displayed
 - > Briefly press [Ta.M]. The display shows a value between "00" .. "07" = door type
 - > Press [Ta.F] and hold down and use [Ta.+] / [Ta.-] to select the door type according to the menu table.
 - > Let go all keys
 - > Press [Ta.M] and hold until the display on "Door status" resets.
- CH = appears briefly once on the display = check and relay are controlled audibly.



CAUTION!

- Due to the large number of different drive systems, it is possible that the default factory settings [M.A0], and thus the automatic adjustment in the sub-menus, are not optimum in some cases. In this case, accurately modify the menu values according to the required functions ([M.A5]..[M.E4]).
- Changing [M.A0] readjusts all basic values according to the menu table and is the same as a "factory reset". All force values and runtimes are deleted; new learn trips are to be made! Non-compliance can lead to failure, destruction and property damage. It is then necessary to adapt the individual menu values.

9.5. 5. Step: Check motor movement directions

- Check again that the door (both doors) is in the centre of the path and keep the emergency stop ready.
- Now briefly press the key [Ta.+] (start command in OPEN direction).
- The door or both doors must now move in the OPEN direction!

- Stop the operation immediately over the emergency stop control device before the end position is reached.
- If the OPEN direction is activated, then M1 and M2 are connected properly. If the CLOSED direction is activated, then switch off the operating voltage and swap the cables M1 open / close or M2 open / close.
- Repeat the test until the both doors move in the OPEN position after switching on the operating voltage and first pressing [Ta.+].
- The motor is then properly connected.

9.6. 7. Step: Programming

- Using the menu table, check the pre-set menu values of the individual menu points.
- All menu values can be modified if needed.
- For control and traceability, enter the set values in the “Settings” column.

9.7. 8. Step: Perform learn trips / teach force values

- The learn trips are to be made following proper connection and checked programming. The displays and effect are described under the points 10.6 displays and 13.2 obstacle detection / power stop.
- Manually position door (both leaves) on the path (not in end position), then give operating command ([Ta.+] = OPEN / [Ta.-] = CLOSE). The door must be able to move from one end position to the other end position according to the corresponding command.
- To teach the force values and paths, a total of four complete learn trips must be carried out from end position to end position.
- The number of learn trips which are still to be made is shown on the display by the flashing numbers (44 .. 11). M1 = left segment, M2 = right segment.
- There must be no STOP on the path during the learn trip! The door must be able to move from one end position to the other end position without restriction.
- After the controller is programmed (change [M.A0], deletion of force values) or after a power outage, the first impulse command always leads to movement in the “OPEN” direction.
- The learn trips are complete when the figures “44” .. “11” stop flashing and the door status is shown by the lit horizontal bar on the display. The system is then ready for basic operation.



BEWARE!

- Check that the force shutdown / power shutdown comply with the force values according to EN12445 and EN12453!
- Caution: During the learn trips, the force shutdown (power stop) is only partially effective and there is an increased risk of property damage and personal injury!



Information / note

- If needed, the taught force values and runtimes can be deleted. Press [Ta.-] and [Ta.+] at the same time and hold them down until “4” or “44” flash on the display. During the deletion, both points also flash quickly on the display.
Caution: New learn trips must be made:
- If needed, the controller can be reset to the factory setting by adjusting [M.A0].
>Press Ta.M] until [M.A0].[M.d9] appears.
>Select menu point [M.A0] with [Ta.-] / [Ta.+].
>Briefly press [Ta.M], the menu value (00...07) is displayed.
>Hold down [Ta.F] and adjust the menu value at the same time with [Ta.+] / [Ta.-], then reset for the appropriate door type (see menu table).
>Release [Ta.F] again.
>All menu settings are reset to their basic values (factory settings) for the corresponding door type by [M.A0].
> **Caution:** Resetting the control system changes the functions of the safety devices. Readjusting the entire control system and carrying out a new trip is required!

9.8. 9. Step: Other control devices / safety devices / plug-in cards

- Turn off the operating voltage, connect all other control devices and insert all plug-in cards on the correct side.
- Adopt the connection, function and setting from this manual or the manual of the control device / plug-in card.

9.9. 10. Step: Back up tests / settings

- It is necessary that you again check all control devices, functions and settings, step-by-step, according to this manual.

- We recommend entering the set menu values in the menu table under “Settings”.
- Particularly check that the obstacle detection / force shutdown / power shutdown comply with the force values according to EN12445 and EN12453!
- We recommend blocking the control panel against unauthorised changes once all work is complete. To do so, set menu point [M.d8] = 01.

9.10. 11. Step: Reset / default setting

If needed, the controller can be reset to the factory setting by adjusting [M.A0].

Changing [M.A0] readjusts all basic values according to the menu table and is the same as a “factory reset”. It is then necessary to readjust the entire control system and new learn trips are then needed!

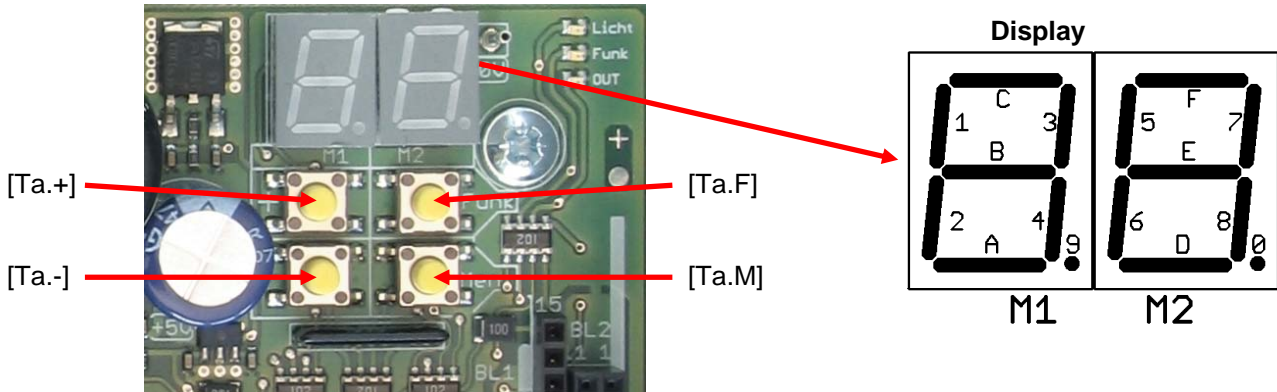
10 Operating elements & functions / display

10.1. General

The controls are arranged on two levels.

1. Level (top level) = select menu point or function
2. Level (bottom level) = select the setting value

The keys, therefore, have different purposes / functions depending on the level.



10.2. Function of the keys

- [Ta.+] + **Value** and + **Menu** and Open / Stop in open direction
- [Ta.-] - **Value** and - **Menu** and Closed / Stop in closed direction
- [Ta.F] **Radio button** For teaching / deleting the radio in radio module operation
- [Ta.M] **Menu button** Menu selection / Input status display

10.3. Set menu point / menu value according to menu table (point 11)

- Display or modify menu point (1st level), to do so,
 - press and hold down [Ta.M]
 - After approx. 2 sec, "A0" or the last called menu point appears on the display.
 - Release [Ta.M]
 - Using [Ta.+] or [Ta.-], select the desired menu point according to the menu table
- Display or modify menu point (2nd level), to do so, now
 - briefly press [Ta.M]
 - The menu value appears on the display as a figure from "00 .. 99"
 - Using [Ta.+] or [Ta.-], change the desired menu value from "00 .. 99"
- Adopt all settings according to this graph.
- To leave the menu, press [Ta.M] > 1 sec (hold down).
- About 15 seconds after the last actuation, the display returns to the "door status display".



Information / note

- If it is not possible to change any menu values, then the complete control panel is locked against adjustments. Release over point 13.16 "Lock / release control panel".
- The menu point A0 (door type) is secured against adjustments. Make changes according to the menu table (point 11) or in accordance with the steps in point 9.4.
- This setting is automatically adopted and saved by changing the menu value.
- The motor cannot run during configuration.

10.4. Display "door status"

- Is shown automatically following "operational voltage on"
- This is shown after pressing [Ta.M] shortly (< 1 sec) many times alternately with "door status" - "status of inputs"

Segment	Segment condition	Motor	Door condition
A	Lit	1	CLOSED in end position
B	Lit	1	Between end positions
C	Lit	1	OPEN in end position
D	Lit	2	CLOSED in end position
E	Lit	2	Between end positions

Segment	Segment condition	Motor	Door condition
F	Lit	2	OPEN in end position
Links	Upward bars	1	Starts up
Links	Downward bars	1	Runs
Links	Bar stationary and flashing	1	Last trip was ended with safety input, light barrier or power stop
Right:	Upward bars	2	Starts up
Right:	Downward bars	2	Runs
Right:	Bar stationary and flashing	2	Last trip was ended with safety input, light barrier or power stop
Richt point 0	Lit	1/2	Automatic closing Open time running
	Flashes		Automatic closing Advance warning time running

10.5. Display “Status of inputs”

- This is shown after pressing [Ta.M] shortly (< 1 sec) many times alternately with “door status” - “status of inputs”
- About 15 seconds after the last actuation, the display returns to the “door status display”.

Segment	Segment condition	Input
1	Lit	Limit switch M1 OPEN pressed
2	Lit	Limit switch M1 CLOSED pressed
3	Lit	Light barrier (LB) pressed
4	Lit	Safety input SE pressed
5	Lit	Input A / impulse pressed
6	Lit	Input B / part opening / inactive leaf pressed
7	Lit	Limit switch M2 OPEN pressed
8	Lit	Limit switch M2 CLOSED
9 / point	Lit	Emergency stop pressed
0 / point	Lit	Automatic closing Open time running
	Flashes	Automatic closing Advance warning time running

10.6. Display “learn trips”

- The number of learn trips still to be made is shown by display “1 .. 4” on the display.
- The display alternates between “door status” and “number of learn trips to still be made”.
- Motor M1 = Left display
- Motor M2 = Right display

10.7. Display “Error messages”

- The display switches between “ER” (error) and the error number (00..28).
- Error list; see point 20 “Error messages”

10.8. Display “radio”

- When teaching the radio module, the display switches between door status and {F0}..{F9} for the selected radio function. The “radio” LED beside the display also flashes.
- Deletion of all codes of a radio module is indicated by fast flashing of {FL} on the display and by fast flashing of the “radio” LED.
- If a learned radio signal is recognised, the learned function {F0}..{F9} is shown on the display and the “radio” LED lights up.

10.9. LEDs beside display (Image [X4])

Labelling	Colour	Function
Light	yellow	Light / warning light output is switched on
Radio	red	Display “radio reception” in radio module operation
OUT	yellow	Display output OUT is switched on

10.10. LEDs behind terminals (image [X7])

Where	Colour	Function
behind [KI.14]+[KI.15]	red	Input emergency stop
behind [KI.16]+[KI.17]	green	Input limit switch open M1
behind [KI.17]+[KI.18]	green	Input limit switch closed M1
behind [KI.19]+[KI.20]	green	Input limit switch open M2
behind [KI.20]+[KI.21]	green	Input limit switch closed M2
behind [KI.22]+[KI.23]	yellow	Input light barrier
behind [KI.23]+[KI.24]	yellow	Input closing edge protection / safety device
behind [KI.25]+[KI.26]	green	Input A (impulse/open)
behind [KI.26]+[KI.27]	green	Input B (part opening / inactive leaf /closed)

10.11. Jumper [J1] (Image[X5])

- If a closing edge protection is connected to the SE input (8K2 or OSD), the jumper J1 must be connected to SE.
- If no closing edge protection is available, the jumper J1 must be inserted into NC.
- Function, see point 12.12

11 Menu table

Basic value (default setting) = marked grey

Menu point	Menu value	Function / value	Basic value							Appointment	Manual point	
			[M.A0] = 00 2-wing swing door	[M.A0] = 01 1-wing swing door	[M.A0] = 02 Sliding door	[M.A0] = 03 Folding door	[M.A0] = 04 Rolling door	[M.A0] = 05 Type 5	[M.A0] = 06 Type 6			[M.A0] = 07 Type 7
A0		DOOR TYPE (DEFAULT SETTING)										9.4
	00	2-wing swing door	00	00	00	00	00	00	00	00		
	01	1-wing swing door										
	02	Sliding door										
	03	Folding door										
	04	Rolling door										
	05	Type 5										
	06	Type 6										
	07	Type 7										
		Caution: Change influences all other menu points!										
A1	00..20	MOTOR VOLTAGE GENTLE STOP M1	10	10	10	5	10	10	10	10		13.10
A2	00..20	MOTOR VOLTAGE GENTLE STOP M2	10	10	10	5	10	10	10	10		13.10
A3	00..20	MOTOR VOLTAGE ON PATH M1	20	20	20	20	20	20	20	20		13.12
A4	00..20	MOTOR VOLTAGE ON PATH M2	20	20	20	20	20	20	20	20		13.12
A5		GENTLE STOP M1 AND M2										13.10
	00	No gentle stop										
	01..20	Gentle stop in 0.5 sec steps before end position, start point self-learning	05	05	05	05	05	05	05	05		
A6		GENTLE START-UP TIME (e-lock time, power stop, suppression)										13.9
	00..05	Start-up time 0.5 .. 3.0 sec, in 0.5 sec steps	02	02	02	02	02	02	02	02		
A7	00..30	POWER IN ON M1 (power stop)	15	15	15	15	15	15	15	15		13.2
A8	00..30	POWER IN CLOSED M1 (power stop)	15	15	15	15	15	15	15	15		13.2
A9	00..30	POWER IN ON M2 (power stop)	15	15	15	15	15	15	15	15		13.2
b0	00..30	POWER IN CLOSED M2 (power stop)	15	15	15	15	15	15	15	15		13.2
b1		AUTOMATIC CLOSING										13.13
	00	Off	00	00	00	00	00	00	00	00		
	01..62	Open time 2 .. 120 sec, in 2-sec steps, plus 5-sec pre-warning time										
	63..90	Open time 63=3 min, 64=4 min, ... 90=30 min plus advance warning time (set value - 60 = time in minutes)										
b2		LIGHT / WARNING LIGHT										12.3
	00	Only during motor operation				00						
	01	During motor operation until 1 min after motor operation										
	02	During motor operation until 2min after motor operation	02	02	02		02	02	02	02		
	03	During motor operation until 3min after motor operation										
	04	4 sec before motor start (open + closed) and during motor operation										
	05	4 sec before motor start (open + closed) and during motor operation - flashing										
	06	4 sec before motor start (closed) and during motor operation										
	07	4 sec before motor start (closed) and during motor operation - flashing										
	08	Status display: Door OPEN in end position										
	09	Status display: Door CLOSED in end position										

Menu point	Menu value	Function / value	Basic value							Appointment	Manual point
			[M.A0] = 00 2-wing swing door	[M.A0] = 01 1-wing swing door	[M.A0] = 02 Sliding door	[M.A0] = 03 Folding door	[M.A0] = 04 Rolling door	[M.A0] = 05 Type 5	[M.A0] = 06 Type 6		
b3		OBSTACLE DETECTION / FORCE SHUTDOWN / POWER STOP									
	00	Start-up: No effect									
	01	Start-up: No effect									
	02	Start-up: No effect									
	03	Start-up: No effect									
	04	Start-up: Stop									
	05	Start-up: Stop				05					
	06	Start-up: Stop									
	07	Start-up: Stop						07			
	08	Start-up: Release									
	09	Start-up: Release									
	10	Start-up: Release	10	10					10	10	10
	11	Start-up: Release			11						
	12	Start-up: Reverse									
	13	Start-up: Reverse									
	14	Start-up: Reverse									
	15	Start-up: Reverse									
		If "no effect" is set, the controller can be damaged or destroyed in the event of overload!									
b4		LIGHT BARRIERS									
	00	Start-up: No effect									
	01	Start-up: No effect									
	02	Start-up: No effect									
	03	Start-up: No effect			03	03					
	04	Start-up: Stop									
	05	Start-up: Stop									
	06	Start-up: Stop									
	07	Start-up: Stop									
	08	Start-up: Release									
	09	Start-up: Release									
	10	Start-up: Release	10	10				10	10	10	10
	11	Start-up: Release									
	12	Start-up: Reverse									
	13	Start-up: Reverse									
	14	Start-up: Reverse									
	15	Start-up: Reverse									
b5		Close after leaving the light barriers									
	00	Function switched off	00	00	00	00	00	00	00	00	
	01..20	Delay time in 0.5 sec steps									

Menu point	Menu value	Function / value	Basic value							Appointment	Manual point
			[M.A0] = 00 2-wing swing door	[M.A0] = 01 1-wing swing door	[M.A0] = 02 Sliding door	[M.A0] = 03 Folding door	[M.A0] = 04 Rolling door	[M.A0] = 05 Type 5	[M.A0] = 06 Type 6		
b6		CLOSING EDGE PROTECTION SAFETY DEVICE									12.12
	00	8k2 Start-up: No effect Stop: No effect									
	01	8k2 Start-up: No effect Stop: Stop									
	02	8k2 Start-up: No effect Stop: Release				02	02	02	02	02	
	03	8k2 Start-up: No effect Stop: Reversing									
	04	8k2 Start-up: Stop Stop: No effect									
	05	8k2 Start-up: Stop Stop: Stop									
	06	8k2 Start-up: Stop Stop: Release									
	07	8k2 Start-up: Stop Stop: Reversing									
	08	8k2 Start-up: Release Stop: No effect									
	09	8k2 Start-up: Release Stop: Stop									
	10	8k2 Start-up: Release Stop: Release	10	10	10						
	11	8k2 Start-up: Release Stop: Reversing									
	12	8k2 Start-up: Reverse Stop: No effect									
	13	8k2 Start-up: Reverse Stop: Stop									
	14	8k2 Start-up: Reverse Stop: Release									
	15	8k2 Start-up: Reverse Stop: Reversing									
	16	OSD Start-up: No effect Stop: No effect									
	17	OSD Start-up: No effect Stop: Stop									
	18	OSD Start-up: No effect Stop: Release									
	19	OSD Start-up: No effect Stop: Reversing									
	20	OSD Start-up: Stop Stop: No effect									
	21	OSD Start-up: Stop Stop: Stop									
	22	OSD Start-up: Stop Stop: Release									
	23	OSD Start-up: Stop Stop: Reversing									
	24	OSD Start-up: Release Stop: No effect									
	25	OSD Start-up: Release Stop: Stop									
	26	OSD Start-up: Release Stop: Release									
	27	OSD Start-up: Release Stop: Reversing									
	28	OSD Start-up: Reverse Stop: No effect									
	29	OSD Start-up: Reverse Stop: Stop									
	30	OSD Start-up: Reverse Stop: Release									
	31	OSD Start-up: Reverse Stop: Reversing									
b7		RELEASE TIME									13.3
	00..15	Release time 0.25 .. 4.0 sec, in 0.25 sec steps,	07	07	01	07	07	07	07	07	
b8		EMERGENCY STOP									12.10
	00	Automatic closing following emergency stop blocked	00	00	00	00	00	00	00	00	
	01	Opening time restarts following release of emergency stop									
	02	Next trip after an emergency stop in gentle operation, automatic closing locked									
b9		Input A / impulse and input B / part opening / inactive leaf and radio receiver									12.8 and 12.9
	00	A: Open impulse + Panic B: Closed impulse + Panic	00	00	00	00	00	00	00	00	
	01	A: Open impulse + Panic B: Closed impulse									
	02	A: Open impulse + Panic B: Closed – Dead man									
	03	A: Open impulse B: Closed impulse + Panic									
	04	A: Open impulse B: Closed impulse									
	05	A: Open impulse B: Closed – Dead man									
	06	A: Open dead man B: Closed impulse + Panic									
	07	A: Open dead man B: Closed impulse									
	08	A: Open dead man B: Closed – Dead man									
	09	A: Impulse (open-stop-closed-...) B: Part opening / inactive leaf									

Menu point	Menu value	Function / value	Basic value							Appointment	Manual point	
			[M.A0] = 00 2-wing swing door	[M.A0] = 01 1-wing swing door	[M.A0] = 02 Sliding door	[M.A0] = 03 Folding door	[M.A0] = 04 Rolling door	[M.A0] = 05 Type 5	[M.A0] = 06 Type 6			[M.A0] = 07 Type 7
C0		PART OPENING										13.14
	00	Inactive leaf operation (only in 2-motor operation)	00			00		00	00	00		
	01..99	Runs until part opening / ventilation position 0.5 .. 50 sec, in 0.5 sec steps,		10	10			02				
C1		1 / 2-MOTOR OPERATION										13.6
	00	2-motor operation	00			00		00	00	00		
	01	1-motor operation		01	01			01				
C2		CLOSING DELAY M1 (2-motor operation)										13.7
	00	Off		00	00	03	00					
	01..19	Stop delay (0.5 .. 10 sec, in 0.5 sec steps,										
	20	Stop delay is learned automatically (M1 reaches end positions approx. 4 sec after M2)	20					20	20	20		
C3		OPENING DELAY M2 (2-motor operation)										13.8
	00	Off		00	00	03	00					
	01..19	Start delay 0.5 .. 10 sec, in 0.5 sec steps,	04					04	04	04		
C4		OUTPUT OUT										12.15
	00	E-lock	00	00				00	00	00	00	
	01	Light barrier test										
	02	Status display: Door OPEN in end position			02							
	03	Status display: Door CLOSED in end position				03						
	04	Radio module functions {F8} and {F9}										
	05	Transfer open command										
C5		RUNTIM LIMIT (M1 + M2)										13.4
	00..99	1 sec.. 100 sec, in 10-sec steps	99	99	99	15	99	99	99	99		
C6		TYPE OF END POSITION RECOGNITION										13.1
	00	Internal limit switch (in the motor line)										
	01	External limit switches (terminals 16 - 21)	01	01	01			01	01	01	01	
	02	Force shutdown / power stop (operation without limit switch. Only permitted with safety bars!)				02						
C7	00	-										
C8	00	-										
C9	00	-										
d0	00	-										
d1	00	-										
d2	00	-										
d3	00	-										
d4	00	-										
d5	00	-										
d6	00	-										
d7	00	-										
d8		Block / release OPERATING FIELD										13.16
	00	Control panel free, menu points adjustable	00	00	00	00	00	00	00	00		
	01	Control panel locked, menu points not adjustable										
		Changeover										
		Press emergency stop, [Ta.+] and [Ta.-] at the same time, with [Ta.M], switch between 00 and 01										
d9		TRIP COUNTER (read-only, not changeable)										13.17
	00	100,000 position										
	01	10,000 position										
	02	1,000 position										
	03	100 position										
	04	10 position										
	05	1 position										

12 Connections & functions



BEWARE!

- Work on the control unit may only be carried out in a voltage- free condition! Non-compliance can lead to severe or fatal injuries.
- 230V AC can be present at [KI.1]..[KI.4]. Risk of electric shock! Non-compliance can lead to severe or fatal injuries.



CAUTION!

Never switch operating voltage / mains voltage to [KI.5]..[KI.29].
Non-compliance can lead to failure, destruction and property damage. No guarantee!



Information / note

- Control and motor cables (e.g. impulse, open, stop, close...) must not exceed a length of max. 30 m!
This does not apply to the power line.
- Always run the power line, motor line and control lines in separate cables and lay at a distance from each other. Non-compliance can lead to functional errors!



ESD hazard

Static electricity can lead to an immediate failure or later failure of the control unit.
Care must be taken that grounding is in line with ESD requirements during all work on the control unit.

12.1. General

Images, see point 16

Block diagram / pin layout; see point 17

12.2. Operating voltage / mains voltage

[KI.1] N-conductor 230V / AC

[KI.2] L-conductor 230V / AC

- The operating voltage is secured over a microfuse with 3.15A point 16 [Si1] supports.



CAUTION!

Connection to the building installation must be done in accordance with the Machinery Directive Appendix I point 1.6.3 over a sufficiently dimensioned mains isolating device. This can be achieved with a plug connection or a lockable main power switch.

12.3. Light / warning light

[KI.3] N-conductor

[KI.4] L-conductor (connected)

- 230 V / AC Output, max. 500W
- The switching status is indicated by the yellow LED "light" image [X4].
- The light function is set over [M.b2].
- With [M.b2] = 00 to 07, the light / warning light can be controlled at the specified times
- With [M.b2] = 08 to 09, a door status display can be shown, whereby the light output is controlled depending on the door position (end position open / closed).

12.4. 24V DC Motor M1

[KI.5] - M1 / OPEN direction, 24V / DC output

[KI.6] - M1 / OPEN direction, 24V / DC output

- Motor 1 is the main motor and is also used as the inactive leaf motor.
- If the controller is only operated with one motor ([M.C1] = 01), this is to be connected to M1.
- The drive must move in the OPEN direction after "operating voltage / mains voltage on" and the first impulse command. Should the drive move in the CLOSE direction despite upward bars, the connection wires [KI.5]+[KI.6] must be exchanged.
- The motor settings are adopted according to M.A1]..[M.A8].
- The controller learns the maximum motor power for each direction of movement.
- Maximum motor capacity 250VA 25% ED.

12.5. 24V DC Motor M2

[KI.7] - M1 / OPEN direction, 24V / DC output

[KI.8] - M1 / OPEN direction, 24V / DC output

- The drive must move in the OPEN direction after “operating voltage / mains voltage on” and the first impulse command. Should the drive move in the CLOSE direction despite upward bars, the connection wires [KI.16]+[KI.17] must be exchanged.
- The motor settings are adopted according to [M.A2]..[M.b0].
- In 2-motor operation, M1 starts in the open direction at the same time as, or before, M2. The opening delay M2 is adjustable over [M.C3].
- In 2-motor operation, M2 starts in the closed direction at the same time as, or before, M1. The closing delay M1 is adjustable over [M.C2].
- The controller learns the maximum motor power for each direction of movement.
- Maximum motor capacity 250VA 25% ED.

12.6. Limit switch ES to M1

[KI.16] OPEN limit switch

[KI.17] 0V / mass

[KI.18] CLOSED limit switch

- Safety input category 1 according to EN ISO 13849-1/2008 (directly switches off the movement direction relay)
- Open contact, potential-free, [M.C6]
- An unused limit switch input must not be bridged!
- With [M.C6] = 00 or 02, the limit switch inputs have no function and the LEDs do not light up, even when there are no bridges in the inputs.
- The LEDs behind the terminals [KI.16] - [KI.18] light up in the end position when the limit switch is pressed / open.
- Alternatively, drives with integrated limit switches can also be used [M.C6] = 00, which interrupt the motor power in the corresponding direction. The controller then evaluates this as external limit switches. There is then no LED display of the limit switch behind the terminals.



CAUTION!

- Only potential-free contacts may be connected.
- Light barriers with an OC output (open collector output) cannot be used. (malfunction!)

12.7. Limit switch ES2 to M2

[KI.19] ON limit switch

[KI.20] 0V / mass

[KI.21] OFF limit switch

- Safety input category 1 according to EN ISO 13849-1/2008 (directly switches off the movement direction relay)
- Open contact, potential-free, [M.C6]
- An unused limit switch input must not be bridged!
- With [M.C6] = 00 or 02, the limit switch inputs have no function and the LEDs do not light up, even when there are no bridges in the inputs.
- The LEDs behind the terminals [KI.19] - [KI.21] light up in the end position when the limit switch is pressed / open.
- Alternatively, drives with integrated limit switches can also be used [M.C6] = 00, which interrupt the motor power in the corresponding direction. The controller then evaluates this as external limit switches. There is then no LED display of the limit switch behind the terminals.



CAUTION!

- Only potential-free contacts may be connected.
- Light barriers with an OC output (open collector output) cannot be used. (malfunction!)

12.8. Input A (impulse /OPEN / dead man)

[KI.25] Signal input

[KI.26] 0V (mass)

- Input for buttons, key switches, external radio receivers, etc.
- Closing contact, potential-free

- Several control devices can be connected in parallel.
- The red LED behind [KI.25 / 26] lights up when the contact is closed.
- The input is switched internally parallel to the radio receiver slot [Bl.2] channel 1.
- The function (impulse / open / dead man) of the input is set over [M.b9].
- Simultaneously pressing input A and input B gives the stop function (not applicable in radio mode).

12.9. Input B (part opening / inactive leaf /CLOSED / dead man)

[KI.26] 0V (mass)

[KI.27] Signal input

- Input for buttons, key switches, external radio receivers, etc.
- Closing contact, potential-free
- Several control devices can be connected in parallel.
- The green LED behind [KI.26 / 27] lights up when the contact is closed.
- The input is switched internally parallel to the radio receiver slot [Bl.2] channel 2.
- The function (impulse / open / dead man) of the input is set over [M.b9].
- Simultaneously pressing input A and input B gives the stop function (not applicable in radio mode).

12.10. Emergency stop (safety input)

[KI.14] Emergency stop (+24V DC unstable)

[KI.15] Emergency stop input

- Safety input category 1 according to EN ISO 13849-1/2008 (directly switches off the movement direction relay)
- Input for emergency stop control device
- Open contact, potential-free
- Several control devices can be connected in sequence.
- An unused emergency stop input must be bridged! When used, the bridge is to be removed.
- The red LED behind [KI.14 / 15] is lit when the contact is opened.
- The automatic closing function after emergency stop is set in [M.b8]
- The emergency stop input (safety function) directly switches off the motor relay and is thus also effective with then the electronics fail! M1 and M2 stop immediately.
- Following an emergency stop command during motor operation, the door moves in the “opposite direction” (away from the hazard area) with the next impulse command.
- Following an emergency stop command when the door is stationary, the door generally starts with the next impulse command.

12.11. Light barrier (LB / safety input)

[KI.22] LB signal input

[KI.23] Switched mass

- Safety function category 2 / performance level C according to EN ISO 13849-1/2008.
- Input for light barriers with potential-free contact output or safety contact bars
- Open contact, potential-free
- An unused light barrier input must be bridged! When used, the bridge is to be removed.
- The input function is set in [M.b4].
- The yellow LED behind [KI.22 / 23] lights up when the contact is open.
- The input has a safety function and is monitored over the electronics' self-tests. The LED shortly flashes during self-tests. If an error is detected in the light barrier input {Er.13}, no door operation is possible.
- When the light barrier input is pressed, a motor can only start when the light barrier has no effect in the corresponding direction of movement (setting [M.b4]).
- During motor operation, a command acts on the light barrier input. Stop, release, reverse or no effect, depending on the direction of movement and the setting in [M.b4].
- When automatic closing is enabled, by pressing the light barrier input, the open time is reset until the input is released again.
- The function “**close after leaving the light barrier**” is set in [M.b5]. If the light barrier is not left when the door is open, the door closes following the set delay time [M.b5]. During the open time, the LED automation to the right of the display lights up. The dot flashes during the advance warning time. Light beam actuation during door operation is temporarily saved. As soon as the door is stationary, closing is started following expiry of the time set in [Mb5].



CAUTION!

- Light barriers with an OC output (open collector output) cannot be used. (malfunction!)
- [KI.23] = Switched mass. Must not be connected with mass / ground, as the light barrier input will otherwise be faulty or will not function! Non-compliance can lead to failure, destruction and property damage. No guarantee!
- External safety equipment must be permitted for personal safety and are not tested by the controller (the self-test only concerns the controller and not the connected peripherals)!
- An external light barrier test is possible: Point 12.15 “output OUT”.

12.12. Safety input (SE) (8K2 / OSD)

[KI.23] Switched mass
 [KI.24] SE-signal input

- Safety function category 2 / performance level C according to EN ISO 13849-1/2008.
- Input for safety contact bars (8k2 or OSD) for closing edge protection
- The type and function of the input is set in [M.b6].
- **OSD connection** +12V (brown) = [KI.9], mass (white) = [KI.10], signal (green) = [KI.24]
- **8k2 connection:** [KI.24] = profile inner conductor, [KI.23] = profile-casing
- If the SE input is not used
 - insert jumper [J1] into NC. Image [X5] (8k2 resistance is switched on internally) and [M.B6] = 10 must be set
 - or
 - the SE input is to be deactivated [M.B6] = 00
- If a closing edge protection is connected, [J1] is to be inserted into SE image [X5].
- The switching status is indicated by the yellow LED behind [KI23 / 24].
- A closed or open SE input is considered as pressed. LED flashes.
- When the SE input is pressed, a motor can only start when the closing edge protection has no effect in the corresponding direction of movement (setting [M.b6]).
- During motor operation, a command acts on the SE input. Stop, release, reverse or no effect, depending on the direction of movement and the setting in [M.b6].
- When automatic closing is enabled, by pressing the SE input the open time is reset until the input is released again.
- The input has a safety function and is monitored over the electronics' self-tests. The LED shortly flashes during self-tests. If an error is detected in the safety device 2 input {Er.12}, no door operation is possible.



CAUTION!

- [KI.23] = Switched mass. Must not be connected with 0V / mass, as the safety device input will otherwise be faulty or will not function!
- External safety devices must be permitted for personal protection.
- Connect the 8k2 safety device to the correct side! Non-compliance can lead to functional errors.

12.13. 24V DC output (unstable)

[KI.10] 0V / mass
 [KI.11] +24V DC (unstable); $I_{max} < 200mA$

- Connection for external users, e.g. light barriers, etc.



CAUTION!

The maximum power according to point 21 “Technical data” must not be exceeded! Non-compliance can lead to malfunction, failure, destruction and property damage.

12.14. 12V DC output (stabilised)

[KI.9] +12V DC (stabilised), $I_{max} < 40mA$
 [KI.10] 0V / mass

Connection for external users, e.g. OSE, light barriers, etc.



CAUTION!

The maximum power according to point 21 “Technical data” must not be exceeded! Non-compliance can lead to malfunction, failure, destruction and property damage.

12.15. Output OUT

[KI.12] Closer

[KI.13] Common

- Relay output, potential-free, 24V max 4A
- The output function is set in [M.C4].
 - E-lock [M.C4] = 00

For the duration of the starting time, the relay is retracted in the opening and closing direction during motor operation [M.A6].
 - Light barrier test [M.C4] = 01

The OUT relay is continuously retracted.
Connection of the 24V light curtain transmitter on [KI.10] = minus and [KI.13] = plus. In addition, a bridge from [KI.11] to [KI.12] is needed. The operating voltage of the light barrier transmitter is interrupted over the OUT output in the self-test. The relay briefly stops during the self-test. The light barrier receiver must react within 2.5 seconds of switching of the operating voltage of the light barrier transmitter. This is evaluated in the software.
 - Status display: [M.C4] = 02 / 03

When the door is at OPEN or CLOSED in the end position, the relay retracts.
 - Radio function: [M.C4] = 04

The OUT output can be directly controlled in radio module operation over the functions {F8} and [F9], in order to switch additional functions outside the controller. In current impulse mode, the output declines again after 10 minutes of motor operation in the self-test.
 - Transmit open command: [M.C4] = 05

Starts the controller in the OPEN direction, the output is closed for 0.5 sec. In combination with automatic closing, several controllers can be synchronously controlled in this way.
- The switching status is indicated by the yellow LED "OUT" image [X4].



CAUTION!

The maximum voltage and maximum power according to point 21 "Technical data" must not be exceeded! Non-compliance can lead to malfunction, failure, destruction and property damage.

12.16. Transformer connection

An isolating or safety transformer [X2] is installed and connected at the factory.

[KI.30]+[KI.31] Transformer connection (primary 230V/AC)

[KI.32]+[KI.33] Transformer connection (secondary 24V/AC)

For safety and EMC reasons, an isolating and safety toroidal transformer according to EN60742 (VDE0551) must be used.

The secondary side (24V AC) must be secured with an external 20A automotive fuse [X1] / [Si2]!

13 Functional description

13.1. Type of end position detection over limit switch or power stop

During start-up, the type of end position detection is to be set in [M.C6].

- **Internal limit switch [M.C6] = 00**
 - With internal limit switches point 16 [X6], the opener contacts are switched in the motor cable and thus directly disconnect the motor power. The controller detects that no motor power is running and interprets this as the end position.
 - To restart the motor from the end position, the power diodes must be switched in parallel to the limit switches. (Limit switches and diodes must be able to turn on the motor power).
 - The LEDs behind [KI.16]..[KI.21] have no effect.
- **External limit switch [M.C6] = 01**
 - Function according to limit switch on [KI.16]..[KI.21]
 - When the door moves to the limit switch, this is recognised as the end position and displayed on the corresponding LED.
- **Force shutdown / power stop [M.C6] = 02**
 - Safety function category 2 / performance level C according to EN ISO 13849-1/2008.
 - During operation without a limit switch, the end position is detected via a power stop. For this, the door must move against a stop in both end positions!

- By changing [M.A7] .. [M.b0], the force at which the motors shut down in the end positions can be varied according to the learn trips.
- An obstacle “on track” is interpreted as an end position and the engine in question is only stopped, regardless of the setting [M.b3]. Release / reverse are not possible.



CAUTION!

During operation without a limit switch, the obstacle detection and compliance with the closing force is to be ensured over external safety devices (light barrier, contact bar, etc.).

13.2. Obstacle detection / force shutdown / power stop

- Safety function category 2 / performance level C according to EN ISO 13849-1/2008.
- The controller learns the force requirement / motor power for each direction of movement and each motor.
- If this value plus the set “force K-value” M.A7]..[M.b0] is exceeded following the learn trip, the controller performs the function according to the setting [M.b3].
- The obstacle detection / power stop function is set in [M.b3].
- The security function is effective in two-motor operation for both motors, even if only one leaf moves on an obstacle.
- The force K-values for the controller are set in the open and close direction, separately for each motor, over
 - [M.A7] = Force M1 opening direction
 - [M.A8] = Force M1 closing direction
 - [M.A9] = Force M2 opening direction
 - [M.b0] = Force M2 closing direction
- If [M.C6] = 02 is set under “type of end position detection”, an obstacle detection / power stop always leads to a stop, regardless of the settings in [M.b3]. For the controller, this stop is the end position, even if the stop was caused by an “obstacle on track”.
- An obstacle detection / power stop is displayed by the error code {Er.26} or {Er.27}.
- During motor operation, obstacle detection / power stop is ineffective for the set start-up time [M.A6] (start-up power suppression).
- Changing the force K-value is only necessary if the door stops over the obstacle detection / power stop, although operation was not disturbed by an obstacle or although there is no detection despite the presence of an obstacle.
- The force values are automatically corrected slightly with each uninterrupted movement from end position to end position. This then enables adaptation for ageing of the system and for summer / winter operation.



CAUTION!

- Obstacle detection / power stop is not effective during the learn trips.
- [M.b3] = No effect; may only be set when safety and compliance with the closing forces is guaranteed by external safety devices!
- Higher force K-values result in insensitive reaction of the obstacle detection / power stop. There is the danger of property damage or personal injury from late or absent shutdown!
- Force K-values which are too low lead to unstable operation.
- With each modification of [M.A1] and [M.A4], the force values and path are automatically deleted. New learn trips must be made!
- The motor voltage on the track and in gentle start-up influence the force values for the power-operated shutdown / power stop. After changing the motor voltage, the function and closing forces of the obstacle detection / power stop must be checked in accordance with EN 12453 using a force measuring tool and corrected, if necessary, over [M.A7]..[M.b0].

13.3. Release / release time (with detected obstacle)

- The door is moved in the opposite direction for the set release time, [M.b7].
- The function can be performed over the inputs: Light barrier, safety device and obstacle detection / power stop. The precondition is that the “release” function is set in the corresponding menu.
- A safety device, activated during motor operation (e.g. an obstacle in activated direction of movement), then leads to a “release” of the obstacle.

13.4. Runtime limit

- The maximum runtime of M1 and M2 can be set over [M.C5].

- In addition to the limit switches, the runtime limit can be set as “overarching runtime cut-off”. Exceeding the maximum set runtime during motor operation leads to a stop (e.g. in the event of gear breakage or run over limit switch). Error report {Er.24}
- The door position is not determined, i.e.: With each trip, the entire set runtime proceeds. Even when the door is “en route”.

13.5. Tubular motor operation

- Tubular motors usually have internal limit switches which directly switch off the corresponding direction of movement.
- These tubular motors can be operated in the menu setting [M.C6] = 00.



CAUTION!

Compliance of the closing force and obstacle detection / power stop requires careful inspection and possibly additional external safety devices (e.g. light barrier, contact bar, etc.)

13.6. 1 / 2-motor operation

- The controller is pre-set in [M.C1] for 1 and 2-leaf operation.
- [M.C1] = 01, particularities in 1-leaf operation
 - Motor 2 is not effective. The limit switches ES2 Open / Closed have no function. The corresponding LEDs are always on if no bridges are screwed to the respective limit switch terminals.
 - In the door status display (horizontal bar), the right display remains off.
 - Opening / closing delay, [M.C3] / [M.C2] have no function.
 - Inactive leaf operation is not possible.

13.7. Closing delay (2-motor operation)

- The closing delay of motor 1 is set in [M.C1].
- [M.C2] = 00, no closing delay, M1 and M2 start at the same time in the CLOSING direction.
- [M.C2] = 01 19, closing delay adjustable, M1 starts ...sec after M2.
- [M.C2] = 20, the closing delay from M1 is learned automatically and thus determined by the controller, M1 reaches the CLOSED end position approximately 4 seconds after M2.



CAUTION!

With closing delay [M.C2] = 01 .. 19, the value to be selected is that which in all door settings, door leaf M1 has a sufficiently safe distance to door leaf M2. Non-compliance can lead to damage to the door system and personal injury!

13.8. Opening delay (2-motor operation)

- The opening delay of motor 2 is set in [M.C3].
- [M.C3] = 00, no opening delay, M1 and M2 start at the same time in the OPENING direction.
- [M.C3] = 01 19, opening delay adjustable, M2 starts ...sec after M1.



CAUTION!

With opening delay [M.C3] = 01 .. 19, the value to be selected is that which in all door settings, door leaf M1 has a sufficiently safe distance to door leaf M2. Non-compliance can lead to damage to the door system and personal injury!

13.9. Gentle start-up / start-up time

- At the start of the motor, door slowly accelerates to the final speed.
- The duration of this start-time, while the door leaves are accelerating, depends on the start-up time after the motor start [M.A6]. The greater the value, the more slowly the door accelerates.

13.10. Gentle stop

- Before the door has reached the end position, the motor voltage is reduced, whereby the door slowly moves to the end position.
- The motor voltage in gentle stopping can be set separately for M1 and M2 via [M.A1] and [M.A2]. The lower the value, the more slowly the door moves (minimum speed = 00, maximum speed = 20).
- The gentle stop time is set over [M.A5]. The greater the value, the longer the gentle movement before the end position.
- During the learn trips, the starting point of the gentle operation is calculated separately for each direction of movement and both motors.



CAUTION!

- With each change to [M.A1], [M.A2] and [M.A5], the force values and tracks are automatically deleted and new learn trips need to be made.
- The motor voltage in gentle start-up influences the force values for the power-operated shutdown / power stop. After changing the motor voltage, the closing forces must be checked and, if necessary, corrected over [M.A7]..[M.b0].

13.11. Gentle stop

- A stop command on the stretch results in the slow stopping of M1 and M2. With force shutdown / power stop, safety device, light barrier, emergency stop commands, M1 and M2 stop abruptly.
- There is no gentle stop in dead man operation.

13.12. Motor voltage on path

- The motor voltage on the path can be set separately for M1 and M2 via [M.A3]. The lower the value, the more slowly the door moves (minimum speed = 00, maximum speed = 20).



CAUTION!

- With each modification of [M.A3] and [M.A4], the force values and paths are automatically deleted. New learn trips must be made!
- The motor voltage in gentle start-up influences the force values for the power-operated shutdown / power stop. After changing the motor voltage, the closing forces must be checked and, if necessary, corrected over [M.A7]..[M.b0].

13.13. Automatic closing

- The automatic closing is activated or set in [M.b1].
 - [M.b1] = 00, off
 - [M.b1] = 01 .. 62, open time 2 .. 120 sec, in 2-sec steps, plus pre-warning time
 - [M.b1] = 63 .. 90, open time 63 = 3 min, 64 = 4 min, ... , 90=30 min plus advance warning time (set value - 60 = time in minutes)
- If the door is not CLOSED in the end position, after the open time [M.b1] expires for 5 s, there is an advance warning via the light output before the door moves to the end position.
- During the open time, the LED automation to the right of the display lights up. The dot flashes during the advance warning time.
- When automatic closing is activated, an impulse command always results in an operation in the OPEN end position.
- If the door is OPEN in the end position, only the open time is reset with an impulse or open command. If there is an impulse or open command (timer operation), the open time remains reset. Only when there is no open / impulse command, does the open time begin to expire.
- When automatic closing is activated, an impulse command always results in an open procedure. This is also applicable when the door is already moving in the closing direction. The open time restarts.
- Commands for targeted open / close are also effective during activated automatic closing.
- The closing operation is stopped and the open time reset over the light barrier input.
- When the door is stopped via power shutdown / power stop while closing, automatic closing is blocked until the next impulse, open, close, door, part opening or radio command.
- If shutdown occurs twice in a row over SE during closing, after the second unsuccessful closing, automatic closing is blocked until the next impulse, open, close, part opening or radio command.
- If [M.b8] = 00, after actuation of the emergency stop, automatic closing is blocked until the next impulse, on, close, part opening or radio command.
- With a stationary motor, only the open time (not cut-off) is reset when an SE or light barrier is actuated. The open time starts to expire only once the inputs are no longer actuated. When automatic closing is activated, this is always effective when one of the door leaves is not in the end position. Automatic closing also occurs in part opening and inactive leaf operation.

13.14. Part opening

- Part opening can be controlled over the input B, channel 2 of a radio receiver in [Bl.2] or over function {F4} in radio module operation.
- The part opening time is set in [M.C0].
- The runtime is the reference for the part-opening position. There can, therefore, be differences in the opening position.

- A part opening command on the CLOSED door in the end position always effects movement in the part open position.
- If the door is “on track” (outside the CLOSE / OPEN position, in part opening, operation runs in the CLOSE end position.
- The door can also be moved into the part open position during automatic closing. Automatic closing occurs after the open time expires.
- An impulse command while the door is in the part open position effects movement toward the OPEN end position.
- If no part opening setting is set via [M.C0], then inactive leaf operation is not possible.

13.15. Inactive leaf

- Inactive leaf operation (only 2-motor operation possible) can be controlled over the input B, channel 2 of a radio receiver in [Bl.2] or over function {F4} in radio module operation. In radio module mode, only motor 1 can be controlled with the function open-stop-close-stop.
- Inactive leaf operation is only possible when the part opening time is deactivated [M.C0] = 00.
- An inactive leaf command is only effective when motor 2 is CLOSED in the end position.
- The door can also be controlled via an inactive leaf command during activated automatic closing. Automatic closing occurs after the open time expires.
- An impulse command follows an (effective) inactive leaf command, always effecting movement in the open direction.

13.16. Block / release control panel

- All menu points can be locked against adjusting in [M.d8]. (Recommended)
- [M.d8] = 00 Control panel / menu points released / changeable (delivery status)
- [M.d8] = 01 Control panel / menu points blocked / no changes possible
- Block / release control panel
 - Hold down emergency stop
 - Select menu [M.d8]
 - Press and hold down keys [Ta.+] and [Ta.-]
 - Using [Ta.M], it is now possible to switch between 00 and 01

13.17. Trip counter

- The number door trips so far can be read in [M.d9].
- Each start in the open direction is counted.
- Instead of the menu value, the display in [M.d9] shows:
 - In left-hand segment: The percentage value (1, 10, ..., 100,000)
 - 0 = 100,000
 - 1 = 10,000
 - 2 = 1000
 - 3 = 100
 - 4 = 10
 - 5 = 1
 - In the right-hand segment: The value must be multiplied with the percentage value.
- The individual 10-unit positions are switched with [Ta.+] and [Ta.-].
- If the display shows, for example, 00, 10, 21, 34, 47, 59, this means that the controller has already made $(0 \times 100.000 + 0 \times 10.000 + 1 \times 1.000 + 4 \times 100 + 7 \times 10 + 9 \times 1) = 1,479$ trips in the open direction.
- The trip counter cannot be reset or adjusted (read-only memory).

14 Plug-in cards / slots

14.1. Radio module (optional)

- The radio code is evaluated and saved in the controller of the control.
- The radio frequency and type of modulation are determined by the radio module.
- The right radio module is to be properly connected to the 15-pole socket connector [BL1].
- The function of the radio remote control during radio module operation is determined when teaching the transmitter with
 - {F0} Impulse (open-stop-closed-..)

- {F1} On impulse with panic function, i.e. stop during motor operation
- {F2} Close impulse with panic function, i.e. stop during motor operation
- {F3} Stop
- {F4} Part opening / inactive leaf
- {F5} Light
- {F6} Open impulse (without panic function)
- {F7} Closed impulse (without panic function)
- {F8} Output OUT with [M.C4] = 04 - Impulse function
- {F9} Output OUT with [M.C4] = 04 - Current impulse function
- Programming the transmitter:
 - Press [Ta.F] < 1 sec (tap). LED "radio" flashes.
 - {F0} flashes in the display.
 - Press [Ta.F] repeatedly until the desired function is displayed {F0}..{F9}.
 - Now press and hold down the transmission buttons to be taught until the selected function {F0} .. {F9} continuously appears on the display (no longer flashes). The transmitter has now been programmed.
 - If not transmitter is programmed, the learning mode is exited after 15 seconds.
- When programming the first sender, the type of coding scheme is defined. The first programming procedure can take up to 10 seconds! Existing codes must first be deleted!
- Up to 40 codes (40 transmitter keys) with different functions can be taught.
- The controller can learn the 12-bit dual coding scheme or the 18-bit Tristate coding scheme or Keeloq coding.
- When trying to re-teach transmitters which have already been taught, the controller recognises this and does not occupy any of the other 40 memory locations.
- Frequency change
 - If problems occur in the frequency range being used, the controller can be converted to a different frequency by replacing the radio module.
 - Switch operating voltage off.
 - Carefully pull the radio module carefully out of the socket.
 - Connect the new radio module on the "right side" with the desired frequency.
 - Switch operating voltage on again.
 - Delete radio.
 - Programme new transmitters.
 - The transmitter should now have the same frequency as the new radio module.
- Delete all transmitters
 - Hold [Ta.F] down for approx. 6 sec.
 - The "radio" LED flashes quickly and flashes {FL} on the display.
 - If the flashing stops, all coding is deleted.
- Antenna connection
 - An antenna wire must be connected to [Kl.29] and passed down through the 2mm drill-hole from the casing.
 - When using a rod antenna, the shield of the coaxial cable is to be connected to [Kl.28] and the inner conductor to [Kl.29]. Feeding into the casing can be accomplished via free sealing elements.

Information / Instruction

- The biggest range results in laying the antenna wire or coaxial cable at the greatest possible distance to power, control and motor cables. Laying in cable channels reduce the range and can lead to faults!
- If the dead man function is set over [M.b9], the corresponding direction of movement cannot be controlled by radio!
- Simultaneous operation of different coding schemes is not possible.
- Other coding (other transmitter makes) on request.
- Teaching a new coding scheme only takes place when the previously learned codes were deleted!
- If a learned radio signal is received, the learned function {F0}..{F9} is shown on the display.

14.2. Radio receiver (optional)

- The radio codes are evaluated and saved on the radio receiver plug-in card.
- The right radio receiver is to be properly connected to the 2x10-pole socket connector [BL2].
- The function is set in [M.b9], see menu table point 11.

- When the panic function is set in [M.b9] for input A or input B, pressing the corresponding channel always leads to a stop during door operation. Only a further actuation starts the door in the desired direction of movement.
- If no "panic function" is set, a radio command in the opposite direction during door operation brings the door to a stop and immediate start in the opposite direction. A radio command in the same direction (current direction of movement) has no effect.
- The channels 1 to 4 (if available) are assigned to the following functions:
 - Channel 1 Impulse (effects on input A, see point 12.8)
 - Channel 2 Part opening / inactive leaf (effects on input B, see point 12.9)
 - Channel 3 Not occupied
 - Channel 4 Not occupied
- Please refer to the operating manual for the operating / technical data for the radio receiver.
- Antenna connection
 - An antenna wire must be connected to the radio receiver and passed down through the 2mm drill-hole from the casing.
 - A rod antenna is to be connected as specified on the radio receiver. Feeding into the casing can be accomplished via free sealing elements.



Information / note

- The greatest range results in laying the antenna wires or coaxial cables at the greatest possible distance to power, control and motor cables.
- Laying in cable channels reduce the range and can lead to faults!
- If the dead man function is set over [M.b9], the corresponding direction of movement cannot be controlled by radio!

15 Regular inspections

All safety devices are to be inspected regularly for their correct functioning in accordance with EN60335 and UVV ASR A1.7.

- Pressure-sensitive safety inputs (SE bars) once a month.
- All other safety devices at least once a year.
- The test results are to be kept in a record / service book.

15.1. LB input

If the LB input is used, for test purposes, the light barrier(s) are to be interrupted during the open / close operation. When there is proper functioning, the controller responds according to the setting from [M.b4]. The error message {Er 22} appears on the display.

15.2. SE input

If 8k2 / OSD bars are connected to the SE inputs, these are to be actuated during the open / close operation for test purposes. When there is proper functioning, the controller responds according to the setting from [M.b6]. The error message {Er 23} appears on the display.

15.3. Emergency stop

If an emergency stop control device is connected, this is to be pressed during opening / closing for test purposes. With proper functioning, the door comes to an immediate stop. The error message {Er 25} appears on the display.

15.4. Obstacle detection / force shutdown / power stop

If obstacle detection is activated ($[M.b3] < 00$), door operation in the OPEN / CLOSE direction is to be stopped with a suitable object (min. 50mm high) for test purposes.

When there is proper functioning, the controller responds according to the setting from [M.b3]. In a 2-leaf door system, the test is to be carried out separately for both door leaves. On the display, the error message {Er 26} appears for motor 1 and {Er 27} for motor 2.

Using a force measurement tool, the obstacle detection is also to be checked for compliance with the force values in accordance with EN 12453.

15.5. Dead man operation

If the controller is run in dead man operation ([M.b9]), it must be checked whether the door stops immediately when opening the open / close input during door operation in the corresponding direction.

15.6. Malfunction

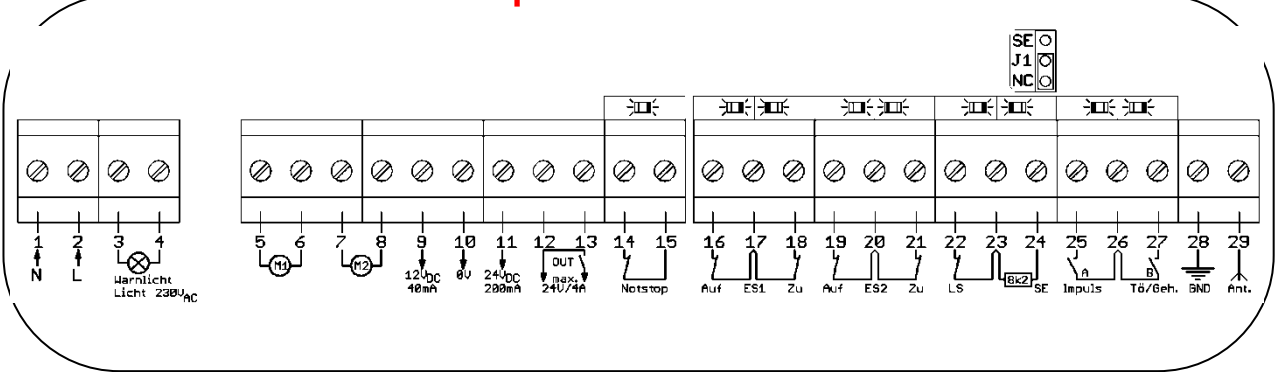
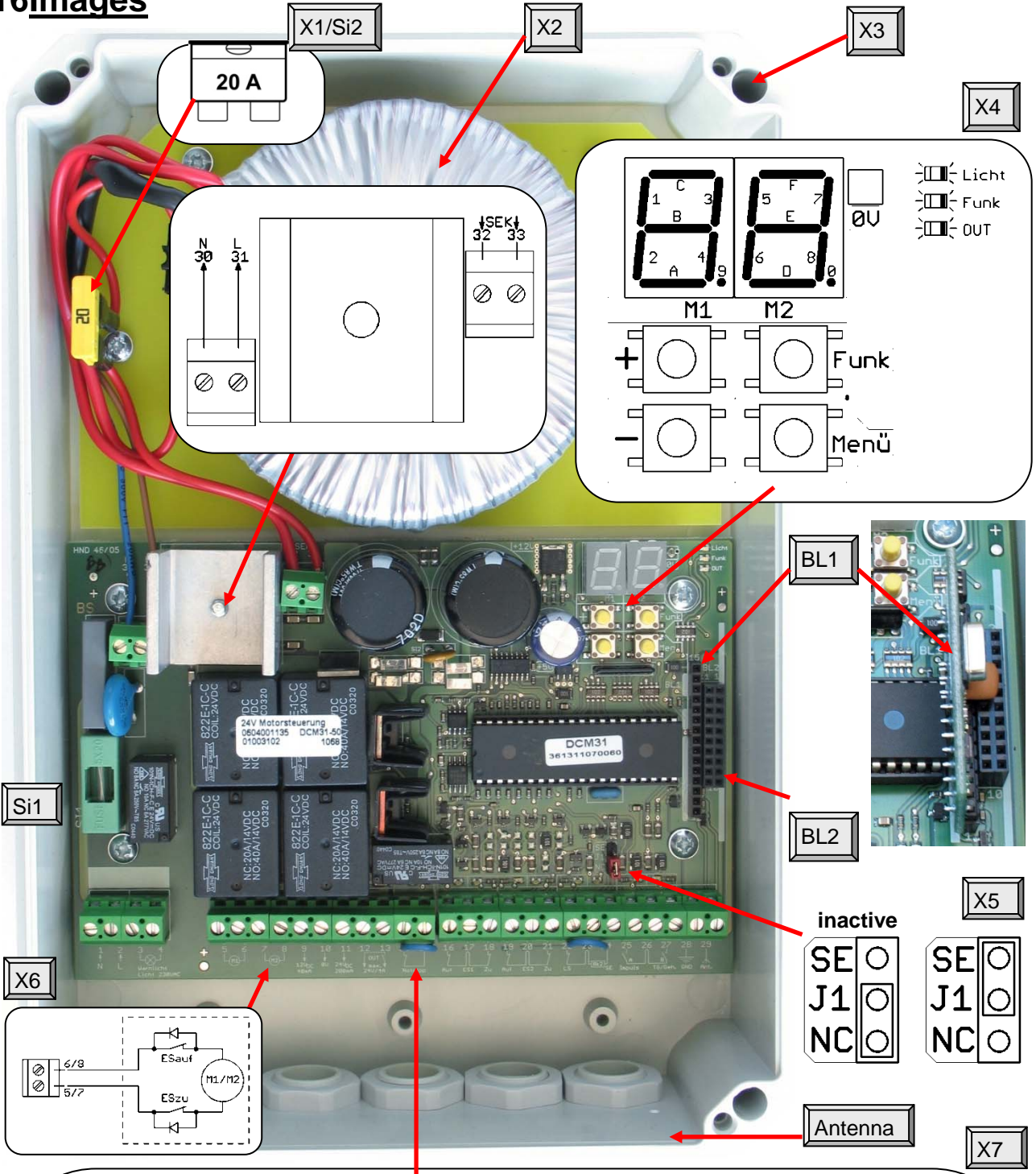
If the door does not react as described in on the corresponding safety device,

- check the associated menu setting.
- check the safety device connection.
- check the safety device (switches, bards, light barriers) itself.

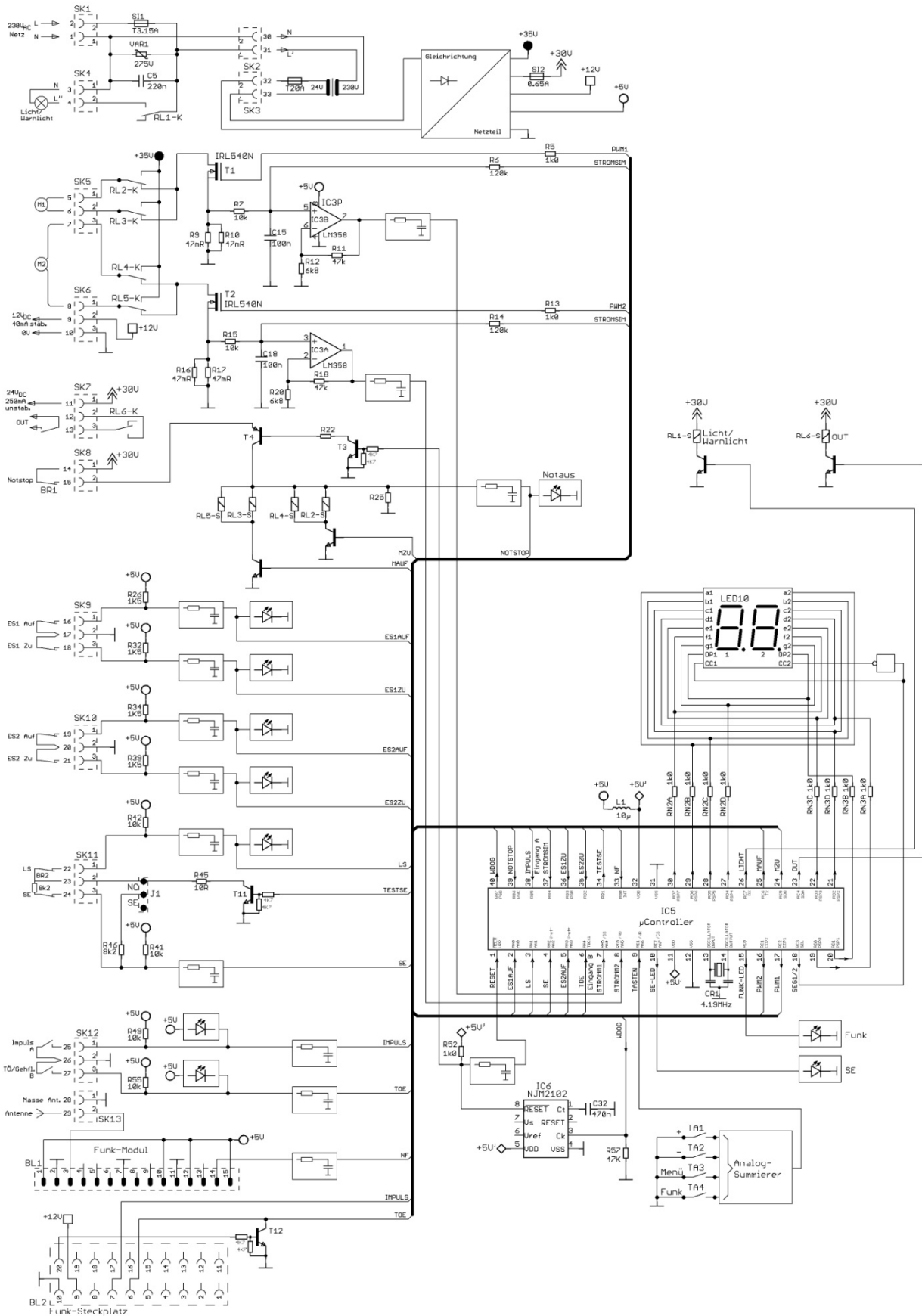
If the cause of error is not identified and removed:

- Take door out of operation
- Secure against switching on again
- Contact customer service

16 Images



17 Block diagram / pin layout



18EC Declaration of Conformity

The company Dickert Electronic GmbH, Fünfhausen1, 35091 Cölbe, Germany hereby declares that the controller DCM31-00 and. DCM31-01 are incomplete machines in the sense of the Machinery Directive 2006/42/EC, Appendix II Part 1B and intended for installation in a door system.

The following basic safety directives were applied and are complied with

- Machine Directive 2006/42/EC
- EN 12453:2000 (Safety in the use of power operated doors, requirements)
- EN 60335-1:2012
- EN 12978 10/2009 (Safety devices for power operated doors, requirements and test methods)
- EN ISO 13849-1:2008 (Safety of machinery)
- Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC

EC type-examination certificate

Registered no. 44 205 12 383677-001

Certification body: TÜV NORD CERT GmbH Langemarckstraße 20, 45141 Essen,

Notified Body 0044

Valid for serial number range: 07050xxxxx

The special technical documents were created in accordance with the Machinery Directive 2006/42/EC Appendix VII B. On reasoned request, we undertake to electronically forward the special technical documentation to the national authorities.

The controller may only be operated once it has been determined that the door system complies with the Machinery Directive 2006/42/EC.

Cölbe, 20.11.2012

Hans Dickert

Hans Dickert

Director &

Authorised document representative



19Environmental protection / disposal

The control unit does not contain any integrated batteries. Solely ROHS-conform components are used. Properly dispose of old and defective appliances and device parts at a collection point! Do not put them in domestic waste!



20Error messages

Errors are indicated by alternating flashing of "Er" (error) and the corresponding error number on the display.

{Er.00} to Er.13} are error messages within the self-tests.

Error no.	Error description	Measure
00	ROM test	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains, there is a hardware error in the controller. The control system must be exchanged.
01	RAM test	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains, there is a hardware error in the controller. The control system must be exchanged.
02	Watchdog test	Turn off operating voltage, wait 10 seconds, turn on operating

		voltage again. If the error message remains, there is a hardware error in the control system. The control system must be exchanged.
03	EEprom access	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains, there is a hardware error in the control system. The control system must be exchanged.
04	EEprom data	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error messages remains, the saved menu parameters, force values or paths are no longer correct. Only [M.A0] can still be called. Switching to another menu point is not possible. The control system must be reset and reconfigured. New learn trips are to then be made.
05	Power measurement M1	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains, there is a hardware error in the control system. The control system must be exchanged.
06	Power measurement M2	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains, there is a hardware error in the control system. The control system must be exchanged.
07	Shutdown relay M1	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains, there is a short circuit in the relay for M1. The control system must be exchanged.
08	Shutdown relay M2	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains, there is a short circuit in the relay for M2. The control system must be exchanged.
09	Shutdown relay M1+M2	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains, there is a short circuit in the relay for M1 and M2. The control system must be exchanged.
10	Shutdown transistor M1	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains, there is a short circuit in the transistor for M1. The control system must be exchanged.
11	Shutdown transistor M2	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains, there is a short circuit in the transistor for M2. The control system must be exchanged.
12	Hardware SE	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains: a) Check setting [M.b6] and [J.1] or connected closing edge protection. b) Check closing edge protection connection, particularly the mass connection to terminal [KI.23]. c) if a) and b) are correct, there is a possible hardware error in the control system. The control system must be exchanged.
13	Hardware LB	Turn off operating voltage, wait 10 seconds, turn on operating voltage again. If the error message remains: a) Check setting [M.b4] and [M.C4] (external light barrier test) or connected light barrier. b) Check light barrier connection, particularly the mass connection to terminal [KI.23]. c) if a) and b) are correct, there is a possible hardware error in the control system. The control system must be exchanged.

{Er.20} to {Er.28} are error messages and show the cause of the last motor stop.

Error no.	Error message	Measure
20	No power at start motor 1	Give new start command. If the door operation is interrupted again with the error message, this means that no motor power was measured. a) Power from motor 1 is too low (<1A) => motor and control system are incompatible b) No motor connected to [KI.5]+[KI.6] c) Motor defective or cable breakage.
21	No power at start motor 2	Give new start command. If the door operation is interrupted again with the error message, this means that no motor power was measured. a) Power from motor 2 is too low (<1A) => motor and control system are incompatible b) No motor connected to [KI.7]+[KI.8] c) Motor defective or cable breakage.
22	Motor stop by LB	Door operation was stopped by actuating the LB input. Check if there is an obstacle in the way. If not, check light barriers and settings of [M.b4]
23	Motor stop by Stop input	The door operation was stopped by pressing the SE input. Check if obstacles in the way. If not, check safety bars and settings of [M.b6]
24	Motor stop by exceeded runtime	Motor operation lasts longer than set in [M.C5]. Check motor, gearbox, emergency unlocking If necessary, adapt [M.C5] to door runtime.
25	Emergency stop pressed	Door operation was stopped by actuating the emergency stop input or by pressing input A and input B at the same time.
26	Power stop Motor 1	The controller stopped the door, as the force on motor 1 was above the taught and permitted value. a) Check if obstacles in the way. b) Check free movement of the door leaf and M1. c) Delete forces and paths and carry out new learn trips. d) Check and increase, if necessary, force values in [M.A7] and [M.A8].
27	Power stop Motor 2	The controller stopped the door, as the force on M2 was above the taught and permitted value. a) Check if obstacles in the way. b) Check free movement of the door leaf and M2. c) Delete forces and paths and carry out new learn trips. d) Check and increase, if necessary, force values in [M.A9] and [M.b0].
28	Insufficient voltage	The operating voltage of the controller is sometimes or always too low. Check network connection

21 Technical data

Operation of the control system is only permitted according to these specifications / data!

Parameters	Symbol	Threshold value			Unit	Test condition
		min.	Model	max.		
Voltage						
Operating voltage	U_{Netz}	190	230	250	V_{AC}	on terminals 1 / 2
Operating frequency	f_{Netz}	48	50	52	Hz	
Microfuse 5 x 20 mm				3.15	A	Supports / Si1
Secondary voltage	U_{Sek}	18	24	29	V_{AC}	on terminals 32 / 33 in at rest / under full load
Blade-type fuse				20	A	automotive, pluggable, yellow, Si2
Internal logic voltage	U_V	4.8	5.0	5.2	V	
Current consumption standby operation	I_R		40		mA	Terminals 32 / 33, no users / cards
Max. total connection power	Pmax			700	VA	
Power consumption	P_{Prim}		2.0	2.5	VA	Terminals 32 / 33, no users / cards
Start time voltage / 1st start	t_{Start}		2.5	3.5	s	@ $U_{\text{Sekundär}} = 24V_{\text{AC}}$
Inputs						
Emergency stop pressed (closed)	$U_{\text{NOTclosed}}$	0.0		0.5	V	Over terminals 14/15
Emergency stop pressed (open)	U_{NOTopen}			1.0	V	Terminals 15 / 0V
Emergency stop electricity (closed)	I_{NOT}		170	200	mA	Over terminals 14/15
Limit switch on / closed not pressed (closed)	U_{ESclosed}			0.5	V	Terminals 16, 18, 19, 21 against 0V
Limit switch on / closed pressed (open)	U_{ESopen}	4.5			V	Terminals 16, 18, 19, 21 against 0V
Limit switch on / closed power (closed)	I_{ES}		0.5	1.0	mA	over terminals 16/17, 18/17, 19/20, 21/20
Light barrier not pressed (closed)	U_{LSclosed}			0.5	V	Terminals 22/23
Light barrier pressed (open)	U_{LSopen}	4.5			V	Terminal 22 against 0V
Light barrier short circuit power	$I_{\text{LSin-0}}$		0.5	1.0	mA	Over terminals 22/23
Light barrier response time	$t_{\text{LS-1}}$		25	50	ms	Time light barrier until motor on
Light barrier reset time	$t_{\text{LS-0}}$		250	350	ms	
SE (8K2) not pressed	$R_{\text{SE12-0}}$	6.0	8.2	13.0	$K\Omega$	Terminals 23/24
SE (8K2) pressed	$R_{\text{SE12-1}}$	17.0		5.5	$K\Omega$	Terminals 23/24
Safety device (OSD) level, release	$U_{\text{SE12OSE-0}}$	4.0		1.0	V	Terminals 23/24
SE (OSE) frequency	$f_{\text{SE12OSE-0}}$	0.5	1.0	2.0	KHz	Terminals 23/24
SE response time	$t_{\text{SE12-1}}$		25	50	ms	at 8K2 or OSE
SE reset time	$t_{\text{SE12-0}}$		250	350	ms	
A / B not pressed (open)	$U_{\text{O-AB}}$	4.5			V	On terminals 25 / 26, 27 / 26
A / B pressed (closed)	$U_{\text{CI-AB}}$			0.5	V	On terminals 25 / 26, 27 / 26
A / B impulse duration (debouncing)	T_{AB}	30	35	50	ms	
NF low level	V_{NFLow}			0.7	V	@ $U_V = 5,0V$, Pin14 from BL1
NF high level	V_{NFHigh}	3.5			V	@ $U_V = 5,0V$, Pin14 from BL1
Outputs						
Voltage 12V output	U_{12V}	11.5	12.0	12.5	V_{DC}	Full load / standby operation
Power 12V output	I_{12V}			40	mA	
Voltage 24V output	U_{24V}	20	32	39	V_{AC}	Full load / standby operation
Power 24V output	I_{24V}			200	mA	
Motor power	I_{Motor}	1.0		11.0	A	Max. 25% cut-in time
Additional power value	I_{Zug}	0.4		5.0	A	can be set over the menu
Motor runtime	t_{Mot}	1		100	S	
Motor connection time	ED			25	%	At maximum motor power, max. runtime
OUT maximum voltage	U_{Out}			30	V	on terminals 12 / 13
OUT maximum power	I_{Out}			4	A	on terminals 12 / 13
Warning light power	P_{Warn}			500	W	on terminals 3 / 4
Radio (radio module, BL1)						
Receiver data						Depending on plug-in card radio module / receiver
Coding system						12- / 18-bit linear, Keeloq (others on request)
Teachable transmitter buttons	n_{Sender}			40	Quantity	Sender keys
Radio slot (BL2)						
Operating voltage	U_{BL2}	11.5	12.0	12.5	V_{DC}	No use of "AFE" type receivers !
Environmental conditions						
Operating temperature	T_{Betr}	-20		+50	$^{\circ}\text{C}$	in normal installation position
Storage temperature	T_{Lag}	-25		+80	$^{\circ}\text{C}$	
Relative air humidity	RH	20		90	%	no condensation permitted!
PCB						
Controller frequency	f_{Cont}		4.19		MHz	internal PLL at 16.76MHz

