

UCM

REA3

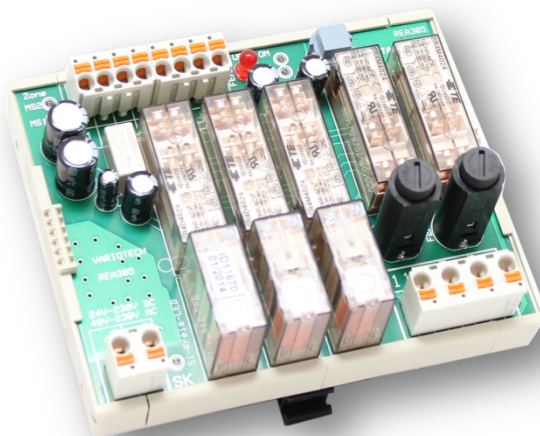
- Manual
- EC-Conformity Declaration
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TUEV-A-AT-1-13-0358-EUA3-5



Operating Manual

REA3 Version 1.3



REA3 Safety switch conforming to EN81-20 5.6.7 “UCM” for “Prevention of unintended travel of a lift”

General information:

The safety switch REA3 is intended for use in safety circuits on a lift.

It consists of a fail-safe control module and corresponding sensors and/or magnetic switches.

The control for the brake element of the protective device is incorporated in the control module. However, the brake element of the protective device itself is not part of this safety switch and/or description and must be provided on the lift system by the customer.

Devices that have been tested according to the regulations of EN81, UCM and can bring the lift to a standstill within the prescribed distance are used as the braking element of the protective unit.

Brief description:

The safety switch REA3 recognises unintended travel of the cabin when the doors are open and switches off safely in case of an error.

Advantages and characteristics:

- **Automatic adjustment to the applied safety circuit voltage in a wide range from 48VAC to 230VAC. (24VDC – 230VDC)**
- **Both magnetic switches are monitored for errors – when closing and opening.**
- **The opening of the switch contact of the reset button is monitored.**
- **The relevant safety circuit is tested with each status change.**
- **Display of all important functions with 5 green LEDs**
- **A red LED blinks in case of an error.**

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General legal notices:

- All rights to this operating manual are held by Variotech GmbH. Copies may be made for internal use within a single company.
- The utmost care was exercised in the creation of this manual; in spite of this we are unable to provide any guarantee as to the accuracy of the operating manual, since it is not possible to entirely avoid errors.
- The contents of this operating manual are subject to change at any time, without prior notice. We appreciate any suggestions for improvements you may have.
- This safety switch was designed exclusively for use in conjunction with a lift controller, and may only be used in accordance with the information in this manual.
- The descriptions which it contains provide the information required to use the controller in the intended manner.
- Knowledge of lift safety regulations is assumed.
- This knowledge is a prerequisite for properly understanding the document.

Explanation of symbols:

Particularly important information in the operating instructions is identified as follows:

**DANGER! + WARNING!**

This notice must be observed unconditionally. The symbol gives warning of impending dangers, which could even cause serious bodily injuries and death.

**ATTENTION!**

This notice alludes to a source of danger and gives information about suitable precautions to prevent minor injuries and avert damage to property.

**IMPORTANT! - INFO!**

This notice indicates situations which could lead to damage to devices or equipment, gives tips on suitable applications, and also provides information on important parts of the text and other special features.

Safety guidelines:

The safety notices are an important part of the operating instructions.

Failure to observe these instructions voids all entitlement to warranty or guarantee as well as any possible liability claims. All regulations concerning accident prevention which are applicable to the lift must be observed. In order to prevent damage due to improper handling of electrical voltages and currents, all relevant (including local) regulations must be observed, particularly in respect of protective measures and proper earthing.

Installation and operating personnel:

The operator may only deploy personnel for installation and commissioning who have knowledge of the basic regulations for accident prevention and safety at work, and have read and understood the safety instructions in this manual.

ESD:

The operating and/or installation personnel must ensure that the device is not damaged by an electrostatic charge/discharge during installation/replacement. Direct contact with the circuit board/electronic components should be avoided or suitable protective measures must be taken.

Warranty and liability:



The entitlement to warranty and liability is void if the controller is not used in the intended manner, if any damage can be traced back to a failure to observe the operating manual, or if installation and operating personnel are not properly qualified or trained.

Intended use:



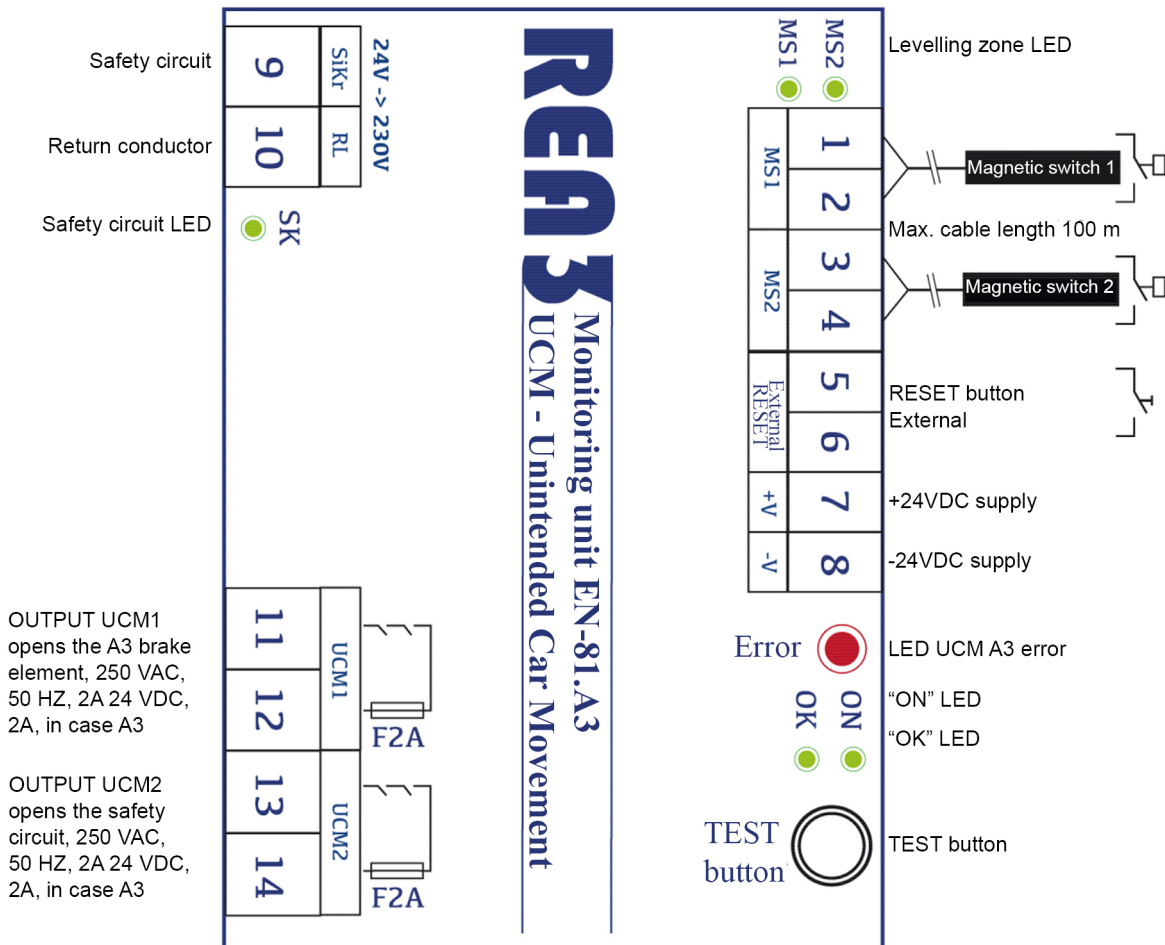
The only acceptable application for the safety switch REA3 is for lift systems. The safety switch REA3 must only be used for the case defined in EN81 Annex 3, prevention of unintended movement of the cabin from a standstill.

Protection from electric shock:

The safety switch REA3 must be installed in an earthed and isolated switch cabinet.

Technical description:

Layout and connections:



Technical specifications:

Connection: plug-in terminals, non-interchangeable, coded.

The terminals are designed for a maximum cable cross-section of 1 mm² with casing or 1.5 mm² without casing.

The maximum cable length for the safety circuit tap is limited to 200m in order to eliminate potential malfunctions due to coupling.

If a cable length > 200m is required, it must be provided with additional suitable protective measures by the customer.

There are no other length limitations on cables.

Requirements:	EN 81–20 / 50
Ambient operating temperature:	-5°C to + 55°C
Air humidity (non-condensing)	< 95 %
Storage temperature:	- 25°C to + 70°C
Dimensions:	10cm x 12cm x height 5cm
Weight:	300g
Deactivation time / system response time:	15ms

Ambient conditions:

The REA3 safety switch is designed to ensure that it has a minimal negative impact on the environment. It does not emit any pollutants, does not contain any substances that are harmful to the environment and only consumes very little energy during operation.

Usage conditions:

The REA3 safety switch must only be used when the following requirements are fulfilled:

- a.) The brake element of the protective device must be type-tested.
- b.) Suitable self-monitoring of the ordinary function of the UCM brake element of the protective device must be provided. This function cannot be carried out by the REA3 safety switch.

Installation / fastening:

Installation of the safety switch should take place close to the lift controller.

The safety switch is delivered in a top-hat rail housing.

An unoccupied top-hat rail width of approx. 10cm is required for installation.

If there is no space available in the switch cabinet, the REA3 safety switch can also be installed in an industrial plastic housing (IP65) at the factory.

Installation must take place in a housing with a minimum protection rating of IP4x. Installation of the magnetic switches and magnetic tape must be sturdy enough that no different switching distances can arise during operation due to mechanical influences (vibrations, etc.). It must be ensured that interruptions and short-circuits are avoided in the wiring of the magnetic switches.

Connections and terminal designation:**Terminals 1, 2, 3 and 4:**

Connection for 2 door zone switches (magnetic switch or equivalent switches/contacts) according to the circuit diagram.

Magnetic tape is used for each switch to define the door zone at each stop.

The length of the magnetic tape should correspond to the unlocking zone of the doors and thus be approx. 20cm.

Terminals 5 and 6: Connection for an external RESET button.

Note: With simple activation/deactivation of the supply voltage, the safety switch cannot be reactivated after a UCM error – in this case, the RESET button must be pressed.

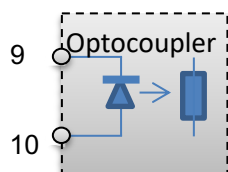
Terminal 7 (plus), 8 (minus): Connection for supply voltage 24V DC (+/- 1,5V)

the voltage should preferably be in the range of 23V to 24V.

The voltage must be supplied from a dedicated mains adapter with disconnecting transformer.

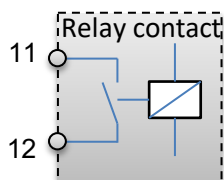
The polarity must be observed on connection. The input must be protected against pole reversal and overvoltage.

Terminals 9 and 10: Connection of safety circuit voltage and safety circuit return conductor.



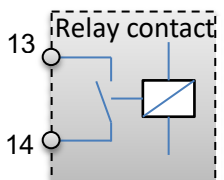
Input with wide voltage range: This input automatically adjusts to the voltage if the applied voltage is a range of 24VDC to 230VDC or 48VAC to 230VAC.

Terminals 11 and 12: Safety relay contact.



This contact is always closed during operation and opens in case of UCM. The relay contacts can be used for a maximum current of 2A and a maximum voltage of 24VDC or 250VAC. It is also safeguarded with a 2A fuse.

Terminals 13 and 14: Safety relay contact.



This contact is always closed during operation and opens in case of UCM. The relay contacts can be used for a maximum current of 2A and a maximum voltage of 24VDC or 250VAC. It is also safeguarded with a 2A fuse.

Note: Since the brake actuator is usually operated with a voltage > 24VDC, it must be ensured that it is switched on the AC side!

Displays and buttons:

LED - light-emitting diodes: Six light-emitting diodes are provided for display of specific operating statuses.

- 2x LED for display of the magnetic switch function with the designation “MS1” and “MS2”
The LEDs illuminate green if the cabin is in a door zone.
If only one LED is illuminated, the magnetic tape is not correctly installed or a magnetic switch is defective.
- 1x LED with the designation “Fehler”. This LED blinks red in case of an error
- 1x LED with the designation “OK” indicates that the safety switch is operating correctly. The LED is normally continuously illuminated green.

- 1x LED with the designation "ON" indicates the presence of a suitable 24V supply voltage.
- 1x LED with the designation "SK" indicates when the safety circuit voltage is connected to terminals 9 and 10 (door switch closed). This LED must illuminate when the doors are closed and locked and the safety circuit is locked.

TEST button on the circuit board: Pressing the button triggers an internal test that checks to ensure the correct function of the device and an adequate supply voltage (24V).

Possible sources of error:

Monitoring of the magnetic switch function:

1. The safety circuit is closed -- voltage is connected to terminals 9 and 10:

If the doors are closed, the UCM monitoring function is not active.

However, the magnetic switch monitoring is active and a possible magnetic switch error is detected and recorded.

Note: When passing through a stop or when the cabin stops, both magnetic switches must always activate on a magnetic tape and if no magnetic tape is present, both magnetic switches must deactivate. If a magnetic switch does not deactivate or activate, it is recognised as an error. The switching time delay between signals MS1/MS2 must be 1 second; otherwise, this is also recognised as an error and recorded.

The REA3 safety switch will then deactivate and shut down due to the recorded error when the next safety circuit opens.

Therefore, deactivation in case of a magnetic switch error does not take place during travel and only occurs after travel, when the cabin stops and the door opens (at a stop).

Comment: The safety switch cannot be reactivated as long as a magnetic switch error is present.

2. The safety circuit is open in a door zone (door contact and/or bolt contact) -- no voltage is connected to terminals 9 and 10:

Comment: The magnetic switches can be activated or deactivated, depending on the position of the cabin.

It is assumed that the lift does not move with an open safety circuit and/or open door. Consequently, each change of the switching status of the magnetic switch with an open safety circuit is considered an error and the safety switch deactivates.

The same applies in an actual case of UCM: If the magnetic switches deactivate with an open safety circuit because the cabin has left the door zone, it is recognised as a UCM error and the safety switch deactivates. In this connection, it is unimportant whether only one magnetic switch deactivates or both switches deactivate simultaneously.

It is only possible to reset an error by pressing the reset button.

A loss of supply voltage does not trigger a reset.

Comment: The safety switch cannot be reactivated as long as a magnetic switch error is present.

Monitoring of the reset button:

Possible error: The reset button remains pressed or the reset button conductor has short-circuited. Situations where recognition of a UCM error is prevented due to a defective reset button or the UCM error is recognised but the error recording does not work must be avoided.

Therefore, the monitoring of the reset button works in the following manner:

- A blocked reset button is recognised immediately
- The error is recorded
- The “ON” LED goes out to indicate the error.
- The safety switch does not deactivate and the lift travel can continue.
- The safety switch deactivates on the next status change, with participation of the safety relay (activate/deactivate current, magnetic switch error, relay error, voltage drop or overvoltage detection, UCM error).

Reset after an error:

An error on the REA3 can be reset by pressing the reset button. If the cause of the error is a malfunction of one or both magnetic switches, it may be necessary to reset the safety circuit by pressing the “Test” button or a power reset before the reset.

Supply voltage monitoring:

General information: The supply voltage must be 24V. A tolerance range of 1.5V above (25.5V) and below (22.5V) is possible and does not have any limiting effect on function or reliability. In case of higher voltage, however, the relay heats up, which should generally be avoided. Most 24V mains adapters have the capability of adjusting the voltage in a range of +/- 10% with a regulator. The correct voltage should be checked with a multimeter prior to commissioning. The safety switch can be tested for correct operation of the activate and deactivate function by briefly pressing the “Test button”.

Voltage drop recognition:

The safety switch tests the supply voltage on each activation and with each status change of the UCM safety relay. If the supply voltage is less than 18V, the circuit can no longer start.

Overvoltage recognition:

The safety circuit device checks the supply voltage continuously. With a supply voltage of more than 27V, the safety switch deactivates automatically. If the voltage returns to the range of 24V, the safety switch re-activates.

Short-circuit protection on the output contacts of the safety relay:

Each of the outputs is protected with a fuse (2A flink). In case of a short-circuit with 230VAC mains voltage at both outputs of the safety switch, the fuse interrupts the current circuit. In the process, none of the parts of the safety switch are damaged. The safety switch operates again after replacement of the fuse.

Installation:

This description for installation relates to the UCM safety switch only and not the type-tested mechanical UCM braking device.



The magnetic switches must be installed correctly and the door zone magnetics must be affixed correctly.

The cabin must be in a door zone and the safety circuit closed.

- Check to ensure the correct mechanical fastening of the safety controller
- Check all connections and terminals
- The green “MS1” and “MS2” LEDs must illuminate (cabin stopped at a stop)
- The green “ON” LED must illuminate.
This indicates that supply voltage is connected.
The correct voltage (24VDC) must be tested with a multimeter
- The green “OK” LED must illuminate.
This indicates that the safety switch operates correctly, no errors are present and the contacts of the output relay (safety relay) have connected.
- The green “SK” LED must illuminate when the safety circuit is closed.
This LED indicates the connection of sufficient safety circuit voltage.
- When the safety circuit is open, the “SK” LED must not illuminate.
In case a check yields a negative result, you have to assume there is capacitively coupled interference. It must be eliminated by the customer.

The lift can be tested now.

UCM error functional test, requirements:



- All green LEDs on the REA3 safety switch must illuminate.
- The red “FEHLER (error)” LED must not illuminate (blink)
- All plugs must be connected.

- The car must stop flush in a stop with closed doors.

Functional test with UCM error simulation:

- Pull out the plug with terminal numbers 9 and 10. (Door open simulation).
- The “SK” LED must go out.
- Disconnect a magnetic switch from terminal 1, 2, 3 or 4.
- The safety switch now believes that it recognises “travel with open door” and is deactivated immediately.
The red “Error” LED will blink and confirm the successful UCM test.

Functional test with UCM error recognition:

- Pull out the plug with terminal numbers 9 and 10 (door open simulation).
- The “SK” LED must go out.
- Give the lift a travel command and wait for it to move away.
- The safety switch will recognise “travel with open door” at the end of a door zone and is deactivated immediately.
The red “Error” LED will blink and confirm the successful UCM test.

UCM error reset:

The UCM error is deleted by pressing the external RESET button.

Note: The error cannot be deleted with activation/deactivation of the supply voltage.

After the reset button is pressed, a check of the REA3 safety controller and external connections takes place.

Function test of external reset button:

By pressing and releasing the external reset button, the UCM error is deleted.

At the same time, the following function must be checked:

- press the external reset button
- Check whether the "ON" LED goes out
- release the external reset button
- Check whether the "ON" LED lights up again

If the "ON" LED continues to light up when the external reset button is pressed, a defect is assumed. In this case, the REA3 device must be replaced.

Magnetic switch error functional test:

A check takes place to determine whether a defective magnetic switch is recognised.

Error possibility 1:

A magnetic switch also remains open if magnetic tape is present.

The test must be initiated with the cabin door closed.

Terminal 2 must be cleared to test Magnetic switch 1 (MS1) by removing the conductor from the terminal. Alternatively, but not simultaneously, Magnetic switch 2 (MS2) can also be tested; for this purpose, Terminal 4 must be cleared by removing the conductor from the terminal.

Then a travel command is issued. The safety circuit must deactivate at the end of travel when the cabin door opens.

Error possibility 2:

A magnetic switch also remains closed if no magnetic tape is present.

The test must be initiated with the cabin door closed.

For the test of Magnetic switch 1, Terminal 1 must be connected to Terminal 2 (MS1) by establishing a conductor connection (wire bridge). Alternatively, but not simultaneously, Magnetic switch 2 (MS2) can also be tested; for this purpose, Terminal 3 must be connected to Terminal 4 by establishing a conductor connection (wire bridge).

Then a travel command is issued. The safety circuit must deactivate at the end of travel when the cabin door opens.

Testing general device functions:

A test for correct function is carried out by pressing the TEST button:

- Redundant (double execution) encoders and sensors for safety functions are subject to testing for plausibility in the REA3 safety switch.
The functional test is carried out for all possible combinations of the two encoders. If a plausibility error occurs, the safety switch deactivates automatically.
- The outputs (safety relay) of the safety switch carry out a functional test with each status change and each time the TEST button is pressed.
Errors when switching the safety relay cause deactivation.
- An error on the periphery wiring causes deactivation.
- A defective magnetic switch, which remains in an activated state or in a deactivate state, regardless of the magnetic tape, is recognised as defective and causes deactivation.
- Errors in the supply voltage, circuit board errors and other errors cause deactivation.
- The testing of the device function was successful if the "OK" LED illuminates after the test.

Troubleshooting:

- Check both fuses. The maximum current is 2A (terminals 11/12 - 13/14).
Note: Use only glass tube fuses "5mm x 20mm, 250V, 2A flink".
- Check the magnetic tape/magnetic switches at each stop.
The green "MS1" and "MS2" LEDs indicate the function.
- Check the suitable safety circuit voltage in the range of 48V to 230V AC:
The "SK" LED must illuminate when voltage is connected.
- If the green "ON" LED does not illuminate: Test the supply voltage (24V) and the reset button.
- If the green "OK" LED does not illuminate: Reset the error with the reset button.
- If no green LED illuminates with connection of the supply voltage, the test button should be checked to determine whether it is blocked.
- If the red LED blinks, the recorded error can be deleted by pressing the external reset button and the lift should be ready for travel, if the customer-provided UCM brake device does not require additional measures. (e.g. clear the catch device, etc.)

Maintenance:

No direct maintenance work or servicing measures are necessary.

The safety switch must always be kept clean and dry.

The following tests must be repeated once a year:

- The "UCM test" as described on page 9 of these operating instructions
- The "Function test of the external reset button" as described on page 10 of these operating instructions

The internal function of the device can be tested by pressing the test button. Then the device carries out an activation test. However, is not a substitute for a UCM test.

It must be ensured that the safety switch is replaced after an operating duration of 20 years or 3.5M journeys, because the stated product life-cycle of the safety relay has then been reached.

Disposal and recycling:

Unusable or irreparable devices as well as those which have reached the end of their product life cycle must be disposed of in accordance with the respective applicable waste disposal regulations for electrical waste. The plastic housing can be disposed of as residual waste.

Scope of delivery:

The scope of delivery includes the REA3 safety switch, the operating manual, 2 magnetic switches (encoders) for the door zone and the necessary magnetic tape (2x 20cm per stop).

The REA3 safety switch is delivered in a plastic housing for top-hat rail installation, and should be installed in a switch cabinet by the customer. On request, the device can also be supplied in an individual industrial plastic housing (IP65).

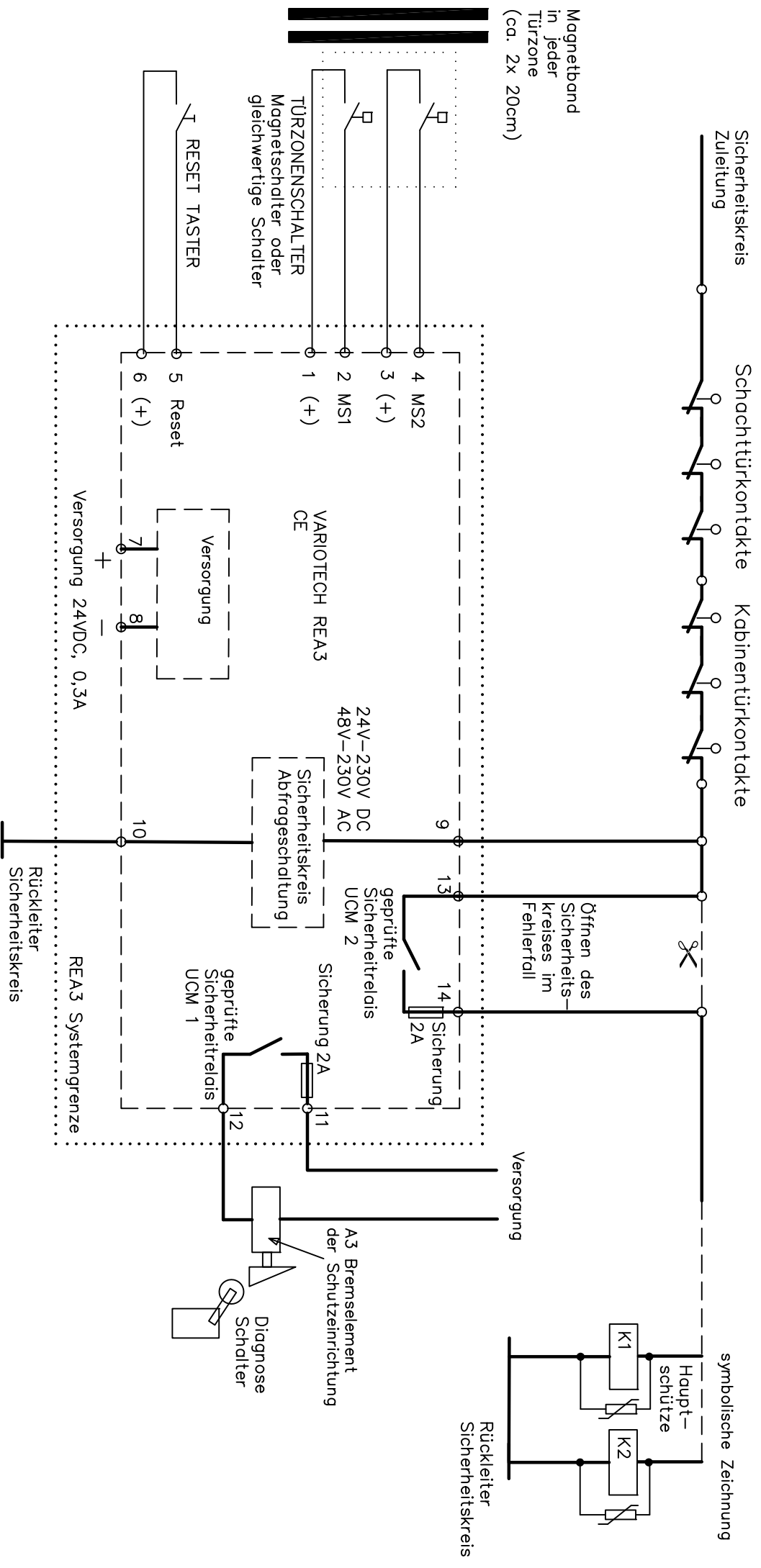
The safety switch is designed as standard for a power supply of 24V DC (+/- 5%).

A mains adapter is also available for a connection voltage of 115V to 230V.

Order information and spare parts:

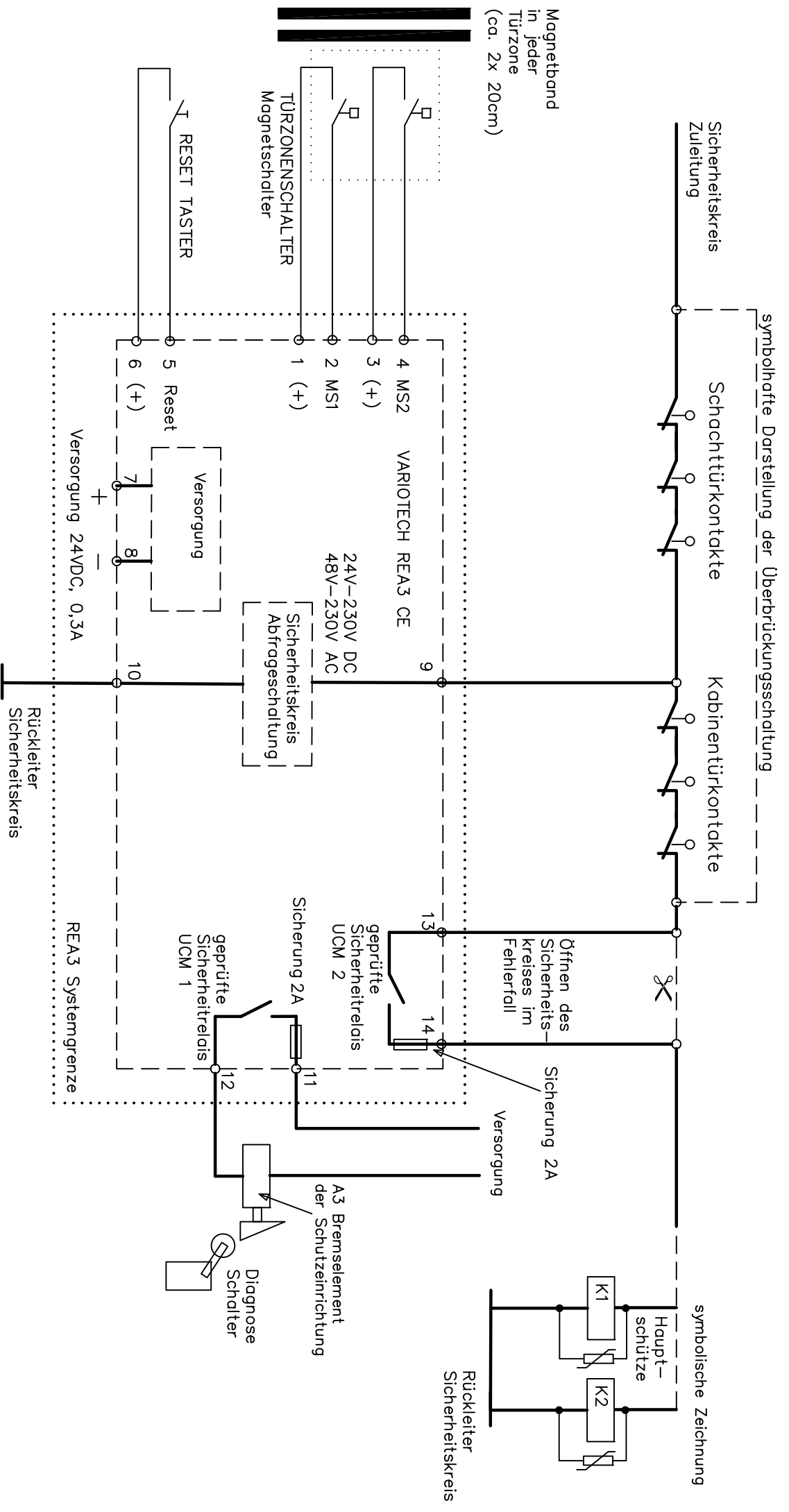
Designation	Description	Order code	Other
REA3 safety switch	Installed in a plastic housing for top-hat rail installation including magnetic switch	REA3-V2MS	
REA3 safety switch	Installed in a plastic housing for top-hat rail installation without Magnetic switch	REA3-V2XX	
Matching IP65 industrial housing	Plastic housing with clear viewing panel 175x150x80	NSYTBS19168T	
Magnetic switch	2 units per device	REA3-MS-RE2	
20cm magnetic tape	2 units per stop	RAE3_MAG20	
Mains adapter 110V to 230V	Mains adapter top-hat rails	REA3_MDR	
REA3 reset button	with cable (length 2m)	REA3-RES1	
REA3 reset button	for top-hat rail installation	REA3-RES2	

Zertifikatszeichnung REA3 Variante 1
 Aufzug mit automatischen Kabinen- und Schachttüren
 ohne Überbrückungsschaltung (Nachholung oder vorzeitige Türöffnung)



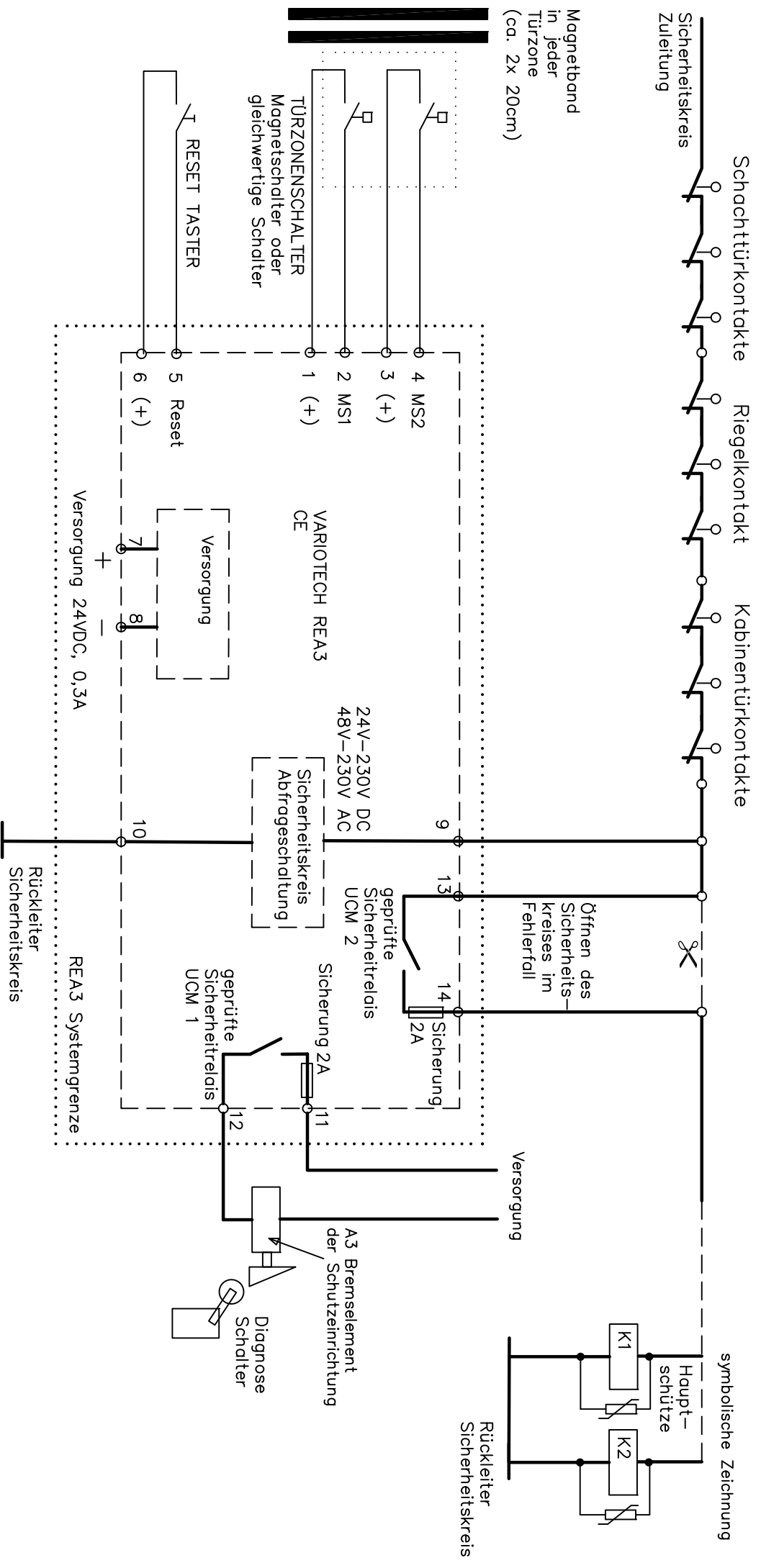
Variotech		Sicherheitschaltung REA3		Einbindung in Steuerung	
AUSTRIA		Baumustergeprüft		REAR3_Plan VI	
				Datum	
				24.06.2014	
				Blatt	
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Zertifikatszeichnung REA3 Variante 2 Aufzug mit automatischen Kabinen- und Schachttüren mit Überbrückungsschaltung (Nachholung oder vorzeitige Türöffnung)



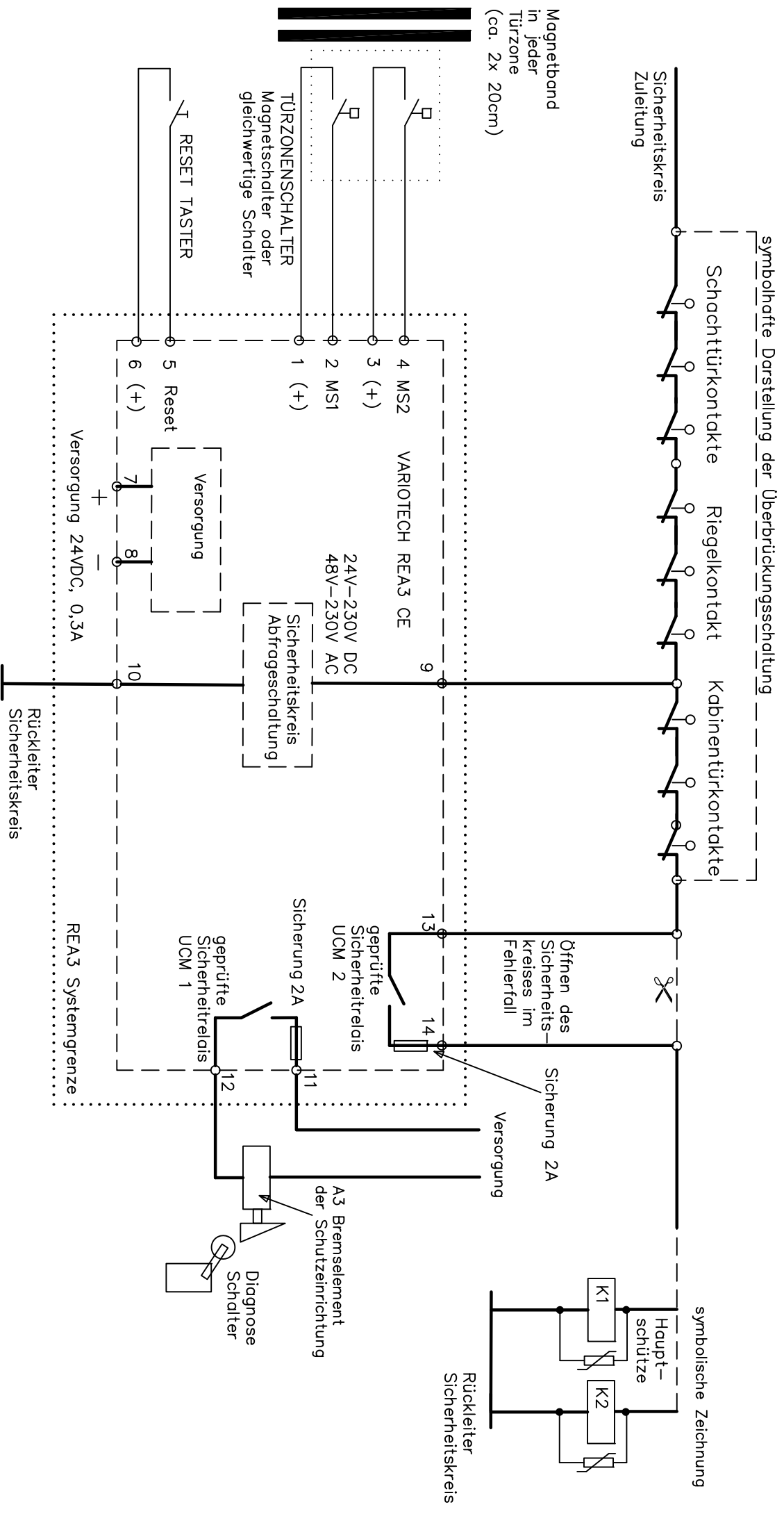
Variotech AUSTRIA	REA3	Sicherheitsschaltung REA3	Einbindung in Steuerung	Zeichnung	Datum	Blatt
		Baumustergeprüft		REA3_Plan V2	24.06.2014	1

Zertifikatszeichnung REA3 Variante 3
 Aufzug mit automatischer Kabinentüre und Schachtdrehtüren
 ohne Überbrückungsschaltung (Nachholung oder vorzeitige Türöffnung)



Variotech AUSTRIA	REA3	Sicherheitsschaltung REA3	Einbindung in Steuerung	Zeichnung	Datum	Blatt 1
		Baumustergeprüft			REA3_Plan V3	

Zertifikatszeichnung REA3 Variante 4
 Aufzug mit automatischer Kabinentüre und Schachtdrehtüren
 mit Überbrückungsschaltung (Nachholung oder vorzeitige Türöffnung)



Variotech AUSTRIA	REA3	Sicherheitsschaltung REA3	Einbindung in Steuerung	Zeichnung	Datum	Blatt 1
		Baumustergeprüft		REA3_Plan V4	24.06.2014	

EU – Konformitätserklärung

EU – Declaration of Conformity

Wir **VARIOTECH** Produktions- und HandelsgesmbH
We

Gewerbeweg 5
2230 Gänserndorf
Österreich / Austria

Erklären in alleiniger Verantwortung, dass das Produkt
Declare under our sole responsibility that the product

REA3-UCM-Steuergerät
REA3-UCM-Control device

Typenreihen: REA3_XXXX

auf das sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder normativen Dokumenten übereinstimmt.

To which this declaration relates is in conformity with the following standard(s) or other normative documents(s)

EN 81.20:2020, EN 81.50:2020,
EN 12015:2020, EN 12016:2013
EN 60068-2-6:2008, EN 60068-2-14:2010, EN 60068-2-27:2010

Das bezeichnete Produkt entspricht den Vorschriften folgender europäischen Richtlinien:
The described product is in conformity with the regulations of the following European Directives:

2014/35/EU Niederspannungsrichtlinie / Low voltage directive
2014/30/EU EMV Richtlinie / EMC directive
2014/33/EU Aufzugs Richtlinie, lift directive

Bescheinigungsnummern:
Certificate numbers:
TÜV-A-AT-1-13-0358-EUA3-5

Anbringung der CE- Kennzeichnung: CE0408
Affixation of the CE mark: CE0408


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