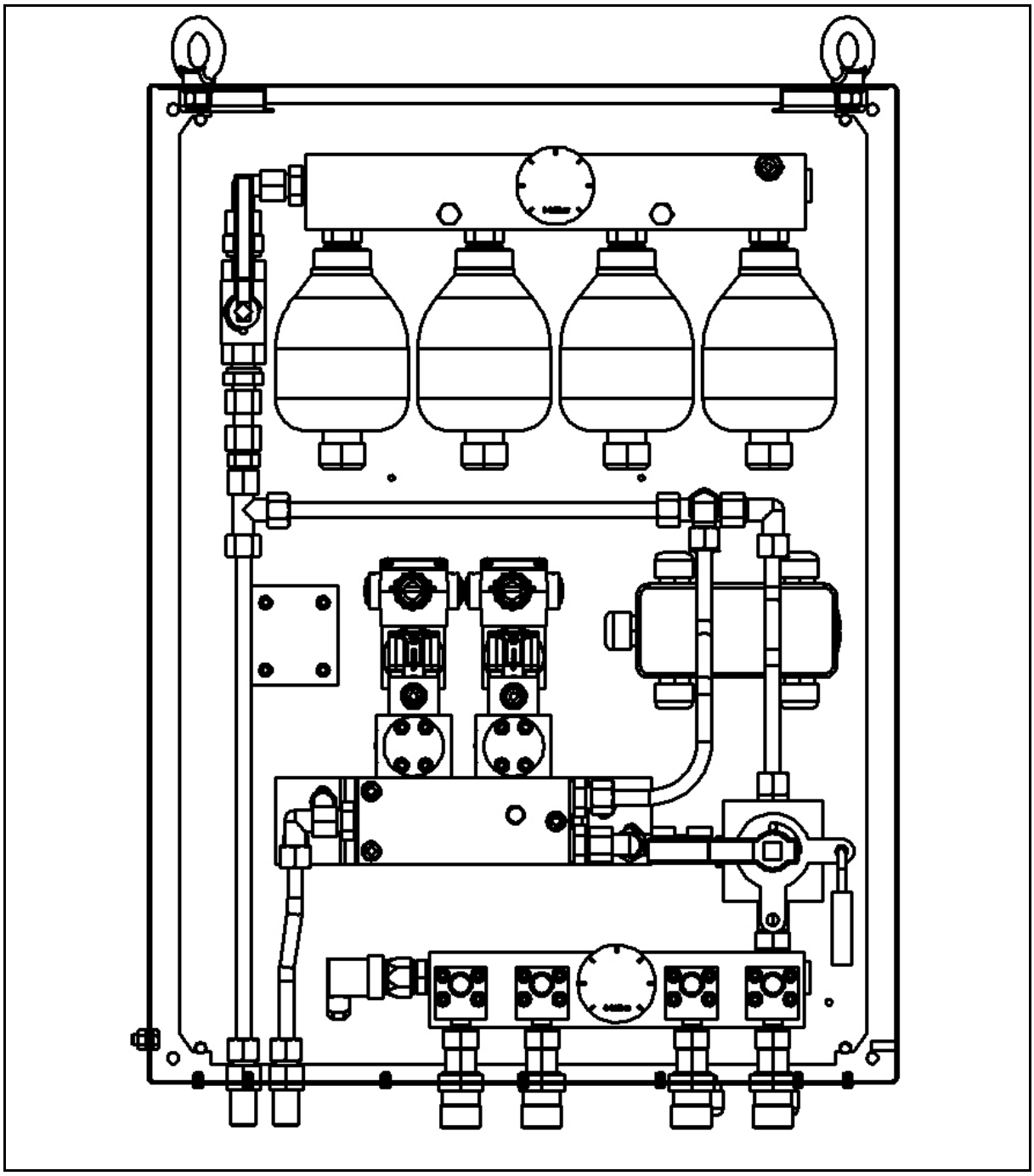
tz-valve control cabinet

- hydraulic



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Particular Safety Instructions and Symbols Used

In the following operating manual, concrete safety instructions are provided to advise against unavoidable residual hazards involved in the operation of the device. These residual hazards include danger posed to:

- persons
- product and machines
- environment

The symbols used in this operating manual are primarily intended to draw attention to the safety instructions!

The most important objective of the safety instructions is to avoid damage to persons. The respective symbol used cannot replace the text of the safety instructions. Therefore, the text must always be read completely!

This symbol shows that dangers to persons are primarily to be expected. (Danger of death, risk of injury)	
This symbol shows that dangers regarding hand injuries are primarily to be expected.	
This symbol shows that dangers regarding hand injuries from hot surfaces are primarily to be expected.	
This symbol warns of dangers that can affect the explosion protection or cause a danger of explosion.	

Table 1: Symbols Used

1 General Information

Copyright
Tüschen & Zimmermann holds the copyright for all documents bearing the signature of Tüschen & Zimmermann (tz) and which you received together with the product or otherwise from Tüschen & Zimmermann. Such documents may neither be made available to third parties nor otherwise improperly used without the prior written approval by Tüschen & Zimmermann.

In-house Use of the Documentation
Tüschen & Zimmermann allows you to use the documentation only for your own in-house use.

1.1 Foreword, General Notes

This installation and operating manual is intended to aid you in safely, correctly and economically using the tz-valve control cabinet. Observing the instructions given in this manual will help you:

- to increase the reliability and service life of the brake system,
- avoid dangers,
- avoid repairs and downtimes.

This manual must be kept at hand at all times while installation, maintenance and repair works are carried out and it must be read and observed by every person carrying out work on the brake system.
The tz-valve control cabinet has been built in accordance with state-of-the-art technology and in compliance with the generally accepted regulations on technical safety. Nevertheless, there still may be possible risks to the life and limb of the user or third persons and/or risks of damage to the machine or other property if the product is used or handled incorrectly. The manufacturer reserves the right to make changes to improve the product properties without providing any particular announcement.

In addition to this operating manual, the relevant country-specific statutory provisions and regulations on accident prevention must be observed. Comply with the safety and accident prevention regulations of

- the mine,
- the mining authority,
- the Bergbauberufsgenossenschaft (professional mining association) or other competent professional associations.

Furthermore, read attentively and carefully the operating manual on the components required for the operation, such as those belonging to the gearbox, the electric motor, the conveyor, etc. Clarify any questions that may arise before starting work.

1.1.1 Intended Use

Strictly observe the warnings according to 4.3 , as well as safety instructions according to 4.4 .
The cabinet unit must only be used for the medium HFC 46 or HFC 68. The permitted operating pressure is 100 bar maximum, and the permitted temperature range of the operating medium is -20°C to +60°C. The cabinet unit serves for the activation of a maximum of 4 brakes.
The use of media incompatible with the material, exceeding limit values for media pressure and temperature and additional mechanical loads, e.g. by clamped connected pipelines, can result in failure of the materials and rupturing of the parts.

Any different use or use in excess of this is not regarded as intended use.

Intended use also includes compliance with this operating manual and adherence to the inspection and maintenance instructions or intervals and the instructions of the relevant ATEX regulations.

Damage resulting from any use other than the intended use shall not be the responsibility of the manufacturer. The risk is solely borne by the user/operator. Spare parts must comply with the technical requirements stipulated by tz. This is always ensured when original spare parts are used as they are subject to continuous quality control.

1.1.2 Instructions and Notes for the Use of the Product in Explosive Atmospheres

- The devices may be installed in underground mines for the danger zone "potentially explosive atmosphere" according to DIN 1127-2 (required design of the device according to Group I, Category M2) and must be included in the cut-off circuit in case of a CH4 hazard.
- The EC type examination certificates and any 'special instructions' that may be contained in these certificates must be complied with.
- The applicable installation and assembly regulations must be complied with.

1.2 General Safety Instructions

1.2.1 Work on the tz-valve control cabinet

DANGER!
During all work on the tz-valve control cabinet, ensure that the plant has been shut down. Maintenance and repair work must only be performed at a depressurised system and with the pressure supply turned off.
Danger of death! Do not open any components while they are under pressure.

Work on the tz-valve control cabinet during ongoing operation may result in open brakes closing accidentally and trigger unintended, uncontrolled braking (fail-safe feature).

1.2.2 Handling of Oils and Greases

ATTENTION!
Follow the applicable safety regulations when handling oils, greases and other chemical substances.

Skin contact:	Avoid longer and repeated contact; after contact clean affected part of the body with soap and water. Use skin protection products during work. Possibly wear oil-resistant protective clothing (e.g. safety gloves, safety goggles). Do not wash hands with petroleum, solvents or emulsions.
Eye contact:	Rinse eyes with plenty of water. If eye irritation remains, seek medical advice.
Ingestion:	Do not induce vomiting. Seek medical aid immediately.
Environment:	The environment can be polluted by operating media. Therefore, they must not get into air, soil or water.
Safety data sheets:	They contain details on health, accident and environmental protection and can be obtained from the manufacturer.

Table 2: Handling of Oils and Greases

1.2.3 Storage, Transportation, Assembly and Disassembly

ATTENTION!
During transportation, installation and removal works, the transport units, sub-assemblies or individual parts must be carefully attached and secured to lifting appliances and load-lifting equipment with sufficient load-carrying capacity.

You can be severely injured or killed by falling objects. Only use appropriate load-lifting equipment.

If the tz-valve control cabinet has to be transported attached to other parts or systems, it must be protected against mechanical damage (e.g. impacts).

ATTENTION!
The eyebolts at the tz-valve control cabinet are provided exclusively for the transport of the tz-valve control cabinet. Do not attach any additional loads.

The following storage conditions have been defined to retain the quality and to achieve as long a service life as possible:

- Stroage location: dry in a closed hall
- Storage temperature: -20°C to +40°C
- Storage period: maximum 12 months

1.2.4 Personnel

The personnel working on the brake system must be familiar with the operating manual, and in particular, with Chapter 1 . The generally accepted technical regulations must be observed when assembling and disassembling the product. The specific safety regulations must be complied with in particular while carrying out any work on the electrical and hydraulic equipment. In Germany, the current version of the "Sicherheitslehrbrief für Handwerker (Safety Requirements for Craftsmen)" must be complied with.

1.2.5 Operation, Maintenance and Servicing

Strictly observe the warnings according to 4.3 , as well as safety instructions according to 4.4 .
The safety and accident prevention regulations apply during operation.
This device coupling has been equipped with protective equipment. Modifications, attachments and / or conversions to the tz-valve control cabinet may affect the safety and must always be approved by tz.

ATTENTION!
The operating pressure must not exceed 100 bar. It must be ensured that hydraulic power units are turned off under pressure control or connected pressure-limited.

The brake system may only be operated if all of the mechanical safety devices as well as all electrical safety and monitoring devices are in place and fully operational. The plant may only be operated after the signal transmission system has been completely connected and wired up.

The operator is also responsible not to subject the device to unacceptable shocks or vibrations.

Regularly, but at least once per month, check the brake system for external damage, cracks and fractures, dirt (particularly grease and oil) or other defects. If necessary, operation of the plant has to be stopped immediately and secured against unauthorised restart. Spare parts must comply with the technical requirements stipulated by tz. This is always ensured when original spare parts are used, as they are subject to continuous quality control.

Appropriate workshop equipment must be used when performing repair work. The tz-brake power unit is controlled by electric valves and actuated pneumatically. The rules and regulations for electrical installations must be complied with. Failure to comply with the relevant safety regulations and instructions when using, operating, servicing or repairing the equipment may cause serious and/or fatal injuries.

Maintenance, servicing and repair work must only be performed with a depressurised system and with the pressure supply turned off. All additional installation locking devices must be removed before recommissioning.

1.2.6 Protection of the Environment

ATTENTION!

Operating resources, auxiliaries and replaced parts must always be disposed of in a safe and environmentally compatible manner. The relevant country-specific regulations must be observed. When handling oils, greases and other chemical substances, the safety instructions and regulations for this product must be complied with.

1.2.7 Residual Hazard

In order to avoid these residual hazards, the respective safety instructions contained in this operating manual must be strictly observed.

This section contains a summary of residual hazards which may occur during the transportation, storage, installation, operation, maintenance and repair works.

Mechanical hazards:

- Over-stretching and tearing off of cables and hoses.
- Insufficient stability

Electrical hazards:

- Damaged or defective lines and components

Thermal hazard:

- Burns due to contact with hot parts. Ignition due to sparks.

Hazard due to the temporary failure of protective devices:

- Temporarily missing protective devices or bridging of control devices or similar items while carrying out repair or maintenance work may cause crushing or shearing of body parts.

Hazards caused by the entire machine and the failure of electric or hydraulic energy must be taken into consideration by the installer of the entire machine; appropriate measures must be taken, and must be included in the risk analysis.

1.3 General Information

The hydraulic valve control cabinet serves to activate hydraulically operated tz-brake power units of the Type series BKG S-HA.

The device corresponds to:

- the CE standards, compliant with the EC Directive 2006/42/EC, (see EC declarations of conformity or the installation declaration regarding the product),
- the applicable EC declarations of conformity for the components,
- the regulations for explosive atmospheres according to Directive 2014/34/EC (ATEX) and is suitable for work below ground, Device Group I, Category M2.

ATEX-Marking:	Ⓔx I M2 Ex h I Mb	
Manufacturer:	Tüschen & Zimmermann GmbH & Co. KG (Address: see cover sheet)	
Definition:	tz-valve control cabinet, hydraulic (in compliance with ATEX)	
Product Identification:	Type plate (positioning: Front door, at the top left)	
Technical Data:	Weight:	approx. 60 kg
	Dimensions:	800 x 600 x 250
	Operating material:	HFC 46, HFC 68
	Temperature of the operating material:	-20 °C to +60 °C
	Minimum pressure:	55 bar
	Maximum pressure:	100 bar
	Operating voltage:	Control voltage = 12 V DC
	Ambient temperature:	-20 °C to +50 °C
	Type of protection according to EN ISO 80079-37::	c – constructional safety
	Mounting position:	vertical
	Additional information:	see Annexes
Scope of delivery:	1 pc. tz-valve control cabinet, hydraulic 1 pc. Installation and Operating Manual 1 pc. Declaration of confirmity Valve control unit hydraulic, TZ-013937	
Copyright tz 2009	Protection mark according to DIN 34	

Table 3: General Information

1.4 Device description

The tz-valve control cabinet was designed for the use in underground mining and serves to activate from 1 to max. 4 tz-brake power units of the Type series BKG S-HA.

1.4.1 Design

(see also Drawing TZ-013999/E)
The tz-valve control cabinet (as shown in Fig. 1) basically consists of:

- Cabinet housing (Item 1, Fig. 1) with external earth connection and holding eyelets (Item 2, Fig. 1)
- Pressure accumulator group with supply pipe (Item 16, Fig. 1), 2-way-shut-off valve (Item 3, Fig. 1), distributor (Item 4, Fig. 1), pressure gauge for the inlet pressure (Item 5, Fig. 1), Minimess vent coupling (Item 6, Fig. 1) as well as up to four bladder-type accumulators (Item 7, Fig. 1)
- Electrical connection and distribution box (Item 8, Fig. 1)
- 3-way-changeover cock (Item 9, Fig. 1) with lock washers (Item 20, Fig. 1) and numeric padlock (Item 21, Fig. 1)
- output manifold block (Item 10, Fig. 1) with pressure gauge for lifting pressure (Item 11, Fig. 1), throttle check valves (Item 12, Fig. 1), connections for the tz-brake power units (Item 13, Fig. 1) as well as the pressure switch (Item 14, Fig. 1)
- valve block (Item 17, Fig. 1) with two hydraulically pre-controlled solenoid valves lifting valve I (Item 18, Fig. 1) and lifting valve II (Item 19, Fig. 1) as well as the return line (Item 15, Fig. 1)

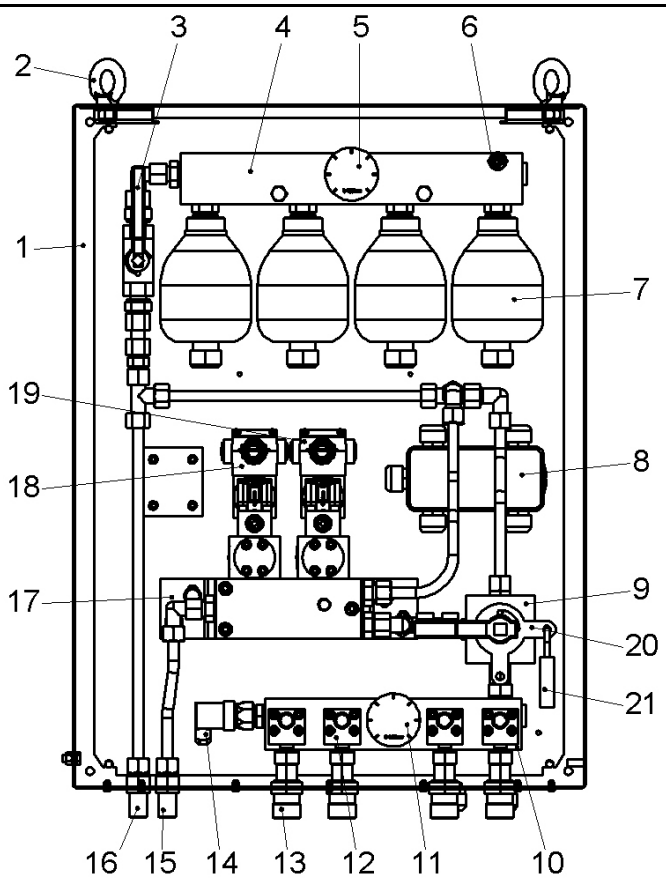


Figure 1: tz-valve control cabinet hydraulic

1.4.2 Operating Principle

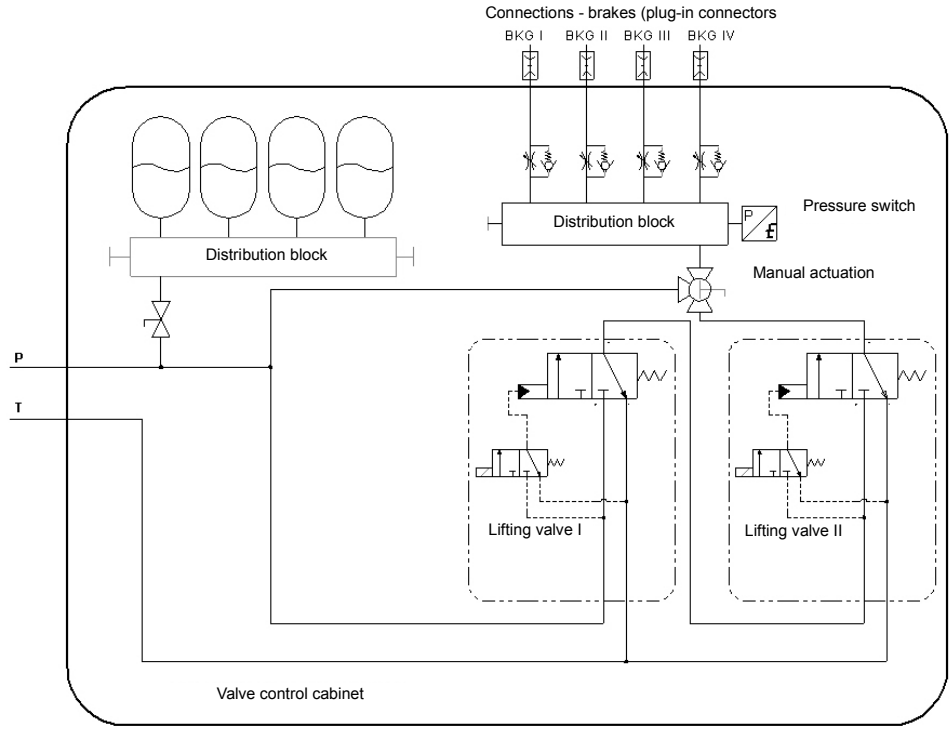


Figure 2: Hydraulic diagram

The tz-valve control cabinet as a switchgear and control unit connects the hydraulic oil supply with the tz-brake power units of the Type series BKG S-HA.
Supply (Item 16, Fig. 1) and return pipe (Item 15, Fig. 1) are connected to the hydraulic power unit. The tz-brake power units are connected to the remaining four outputs (Item 13, Fig. 1).

The 3-way-changeover cock (Item 9, Fig. 1) is set to the 0 position in normal operation, meaning the connection between the valve block and the tz-brake power units is opened; however, the direct connection is closed.

Upon switching on the hydraulic power unit, the bladder-type accumulators (Item 7, Fig. 1) are loaded.

ATTENTION!
The operating pressure must not exceed 100 bar. It must be ensured that hydraulic power units are turned off under pressure control or connected pressure-limited.

The intensity of the pressure within the supply pipe can be monitored via the pressure gauge (Item 5, Fig. 1).

The tz-valve control cabinet works redundantly with two hydraulically pilot-operated 3/2-way directional control valves (Items 18 and 19, Fig. 1).
As soon as the brake lifting command is given, the magnetic coils (12V DC, intrinsically safe) of both valves are activated, the supply pipe (Item 16, Fig. 1) is primed and the connected tz-brake power units open starting with a lifting pressure of approx. 55 bar. Once the activation is no longer pending at the magnetic coils, the valves move to resting position, open the return pipe to the tank for the pressure medium (Item 15, Fig. 1) and the tz-brake power units close due to the restoring force of the preloaded spring assemblies.

If, in exceptional cases, the tz-brake power units are to be actuated by hand, the 3-way changeover cock (Item 9, Fig. 1) is turned to the position 'Manual operation' and thus the hydraulic pressure, when bypassing the valves, is passed directly to the brake connections (Item 13, Fig. 1).

Then the tz-brake power units remain lifted until the 3-way changeover cock (Item 9, Fig. 1) is reset.

The operating state of the tz-brake power units must be monitored via the pressure indicator (Item 11, Fig. 1) on the output manifold block (Item 10, Fig. 1) In addition, the lifting pressure can be monitored via the pressure switch (Item 14, Fig. 1) Starting with a pressure of approx. 55 bar the brake power returns to 0.

Caution when handling an emptied bladder-type accumulator (Item 7, Fig. 1):
The complete charge of the bladder-type accumulator (Item 7, Fig. 1), e.g. when turning it on for the first time or after an extended standstill, may take approx. 10 s.
However, a partial charge already allows the opening of the tz-brake power unit.

2 Installation

2.1 General Safety Instructions

Strictly observe the warnings according to 4.3 , as well as safety instructions according to 4.4 .

2.1.1 Electrical installation

ATTENTION!

a) The devices may be installed in underground mines for the danger zone "potentially explosive atmosphere" according to DIN EN 1127-2 (required design of the device according to Group I, Category M2) and must be included in the cut-off circuit in case of a CH4 hazard.
b) The installation of the intrinsically safe power circuits must be performed in accordance with the applicable installation regulations (e.g. DIN VDE 0118) by qualified experts (proof of professional qualification of the assembly personnel, protected installation of intrinsically safe circuits, etc., is to be furnished).
c) The devices comply with the type of protection IP 54 and therefore have to be suitably protected in the case of adverse ambient conditions such as splashed water or dirty conditions exceeding contamination level 2.
d) The EC type examination certificates must be observed. Any “special regulations” that may be contained therein must be complied with.
e) The device must only be used in compliance with its designated purpose.
f) The interconnection with the power supplies must be checked separately with special care. All the cables and wires must be connected according to the terminal diagram.
g) Equipotential bonding must be provided at the marked connection point.

2.1.2 Delivery State

The tz-valve control cabinet is delivered closed and with the following default settings:

- the 2-way shut-off valve (Item 3, Fig. 1) is set to “open” (lever points upwards)
- the 3-way-changeover cock (Item 9, Fig. 1) is set to “normal operation” (lever positioned horizontally to the left)

2.1.3 Inspection before installing the unit

ATTENTION!
Prior to the installation, the tz-valve control cabinet must be checked for leaks, mechanical damages and other defects. Check the pressure connections for firm fit.

2.1.4 Mounting the tz-valve control cabinet

Preferably, the tz-valve control cabinet is mounted suspended from the holding eyelets (Item 2, Fig. 1). The dimensions are contained in the drawing in the annex.

2.2 Connection of the Operating Medium

2.2.1 Fluid connection

ATTENTION!
Prior to the connection, remove contamination from the pipes. Open the media supply only with a correct connection and following a check of the same.

Attach the line connections close to the cabinet unit. (Only permissible connection elements and permissible sealing elements may be used).
Ensure correct cock position of the valves.

Connect supply (Item 16, Fig. 1) and return pipes (Item 15, Fig. 1) to the hydraulic power unit. Subsequently, connect the tz-brake power units to the connections (Item 13, Fig. 1).

2.2.2 Electrical connection

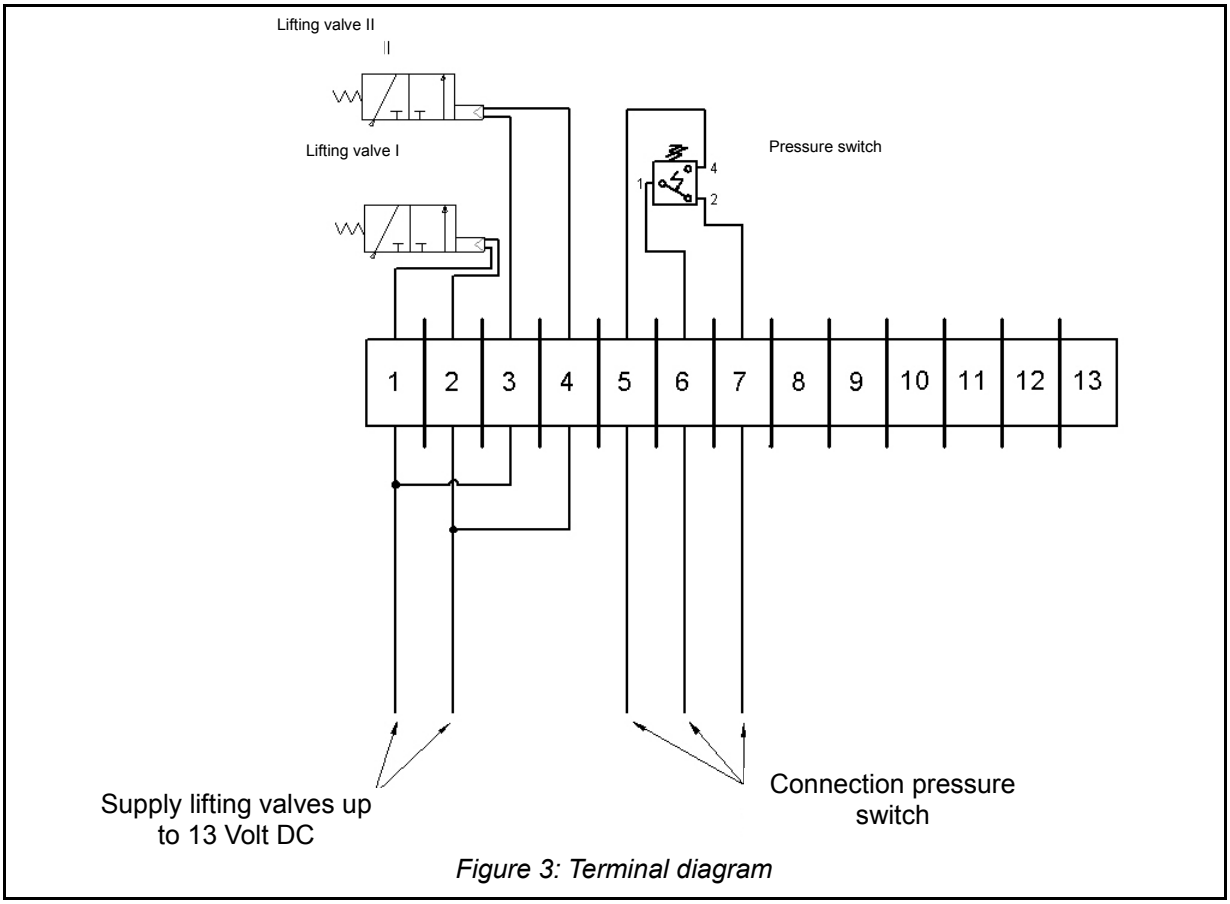


Figure 3: Terminal diagram

The electrical connection of the tz-valve control cabinet is provided via the connecting terminals and/or connectors.
Particular attention should be paid to the correct installation and maintenance of the IP protection.

3 Commissioning

Strictly observe the warnings according to 4.3 , as well as safety instructions according to 4.4 .

3.1 Normal operating conditions

Position of the 2-way shut-off valve (Item 3, Fig. 1**):**
For a proper functioning of the tz-valve control cabinet, the 2-way shut-off valve (Item 3, Fig. 1) must always be open (hand lever points upwards).

Position of the 3-way changeover cock (Item 1, Fig. 4**):**
(Brake application via solenoid valves)

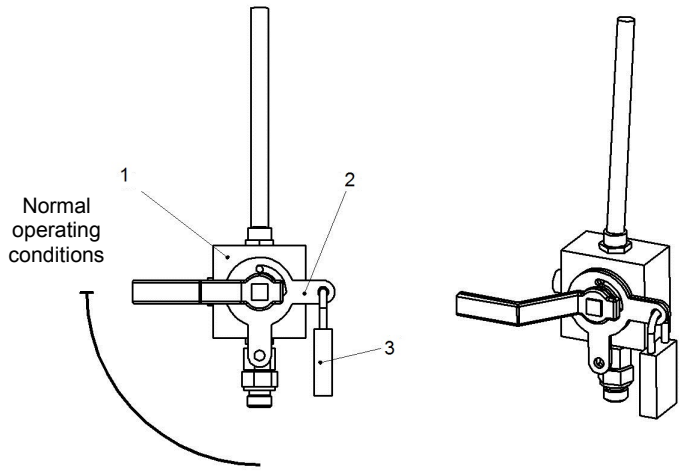


Figure 4: Normal operating conditions

The 3-way changeover cock (Item 1, Fig. 4) is set to 'Normal operating conditions' (horizontally to the left).
By using the combination padlock (Item 3, Fig.) , the locking plates (Item 2, Fig. 4) ensure an unintended adjustment of the switching position. The switching position must always be secured with the combination padlock (Item 3, Fig. 4).

Prior to putting the plant in operation the tz-valve control cabinet as well as the pressure pipes to the tz-brake power unit must be vented carefully.

Venting:
With the hydraulic power unit running, ventilate the tz-valve control cabinet by fastening the Minimess hose included in the delivery to the Minimess vent coupling (Item 6, Fig. 1). This opens a one-way flow control valve, and the service liquid can be drained into a vessel until the liquid exits free of bubbles. In the process, ensure that the liquid is returned to the tank to replenish the decreased tank level. The venting Minimess coupling (Item 6, Fig. 1) closes automatically as soon as the Minimess hose is removed. If necessary, with elevated pressure hoses to the tz-brake power units, the same method may also have to be applied to vent the tz-brake power units.
If the tz-brake power units are not provided with a Minimess vent coupling, during the ventilation of the system it must be ensured that the hoselines and the tz-brake power units are positioned lower than the Minimess vent coupling (Item 6, Fig. 1).

Operate the solenoid valves (Items 18 and 19, Fig. 1) via the upstream electrical control system (on the operator side) while ensuring function and tightness of the system.
For installation into the brake hoods, the connected tz-brake power units can also be actuated manually.(see 3.2).

3.2 Manual operation

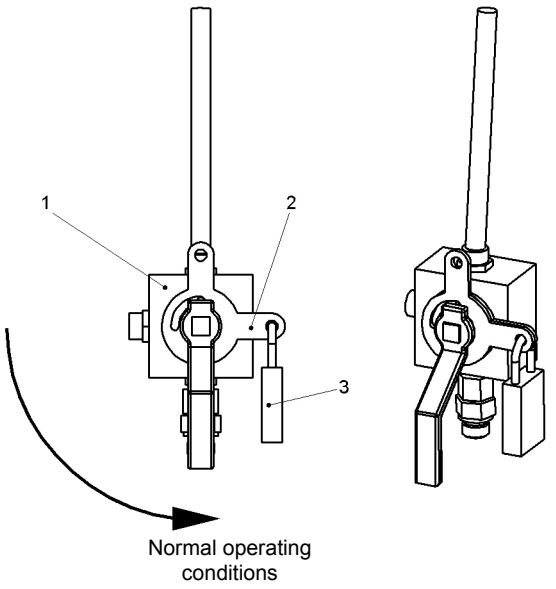


Figure 5: Manual operation

Open brake:
Set 3-way-changeover cock (Item 1, Fig. 5) to “manual mode”
(Lever is in vertical position pointing down)

Close brake:
Return 3-way changeover cock (Item 1, Fig. 5) to “Normal operation”.
(Lever is positioned horizontally to the left, see Item 1, Fig. 4)

CAUTION!
When handling the tz-brake power units connected to the pressure supply, the valves (solenoid valves, 3-way changeover cock) must be secured against unauthorised switching, since unexpected brake calliper movements contain within themselves the danger of crushing resulting in severe injuries.

By using the combination padlock (Item 3, Fig. 5) , the locking plates (Item 2, Fig. 5) ensure an unintended adjustment of the switching position. The switching position must always be secured with the combination padlock (Item 3, Fig. 5).

Upon completion of the manual operation, it must be ensured that the 3-way changeover cock (Item 1, Fig. 5) does not remain in the position 'Manual operation', since this would block the “Normal operation”. The result is that no regular braking is possible via the electro hydraulic control system.
After resetting the 3-way changeover cock (Item 1, Fig. 5) to the position “Normal operating conditions," this position must be secured again against unintended switching using the locking plates (Item 2, Fig. 5) and the combination padlock (Item 3, Fig. 5).

4 Service

Strictly observe the warnings according to 4.3 , as well as safety instructions according to 4.4 .

4.1 Maintenance

4.1.1 Definition of maintenance and servicing

(definitions under IEC 60079-17)

Maintenance and repair: A combination of all activities that are performed in order to maintain an object in or restore it to a condition that fits the requirements of the specification and ensures the execution of its required functions.

Inspection: An activity that includes a careful analysis of the object with the intention of providing a reliable statement about the condition of the object. The analysis has to take place without disassembly or, if necessary, with partial disassembly, completed with arrangements like e.g. taking measurements.

Visual inspection: A visual inspection is an inspection for visible faults without using keys or tools, e.g. looking for missing screws.

Close inspection: An inspection where, in addition to the visual inspection, also the use of means of access, e.g. stairs (if needed) or tools is permitted to detect faults, e.g. loose screws, which would otherwise remain undetected. For close inspection, usually a housing does not need to be opened and the equipment has not to be set de-energised.

Detailed checking: An inspection where, in addition to the aspects of a close inspection, faults like loose connections can be detected, which can only be recognised by opening housings and/or, if necessary, using tools and testing equipment.

1. Servicing measures must always be carried out by qualified persons (or persons with comparable qualifications, see TRBS 1203).
2. Components must be replaced with original spare parts, which are also released for use in hazardous areas; this also applies to the lubricants and additives used.
3. The equipment used in the hazardous area must be serviced and cleaned regularly. The intervals are defined by the operator depending on local levels of environmental pollution.
4. After the maintenance and/or servicing, all removed barriers and instructions must be attached again in the original position.

4.1.2 Maintenance of the tz-valve control cabinet

Weekly checks:

- Visual inspection of the tz-valve control cabinet for leaks and mechanical damage.
- Function check of the solenoid valves as well as the pressure indicators during a deceleration or a brake test.

In order to maintain system reliability, the tz-valve control cabinet must be sent to the manufacturer for a general overhaul after no more than 5 years.

If damage or deficiencies cannot be removed, the tz-valve control cabinet must be replaced.

4.2 Repair and Revision activities

ATTENTION!

Repairs and adjustments to the tz-valve control cabinet that exceed the scope of a normal inspection may only be carried out at the manufacturer's factory.

Professional repair or reconditioning can only be guaranteed by the manufacturer.

Interventions carried out on the plant by a third party may alter specified characteristics and may lead to faults and malfunctions for which tz does not assume any liability.

4.3 Warnings

ATTENTION!

Only use clean hydraulic fluid as operating medium. Minimum pressure 55 bar – Maximum pressure 100 bar.

Ensure cleanliness of the compensation oil. Dirt and contamination lead to the destruction of seals and to improper operation of the compensation unit for brake lining wear of the tz-brakes.

The system must be empty and de-pressurised when changing any connections.

Do not use hemp or similar products to pack connections.

Use new seals only.

All screwed connections released must be properly tightened before operating the equipment again.

Do not operate the system beyond the maximum release pressure. (Maximum pressure 100 bar).

4.4 Safety Instructions

4.4.1 General Information

ATTENTION!
Maintenance and repair work must only be performed at a depressurised system and with the pressure supply turned off. Danger of death! Do not open any components while they are under pressure. All additional installation locking devices must be removed before recommissioning. Welding or soldering work or mechanical operations regarding the pressure accumulator are prohibited.

4.4.2 Handling of hydraulic equipment

Maintenance and repair work at the hydraulic equipment must only be performed by specially trained personnel. Release the pressure in the hydraulic equipment before starting any maintenance or repair work. On principle, all service work on hydraulic equipment must be carried out while the machine is at a standstill. Prior to starting any work on the equipment, make sure that all the drives are secured against unintentional re-start. Replace hoselines as a preventive maintenance measure (Observe manufacturer's instructions).

Inappropriate behaviour of a person may lead to ignition hazard.
A warning sign with the text "Use only with hydraulic fluid HFC 46" or "Use only with hydraulic fluid HFC 68" must be attached to the device.

4.4.3 Operating medium / treatment

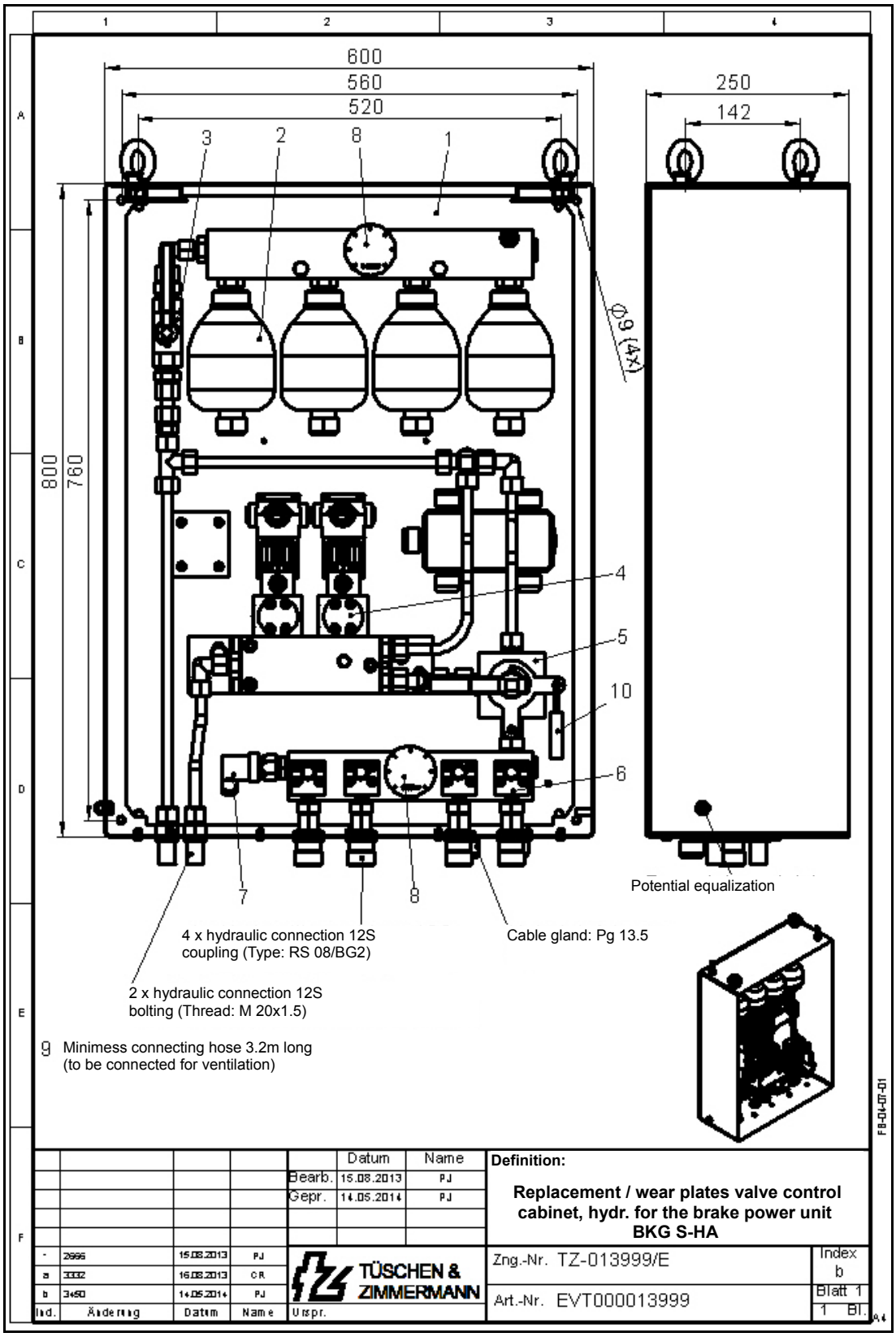
Introduction
The hydraulic fluid in the piping system may contain contaminants such as dirt and rust particles. These contaminations may affect the service life and the correct operation of the hydraulic devices connected.

Pressure fluctuations
Pressure fluctuations may cause problems with respect to the proper operation of the hydraulic devices. Unacceptably high pressures can damage the hydraulic devices.

Hydraulic fluid to be used:: HFC 46 or HFC 68

4.5 Disposal

The packaging material and used parts have to be disposed of in accordance with the laws and regulations of the country where the device is installed.


600
560
520
250
142
3
2
8
1
Φ9 (4x)
800
760
4
5
10
6
7
8
Potential equalization
4 x hydraulic connection 12S coupling (Type: RS 08/BG2)
Cable gland: Pg 13.5
2 x hydraulic connection 12S bolting (Thread: M 20x1.5)
9 Minimess connecting hose 3.2m long (to be connected for ventilation)
Datum
Name
Bearb. 15.08.2013 PJ
Gepr. 14.05.2014 PJ
Definition:
Replacement / wear plates valve control cabinet, hydr. for the brake power unit BKG S-HA
TÜSCHEN & ZIMMERMANN
Zng.-Nr. TZ-013999/E
Index b
Art.-Nr. EVT000013999
Blatt 1
1 Bl.
A4

1	2	3	4	5	6
Item	**Quantity**	**Unit**	**Definition**	**TZ Dwg.no/TZ parts list no.**	**TZ Art. no.**
1	1	Item	**Valve control cabinet, cpl., hydr.** 12V intrinsically safe, ATEX, redun. for 4x brake power units S-HA	TZ-013937/E TZ-013937/ES	163 000 013 937
2	1	Item	**Pressure accumulator, cpl.** SBO 100-07, 50 bar red, including connection		163 000 013 998
3	1	Item	**HD-block ball cock 1/2"** Cat. no. 100020		130 062 2
4	1	Item	**3/2-way directional control valve** NG9 200 bar single hydr. pilot-operated		120 038 6
5	1	Item	**HP-block 3-way ball cock** CES 12S-DN, 500 bar T-bore with guided ball selector shaft		130 016 4
6	1	Item	**Throttle check valve** DRVP-06-12.X seal: NBR		130 062 4
7	1	Item	**Pressure switch** Type: DWS-1-100-NBR-90 / VA intrinsically safe		120 037 0
8	1	Item	**Pressure gauge 0 - 160 bar** with glycerine filling Manufacturer: WIKA		130 022 2
9	1	Item	**Minimess connecting hose** 3.2 mtr. long 630 bar		130 007 7
10	1	Item	**Padlock** combination lock ABUS 165/40		170 373 3

Remark:

					Date	Name
				Compiler	06 August 2013	CR
				Rev.	06 August 2013	pj
				Stand.		
				Tüschen & Zimmermann		
a	3332	15 August 2013	pj	Prod. Dwg. TZ-013999/EZ		
cond.	Revision	Date	Name	Orig. Ed. TZ-013999/ES		

Definition:

Replacement / wear plates valve control cabinet, hydr. for the brake power unit BKG S-HA

Spare part list no.: **TZ-013999/ES** Index **a**

Art. no.: **EVT 000 013 999** Sheet 1

1 sheet

FB-04-08-01

Tüschen & Zimmermann
D-57368 Lennestadt

Type: TZ-xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

TZ-art.-no.: xxxxxxxxxxxx

Ex I M2 Ex h I Mb

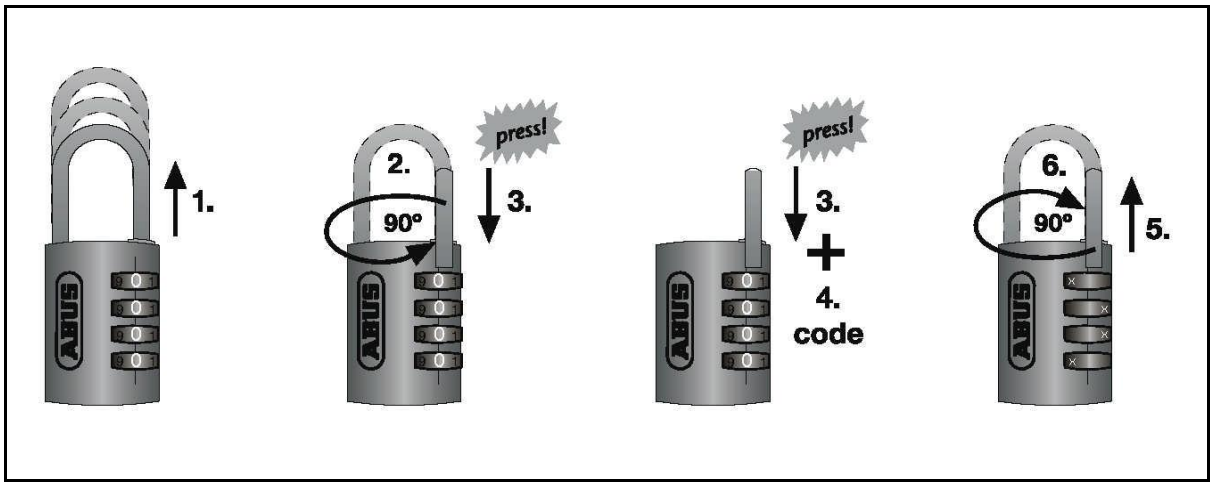
TFR: ATEX TZ-013937

Operating pressure: min. 55bar / max. 100bar

CE

Weight: xxx kg

Serial number.: xxxx Construction year: xx.xx.xxxx


1.
2.
90°
press!
3.
press!
3.
+
4.
code
6.
90°
5.