



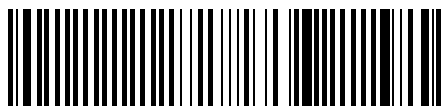
# Installation-/ Operating instructions

## Door control TS 971-Ex

for use in ATEX; zone 1 & 2 / zone 21 & 22

Part no.: 20003679

Version: 51171729\_00002



0000000 0000 51171729 00002



-en-

Version: a / 05.2017



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## 1. General note

„The enclosed BARTEC instruction booklet has to be considered before installation and start-up of the control panel!

These instructions have to be disposable during the complete lifetime of the product!

These instructions are assigned to the control panel via the serial number and can not be used (completely or in extracts) for any other control panel of the same or a similar type!

Please contact BARTEC, if the instruction booklet is missing.”

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## 2. 1. Safety instructions

### Fundamental Points

The control is suitable for door drives in hazardous (potentially explosive) areas. The control itself may be used in hazardous areas in zone 1 or 2 and zone 21 or 22. It was built in accordance with the valid standards, it was tested and it left the factory in a perfect condition in terms of meeting safety requirements. To ensure that this product operates perfectly and safely, the user must heed all the instructions and warnings contained in these operating instructions.

Any work relating to assembly, commissioning, maintenance and repairs may only be done by qualified specialists. As a basic rule, only electricians may work on electrical systems. They must be able to evaluate the work assigned to them, recognise possible sources of danger and be capable of taking suitable safety measures.

As a fundamental principle, the control may not be converted or modified in any way that might impair the protection against explosion. If conversions or modifications are necessary, they are only permitted after prior consultation with the manufacturer. In the interest of safety, only original spare parts and accessories authorised by the manufacturer should be used. No liability will be assumed if other parts are used.

The operating safety of the supplied control is only ensured if used for the intended purpose. On no account may the limit values specified in the technical data be exceeded (see the corresponding sections in the operating instructions).

The control may only be operated if it is clean and not damaged in any way. Damage can cancel the protection against explosion. Incorrect or impermissible use and non-compliance with the warnings in these operating instructions will cancel any warranty on our part.

### Regulations important for safety

When installing, commissioning, doing maintenance work and conducting inspections, the safety and accident prevention rules applicable to the specific application must be observed.

The following must be observed when setting up and operating:

- Regulations for power-operated doors
- Specific standards for hazardous areas in conformance to EC Directive 2014/34/EU
- National regulations and accident prevention regulations in the country of use!
- National installation and assembly regulations (e.g. EN 60079-14)
- Generally recognised technical regulations
- Safety guidelines in these operating instructions
- Plant-specific regulations and requirements
- Pertaining operating instructions
- Characteristic values and rated operating conditions on the type and data labels
- Additional warning labels on the device

### Explanations of the Danger Warnings

These operating instructions contain warnings that are important for operating the door control correctly and safely. It is essential that you heed these warnings during installation and operation.

The individual warnings have the following meanings



#### **DANGER**

This means that there is a risk to the life and the health of the user unless the relevant precautionary measures are taken.



#### **CAUTION**

This is a warning about the possibility of damage to the door control or other objects if the relevant precautionary measures are not taken.

### General Danger Warnings and Safety Measures

The following danger warnings are to be understood as general guidelines for handling door control in conjunction with other devices. It is essential that you heed these warnings during installation and operation.

### 3. Technical data

Identification mark of the control		BARTEC C-ASSEMBLY / 07-4C60-0761/0001 BARTEC C-ASSEMBLY / 07-4C60-0761/0002
Area where used (Ex Zone)		Zone 1, 2 (Gas) and zone 21, 22 (Dust)
Type of protection (gas)		⊕ II 2(1)G Ex de [ia Ga] IIC T6 Gb
Type of protection (dust)		⊕ II 2(1)D Ex tb [ia Da] IIIC T85° Db
ATEX EC type examination certificates		DEKRA 13ATEX0209
Dimensions of the enclosure combination	mm	338 x 571 x 232 (W x H x D)
Enclosure threaded cover, with window	mm	M 250 x 3, Ø 195
Assembly	mm	Mounting strips on the enclosure, 308 x 270 (W x H)
Operating voltage (mains/motor voltage) (+/- 10%)	V	3 x 230 3 x 400 AC
Max. permissible backup fuse	A	3x 10 (slow)
Control voltage internal	V	24V DC
External mains supply: (internal electronic protection)	V DC	24
	A	0,35
External mains supply: X1/L, X1/N (protection via F1 micro-fuse)		1 N~230 V
	A	1,6
Motor protecting switch (setting range)		0,37kW = 1,0 A - 1,6 A 1,10kW = 1,6 A - 2,5 A
Frequency	Hz	50
Degree of protection	IP	65
Ex-specific associated equipment		Safety barrier 9001/01-280-085-101 Safety barrier 9001/01-252-060-141 Switch device GM D1030D
Ex marking - Zener barriers  - Switch device		⊕ II 3(1)G [Ex ia Ga] IIC T4 Gc ⊕ II (1)D [Ex ia Da] IIIC ⊕ II (1)G [Ex ia Ga] IIC ⊕ II (1)D [Ex ia Da] IIIC
Permissible ambient temperature	°C	-5/+40
Air humidity		up to 80 % non-condensing
Relay contact		When switching inductive loads, freewheeling diodes and appropriate interference suppression measures must be used
Weight	kg	19

## 4. Components

### 4.1 Motor protection switch

Motors for use in potentially explosive atmospheres (Ex) require protection against overload and short circuit. Overload protection is provided by a built-in motor protection switch (Q2). The motor protection switch is suitable for Ex-d/Ex-de and Ex-e motors. The protection is current-dependent and becomes effective when the motor is blocked. Only manual reset is permissible. The setting value of the overload device must correspond to the rated motor current. For Ex-e motors, it must be ensured that the motor is disconnected from the mains within the warming period  $t_E$ . The actual tripping time  $t_A$  at relative operating current  $I_A / I_N$  must be determined using the tripping characteristic of the motor protection switch. It must be ensured that  $t_A < t_E$  is given.

### 4.2 Zener barriers

Zener barriers of series 9001 are used as isolation stages without galvanic separation between intrinsically safe and non- intrinsically safe current circuits. Zener barriers protect current circuits (such as conductors and equipment) installed in explosive atmospheres. As they also contain non-intrinsically safe current circuits, Zener barriers must be installed outside the explosive zone. Zener barriers represent **associated equipment**.

### 4.3 Safety edge system

The Zener barrier N1 is an associated device without galvanic isolation. This barrier is suitable for zones 1, 2 (gas) as well as 21, 22 (dust) and may be used in combination with an electric safety edge as a safety edge system. The safety edge is connected directly to the Zener barrier. For example, the rubber profile "Contact-Duo" by GELBAU can be used as safety edge. The design of the rubber profile must be suitable for Ex atmospheres. The safety edge must be equipped with an end of line resistor of 8k2 ohms. The power dissipation of the resistor must be observed (a resistance of 1W corresponds temperature class T4).

Ex-factory, a resistor R1 of 8k2 Ohm is connected to terminals 3-4. This resistor is for test purposes only and must be removed after commissioning.

Technical data of the Zener barrier:

Manufacturer:	R. Stahl Schaltgeräte GmbH, Waldenburg
Type:	9001/01-280-085-101
Certification:	PTB 01 ATEX 2088 X
Explosion protection:	$\text{Ex}$ II 3(1)GnA [Ex ia Ga] IIC T4 Gc $\text{Ex}$ II (1)D [Ex ia Da] IIIC
$U_0, I_0, P_0$ :	28V, 85mA, 595mW
$L_0$ :	2.4mH (IIC) / 16mH (IIB)
$C_0$ :	0.083 $\mu$ F (IIC) / 0.65 $\mu$ F (IIB)

## 4.4 Pass-door / slack-rope switch

The Zener barrier N2 is an associated device without galvanic isolation. This barrier is suitable for zones 1, 2 (gas) as well as 21, 22 (dust) and serves to evaluate a switch contact (pass-door / slack-rope switch). Multiple contacts must be connected in series.

Technical data of the Zener barrier:

Manufacturer:	R. Stahl Schaltgeräte GmbH, Waldenburg
Type:	9001/01-252-060-141
Certification:	PTB 01 ATEX 2088 X
Explosion protection:	⊕ II 3(1)GnA [Ex ia Ga] IIC T4 Gc ⊕ II (1)D [Ex ia Da] IIIC
$U_0, I_0, P_0$ :	25.2V; 60mA; 378mW
$L_0$ :	6.2mH (IIC) / 25mH (IIB)
$C_0$ :	0.107 $\mu$ F (IIC) / 0.82 $\mu$ F (IIB)

## 4.5 Switch device

The 2-channel switch device A2 serves as an interface between signals from the explosive atmosphere and the non-explosive atmosphere. Due to the galvanic isolation, no connection to the potential equalisation is required. **The switch device is considered an associated device.** LEDs (power: green, status: yellow, error: red) signal operational readiness and output status. Any photocell built and tested according to NAMUR standard with Ex approval may be connected to the switch device.

In principle, the photocells are approved zones 1 and 21. The photocell must be connected unblinking.

Technical data:

Manufacturer:	G. M. International
Type:	GM D1030D
Certification:	DMT 01 ATEX E042 X
Explosion protection:	⊕ II (1)G [Ex ia] IIC ⊕ II (1)D [Ex iaD]
$U_0, I_0, P_0$ :	10.7V, 15mA, 39mW
$L_0$ :	172mH (IIC) / 689mH (IIB) / 1379mH (IIA) / 689mH (iaD)
$C_0$ :	2.23 $\mu$ F (IIC) / 15.6 $\mu$ F (IIB) / 69 $\mu$ F (IIA) / 15.6 $\mu$ F (iaD)
Auxiliary power:	at 24VDC, 75mA (1.8W)
Input level:	ON I > 2.1mA    OFF I < 1.2mA

## 4.6 Pushbuttons in the Ex e Junction Box

The pushbuttons are used as a command point in the door area and serve at the same time for selecting and setting the parameters for the TS 971 door control.



## 5. Installation

Before installation, the door control must be checked for transport or other damage. The base for attaching the door control must be level and free of vibrations. The door control must be easily accessible and be installed between 0.6 m and 1.7 m above the floor. Installation is only permissible in vertical mounting position. Ensure that no foreign bodies (such as drilling chips) enter the housing.

Opening and closing of enclosures:

- Do not open while energized or in presence of explosive atmosphere
- Note additional safety instructions on the equipment
- Open lid and drop
- The closing is the same in reverse order

The owner-operator of a plant is obliged to set up workplace rules. These workplace rules for workplaces at risk because of potentially explosive atmospheres should in particular make clear where there is a risk of explosion, which mobile work equipment may be used and if the circumstances necessitate special personal protection (e.g. conductive work shoes, safety goggles, breathing masks). Work permits with details of the required measures before starting work and during work must be agreed on.



### DANGER

- The threaded cover may **ONLY** be opened if either the control is de-energised or it is ensured by means of a gas monitor that the atmosphere is not potentially explosive

### 5.1 Mains supply

The door control is intended for three-phase drives with a mains voltage of 3 ~ 230 V and 3 ~ 400 V. The mains connection point must be protected with the specified backup fuse. Use copper cables with the appropriate cross-section to avoid excessive voltage drop during start-up and during operation. The motor voltage must be within a limit of +/- 10%. The outer diameter of the cable must correspond to the cable gland's diameter.

### 5.2 Motor connection

Choose the size of mains cables according to DIN VDE 0298. When using motors with integrated brake, two separate lines are required. Cable entries and cable diameters are specified in the installation instructions of the drive unit.

### 5.3 Other connections

- Limit switch at drive unit
- Control device in door area
- Ceiling pull switch (optional)
- A latching switch to release the automatic closing mechanism (optional)

The connection terminals are located in control circuits with 24 V DC.



#### DANGER

- Installed devices within the Ex zone must be flameproof and have an Ex approval.



#### CAUTION

- ▶ Door operating mode "hold-to-run":  
Ensure unobstructed view from the place of operation to the door.

### 5.4 Proof of intrinsic safety

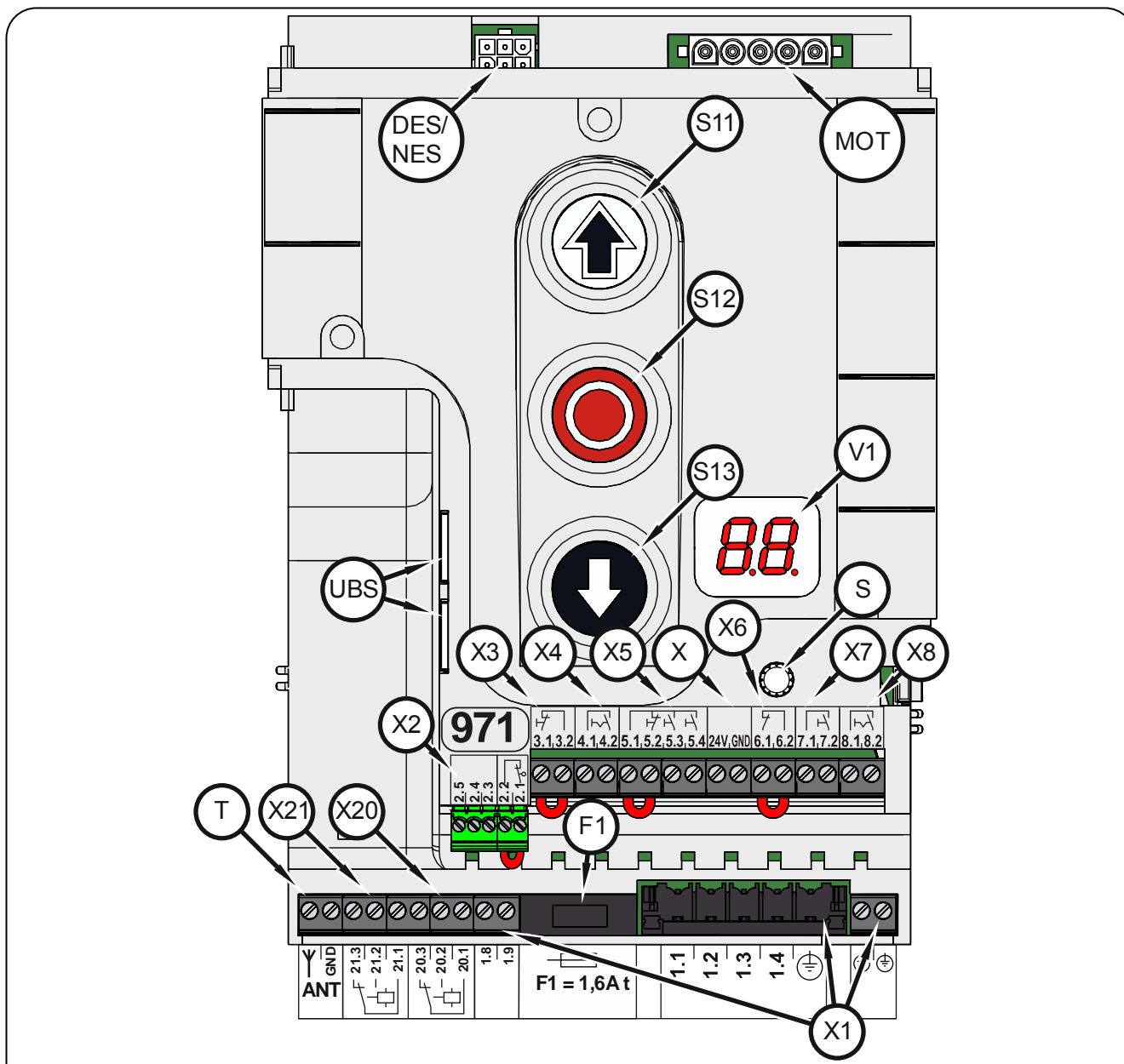
Intrinsically safe current circuits are:

- Safety edge with resistor of 8k2 Ohm, spiral cable and connection cable
- Pass-door and slack-rope switch with connection cable
- Photo cell with connection cable

The erection regulations DIN EN 60079-14 [1] require a proof of intrinsic safety for intrinsically safe current circuits. For technical data of equipment N1, N2 and A2, please refer to the technical data sheets by the manufacturers.

## 6. Description door control TS 971

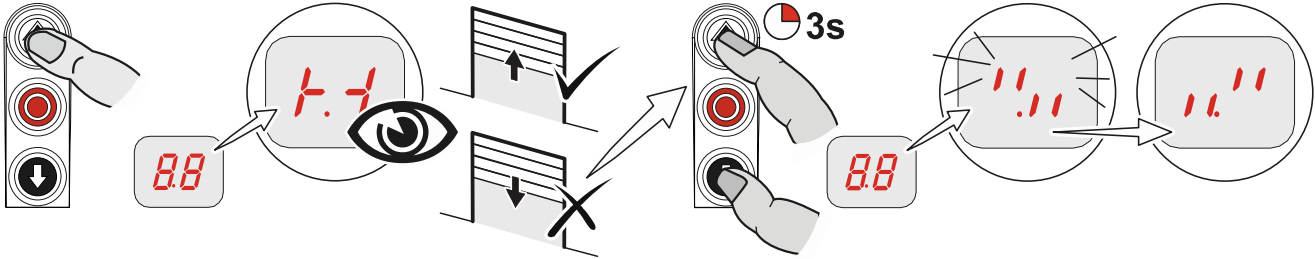
### 6.1 Overview of control



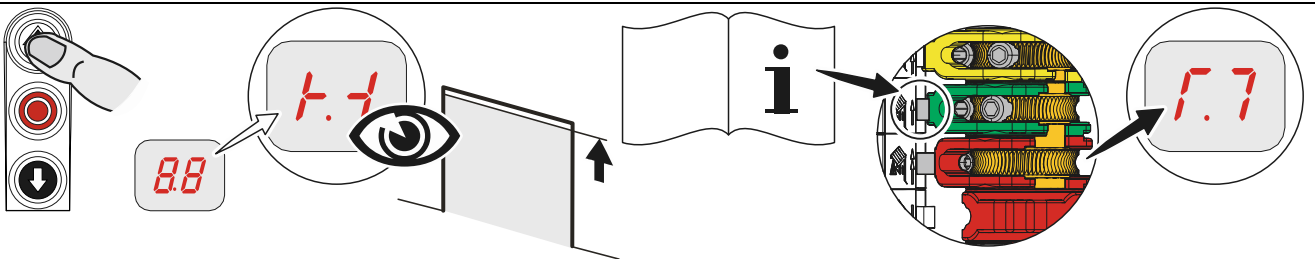
<b>DES/ NES</b>	DES or NES limit switch socket	<b>X</b>	24 V mains supply, external devices
<b>F1</b>	Micro-fuse 1.6 A time-lag	<b>X1</b>	Mains supply
<b>MOT</b>	Motor socket	<b>X2</b>	Safety edge and door safety switch
<b>S</b>	Selector switch	<b>X3</b>	Emergency STOP control device
<b>S11</b>	OPEN push-button	<b>X4</b>	Automatic closing On/Off
<b>S12</b>	STOP push-button	<b>X5</b>	Control device, external three push-button
<b>S13</b>	CLOSE push-button	<b>X6</b>	Through / reflective photo cell
<b>T</b>	Internal aerial, 434 MHz	<b>X7</b>	Pull switch, external radio receiver
<b>UBS</b>	Universal command sensor socket	<b>X8</b>	Intermediate open On/Off
<b>V1</b>	Display	<b>X20</b>	Potential-free relay contact 1
		<b>X21</b>	Potential-free relay contact 2

## 6.2 NES: Rapid adjustment of final limit positions

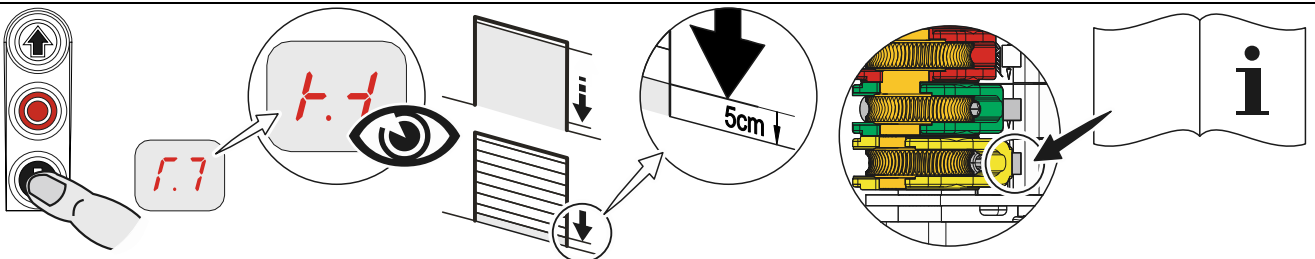
### 1. Check output rotating direction



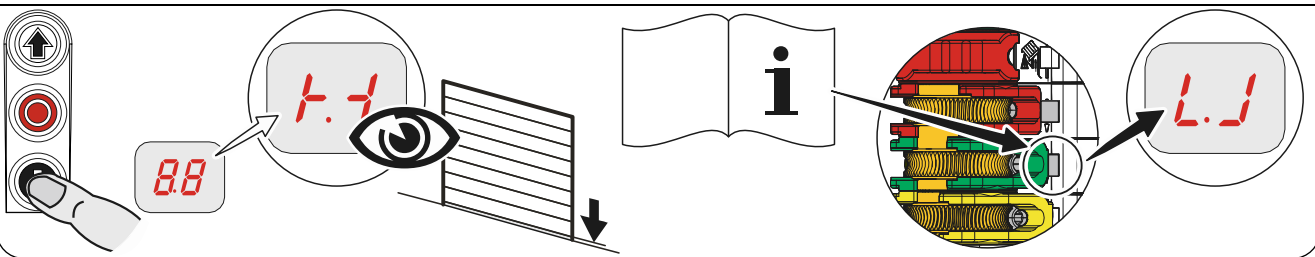
### 2. Move to OPEN final limit position and adjust S3 OPEN limit switch



### 3. Move to CLOSE final limit position 5cm above the ground and adjust S5 pre-limit switch



### 4. Move to CLOSE final limit position and adjust S4 CLOSE limit switch

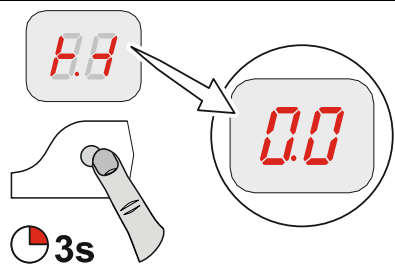


**Observe the installation instructions of the drive unit!**

- For adjusting the mechanical limit switch, see the drive unit installation instructions

## 7. Control programming

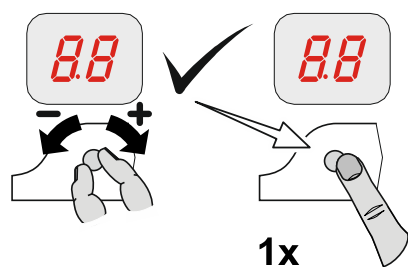
### 1. Start programming



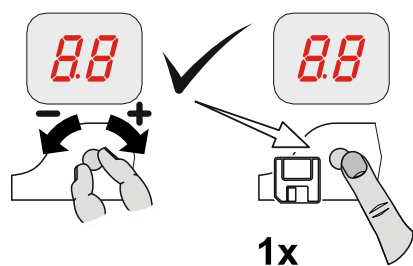
#### Note!

- Possible after rapid adjustment of final limit positions

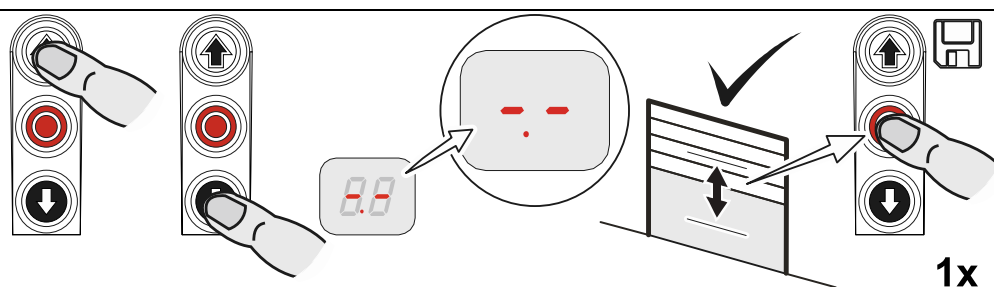
### 2. Select menu item and confirm



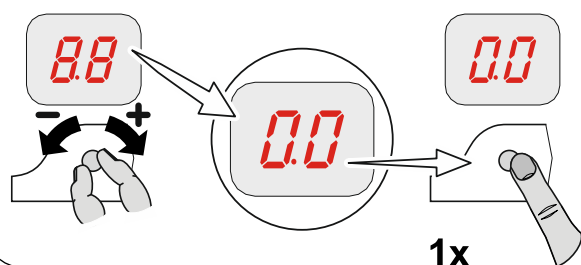
### 3.a) Set and store functions






















### 3.b) Set and store positions


















### 4. Exit programming



## 7.1 Table menu items

Door operating modes			
 1x 	<b>Door operating mode</b>		
		OPEN Hold-to-run CLOSE Hold-to-run	1x  
		OPEN Self-hold CLOSE Hold-to-run	
		OPEN Self-hold CLOSE Self-hold	
		OPEN Self-hold CLOSE Self-hold, CLOSE hold-to-run release via external X5 control device	
		OPEN Hold-to-run CLOSE Hold-to-run with active safety edge	
 1x 	<b>Output rotating direction</b>		
		Maintain output rotating direction	1x 
		Change output rotating direction	 3s

Door functions, Part 1			
 1x 	<b>Safety device</b>		
		Spiral cable	1x  
 1x 	<b>Safety edge function in the pre-limit area</b>		
		Safety edge active	1x  
		Safety edge inactive	

## Door functions, Part 2

<b>2.3</b>	 1x	<b>Automatic closing</b>	 	<b>00</b>			
	<b>00</b>		<b>2- 40</b>	0 to 240 seconds			
<b>2.4</b>	 1x	<b>Extended photo cell function</b>					
	<b>.0</b>	Off			 1x		
	<b>.1</b>	Cancel automatic closing and CLOSE command					
	<b>.2</b>	Vessel recognition Cancellation of automatic closing and CLOSE-command if photo cell activation duration > 1.5 seconds					
<b>2.5</b>	 1x	<b>Reversing</b>			 	<b>02</b>	
	<b>00</b>		<b>10</b>	0 = Off 1 to 10 safety-device activations			
<b>2.6</b>	 1x	<b>Pull switch or radio receiver function X7</b>					
	<b>.1</b>	Type of impuls 1 Door is in OPEN final limit position      CLOSE command Door is not at OPEN final limit position      OPEN command			 1x		
	<b>.2</b>	Type of impuls 2 Command sequence OPEN – STOP – CLOSE – STOP – OPEN					
	<b>.3</b>	Type of impuls 3 OPEN command only					

### Door functions, Part 3

		Relay function on X20		
2.7				
2.8	1x	Relay function on X21	X20	X21
	0	Off		
	1	Impuls contact* for 1 second		
	2	Permanent contact*		
	3	Red lamp, permanently lit during door movement OPEN final limit position      Flashing for 3 seconds CLOSE final limit position      Flashing for 3 seconds		
	4	Red lamp, permanently lit during door movement OPEN final limit position      Flashing for 3 seconds CLOSE final limit position      Off		
	5	Red lamp, permanently lit during door movement OPEN final limit position      Permanently lit for 3 seconds CLOSE final limit position      Permanently lit for 3 seconds		
	6	Red lamp, permanently lit during door movement OPEN final limit position      Permanently lit for 3 seconds CLOSE final limit position      Off		
	7	Dock leveller release or permanent green light Active only in OPEN final limit position		
	8	Permanent contact in CLOSE final limit position		
	10	Light sensing device 1-second pulse at each OPEN command		
	11	Permanent contact at door position*		
	12	Brake control Active during operation Inactive at stop		
	14	Light curtain test, etc. Test prior to each closing operation		

\*) Door positions respectively via the S6 auxiliary limit switch of the drive unit (NES).



## Door functions, Part 4

<b>2.9</b>	 1x	<b>Intermediate open function</b>				
		All command inputs			1x	
		Input X7.2 and internal radio receiver				
		Input X5.3 and OPEN push-button of control				

## Safety functions

<b>3.3</b>	 1x	<b>Travel time monitoring (NES)</b>						
				0 = Off 0 to 90 seconds		1x		
<b>3.4</b>	 1x	<b>Door safety switch function</b> (Input X2.2)						
		Slack-rope or pass-door switch			1x			
<b>3.5</b>	 1x	<b>Automatic opening</b> (Automatic closing menu item 2.3)						
				0 = Off 0 to 99 minutes		1x		
<b>3.8</b>	 1x	<b>Reversing duration adjustment</b>						
				[+] slower [-] faster		1x		

Maintenance cycle counter						
8.5 1x		Maintenance cycle preselection				0.0 
	0.0	0.1		9.9	01-99 corresponds to 1,000 to 99,000 cycles Cycles are counted down	1x 
8.6 1x		Reaction upon reaching "Zero"				
	.1	Status indication "CS" appears in turns with value set by menu item 8.5.			1x 	
	.2	Changeover to "Hold-to-run" door operating mode. Status indication "CS" appears in turns with value set by menu item 8.5.				
	.3	Changeover to "Hold-to-run" door operating mode. Status indication "CS" appears in turns with value set by menu item 8.5. Option: Press STOP-button for 3 seconds to deactivate changeover and status indications for 500 cycles.				
	.4	Status indication "CS" appears in turns with value set by menu item 8.5 and relay contact X21 switches.				

## Readout of Data memory

<b>9.1</b>	 1x	<b>Cycle counter</b> 7-digit number																	
	<table style="width: 100%; border: none;"> <tr> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">1.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">r.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">n.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">0.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">P.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">e.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">8.</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">HT</td> <td style="text-align: center;">ZT</td> <td style="text-align: center;">T</td> <td style="text-align: center;">H</td> <td style="text-align: center;">Z</td> <td style="text-align: center;">E</td> </tr> </table>	1.	r.	n.	0.	P.	e.	8.	M	HT	ZT	T	H	Z	E				
1.	r.	n.	0.	P.	e.	8.													
M	HT	ZT	T	H	Z	E													
	Displayed in division of ten consecutively <b>M</b> = 1,000,000 <b>ZT</b> = 10,000 <b>H</b> = 100 <b>E</b> = 1 <b>HT</b> = 100,000 <b>T</b> = 1,000 <b>Z</b> = 10																		
<b>9.2</b>	 1x	<b>Last faults</b>																	
	Display change of the last 6 faults																		
<b>9.3</b>	 1x	<b>Data counter</b> 7-digit number																	
	<table style="width: 100%; border: none;"> <tr> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">1.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">r.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">n.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">0.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">P.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">e.</td> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">8.</td> </tr> <tr> <td style="text-align: center;">M</td> <td style="text-align: center;">HT</td> <td style="text-align: center;">ZT</td> <td style="text-align: center;">T</td> <td style="text-align: center;">H</td> <td style="text-align: center;">Z</td> <td style="text-align: center;">E</td> </tr> </table>	1.	r.	n.	0.	P.	e.	8.	M	HT	ZT	T	H	Z	E				
1.	r.	n.	0.	P.	e.	8.													
M	HT	ZT	T	H	Z	E													
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	<table style="width: 100%; border: none;"> <tr> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">.1</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">.2</td> </tr> </table>	.1	.2	Cycle counter of the last change in programming  Number of activations of slack-rope, pass-door and crash switch		 1x													
.1																			
.2																			
<b>9.4</b>	 1x	<b>Software version</b>																	
	The software version of the control is displayed.																		

## Deleting / readout

<b>9.5</b>	 1x	<b>Deleting of all settings</b>					
	<table style="width: 100%; border: none;"> <tr> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">.0</td> </tr> <tr> <td style="border: 1px solid black; width: 20px; height: 20px; text-align: center; font-size: 12px;">.1</td> </tr> </table>	.0	.1	Activating GfA stick  All settings are set to factory setting! Except for cycle counter		 1x	 3s
.0							
.1							

## 8. Safety devices

### 8.1 X2: Input, safety edge system 8k2

The door control automatically detects different safety edges to protect the closing movement of the gate wing.



#### Note

- ▶ Connect safety edge systems in accordance with EN 12978!
- ▶ Check position of S5 pre-limit switch on the safety edge
- When the door is opened > 5cm, a reversing must be executed if the safety edge has been activated
- "Hold-to-run" door operating mode can always be used should the safety edge be defective

### 8.2 Pass Door / Slack Cable Switch

The pass door /slack cable switch is also evaluated in the TS 971. Motor door movement is no longer possible once this switch responds.

### 8.3 Light Barrier

A reflective or a one-way light barrier can be connected. The voltage is supplied to the light barrier by the switch amplifier A2. The light barrier must conform to the NAMUR standard and have Ex-approval. It must be operated in the "light mode", i.e. the isolating device contact is closed in operating readiness. If the light beam is interrupted, the contact opens and causes the following reaction:

Door position	Reaction caused by interruption in the light barrier
Closing end position	no effect
Opening	no effect
<b>End position Open *)</b> without automatic closing time	no effect
<b>End position Open *)</b> with automatic closing time	New start of the time when automatic closing time is set
<b>End position Open *)</b> with automatic closing time and time-out	When the light barrier is free, the door closes after 3 secs. irrespective of the remaining time of the automatic closing
Closing	Stop, re-opening to open end position*)










\*) or intermediate position when the S23 key switch (terminals X2/13-27) is switched on

If no light barrier is used, the R2 (1.2k) resistance, included in the scope of supply, must remain connected.

## 8.4 X3: Input, emergency stop

Connection of an emergency stop control device as per EN 13850 or an evaluation unit for an anti-trap safety device. The "F1.4" fault indication appears upon activation.





## 9. Status display

Faults		
	Display: "F" and code	
Code	Fault description	Fault causes and fault correction
	Terminals X2.1 – X2.2 are open. Slack-rope switch/Pass-door contact is open.	Check door safety switch. Check whether the connection cable is connected.
	Open safety circuit (DES) Emergency manual operation has been activated. Thermal protection of the motor has tripped	Check emergency manual operation. Check for overload or stalling of the drive unit.
	Terminals X3.1 – X3.2 are open. Emergency stop has been activated.	Check emergency stop. Check whether the connection cable is connected.
	No safety edge detected.	Check the wiring of the safety edge.
	Terminals X6.1 – X6.2 are open. Photo cell has been activated.	Check alignment of the photo cell. Check connection cable. Replace photo cell if necessary.
	Maximum number of reversing movements for door through safety edge system activation has been reached. (Only with automatic closing)	Obstacles along the door travel path. Check whether the safety edge system is correctly functioning.
	Activation of safety edge 8k2.	Check whether the safety edge system is correctly functioning. Check whether the connection cable has short-circuited.
	Safety edge 8k2 defective.	Check whether the safety edge system is correctly functioning. Check whether the connection cable is connected.





## Faults













F.	Display: "F" and code	
Code	Fault description	Fault causes and fault correction
3.1	(NES) OPEN or CLOSE emergency stop switch reached. Emergency manual operation has been activated. Thermal protection of the motor has tripped Limit switch system has changed over from NES to DES without the control being reset.	Check OPEN/CLOSE emergency stop switch. Check emergency manual operation. Check drive unit for overload or stalling. Reset of control via menu item "9.5".
3.4	(NES) Faulty activation of the "S5" pre-limit switch.	Check the "S5" pre-limit switch for correct functioning and setting.
3.5	No limit switch detected (active at initial operation).	Connect the limit switch to the control. Check the limit-switch connection cable.
3.7	Internal plausibility error.	Execute fault clearance trough movement command.
3.8	Internal control temperatur too high.	Switch of control and let it cool down.
5.0	Fault of the controller.	Switch control off and on. Replace control if necessary.
5.1	ROM error.	Switch control off and on. Replace control if necessary.
5.2	CPU error.	Switch control off and on. Replace control if necessary.
5.3	RAM error.	Switch control off and on. Replace control if necessary.
5.4	Internal fault of control.	Switch control off and on. Replace control if necessary.

### Commands

Commands	
	Display: "E" and code
Code	Command description
	An OPEN-command is present. Inputs X5.3, X7.2, internal radio system, UBS control device or UBS radio receiver
	A STOP command is present. Inputs X5.2, X7.2, internal radio system, UBS control device or UBS radio receiver or simultaneous OPEN and CLOSE commands
	A CLOSE command is present. Inputs X5.4, X7.2, internal radio system, UBS control device or UBS radio receiver













### Status indications










Status display	Description
	Preset value for maintenance cycle counter reached.
	Dot on left is not lit: control circuit has a short circuit or is overloaded.
	Function for changing the rotating direction is activated, only possible during initial operation.
	Change of rotating direction has been carried out, only possible during initial operation.

<b>Status indications</b>	
<b>Status display</b>	<b>Description</b>
 Flashing	Emergency operation is active or programming option is blocked.
 Flashing	Teach in OPEN final limit position.
 Flashing	Teach in CLOSE final limit position.
 Flashing	UPWARDS travel active.
 Flashing	CLOSING operation active.
 Flashing	Stop between the set final limit positions.
 Flashing	Stop at the OPEN final limit position.
 Flashing	Stop at the intermediate stop position.
 Flashing	Stop at the CLOSE final limit position.
 Flashing	Blocking of programming option confirmed. Flashing display: Unblocking of programming option active.
 Flashing	Interruption of the photo cell function: At first interruption of the light beam.
 Flashing	Interruption of the photo cell function: When exiting the programming.



## 10. Explanation of symbols

Symbol	Explanation
	Prompt: Read installation instructions
	Prompt: Check
	Prompt: Note
	Prompt: Note the setting of the menu item below
	Factory setting of the menu item
	Factory setting of the menu item, value on the right
	Factory setting of the minimum limit, dependent on drive unit
	Factory setting of the maximum limit, dependent on drive unit
	Setting range
	Prompt: Select menu item or value, turn selector switch to the left or to the right
 1x	Prompt: View menu item, press selector switch once
 1x	Prompt: Store, press selector switch once

Symbol	Explanation
	Prompt: Setting via OPEN/CLOSE built in push-button; Use OPEN push-button to increase value, CLOSE push-button to decrease value
 1x	Prompt: Press stop button once via built in push-button
 1x	Prompt: Save, press stop button once via built in push-button
 3s	Prompt: Save, press stop button for three seconds via built in push-button
 3s	Prompt: Reset the control, press stop button for three seconds via built in push-button
	Prompt: Move to door position
	Prompt: Move to door position for OPEN final limit position
	Prompt: Move to pre-limit
	Prompt: Move to door position for CLOSE final limit position

## 11. Commissioning

You need to check the following points before switching on:

- Correctly inserted lines
- Tightened seal plugs; sealed unused openings
- Connection space clean and free from foreign bodies (such as drilling chips)
- Connected wire-links or devices on terminals X2 / 11-12; X3 / 3.1-3.2 and N2 / 3-4



### CAUTION

- ▶ Delivery state of door control: Door operating mode "hold-to-run"  
(Programming point 0.1 set to .1)
- ▶ The desired door operating mode can be set after commissioning only

### 11.1 Switching On



### DANGER

- The mains voltage may only be switched on if it has been ensured that there is no risk of explosion.

## 12. Maintenance / annual inspection



### CAUTION

- ▶ Do not open electrical components that are under voltage.
- ▶ Only authorised and trained personnel may carry out maintenance and repairs.
- ▶ In case of defects with an impact on the explosion protection, the equipment must be taken out of operation until the deficiencies are remedied

The door control is maintenance-free. Maintenance is limited to the safety-relevant components of the door system located in the door area.

This includes the following components:

- Safety edge with spiral cable
- Photo cell (when present)
- Slack-rope / pass-door switch (when present)
- Control devices
- Connecting cables

The following requires checked during the annual inspection:

- Firm seating of all electrical connections and screw connections
- No damage to the gaskets
- Compliance with the permissible temperatures (according to EN 60079-0)
- No damage to the insulation of all cables
- No corrosion on metal parts and micro switches
- No damage to micro switches and control devices

## 13. Repairs

The door control may be repaired on site if no components of the explosion protection require replacement. Only complete components may be exchanged for original components.

GfA assumes no liability whatsoever for damage resulting from the use of non-original spare parts and accessories.

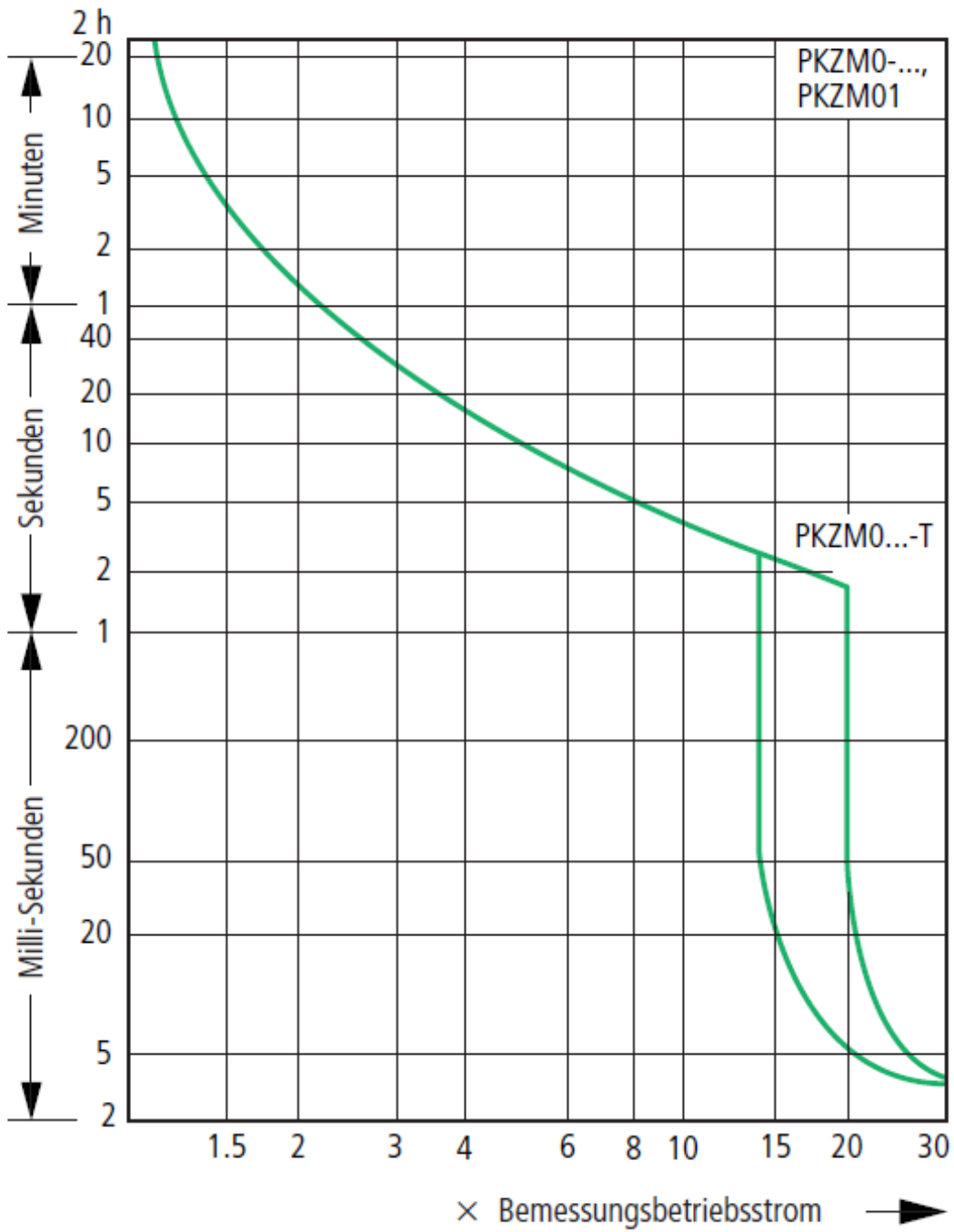
The manufacturer of the door or another specialist company must correct any faults that the user cannot eliminate.



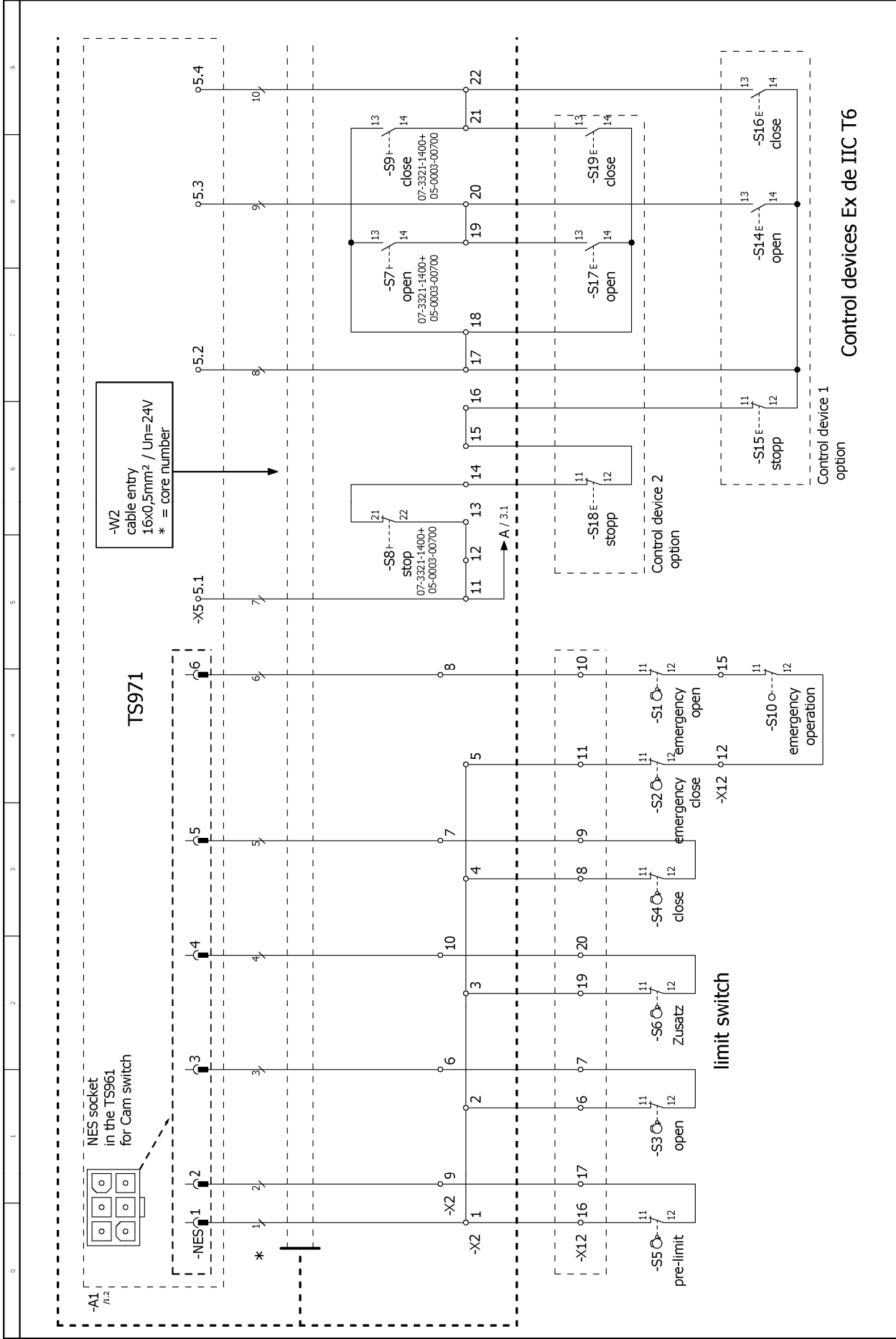
### CAUTION

- ▶ Modifications and alterations to the door control are not permitted.
- ▶ Do not open electrical components that are under voltage.

## 14. Characteristic curves of motor protection switches

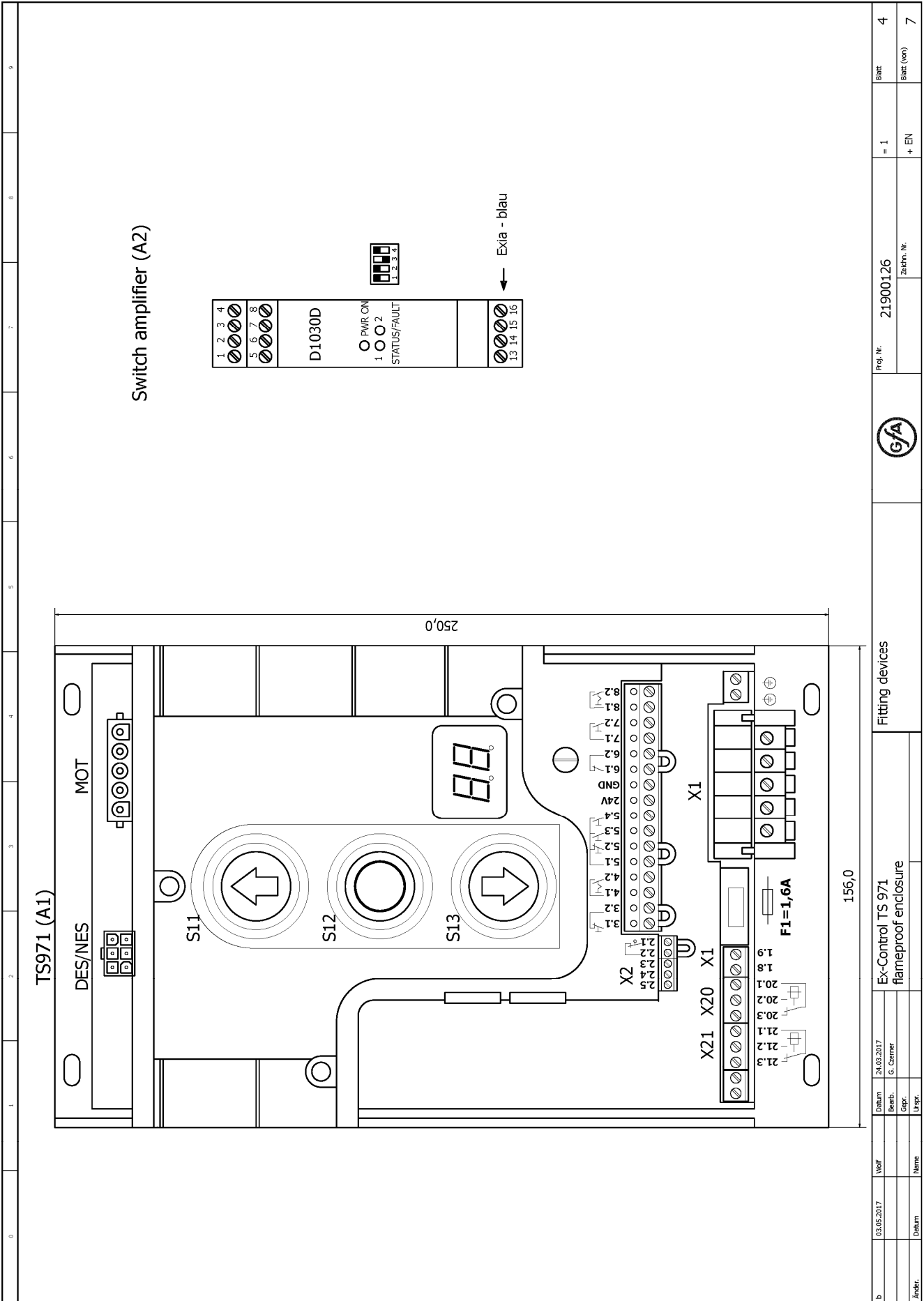






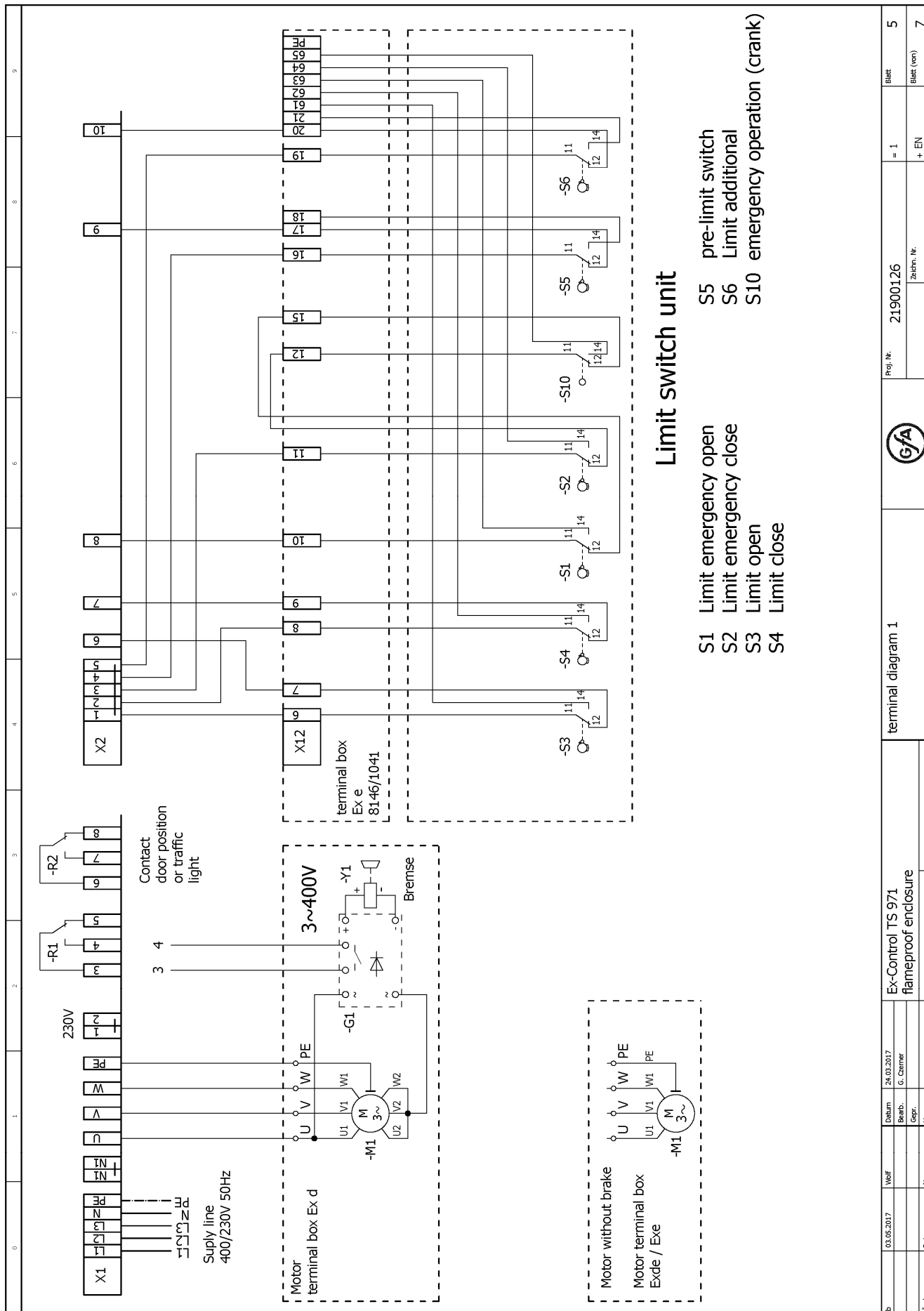
b		01.05.2017	Wolf	Datum	24.03.2017	Ex-Control TS 971 flameproof enclosure		Control circuit plan		Proj. Nr. 21900126		Blatt 2
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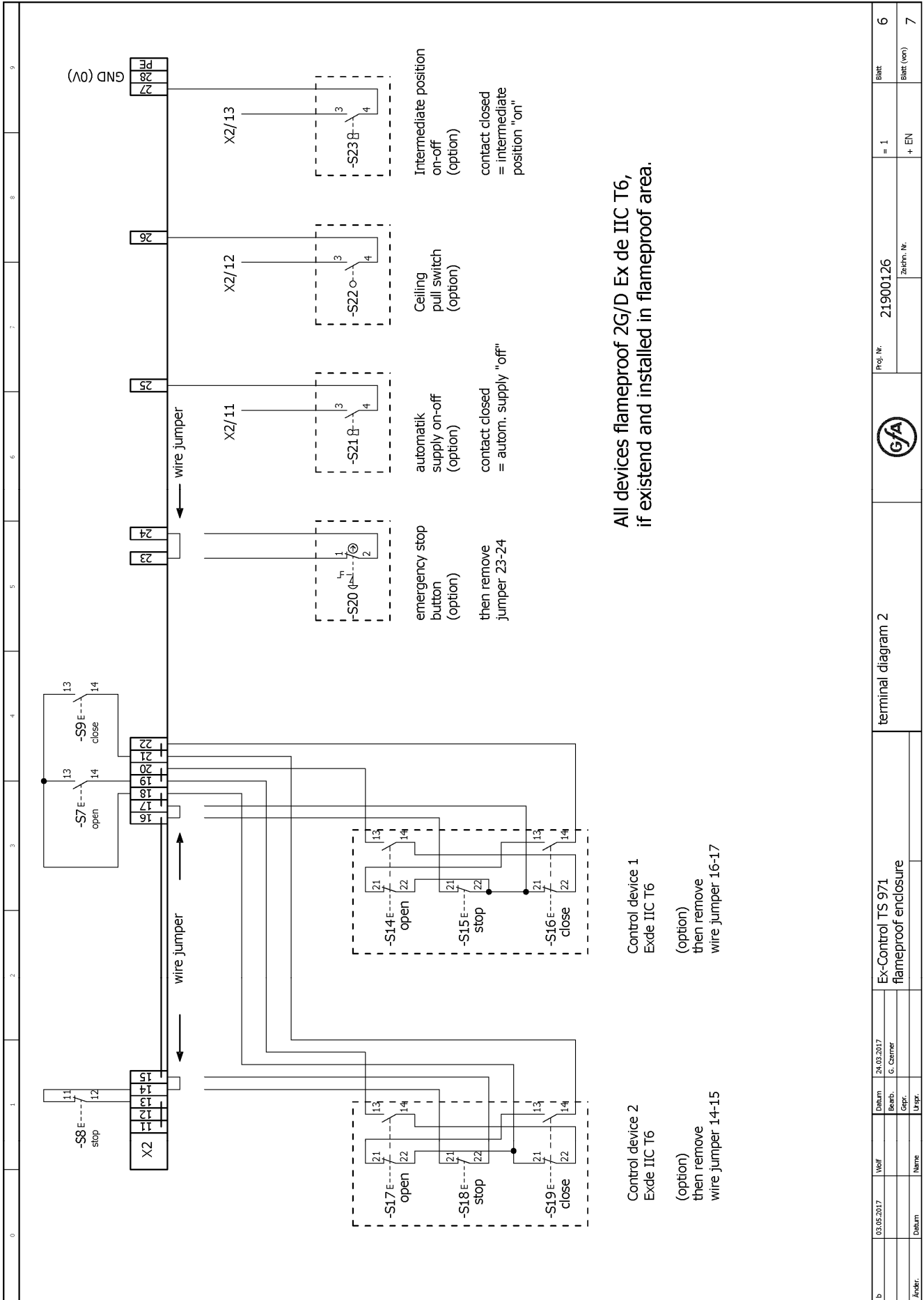


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b		Wolf		= 1				+ EN		Blatt (von)	
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G. Czermer		Name									
Gepr.		Uspz.									
Uspz.											
Fitting devices		Ex-Control TS 971									
flameproof enclosure											

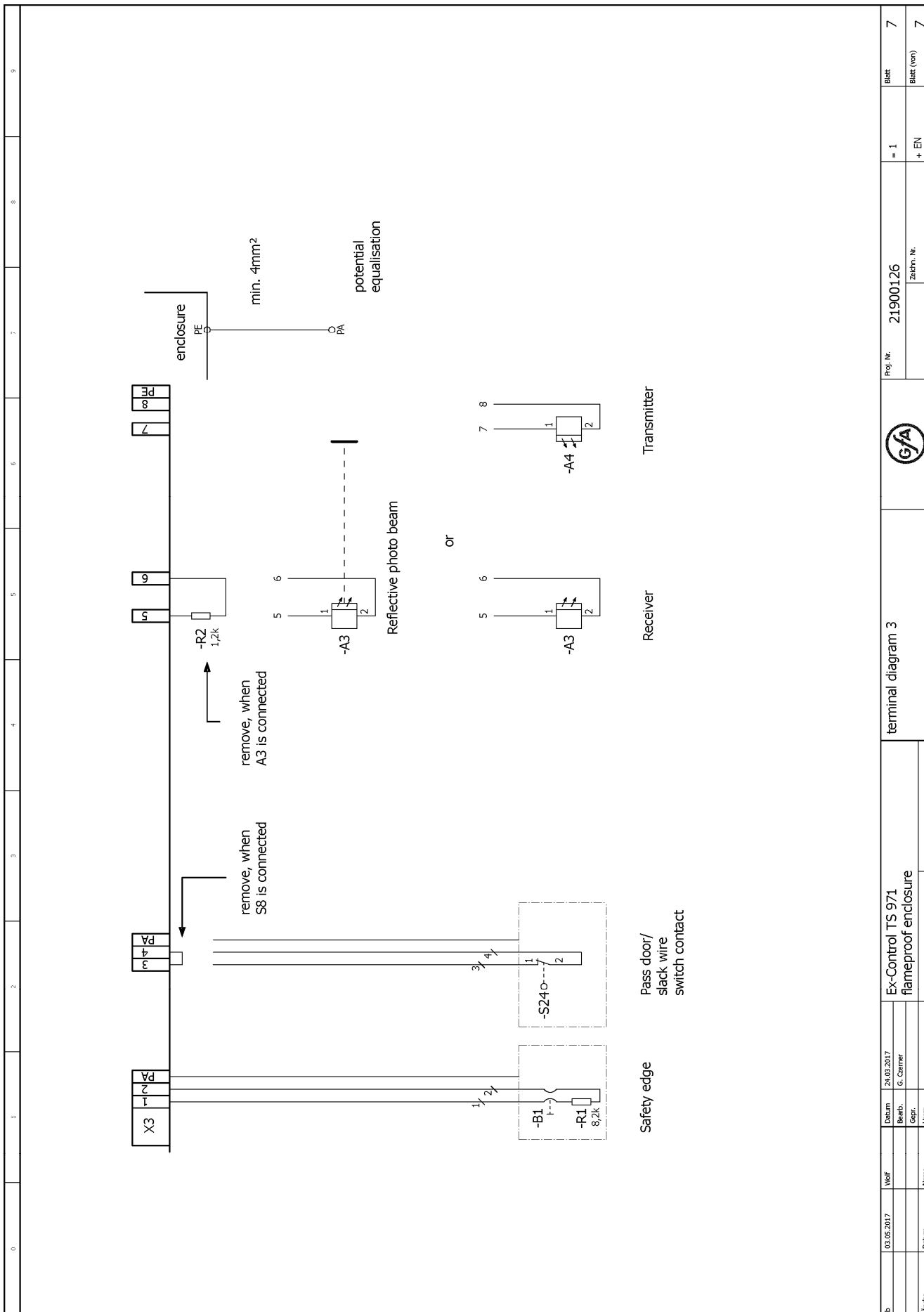




b	03.08.2017	Wolf	Datum	24.03.2017	Ex-Control TS 971 flameproof enclosure	terminal diagram 1	Proj. Nr.	21900126	Blatt	5
									= 1	
Zedr.	Datum	Name	Uepr.	Gepr.	Bearb.	G. Cernor	Zadrn. N.	+ EN	Blatt (ver)	7



All devices flameproof 2G/D Ex de IIC T6,  
if existend and installed in flameproof area.



## 16. Parts list

Item	Quantity	Type	Designation	Manufacturer	Marking
1	1	TS 971	Door control TS 971 / Part no. 30005070/00001	GFA	
2	1	D1030D	Switch device two-channel DC24V 2 x relays change-over contact	GM	A2
3	3	07-3321-1400	Switch module for floor-mounting with terminals 1 N/C/1 N/Or	BARTEC	S11; S12; S13
4	3	05-0003-000700	Pushbutton element	BARTEC	S11; S12; S13
5	1	05-1144-000601	Pushbutton label white for pushbuttons with special printing	BARTEC	S11
6	1	05-1144-0017	Pushbutton label black for pushbutton element. Special printing	BARTEC	S13
7	1	05-1144-0010	Pushbutton label red for pushbutton element 0 (white printed)	BARTEC	S12
8	1	07-3331-1N01	ComEx control switch with terminals, 2 switching positions 4 S latching.	BARTEC	Q1
9	1	05-0003-006301	Position selector with protective collar 0 I	BARTEC	Q1
10	1	03-6062-0239	Cable gland II2 G Ex eb IIC M20x1,5 L10 SW15 Ø7-12 BK	WISKA	
11	4	03-6062-0242	Cable gland II2 G Ex eb IIC M25x1,5 L10 SW15 Ø12-17 BK	WISKA	
12	1	03-6065-0153	Cable gland II2 G Ex eb IIC M16x1,5 L10 SW15 Ø5-8 BU	WISKA	
13	1	03-6065-0155	Cable gland II2 G Ex eb IIC M20x1,5 L10 SW15 Ø7-12 BU	WISKA	
14	4	03-5210-0064	Plug II 2 G Ex e II M20x1,5 PA black IP66	BARTEC	
15	2	03-5210-0065	Plug II 2 G Ex e II M25x1,5 PA black IP66	BARTEC	
16	1	9001/01-280-085-101	Safety barrier Ex II(1)GD	Stahl	N1
17	1	9001/01-252-060-141	Safety barrier Ex II(1)GD	Stahl	N2
18	1	PKZM0-1,6 PKZM0-2,5	Motor protecting switch PKZM0 1,0 A - 1,6 A Motor protecting switch PKZM0 1,6 A - 2,5 A	Eaton	Q2