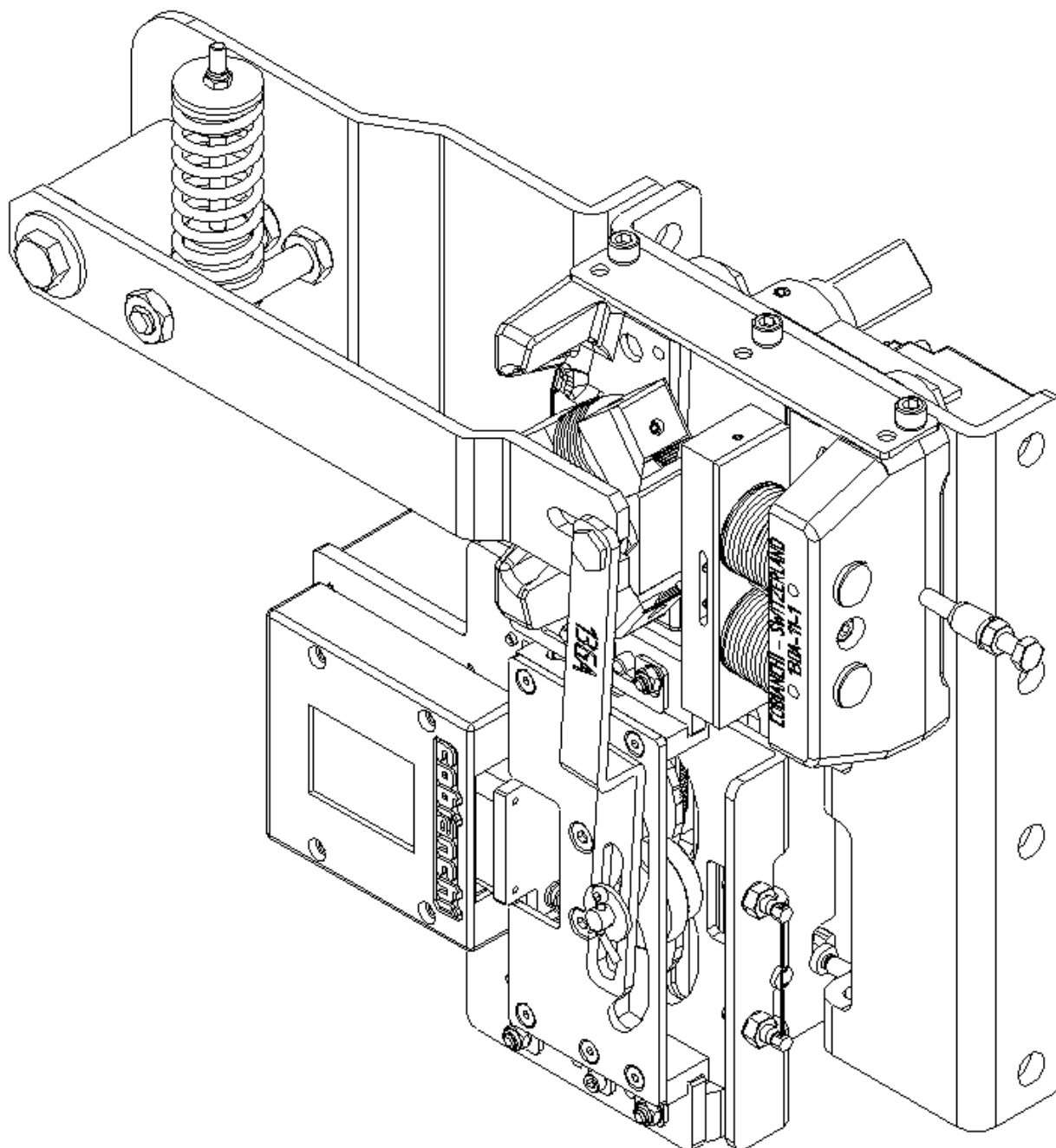


PC13G_REA operating manual

Electrically-triggered safety gear

PC13GAREA / PC13GOREA / PC13GUREA



Revision / Issue date / Language:

1.0 / September 2023 / English

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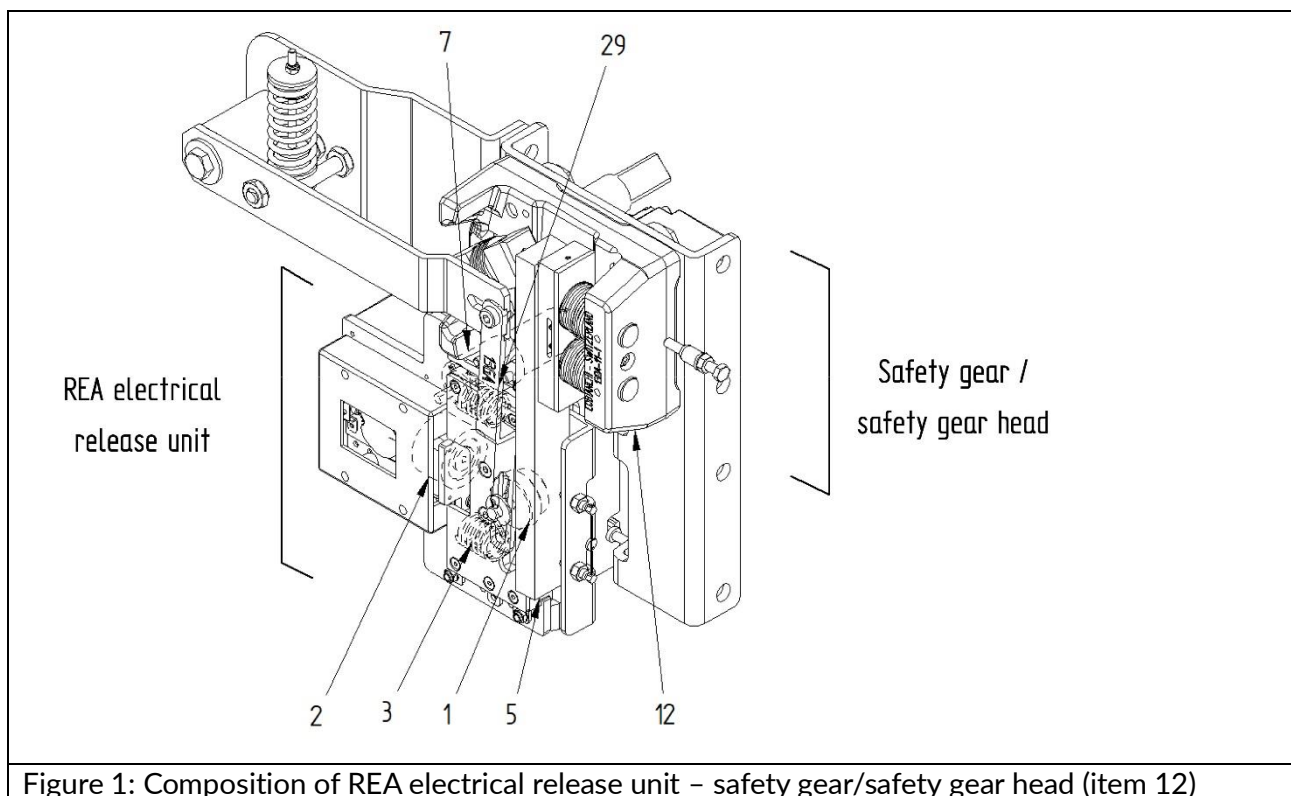
1. Description

1.1. Product layout and mode operation

Figure 1 shows the electrical release unit known as the REA, which is fitted to at least one safety gear head (left or right brake components on the safety gear pair).

If an event occurs, the REA release unit is actuated by the holding magnet (item 2) being de-energised and, as a result, the trigger roll (item 1) is pushed by a lifting motion on the guide rail (item 5) generated by the pressure springs (item 3). By coupling (item 29) the trigger roll (item 1) to the safety gear (item 12), this is engaged by the elevator car movement.

The reset motor (item 7) must be energised to reset the REA electrical release unit. The rotation generates a lifting motion via an excentric, which can be used to reset the trigger roll (item 1) with energised holding magnet (item 2) (pull away from the guide rail).



1.2. Proper use

The electrically-triggered safety gear described in this operating manual is intended as a safety component for a lift to perform safety-relevant functions. It is the lift manufacturer's responsibility to ensure that the overall functions are correct. The electrically-triggered safety gear is designed exclusively for the proper use described below. All specifications in this operating manual must be adhered to strictly. Modifications, conversions or changes to the design or individual parts or components of the electrically-triggered safety gear are prohibited.

Any types of claims due to improper use will be rejected. The owner of this product is solely liable for all damage due to improper use.

The Cobianchi Lifteile AG general terms and conditions apply.

1.3. General

This operating manual is intended to aid the frame manufacturers, the assembly operations and the maintenance companies when producing, marketing, operating and maintaining the products described below.

This operating manual documents the standard designs PC13GAREA, PC13GOREA and PC13GUREA, comprising safety gear PC13GA, PC13GO or PC13GU and the REA electrical release unit. The REA electrical release unit along with safety gear PC13GA/GO/GU have been tested for type examination (with an EU type examination certificate).

The electrically-triggered safety gear can be installed both on the elevator car and as a counter weight. The following describes use on the elevator car. This operating manual also applies accordingly to installation on the counter weight.

All power specifications on the type plate relate to use in pairs (two individual safety gear heads).

The unique serial numbers are embossed into all safety gear heads. These numbers must match those stuck on, as well as those on the enclosed type plate and must be able to be assigned to the lift's serial number (traceability of safety components).

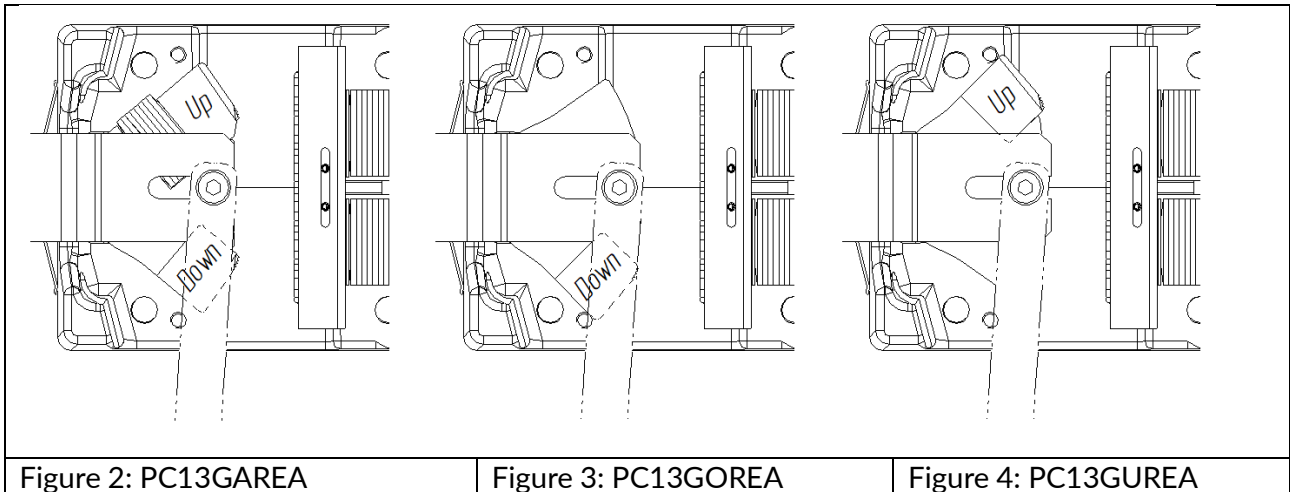
1.4. Design and installation variants

The various design and installation variants are provided on drawing 13GAREA-BA01-1. Only type PC13GAREA with a 180 mm width of installation is illustrated. Types PC13GOREA and PC13GUREA are designed to be identical.

Cobianchi provides order-related drawing data (2D/3D) on request. Customer-specific design and installation variants can be checked and implemented if needs be.

1.5. Type designations

1.5.1. Overview



1.5.2. PC13GAREA

Type PC13GAREA is double-acting. The two individual safety gear heads are connected/synchronised using a connection bar. The connection bar can be arranged “inside” or “outside”. If both safety gear heads are provided with an REA release unit, one connection bar can be omitted. When installed with gusset plates, “widths of installation” of 180 mm, 200 mm or 240 mm are available. When installed using an “external housing” (section 1.10), the outer dimensions are fixed. The REA release unit can be aligned downwards or upwards.

1.5.3. PC13GOREA

Type PC13GOREA is downward-acting (safety gear). The two individual safety gear heads are connected/synchronised using a connection bar. The connection bar can be arranged “inside” or “outside”. If both safety gear heads are provided with an REA release unit, one connection bar can be omitted. When installed with gusset plates, “widths of installation” of 180 mm, 200 mm or 240 mm are available. When installed using an “external housing” (section 1.10), the outer dimensions are fixed. The REA release unit can be aligned downwards or upwards.

1.5.4. PC13GUREA

Type PC13GUREA is upward-acting (brake unit). The two individual safety gear heads are connected/synchronised using a connection bar. The connection bar can be arranged “inside” or “outside”. If both safety gear heads are provided with an REA release unit, one connection bar can be omitted. When installed with gusset plates, “widths of installation” of 180 mm, 200 mm or 240 mm are available. When installed using an “external housing” (section 1.10), the outer dimensions are fixed. The REA release unit can be aligned downwards or upwards.

1.6. Safety gear

Types PC13GAREA and PC13GOREA can be used as safety gear (downwards) according to EU type examination certificate 01/208/4A/7112.00/23.

1.7. Braking device as part of the protection device against overspeed for the car moving in upwards direction (PDOU)

Types PC13GAREA and PC13GUREA have a braking device as part of the protection device against overspeed for the car moving in upwards direction.

1.8. Protective device against unintended car movement (UCM)

1.8.1. General

The PC13GAREA/PC13GOREA/PC13GUREA electrically-triggered safety gear form the braking subsystem and parts of the triggering system for the complete UCM system. Detection and control as part of the triggering system must be designed in an accordingly safe manner. Absolute Positioning Systems (APS) can meet these requirements. Based on the reaction times (APS and electrically-triggered safety gear), assembly operation of the lift must demonstrate the required conditions regarding distances (EN 81-20:2020, 5.6.7.5).

APS systems must meet the PESSRAL requirements. PESSRAL stands for “*Programmable Electronic System in Safety Related Applications for Lifts*”.

1.8.2. Calculated UCM certificate

The calculation for a UCM certificate for a traction drive lift based on EN 81-50:2020, section 5.8.1 when using a PC13GAREA double-acting electrically-triggered safety gear in conjunction with an APS system is described below.

Specified parameters:

- Normative (from EN 81-20:2020 and EN 81-50:2020):

Maximum possible drive acceleration downwards/upwards	$a_A=$	2.50	m/s ²	EN 81-50:2020, 5.8.1
Natural acceleration downwards/upwards	$a_n=$	1.50	m/s ²	EN 81-50:2020, 5.8.1 (remark)
Elevator car skirt	ECS=	0.75	m	EN 81-20:2020, 5.4.5.2
Elevator car height	ECH=	2.00	m	According to EN 81-20:2020, 5.4.1, the clear height must be at least 2 m
Maximum retraction speed	$V_0=$	0.80	m/s	EN 81-20:2020, 5.12.1.4

- PC13GAREA:

Max. REA reaction time	$t_{REA} =$	0.10	s	Time from power failure on the holding magnet to SG engaged fully
SG downwards deceleration (elevator car fully loaded)	$a_{SGDOWN} =$	6.00	m/s ²	according to EN 81-50:2020, 5.3.3 Set value
SG upwards deceleration (elevator car empty)	$a_{SGUP} =$	6.00	m/s ²	Set value

- APS system:

Door zone down/up (controller/APS parameter)	DZ=	0.15	m	The door zone is smaller than the unlocking zone in accordance with EN 81-20:2020, 5.3.8 by 0.2 m or 0.35 m
max. UCM APS reaction time	$t_{APS} =$	0.05	s	Time from UCM detection to disconnecting the voltage on the holding magnet and opening the safety circuit

Using these specified parameters, the elevator car comes to a stop at an upwards or downwards distance of 644 mm from the threshold.

Note: This certificate is based on typical parameters. Other lift, APS system and controller parameters may cause different stopping distances.

The calculation is provided in the appendix.

1.9. Design notices

The best possible access to the electrically-triggered safety gear for maintenance and repair should be guaranteed. The electrically-triggered safety gear should be able to be replaced when the guide rails are installed and the suspension present.

The electrically-triggered safety gear fastening in the frame must be calculated by the frame manufacturer depending on the application and based on the design, and the torque that occurs on the frame structure during a braking process, as well as the reaction forces must be able to be absorbed safely.

The guide rail (item 5) must be exactly central to the mounting plate (item 25) in order to be able to ensure that the required lateral movement of the electrically-triggered safety gear is sufficient (figure 5). Any screw connections or other components must not impair the required lateral movement and deflection of the moving parts during a braking process on the electrically-triggered safety gear. Depending on the position of the REA release unit, an emergency guide (item 36) is installed on the bottom or top of both safety gear heads (item 12), which must have a gap of 3 mm to the rail front surface (continuously from the shaft pit to the shaft head). This ensures that the

trigger roll (item 1) can engage sufficiently on the rail surface, e.g. when car guide elements fail when engaging.

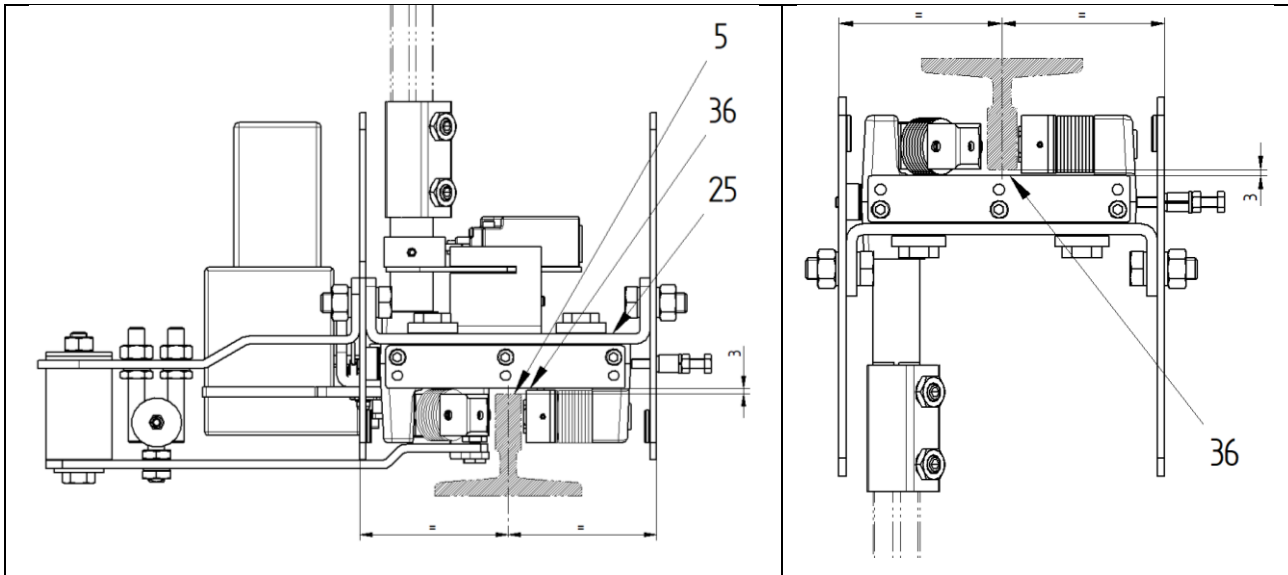


Figure 5: Positioning the guide rail (item 5) central to the mounting plate (item 25) and front gap of 3 mm to the emergency guide (item 36)

1.10. Installation with external housing

The electrically-triggered safety gear can also be installed using an external housing in accordance with figure 6. The mounting plates (item 25) described above in this operating manual are part (welded in) of the external housing in this case. The centre line of the external housing must coincide with the centre of the guide rail. This ensures that the required lateral movement and deflection of the moving parts during a braking process on the electrically-triggered safety gear are not impaired.

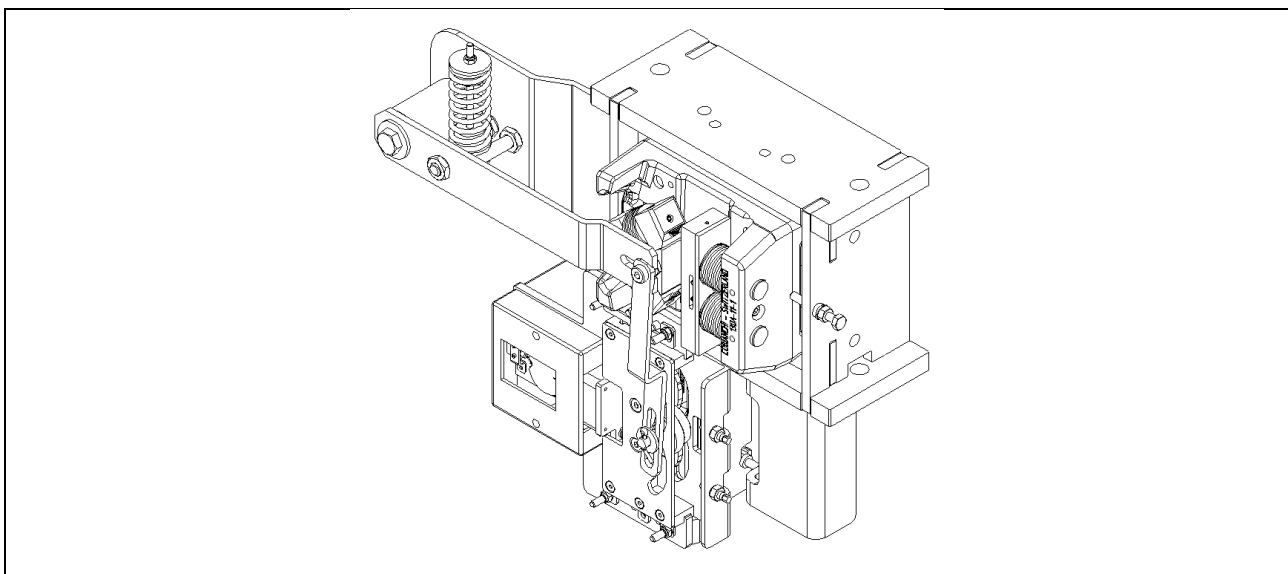


Figure 6: Attachment with external housing

1.11. Ambient conditions

The ambient conditions in the shaft according to EN 81-20:2020 must be adhered to.

The energised holding magnet heats up and warms the adjacent components. There is no risk of burns and the environment is barely affected.

The REA electrical release unit is protected by a housing. Excess contamination and water ingress must be prevented.

Use in corrosive or explosive atmospheres is prohibited.

1.12. Use in an elevator for fire department

The electrically-triggered safety gear can be used in an elevator for fire department in accordance with EN 81-72:2020 if suitable covers (at least IPX3 according to EN 60529:1991) are installed to protect from water. When installing the electrically-triggered safety gear below the elevator car, you must ensure that the shaft pit is deep enough to ensure that a gap of at least 0.5 m remains to the electrically-triggered safety gear at the highest permissible water level. The electrically-triggered safety gear manufacturer must be contacted about this. Assembly operation must prove that the normative requirements are met.

In addition to protecting against water (EN 81-72:2020, Annex D), a secondary power supply (EN 81-72:2020, Annex C) must be ensured.

1.13. Technical data

Designation (type):	PC13GAREA, PC13GOREA, PC13GUREA
Minimal surface of guide rails:	$n \geq 26$ mm (T lift guide rails in accordance with ISO 7465)
Downward braking force (nominal):	see type plate
Upward braking force (nominal):	see type plate (only for PC13GAREA or PC13GUREA)
Reaction time:	100 ms duration from power failure on the holding magnet to fully engaged electrically-triggered safety gear.
Adjustment amounts:	T guide rail head thickness (infinitely variable from 5.0 mm – 16 mm)
Sealing:	various seals with "C" embossing
Serial number:	assigned uniquely by the manufacturer, embossed or engraved on the component
Type plate:	3 stickers (serial number, guide rail head thickness, etc.)
Guide rail oil information label:	a green information label is supplied for oiled guide rails
Operating voltage:	24 VDC $\pm 10\%$ (directly on the holding magnet and the reset motor)
(including emergency power supply)	(Power supply: stabilised, SELV/PELV)
Holding magnet activation duration:	100 % AD
Recommended cable cross sections:	at least 0.75 mm ² for plugs XC1 and XC2 (figure 20)
Power per holding magnet:	5.2 W
Fuse per holding magnet:	0.25 mA (if not integrated into APS)
Power per reset motor:	max. 55 W (calculated with 2.3 A initial current)
Reset motor fuse:	1.25 A (M – medium lag time)
Reset motor runtime:	maximum of 3 minutes (in the event of a reset error) If the reset motor is blocked and the winder therefore gets hot, a thermal protection element is used to stop it. The reset motor starts to run again once it has cooled down.
Air gap to the guide rail:	at least 1.5 mm on both sides
Operating temperature:	+5°C - +40°C
Storage temperature:	+0°C - +50°C
Air humidity:	max. 95%, non-condensing
Self-monitoring:	max. 1 actuation cycle per 24h Switching to the ready position during each stop is not permitted (section 2.4).
Maximum service life:	15 years from "Manufacturing Date" (except for the emergency power supply)

For more data and conditions, see the EU type examination.

2. REA electrical release unit

2.1. Home position (open position)

In the home position when the safety gear is not actuated (figure 1, item 12), movement is possible, the trigger roll (figure 1) is not held by the energised holding magnet (item 2). The trigger roll (item 1) is far enough away from the guide rail (item 5) in the home position and this prevents engaging. The pressure springs (item 3) have maximum pre-tension in the home position.

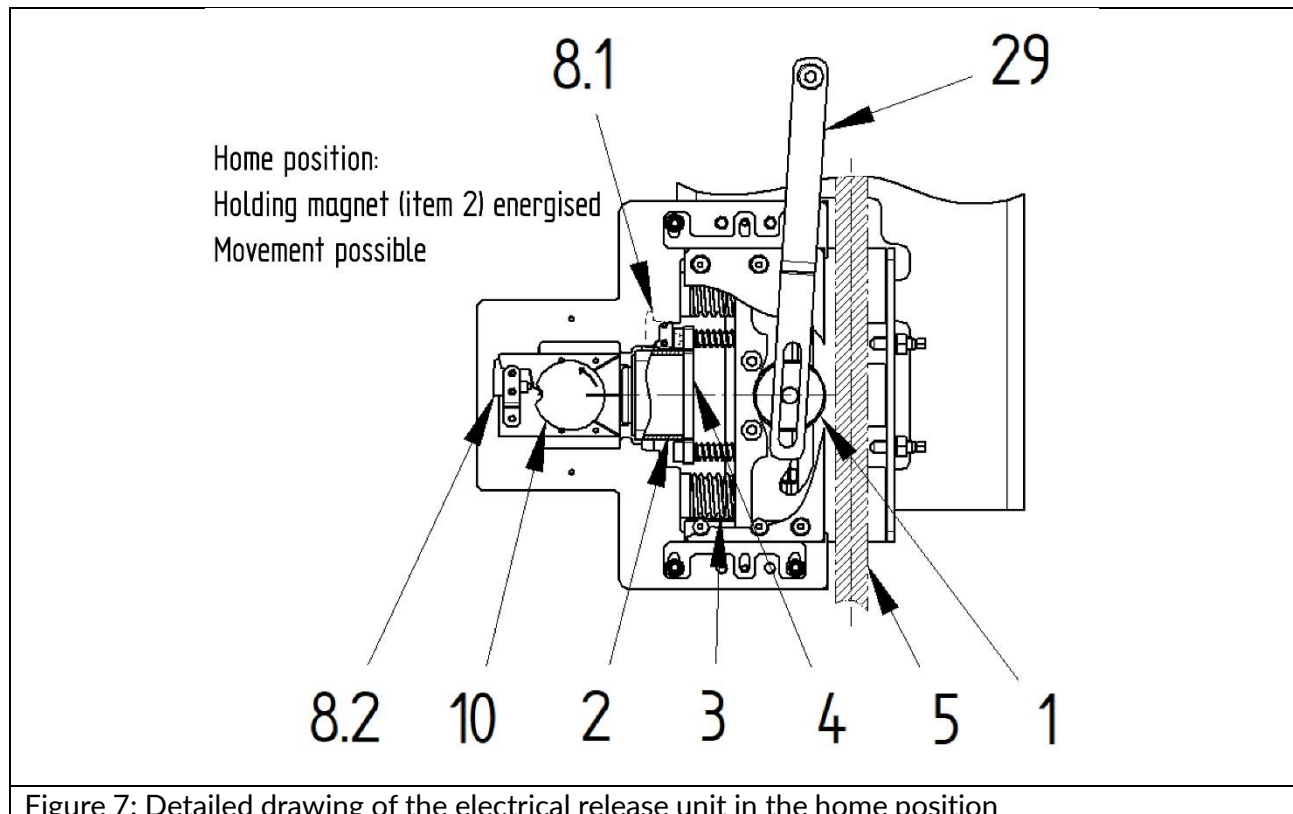


Figure 7: Detailed drawing of the electrical release unit in the home position

2.2. Triggering via PESSRAL

Triggering is performed via an electrical signal. PESSRAL uses a safety switch certified to SIL3 to interrupt the power supply to the holding magnet (item 2). The magnetic force drops and the coupling plate (item 4) releases from the holding magnet (item 2). The pressure springs (item 3) press the trigger roll (item 1) onto the guide rail (item 5). The elevator car movement moves the trigger roll (item 1) with its axle into the elongated hole on the coupling (item 29) and, when the end of the elongated hole is reached, the safety gear (figure 8, item 12) engages.

2.3. Ready position

In the ready position, the trigger roll (item 1) is pressing against the guide rail (item 5) but the safety gear (item 12) is not yet actuated. Once the elevator car moves, this moves the trigger roll (item 1) with its axle into the elongated hole on the coupling (item 29) and, when the end of the elongated hole is reached, the safety gear (item 12) engages. The status (engaged or not engaged) of the safety

gear (item 12) can be identified using the safety switches (figures 14 and 20, item 11, monitoring contact S2.2).

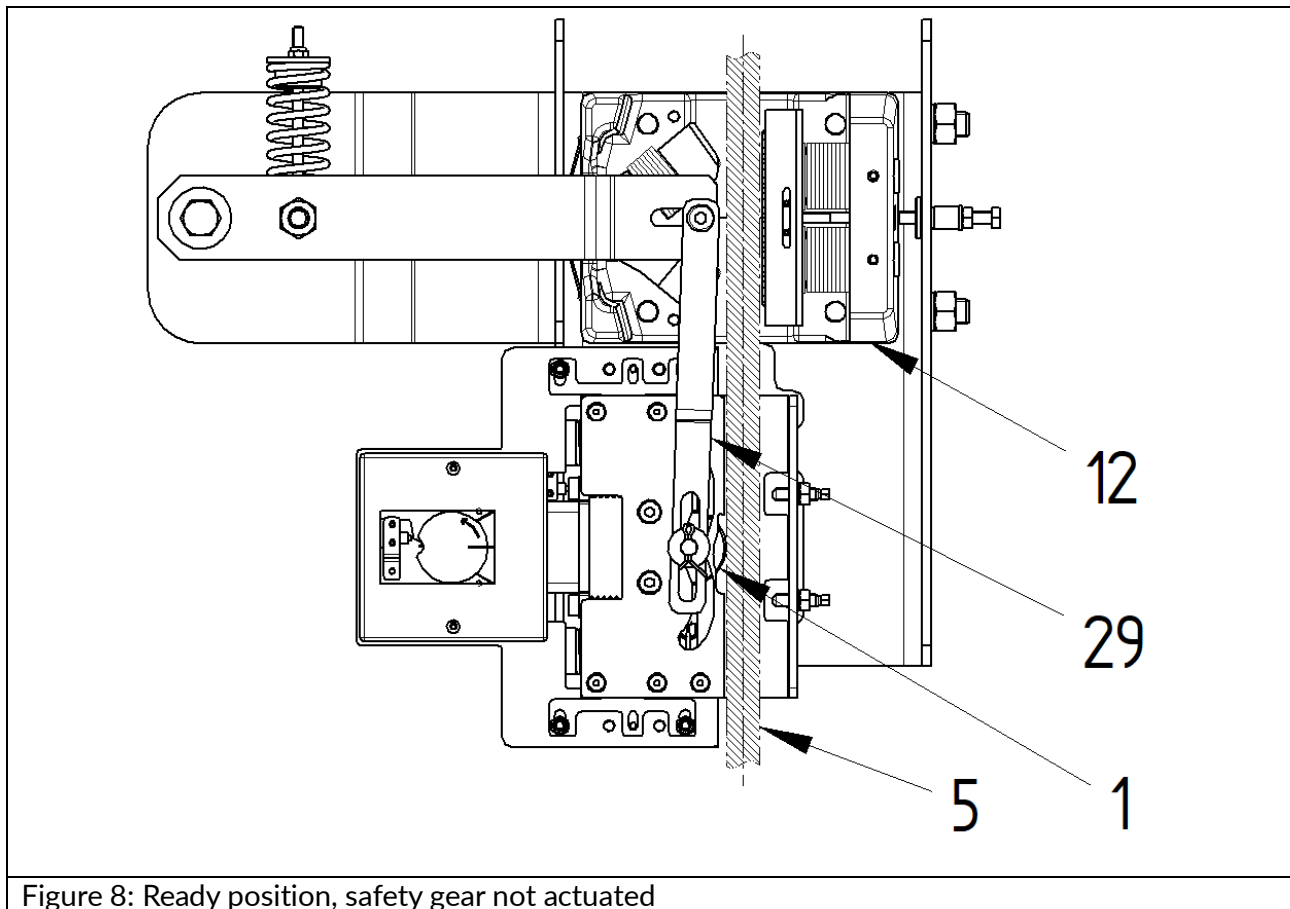
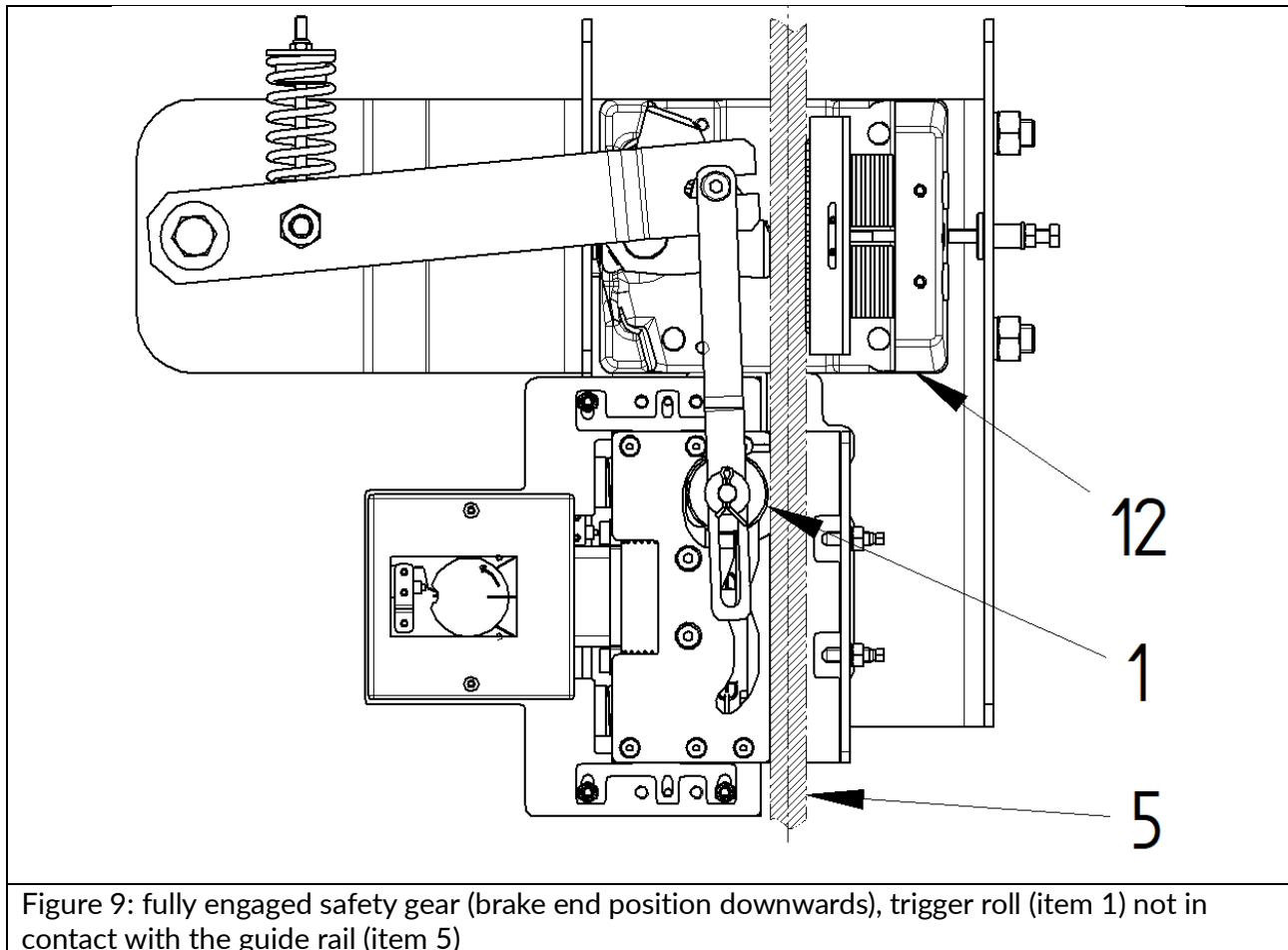


Figure 8: Ready position, safety gear not actuated

2.4. Brake end position

The brake end position is only reached if there is sufficient movement energy. Otherwise, the safety gear (item 12) remains in the braking area and the elevator car no longer moves. In the (top or bottom) brake end position for the safety gear (item 12), the trigger roll (figure 1) no longer contacts the guide rail (item 5). This ensures that the edge of the trigger roll (item 1) does not wear during the braking process (sliding along the guide rail) (see figure 9).

The safety switch (figure 14, item 11) on the electrically-triggered safety gear is actuated when reaching the brake end position at the latest (direct opening contact interrupts the safety circuit) and the monitoring contact (second contact in the safety switch (figures 14 and 20, item 11, monitoring contact S2.2)) switches.

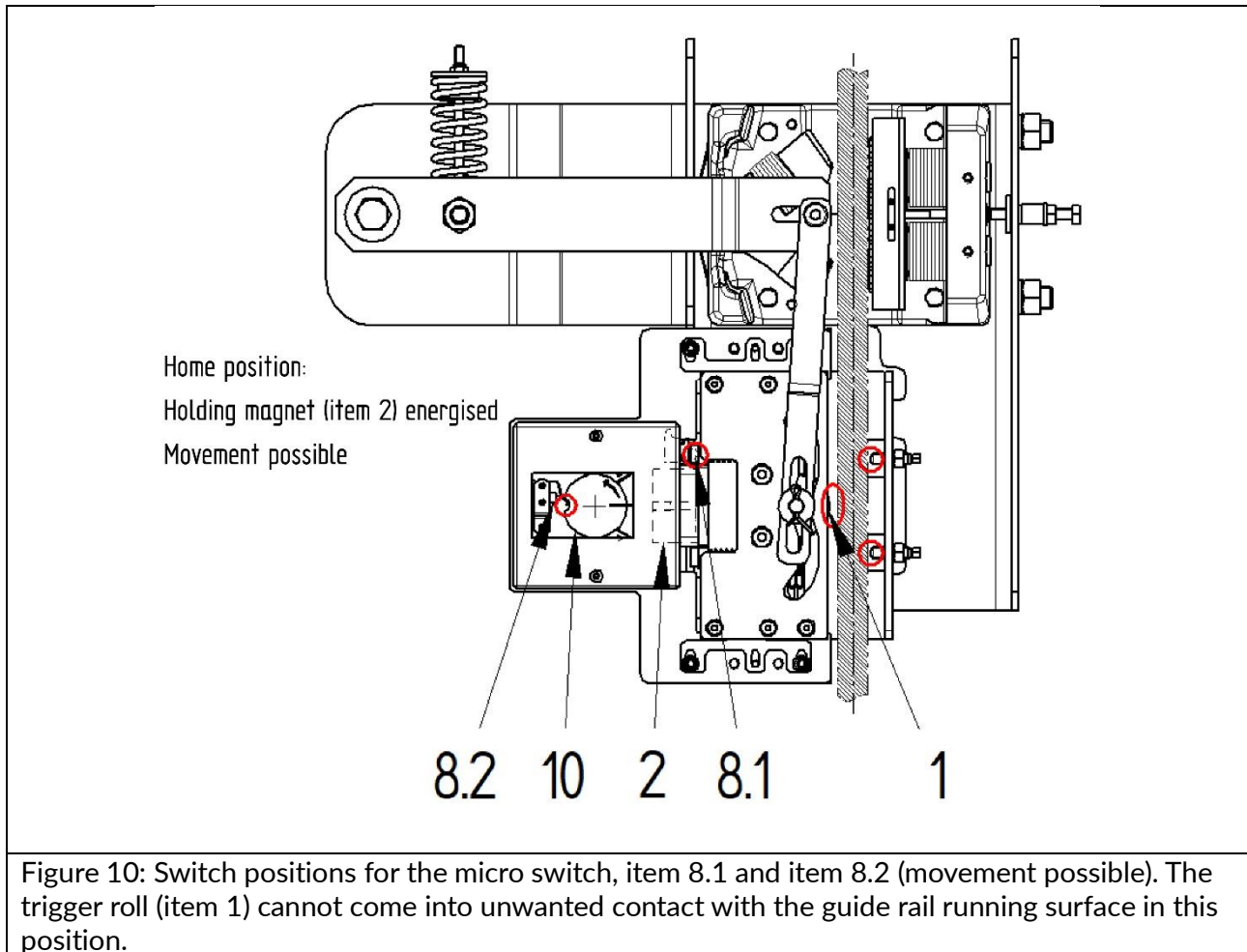


2.5. Status monitoring

Two micro switches (item 8.1 / 8.2) and the aforementioned safety switch (item 11) enable the status of the electrically-triggered safety gear to be queried. The one micro switch (item 8.1) monitors the position of the trigger roll and the other micro switch (item 8.2) monitors the rotary movement (position) of the reset motor (item 7) via the release disc MS (item 10).

If the switch bar for the micro switch (item 8.2) is in the recess for the release disc MS (item 10) (micro switch not actuated) and the micro switch (item 8.1) is actuated, the trigger roll (item 1) is pulled away from the guide rail (item 5) completely.

A normal run may only be released once the two switch positions on the micro switch (item 8.1 / 8.2) detect a completely withdrawn trigger roll (item 1) and the monitoring contact (figure 20, S2.2) on the non-actuated safety switch (item 11) on the safety gear indicates a non-engaged safety gear. When the trigger roll (item 1) is withdrawn completely, this ensures that it cannot come into contact with the guide rail (item 5) (figure 10).



2.6. Reset

2.6.1. Resetting from the ready position

In order to reset from the ready position (figure 8), first the holding magnet (item 2) and then the reset motor (item 7) must be energised again. The lifting motion causes the holding magnet (item 2) to be able to connect to the coupling plate (item 4) through magnetic force. Turning the reset motor (item 7) further, which has only one direction of rotation (observe the pole connection) to the home position moves the trigger roll (item 1) away from the guide rail (item 5) and the pressure springs (item 3) are pre-tensioned again. As previously described in section 2.6, the trigger roll (item 1) no longer touching the guide rail (item 5) can be detected (home position) and movement is possible again.

2.6.2. Resetting from the brake end position

If, as described above, an engaged safety gear (item 12) is determined by status monitoring (section 2.5), the status (engaged or not engaged) of the safety gear (item 12) can be identified using the safety switches (figures 14 and 20, item 11, monitoring contact S2.2), the safety gear (item 12) must also be pulled out of the catch (electrical lift return control, safety switch (item 11) bypass for the

safety gear). In the **first step** of the reset from the brake end position, the holding magnet (figure 7, item 2) must be energised. In the **second step** when moving out of the catch, the trigger roll (figure 7, item 1) is moved by the coupling (figure 7, item 29) and the coupling plate (figure 7, item 4) therefore accesses the holding magnet (figure 7, item 2) and re-connects with this. A reset using the reset motor (item 7) is not required.

By **adhering to the sequence**, first energising the holding magnet and then moving out of the catch, this ensures that inadvertent engagement in the opposite direction does not occur in the event of a double-acting electrically-triggered safety gear.

3. Mechanical installation

3.1. General

The electrically-triggered safety gear or electrically-triggered braking device comprises two set and sealed safety gear heads (item 12) and at least one REA release unit. The number of REA release units depends on whether a connection bar is installed between the safety gear heads or not.

3.2. Adapting the safety gear heads (according to drawing 13GAREA-BA01-1)

- The safety gear heads are adapted in the catch frames using mounting plates (item 25) onto which the safety gear heads are mounted so that they can be moved sideways. Additional gusset plates (item 14 + 15 + 24) are installed accordingly. When using external housing (figure 6) for installation, the mounting plates (item 25) are integrated parts of the external housing.

The appraisal of the connection between the mounting plate (item 25) or the gusset plate (item 14 + 15 + 23) and the catch frame (crossbar, hanging angle, etc.) is the frame manufacturer's responsibility (also see section 1.9). When using external housing (figure 6), a stability appraisal must also be performed (the braking forces that are generated by the safety gear pair are specified on the type plate).

- It is essential that the **"Down"** marking is at the bottom and the **"UP"** marking on the top.
- After tightening the cylinder screws (item 24) if they have not already been fitted in the factory (tightening torque 70 Nm, secure with at least medium-strength liquid screw adhesive), you must check whether the safety gear heads (item 12) can be moved to the side and are returned to the original position via the flat spring (item 22).
- The guide rail (item 5) must be exactly in between the side attachments (e.g. gusset plates (item 14 + 15 + 23)) (also see section 1.9) in order to be able to ensure that the required lateral movement of the safety gear heads is sufficient. When engaged (figure 9), no safety

gear head (item 12) is permitted to touch these side attachments (e.g. gusset plates (figure 14 + 15 + 23)).

- The safety gear centre surfaces must be vertically and horizontally parallel to the guide rail centre surfaces.

3.3. Notes regarding the connection bar and resetting via spring systems

The various installation positions are provided on drawing 13GAREA-BA01-1. Here, a difference is made between:

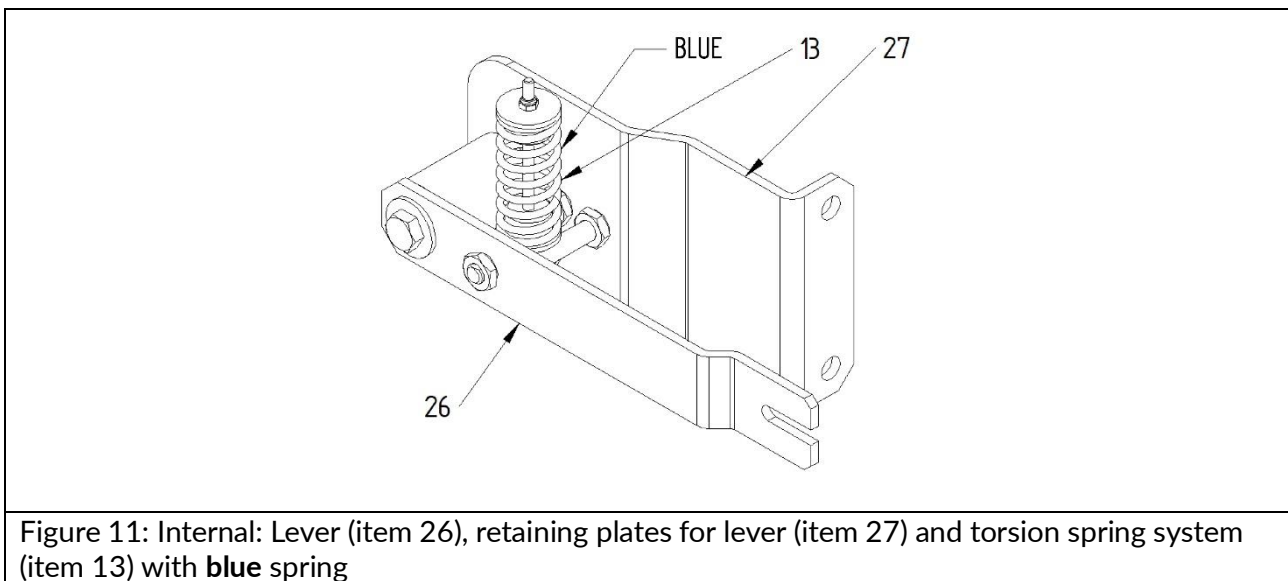
- Internal or external connection bar to synchronise both safety gear heads (item 12):
If a connection bar is used, a spring system (item 13) is required to hold the neutral position (safety gear home position (open position)). This spring is **blue**. Other springs are not permitted.
- No connection bar: both safety gear heads (item 12) have a release device:
If there is no connection bar, a spring system (item 13) is required on both sides to hold the neutral position (safety gear home position (open position)). These springs are **blue**. Other springs are not permitted.

The spring systems supplied as standard must be installed.

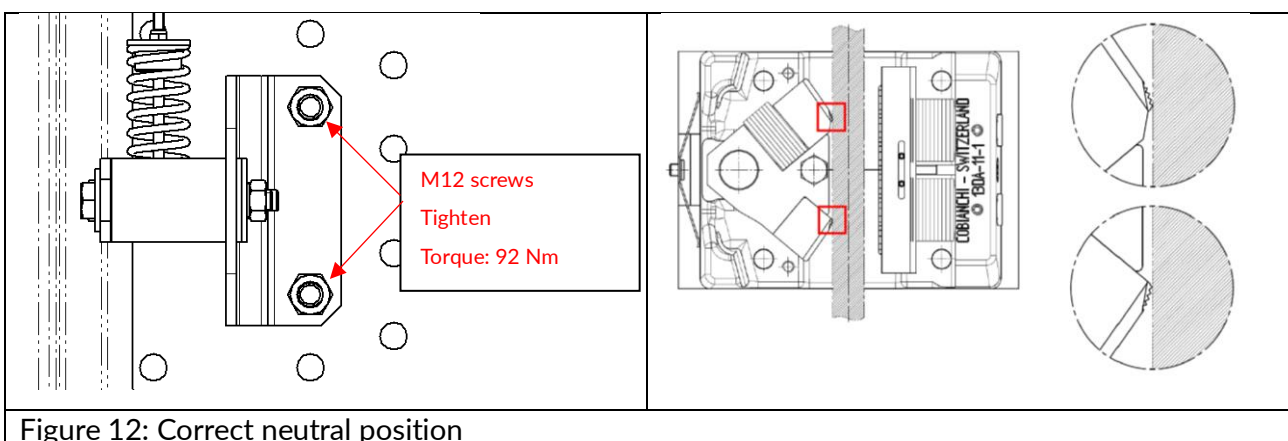
Changing the spring force setting is not permitted. Excess spring forces would cause the safety gear heads to not be able to engage properly.

3.4. Installing the lever and retaining plates for lever with the torsion spring system if the connection bar is internal

Screw the lever (item 26) including the torsion spring system (item 13) to the side of the gusset plate (item 14 + 15 + 23) using the retaining plates for lever (item 27). Connect the front slot on the lever (item 26) to the safety gear (item 12) by pushing it on. This arrangement stabilises the neutral position and ensures that the neutral position can be reached again after an event (deflection) (figure 10). The torsion spring system (item 13) works in the same way when deflected downwards or upwards and can therefore be arranged either upwards or downwards.



To ensure that the gaps between the move-in tothing on the brake elements on the safety gear heads and the guide rail (item 5) on the double-acting safety gear can be set identically at the top and the bottom (to prevent unwanted release), we recommend undoing both M12 screws from the retaining plates for lever (item 27) and, in the next step, undoing the adjustment screw (item 30) until the top move-in tothing and bottom move-in tothing are positioned on the guide rail (item 5) according to figure 12 and then re-tightening both M12 screws on the retaining plates for lever (item 27). If the required result cannot be obtained using this procedure, both headless screws in the torsion spring system (item 13) must also be undone, aligned and re-tightened. The re-adjust the air gap (1.0 – 1.5 mm) in accordance with figure 17.



3.5. Installing the lever and retaining plates for lever with the torsion spring system if the connection bar is external

Screw the levers (item 16), the torsion spring system (item 13) with the blue springs and the stop sleeves (item 19) to the side of the gusset plates (item 14 + 15 + 23) together with the retaining

plates for lever (item 27). Screw the connection bar to the levers (item 16) and the stop sleeves (item 19) and use the lock nuts to secure. Connect the front slot on the lever (item 16) to the safety gear (item 12) by pushing it on. This arrangement stabilises the neutral position and ensures that the neutral position can be reached again after an event (deflection) (figure 10). The torsion spring system (item 13) works in the same way when deflected downwards or upwards and can therefore be arranged either upwards or downwards. This is attached to the side of the REA release unit

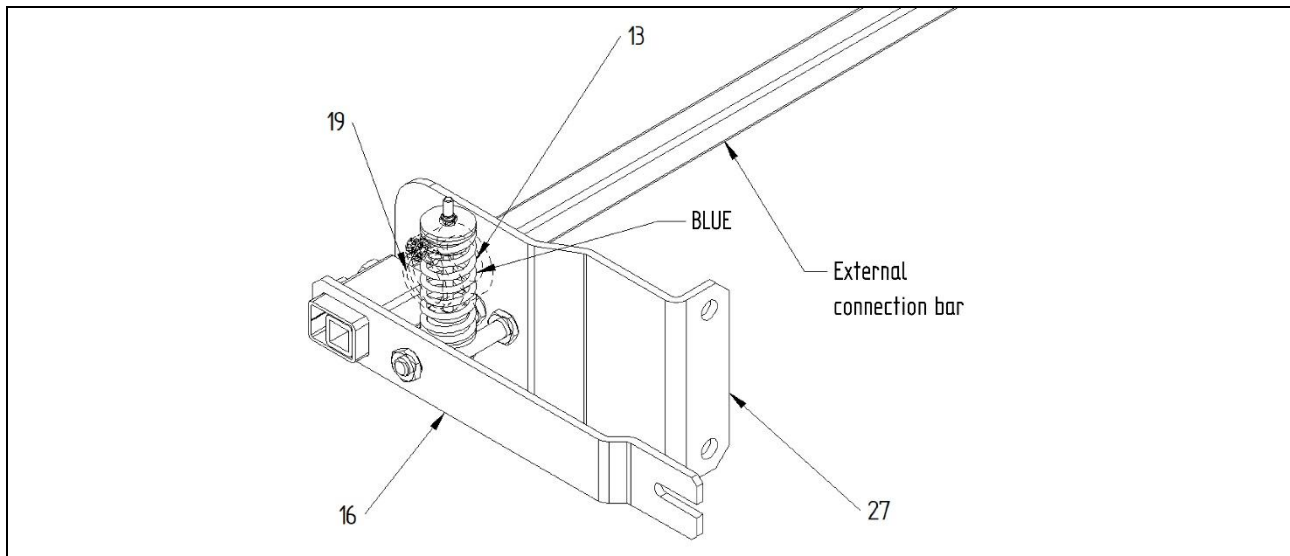


Figure 13: External: Lever (item 16), retaining plates for lever (item 27) stop sleeve (item 19) and torsion spring system (item 13) with blue spring

3.6. Installing the connection bar (if present)

The connection bars are not supplied as standard by Cobianchi.

If the *connection bar is internal*, the sectional steel tube that has been cut to the suitable length (actual dimension -290 mm),

20/20x2.5 or 3.0 mm according to DIN EN10305-5 with the release square end (item 28) must be screwed to the release shafts on both safety gear heads.

If the *connection bar is external*, the sectional steel tube that has been cut to the suitable length (actual dimension +113mm), 20/20x2.5 or 3.0 mm according to DIN EN10305-5 must be screwed to the lever (item 16).

After installing the connection bar, check that the bar can be turned easily by hand when in the home position. On internal connection bars in particular, ensure that no excess torsion (twisting) occurs inside the connection bar. Both safety gear heads (item 12) must engage on both guide rails (item 5) simultaneously. The connection bar must be reinforced (stiffened) in the event of large actual dimensions.

3.7. Adjusting the release sleeve

If the release sleeve (item 17) is supplied loose, it must be installed and aligned so that the safety switch (item 11) always actuates when the safety gear is engaged and that the lift's safety circuit is interrupted. The threaded pin in the release sleeve must be tightened fully.

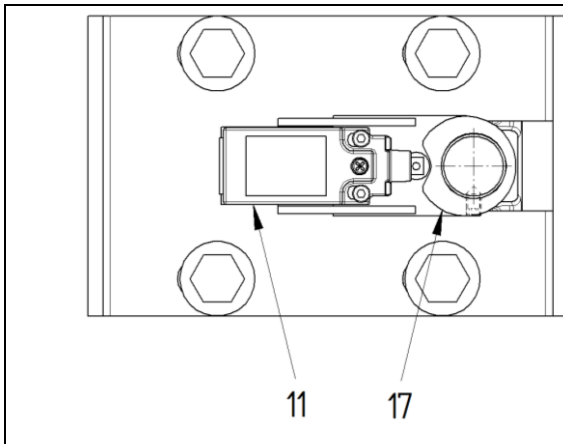


Figure 14: Safety switch (item 11) not actuated

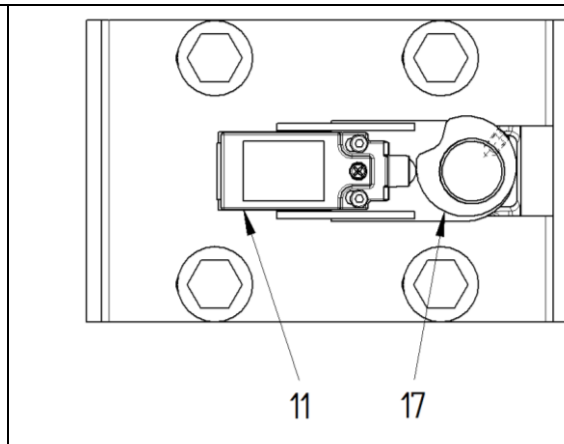


Figure 15: Safety switch (item 11) actuated

3.8. Attaching the type plates and information stickers (for oiled guide rails)

Before attaching the enclosed type plates in a clearly visible location on the frame, the intended surface must be cleaned and be completely dry. Do not touch the adhesive surface on the type plates excessively. Press tight after sticking on.

A green information sticker is enclosed with every electrically-triggered safety gear intended for use on oiled guide rails. This must be attached in a clearly visible location (e.g. on the guide rail oiler). Recommended oil: HLP oils in accordance with DIN 51524, part 2, or comparable oils, viscosity ISO VG 68-150.

3.9. Installing the REA release unit

The REA release unit is installed in the manufacturer's factory and at least one screw is sealed, as the release unit is not permitted to be replaced or modified without contacting the manufacturer, as the components are tailored to each other.

You must ensure that collisions cannot occur in either the home position or in the deflected position.

In the condition as delivered, the release unit is held in the home position mechanically using at least one red locking pin. This ensures that the release unit can be positioned in relation to the guide rail (item 5) during installation and that the holding magnet (item 2) can be coupled to the coupling plate (item 4) after initiation.

The red locking pins must be removed after installation.

The easiest way to do this is to initiate a reset. This releases the locking pins, enabling them to be removed easily.

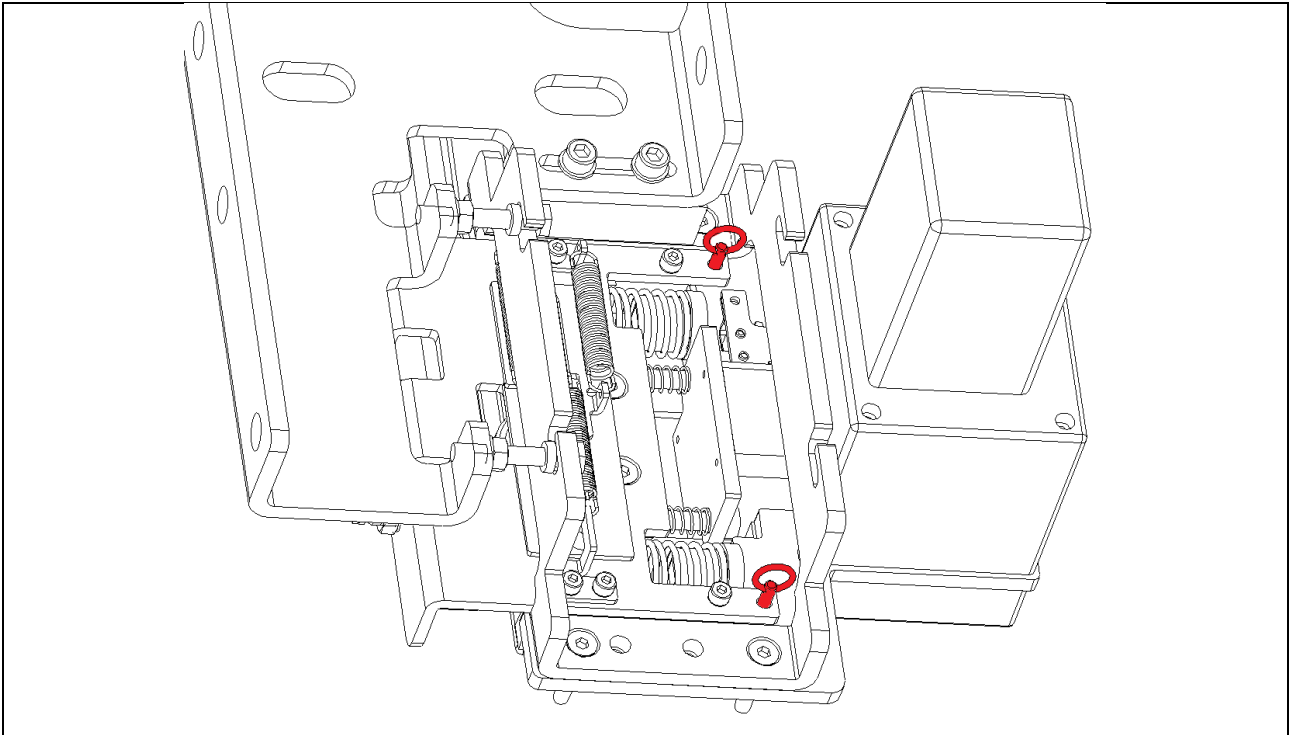


Figure 16: Locking pins (red) in the condition as delivered (**remove after installation**)

3.10. Adjusting the safety gear side position

The side position for the safety gear heads must be aligned to the guide rail (item 5) in the home position.

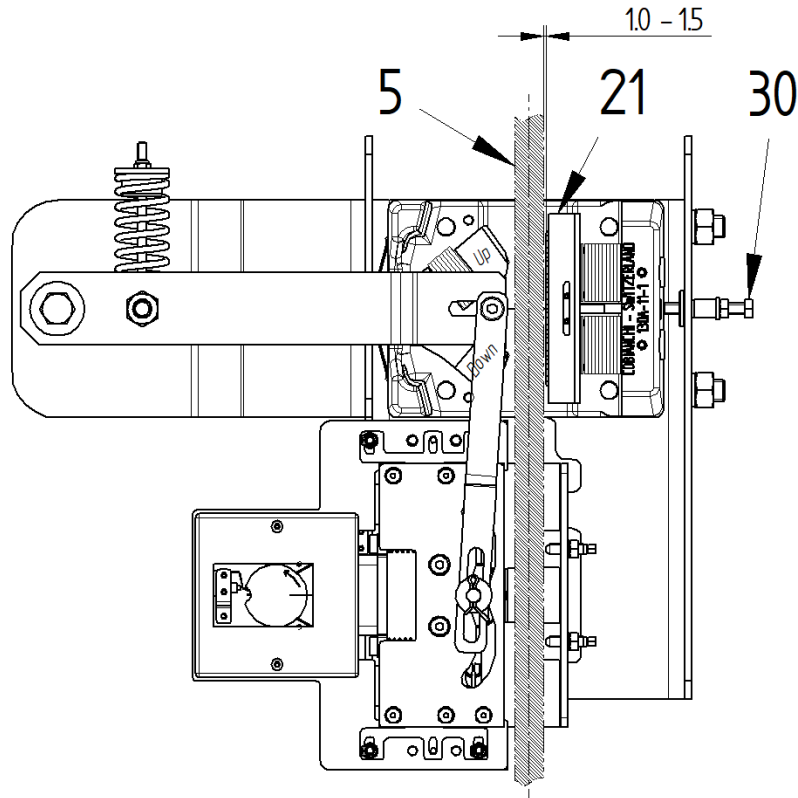


Figure 17: Side position adjustment using the adjustment screw (item 30): easy release mechanism (item 21) – guide rail (item 5) 1.0 – 1.5 mm

3.11. Adjusting the release unit side position

The release unit must be aligned to the side of the guide rail (item 5) separately using the screws, item 32 and item 33.

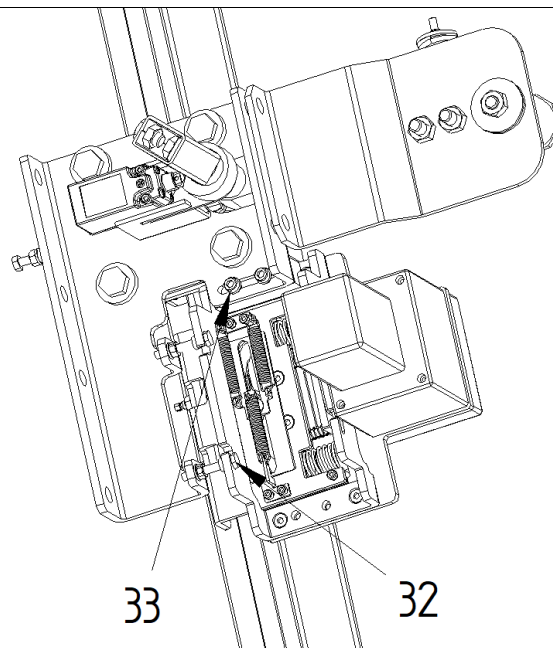


Figure 18: The screws (item 32 + item 33) must be used to adjust the side of the release unit to the guide rail (item 5). The distances to the rail are provided in figure 19.

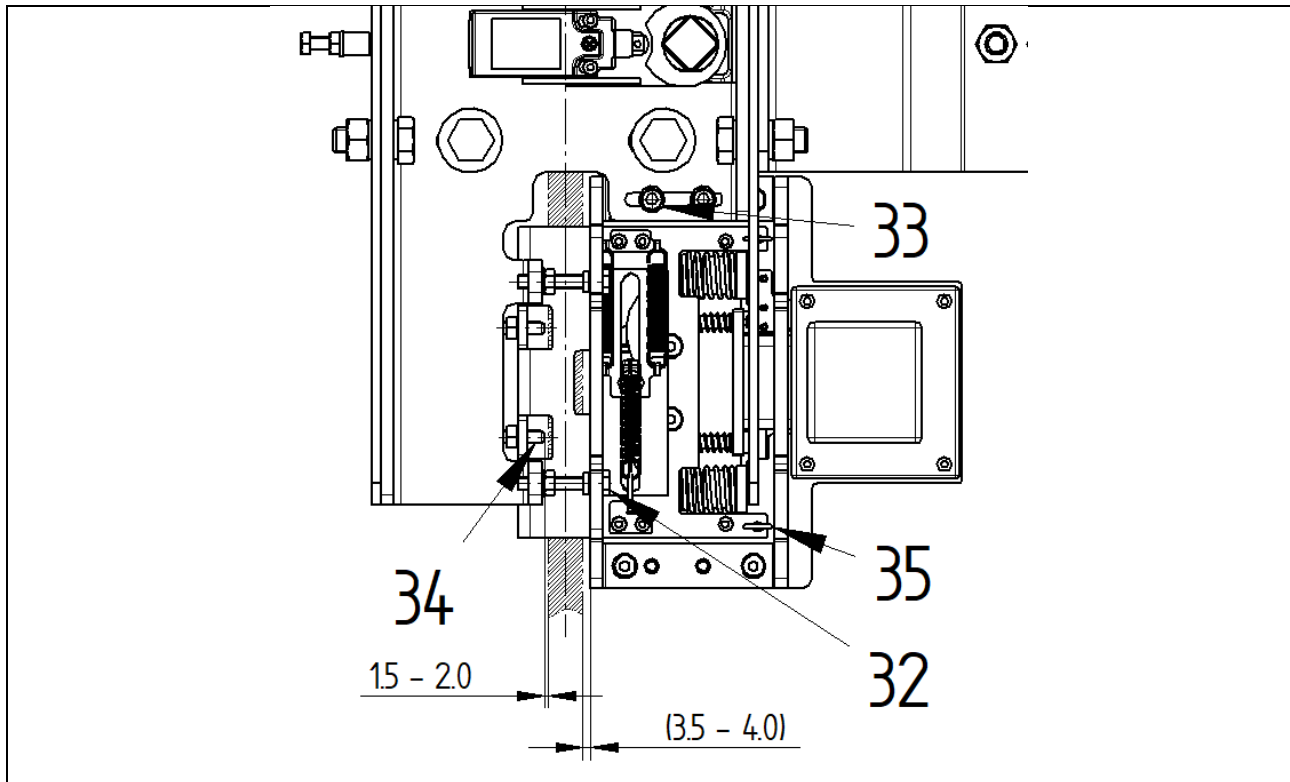


Figure 19: The screws (item 32 + item 33) must be used to adjust the side of the release unit to the guide rail (item 5). The distances to the rail are provided in this figure.

4. Installing and connecting the electrical system

4.1. General

The release unit must be installed, connected and started up by people with the requisite electrical knowledge and capabilities.

4.2. Circuit diagram

The REA electrical release unit must be connected in accordance with the circuit diagram.

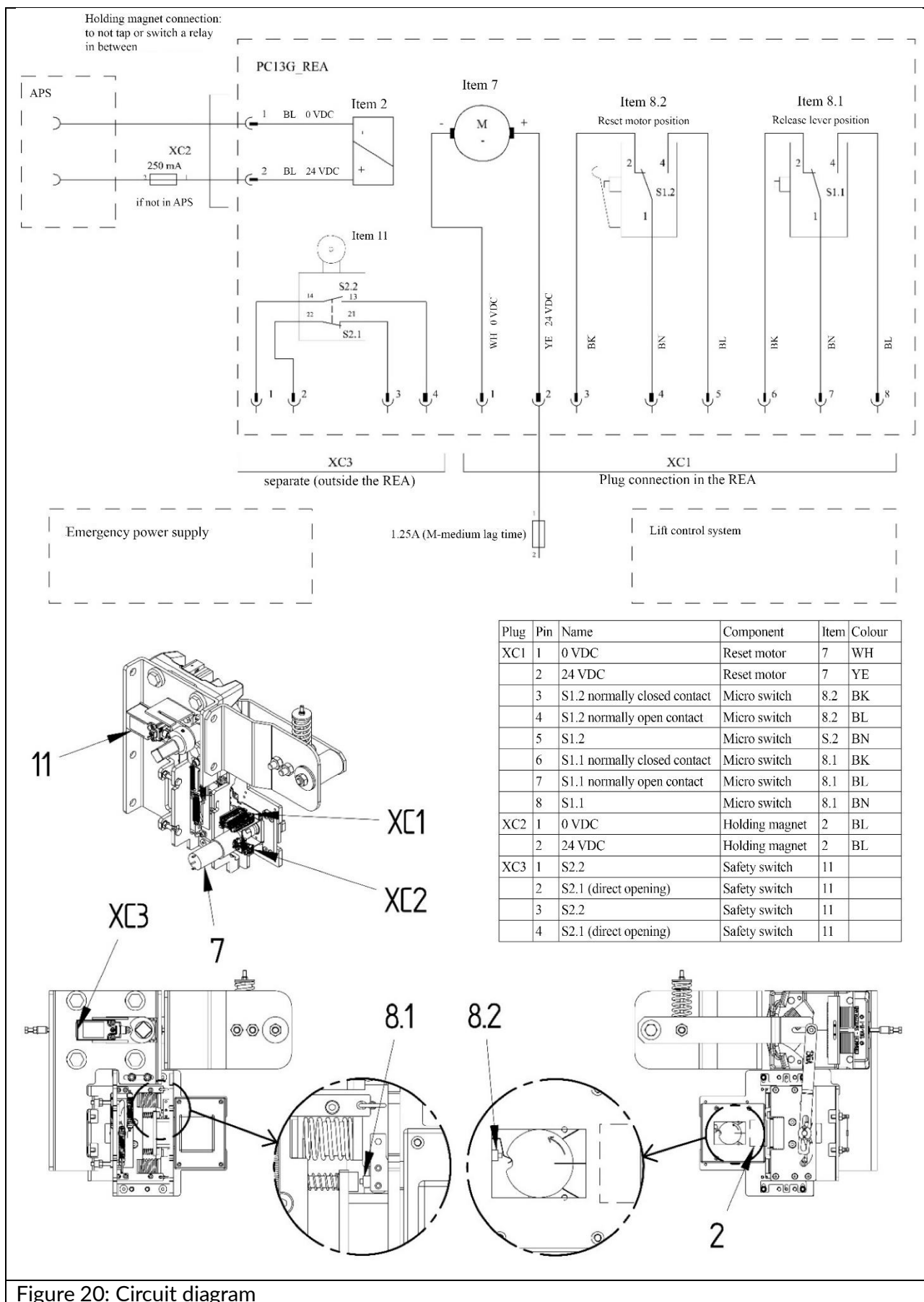


Figure 20: Circuit diagram

4.3. Connecting several REA release units

The circuit diagram in figure 20 shows how to connect one individual release unit (solution with a connection bar). If installing without connection bars with at least two release units, we recommend using a control system to ensure that an error (inadvertent release, cable breakage, etc.) on one release unit causes all others to also be actuated immediately and therefore prevent a one-sided load on the catch frame.

4.4. Fuses

4.4.1. Holding magnet

We recommend fusing each holding magnet (item 2) electrically. If the fuse is not part of the APS unit, provide an external fuse (250 mA).

4.4.2. Reset motor

Each reset motor (item 7) must be fused with a 1.25 A (M – medium lag time) fuse. This prevents a fire occurring in the event of a fault (motor blockage).

4.5. Wiring

The holding magnet (item 2) must be wired safely (impact protection, avoid chafing and crushing) and connected safely (EN 81-20:2020, section 5.10.6.3.2). Tapping this wire or installing a switch/relay are not permitted. The wire cross sections (recommendation: min. 0.75 mm²) must be determined by assembly operation. The cables are not supplied as standard.

4.6. Plug connections

Plug connections that cannot be interchanged are supplied as standard for the holding magnet (item 2), the micro switch (item 8.1 / 8.2) and the reset motor (item 7).

4.7. Reset motor direction of rotation

The cable connection for the reset motor (item 7) is established in the factory. Despite this, pay attention to the correct polarity. If the direction of rotation is incorrect, the micro switch (item 8.2) will be damaged (+24 VDC is applied top the connection, which is marked by a red dot on the motor housing). The terminal assignment for the plug connection is provided in the circuit diagram.

4.8. EMC

Assembly operation must ensure that the applicable EMC specifications are considered and adhered to for the wiring during installation.

4.9. Safety gear safety switch

Wire the safety switch (item 11) (AC-15, DC-13, in accordance with EN 81-20:2020, section 5.11.2.2) and check that it functions. A direct opening contact must be integrated into the lift's

safety circuit. A second contact (generally a normally open contact) that is separated from the direct opening contact electrically (monitoring contact) is required for control purposes (query as to whether the safety gear is actuated or not). If this monitoring contact should be a normally closed contact, the manufacturer must be informed of this.

The connection cable and the cable screw connection for the safety switch (item 11) are not supplied as standard.

4.10. Holding magnet voltage measurement

You must ensure that the power supply directly to the holding magnet (item 2) complies with the specifications (see the technical data). The measured voltage from both the mains adapter and the emergency power supply must be 24VDC $\pm$ 10%. Any power failures must be compensated for by the cables.

4.11. Position monitoring

If the holding magnet (item 2) is energised and the trigger roll (item 1) is in the home position, the marking on the release disc MS (item 10) must be between the two marking lines on the excentric guide. If the line on the release disc MS (item 10) is outside this range ($\pm$ 30°), you must contact the manufacturer (figure 21).

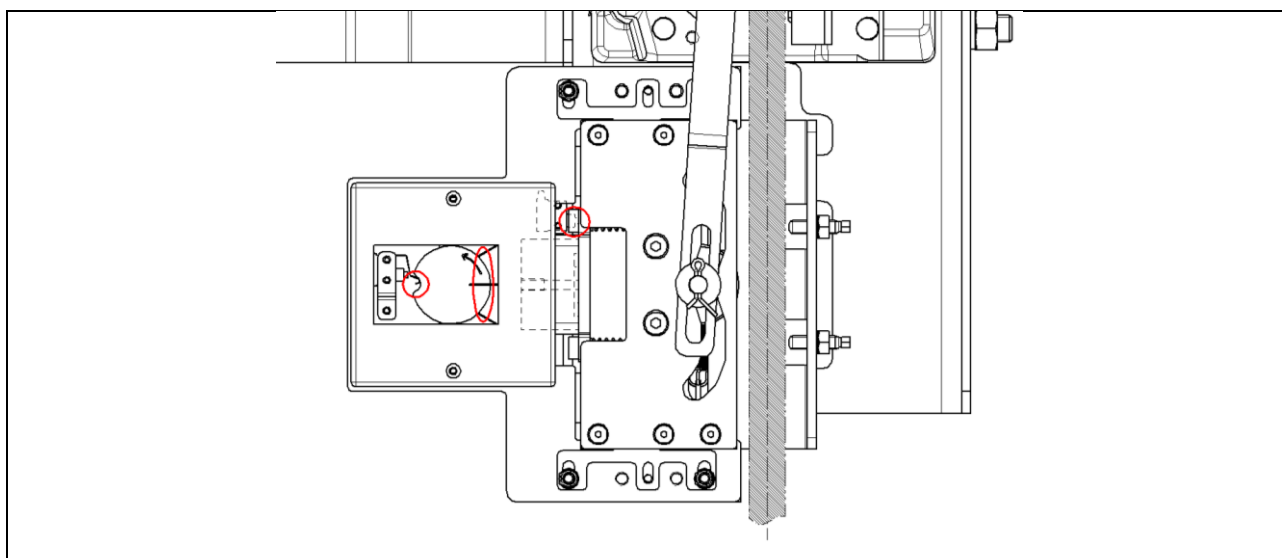


Figure 21: Position monitoring check points

5. Emergency power supply

The emergency power supply to the holding magnet (item 2) and the reset motor (item 7) must supply a voltage of 24 VDC $\pm$ 10% in the event of a mains power failure. The duration of the emergency power supply must be calculated so that freeing a person can be guaranteed if the mains power fails. The rechargeable secondary power supply unit and the rating for this are not supplied as

standard. The emergency power supply can be specified individually for the release unit or can also be part of the overall lift control concept. The emergency power supply must be monitored and inspected on a regular basis (e.g. self-monitoring cycle using emergency current). If faults in the secondary power supply cause the release unit to no longer be able to be held in the home position and a reset would no longer be possible, the elevator car must stop at a floor so that people can get out. An elevator car restart must be prevented. A specialist must re-establish the emergency power supply and a return to normal operation is only possible after this has been done. The changeover from the normal to the emergency power supply must occur without interruptions. We recommend replacing the emergency power supply component (rechargeable battery) after three years at the latest.

6. Function test / commissioning

6.1. Notes

Note the following before the first safety gear test:

The surface of guide rails must always be free of dirt, rust protection and any paint coatings. Cold cleaning solvents or brake cleaners are most suitable for cleaning.

The HLP oils recommended by the green information stickers must be used for oiled guide rails (DIN 51524, part 2, viscosity ISO VG 68-150).

It is advisable to move through the entire shaft at reduced speed in order to identify any collision points.

6.2. Electrical function test

6.2.1. Release

When the voltage to the holding magnet (item 2) is disconnected suitably, the trigger roll (item 1) must strike the guide rail (item 5) suddenly.

6.2.2. Reset

When a reset is initiated, the holding magnet (item 2) must be re-energised and the reset motor (item 7) must rotate until the trigger roll (item 1) is in the home position again.

6.3. Mechanical function test

6.3.1. Engaging the SG (static safety gear test)

When the release device is released and the trigger roll (item 1) is pressed against the guide rail (item 5), the safety gear must be engaged by moving the elevator car. Ensure that both items of safety gear are synchronised when they move.

After the reset, perform a visual inspection of all components on the electrically-triggered safety gear, check whether the home position has been reached again and check whether the bar moves easily again (move by hand).

6.4. Safety gear test

During commissioning, the electrical safety gear must be checked in accordance with EN81-20:2020 (6.3 ff.).

Assembly operation must provide a procedure for this to ensure that a safety gear test can be performed at a defined speed (nominal speed) when the mechanism is running. The mechanism brake is not permitted to be effective during the safety gear test.

The reset that is required subsequently (release from the catch) is described in section 2.7.

After the reset, perform a visual inspection of all components on the electrically-triggered safety gear, check whether the home position has been reached again and check whether the bar moves easily again (move by hand).

7. Freeing people

7.1. General instructions

The following describes the different processes for freeing people depending on the status of the safety gear and the release unit.

You must determine the statuses in which the safety gear (released or not) and the release unit (released (in ready position, holding magnet de-energised) or not released (home position)) are. A status indicator must also be available after the mains power fails.

7.2. Safety gear and release unit are not released

The switch positions for the micro switch (item 8.1 / 8.2) are used to determine whether the release unit is released or not. The safety switch (item 11) on the safety switch can be used to determine whether it is engaged or not.

If neither the safety gear nor the release unit is released, the elevator car can be moved to the next stop.

7.3. Release unit is released / safety gear is not released

The switch positions for the micro switch (item 8.1 / 8.2) are used to determine whether the release unit is released or not. The safety switch (item 11) on the safety switch can be used to determine whether it is engaged or not. If the release unit is released but the safety gear is not released (the

elevator car did not move when the release unit was released), the first step is to reset the release unit and the second step is to move the elevator car to the next stop.

7.4. Safety gear is released

If the safety gear has released, the safety switch (item 11) is actuated and the safety circuit is therefore interrupted. The status can be detected by a second contact in the safety switch (item 11). In this case, the first step is to reset the release unit and the second step is to initiate the safety gear by moving the elevator car in the appropriate direction (opposite direction to the braking direction). The safety switch (item 11) can be used to determine that the safety gear has been released and the third step is to move the elevator car to the next stop.

8. Self-monitoring cycle

A daily self-monitoring cycle is recommended and this must be performed when the elevator car is stopped flush with a stop and no movement command is present.

In a self-monitoring cycle, the reset unit (reset motor (item 7) and micro switch (item 8.1 / 8.2)) and the lifting motion of the trigger roll (item 1) are tested. Any faults on the electrically-triggered safety gear are detected in good time and the risk of people being trapped in the elevator car during a potential later event is reduced.

Checking whether the holding magnet (item 2) releases on the coupling plate (item 4) is not part of self-monitoring. For this reason, it is possible to use the reset unit with an energised holding magnet (item 2) to subject the trigger roll (item 1) to a low-noise self-monitoring cycle by triggering the reset motor (item 7).

Energising the holding magnet (item 7) moves the trigger roll (item 1) towards the guide rail (item 5). When coming into contact with this and when turning the reset motor (item 7) further, spring-mounted parts ensure that no components get damaged. After a half turn, the trigger roll (item 1) is pulled back from the guide rail (item 5) again. The switch statuses of both micro switches (item 8.1 / 8.2) must be queried and monitored. As soon as the bar on the micro switch (item 8.2) is in the notch on the release disc (item 10), the reset motor (item 7) must stop immediately. In this home position (section 2.2), the trigger roll (item 1) is at a sufficient distance from the guide rail (item 5) and the micro switch (item 8.1) is actuated. If malfunctions are detected during status monitoring (section 2.6) on the micro switch (item 8.1 / 8.2), the next movement must be prevented and a fault indicated. The reset motor (item 7) must be shut down after 5 minutes.

The self-monitoring cycle can be integrated into the lift control system as a routine or be part of a control unit for an absolute positioning system.

If a check as to whether the holding magnet (item 2) has been released from the coupling plate (item 4) is also to be performed in addition to the self-monitoring cycle described here, the trigger roll

(item 1) can be moved to the ready position and the power supply to the holding magnet (item 2) can then be disconnected in the release lever as described in section 10.2. If the reset motor (item 7) is re-energised, the rotary movement actuates the micro switch (item 8.2) but the micro switch (item 8.1) is not actuated if the holding magnet (item 2) is released from the coupling plate (item 4). By comparing the switch statuses of both micro switches, item 8.1 and item 8.2, a test routine can be implemented in the lift control system.

9. Faults: Unwanted release

9.1. REA causes

If the holding magnet (item 2) loses its adhesion force, an unwanted release of the release unit may occur. The causes for an unwanted reduction to the magnetic force may be:

- Contamination on the holding magnet (item 2) or the coupling plate (item 4)
- Voltage losses/current failure on the holding magnet (item 2) due to a power failure

If contamination is the cause of the fault, the manufacturer must be contacted.

9.2. Safety gear causes

The safety gear heads are at best poorly aligned with the guide rail (item 5) or the connection bar with the reset spring system is poorly positioned.

In this case, adjustment in accordance with section 3 must be performed.

9.3. Inspection after a fault

After an unwanted release of the release unit, all components must be inspected.

If the electrically-triggered safety gear was released by a fault, its functions must be inspected after rectifying the fault (visual status inspection, static safety gear test (engaging the electrically-triggered safety gear from a standstill)).

10. Low power mode

10.1. General

If the lift has stopped for an extended period, the release unit can be monitored by the reset components and moved gently and quietly into low power mode. This disconnects the power supply to the holding magnet (item 2) and reduces the required power to zero.

Using low power mode affects the electrical release device's service life and is limited to 22,000 cycles and 15 years.

Low power mode and the self-monitoring cycle (section 8) can be combined.

10.2. Function

Low power mode may only be activated at a stop. The trigger roll (item 1) is moved onto the guide rail (item 5) for a reset motor (item 7) triggering period that can be specified in parameters and is therefore in the ready position. This triggering period is around 2 seconds. The precise triggering period must be set during commissioning. The markings in figure 21 are provided for this. Due to the spring-mounted components, the required stopping precision for the rotary movement is within a tolerance range of 5 degrees. In this tolerance range, the trigger roll (item 1) is touching the guide rail (item 5) in accordance with figure 8.

In this ready position, the power supply to the holding magnet (item 2) can be disconnected. The electrically-triggered safety gear would engage in the event of an elevator car movement and therefore, no movement may be initiated.

To leave low power mode, the holding magnet (item 2) must be re-energised and the reset motor (item 7) must then be triggered again until both micro switches (item 8.1 / 8.2) detect the home position (movement possible).

If malfunctions are detected during status monitoring (section 2.6) on the micro switch (item 8.1 / 8.2), the next movement must be prevented and a fault indicated. The reset motor (item 7) must be shut down after 5 minutes.

11. Maintenance / repair

11.1. General instructions

Maintenance must be performed in accordance with EN 13015:2001+A1:2008 (Annex A, points A.1 and A.2).

If the electrically-triggered safety gear is installed correctly, maintenance is limited to checking the following points.

11.2. Condition of the guide rails

The surfaces of the guide rails must be clean and in accordance with the specifications on the type plate for the electrically-triggered safety gear. "Dry" guide rail surfaces must not have any contamination. "Wet" guide rail surfaces may only be treated with the specified oil.

11.3. Connection bars (if present)

The safety gear heads must be synchronised when triggered and a play-free connection for the safety gear heads must be ensured. The required rotary movement of the connection bar (including the lever) when engaging must be possible easily and without collisions in one or both directions.

11.4. Reset spring system

This must be present and ensure safe holding in the home position.

11.5. Safety switch (item 11)

Electrical / mechanical function, actuation guaranteed.

11.6. Safety gear head positions

The individual safety gear heads (item 12) must be positioned correctly in relation to the side and rail front on the guide rail (item 5) (figure 5 and figure 17).

11.7. Elevator car guides

These must be in perfect condition. Expanded, worn or non-existent sliding guides (inserts) must be replaced, as these pose a risk of the safety gear engaging inadvertently.

Roller guides must be free of play.

11.8. Fastening / lateral movement

The fastening points on the electrically-triggered safety gear for the elevator car structure must be inspected. The safety gear heads must be clearly moveable on the sides from the adjustment screw (item 30) to the flat spring (item 22).

11.9. Cleanliness

In general and particularly in the event of building work in the building, ensure that the safety gear heads are protected to prevent contamination by plaster, concrete, cement, mortar, grit or other building materials. Contaminated safety gear heads must be removed and cleaned.

11.10. Checking the home position

In the home position, the marking line must be within the range shown in figure 21.

11.11. Functions / static safety gear test

As part of regular maintenance, a static safety gear test (engaging from a standstill at low speed and with an empty elevator car) must be performed to check the functions by disconnecting the power supply to the holding magnet (item 2) from the home position. This must cause the trigger roll (item 1) to come into contact with the guide rail (item 5) suddenly. As soon as the elevator car is moved (only in one direction or alternately in both directions), engaging must occur and the elevator car must come to a standstill with the operating brake released. A reset must then be initiated.

11.12. Replacing faulty components / repair

11.12.1. General

If the reset motor (item 7), the holding magnet (item 2) or a micro switch (item 8.1 / 8.2) malfunction or are faulty, the complete electrical part of the release unit must be replaced (figure 22).

For support and to obtain spare parts from the manufacturer, the serial number must be declared.

11.12.2. Procedure

The release unit must be actuated (disconnect the power supply to the holding magnet (item 2)).

Then disconnect all required cables at the plugs (open the protective housing). The electrical part of the release unit can be pulled away sideways and a replacement assembly can then be installed.

Then re-connect all cables and perform a function test. Detailed instructions are enclosed with the spare parts delivered.

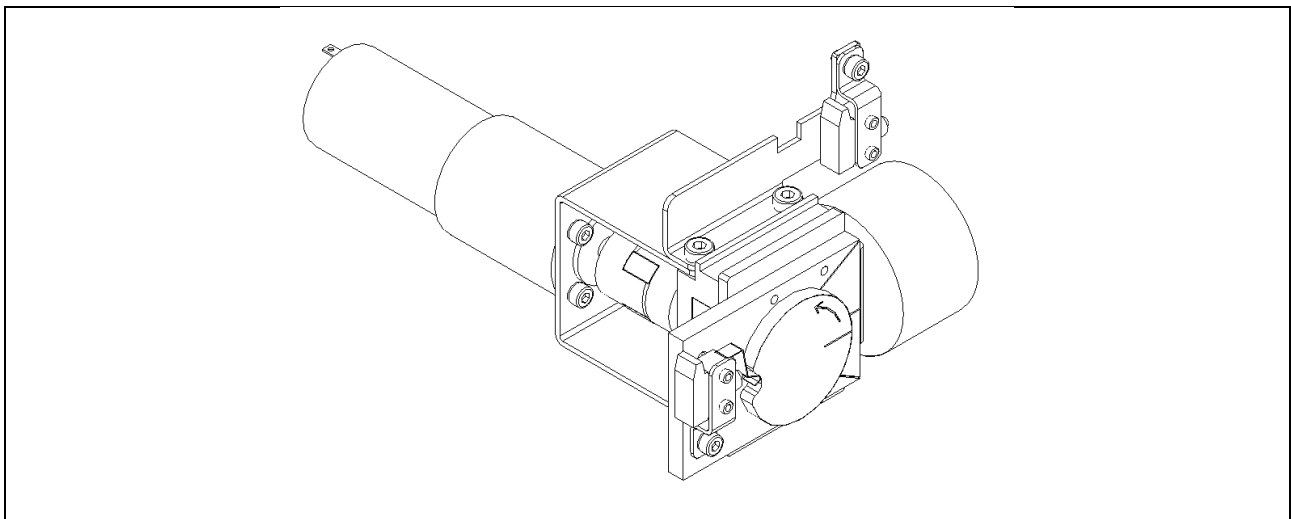


Figure 22: Replacement assembly for the release unit

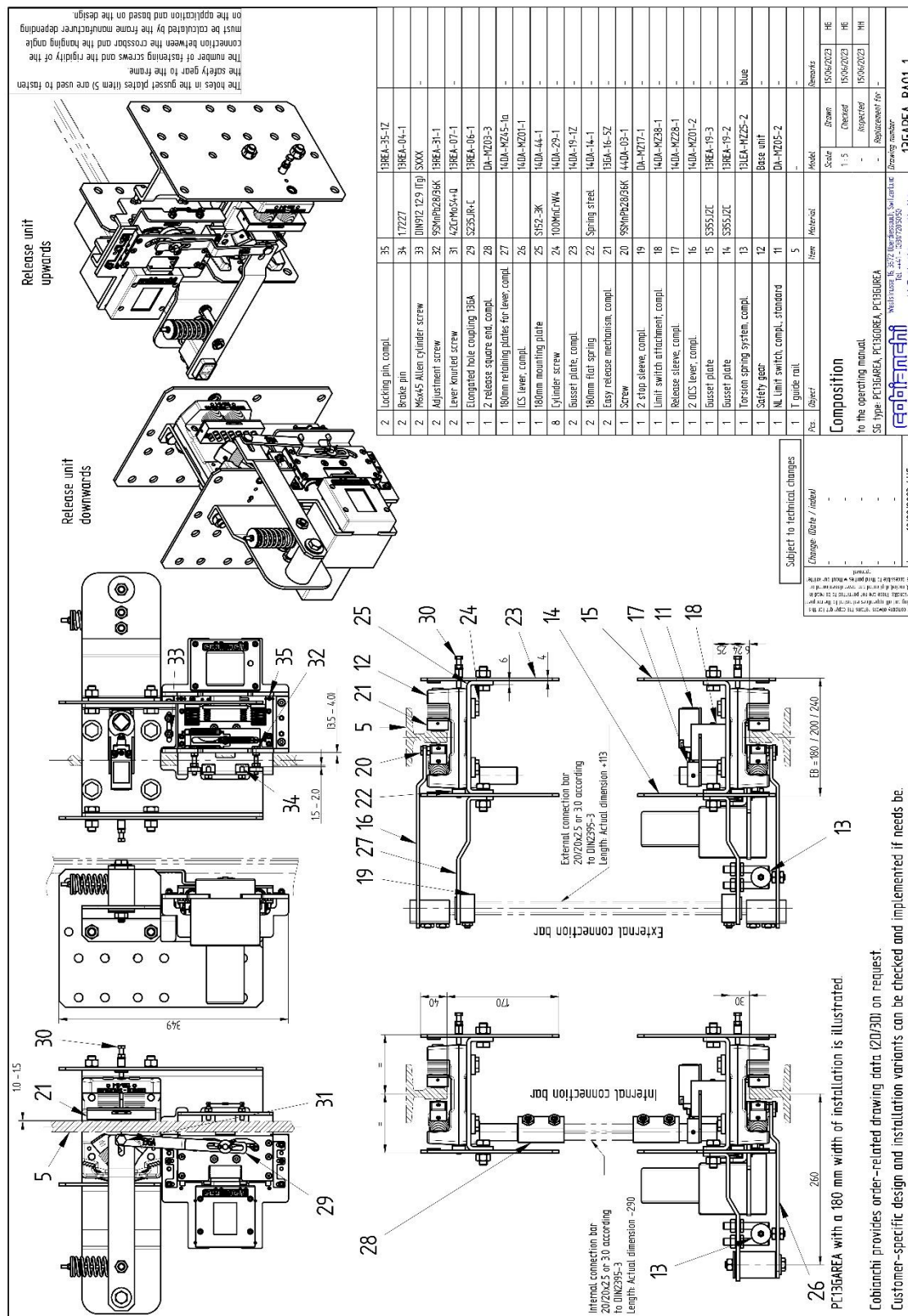
12. Accessories

12.1. Installation kit

An optional installation kit is available. The kit can be used to operate the REA release unit during installation while the control system with the APS components is not yet operating. The installation kit has two pushbuttons and two LED lights. When pressing the pushbuttons, the holding magnet is energised and the release unit performs a reset so that the trigger roll is in the home position. When a pushbutton is released, the release unit is triggered and moves to the ready position.

13. Appendix

13.1. Drawing 13GAREA-BA01-1



13.2. UCM calculation example

UCM calculation (basis: EN 81-50:2020, section 5.8f)

given:

Traction drive lift	DZ=	0.15	m	The door zone is smaller than the unlocking zone in accordance with EN 81-20:2020, 5.3.8 by 0.2 m or 0.35 m
Door zone down/up (APS parameter)	a_A	2.50	m/s ²	EN 81-50:2020, 5.8.1
Maximum possible drive acceleration downwards/upwards	a_n	1.50	m/s ²	EN 81-50:2020, 5.8.1
Natural acceleration downwards/upwards	V_0	0.80	m/s	EN 81-20:2020, maximum 0.8 m/s
Maximum retraction speed	t_{APS}	0.05	s	Time from UCM detection to disconnecting the voltage on the holding magnet and opening the safety circuit
max. UCM APS reaction time	t_{REA}	0.10	s	Time from power failure on the holding magnet to SG engaged fully
Max.REA reaction time	a_{SGDOWN}	6.00	m/s ²	Set value: Safety gear
SG downwards deceleration (elevator car fully loaded)	a_{SGUP}	6.00	m/s ²	Set value: Safety gear
SG upwards deceleration (elevator car empty)				

Downwards:

Calculation:

1st step:

Top door zone start point at V_0
Acceleration downwards with a_A to the bottom door zone

Speed V_1 when reaching the bottom door zone

Path travelled downwards from the threshold

2. step:

Acceleration downwards with a_A during t_{APS} to V_2

Path travelled downwards during t_{APS}

3. step:

Acceleration downwards with an during t_{REA} to V_3

Path travelled downwards during t_{REA}

4. step:

SG decelerated with a_{SGDOWN} to standstill

The counterweight effect is not considered.

Decelerations below 0.6 x g are not considered

6. step:

Calculating the UCM distance downwards from the threshold:

$$S_{UCMdown} = 0.644 \text{ m} \quad S_{UCMdown} = S_1 + S_2 + S_3 + S_{SG}$$

Upwards:

Calculation:

Calculation steps 1 - 5 for the downwards calculation can be applied identically to the upwards calculation.

The UCM distance upwards from the threshold is:

$$S_{UCMup} = 0.644 \text{ m}$$