

**Installation and Operating Instructions for  
Brake Caliper DH 020 PFK and DV 020 PFK**

**E 09.619e**



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<b>RINGSPANN</b>	<b>Installation and Operating Instructions for Brake Caliper DV / DH 020 PFK pneumatically activated, spring released</b>	<b>E 09.619 e</b>			
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## IMPORTANT

Please read these instructions carefully before installing and operating the product. Your particular attention is drawn to the notes on safety.

These installation and operating instructions are valid on condition that the product meets the selection criteria for its proper use. Selection and design of the product is not the subject of these installation and operating instructions.

Disregarding or misinterpreting these installation and operating instructions invalidates any product liability or warranty by RINGSPANN; the same applies if the product is taken apart or changed.

These installation and operating instructions should be kept in a safe place and should accompany the product if it is passed on to others -either on its own or as part of a machine- to make it accessible to the user.

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## SAFETY NOTICE

- Installation and operation of this product should only be carried out by skilled personnel.
- Repairs may only be carried out by the manufacturer or accredited RINGSPANN agents.
- If a malfunction is indicated, the product or the machine into which it is installed, should be stopped immediately and either RINGSPANN or an accredited RINGSPANN agent should be informed.
- Switch off the power supply before commencing work on electrical components.
- Rotating machine elements must be protected by the purchaser to prevent accidental contact.
- Supplies abroad are subject to the safety laws prevailing in those countries.

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## 1. General information

These installation and operating instructions apply to:

- the DV 020 PFK, brake calliper mounted parallel to the brake disc (frame construction V).
- the DH 020 PFK, brake calliper mounted at a right angle to the brake disc (frame construction H)
- for installation on a brake disc with a thickness of 12,5 mm.
- the versions with enhanced corrosion protection
- various types of brake-pads, e.g. with wear alarm cable, increased glide speed, double friction surface or other special brake pad materials.

An identification plate with a 16-digit part number is affixed to the calliper. The precise design of the brake calliper is defined by this part number only.

Please consult the drawings in each section when using this instructions.

## 2. Configuration and function

The brake calliper is used as a stopping, control and parking brake.

Braking force is generated by compressed air. The brake is released (opened) by spring force.

Rotating parts must be secured by the user against inadvertent contact (e.g. brake disc).



### **Danger to life and limb!**

**It is essential to secure the entire drive train against inadvertent starts during brake installation and maintenance. Rotating components can cause severe injuries.**

**Therefore, rotating components (e.g. brake disc) must be secured by the operator to prevent accidental contact.**

### 3. Drawing and parts list

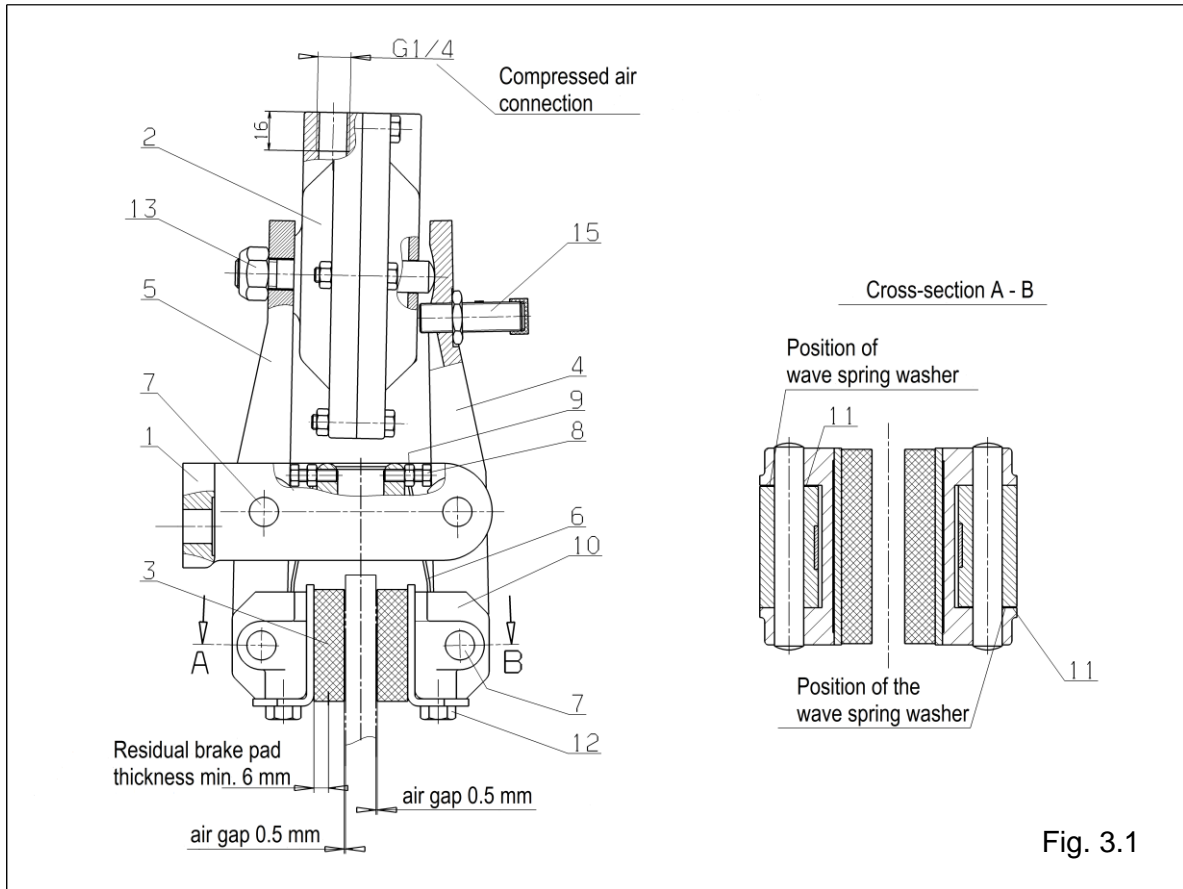


Fig. 3.1

#### Parts list:

Part	Nomenclature	Quantity	Part number
1	Frame to DV 020 PFK	1	2474-152001-000000
	Frame to DH 020 PFK	1	2474-108004-000000
	Frame to DV 20 for symmetric air gap	1	2474-152003-000000
2	Brake chamber, Standard version	1	3514-032102-000000
3	Standard brake pad	2	2472-005013-A00112*
	Brake pad from BK 5300 (v=50m/s)	2	2472-005013-A00103*
	Brake pad from BK 6905	2	2472-005013-A00117*
	Brake pad from PTFE (Telfon)	2	2472-005013-A00105*
	Brake pad from BK 8006 with alarm cable	1	2472-005013-A00113**
	Brake pad from BK 4773	2	2472-005013-A00102*
4	Lever	1	2475-190001-000000
5	Lever for brake chamber	1	2475-190002-000000
	Lever with thread for encoder mounting	1	2475-190008-000000
6	Retracting spring to DV 20	1	2449-110001-000000
7	Grooved pin, special	4	1151-.000011-000000
8	Hexagon head screw M5x16 DIN EN ISO 4017	2	5019-005006-000000

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Part	Nomenclature	Quantity	Part number
9	Hexagon nut M6 DIN EN ISO 4032	2	5101-005301-000000
10	Swivel part	2	2476-081001-000000
11	Wave spring washer	2	5124-021001-000000
12	Hexagon head screw M8x12 DIN EN ISO 4017	4	5019-008003-000000
13	Hexagon nut self-locking	1	5113-012001-000000
15	Proximity switch for universal plug (Only possible with frame 4457.103.178)	1	3504-000070-000000

\*) Part number for 1 pad

\*\* ) Part number for 1 set (2 pieces) brake pads

#### 4. Condition on delivery

The brake caliper is delivered with a clamping gap of approx. 13.5 mm between brake pads (brake disc thickness of 12.5 and a gap of 0.5 mm between the disc and each brake pad).

#### 5. Installing the RINGSPANN brake calliper

Before installing the brake, the brake disc must be cleaned with alcohol, e.g. ethyl or isopropyl alcohol, or a water-based surfactant solution (soapy water, etc.) and then rubbed dry with a clean cloth.

When cleaning the brake disc with a thinner, acetone or a brake cleaning agent, it is important to ensure that neither these cleaners nor any cleaner residues come in contact with the brake pads. This is especially important in the case of brakes used only as parking brakes, as no dynamic braking operations take place during which thinner residues would be rubbed off the brake disc.



#### Caution!

Oil and rust-proofing-agent residues reduced friction coefficient and thus diminish transmissible braking torque substantially!

#### 5.1 Installation

The brake caliper should be mounted to stabile, vibration-free machine components in order to ensure noise-free, non-screech.


During installation, it is essential to ensure that brake pads are centred and in full contact with the brake disc (the midlines of the brake arm must point to the midpoint of the brake disc). Maximum permissible lateral brake disc wobble is 0.2 mm. Greater wobble may cause rattling and shaking of the brake unit.



#### Caution!

When mounting the brake caliper the brake chamber can not be filled with compressed air.

The brake caliper is mounted to the machine component with using 2 M12 bolts (with frame construction V) or 1 M 20 bolts (with frame construction H) the strength class 8.8.

	<p><b>Caution!</b></p> <p>During installation, ensure that the brake pads are centred and in full contact with the surface of the brake disc . The gap between the brake pads and the brake disc should always be approx. 0,5 mm on each side. Please observe maximum the wear limit .</p>
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### 5.2 Compressed air connection

A flexible hose connection is required. Please use hoses with a diameter of 6 mm. Hose pressure must be at least 7 bar (preferably 12 bar) with a temperature range of approx. - 20°C to + 80°C. Air hoses are connected to the brake chamber with a G 1/4 " fitting (Whitworth-Rohrgewinde DIN ISO 228-1).

The caliper must first be mounted onto the brake disc before air pressure is introduced.

Compressed air must be filtered to remove all dirt, pipe chips, rust and condensation. Purified air must then be enriched with a fine oil mist injected by a standard, commercially available air-preparation unit. The quantity of oil added depends on the nominal air flow rate in l/min and is specified by the manufacturer of the air-preparation unit.


The following types of oil are recommended for air-preparation units:

<u>Suitable types of oil</u>	<u>Viscosity at 20° C (mm<sup>2</sup>/s)</u>
Avia Avilub RSL 3	34
BP Energol HLP 40	27
ESSO Spinesso 34	23
Shell Tellus Öl C 10	22
Mobil VAC HLP 9	25,2

Maximum air consumption per braking operations is approx. 120 cm<sup>3</sup> .

### 5.3 Running-in procedure

Optimum braking effect is achieved only when both brake pads (3) are in full contact with the brake disc and the brake pads have attained a temperature of approx. 200°C. A repeated, short braking with low compressed air (1-2 bar) at a rotating disc is therefore necessary.

	<p><b>Caution!</b></p> <p>If the brakes are used as parking brakes, the braking torques specified are not met. Reductions up to 50% of the braking torques are possible.</p>
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**Caution!**

Check to ensure that the brake disc rotates freely.



**Caution!**

If the brake pads cannot be run in, the torques listed in our Publication 46 cannot be achieved. Reductions of up to 50% are possible.



**Caution!**

It is important to ensure that the brake pads do not rub against the brake disc when the brake is released.

## 6. Maintenance

Maintenance should be performed on the brake caliper at intervals of 4 to 12 weeks, depending upon the frequency and duration of operation.

### 6.1 General maintenance

- Check both brake levers for easily of movement.
- Clean all bearings and glide points
- Lubricate all bearing and glide points.

#### Check for fixed bolt / screw connections:

- Brake caliper to machine component
- Brake chamber to caliper-lever arm
- brake pad on the swivel part
- Brake chamber-flange connection

#### Check the following for proper seal / leaks:

- Hose connection and connection to the brake chamber  
Leaks can be detected quickly and easily using commonly used leak searcher.



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## 6.2 Permissible brake pad wear and brake pads exchange

Brake pad material must have a thickness of at least 6 mm (from the top surface of the brake pad to the top surface of the steel mounting plate (see Fig. 3.1 in Section 3). Brake pads or brake linings (Pos.3) must always be replaced in pairs. For unscrewing and screwing on fixed spanners or ring spanners with SW 13 are needed.



### Caution!

Secure the brake for disassembly.



### Caution!

Brake pads are basically always replace in pairs.



### Caution!

Ensure that the brake caliper is not under air pressure before replacing the brake pads .

## 7. Disassembly, replacement of worn parts in the brake chamber

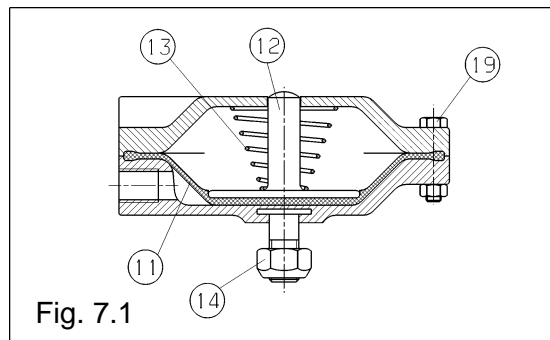
The brake chamber is defective if the push rod Pos. 12 Fig. 7.1 does not move when compressed air is applied and released or when air escapes from the brake chamber. The brake chamber should be overhauled by the manufacturer. If this is not possible the procedure described in Section 7.2 should be followed



### Danger to life and limb!

**When disassembling the brake it is essential to ensure that the entire drive train is secured against inadvertent activation. Rotating components can cause severe injuries. Therefore, rotating components (e.g. brake discs) must be secured against accidental contact. To prevent injuries to personnel, secure the brake with the aid of an assembly locking device.**

### 7.1 Drawing brake chamber (Type 5)



Part	Nomenclature	Quantity	Part number
11	Diaphragm	1	1473-130001-000000
12	Push rod	1	2514-062001-000000
13	Retracting spring	1	2701-042101-000000
14	Hexagon nut self-locking	1	5113-012001-000000

Parts list (valid for standard brake chamber 3514-032102-000000).

### 7.2 Disassembly, assembly and replacement of worn parts in the brake chamber

- Remove the entire brake calliper from the machine component by loosening the screws. If this cannot be done, the brake pads must be removed so that the brake chamber can be removed.
- Remove the brake chamber from the caliper-lever arm.
- Remove the flange bolts (Pos.19, Fig. 7.1) and nuts.
- Remove the retracting spring (Pos.13, Fig. 7.1), the pus rod (Pos.12, Fig. 7.1) and the diaphragm (Pos.11, Fig. 7.1).
- Before reassembling the unit, clean all parts and the inside walls of the brake chamber halves.
- Replace worn parts (e.g. the diaphragm). Ensure that round edge of the diaphragm fits precisely into the circular grooves of the brake chamber halves.
- Assemble the components as shown in Fig. 7.1.
- Tighten the flange bolts M6x30 DIN EN ISO 4014-8.8 (Pos.19, Fig. 7.1) crosswise in equal increments to block (tightening torque 10 Nm).