

Operating instructions

Fuka Dual-Circuit Brake Systems

Rudolf Fuka GmbH
Richard-Byrd-Str. 41
50829 Cologne Germany

phone: +49 221 539958-0
fax: +49 221 539958-55
E-mail: info@fuka.de
Web: www.fuka.de

Registered office of the company: Cologne
District Court Cologne – HRB 36096

Management:

Rudolf Fuka
Torsten Fuka

Version: 4th Version
Edition date: 2018/11

Subject to change

We reserve the right to make technical changes that serve to improve our products or increase the level of safety even without separate announcement.

All rights reserved.

© Copyright by Rudolf Fuka GmbH

1. General information3
 Content of this manual3
 Explanation of terms and symbols3
 General safety and health information3
 Intended use of the brake.....3
 Warranty and liability3

2. Transport, storage and packaging4
 Inspection by recipient.....4
 Temporary storage4

3. Components and variants of the brake device5
 Spreading solenoids (type GS)/double-spreading solenoids (type GSD)6
 Brake release lever.....6
 Brake shoes.....6

4. Installation/commissioning7
 Adjusting the spring preload.....7
 Setting the working stroke8
 Adjusting the microswitch.....8

5. Periodic inspection of the brake system9

6. Electrical installation/connection diagrams10

1. GENERAL INFORMATION

Content of this manual

The content of these operating instructions includes procedures, inspection instructions and guidance on commissioning, adjustments, operation and maintenance of the dual-circuit brake. The guidelines must be followed to ensure the safe operation of the brake. Further relevant components are described with details of technical data. Electrical connection diagrams and data sheets can be found in the appendix.

Explanation of terms and symbols



Information



Warning of danger



Warning of hand injuries



Warning of electrical voltage



Warning of hot surface

General safety and health information

Prerequisite for the safe handling and trouble-free operation of the safety component is the knowledge of the basic safety regulations and the safety notes in these operating instructions. All persons who install or operate this safety component are obliged to observe the safety and warning instructions. In addition, all general rules and regulations for accident prevention must be observed. The operating manual must be kept at the installation site.

Intended use of the brake

The drum brake has been designed according to state of the art and the recognized safety rules. It may only be used as intended and in absolutely perfect condition with respect to safety. The brake device may only be used in dry environments and in surroundings not at risk of explosion. All other types of use are considered improper.

Warranty and liability

No liability is assumed for damages or disruptions caused by incorrect installation or failure to comply with these operating instructions. For damages resulting from the use of spare parts or accessories that have not been approved by the manufacturer, any further liability and warranty of the manufacturer is excluded. Any unauthorized repairs, alterations and modifications are not permitted for safety reasons and exclude liability and warranty of the manufacturer for resulting damages as do the insufficient monitoring of parts that are subject to wear, improperly performed repairs, improper attachment or connection of additional or spare parts, damages caused by external influences, disasters or force majeure.

2. TRANSPORT, STORAGE AND PACKAGING

Inspection by recipient

The brake is supplied in suitable packaging (carton/pallet).The delivered goods and the packaging must be inspected upon receipt for completeness and damage. Later complaints cannot be accepted.

Temporary storage

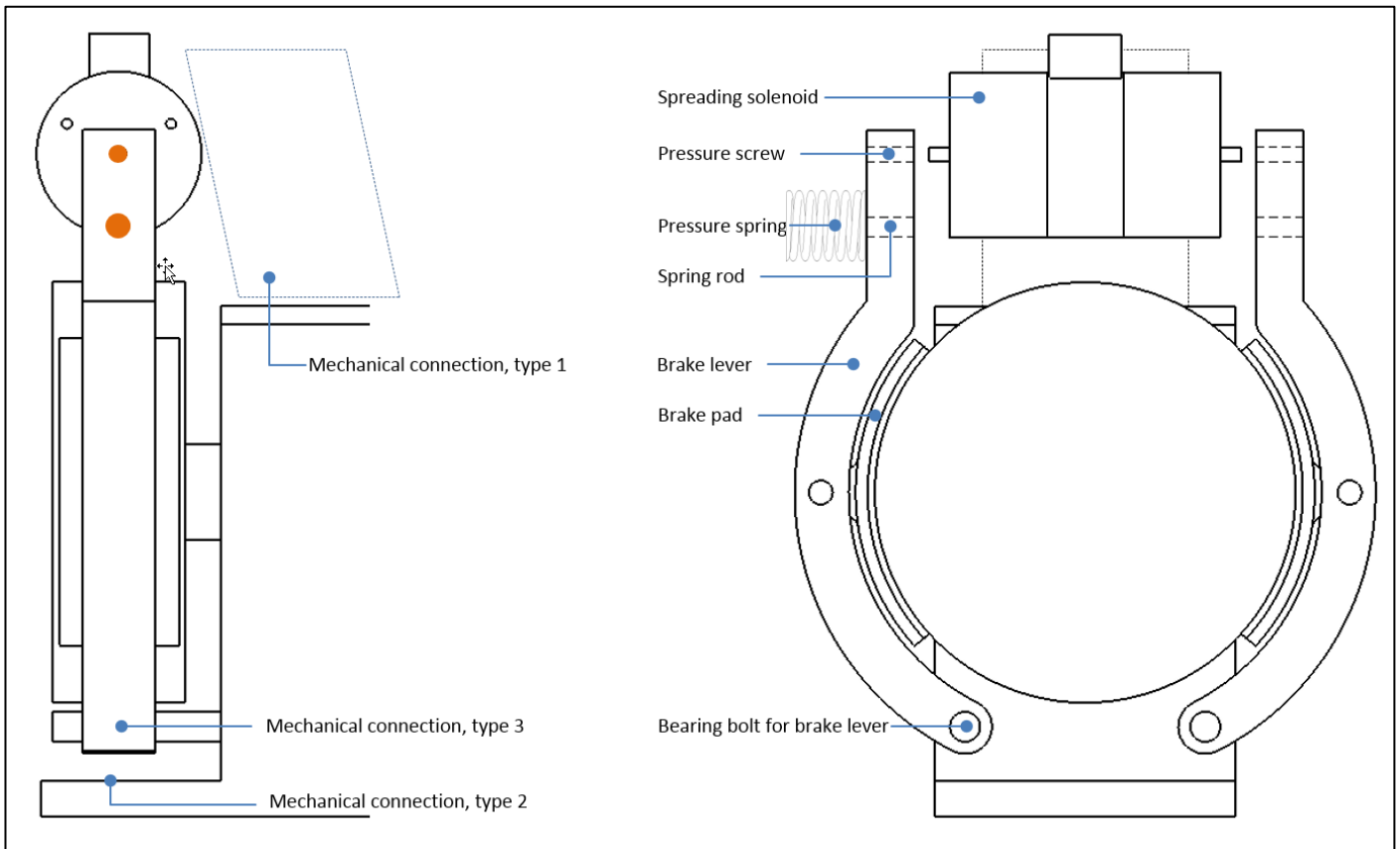
If the drum brake is not installed immediately, it must be stored so as to protect it against moisture, dirt and damage.



The requirements for machine and pulley rooms shall also apply to environmental conditions at the installation site of the drum brake

3. COMPONENTS AND VARIANTS OF THE BRAKE DEVICE

Depending on the type of brake, not all components are included in the scope of delivery but can be added as spare parts. These include brake levers, brake pads, compression springs and brake lever bolts. Should some components not be included in the scope of delivery, the brake system is designed so that the original parts of the existing brake are compatible, e.g., brake pads and brake lever. Dual-circuit brakes from the Rudolf Fuka GmbH company can be divided into three types according to the type of fastening (mechanical connection).



Mechanical connection, type 1

With this type, the brake release device is mounted on the existing gear cover. A new gear cover is supplied if required. The brake is supplied in pre-assembled condition. Installation is simply carried out by replacing the old gear cover with the new component or by mounting the supplied brake release device on the existing mounting holes of the old gear cover.

Mechanical connection, type 2

This type of "braking station" is positioned on the existing machine bed. Delivery of the brake station includes new brake levers/pads. In general, appropriate mounting holes exist in the machine bed on delivery of a brake station. In some cases, it may be necessary to drill mounting holes on site. In this case, you will be informed, and the brake will be supplied with a drawing with the appropriate dimensions.

Mechanical connection, type 3

This type of "braking station" is placed on the existing brake lever bolts of the gearbox and secured against axial displacement with the existing safety elements. New brake lever bolts and brake pads are included in the scope of delivery.

Spreading solenoids (type GS)/double-spreading solenoids (type GSD)

Solenoids of the GS or GSD series are used with all Rudolf Fuka GmbH brakes. Both solenoid series are used for operating spring-operated brakes in the drives of elevators. When energized, the solenoid pushes the brake levers apart. In case of an emergency, the solenoid can be released by a brake release lever. The solenoids are actuated with a DC voltage. The DC voltage must be provided by the elevator control, except for brakes that are designed with over-excitation controller; these are actuated on-site with 230V AC. The overexcitation controller provides the required DC voltage for the solenoids. *You can find data sheets and connection diagrams for the electrical components in the appendix of these operating instructions.*



High surface temperatures can occur on the external parts of the solenoids during operation. When performing maintenance during operation, protective measures are to be taken against touching if necessary.

Brake release lever

The brake release lever is used to manually release the brake. The brake release lever must be stored in the vicinity of the brake. For brakes designed with double-spreading solenoids, the brake release lever is part of the solenoid. Versions with two single-acting spreading solenoids are supplied with separate brake release lever.

Brake shoes

If brake shoes are included with the delivery, the standard brake lining has a coefficient of friction of $\mu = 0.35$. As an alternative to new pads, a pad of comparable coefficient of friction that is permissible for use with drum brakes may be used. If brake linings are not included in the scope of delivery, the brake system is designed so that the existing brake shoes are compatible.



The brake lining thickness must be examined at appropriate intervals, depending on the frequency of use of the elevator. The brake lining must be replaced when worn down to 3 mm. Wear to less than 2 mm must absolutely be avoided.

4. INSTALLATION/COMMISSIONING

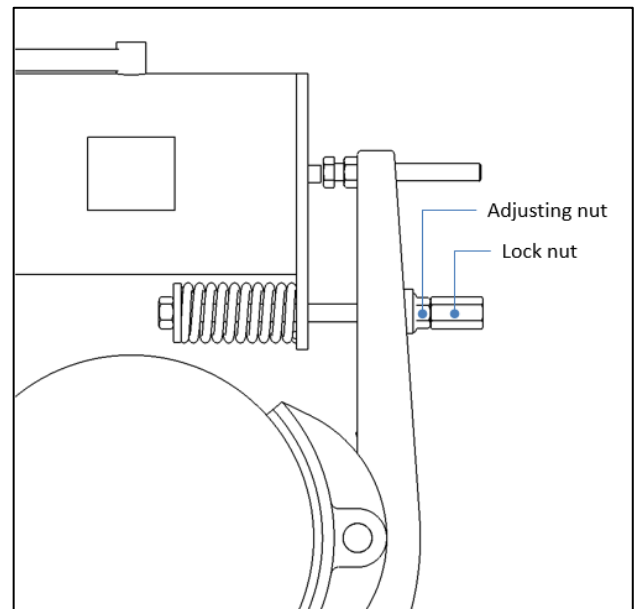
The safety regulations according to *DIN VDE 0105* must be observed during installation/commissioning. Should the brake device be damaged, please contact Rudolf Fuka GmbH. The components of the brake system are delivered in a pre-assembled condition. Changes are not usually necessary on-site. The installation of the brake system – or the brake release device – adjustment of the spring preloading and of the residual stroke are described on the following pages.

Fuka dual-circuit brakes are mounted on the existing mounting points of the old brake. Should it be necessary to drill new holes in individual cases, a separate drawing is supplied.

Fuka dual-action brakes are generally designed so that the compression springs are positioned below the solenoid. In some cases, this is not possible due to space limitations. In these cases, the compression springs are positioned outside on the brake lever. In both cases, the spring acts as a compression spring. Compression spring bars that are too long can be shortened on site by the installer, but before adjusting the spring preload.

Adjusting the spring preload

The braking torque is adjusted by the spring preload force. The preload of the compression springs must be set at least so that the braking torque meets the requirements of the braking deceleration. If the springs are overtightened, the magnetic force can fail. Note that the solenoid warms up and loses a small amount of power during operation. A follow-up inspection and, if necessary, readjustment, must therefore be performed after some time. To adjust the braking torque, loosen the **lock nut** on the spring rod. Then use the **adjusting nut** to preload the compression springs until the required preload is achieved. Ensure that both sides are uniformly preloaded. Tighten the lock nut again and check for proper brake release. The brake function of the system must then be tested.



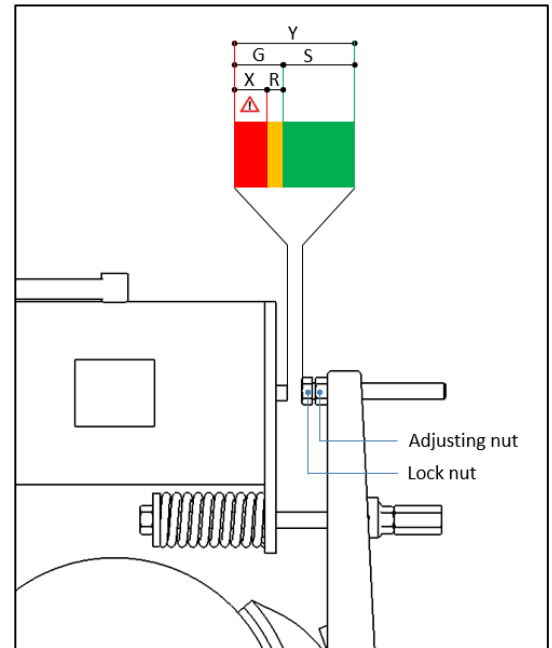
Setting the working stroke

The working stroke that is made available by the magnetic plunger for releasing the brake is set with the brake closed and mounted. Before adjusting the working stroke, make sure that the plungers of the solenoid are completely in the rear end position (retracted).

Type	GSD 100	GSD 115	GSD 135	GSD 136	GSD 165	GS 100
Y [mm]	2.5	3.0	3.0	4.0	4.0	5.0
S [mm]	1	1	1	2	2	3
G [mm]	1.5	2	2	2	2	2
R [mm]	0.7	1	1	1	1	1
X [mm]	0.8	1	1	1	1	1

Y = total stroke; S = working stroke; G = air gap (R + X);

R = reserve zone; X = danger zone

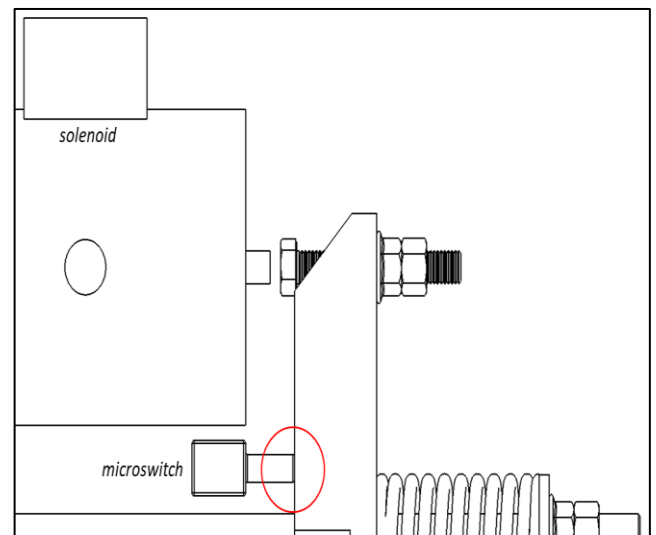


If the brake lining wears during operation, the air gap G and, thus, the reserve zone R

are also reduced. If the magnetic piston is in the reserve zone R, the air gap G must again be adjusted to the correct value. The magnetic piston must never enter the danger zone: if the brake comes into contact with the solenoid plunger, the brake will lose its braking effect! To adjust the residual stroke, loosen the lock nut and adjust the adjusting screw to the correct position (table above). Next, secure with the lock nut. Then release the brake several times and check the residual stroke again. The air gap G must also be checked again after replacing the brake shoes.

Adjusting the microswitch

Microswitches can optionally be supplied with the braking device. If microswitches are used for brake lever monitoring, each brake shoe must be fitted with a contact that is directly operated mechanically. A malfunction must immediately shut down the elevator. The installer of the elevator system is to integrate the self-monitoring of the brake shoes in the elevator control. At a minimum, the non-opening and non-closing of the individual monitoring contacts as well as short circuit and interruption of the electrical connections and a power failure of the brake control must be considered as malfunctions of the self-monitoring system. The position of the microswitch may vary for the different brake types. The diagram is provided for illustration purposes only. The microswitches are adjusted with the brake shoes resting against the drum and after the spring preload force of the brake springs has been set. To do this, the microswitch is turned with the inner brake lever until there is an audible "click."



5. PERIODIC INSPECTION OF THE BRAKE SYSTEM

Fuka dual-circuit brakes are equipped with a redundant braking system according to DIN EN 81. The brake system is to be tested in accordance with the regulations for the operation of elevators; this may only be performed by qualified personnel.

Brake shoes:

The brake linings must be inspected for wear periodically and replaced if necessary. The maintenance intervals are to be defined by the responsible elevator company depending on the frequency of use of the elevator.

Limit switches:

The limit switches must be checked for proper function. It must be ensured that the limit switches switch when the brake release device opens.

Residual stroke:

Regularly check the present residual stroke on the pressure screw. This decreases with increasing wear of the brake shoes.

Failure of one brake circuit:

The individual brake circuits are tested by mechanically blocking one brake side. When the drive is switched off at the rated speed, the car must slow down sufficiently. The speed of the car upon hitting the buffer must not exceed the rated speed. Next, test the other brake side. If the deceleration is not sufficient, the spring force of the springs must be increased, whereby it must be ensured that the maximum preloading is not exceeded. Emergency braking is triggered with both the left and right braking distance and the stopping distance tested in accordance with elevator regulations.

6. ELECTRICAL INSTALLATION/CONNECTION DIAGRAMS

Rudolf GmbH Fuka uses Kuhse solenoids of the GS series (single-spreading solenoid) and GSD (double-spreading solenoid). The type of solenoid is marked on the solenoid body. Below, you can find the connection diagrams of the various solenoid models and of the microswitches. Before connecting, the connection voltage must be compared with the rated voltage and voltage type specified on the type plate and brought into compliance if necessary. When using our solenoids in a service brake, we recommend using a shutdown system on the DC side. This causes the brake lever to actuate quickly, thereby resulting in a shorter braking distance.

