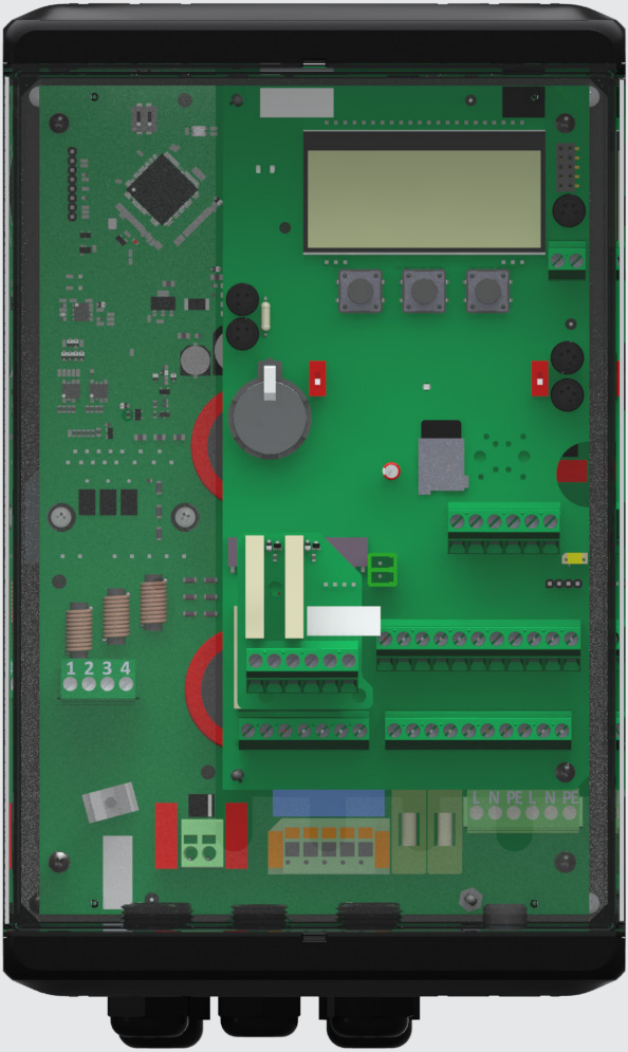
DRICOslife750/2400FU+DC(A01)

OPERATING MANUAL

DRICO® slife



ASO Safety Solutions

Übergabedokumentation / Documentation

Anlagenbeschreibung / Description

Anlagenart / Type of plant

Hersteller / Manufacturer

Seriennummer / Serial number

Datum der Inbetriebnahme / Commissioning date

Aufstellort / Site of installation

Verwendete Steuerung / Control unit

Zusatzkomponenten / Additional components

Funktionsprüfung / Functional test

Sicherheitssensoren reagieren auf Betätigung / Safety sensors response to actuation	ok
Sicherheitssensoren reagieren auf Zuleitungsunterbrechung / Safety sensors response to supply line intteruption	ok

Name der ausführenden Firma / Installing company

Name des Installateurs / Installer

Datum / Date

Unterschrift / Signature

DRICO® slife

Inhaltsverzeichnis

1 General Notes

This document serves as a draft of the original operating instructions for the DRICO slife control system for use with gate and barrier drives. It covers the installation, operation, maintenance, servicing, decommissioning, and disposal of the control system. It is specifically intended for technical installers and service technicians working with this control system.

These operating instructions apply to the following items:

Article number	Designation	Version
1414-0530	DRICO slife 750 FU A0101 (Master, FU 230V, 4A)	0.1
1414-0570	DRICO slife 750 FU A0103 (Slave, FU 230V, 4A)	0.1
1414-0540	DRICO slife 2400 FU A0102 (Master, FU 230V, 10A)	0.1
1414-0580	DRICO slife 2400 FU A0104 (Slave, FU 230V, 10A)	0.1

All previous editions of this document lose their validity for the current hardware and software of the control unit with this edition. The information in this document is subject to change without prior notice.
The control unit may only be commissioned by qualified electricians who are familiar with the safety standards of electrical drive and automation technology,
must be carried out. Precise knowledge of the control unit and the doors it operates absolutely essential.
Therefore, please read these operating instructions carefully.
The safety instructions must always be observed!

1.1 Explanation of Symbols

DANGER!
It denotes a hazard with a high degree of risk which, not avoided, result in death or serious injury.
The following safety instructions must be observed to avoid serious personal injury.

WARNING!
It indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
The following safety instructions must be observed to avoid personal injury.

CAUTION!
It indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury. The following safety instructions must be observed to avoid personal injury or damage to property.

Note
Further information or references to other documentation are provided.

1.2 Terms and Abbreviations

AC.....Alternating current

BMZ.....Fire alarm control panel

CRC16.....16-bit Cyclic Redundancy Check

DC.....Direct current

DIN.....German Institute for Standardization

EEPROM.....Electrically Erasable Programmable Read-Only Memory

EMV .....Electromagnetic Compatibility

EN.....European Standard

FI.....Residual current circuit breaker

FU.....Frequency Converter

GND.....Ground Potential

HW.....Hardware

IP.....Protection class against foreign bodies and water (intrusion protection)

INDUS (ISK).....Inductive cable transmission system from ASO, which uses the trailing cable for Transmission of the traveling safety contact strips replaced

ISO.....International Organization for Standardization (International Organization for Standardization)

LCD.....Liquid Crystal Display

LED.....Light Emitting Diode

RAM.....Random Access Memory

ROM.....Read Only Memory

RTC.....Real Time Clock

SKL .....Safety contact strips

TÜV .....Technical Inspection Association

VCC .....Voltage of common collector

ZK.....DC link

1.3 Safety regulations / Protective measures

WARNING!
Please read these operating instructions carefully before the door control unit.

- The manufacturer and operator of the system/machine on which the door control unit is used are responsible for coordinating and complying with all applicable safety regulations and rules.
- The operating instructions must always available at the place of use of the control unit/gate/barrier. It must be thoroughly read and applied by every person who is tasked with the operation, maintenance and servicing of the control unit.
- The control unit may only be installed and commissioned by qualified personnel who are familiar with the operating instructions and the applicable occupational safety and accident prevention regulations. The instructions in the manual must be observed and complied with.
- Electrical work may only be carried out by qualified electricians. Safety regulations of electrical engineering and the employers' liability insurance association must be observed.
- The instructions in this manual must be observed to guarantee function and safety. Failure to observe the warnings may result in personal injury and damage to property. The manufacturer is not liable for damage caused by failure to observe the instructions.
- The drive system must be disconnected from the power supply before any wiring work is carried out. It must be ensured that the power supply remains disconnected during the wiring work.
- All door pulse generators and control devices must installed within sight of the door and at a safe distance from the moving parts of the door. A minimum installation height of 1.5 meters must maintained.
- All existing emergency command devices must be checked before the system is commissioned.
- It must be ensured that children cannot play with the door control unit.
- Possible crushing and shearing points on the door system must be taken into account and secured if necessary.
- Before moving the door, it must ensured that no persons or objects are inside the door. danger zone of the gate.
- Never reach into a moving door or moving parts.
- The operators of the door system or their deputies must be instructed in its operation after commissioning.

  The control unit does not contain any user-serviceable components. Unauthorized modifications or repairs to the control unit will invalidate any warranty and liability of the manufacturer.

  The control unit guarantees functional safety, but not the safety of the entire system. Before using the control unit, a safety assessment of the entire system in accordance with DIN EN 13241-1 „Doors - Product standard" is therefore necessary.

  To ensure that the safety system is designed in accordance with the standard DIN EN 12453 „Safety in use of power-operated doors and gates", the system must be checked for correct function by experts

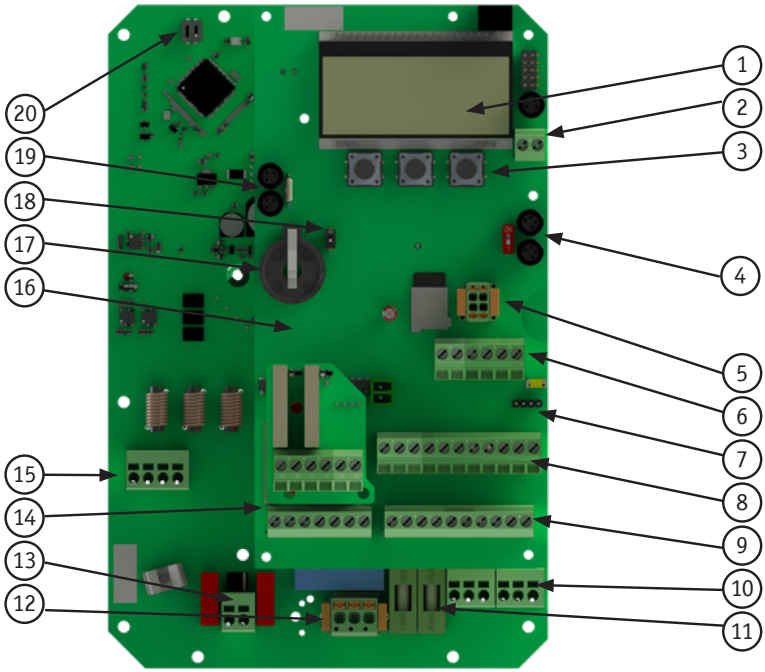
WARNING!
The DRICO slife gate control unit is a frequency converter. After switching off, dangerous voltages may still be present due to charged capacitors. Therefore, a waiting time of 5 minutes must be observed to allow the capacitors to discharge. Working on the control unit while it is live poses a risk of death and fire!
The following safety instructions must be observed to avoid personal injury.

If the control system is protected by a residual current circuit breaker, only type B residual current circuit breakers that are sensitive to all currents may be used.

The manufacturer accepts no liability in the event of non-compliance or deliberate misuse.

2 General view

2.1 Device overview DRICO slife



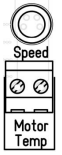
Designation of the image numbers

1. 4-line LC display
2. Connections for rotary encoder and motor overtemperature switch
3. Buttons for display selection and menu operation
4. CAN1 connection for expansion modules
5. Connection for OSE optical safety contact strip (optional)
6. Connections for the fixed and traveling safety contact strips
7. Connection for optional membrane keyboard
8. Connections for the inputs of the external command devices and light barrier(s)
9. 24VDC connections for supplying the external devices and operating elements
10. Mains supply voltage 230VAC (L | N | PE)
11. Fuses for mains supply voltage 230V (AC IN | AC OUT)
12. Brake set (optional)
13. DC link connection for active ASO brake chopper
14. Relay outputs REL1 to REL3 (REL4+5 via plug-in module optional)
15. Motor connection (PE | W | V | U) with shield clamp
16. Connection for radio receiver module and antenna
17. CR2032 3V lithium battery for real-time clock
18. Selection switch for master & slave operation
19. CAN2 connection (connection for external components in consultation with ASO)
20. Selection switch for master & slave operation

2.2 Electrical connection Controller- Board

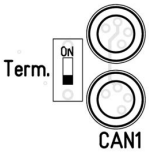
Note:
The variants may differ in details (e.g. the number of inputs and relays).

Encoder & motor thermal switch



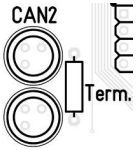
Connection	Function
Speed	M8 4-pin for rotary encoder
Motor Temp	Motor overtemperature switch (normally closed contact,)

CAN1



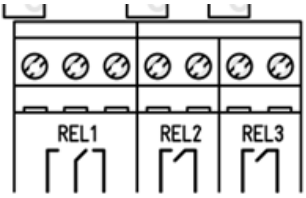
CAN1 connection (M8 4-pin)
1: +24V
2: CAN1_H
3: GND
4: CAN1_L

CAN2

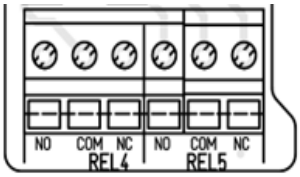


CAN2 connection (M8 3-pin)
1: CAN2_H
2: GND
3: CAN2_L

Relay

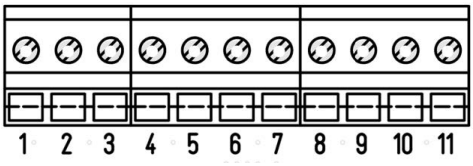


Connection	Function
REL1.1	Relais 1 NC
REL1.2	Relais 1 Common
REL1.3	Relais 1 NO
REL2.1 REL2.2	Relais 2 (NO contact)
REL3.1 REL3.2	Relais 3 (NO contact)



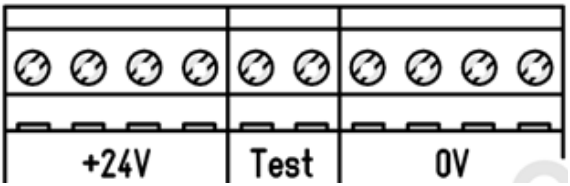
Optional:	
REL4.1	Relais 4 NO
REL4.2	Relais 4 Common
REL4.3	Relais 4 NC
Optional:	
REL5.1	Relais 5 NO
REL5.2	Relais 5 Common
REL5.3	Relais 5 NC

Inputs



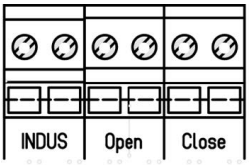
Connection	Designation	Function
1	IN1	
2	IN2	
3	IN3	
4	IN4	
5	IN5	
6	IN6	Signal inputs (24V IN)
7	IN7	
8	IN8	
9	IN9	
10	IN10	
11	IN11	

Supply



Connection	Function
+24V	Supply for external devices or signal transmiters(+24V DC)
Test	Switched +24V power supply for safety-related signals
0V	Reference potential for external devices or signal transmitters (GND,0V)

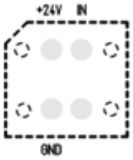
Safety



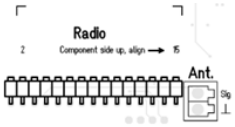
Connection	Function
INDUS	Connection for inductive cable circuit for safety contact edges
Open	Safety contact edge (8,2kΩ) in OPEN direction
Close	Safety contact edge (8,2kΩ) in CLOSE direction

Optional: OSE

Connection	Function	Wire color
+24V	Power supply for OSE (+24VDC)	Brown
GND	Reference potential for OSE (0V)	White
IN	Input signal OSE	Green



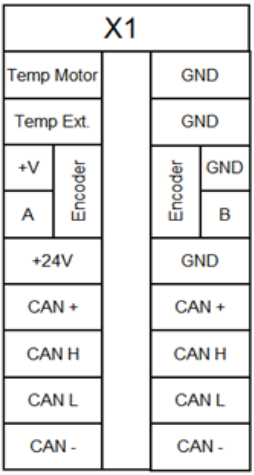
Radio



Anschluss	Function
Radio	Connection for radio receiver
Ant. 1 Ant. 2	Signal connection for antenna Shielding for antenna

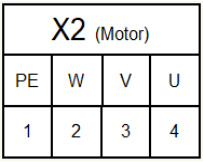
2.3 Electrical connection Power-Board FU

Optional: X1



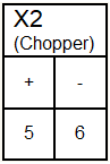
Designation	Function
Temp Motor GND	Motor overtemperature switch (NC) Reference potential (0V, GND)
Temp Ext. GND	Connection of external PT1000 temperature sensor with reference potential (0V, GND)
+V GND A B	Motor encoder connection (Voltage +V depends on the connected encoder module +24VDC or +15VDC)
Temp Ext. GND	Measured value of external temperature sensor PT1000
+24V GND	Power supply for external components with +24VDC Reference potential (0V, GND)
CAN + CAN H CAN L CAN -	Power supply CAN bus (+24VDC) Signal line CAN High Signal line CAN Low Reference potential CAN (0V, GND)

X2 Motor connection



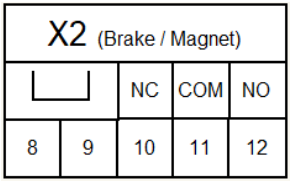
Connection	Designation	Function
X2.1 X2.2 X2.3 X2.4	PE Phase W Phase V Phase U	Motor connection

X2 (Optional) ASO brake chopper



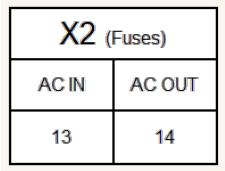
Connection	Designation	Function
X2:05 X2:06	+ -	ASO brake chopper connection

X2 (Optional) Brake / Lifting Magnet



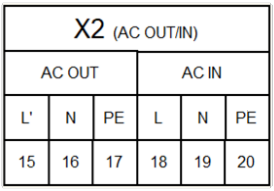
Connection	Designation	Function
X2.8	Auxiliary contact	
X2.9	Auxiliary cointact	Brake/magnet connection (auxiliary contact depending on variant)
X2.10	NC	
X2.11	COM	
X2.12	NO	

X2 fuses



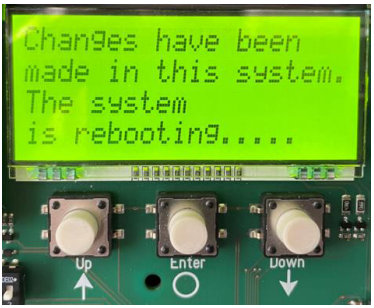
Connection	Designation	Function
X2:13	AC IN	Mains input protection for control unit
X2:14	AC OUT	Output protection for external 230 VAC components

X2 power connection



Connection	Designation	Function
X2.15	L‘	Mains voltage connection for external components (AC OUT)
X2.16	N	
X2.17	PE	
X2.18	L	Mains voltage supply connection (AC IN)
X2.19	N	
X2.20	PE	

2.4 Operating and display elements



The control unit is operated directly using the three buttons below the LC display (UP, ENTER, DOWN).

The function of the operating elements is on the LC display.

Tastenbezeichnung	**UP**	**ENTER**	**DOWN**
Start commissioning	MENU	ENTER	
Settings More / Less	(+)	SAVE	(-)
Settings Yes / No	YES		NO
Contol drive	OP	ENTER	CL
Confirmation		ENTER	
Learning journey	OPEN	SAVE	CLOSE
Reference run	OPEN	STOP	CLOSE

Status display LED_CPU, LED_PER, LED_PWR, LED_BKP (optional)

LED off	Missing power supply; component defective
Blue flashes	Initialization microcontroller and internal functions
Green flashes	Component ready for operation (CPU or PER or PWR)
Green flashes synchronously	System ready for operation (CPU and PER and PWR, BKP if applicable)
Red flashes	Internal software error occurred

Display backlighting

Red flashes	Error occured. Error code is shown in the display
Red on	Not ready to drive (e.g. emergency stop, safety stop)
Green on	Ready to drive
Green flashes	Limited driving functionality (safety is triggered)

3 Connection and Functional description

3.1 Intended use Use

The control unit can only fulfill its safety-related task if it is used as intended.

The control unit is designed for use on door systems in accordance with standard EN 13241-1.

The control unit must not be used on the following exceptions to door systems:
- Dock and sluice gates
- Elevator doors
- Vehicle doors
- Gates mainly used for animal husbandry
- Textile theater curtains
- Dangerous machines that are not gates or barriers.

Any other use or use beyond this is not in accordance with the intended use. The manufacturer accepts no liability for damage resulting from improper use.
Use in special applications requires approval from the manufacturer.

DANGER!
If only a light grid and no safety edge is used to secure the closing edge of a vertical door, it must be noted that no obstacle detection takes place above the light grid and door movement is not stopped. If an obstacle is moved into the door's path that may be located above the light grid, the operator must switch off the automatic door movement.

3.2 Technical features

The DRICO slife control unit is an electronic control unit with safety functionality. It is used to control the operation of electrically operated sliding doors, sectional doors, rolling and lattice doors, swing and folding doors in industrial environments. It contains a frequency inverter and electronics for the stepless control of a three-phase motor with up to 4A or 10A on a single-phase power supply. The frequency inverter offers the option of smooth starting and braking of the door, as well as the option of different speeds. The maximum frequency output by the inverter is limited to 100 Hz.

The control unit has the following features:
- Auto configuration and extensive default settings for standard door systems
- Controllable output voltage and frequency for the connected three-phase motor
- Comprehensive parameterization system
- Parameterizable inputs for OPEN, STOP, CLOSE, toggle (OPEN, STOP, CLOSE, STOP), partial OPEN, emergency STOP, limit switch
- Parameterizable output relays (NO contact) for flashing light, OPEN position and CLOSE position
- Parameterizable output relays (changeover contacts) for traffic lights and conveyor technology
- Connections for safety contact strips (8.2 kΩ) in OPEN and CLOSE direction
- Inputs for the evaluation of the traveling safety contact strips
- Motor speed and direction of rotation detection as well as virtual door position detection via incremental encoder on the motor shaft
- Positioning of the door by limit switch and reference run
- 4-line LC display for diagnostic display and extensive parameterization via menu navigation

- Easy operation and configuration via 3 buttons
- Real-time clock for precise fault/event analysis and for calendar-controlled gate functions
- Temperature sensors on the power and control electronics
- Optional, clip-on radio receiver for hand-held radio transmitter for remote control of the door

The control unit is only fully functional in the ready-to-use door system. Further external components are required for this, e.g:

- Drive (electric motor and gearbox)
- Command input devices (switches, buttons, loop detectors)
- Signaling devices (blinker lights, horns, status displays)
- Sensor elements (safety edges, light barriers)

These are not included in the scope of delivery of the control unit.

Notizen

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3.3 Operating modes

The control controller software is divided into individual function modules and is available to the user in three possible operating modes (dead man's mode, automatic mode, and emergency mode):

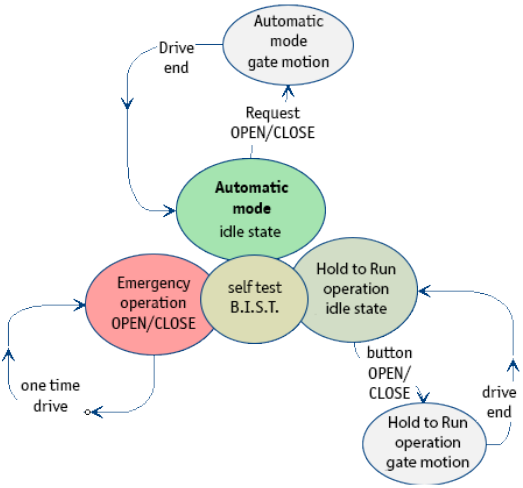


Figure 1 – Overview of operating modes

3.3.1 Operating Modes

The control software is divided into individual function modules and offers users three possible operating modes (dead man's mode, automatic mode, and emergency mode).

3.3.2 Deadman operation

The door control unit can be used in dead man mode with limited convenience. In dead man's mode, the door can only be moved using the OPEN and CLOSE buttons specially connected to the inputs defined for dead man's mode. The door does not require any safety contact strips for this operating mode.
The door only moves as long as the OPEN or CLOSE button is pressed. Dead-man operation is only permitted if the operator has full visual contact with the door system and can operate it safely for himself and other persons.

3.3.3 Reference run

If the first movement after restarting the control unit is not successful (e.g. moving to the mechanical end position after disengaging the motor), the control unit switches to this operating mode.

As the position of the door not yet known, it must detected once via a reference. For this purpose, a fixed end position (e.g. mechanical end positions or limit switches) can approached automatically. If no fixed end position available, an end position can be approached using the open/close inputs enabled for this purpose or the display buttons and then the end position can be defined by pressing Stop and the button for the direction at the same time.

The control unit then switches to the set operating mode.

3.3.4 Automatic mode

When safety is fully configured, the control unit is normally operated in this mode, activation with automatic self-hold. Only in automatic mode are all the comfort functions of the control unit available to the user. Here, the full safety of the door is guaranteed when the safety devices are activated. In this operating mode, the door moves with its maximum set speed. In automatic mode, a door movement can be initiated by:

- Dead man's switch / key switch (OPEN or CLOSE)
- Pulse command transmitter (OPEN, partial OPEN or CLOSE)
- Pulse button with TOGGLE function (OPEN, STOP, CLOSE, STOP)
- Commands via the radio remote control (provided it has programmed beforehand)
- Commands via the built-in clock and the parameterized calendar

Each movement command leads to the execution of the complete, selected action (open door, close door, passage of persons, etc.). Each action is ended immediately by a stop command or a signal from the safety devices. The activation of a safety contact strip during a door movement leads to an immediate reversal of the door. Interrupting the light barrier during the closing process also leads to an immediate stop and automatic opening of the door. A movement command in the opposite direction to the current movement gently brakes the door and then allows it to in the opposite direction.

Note: Automatic operation with incomplete setup:
If the gate has not yet been fully set up or the control system's reference run has not yet been completed, the control system runs in a special safety mode (example: the end positions of the gate have not yet been defined and/or both have not yet been detected during the reference run). The gate then only moves at a slower speed. Only after the measurement run at slow speed is the system switched to automatic speed.
Even if the control system was electrically de-energized, the gate will only move at a slow speed the first time until both end positions have been reached. After that, it will switch to full automatic speed. This behavior prevents the gate from accidentally moving too quickly to its end positions (for example, after the motor has been mechanically disengaged).

3.3.5 Emergency operation

The door control system can switch automatically from automatic mode to emergency mode. This automatic switch can only be triggered by an "Emergency Open" or "Emergency Close" input signal from a fire alarm control panel. In this operating mode, only the requested movement (OPEN or CLOSE, depending on the parameterization) is performed at slow speed. The safety devices are activated during this movement. The movement can be interrupted by pressing and holding the STOP button or by activating a safety device. Once this interruption has been removed, the door continues moving immediately.

A statically applied OPEN or PARTIALLY OPEN signal is ignored by the control system in this operating mode. When the program starts (e.g., when the control system is switched on), a statically applied "emergency" input signal is not executed in order to prevent accidents caused by accidentally incorrectly connected inputs.

3.3.6 Changing the operating mode

The control system, which normally runs in automatic mode, can be switched to dead man's mode. The door can then only be controlled using the connected dead man's buttons. The motor only runs as long as the corresponding button is pressed. All safety devices (contact strips and light barriers) are ignored by the control system. The user is responsible for safe operation.

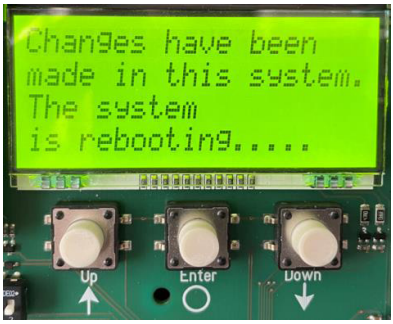
3.3.7 Automatic change of operating modes

The door control system can switch from automatic mode to emergency mode if the parameter settings allow it and the system detects a corresponding „emergency" signal from a fire alarm control panel.
In this case, only this operating mode will be active until the control unit is restarted.
The restart is performed automatically when the emergency signal is reset (no longer active) and the target door position (either OPEN or CLOSED, depending on the predefined setting via parameter no. 76) has been reached.
Upon restart, the system returns to automatic mode and waits for the first travel command via a dedicated push-button located near the door.
If electronic safety devices on the door fail (e.g. defective light barrier or safety edge), the control system can automatically switch from automatic mode to dead man mode.
This automatic switch is valid only for the currently active motor movement and only when the buttons intended for dead man operation are pressed continuously.
The switch occurs after 3 seconds of continuous button actuation.
Once the buttons are released, the system returns to automatic mode. However, if the fault persists or reoccurs, the system may switch back to dead man mode during the next travel operation.
A change between the operating modes is possible in the following directions:

- Automatic mode → Dead man's mode
- Dead man's mode → Automatic mode (when safety restored)
- Automatic mode → Emergency mode
- Emergency mode → Automatic mode (when no emergency signal is actice)

3.4 Menu operation

The menu operation is shown on the four-line LC display. The menu operated using the three buttons below the LC display (UP, ENTER, DOWN).



The menu can be accessed by pressing and holding (2 seconds) the ENTER button. Use the UP and DOWN buttons to navigate the menu cursor up or down. Use the ENTER button to select individual menu items. Press and hold (2 seconds) the UP and DOWN buttons simultaneously to exit the menu. If changes have been made, a message will appear. The changes can then be accepted or rejected.

3.4.1 Menu system

The menu system resembles a DOS structure with systematic numbering. Using a quick selection feature, each menu item can be accessed or edited with just a few keystrokes (provided that a password has been entered beforehand, if necessary).

3.4.2 Menu overview

List of menu items

Level 0		Level 1		Level 2	
00	Information	00	Return		
		01	PER Master Status		
		02	PER Slave Status		
		03	SKL Master Status		
		04	SKL Slave Status		
		05	System Log	00	Return
				01	Show log
				02	Save log
				03	Delete log
		06	Maintenance	00	Return
				01	Cycle counter
				02	Display maintenance counter
				03	Remaining cycles
				04	Remaining time
				05	Reset maintenance
				06	Set cycles until maintenance
				07	Set time until maintenance
		07	Firmware versions		
		08	System Information		
01	Installation	00	Return		
		01	Gate	00	Return
				01	Set part-open position
				02	Reverse distance
				03	Dist. slow speed before close
				04	Dist. slow speed before open
				05	Dist. slow speed from close
				06	Dist. slow speed from open
				07	M/S Synchron selection
				08	Opening width Master
				09	Opening width Slave
				10	Dist. deactivate safety before close
				11	Dist. deactivate safety before open
				12	Operating mode

Level 0		Level 1		Level 2	
		02	Motor	00	Return
				01	Slip detection
				02	Speed preselection
				03	Power offset
				04	Boost voltage
				05	Nominal voltage
				06	Nominal frequency
				07	Rated speed
				08	Encoder selection
				09	Increments per revolution
				10	Gear ratio
		03	Timer	00	Return
				01	Auto Close Open
				02	Auto Close partially Open
				03	Auto Close undefined
				04	Auto Close shortened
				05	Activate advance warning
				06	Courtyard light switch-off time
				07	Traffic light switch-off time
		04	PER Master	00	Return
				01	SKL Open
				02	SKL Close
				03	ISK Open
				04	ISK Close
				05	IN 1
				06	IN 2
				07	IN 3
				08	IN 4
				09	IN 5
				10	IN 6
				11	IN 7
				12	IN 8
				13	IN 9
				14	IN 10
				15	IN 11
				16	Rel 1
				17	Rel 2
				18	Rel 3
				19	Rel 4
				20	Rel 5

Level 0		Level 1		Level 2	
		05	PER Slave	00	Return
				01	SKL Open
				02	SKL Close
				03	ISK Open
				04	ISK Close
				05	IN 1
				06	IN 2
				07	IN 3
				08	IN 4
				09	IN 5
				10	IN 6
				11	IN 7
				12	IN 8
				13	IN 9
				14	IN 10
				15	IN 11
				16	Rel 1
				17	Rel 2
				18	Rel 3
				19	Rel 4
				20	Rel 5
		06	Radio	00	Return
				01	Radio active?
				02	Number trained
				03	teach toggle
				04	teach open
				05	teach close
				06	teach stop
				07	teach partially open
				08	Delete button
				09	Delete all
		07	Calendar	00	Return
				01	Calendar active?
				02	Weekly calendar list
				03	Annual calendar list
				04	Weekly calendar Config.
				05	Annual calendar Config.
		08	Date & time	00	Return
				01	Change date
				02	Change time
				03	Automatic summer time
				04	Manual summer time

Level 0		Level 1		Level 2	
		09	New reference run		
		10	New learning journey		
		11	Save parameters		
		12	Restore parameters		
		13	Factory Settings		
02	SD card	00	Return		
		01	Save parameters		
		02	Restore parameters		
		03	Update CPU		
		04	Update PER		
		05	Update PWR		
		06	Update PER Slave		
		07	Update PWR Slave		
		08	Update texts		
03	Password				
04	Language	00	Return		
		01	English		
		02	German		
		03	Dutch		
		04	French		
05	Quick selection				
06	Restart				

3.4.3 Set national language

The language of the controls can be changed in menu item 4.

Only the texts are changed. The numbering, internal parameters, functions, and settings remain unchanged.

3.5 Display functions

3.5.1 Operating mode display

The following information is on the overview page:

Operating mode
Gate position / gate action
Messages (e.g. stop active)
Date and time (right-aligned message Calendar permanent command active)

3.5.2 Sensor display

The sensors and inputs and outputs can be read out via the respective menu item. In addition, a triggered safety device appears directly as a message on the overview page in the display.

3.5.3 Password entry

To obtain higher rights and access certain settings, a password must be entered.
When the function is called up, a 4-digit code is displayed with which an authorized person can generate a time-limited password. The communicated password must then be entered in the control unit to enable access.
As the current date also included in the password generation, it must be ensured that a current date is set.

3.5.4 Error / event display

The display proactively shows information about certain error messages and special events relating to the control system or the gate, without the operator having to first look up the diagnostic menu or sensor display.

How does this proactive display work?
These events are only shown on the overview screen during the operating mode display. During the sensor display or in the menu display, the event and error display is not active. If several events are active at the same time, they are displayed one after the other.
The messages displayed refer to the section on the error system in chapter 9.1 of this document.

Examples of proactive insertion

- If a safety contact strip is triggered, this information is on the display.
- If an error occurs that does not allow any further control of the motor, the control unit switches to error status and shows the last error that occurred on the display.

3.6 Radio receiver and antenna

An optional radio receiver and a corresponding antenna can connected to the control card.

3.6.1 Activate radio

The radio is deactivated by default and must be activated once with a password.

Note
After activation, the system must be restarted with the settings saved. A handheld transmitter can only be programmed after this step.

3.6.2 Supported hand-held transmitters

- 32-bit Rolling Code (constant part)
- 12-bit Code (long transmission pulses)
- 36-bit Code
- 12-bit Short Code (short transmission pulses)
- 18-bit Multi-bit Code

3.6.3 Memory locations

There are 150 memory locations available, each of which can store a complete standard handheld transmitter or a button.

3.6.4 Teach in button function

Individual button functions of a transmitter can be programmed using the following sub-items:

- Learn button as OPEN function
- Learn button as CLOSE function
- Learn button as STOP function
- Learn button as PART UP function
- Learn button as TOGGLE function

After making the selection, the operator has 20 seconds to press the corresponding button on the hand-held transmitter.

Figure 2 – Display during teaching.

When the transmitter is recognized, a memory location is occupied in the control unit, where the button functions are stored. A confirmation message “success” appears on the display for 2 seconds, after which the system automatically returns to the menu.
If the program does not recognize a valid code within 20 seconds of activating the learning process, or if an attempt is made to relearn a button that has already been learned, the message “failed” appears on the display for 2 seconds before the system returns to the menu.

After that, additional buttons can be learned by selecting the sub-item again.

3.6.5 Delete transmitter

After making their selection, the user has 20 seconds to press the corresponding button or, in the case of a standard handheld transmitter, any button on the handheld transmitter.
Once the transmitter has been recognized, the memory location in the control unit is deleted. A confirmation message “success” appears on the display for 2 seconds, after which the system automatically returns to the menu.
If the program no longer recognizes a valid code within 20 seconds of activating the teach-in process, or if an attempt is made to delete an unknown button, a „failed“ message appears on the display for 2 seconds before returning to the menu.

Further hand-held transmitters can then be deleted by selecting the sub-item again.

3.6.6 Delete all transmitters

Neither the corresponding transmitters nor a radio receiver are required for this. Once this menu item has been called up, remote control of the door by radio remote control is no longer possible until the next teach-in process.

3.7 Built-in real-time clock

With the integrated real-time clock module in the control system, time-controlled and automatically executed door movements can be configured.
Date and time are reliably maintained for several months even during a power outage.

3.7.1 Set clock

The internal clock of the control unit is set ex works. If this time should nevertheless deviate from the real, local time, it can be adjusted here.

3.7.2 Summertime

There is an automatic summer time changeover according to the rules of the EU member states. The time is then put forward by one hour on the last Sunday in March at 2:00 am and put back by one hour on the last Sunday in October at 3:00 am.

This function is activated by default.

Daylight saving time can be activated or deactivated manually under „Manual daylight saving time“

3.8 Calendar functions

In automatic mode, the calendar functions enable the control system to influence the behavior of the gate at specific times.
A number of commands are available for gate actions, which can be called up at precisely defined times. The times and commands can be repeated on a weekly basis for the seven days of the week.
However, an annual calendar with a higher execution priority (e.g., for public holidays or vacations) also makes it possible to override this weekly recurring schedule with other time and command combinations. The behavior of the gate can thus be automatically predefined individually with the entries in the calendar.

Up to 20 entries per day can be entered in the weekly calendar.
The annual calendar allows a maximum of 40 entries.

When switching to automatic mode, the weekly calendar and the annual calendar are searched retroactively for one week. The last command found is executed again.

Possible functions of the calendar(actions that the control unit can perform via the calendar)

ID	Command	Meaning
00	None	
01	Open	Gate opens
02	Close	Gate closes
03	Part-open	Gate moves partially open
04	Hold open start	Gate is held open (closing not possible)
05	Hold open end	
06	Hold close start	Gate is held closed (cannot opened)
07	Hold close end	
08	Hold part-open start	Gate is held partially open (gate only moves between Partial up and up)
09	Hold part-open end	
10	activate timer	Deactivate automatic feed timer
11	deactivate timer	
12	Locked start	Gate is locked when closed (can only be locked with Authorized input „Lock open“ opened become)
13	Locked end	
14	Deactivate radio	Deactivate operation via radio
15	Activate radio	

3.8.1 Activating the calendar

The calendar is deactivated by default and must be activated once with a password.

3.8.2 Menu selection of calendar types

The following menu items manage the weekly calendar:

- Weekly list (display of entries sorted by day of the week)
- Weekly config (configuration according to the selection of an operator action)

The following menu items manage the annual calendar:

- Year list (display of entries)
- Year config (configuration according to the selection of an operator action)

3.8.3 Operator actions Weekly calendar

An overview of possible user actions for the weekly calendar in configuration mode shows table below.

Val	Text in the display	Meaning, required input dialogs
00	No action	No action
01	Add	Add a single entry, consisting of: -Weekday -Time (hour : minute) -Command
02	Delete	Remove a single entry, consisting of: -Weekday -Time (hour : minute) -Command
03	Delete time	Remove one or more entries of a weekday at a specific time, consisting of: -Weekday -Time (hour : minute)
04	Delete until	Remove all entries of a weekday up to a certain time, consisting of: -Weekday -Time (hour : minute)
05	Delete day	Remove all entries of a weekday, required: -Weekday
06	Delete all	Remove all entries for all days of the week
07	Copy day	Copy all entries of a source weekday (1st) to the memory of the target weekday (2nd), required: -source weekday (1st) -Target day of the week (2nd)

3.8.4 Operator actions Annual calendar

An overview of possible user actions of the annual calendar in configuration mode shows table below.

Val	Text in the display	Meaning, required input dialogs
00	No action	No action
01	Add	Add a single entry, consisting of: -Date (day . month . year) -Time (hour : minute) -Command
02	Delete	Remove a single entry, consisting of: -Date (day . month . year) -Time (hour) -Command
03	Delete time	Remove one or more entries of a date at a specific time, consisting of: -Date (day . month . year) -Time (hour : minute)
04	Delete day	Remove a specific date from the annual calendar, required: -Date (day . month . year)
05	Delete until	Remove all entries from the annual calendar up to a certain date and time: -Date (day . month . year) -Time (hour : minute)
06	Delete all	Remove all entries of all date entries
07	Copy day	Copy all entries of a source date (1st) into the memory area of the target date (2nd), required: -Source date (1st) -Destination date (2nd)
08	Move day	all entries of a source date (1st) to the memory area of the target date (2nd): -Source date (1st) -Destination date (2nd)

3.8.5 Display weekly calendar

In the weekly calendar, up to 20 different switching times and associated functions (gate actions) can be entered for each individual day of the week (Sunday to Saturday).
In the display mode of the weekly calendar, only the entered dates are shown, while the empty memory locations are skipped. The weekly calendar display is accessed as follows:
-Menu: „Installation“, „Calendar“, select „Weekly list (day)“
-The following dialog allows you to display saved data from the weekly calendar, the can be filtered by preselection (of the day of the week).

If you select “Weekly list,” all entries in the weekly calendar are displayed.
If you select “Weekly list day,” only the entries for the selected day in the weekly calendar are displayed.

The following dialog allows the display of stored data from the weekly calendar, filtered based on the selected weekday.

Mo	Usd:05	Fre:15
01	13:43	Cmd:02
02	13:43	Cmd:05
TOGGLE	LEAVE	NEXT

The left column shows the numbering, the right column shows the ID of the command.
The “Toggle” button suppresses the time display (numbering on the left remains unchanged) and converts the numerical display of the command into text. Pressing the button again (“Toggle”) restores the original display.
Pressing the “NEXT” button displays the next page.
Pressing the “LEAVE” button ends the display.

Mo	Usd:05	Fre:15
01	C:CLOSE	
02	C:HOLDCLOSE,s	
TOGGLE	LEAVE	NEXT

Note:
The sum of the fields „Usd:“ and „Fre“ must always be 20 for the weekly calendar. If both fields show the value „00“, this indicates a communication fault with the control system!

3.8.6 Weekly calendar configuration

Procedure:
1. Selecting the operator action (see 3.8.3)
2. Enter the required information for the action e.g. Add
   a. Weekday
   b. Time
   c. Command
3. Summary and confirmation of the entry

3.8.7 Display annual calendar

Above the weekly calendar, there is an annual calendar in the control system that can store a total of 40 entries for dates, switching times, and associated gate actions. If switching times are entered in the annual calendar for a specific date, only these entries are used on that day and the weekly calendar for that day is ignored.
In the display mode of the annual calendar, only the entered dates are shown. The empty memory locations are skipped. The annual calendar display is called up as follows:

- Menu: Select “Installation,” “Calendar,” “Annual Calendar.”

The following dialog allows you to display saved data from the annual calendar.

01-02	Usd:05	Fre:35	
02.02.2023	13:43	02	
04.02.2023	13:44	05	
TOGGLE	LEAVE	NEXT	

1st line top left shows the numbering („from“ - „to“).
The „Toggle“ button suppresses the date and time display (the numbering at the top is retained) and resolves the numerical display of the command to text. Pressing the button again („Toggle“) the original display.The left hand columns show the date and the switching time, the right-hand column shows the ID of the command The „NEXT“ keystroke displays the next page.
Pressing the „LEAVE“ button ends the display. You return to the „Calendar types“ menu selection (01.09.02).

01-02 Usd:05 Fre:35
C:CLOSE
C:HOLDCLOSE,s
TOGGLE LEAVE NEXT

Information: The „No action“ command can be used to prevent other planned actions of the door from the weekly calendar specifically for a single day of the year (e.g. public holiday).

Note:
The sum of the fields „Usd:“ and „Fre“ must always be 40 for the annual calendar. If both fields show the value „00“, this indicates a communication fault with the controller!

3.8.8 Annual calendar configuration

Procedure:
1. Selecting the operator action (see 3.8.4)
2. Enter the required information for the action e.g. Add
   a. Date
   b. Time
   c. Command
3. Summary and confirmation of the entry

3.9 Parameter settings

3.9.1 Save parameters

The current status of the parameters can be saved, overwriting a previous backup.

3.9.2 Reload parameters

The last backup can be restored, overwriting all current parameters.

3.10 Temperature monitoring

The temperature on the circuit board is measured. If the measured temperature exceeds the limit value for overtemperature, an error message is generated and the firmware no longer executes motor control.

The temperature is measured in the power driver for the motor control. If the measured temperature exceeds the limit value for overtemperature, an error message is issued and the firmware no longer executes motor control.

An external overtemperature switch (for example, integrated in a motor) can optionally be connected. If an overtemperature is reported by the external overtemperature switch, an error message is generated and further motor control is inhibited by the firmware.
If no overtemperature switch is used in the motor, the “Temp” terminal on the controller must be bridged.

Caution!
Temperature monitoring, especially engine temperature monitoring, is only a convenience feature and not part of the safety function.

4 Installation

This section describes the preparatory commissioning of the DRICO slife control unit, both the mechanical installation and the electrical installation.

4.1 Assembly

Before installation, check the control unit for any transport or other damage.
Avoid touching the electronic parts, especially the parts of the processor circuit. Electronic components can permanently damaged or destroyed by electrostatic discharges.
During installation of the control unit, the system must always be disconnected from the power supply. The control unit must be installed free of mechanical stress.
Unused cable entries must be sealed with appropriate blanking plugs to ensure the enclosure‘s degree of protection.
The cables must not be exposed to any mechanical tensile stress.

The control unit is wall-mounted directly on a straight wall using four cylinder head screws with a maximum diameter 4.25 mm. The control unit is designed for vertical mounting provided. An air space of at least 10 cm mu it.

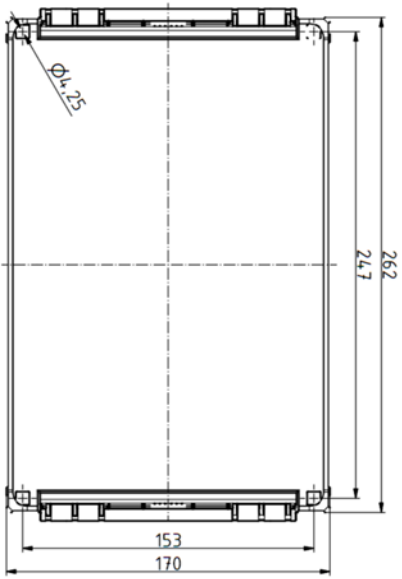


Figure 3 – Mechanical dimensions of the control system

4.2 Electrical Connection

Caution!
For safety reasons, the electrical installation must always be done by an authorized electrician.

Warning!
When working on the control unit, the power supply must be safely disconnected and secured against unintentional reconnection.

Work on the control unit is only permitted when all poles of the power supply are disconnected. A mains plug is fitted to disconnect all poles. The mains connection cable may only be replaced with a similar cable supplied by the manufacturer. If the supply is permanently wired without a mains plug, an additional disconnecting device must be provided.
The points listed in the Safety instructions section must be observed. Parallel routing of signal and power cables should avoided. All cables must be dimensioned according to the power consumption.
The cable glands used in the housing must be treated in such a way that after the cables have been fed through, the protection against the ingress of water and foreign bodies still corresponds to the specified IP class. Unused cable glands must be replaced with dummy plugs. Damaged cable glands must be replaced immediately with undamaged ones.

4.2.1 Notes on EMC-compliant installation

Caution!
If the installation is not EMC-compliant, this may cause interference with other devices in the vicinity of the control unit.

The control unit contains a frequency converter. Frequency inverters are devices that can generate electromagnetic interference in their environment due to their circuitry.
Therefore, only a shielded cable may be used as the motor cable. The shield must be connected to the motor using an EMC gland and to the PE clamp provided in the control unit. The maximum permissible motor cable length is 3m. Interference is possible with longer cable lengths.

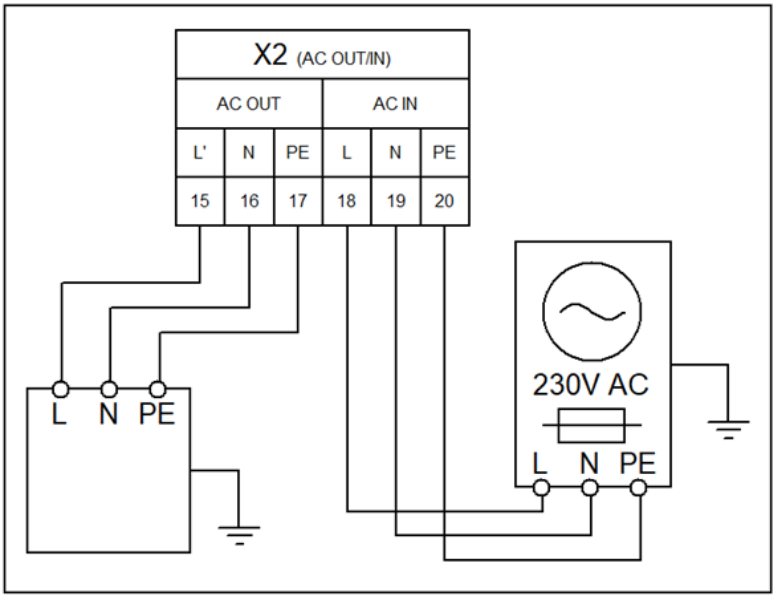
4.2.2 Separating device

If the control unit is used with a power supply cable equipped with a plug, a socket outlet must be installed in the immediate vicinity of the control unit and be freely accessible to serve as a disconnecting device..
If the control unit is permanently installed without a power supply cable and without a plug, a switch with all-pole disconnection and a contact gap complying with overvoltage category III must be installed in the fixed electrical installation as a disconnecting device. This switch must be located in the immediate vicinity of the control unit and be freely accessible.

Warning!
When working on the control unit, the power supply must be safely disconnected and secured against unintentional reconnection.

4.2.3 Supply voltage connection (FU)

The power electronics of the DRICO slife control unit is designed for a single-phase input voltage of 230VAC 50Hz. The supply voltage is connected to the terminals labeled „L“, „N“ and „PE“ on the powerboard



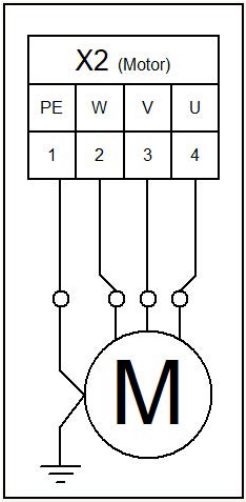
Danger!
It is essential to ensure that the mains supply is connected correctly, especially the protective earth conductor.

4.2.4 Connection of the motor

The output voltage for the three-phase motor of the door drive is generated by the control system using pulse width modulation from the supply voltage of the power electronics. The motor is connected to the "U", "V", 'W' and "PE" terminals for this purpose. When connecting the motor itself, the connection diagrams provided by the motor manufacturer must be observed. The shielding must be securely fastened in the shield clamp.

It is essential to ensure that the protective conductors and the shielding of the motor connection cable are connected correctly.

The motor should preferably be connected in delta configuration in order to obtain effective mechanical torque.



When commissioning the gate system, the direction of rotation of the motor must be taken into account so that when the OPEN button is pressed, the gate moves in the desired direction. If necessary, swap the motor connections "V" and "W" or change the motor direction of rotation via the software.

Warning!
PE must connected to the motor. For contact protection, it must ensured that there is a PE connection to the connection terminal on the door control unit via the motor connection cable.

4.2.5 Brake chopper connection

In the case of heavy doors that are braked very quickly, it is possible that the motor may receive a mechanically pushing torque. This, in turn, can charge the DC link with additional energy so that the rated voltage is considerably exceeded. A brake chopper is used to prevent this unintentional increase in the DC link voltage, which independently converts the additional energy into heat.

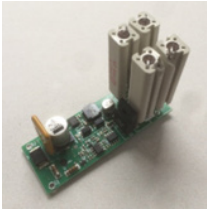
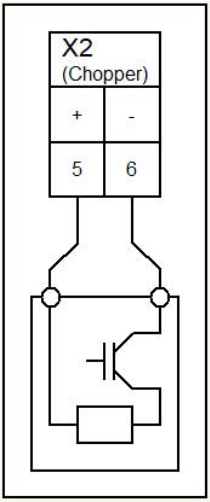


Figure 4 – External brake chopper without mounting base

The two connecting wires of the brake chopper are plugged into terminal points 5 & 6 on the powersection. The red wire is connected to „5 +“ and the black wire to „6 -“.

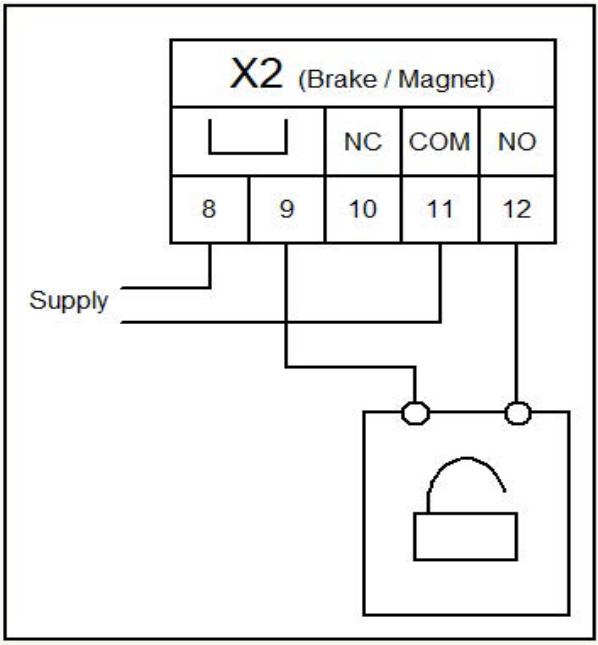


Note!

The Chopper terminal is designed solely for connection to an ASO brake chopper. Connecting only a brake resistor is not allowed.

4.2.6 Brake connection

This optional connection can be used to release an existing brake or lock before motor control. The function of the brake is not monitored by the control system.
If a strong inductive load is switched, it must be equipped with a suitable free-wheeling diode as an interference suppression measure.



Warning!
No motor movement is stopped with this brake. The connectable brake is only a convenience function and not part of the safety function.

4.3 Factory Setting of the inputs and outputs

Various inputs and outputs are already defined with functions when the control unit is delivered. Some can be parameterized, but many are fixed for reasons of hardware design.

4.3.1 Wiring of the inputs and outputs (FU)

There are numbered terminals on the power board for connecting the power supply and external devices.
The connection terminals are numbered X2 from 1 to 20. They are divided into function blocks.

Motor connection

X2.1	PE
X2.2	Phase W
X2.3	Phase V
X2.4	Phase U

Brake chopper connection

X2.5	Positive connection „+“
X2.6	Negative connection „-“

Optional: Brake / solenoid connection

X2.8	Bridge to X2.9
X2.9	Bridge to X2.8
X2.10	Relay connection Normaly Closed
X2.11	Common relay connection, common connection
X2.12	Relay connection Normaly Open

Fuses

X2.13	Fuse for mains input
X2.14	Fuse for external 230VAC components

Power Connection

X2.15	Mains output phase L‘ (fused via X2.14)
X2.16	Mains output neutral conductor N‘
X2.17	Mains output PE
X2.18	Mains input phase L (fused via X2.13)
X2.19	Mains input neutral conductor N
X2.20	Mains input PE

The brake and solenoid connection is optional and can be plugged in if required. As supplied, the contacts are not wired and are potential-free. The two contacts X2.8 and X2.9 are connected to each other, which clearer cable routing.

Warning!
PE must be connected to the motor and to the external components supplied with 230 V. For protection against accidental contact, it must be ensured that the connecting cables have a PE connection to the terminals on the door control unit.

4.3.2 Wiring of the inputs and outputs (controller)

There are several terminal blocks on the control unit for connecting external devices and control devices.They are each labeled on the circuit board and in most cases have a fixed default setting.

Rotary encoder connection

M8, 4-Pin
Note: Do not swap with CAN cable! This could damage the electronics!

CAN1 connection, e.g. for expansion modules

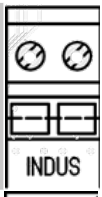
M8, 4-Pin
Note: Do not interchange with the rotary encoder cable! This could damage the electronics!

CAN2 connection, e.g. for connecting several control units together

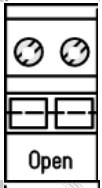
M8, 3-Pin

Connections Safety edges

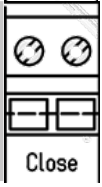
Connection for INDUS inductive rope transmission system for moving safety contact edges



Safety edge OPEN, 8.2 kΩ

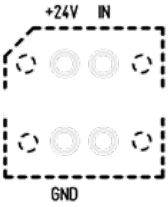


Safety edge CLOSE, 8.2 kΩ



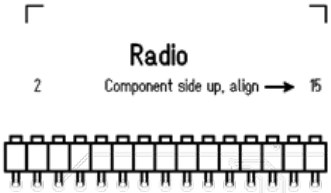
Alternatively (but not together with safety contact edge 8.2kΩ CLOSED):

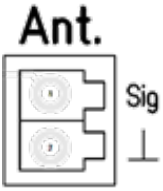
+24V	Safety contact edge OSE, brown wire
IN	Safety contact edge OSE, green wire
GND	Safety contact edge OSE, white wire



Optional: Radio receiver connection

Plug-in socket for radio receiver module
The module must be inserted flush to the right, with the components facing upwards.

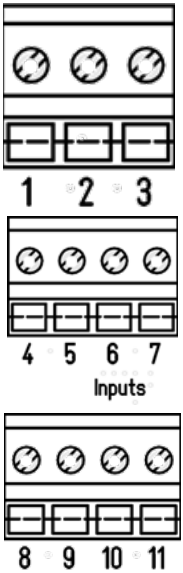




1, Top: Radio receiver antenna: signal connection
2, Bottom: Radio receiver antenna: cable shielding

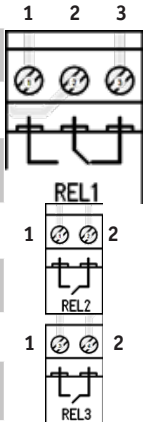
Inputs:

1	Limit switch Closed
2	Limit switch open
3	Switching pulse (toggle) OPEN-STOP-CLOSE-STOP
4	Close
5	Open
6	Stop
7	Close (dead man)
8	Open (dead man)
9	Light barrier
10	Part-open (Passage of persons)
11	Emergency stop



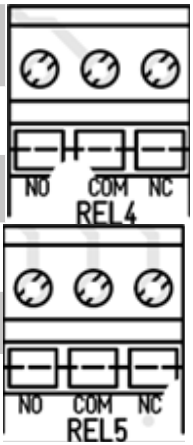
Relay outputs:

1	REL1, changeover contact, normaly open contact
2	REL1, changeover contact, common contact
3	REL1, changeover contact, normaly closed contact
1	REL2, NO contact, contact 1
2	REL2, NO contact, contact 2
1	REL3, NO contact, contact 1
2	REL3, NO contact, contact 2



Supply for external devices / control devices:

1 NO	REL4, changeover contact, Normaly Open Kontakt
2 COM	REL4, changeover contact, Common Kontakt
3 NC	REL4, changeover contact, Normaly Closed Kontakt
1 NO	REL5, changeover contact, Normaly Open Kontakt
2 COM	REL5, changeover contact, Common Kontakt
3 NC	REL5, changeover contact, Normaly Closed Kontakt

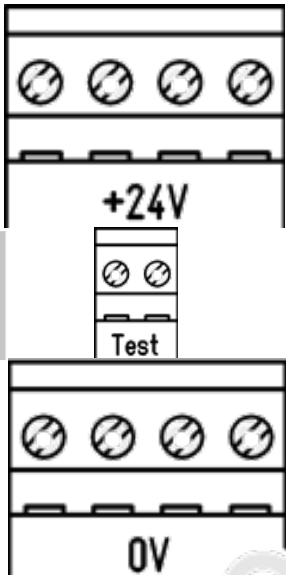


Power supply for external devices / command devices:

Supply voltage +24V (4x)

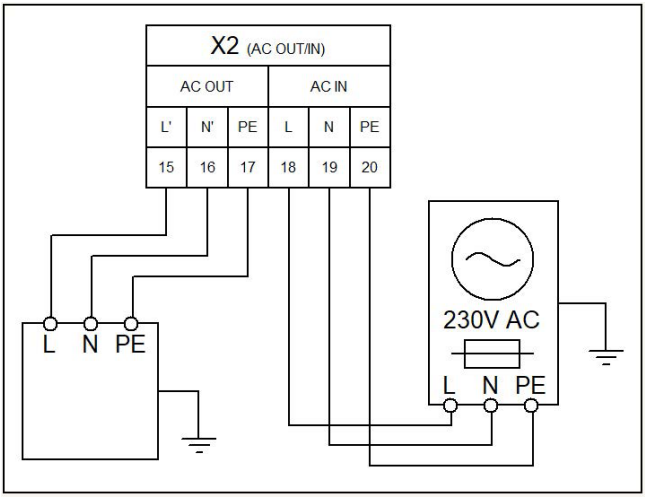
Test output (+24V, pulse briefly OFF) (2x)

Reference potential, 0V (4x)



4.3.3 Supply external devices with 230 VAC

External consumers of the control system that operate with a 230 VAC power supply can be connected via the fused voltage output with the terminal designations “L” and “N” on the control system‘s power board. The maximum load specified by the fuse used must be observed. Therefore, another controller (e.g., for master-slave operation) must not be connected to this connection.



Warning!
PE must be connected to the external components. For protection against accidental contact, it must be ensured that there is a PE to the connection terminal on the door control unit via the connection cable of the external components.

4.3.4 Supply external devices with 24 VDC

A regulated 24VDC power supply is provided on the control unit to supply the external devices, command transmitters and sensors, which can deliver a maximum current of 1500mA. This supply voltage is protected on the circuit board with an automatically resetting fuse.
The 24VDC is available on the lower terminal strip at the left-hand terminals no. 1 to 4 with the designation „+24V“. To the right is the corresponding earth potential labeled „0V“.
A separate „test“ supply output is available for safety functions such as emergency stop and emergency (fire alarm). The supply voltage (+24VDC) is switched on and off in a controlled manner on this output during the idle phases of the control unit. This enables the control unit to detect an electrical short circuit of the control unit against +24VDC and a line interruption at its inputs.

External Power									
+24V				Test		0V			
1	2	3	4	5	6	7	8	9	10

5 Control unit and limit switch

5.1 Command buttons for dead man‘s mode

The door can be commissioned using the buttons located below the display. During commissioning, these are temporarily used like dead man‘s buttons, i.e. during operation without self-holding. The operator must always have a complete view of the door system and all danger points. The end positions are taught in with these buttons during commissioning. They are then used exclusively as menu buttons.
Additional control devices can also be parameterized with deadman permission (priolevel 2). The operator is again responsible for this, as he also carries out the wiring of the control devices. Only manual control devices may be used for this function (e.g. no radar or loop detectors). In automatic mode, these buttons also act as pulse generators, but can also move the door at a reduced speed if they are actuated continuously in the event of defective safety components.

5.2 Command buttons for operation with self-hold

The control devices for operation with latching action are „classic“ buttons and operating elements for automatic mode. The possible functions are described in section 7.4.2.

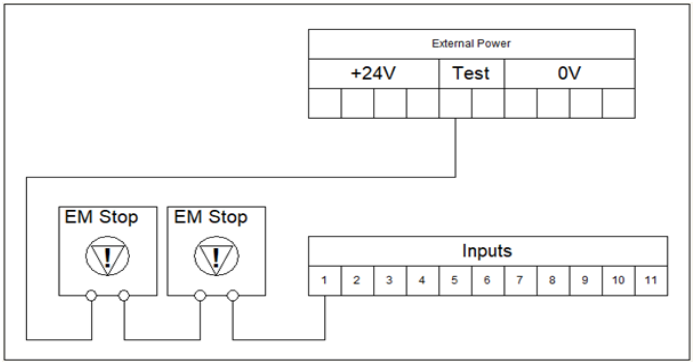
5.3 Safety devices

To ensure safety for man and machine, various safety can be connected to the control system. These include, for example, safety contact strips or light barriers. The connection of these components is described below.

Caution!
The connectable safety components must fulfill the requirements of functional according to category 2 PL c. When using the safety components, a new calculation must ensure that the entire safety function fulfills the functional safety requirements of category 2 PL c.

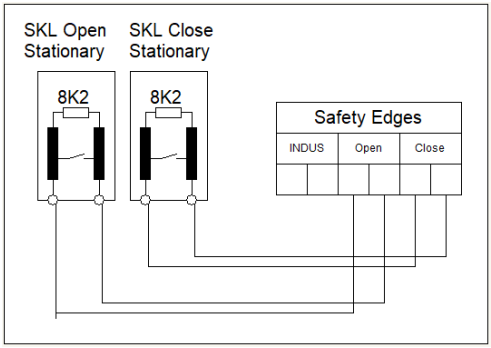
5.3.1 Emergency stop

An emergency stop device can be connected via a generic input (e.g., emergency stop button, safety door contact, dead man's switch). Testing is activated via the parameter setting for the input. When the emergency stop components are in their idle state, the signal path is closed and is tested by the control system. Several emergency stop components can be connected in series.



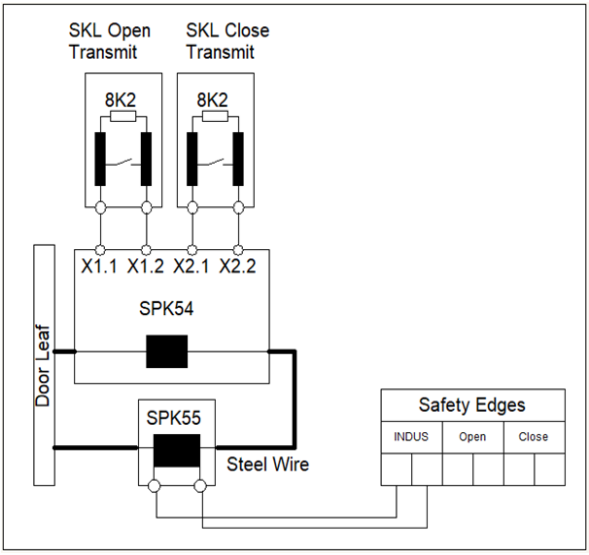
5.3.2 Fixed safety contact edge

The fixed safety contact edge (SKL) are primarily used for personal protection. The hardware is matched to SKL with 8.2kΩ resistance. They are connected on the control board at the connections provided for this purpose (SKL Open and SKL Close). As are ohmic resistors, the polarity does not matter.
If no SKL is installed, the corresponding input can deactivated.



5.3.3 Inductive rope circuit (ISK)

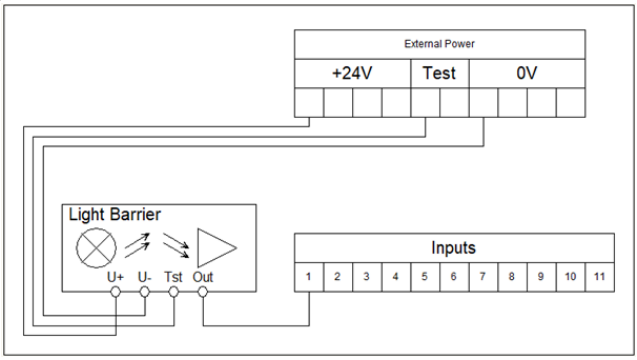
In some control variants, the traveling SKLs are connected via the ASO's own inductive cable transmission system. An "INDUS" connection is provided on the circuit board for this purpose. The polarity is irrelevant for the connection. The coil core permanently mounted on the gate is connected to the control unit, and the two SKLs on the gate leaf are connected to the respective connections for OPEN and CLOSE on the traveling coil core.



If no SKL is installed, the corresponding input must be deactivated.

5.3.4 Light barrier

Both through-beam photoelectric sensors and retro-reflective photoelectric sensors with a 24 VDC operating voltage can be connected to an input of the controller. The corresponding parameter of the respective input must be configured with the desired function. Photoelectric sensors are usually supplied with a tested voltage, which means that the connection at the "Test" terminal is required for the supply.



5.4 Rotary encoder

To determine the travel direction, speed, and end positions of a door, either an incremental encoder or an absolute encoder can be connected to the control system:

- The incremental encoder is installed in or on the motor and provides two phase-shifted square wave signals, from which the required information is derived by the software.
- The absolute encoder outputs a position value directly via a communication interface.

Depending on the type of encoder connected, a corresponding evaluation module must be plugged onto the power board.

5.4.1 Incremental encoder

The rotary encoder is plugged into the „Speed“ connection via M8. The polarity is fixed by the customer and therefore cannot be reversed.

Caution!
Do not connect the rotary encoder to the „CAN1“ connection! may damage the encoder.

If the power supply is interrupted, the control unit saves the last position and adopts this as the last known position when restarting. After a restart, the door continues to move as in the last selected operating mode (provided that all safety devices are present and free). If the door has been moved manually, it will probably collide with the mechanical stop in one of the end positions. An error message is then generated and a new reference position must be taught manually in order to put the system back into regular operation.

5.4.2 Absolute encoder

The absolute encoder is alternatively plugged into the “Speed” connection instead of the incremental encoder. Data is retrieved via an RS485 interface and processed by the software. Depending on the application, either single-turn or multi-turn absolute encoders can be used:

- A single-turn absolute encoder provides a unique output value for each position of its shaft. It cannot distinguish between multiple rotations. Therefore, single-turn absolute encoders are suitable for applications where the encoder does not perform a full 360° rotation, e.g., at the rotation axis of a folding door or a barrier gate.
- A multi-turn absolute encoder provides two pieces of information: a value for the shaft rotation and a count of the number of rotations. This allows precise position determination over multiple revolutions. These encoders are also suitable for door applications directly on the motor shaft.

Since there are many different absolute encoders on the market using various protocols, only components approved by the manufacturer may be used.

Notizen

Notizen

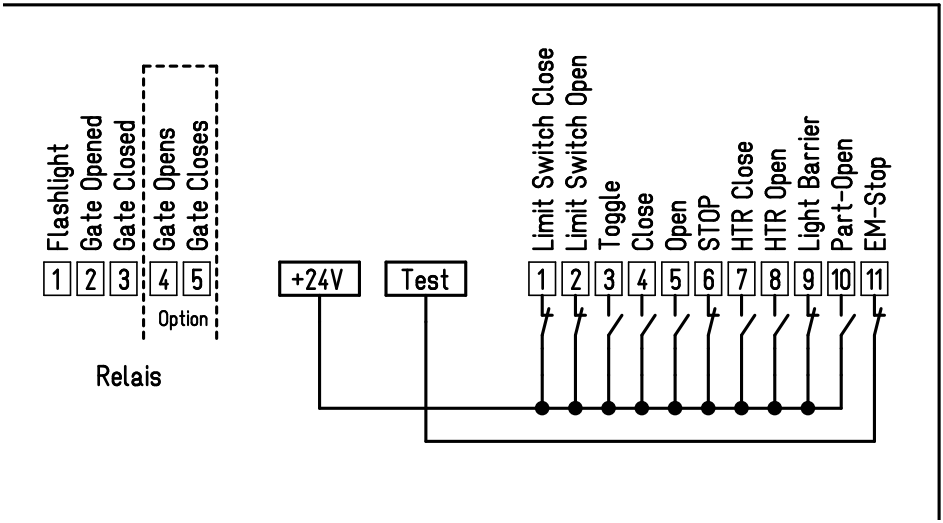
6 Commissioning and function test

Before commissioning and functional testing, the cabling and correct connection of the PE connections must be checked to ensure protection against accidental contact.

Warning!
Am Motor und an den mit 230V versorgten externen Komponenten muss PE angeschlossen werden. Es muss für den Berührungsschutz sichergestellt werden, dass über die Anschlussleitungen eine PE-Verbindung zu den Anschlussklemmen an der Torsteuerung besteht.

Guided commissioning is started automatically on delivery. To start a guided commissioning manually, the control unit must be reset to the delivery status.
The following steps are carried out during guided commissioning.
If changes to the configuration are then necessary, these can be made using the functions are handled.

6.1 Basic setting of the inputs and outputs



6.2 Selecting the Language

First of all, the language of the controls can customized.

6.3 Setting the date and time

The date and time are displayed one after the other and can adjusted if necessary.

6.4 Selection of the door application with the specific parameters

By answering a few questions, the control unit is fundamentally adjusted to the drive and the application.
Once these steps have been completed, the control unit restarts automatically for the changes to effect.

6.4.1 Rated speed of the motor

Set the specified nominal speed of the motor. This setting also applies to the slave, if present.
Unit: „RPM“, („min-1“, „1/min“)

6.4.2 Rated frequency of the motor

Set the specified nominal frequency of the motor. This setting also applies to the slave, if available.
Unit: „Hz“

6.4.3 Rated voltage of the motor

Set the specified nominal voltage of the motor. This setting also applies to the slave, if present.
Unit: „V“

6.4.4 Encoder selection

Select whether or which rotary encoder is present. This setting also applies to the slave, if present.
Selection options:

- No rotary encoder (limit switches must be present)
- Incremental encoder (limit switches are as reference points, if available)
- Kostal (DES, limit switches are used as reference points if available)

6.4.5 Rotary encoder setting

For incremental encoders, specification of the increments per motor revolution For Kostal, specification of the motor to encoder ratio

6.4.6 Speed preselection

Selection of the driving speed:

Selection	Fast speed	Slow speed
Slow	33 Hz	25 Hz
Normal	50 Hz	33 Hz
Medium	62 Hz	33 Hz
Fast	75 Hz	33 Hz

6.4.7 Operating mode

Selection of the operating mode:
-Automatic
-Deadman (Hold-To-Run)

6.4.8 Master opening width

Set the opening width of the master. The unit of this value can be freely selected (e.g., cm, mm, degrees). Settings that relate to the position of the gate (e.g., slow speed before end positions) must be set in the same unit.

Note
If the value is to 0, the control unit uses the determined increments as the opening width. All settings relating to the position of the door (e.g. slow movement before end positions) must then be set in increments.

6.4.9 Slave opening width

Set the opening width of the slave. The unit of this value can be freely selected (e.g., cm, mm, degrees). Settings that relate to the position of the gate (e.g., slow speed before end positions) must be set in the same unit.

Note
If the value is to 0, the control unit uses the determined increments as the opening width. All settings relating to the position of the door (e.g. slow movement before end positions) **must** then be set in increments.

6.5 Setting the direction of rotation of the motor with control travel

Note
The door should not be in one of its end positions at the start of this step.

When checking the direction of rotation of the motor, the drive can be moved using the up/down buttons. Even if the gate is not moving in the correct direction, it must be moved a short distance so that the control system can correctly recognize the counting direction of the rotary encoder when connected and selected.
After completing this step, the control unit will restart automatically so that the changes take effect.

6.6 Executing a learning drive

During the learn drive, the Up/Down buttons are used to move to the end positions of the door. The end position is then saved by pressing and holding „Save“ and the corresponding direction. Once both end positions have been saved, the control unit restarts automatically and is now in the set operating mode. If a slave control unit is available, this step must be carried out again for the second leaf.

7 Setting up the control unit

7.1 Gate configuration

The gate-specific settings are configured menu group „01.01“.

Note
All position settings refer to the settings made during commissioning or in the menu under „Master opening width“ and/or „Slave opening width“ set values.

7.1.1 Part-open position

In this menu item, the current door position can be saved as a partial open position.

7.1.2 Short reversing distance

This menu item is used to set the distance by which the system reverses when the „Reverse short“ input function is activated.

7.1.3 Slow travel before end position

In order to comply with the lower permissible forces in front of a pinch point, these menu items can be used to set the distance over which a slower speed is driven before the end position.

7.1.4 Slow travel from end position

To make the movement more comfortable, e.g. for folding doors, the distance at which a slower speed is run from the end position can be set in these menu items.

7.1.5 Slow travel before end position

In order to comply with the lower permissible forces before a pinch point, these menu items can be used to set the distance over which a slower speed is used before the end position.

7.1.6 Master-slave synchronous operation

A time for staggered movement of master-slave doors can be set here.
-Positive value: Slave opens if master opens more than this value before the slave. Master closes if the master is more than this value before the slave.
-Negative value: Master opens if slave is more than this value before the master. Slave closes if slave is more than this value before the master.

7.1.7 Master opening width

The opening width of the master is set here. The unit of this value can be freely selected (e.g. cm, mm, degrees). Settings that relate to the position of the door (e.g. slow movement before end positions) **must** set in the same unit.

Note
If the value is to 0, the control unit uses the determined increments as the opening width. All settings relating to the position of the door (e.g. slow movement before end positions) **must** then be set in increments.

7.1.8 Slave opening width

The opening width of the slave is set here. The unit of this value can be freely selected (e.g. cm, mm, degrees). Settings that relate to the position of the door (e.g. slow movement before end positions) **must** set in the same unit.

Note
If the value is to 0, the control unit uses the determined increments as the opening width. All settings relating to the position of the door (e.g. slow movement before end positions) **must** then be set in increments.

7.1.9 Deactivation of safety before end positions

To prevent false triggering, e.g. of safety edges on overhead doors, shortly before the end positions, a dead zone can be set in which the safety devices are ignored.

Warning!
It must be ensured that changing this parameter does not create a hazardous situation.

7.1.10 Operating mode

Here you can switch between automatic and dead man‘s mode.

7.2 Drive configuration

If the default settings for the current door do not meet the expectations, some necessary changes can be made in the menu group „01.02“.

Note
This group can only be selected with elevated rights.

7.2.1 Sli detection

If the operator equipped with an encoder, the control unit can calculate an increased slippage of the door by comparing the frequency output and the frequency reported back. The inertia of the detection can be set in this menu item. The value range is from 0 to 50. 0 deactivates the slip detection, the higher the value, the slower the detection. For larger or heavier doors, the value may need to be increased to false triggering.

7.2.2 Speed preselection

Selection	Fast speed	Slow speed
Slow	33 Hz	25 Hz
Normal	50 Hz	33 Hz
Medium	62 Hz	33 Hz
Fast	75 Hz	33 Hz

7.2.3 Power Offset

Power offset between -50% and +50%.

7.2.4 Boost voltage

If the motor does not develop sufficient torque at low speeds, the voltage can be increased at low frequency by increasing the boost value. Until the rated voltage is reached at the rated frequency.

7.2.5 Rated voltage of the motor

Set the specified nominal voltage of the motor. This setting also applies to the slave, if present.
Unit: „V“

7.2.6 Rated frequency of the motor

Set the specified nominal frequency of the motor. This setting also applies to the slave, if available.
Unit: „Hz“

7.2.7 Rated speed of the motor

Set the specified nominal speed of the motor. This setting also applies to the slave, if present.
Unit: „RPM“, („min-1“, „1/min“)

7.2.8 Drehgeberauswahl

Select whether or which rotary encoder is present. This setting also applies to the slave, if present.
Selection options:
-No rotary encoder (limit switches must be present)
-Incremental encoder (limit switches are as reference points, if available)
-Kostal (DES, limit switches are used as reference points if available)

7.2.9 Rotary encoder setting

For incremental encoders, specification of the increments per motor revolution.
For Kostal, specification of the motor to encoder ratio.

7.3 Configuration of the time functions

7.3.1 Automatic feed

To close the door automatically after a set time, times can be set for various positions in the menu.
The times can set in these menu items.
Range (open and partially open): 0s (switched off) - 900s (15 min)
Range (intermediate position and shortening): 0s (switched off) - 300s (5 min)

7.3.2 Warning time

The control unit can issue a warning via an adjustable output (see 7.5) before the drive starts.
Whether this warning is only issued before automatically requested trips or before all trips can set here.

7.3.3 Energy saving time traffic light

This setting determines when an output parameterized to „Traffic light on/off" is switched off when the door is completely closed.
Range: 0s - 1800s (30min)

7.3.4 Yard light switch-off time

This setting defines the duration of the switch-off delay for the courtyard light function.
Range: 0s - 300s (5 min)

7.4 Input configuration

Several settings must be made to configure an input.

7.4.1 List of input functions

This table lists the functional requirements with the limits of the individual settings.

Functional request	Priority	Polarity	Testing	Target
No funcion	Level 0	NO	Untested	Both
Stop	Level 3	Selectable	Selectable	Both
Open	Level 0-2	Selectable	Selectable	Selectable
Close	Level 0-2	Selectable	Selectable	Selectable
Part-Open	Level 0-1	Selectable	Selectable	Selectable
Toggle	Level 0-1	Selectable	Selectable	Selectable
EM-Stop	Level 5	NC	Testet	Both
Fire Open	Level 3	NC	Testet	Both
Fire Close	Level 3	NC	Testet	Both
Deactivate timer	Level 0	Selectable	Selectable	Both
Deactivate calendar	Level 0	Selectable	Selectable	Both
Deactivate radio	Level 0	Selectable	Selectable	Both
Full reversing when opening	Level 1	NC	Testet	Selectable
Full reversing when closing	Level 1	NC	Testet	Selectable
Short reversing when opening	Level 1	NC	Testet	Selectable
Short reversing when closing	Level 1	NC	Testet	Selectable
Full reversing when opening (soft)	Level 1	NC	Testet	Selectable
Full reversing when closing (soft)	Level 1	NC	Testet	Selectable
Short reversing when opening (soft)	Level 1	NC	Testet	Selectable
Short reversing when closing (soft)	Level 1	NC	Testet	Selectable
Limit switch open	Level 2	Selectable	Selectable	Master or Slave
Limit switch close	Level 2	Selectable	Selectable	Master or Slave

7.4.2 Description of the input function

7.4.2.1 Stop

This function stops a running engine or prevents the engine starting.

7.4.2.2 Open

This function causes the door to move in the OPEN direction to the defined position when activated. This function could also be operated by a timer, loop detector or similar electronics that keep the door open when a continuous signal is given.

7.4.2.3 Close

This function causes the door to move in the CLOSE direction to the defined position when activated. This contact could also be operated by a timer, loop detector or similar electronics that hold the door closed when a continuous signal is received.

7.4.2.4 Part-Open

Activating this input „PARTIAL OPEN function“ leads to the following actions of the door:

- If the door is in the OPEN or PARTIALLY OPEN position, there is no action.
- If the door is in any other position, the control unit attempts to to the PART OPEN position if it is not prevented from doing so by other command devices or sensors.
- If the door is already moving to the OPEN position, it does not stop at the PARTIALLY OPEN position and does not move back there either.
- If the door moves to the CLOSED position, the control unit attempts to to the OPEN position instead if it is not prevented from doing so by other command devices or sensors.

7.4.2.5 Toggle

The „Toggle“ function can be used to connect a push-button that generates OPEN, STOP, CLOSE, STOP movement commands via a toggle pulse. Each time the button is pressed, either motor operation is started or ongoing operation is interrupted by a stop command. The new direction of travel is always opposite to the last one. This function is only supported in automatic mode.

7.4.2.6 Emergency stop

Every door movement is stopped immediately when the emergency stop function is triggered. The motor is prevented from being activated again until the function is reset. The control unit then switches to emergency stop mode.

Note
Only latching NC contacts are permitted as command devices for this function.

7.4.2.7 Fire open

Activating this function immediately results in a change to the emergency operating mode and a movement in the up direction as described in 3.3.5.

7.4.2.8 Fire close

Activating this function immediately results in a change to the emergency operating mode and travel in the closed direction as described in 3.3.5.

7.4.2.9 Deactivate timer

Activating this function deactivates all set inlet times.

7.4.2.10 Deactivate calendar

Activating this function deactivates all set calendar functions.

7.4.2.11 Deactivate radio

Activating this function deactivates operation via radio remote control.

7.4.2.12 Full reversing

If this function is activated during door closing, the door is abruptly decelerated and moves back to the start position. If the door was started from a partial open position, it will only return to that partial open position.
If the door is automatically commanded to close again after a reversal (e.g., by a run-on timer) and reverses once more, this sequence will repeat three times. After that, the timers are disabled, and the door must be reactivated manually (e.g., via a toggle command).
When selecting "Full Reverse Soft", the function remains the same, but gentler ramps are used. This can be useful, for example, with contactless safety devices to protect the door's mechanics.

DANGER!
If the „soft" function used, care must taken to ensure that the maximum forces still maintained.

7.4.2.13 Part reverse

If this function is activated while the door is opening, the door will be abruptly decelerated and then reverse by the distance configured under 01.01.05.
If the door is automatically commanded to close again after a reversal (e.g. by an approach timer) and reverses once more, this process will be repeated up to three times. After the third reversal, all timers will be deactivated, and the door must be reactivated manually (e.g. via a toggle command).
When "Full Reverse Soft" is selected, the function remains the same, but smoother acceleration and deceleration ramps are used.
This can be beneficial when using contactless safety devices, to reduce mechanical stress on the door.

DANGER!
If the „soft" function used, care must taken to ensure that the maximum forces still maintained.

7.4.2.14 Limit switch open/close

If an input is assigned to this function, the following functionality is enabled:

- At the start of a travel with activated limit switch, the limit switch must released within 10% of the issued travel distance. Otherwise the door will stop immediately with an error message and must be restarted by the operator.
- If the limit switch not yet been reached at the end of a travel with an activated limit switch, an attempt is made to reach it in a slow search travel. As with exiting, the limit switch must be reached within 10% of the travel distance.
- If a limit switch is activated during travel, the door stops immediately and references the corresponding open or closed position.

7.4.3 Description of the target selection

The target selection determines for which door leaf the input is valid.

Master: The function only affects the master leaf.
Slave: The function only affects the slave leaf
Both: The function affects both leafs

7.4.4 Description of the priority levels

The priority level determines the operating modes in which an input is taken into account. Example: A connected switch with priority 1 can start a reference movement, but cannot perform a dead man's movement.
The levels build on each other; a higher level always has all the authorizations of the levels below it.
Level 0: Automatic
Level 1: Level 0+ Reference run
Level 2: Level 1+ Emergency+ Commissioning
Level 3: Level 2+ Deadman
Level 4: Level 3+ Emergency stop
Level 5: Level 4+ Error

7.4.5 Description of the switching behavior

NC = 24V signal applied (e.g. normally open contact of a push-button)
NO = 0V signal applied (e.g. normally closed contact of a pushbutton)

7.4.6 Description of the test

For safety-related functions (e.g. emergency stop), testing is required.
Tested inputs must be configured and wired as normally closed (NC).
„Untested": The input is not tested and must not be connected to the test output.
„Tested": The input is tested by switching the test output to 0 V before each run or every 7 minutes. The signal at the input must also switch to 0 V within a defined time.
After that, the test output is switched back to 24 V, and the input must also return to 24 V within a defined time. If either time is exceeded, the input is set to a fault state, which may prevent an unsafe movement.
The time limits are factory-set and can only be changed by the manufacturer.

7.4.7 Configuration of a generic input

After selecting one of the menu items, the operator is guided through the setting step by step. Depending on the setting of the previous step, the limits of the selection are set or, if necessary, defined directly without user intervention.

1. Selecting the function
Selection of the function that is triggered by the input when activated (see 7.4.1+ 7.4.2).

2. Selection valid for which leaf (only if master-slave configuration)
Selection of whether the input applies to the master, the slave or both leafs.

3. Selection of authorization
Selection of the operating modes in which actuation of the input is taken into account (see 7.4.4).

4. Selection of the switching behavior
Selection of the signal status when the signal transmitter is activated (see 7.4.5).

5. Selection of the test
Select whether the input should be checked regularly for function (see 7.4.6).

7.4.8 Configuration of a safety contact edge

With the safety contact edge, the SKL type is queried before the setting is made.
The selection options are
„Deactivated“ no SKL connected, is not observed
„8k2“ an 8k2-SKL connected, 8k2 evaluation activated
„OSE“ an OSE-SKL is connected, OSE evaluation activated (only input „SKL Close“)
Then the procedure is the same as for the generic inputs, but only steps 1 and 2.

7.5 Output configuration

7.5.1 List of output functions

0. No function
1. Gate open
2. Gate part-open
3. Gate closed
4. Gate undefined
5. Gate opens
6. Gate closes
7. Gate moves
8. Prewarning
9. Service
10. Courtyard light
11. Ready
12. Open pulse (1 sec.)
13. Close pulse (1 sec.)
14. Simple traffic light
15. Traffic light on/off
16. SKL active

7.5.2 Description of the output functions

7.5.2.1 No function

This function can be assigned to unused inputs in order to minimize unnecessary switching of the relay and thus wear.

7.5.2.2 Gate open

An output to which this function has been assigned is activated when the door is in the open position and not controlled

7.5.2.3 Gate part-open

An output to which this function has been assigned is switched off when it is in the partially open position. Activated when the door is closed and not activated.

7.5.2.4 Gate closed

An output to which this function has been assigned is activated when an output is in the closed position. and non-activated gate activated.

7.5.2.5 Gate undefined

An output to which this function has been assigned is activated if the door not in a defined position and is not controlled.

7.5.2.6 Gate opens

An output to which this function has been assigned is activated when a door opens.

7.5.2.7 Gate closes

An output to which this function has been assigned is activated when the door closes.

7.5.2.8 Gate moves

An output to which this function has been assigned is activated when the door is moving.

7.5.2.9 Prewarning

An output to which this function has been assigned is activated a set time before the movement and during the movement. This function is intended for a flashing light as a warning, for example. The pre-warning times are described in 7.3.2.

7.5.2.10 Service

An output to which this function has been assigned signals a necessary service of the door (time or cycle controlled).
The values for triggering are defined in the pre-parameterization.

7.5.2.11 Court light

An output to which this function has been assigned is activated during a movement and for a set time after the end of the movement.

7.5.2.12 Ready

An output to which this function has been assigned is activated when the control unit is in the is ready for operation (one trip is possible).

7.5.2.13 Open pulse(1 Sec.)

An output to which this function has been assigned is activated for 1 second when the door has reached the open position.

7.5.2.14 Close pulse (1 Sec.)

An output to which this function has been assigned is activated for 1 second when the door has reached the closed position.

7.5.2.15 Simple traffic light

A simple traffic light can be implemented with a changeover relay output. The relay is always activated when the traffic light should be green.
The traffic light is switched to green when the door is fully open and no movement has been requested.

7.5.2.16 Traffic light on/off

The supply to a traffic light is switched on by a simple NO contact output that has this function. This allows a time-delayed switch-off for energy saving to be implemented via the „Traffic light energy-saving time“ setting.

7.5.2.17 SKL-Active

This function signals on an output that at least one safety contact strip is actuated.

7.5.3 Configuration of an output

After selecting the corresponding output, the desired function can be selected.

7.6 Electromechanical brake

If an additional electromechanical brake needs to be released, an optional relay can be plugged into the frequency converters. This relay is activated during every journey and serves this specific purpose. The release of the brake is not monitored by the control system. Because an inductive load is switched each time the brake is applied, this relay can gradually wear out, which is why it is designed as a plug-in version.

Warning!
No motor movement is stopped with this brake. The connectable brake is only a convenience function and not part of the safety function.

7.7 Connection of double-leaf gates

Two gates running synchronously against each other can be controlled using two controllers connected via CAN. One of the two controllers acts as the “master” and the other (called the “slave”) strictly follows its instructions. The safety sensors are also only reported by the slave and evaluated by the master. If a response is necessary, it is initiated by the master.
Command generators can be connected to both the master and slave controllers. The master evaluates whether a movement command for one or both gate wings is required.
To ensure that the components are addressed correctly by the software, the respective DIP switches must be set correctly.

Danger!
The DIP switches “Board ID” on the power board may only be switched when the power is off and after waiting for the voltage to drop. Otherwise, there is a risk of electric shock

8 Maintenance instructions

According to the workplace directive, the door system should be maintained and checked at least once a year. In addition to the functional test of the door control unit, the electrical wiring on the door control unit and on the door system must also be checked for damage and correct connection. Particular attention must be paid to the wiring and correct connection of the door control unit to ensure protection against accidental contact.
PE connections must be observed.

Warning!
PE must be connected to the motor and to the external components supplied with 230 V. For protection against accidental contact, it must be ensured that the connecting cables have a PE connection to the terminals on the door control unit.

8.1 Cycle Counter

As soon as the cycle counter reaches a threshold (default: 10,000 cycles), a maintenance request is issued. The remaining cycles until maintenance are visible in the menu. For this purpose, a relay can be used, for example, and a message can be displayed on the screen.

8.2 Maintenance interval

The general maintenance interval is time-based (default: 365 days). The next time-based maintenance can be viewed in the menu. Here too, a relay or the display can be used for signaling.

8.3 Reset maintenance request

After maintenance has been carried out, the maintenance request must be reset in the menu. The counter value of the maintenance performed is then increased by 1.

9 Fault diagnosis

9.1 Error display

The display lighting is the first indication of the door status. The lighting has the option of green and red illumination, which can also flash depending on the status.
Errors are proactively on the display. As soon as an error occurs, it is in the display as short plain text. If several faults have occurred, the most recent one is displayed. The display flashes red to indicate quickly and from a distance that an error has occurred.

Error indication via display backlighting

Red flashes	Error occured. Error code is shown in the display
Red on	Not ready to drive (e.g. emergency stop, safety stop)
Green flashes	Limited driving functionality (safety is triggered)

Each module also has a three-color status LED installed for each microcontroller. These an initial indication of the status of the program sequence. In the event of errors in the communication or e.g. the power supply, the status LEDs can also flash depending on their status.

Error display via status LED

LED off	Missing power supply; component defective
LED permanently on	Internal error, restart necessary, possibly hardware or software error
Rot flashes	Internal software error occurred
Flashing blue lasts too long	If the status is too long, the CAN termination configuration or CAN identification must be checked

Listing all the parameters would go beyond the scope of this document, as there well over 1500 entries. All adjustable parameters are accessed in the control system via the menu numbering, which always remains the same. In the main menu 05, a specific menu item can be accessed so that a setting be made even without navigating to this area. If a setting is protected by a password, this is then requested.
All errors are stored in the log system as plain text. If a text is missing, a number is displayed instead. The 5-digit numbers follow a system:
Numbers 1-2: Which microcontroller is reporting the error?
Numbers 3-5: Which error is present?

9.2 Error list

This list contains error texts and their meaning.

9.2.1 General

Display text	Meaning / Remedy
Internal error	Error in internal processing / restart control unit, recurring, contact manufacturer.
Runtime error	Program runtime exceeded. (serious exception error)
B.I.S.T. error	Error during controller self-test (serious exception error)
Parameter error	Failed to save or load parameters / restart the control unit / if this occurs repreatedly, contact the manufacturer.
Comm. error	Check communication errors / connections of the participants / restart the control unit / contact the manufacturer if this occurs repeatedly.
Overtemperature	Switch off the controller/control unit and allow to cool down.

9.2.2 CPU

Display text	Meaning / Remedy
SKL error	SKL participant reports error (PER error message is displayed)
PWR Master Error	PWR master reports error (error message of the PWR master is displayed)
PWR Slave Error	PWR slave reports error (error message of the PWR slave is displayed)
PER Master Error	PER Master reports error (error message of the PER Master is displayed)
PER Slave Error	PER slave reports error (error message of the PER slave is displayed)
Service module Error	Service module reports error (note service module display)
Pos Limit reached	Value range of the position exceeded
Frequency too high	Target frequency above parameterized limit / Check set frequency
Unknown device	CAN device could not be recognized / use only enabled devices
Pool pairs implausible	Pool pairs set to 0 / check motor parameters
Frequency par. Error	Parameterized frequency exceeds the permissible limits / Check parameterization
Force par. Error	Parameterized force exceeds the permissible limits / Check parameterization
Position par. Error	Parameterized target position exceeds the permissible limits / Check parameterization
Open position exceeded	Open position was clearly overrun
Close position exceeded	Close position was clearly exceeded
Engine not stoped	Motor did not stop within a pecified time / check forces, check mechanical installation
Movement error	unexpected or no movement detected
End not reached	Limit switch was not detected in the expected position window (target +10% of the opening width) / Check limit switch, check parameterization
Do not leave the end	Limit switch was not detected in the expected position window (target +10% of the opening width) / Check limit switch, check parameterization

9.2.3 PER

Display text	Meaning / Remedy
SKL error	General SKL error / check connection and parameterization
SKL open error	Check error of fixed SKL in open direction / SKL connection
SKL close error	Error of the fixed SKL in closing direction / Check SKL connection
ISK error	General ISK error / check connection and parameterization
ISK open error	Error of the traveling SKL in open direction / Check SKL connection
ISK close error	Check the error of the traveling SKL in the closing direction / SKL connection
Input error	A generic input reports an error (e.g. test failed) / Check wiring and parameterization

9.2.4 PWR

Display text	Meaning / Remedy
Input Overcurrent	Check overcurrent in the input path of the controller / force parameter
DC link error	DC link voltage faulty (e.g. in the event of mains failure or insufficient mains power) / Check mains connection
DC link max	DC link voltage too high (e.g. regeneration due to motor braking) / Lower ramps or install brake chopper
Motor temp	Motor thermal switch has tripped / have motor cooled down, check wiring if necessary
Output stage temp	Allow output stage / control unit to cool down, then restart, check control unit overload
Power card temp	Allow the power card / control unit to cool down, check overload of the control unit
Encoder error	Too many or implausible signals from the encoder / Check encoder
Encoder removed	Connection to plug-in encoder module lost during operation/ Defect of the encoder module possible, if necessary have it replaced by qualified personnel
Output stage fault	Power amplifier fault (e.g. short circuit at output) / check wiring, check motor
Overcurrent output	Check overcurrent at the output / force settings, check mechanical structure (e.g. stiffness of the door)

9.3 Version display

The software versions of all microcontrollers can be displayed in the menu. All controllers in the system are listed there, not just those on the corresponding circuit board.

9.4 Status display

A user can quickly recognize the status of the door via the overview screen and the status LED. The first glance at the flashing display indicates whether normal operation or a fault is present. Various data is then displayed on the overview pages. The page contains:

- The current operating mode
- The current door status (position, whether it is moving, etc.)
- Status message of the door, e.g: (if active) error messages, triggered SKL
- Date and time, as well as a „CAL“ message if an active calendar command is pending.

9.5 Fault signal via relay output

The control unit can switch on a relay in the event of some recognizable faults in the door or the control unit itself in order to indicate the fault or the incorrect operating status in an easily recognizable manner by means of a signal light or a higher-level control unit. More detailed information can then be read on the control unit display.
It is possible to set up such a fault display on any relay. The respective output configuration of the relays. (See 7.5)

9.6 System log

The system logbook is a ring buffer with a maximum of 256 entries. Relevant program events are stored here in the memory with a name and a time stamp and are still available after a restart or power failure. The time entered refers to the internal real-time clock. If this is set correctly, the information in the system log is also correct. Independent the entries are in chronological order. This log can be used to trace the last actions of the door and any errors that may have occurred.
The log can be viewed in the menu. The output is as follows:

Line 1: Error or info entry, reporting controller, error number
Line 2: Descriptive text of the entry (here motor overtemperature)
Line 3: additional environmental data of the entry (e.g. overcurrent in mA)
Line 4: Date and time of the message

Use the „Up“ and „Down“ buttons scroll through the entries. Press „Enter“ to exit the display.

Line 1:
An error entry is indicated by „ERR“ and an info entry by „LOG“.

Line 2:
The error text is here in the selected language. Relevant messages for the user are listed below.

Line 3:
The value in this line provides further information about the error. A description of this information for userrelevant errors is listed below.

Line 4:
This shows the date and time at which the entry was reported.

10 Decommissioning and disposal

The products manufactured by ASO are intended exclusively for commercial use (B2B). After use, the products must be disposed of in accordance with all local, regional and national regulations. ASO will also gladly take back the products and dispose of them properly.
The control unit is equipped with a CR 2032 battery. According to the German Battery Act, every consumer is legally obliged to return all used batteries. Disposal with household waste is prohibited. Old batteries and rechargeable batteries can be disposed of free of charge at the public collection points of the municipality and wherever batteries and rechargeable batteries are sold. You can also return batteries purchased from us after use. In doing so, you are making a significant contribution to environmental protection!

11 Accessories and spare parts

Article number	Product
1415-0230	DRICO slife brake chopper
1415-0220	Brake rely set (Relay+SKEDD terminal 3 pole)
1415-0210	Brake rely set (Relay+SKEDD terminal 5 pole)
1414-0201	Rotary encoder adapter board (Ink)
1414-0211	Rotary encoder adapter board (Abs)
1402-1620	Radio receiver RX-8MR50FM++

Notizen

12 Technical data

12.1 Technical data FU

Electrical values

Power supply	1 phase 230VAC, N, PE, 50Hz
Fuse protection on site	max. 16 A (Low power class: 1414-0090) max. 16 A (High power class: 1414-0100
Fuses in the device (on the power board)	Fuse 5x20 mm, 6.3 A slow-blow (Connection 13, AC IN) Fuse 5x20 mm, 6.3 A fast-blow (Connection 14, AC OUT)
Power consumption (without motor and external consumers)	max. 16W
Appliance class	II
External supply for external 230VAC devices	230VAC ± 10%, 50Hz Protected by fuse in the device
External supply for external 24VDC devices	24VDC (±10 %) max. 1500mA (protected with self-resetting semiconductor fuse)
Control inputs	24VDC / typically 1mA < 8V: inactive -> logical 0 > 18V: active -> logical 1
Relay outputs	max. 250VAC / 5A
Maximum motor current	4A continuous, 10A short-time (1414-0090) 10A continuous, 20A short-time (1414-0100)
Output frequency at the motor	2Hz to max. 100Hz
Maximum permissible motor cable length	30m

If inductive loads are switched (e.g. additional relays or brakes), these must be fitted with a flyback diode as a suppression measure.

Mechanical values

Housing material	PC Plastic
Dimensions W x H x D	170 x 270 x 120mm
Weight	Approx. 2,5kg
Degree of protection	IP54
Temperature range	-20 °C to +55 °C
Humidity range	max. 99 % non-condensing

Security characteristics

DRICO slife Article number 1414-0530 Article number 1414-0540 Article number 1414-0570 Article number 1414-0580	EN ISO 13849-1:2015 Category 2 PL d MTTFD 252 years, DC 82,16%, PFHD 5,28E-07 1/h

Appliance class II (double insulated)

EC Type No.: 44 205 13031838

TÜVNORD
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Baumuster geprüft
tuev-nord.de

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DRICO®
slife

ENGLISH

DOC0001644 Operating instructions Rev 02
Subject to technical changes.
No liability can be accepted for errors and misprints.

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