

UCM Control

ENA3

- Manual
- TÜV Certificate
- Schematics

Manual

UCM safety control in accordance with EN81-20 5.6.7 - to prevent an unintended car movement

Manual: ENA3 Version 2.2

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In preparing this manual we have used the utmost care, but we cannot guarantee the accuracy of this manual, because mistakes cannot be avoided 100%.

The contents of this manual can be changed anytime without notice. For improving information we will be grateful.

This safety control is designed exclusively for use in a lift control system and may be used only as specified in this manual.

This description contains the information necessary for the intended use of the controller.
Knowledge about the safety of the operating field 'Lift' is assumed.
These skills are fundamental for the understanding of this description.

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General:

The safety control ENA3 is destined for use in safety circuits by a lift.
It consists of a fail-safe control module and proper sensors or magnetic switches.

ENA3 Unit performs a daily self-test.
Details on the self-test are described in more detail in the section "Self-test of the outputs".

The activation of the brake actuators and a control input to verify the correct operation of the actuators are implemented in the control module.

The (brake) actuators themselves are not part of this safety control or the description but must be installed on-site at the lift.

Those stopping brake actuators can be used, which have been examined in accordance with the requirements of EN81-20 and are able to stop the lift within the required distance.

These include examined traction sheave brake, safety gears in combination with an overspeed governor rope brakes, guide rail brakes and safety valves that an EN81-20/50 type examination have been subjected.

The software in the safety control is factory tested and sealed and can not be modified or changed in any way.

Legend:

Particularly important information in the manual are identified as follows:



DANGER! + WARNING!

This notice must be strictly observed. The sign warns of imminent danger, which can cause serious injury and death.



ATTENTION!

This note indicates attention to a hazard and informs of appropriate precautions to prevent minor injuries and property damages.



IMPORTANT! - INFO!

This note presents situations that can lead to damage of equipment or facilities, and provides tips for proper application and also provides information on key passages and other special features.

Safety guidelines:



The safety instructions are an important part of the operating manual.
In consequence of non-compliance of the instructions, all warranty claims and warranties, as well as potential liability claims are lost. Moreover all regulations on accident prevention for lifts must be observed. All local rules must be taken into account to prevent damage due to improper handling with voltages and currents. Especially concerning protection measure and correct earthing.

Training of the installation and operation personnel:



The operator may only use people for installation and commissioning, which have the basic rules of accident prevention and safety knowledge and have read and understood the safety instructions in this manual.

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

Warranty and liability management:



Warranty and liability claims will be lost if the control is not used as intended or if any damage due to non-observance of the operating instructions or if the installation and operating personnel have not been trained properly.

Intended use:



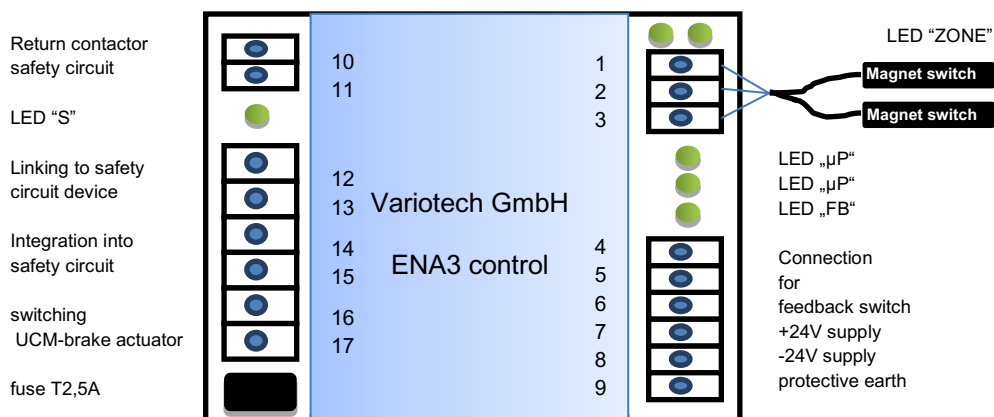
The application of ENA3 safety controls are provided solely lift systems. The control may not be used in of other systems or particular in industrial plants. The safety control ENA3 may only be used for the case defined in EN81-20 5.6.7, to prevent of an unintended movement of the car from a standstill.

Protection against electric shock:

The safety control ENA3 must be installed in a grounded or protective insulated control box.

Technical description:

Layout and Connections:



Technical details:

Connection: plug-in terminals, no confusion because different numbers of poles.

The terminals are designed for a max. conductor cross section 1 mm² with sleeve, or 1.5 mm² without sleeve.

The maximum cable length for the safety circuit tapping is limited to a maximum of 200m, in order to prevent malfunction due to coupling.

If a cable length > 200m is required, this must be additionally protected by suitable measures.

All other cables are not limited in their length.

Connection cables must have a minimum cross-sectional of 0.75 mm², except the magnetic switch.

cable length: there are no prescribed limits

The cables must be routed so that it can come to no damage during operation. (Protected installation).

Shielded cables are not necessary.

Safety Integrity Level: SIL2
Requirements: EN 81-20/50,
EN 13849 part1+part2
EN 61508 part1 to part7,
ISO 22201,
EN12015, EN12016

System response times: **70ms**
- if there is an external safety circuit to bypass the doors and the tap of the safety circuit (terminal 10/11) is after the doors..
30ms
- if no safety circuit is connected or monitoring
or
- for automatic doors if the tap of the safety circuit (terminal 10/11) is between the car door contacts and the landing door contacts (independent of an external safety circuit).

Operating ambient temperature: 5°C + 55°C
Humidity (no condensation) < 95 %
Storage temperature: – 25°C + 70°C
Dimensions: 10cm x 10cm x height 7cm
Fatigue strength: according EN81-50
Resistance to shock: according EN81-50
Weight: 400g

Environmental conditions:

The ENA3 security control is designed so that it pollutes the environment as little as possible. It emits no pollutants and does not contain environmentally harmful substances and consumes very little power.

Assembly / Fastening:

Installation of security control should preferably be close to the elevator control. If more space is available in the control box, a free DIN rail width of about 10cm is required. Possible is also mounting on the car roof.

If there is no space available, it is possible to mount the unit nearby to the control box.

In that case the safety control ENA3 can be delivered in a special industrial plastic housing.

An assembly without housing is not allowed, because a case is required with a protection factor of at least IP2x.

Connections and terminal description:

Terminals 1, 2, 3: Connection for magnet switches (door zone) according to the schematic

The door zone is defined in each station by means of 2 magnetic tapes.

The dimension of the door zone should correspond to the unlocking zone of the door, and therefore

should be of approximately flush to the top / bottom of each 10cm (20cm total).

Note: For encoders of safety circuits, the requirements of EN 81-50: 2014, 5.6.3.1.1 apply.

Terminals 4, 5, 6: Connection for a feedback contact of the braking device.
(UCM-approved traction sheave brake, or UCM-approved safety gear and over speed governor)
The braking system must be monitored. If a normally closed -NC contact is available, this contact should be used.

This also allows a detection of a line interruption.

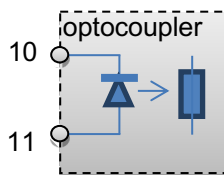
However, if only one normally open contact (NO contact) is present it can also be used.

- A normally closed NC contact must be connected to terminal 5, 6
- A normally open contact NO contact must be connected to terminal 4, 5
- If no feedback contact is present, the terminals 5, 6 must be bridged.

Terminal 7 (PLUS), 8 (Minus): connection power supply 24V DC (+/- 10%)

Terminal 9: connection protected earth.

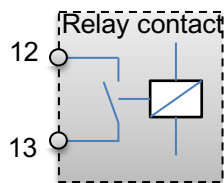
Terminal 10, 11: connection for safety circuit and safety circuit feedback



with wide input voltage range:

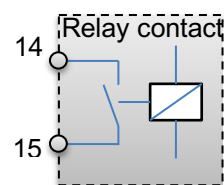
This input automatically adjusts to the applied voltage in a range from 24V to 230V AC / DC.

Terminal 12, 13: Safety relay contact.



This contact is used to test a door zone bypass circuit of the door switches and is integrated in series in the bypass. If no bypass circuit is present the terminals 12 and 13 remain free. When leaving the door zone the contact is opened so that the door switch can be tested without any interference from the bypass circuit. The relay contacts have a switching capacity of 2,5A, 250VAC.

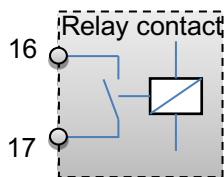
Terminal 14, 15: Safety relay contact.



This contact will be integrated in the safety circuit according to the schematic diagram and serves to switch off the lift on the UCM error. To protect the contacts of the safety relay and thus to increase the reliability, a fuse in series with the contacts was implemented directly on the board.

The relay contacts are designed for a switching capacity of 2.5A, 250VAC and are fused with a 2.5A fuse.

Terminal 16, 17: Safety relay contact.



This contact is for switching off the UCM-braking system and should therefore be integrated directly in the circuit of the braking device.

The relay contacts have a switching capacity of 3A, 250V.

Note: Assuming that a connected coil with a suitable protective diode (freewheeling diode) is connected, the relay outputs (terminal 12/13, 14/15, 16/17) switch a maximum DC voltage up to 24VDC, 1A.

Displays, Signal Transducer and Switches:

LEDs: To view certain operating conditions 6 LEDs are available.

- 2 LED labeled with "Zone"
The LED indicates when the car is in a door-zone.
If both LEDs are lighted the car is within the door zone.
If only one LED is lighted a magnetic switch is defective and must be replaced.
- 2 LED labeled with „µP“ indicate that the safety system is working properly.

µP Leds	Activity
Lights continuously	Elevator in the zone
Blinking fast	Elevator out of the zone
Blinking slowly	Elevator enters the zone
Blinking with pause and sound	Error (see chapter „Displaying type of error“)

If one of the two LEDs is not lit, the safety controller is defective and must be replaced.

- 1 LED labeled with "FB" indicates the correct function of the feedback switch (braking device).
This LED should light when the car is stopped and the UCM-braking system has switched off.
If the LED is not lighted, the UCM-braking device or the switch must be checked.
- 1 LED labeled with "S" indicates when the safety circuit is activated (door contacts closed).
This LED must be lighted by closed and locked doors or rather closed safety circuit.

Piezo signal transducer (Buzzer):

- The Piezo buzzer is in normal operation without function.
However, if an error occurs the Piezo buzzer starts to beep - the same rate as the indicator of „µP“ LED

Reset button:

- This button has no function during normal operation.
It serves only to restart ENA3 safety control after an error. The button must be pressed briefly. If the button is jammed or otherwise remains in the pressed state, the safety circuit will not come into operation again.

Optimization of the number of necessary traveling cable wires:

Especially in the modernization of existing lifts, there is often a lack of free traveling cable wires.

The following table shows the required number of traveling cable wires depending on what UCM actuator is used and where it is mounted.

Version A: ENA3 safety control mounted nearby the lift control	At lift box	On the car roof	Required traveling cable wires
Door zone switch	-	x	3
UCM brake actuator, and feedback contact	-	x	4
UCM brake actuator, and feedback contact	x	-	-
supply 24V DC	x	x	-
Safety circuit monitoring	x	-	-
Safety circuit shutdown	x	-	-
re-leveling: test and switch off the bridging of the safety circuit	x	-	-

Commissioning:



It is assumed that the magnet switch is properly installed and the door zone magnets were installed correctly.
The car must be in a door zone.

- Inspection of the correct mechanical fixation of the safety control
- Inspection of all connections and terminals
- Remove the orange plug and afterwards switch on the unit
- The 2 LEDs „Zone“ must be on (car at level)
- The 2 LEDs „µP“ must be on. Indicate that the safety system is working properly - no fault and all relays are switched through.
- The LED „FB“ must be on. Indicates the correct function of the feedback switch (braking device).
- The LED „S“ must be on. Indicates when the safety circuit is activated. (Door closed).
- When safety circuit is open, the "S" LED must **not** light.
In the case of a negative test, one must assume a capacitive coupling in the safety circuit. This is to be remedied on-site.

The orange plug must be connected again.

Now the lift can be tested.

All functions of the elevator controls should work properly.

Function test UCM-error:

Precondition for a meaningful review of the UCM function is a proper function of the lift itself and the proper integration of ENA3 safety control.

Check before testing:



- After the correct installation of the ENA3 or pressing the reset button of the elevator before the function test must make a Normal trip!
- All LEDs on the ENA3 safety control must be lighted.
- All connectors must be plugged correctly

Actual testing (UCM error tests)

- Disconnect the connector with the terminal numbers 10 and 11 (safety circuit).
- The "S" LED must switch off.
- Give a lift call.
- The car should be starting to move.
- As soon as the car leaves the door zone ENA-3 safety control initiates an emergency stop.

Effects of UCM-error tests:

- The car is located near the station with closed doors.
- The distance to the station depends on the effectiveness of the UCM-braking device.
- On the safety control ENA3 the LED „µP“ is flashing and the LED "FB" is lighted.
All other LEDs must be off.
- The LEDs "µP" will flash 2 times with a subsequent pause of about 1 second.
This is the signal for an UCM fault. The piezo buzzer beeps additional to the LED in the same rate.
- Check disconnection of safety circuit terminals (terminals 14, 15) and terminals of the brake actuator (terminals 16, 17).

UCM-error-reset:

Pressing the reset button on the control board of the safety control clears the error and the lift should be back in operation mode, as far as the UCM-brake actuator does not require additional steps. (release safety gear, etc.)

The error cannot be deleted by switching the device off and on.

Diagnostic-input

The function of the UCM-brake actuator or UCM-safety valve is monitored by a diagnostic switch. The contacts of this switch have to be connected to the diagnostic input of the ENA3 control.

A LED (FB) indicates the correct function.

When multiple switches on the brake actuator are monitored and included, multiple normally closed contacts can be connected in series or normally open contacts can be connected parallel.

The diagnostic function of the switch can be simulated:

The ENA3 control has a LED (FB) which indicates the correct function of the unit.

If the UCM-brake actuator (brake, overspeed governor, safety valve, etc.) is in non-operating state (lift stands still with activated brake actuator) the LED "FB" is on.

If the brake actuator is released, the LED switches off.

If there are dual circuit brakes, the function of the diagnostic switch is checked by releasing one part of the brake. The LED must switch off and by releasing of the part brake the LED should go on again. The second part of the brake should be tested too.

The instructions of the manufacturer of the UCM-brake actuators must be observed for proper testing of the diagnostic switch.

The diagnostic switch can be configured as NO or NC contact:

Version: diagnostic switch is a normally closed contact (NC)

Diagnostics switch (NC) on terminal 5 and 6, terminal 4 stays free permanently.

Diagnostic switch as NC contact	Diagnostic switch	LED "FB"
Lift stands still, UCM-brake actuator in non-operating state	Terminal 5 and terminal 6 are connected by switch	lighted *
Lift moves	Terminal 5 and terminal 6 are not connected by switch (because NC)	off
testing of the diagnostic switch, then give a lift call	Wire from terminal 5 (or terminal 6) must be disconnected.	off
After the end of drive the function of the diagnostic switch is tested by ENA3 control.	LED "µP" flashes 3 times Buzzer beeps 3 times.	off
The ENA3 control detects the error and switches off, thereby the lift is out of service.		
Connect wire on terminal 5 or terminal 6 again. Switch on the device again by pressing the reset-button.		

Version: Diagnostic switch is a normally open contact (NO)

Diagnostics switch (NO) on terminal 4 and 5, make a permanently bridge from terminal 5 to terminal 6.

Diagnostic switch as NO contact	Diagnostic switch	LED "FB"
Lift stands still, UCM-braking system in non-operating state	Terminal 4 and terminal 5 not connected by switch	lighted *
Lift moves.	Terminal 4 and 5 connected by switch (because NO)	off
testing of the diagnostic switch, then give a lift call	Bridge between terminal 4 and terminal 5.	off

After the end of drive the function of the diagnostic switch is tested by ENA3 control.	The LED „µP“ flashes 3 times. Buzzer beeps 3 times.	off
The ENA3 control detects the error and switches off, thereby the lift is out of service.		
Remove bridge between terminal 4 and terminal 5. Switch on the device again by pressing the reset-button.		

* If the brake actuator (e.g. coil) is not controlled (on/off) by the lift control and it rest in „on“ position the LED „FB“ will not be lighted if the lift is in the station!

Note: There are different types and designs of diagnostic switches on the various UCM-braking devices. For proper use the manufacturer's instructions of the UCM-braking device must be observed. This applies to UCM-brake actuators like dual-circuit brake, a limiter with safety gear, cable brake, etc. as well as for hydraulic lifts with UCM safety valves.

If the UCM-brake actuator has no diagnostic switches or contacts available to connect to the ENA3 control, it can be assumed that the UCM-tested brake actuator already includes other equivalent ways of self-monitoring. Thus, the terminals 5 and 6 must be bridged, that the ENA3 control will still operate!

Error detection:

The ENA3 safety control is responsible, for detecting a specific error (UCM-error) and in the case of an error, to initiate an immediate emergency stop of the lift.

The ENA3 safety control itself has no direct control function of the lift.

Possible errors:

- Error in the ENA3 safety control itself. Such an error is detected by the safety control itself and always leads to a shutdown of the device, and thus the lift.
- Wiring errors at the inputs of the safety control are also detected and lead also to a shutdown.
- External wiring errors on the safe outputs of the safety control system must be detected during the installation and must be corrected. The safety control must not be used until all wiring errors (no missing or incorrect external connections) are corrected.

Concept for possible error detection and error prevention:

- Error indication by LEDs which are not lighted:
In normal operation and when the lift is in the station with closed doors, all LEDs on the board should be lighted. It is therefore absolutely necessary to monitor the LEDs and in case of a not lighted LED to find the cause of it.
- Detecting errors using the automatic testing of safety control:
If safety control detects an error, the „µP“ LED starts flashing and the piezo-buzzer starts beeping.
- Prevention of errors by suitable wiring management.
Errors in the output circuit are detected by a functional test.

Plausibility check: (Testing of the correct function)

- Redundant (twice arranged) transmitters and sensors for safety functions are subjected to an examination for plausibility by ENA3 safety control. The functional test is carried out for all possible combinations of the two transmitters. If a plausibility-error occurs the safety control shuts down automatically.
- The feedback contacts of the brake actuator must be wired and evaluated properly, otherwise the safety control would also shut down during the plausibility check.

Self-test of outputs:

- On power supply or after a reset, ENA3 performs a self test for the first 5 times when the car is in a door zone with open safety circuit . After the first 5 trips the self-test is carried out every day.
The relays R1, R2, R3 switch during a test.
 - With an open safety circuit (door opens) the test is carried out after about 2 seconds

- With a closed safety circuit the test is not performed

On a new drive the relay R4 switches quickly on/off upon exiting the door zone.

In case of pre-opening of doors it must be ensured that the brake has already fallen before the self-test is performed.

- Disruptions of the peripheral wiring lead to the shutdown of the lift.
- Errors while switching of safety relay lead to the shutdown of the lift.

Display the type of error:

The ENA3 safety control detects different types of errors. It saves them and displays (report) them visually and acoustically.

Only by pressing the ENA3 reset button it is possible to clear errors.

- Actual UCM error (unintended car movement).
If the lift is not in the door zone such an error will result in immediate shutdown of the lift.
ENA3 displays the error by 2-time blinking of the LED and peeping of the buzzer.
- Errors of the UCM-brake actuator or feedback contact.
This error will result in an immediate shutdown of the lift in the door zone.
ENA3 displays the error by 3-time blinking of the LED and peeping of the buzzer.
- Error in the microprocessor or in the electronic circuit.
This error will result in an immediate shutdown of the lift in the door zone.
ENA3 displays the error by 4-time blinking of the LED and peeping of the buzzer.
- Malfunction in the control or within an output relay.
This error will result in an immediate shutdown of the lift in the door zone.
ENA3 displays the error by 5-time blinking of the LED and peeping of the buzzer.

Cause of error	Error code	Troubleshooting
Error of safety relais (R1,R2,R3)	1-fold flashing of the LEDs μ P and simultaneous acoustic signal	Check supply voltage 24VDC! Then press the ENA3 reset key. If the error is still present, the device must be replaced.
Actual UCM error UCM	2-time blinking of the LEDs μ P and peeping of a buzzer	Push ENA3 Reset button
Errors of the UCM-brake actuator or feedback contact	3-time blinking of the LEDs μ P and peeping of a buzzer	Check the brake actuator and the feedback contact Then push ENA3 Reset button
System error in the microprocessor or in the electronic circuit	4-time blinking of the LEDs μ P and peeping of a buzzer	Push ENA3 Reset button If the error occurs again you have to replace the control unit
Error safety relay (R4)	5-time blinking of the LED μ P and peeping of a buzzer	Push ENA3 Reset button. If the error persists the device must be replace.
Error of the magnetic switches	6-time blinking of the LED μ P and beeping of the buzzer	Check the magnet switches and if they were installed correctly. Both magnetic switches must always switch simultaneously.
Error of input - safety circuit tap	7-fold flashing of the LEDs μ P and simultaneous acoustic signal	Check the safety circuit tap. Then press the ENA3 reset key. If the error persists, the device must be replaced.
System error - error in the microprocessor or electronic circuit.	8-fold flashing of the LEDs μ P and simultaneous	Press the ENA3 reset key If the error persists, the device must be replaced.

Error-Reset:

It is not possible to bring the unit back in operation (reset) by switching on and off the supply voltage.

The error is stored permanently. Only by pressing the reset button on the control board the error of the UCM safety circuit will be cleared and the lift should get back in normal operation, as far as the UCM-brake actuator does not require additional measures. (for example, release of safety gear, etc.)

Maintenance:

There are no direct services or maintenance measures necessary. The safety control must always be kept clean and dry. It must be ensured that the safety control is replaced after an operating period of 10 years or 3.5 million drives because the specified product life cycle of the safety relay has been reached or exceeded.

Disposal and Recycling:

Unusable or irreparable devices and devices which have exceeded their lifecycle have to be disposed in accordance to the applicable waste disposal regulations for electronic waste. The plastic housing can be disposed as residual waste.

Included in delivery:

The scope of delivery includes the safety control ENA3, the manual and two special magnetic switches (Encoder Typ C1511FDA0300S) for monitoring of the door zone.

The ENA3 safety control will be delivered in a plastic housing which can be fixed on a DIN rail and should be installed in the control box of the lift.

The safety control system needs a power supply of 24 VDC (+ / - 10%).

On request, the necessary magnetic tape (20cm per stop), a power supply for a supply voltage of 115V to 230V can be delivered as well.

In addition the unit can be installed and delivered in an industrial plastic housing (IP65).

Ordering information and spare parts:

Title	Description	Part number
ENA3 Control 24V incl. magnetic switches	Mounted in a plastic housing for DIN rail mounting with needed magnet switches	ENA3_V2MS
ENA3 Control 24V excl. magnetic switches	Mounted in a plastic housing for DIN rail mounting with needed magnet switches	ENA3_V2XX
ENA3 Magnetic switches	2x monostable magnetic switches (redundant version) incl. mounting kit	MS-KIT
ENA3 EX magnetic switches	2x monostable magnetic switches in explosion-proof design incl. mounting kit	MS-EX-KIT
Magnetic tapes	for door zone 20cm	MAG-BAND-020
Fixation kit for magnetic tapes	for indirect mounting of 2 magnetic strips on the guide rails,	MAG-BAND-BEF
Power Supply 110V to 230V	DIN rail power supply for 24VDC supply voltage ENA3	MDR-6024
ENA3 with emergency power supply	ENA3 control unit incl. solenoid switch and an intelligent emergency power unit NSE with various additional functions for UCM brake actuators which must continue to be supplied in the event of a power failure (e.g. overspeed governor).	ENA3-NSE-BOX

Other designs and special solutions on request.

EU – Konformitätserklärung EU – Declaration of Conformity

Wir **VARIOTECH** Produktions- und HandelsgesmbH

We Name des Anbieters – Suppliers name

Gewerbeweg 5
A-2230 Gänserndorf
Anschrift / Adress

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

ENA3-UCM-Steuergerät
ENA3-UCM-Control device

Diese Konformitätserklärung entspricht der Europäischen Norm ISO/IEC 17050-1: 2010 06 01 „Allgemeine Anforderungen für Konformitätserklärungen von Anbietern“.

Typenreihen: ENA3_VXXX

Bezeichnung, Typ oder Modell, Los, Chargen- oder Seriennummer, möglichst Herkunft und Stückzahl
name, type or model, batch or serial number, possibly sources and number of items

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)

EN81.20, EN81.50,

This declaration of conformity is suitable to the European standard ISO/IEC 17050-1: 2010 06 01. "General criteria for supplier's declaration of conformity".

EN 12015, EN 12016

EN60068-2-6, EN60068-2-27, EN60068-2-14

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-1-11-0282-EUES-4

Anbringung der CE- Kennzeichnung: CE0408

Affixation of the CE mark: CE0408


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Gänserndorf
30.04.2021

Georg Spitzer
Geschäftsführer / General manager

Ort und Datum der Ausstellung
Place and date of issue

Name und Unterschrift oder gleichwertige Kennzeichnung des Befugten
Name and signature or equivalent marking of authorized person

EU-Baumusterprüfbescheinigung

nach EU Richtlinie für Aufzüge 2014/33/EU

Certificate of EU-Type Examination

according EU Directive for Lifts 2014/33/EU

Produkt / Product: Elektrisches, elektronisches sowie programmierbares System für sicherheitsbezogene UCM-Anwendungen für Aufzüge

Electrical, electronic and programmable system for safety related UCM-applications for lifts

Type / Type: ENA3-Steuergerät / ENA3-Control device

Antragsdatum / Date of application:
13.10.2020

Bescheinigungsnummer / Certificate number:
TÜV-A-AT-1-11-0282-EUES-4

Zugelassene Stelle / Approved body:
TÜV AUSTRIA SERVICES GMBH
Deutschstraße 10
A-1230 Wien
ID-Nr.: 0408

Bescheinigungsinhaber / Certificate holder:
VARIOTECH GmbH
Gewerbeweg 5, A-2230 Gänserndorf, AT

Prüfstelle / Test laboratory:
TÜV AUSTRIA SERVICES GMBH
Deutschstraße 10, A-1230 Wien, AT

Hersteller / Manufacturer:
VARIOTECH GmbH
Gewerbeweg 5, A-2230 Gänserndorf, AT

Prüfgrundlage:
Basis of examination:
EN 81-20:2014, 5.6.7.7
EN 81-50:2014, 5.6, 5.8

Datum und Nummer des Prüfprotokolls:
Date and number of laboratory report:
30.04.2021, 2021-AT-0063

Bemerkungen: Das geprüfte Produkt erfüllt die Prüfgrundlagen im Rahmen des im Anhang 1 dieser Bescheinigung definierten Anwendungsbereichs.
Remarks: *The product fulfils the base of examination in the scope of application, defined in the annex 1 of this certificate.*

Verbreitung dieser Bescheinigung nur im Ganzen mit Anhang 1 und darin angeführten Unterlagen.
Spread of this certificate allowed complete only with annex 1 and documents called there.

02.05.2021
Gültig ab
Valid from

Ing. Thomas Maltet
Zertifizierungsstelle
Certifying Department

siehe Anhang 1, Abschnitt 3
see Annex 1, clause 3
gültig bis / valid until



Auszugsweise Vervielfältigung nur mit Genehmigung der TÜV AUSTRIA SERVICES GMBH gestattet
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TÜV AUSTRIA SERVICES GMBH

Notified Body 0408

Anhang 1 zu / Annex 1 to EU-Baumusterprüfbescheinigung / Certificate of EU-Type Examination TÜV-A-AT-1-11-0282-EUES-4

Wien, 02.05.2021

Dieser Anhang wurde erstellt in: Deutsch / German
This annex has been issued in: Englisch / English

1. Anwendungsbereich / Scope of application

1.1 Kurzbeschreibung/ Short description:

Die Sicherheitssteuerung „ENA3-Steuergerät“ ist für den Einsatz in der elektrischen Sicherheitskette eines Aufzugs bestimmt. Sie besteht aus einem fehlersicheren Steuerungsmodul und dazugehörigen Sensoren bzw. Magnetschaltern. Die Ansteuerung des Bremslements gemäß EN 81-20:2014, 5.6.7 und ein Überwachungseingang zur Diagnose der richtigen Funktion dieses Bremslements sind im Steuerungsmodul vorhanden. Die Bremslemente (Bremsaktoren) selbst sind nicht Teil des Auswertegerätes „ENA3-Steuergerät“. Als Bremsaktoren können Einrichtungen verwendet werden, welche nach den Anforderungen der EN 81-20:2014 geprüft und bescheinigt wurden und die in der Lage sind, den Aufzug innerhalb der vorgeschriebenen Wegstrecke zum Stillstand zu bringen und im Stillstand zu halten. Dies sind beispielsweise geprüfte Treibscheibenbremsen, (beidseitig wirkende) Fangvorrichtungen in Kombination mit einem/einer entsprechend geprüften und bescheinigten Geschwindigkeitsbegrenzer, Seilbremse, Schienenbremse oder Sicherheitsventilen, welche einer UCM-Baumusterprüfung unterzogen worden sind. Das Sicherheitssystem „ENA3-Steuergerät“ besteht aus den Sensoren, der programmierbaren elektronischen Auswerteeinheit und dem Aktor.

The safety control "ENA3-Control device" is designed for the use in the electric safety chain for lifts. It consists of a fail-safe control module and associated sensors and magnetic switches. The control of the stopping element according to EN 81-20:2014, 5.6.7 and a monitoring input for the diagnosis of the correct function of the stopping element are existing in the control module. The stopping elements (stopping actuators) themselves are not part of the evaluation device "ENA3-Control device". As stopping elements (stopping actuators) devices can be used, which have been examined and certified in accordance with the requirements of EN81-20:2014 and which are able to stop the lift within the required distance and to keep it stopped. These include examined and certified traction sheave brakes, (bi-directional) safety gears in combination with an accordingly examined and certified overspeed governor, rope brake, guide rail brake or safety valves for which an UCM-type examination has been subjected. The safety system "ENA3-Control device" consists of sensors, the programmable electronic evaluation unit and the actuator.

Folgende Anforderungen wurden definiert / The following requirements were defined:

➤ EN 81-50: 2014, 5.6:

Baumusterprüfung für Sicherheitsschaltungen mit elektronischen Bauelementen und/oder programmierbaren elektronischen Systemen (PESSRAL).

Type examination of safety circuits containing electronic components and/or programmable electronic systems (PESSRAL).

➤ EN 81-50: 2014, 5.8:

Baumusterprüfung für Schutzeinrichtungen gegen unbeabsichtigte Bewegungen des Fahrkorbs.
Type examination of unintended car movement protection means.

➤ EN 81-20: 2014, 5.6.7.7:

Die unbeabsichtigte Bewegung des Fahrkorbs muss durch eine elektrische Sicherheitseinrichtung nach 5.11.2 spätestens beim Verlassen der Entriegelungszone erkannt werden (5.3.8.1).

The unintended movement of the car shall be detected by an electric safety device in conformity with 5.11.2 at latest when the car leaves the unlocking zone (5.3.8.1).

➤ Zusätzliche Anforderungen / Additional requirements:

Unbeabsichtigte Bewegung des Fahrkorbs von der Haltestelle weg bei geöffneter / geöffneten Fahrkorb- und / oder Schachttüre(n).

Unintended car movement away from the landing with open car door(s) and / or landing door(s).

Überwachung des ordnungsgemäßen Öffnens oder Schließens des Bremsesementes gemäß EN 81-20:2014, 5.6.7.

Monitoring of the correct lifting or dropping of the mechanism of the stopping element according to EN 81-20:2014, 5.6.7.

1.2 Das Sicherheitssystem "ENA3-Steuergerät" setzt sich aus folgenden Teilsystemen zusammen:
Safety system "ENA3-Control device" consists of the following partial systems:

➤ Kombination von Sensoren / Combination of sensors:

Sensor Eingang / *Sensor Input*: 1 & 3

Sensor Eingang / *Sensor Input*: 2 & 3

Abgriff der elektrischen Sicherheitskette; Eingang: 10
Connection of the electric safety chain; Input:

Gemeinsamer Leiter der elektrischen Sicherheitskette; Eingang: 11
Common of the connections to the electric safety chain; Input:

Eingang für Diagnosesensor Bremsselement: 4 & 5 (NO) oder / or 5 & 6 (NC)
Input of the diagnosis sensor of the stopping element:

➤ Logik (Überwachungsgerät) / Logic (monitoring device):

Auswerteplatine / *Evaluation Print*: ID Nr. ENA3v120

➤ Aktoren / Actuators:

Relais K1, K2 & K3 in der elektrischen Sicherheitskette; Ein- und Ausgang: 14 & 15
Relais K1, K2 & K3 in the electric safety chain; In- and Output:

Sicherheits-Relais K1 & K2 im Energiefluss des Bremseslements; Ein- und Ausgang: 16 & 17
Safety relay K1 & K2 in the supply of the stopping element; Input & output:

Diagnosekanal-Relais K4*) im Türüberbrückungskanal für Einfahren und Nachstellen bei offenen Türen; Ein- und Ausgang: 12 & 13

Diagnosis channel relay K4) in the door overbridging channel for levelling and re-levelling with doors open; In- and Output:*

*) Ohne Türüberbrückungskanal ist die Einbindung nicht erforderlich.

*) *Without the door overbridging channel the wiring is not required.*

➤ Verbindungen / *Connections:*

Verdrahtungsleitungsquerschnitt / *Wiring cable cross-section:* $\geq 0,75 \text{ mm}^2$

Kabel des Sensors / *Cable of the sensor:* $\leq 1,7 \text{ m}$ Länge / *Length* $< 0,75 \text{ mm}^2$
 $> 1,7 \text{ m}$ Länge / *Length* $\geq 0,75 \text{ mm}^2$

2. Bedingungen und Voraussetzungen / *Conditions and Preconditions*

2.1 Versorgungsspannung / *Supply voltage:* 24 VDC +/- 10%

2.2 Abgriffspannung der elektrischen Sicherheitskette: 48 - 230 VAC / max. 24 - 200 VDC
Voltage of the connection to the electric safety chain:

2.3 Spannung des Stromkreises 12/13 & 14/15: max. 230 VAC / max. 24 VDC
Voltage of the circuit 12/13 & 14/15:

2.4 Spannung des Stromkreises 16/17: max. 230 VAC / max. 24 VDC
Voltage of the circuit 16/17:

2.5 Überspannungskategorie / *Overvoltage category:* III

2.6 Isolierstoffgruppe / *Isolation material group:* III

2.7 Inhomogenes Feld / *Inhomogeneous field*

2.8 Verschmutzungsgrad / *Degree of contamination:* 3

2.9 Überlast-/Kurzschlussschutz der elektrischen Sicherheitskette: max. 2,5 A, integriert auf Platine
Overload-/short circuit protection of the electric safety chain: max. 2,5 A, integrated on print

2.10 Überlast-/Kurzschlussschutz des Überbrückungsstromkreises zum Einfahren und Nachstellen: max. 2,5 A
Overload-/short circuit protection of the overbridging circuit for levelling and re-levelling:

2.11 Überlast-/Kurzschlussschutz des Bremsenelementstromkreises: max. 3A
Overload-/short circuit protection of the stopping element circuit:

2.12 Schutzgrad: IP 00 (Platine), einzubauen in einem geschützten und geerdeten Gehäuse $\geq \text{IP2X}$
Degree of protection: IP 00 (circuit board), to be installed in a protected and grounded enclosure $\geq \text{IP2X}$

2.13 Schutzgrad des Sensors*) / *Degree of protection of the sensor*):* min. IP 54

2.14 Betriebstemperatur / *Operating temperature:* $-5^\circ\text{C} - 55^\circ\text{C}$

2.15 Relative Luftfeuchte Betrieb: 15% - 95% ohne Kondensation
Operating relative humidity: 15% - 95% without condensation

2.16 Lager- und Transporttemperatur / *Storage and transport temperature:* $-25^\circ\text{C} - 70^\circ\text{C}$

- 2.17 Relative Luftfeuchte Lager / Transport: 5% - 95 % ohne Kondensation
Storage / transport relative humidity: 5% - 95 % without condensation
- 2.18 Luftdruck / *Air pressure*: 1013 hPa - 800 hPa bis/up to 2000 m über/over NN
- 2.19 Identifikationsnummer der Platine / *Identification number of PCB*: ENA3v120
- 2.20 Systemreaktionszeit / *System reaction time*: max. 70 ms
- 2.21 Zonenlänge / *Zone length*: max. gemäß / *according to* EN 81-20:2014, 5.3.8.1
- 2.22 Softwareversionsnummer / *Software version number*: ENA3v120
- 2.23 Software signature / *Software signature*: 0xf857
- 2.24 Wahrscheinlichkeit eines gefahrbringenden Ausfalls pro Stunde PFH_D: 8,69 E-08
Probability of dangerous Failure per Hour PFH_D:
- 2.25 Diagnosedeckungsgrad / *Diagnostic coverage DCavg*: 67,37%
- 2.26 Fehler gemeinsamer Ursache / *Common Cause Failure CCF*: 80 Punkte / *80 points*
- 2.27 Proof-Test-Intervall / *Proof-Test-Interval*: 20 Jahre / *20 years*
- 2.28 Elektromagnetische Verträglichkeit / *Electromagnetic compatibility*: EN 12015:2014 & EN 12016:2013
- 2.29 Vibrationsfestigkeit / *Vibration resistance*: EN 81-50:2014, 5.6.3.1
- 2.30 Verbindungen / *Connections*:
- i. Verdrahtungsleitungsquerschnitt / *Wiring cable cross-section*: min. 0,75mm²
(geschützte Verlegung / *protected installation*)
 - ii. Kabel des Sensors*) / *Cable of the sensor*)*: ≤1,7m Länge / *Length <0,75 mm²*
>1,7m Länge / *Length ≥0,75 mm²*
(geschützte Verlegung / *protected installation*)
- *) Zwei unabhängige Geberelemente: EN 81-20:2014, 5.11.2.5, EN 81-50:2014, 5.6.3.1.2
Two self-contained transmitter elements:

Wahrscheinlichkeit eines gefahrbringenden Ausfalls pro Stunde PFHD des Geberelementes
Probability of dangerous Failure per Hour PFHD of the transmitter element: ≤10⁻⁸

- 2.31 Kabellänge des Türstromkreises / *Cable length of the door circuit*:
- i. ≤200,0 m geschützte Verlegung / *protected installation*
 - ii. oder >200,0 m mit zusätzlichen Maßnahmen und geschützte Verlegung
or >200,0 m with additional measures and protected installation
- 2.32 Diagnosetestintervall / *Diagnostic-Test-Interval*:

Bei jeder Zustandsänderung, längstens jedoch nach 24 Stunden. Alle genannten Sicherheitsfunktionen können ihr Sicherheitsniveau nur dann erreichen, wenn die zugehörige Hardwareumgebung „Bremsenelement“ mindestens denselben Anforderungen des jeweiligen Sicherheitsniveaus genügt.

At the next operating sequence, but not later than after 24 hours. All these safety functions can just achieve their safety level, if the associated hardware environment of the "stopping element" meets at least the same requirements of each safety level.

2.33 Manueller Wiederanlauf / *Manual restart:*

Nach Auslösen einer Sicherheitsfunktion muss der sichere Zustand aufrechterhalten bleiben, bis der sichere Zustand für einen Wiederanlauf gegeben ist und die manuelle Rückstelleinrichtung (Quittierfunktion: Reset-Taster auf ENA3-Steuergerät) betätigt wurde.

After the triggering of a safety function, the system must remain held in a secure state until a manual reset is performed for a restart (reset function: reset button on ENA3-Control device).

2.34 Systematischer Ausfall / *Systematic failure:*

Grundlegende und bewährte Sicherheitsprinzipien, bewährte Bauteile, Maßnahmen zur Beherrschung systematischer Ausfälle, Maßnahmen zur Vermeidung systematischer Ausfälle (Organisation, Management und Technik) und Maßnahmen zur Vermeidung systematischer Ausfälle während der Integration (Organisation, Management und Technik) sind anzuwenden.

Basic and proven safety principles, proven components, measures to control systematic failures, measures to avoid systematic failures (organization, management and technology) and measures to avoid systematic failures during the integration (organization, management and technology) are applied.

2.35 Die entsprechenden Einzelkomponentengrenzwerte und deren Installationsrichtlinien sind einzuhalten. *The corresponding individual components limits and their installation guidelines must be followed.*

2.36 Die Baumusterprüfbescheinigung, die Konformitätserklärung und die Betriebsanleitung sind der Anlagendokumentation beizulegen. Diese Dokumente dienen zur Prüfung vor der Inbetriebnahme, zur wiederkehrenden Prüfung, Prüfung nach wesentlichen Änderungen und nach einem Unfall.

The certificate of type examination, the declaration of conformity and the operating manual shall be enclosed to the system documentation. These documents are used for examinations and tests before putting into service, for periodical examinations and tests, examinations and tests after an important modification or after an accident.

3. Anmerkungen und Hinweise / *Remarks and advices*

3.1 Folgende sicherheitsbezogene Anwendungen wurden analysiert und realisiert. Anhand von Gefahrenanalysen und anschließender Gefahrenbewertungen wurden die notwendigen Schutzniveaus ermittelt und durch die entsprechenden Spezifikationen erreicht.

The following safety-related applications have been analyzed and implemented. The required safety protection levels have been identified from risk analysis and subsequent risk assessments based on the appropriate specifications.

- Erkennung einer unbeabsichtigten Bewegung des Fahrkorbs bei geöffneten Türen von der Haltestelle weg, Auslösung und Überwachung des Bremseselementes gemäß EN 81-20:2014, 5.6.7.

Detection of unintended car movement away from the landing with open doors, the activation and monitoring of the stopping element according to EN 81-20:2014, 5.6.7.

SIL_{gefordert/required}: 2

SIL_{erreicht/reached}: 2

3.2 Am Bauteil muss ein Schild mit folgenden Angaben zur Identifikation angebracht sein:
For identification, a label must be placed on the device, indicating the following:

- Herstellerangaben / *Manufacturers data* (*)
- Typenbezeichnung / *Type*
- Baumusterprüfkennzeichen / *Type examination certificate number*

(*) Herstellerangaben entsprechend Europäische Richtlinie für Aufzüge 2014/33/EU, Artikel 8 (6)
Manufacturers data according European Directive for Lifts 2014/33/EU, Article 8 (6).

3.3 Diese Bescheinigung darf nur im Ganzen und mit den Unterlagen nach Punkt 4 dieses Anhangs 1 zur Bescheinigung verbreitet werden.

This type examination certificate must be spread just together with all documents according clause 4 of this annex 1 to the type examination certificate.

3.4 Änderungen der Einrichtung sind der Zertifizierstelle schriftlich mitzuteilen. Diese entscheidet, ob und in welchem Umfang Ergänzungsprüfungen des geänderten Prüfgegenstands erforderlich werden.

Modification of the device must be reported to the certification body in written. It is in its decision, if and in which scope any modification makes additional tests necessary.

3.5 Die vergebene Bescheinigungsnummer darf nicht für andere Produkte verwendet werden, die nicht mit dem geprüften Produkt übereinstimmen.

This type examination number must not be used for any other products, which are not fully in compliance with the tested product.

3.6 Bei Änderungen bzw. Ergänzungen der auf der Bescheinigung angeführten Prüfgrundlagen kann eine Überarbeitung dieser Bescheinigung notwendig werden.

Modification(s) and/or amendment(s) of the basis of examination, which is listed on the certificate, may make a revision of this certificate necessary.

3.7 Voraussetzung des Einsatzes dieser Einrichtung ist unter anderem, dass diese im Rahmen ihres Inverkehrbringens als Sicherheitsbauteil nach Aufzugsrichtlinie 2014/33/EU die für das Inverkehrbringen von Sicherheitsbauteilen geltenden Bedingungen der Richtlinie 2014/33/EU, Artikel 15 (Überwachung der Produktion) eingehalten werden. Dies, um sicherzustellen, dass die inverkehrgebrachten Einrichtungen mit dem geprüften Muster bzw. den geprüften Mustern übereinstimmen.

Die möglichen Verfahren zur Überwachung der Produktion der Einrichtung sind:

- a. Konformität mit der Bauart mit stichprobenartiger Prüfung bei Sicherheitsbauteilen für Aufzüge (Aufzugsrichtlinie 2014/33/EU, Anhang IX, Modul C 2).
- b. Konformität mit der Bauart auf der Grundlage der produktbezogenen Qualitätssicherung bei Sicherheitsbauteilen für Aufzüge (Aufzugsrichtlinie 2014/33/EU, Anhang VI, Modul E).

Precondition for application of this device is, beside others, that the requirements for placing the product on the market according European Directive for Lifts 2014/33/EU are kept for the device according European Directive for Lifts 2014/33/EU, Article 15 (surveillance of production). This is to assure, that the products, placed on the market are in compliance with the tested sample(s).

The possible procedures for surveillance of production of the device are:

- a. Conformity to type with random checking for safety components for lifts (Lifts Directive 2014/33/EU, Annex IX, Module C 2).
- b. Conformity to type based on product quality assurance for safety components for lifts (Lifts Directive 2014/33/EU, Annex VI, Module E).

3.8 Die Gültigkeit dieser Bescheinigung erlischt automatisch mit dem Eintreten mindestens eines der nachfolgenden Kriterien:

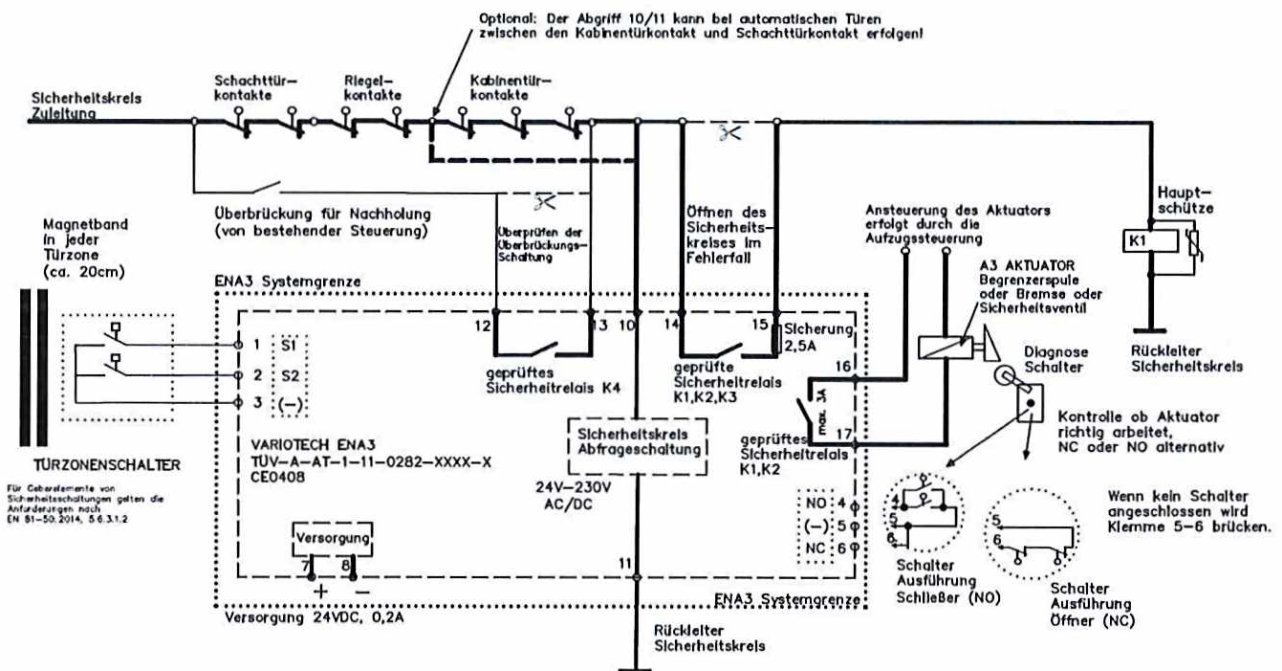
The validity of this certificate expires automatically upon the occurrence of at least one of the following criteria:

- a. Mit Streichung der EN 81-20:2020 oder der EN 81-50:2020 aus der Liste der harmonisierten Normen für Aufzüge und Sicherheitsbauteile für Aufzüge zur Unterstützung der Richtlinie 2014/33/EU des Europäischen Parlaments und des Rates.

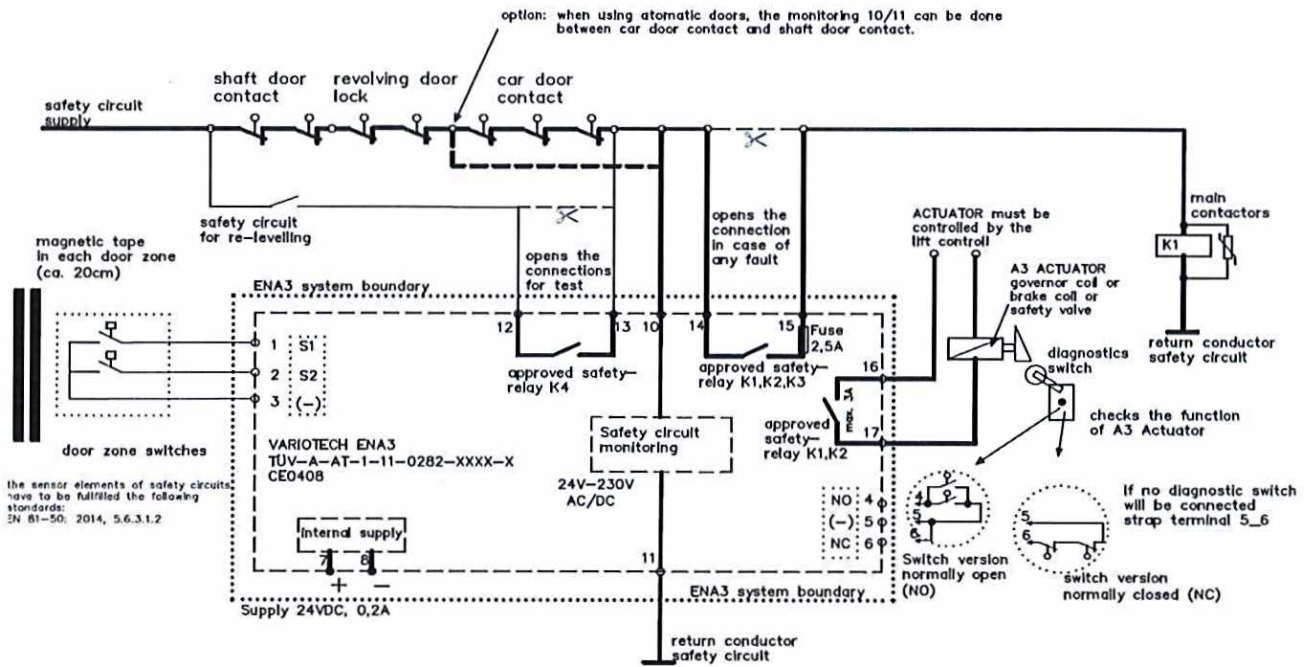
With deletion of EN 81-20:2020 or EN 81-50:2020 from the list of harmonised standards for lifts and safety components for lifts drafted in support of Directive 2014/33/EU of the European Parliament and of the Council.

4. Bilder, Diagramme, Skizzen, Zeichnungen / Pictures, diagrams, sketches, drawings

Zertifikatszeichnung ENA3 Seil – Hydraulik



Type examination diagram Traction lift – Hydraulik lift



Definition automatische Türen: Gleichzeitig bewegte, mechanisch gekuppelte Schacht- und Fahrkorb-türen.
 Definition automatic doors: Mechanically coupled car and landing doors.



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