

## **KTR-STOP® S-A-F B-xx**

S-A-F B-xx is a brake actuated hydraulically in a floating caliper design serving to generate a brake force on a brake disk in order to decelerate a machine's movement or stop it, respectively, or keep it at standstill.

 <b>KTR-Group</b>	<b>KTR-STOP® S-A-F B-xx</b> <b>Operating/Assembly instructions</b>	KTR-N 44591 EN Sheet: 2 of 24 Edition: 6
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The KTR brake system was designed to operate as a service brake/emergency stop brake on rotating brake disks. For any other applications please consult with KTR.

## Table of contents

<b>1</b>	<b>Technical data</b>	<b>3</b>
<b>2</b>	<b>Advice</b>	<b>5</b>
2.1	General advice	5
2.2	Safety and advice symbols	5
2.3	General hazard warnings	5
2.4	Intended use	5
<b>3</b>	<b>Storage, transport and packaging</b>	<b>6</b>
3.1	Storage	6
3.2	Transport and packaging	6
<b>4</b>	<b>Assembly</b>	<b>7</b>
4.1	Components of the brake	7
4.2	Preparation of assembly	10
4.3	Brake pads	11
4.4	Assembly of the brake	11
4.5	Setting/resetting of the centering system	13
4.6	Pressure port of a brake	14
4.7	Pressure port of several brakes	15
4.8	Start-up of the brake	16
4.9	Recommendation of fluids to be used	16
4.10	Disassembly of the brake	17
4.11	Spares inventory, customer service addresses	17
4.12	Disposal	18
<b>5</b>	<b>Maintenance</b>	<b>18</b>
5.1	Replacement of brake pads	18
5.2	Maintenance of the brake / replacement of single parts	19
5.3	Maintenance and service	22
<b>6</b>	<b>Accessories - Sensor</b>	<b>23</b>
6.1	Technical Data „State/wear sensor“	23
6.2	Assembly / start-up	24

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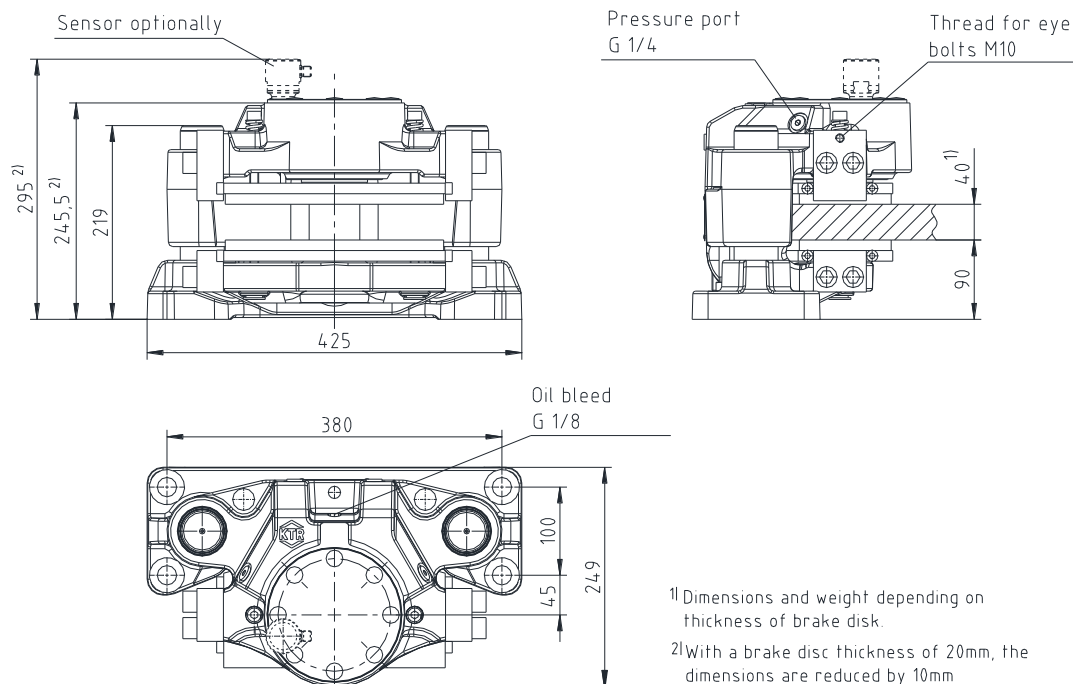


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# KTR-STOP® S-A-F B-xx Operating/Assembly instructions

KTR-N 44591 EN  
Sheet: 3 of 24  
Edition: 6

## 1 Technical data



1) Dimensions and weight depending on thickness of brake disk.

2) With a brake disc thickness of 20mm, the dimensions are reduced by 10mm

Illustration 1: Dimensional drawing

Table 1: Technical data

			S-A-F B-xx
Weight	[kg]		Approx. 78 <sup>1)</sup>
Width of brake pad	[mm]		125
Surface of each brake pad	organic	[mm <sup>2</sup> ]	28,700
	powder metal	[mm <sup>2</sup> ]	26,800
Max. wear of each brake pad <sup>3)</sup>	[mm]		6
Rated coefficient of friction <sup>4)</sup>	[μ =]		0.4
Total brake piston surface - complete brake	[cm <sup>2</sup> ]		44.2
Volume for each brake caliper with 1 mm stroke	[cm <sup>3</sup> ]		4.2
Max. operating pressure	[bar]		125
Width of brake disk	[mm]		20 – 40
Pressure port			G 1/4
Oil bleed			G 1/8
Floating range on axles	towards mounting surface	[mm]	5
	away from mounting surface	[mm]	10
Min. diameter of brake disk ØD <sub>A</sub>	[mm]		500
Operating temperature	[°C]		-20 to +50

3) The permissible wear reduces with deviating thickness of brake disk.

4) The friction coefficient each depends on the application or material of the brake pad; please consult with KTR.

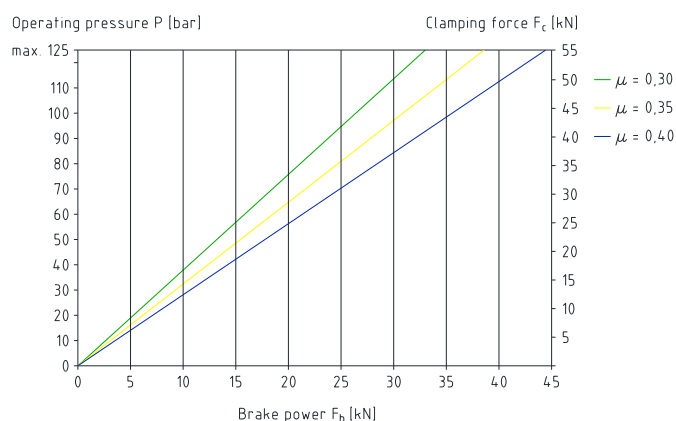


Illustration 2: Diagramme – KTR-STOP® S-A-F

$$F_b = F_c \cdot 2 \cdot \mu$$

$$M_b = z \cdot F_b \cdot \frac{D_A - 0,125}{2}$$

F<sub>b</sub> = Braking power [kN]  
F<sub>c</sub> = Clamping force [kN]  
M<sub>b</sub> = Braking torque [kNm]  
z = Number of brakes  
D<sub>A</sub> = Outside diameter of brake disk [m]  
0.125 = Width of brake pad [m]

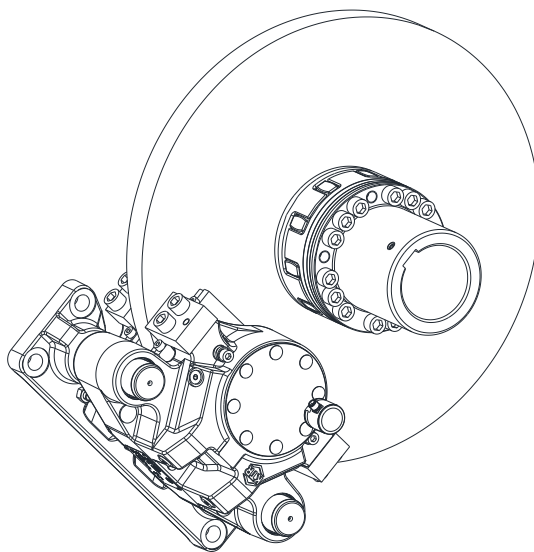
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Replacing: KTR-N dated 2019-08-13  
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## 1 Technical data

### Calculation of brake disk:

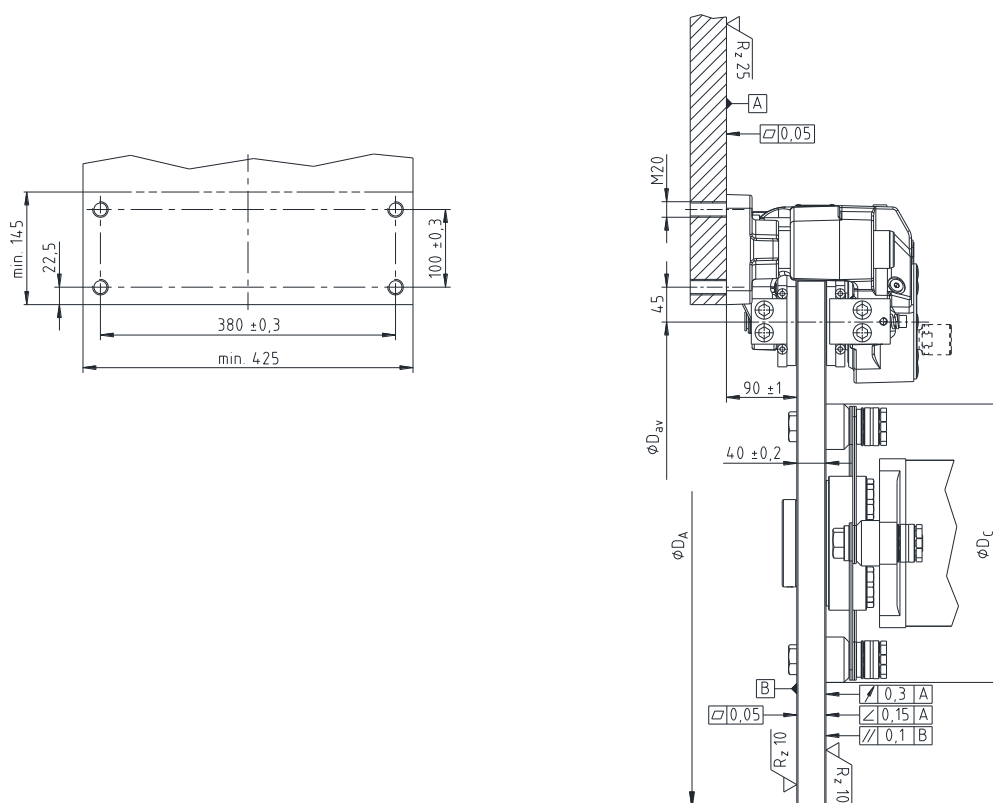


### Illustration 3: Assembly of brake

### Table 2: Calculation of brake disk

up to $\varnothing D_A = 1000$ mm	from $\varnothing D_A = 1000$ mm to $\varnothing D_A = 1800$ mm	from $\varnothing D_A = 1800$ mm
$D_C \text{ max.} = D_A - 305$	$D_C \text{ max.} = D_A - 295$	$D_C \text{ max.} = D_A - 285$
$D_{av} = D_A - 130$	$D_{av} = D_A - 120$	$D_{av} = D_A - 110$

### Connection dimensions of brake



#### Illustration 4: Connection dimensions

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	Verified:	2022-01-28 Ka	Replaced by:	

 <b>KTR-Group</b>	<b>KTR-STOP® S-A-F B-xx</b> <b>Operating/Assembly instructions</b>	<b>KTR-N</b> 44591 EN <b>Sheet:</b> 5 of 24 <b>Edition:</b> 6
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## 2 Advice

### 2.1 General advice

Please read through these operating/assembly instructions carefully before you start up the brake.  
Please pay special attention to the safety instructions!  
The operating/assembly instructions are part of your product. Please store them carefully.  
The copyright for these operating/assembly instructions remains with KTR.

### 2.2 Safety and advice symbols



**Warning of personal injury**

This symbol indicates notes which may contribute to preventing bodily injuries or serious bodily injuries that may result in death.



**Warning of product damages**

This symbol indicates notes which may contribute to preventing material or machine damage.



**General advice**

This symbol indicates notes which may contribute to preventing adverse results or conditions.

### 2.3 General hazard warnings



**With assembly, operation and maintenance of the brake it has to be made sure that the entire drive train is secured against accidental switch-on. You may be seriously hurt by rotating parts. Please make absolutely sure to read through and observe the following safety indications.**

- All operations on and with the brake have to be performed taking into account "safety first".
- Make sure to switch off the power pack before you perform your work on the brake.
- Secure the power pack against accidental switch-on, e. g. by providing warning signs at the place of switch-on or removing the fuse for current supply.
- Do not reach into the operating area of the brake as long as it is in operation.
- Please secure the brake against accidental contact. Please provide for the necessary protection devices.
- Please make sure that the overall brake/hydraulic system is depressurized during maintenance operations.

### 2.4 Intended use

You may only assemble, operate and maintain the brake if you

- have carefully read through the operating/assembly instructions and understood them
- had technical training
- are authorized by your company

The brake may only be used in accordance with the technical data (see chapter 1). Unauthorized modifications on the brake design are not admissible. We will not assume liability for any damage that may arise. In the interest of further development we reserve the right for technical modifications.

The **brake type S-A-F B-xx** described in here corresponds to the state of the art at the time of printing of these operating/assembly instructions.

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 <b>KTR-Group</b>	<b>KTR-STOP® S-A-F B-xx</b> <b>Operating/Assembly instructions</b>	<b>KTR-N</b> 44591 EN <b>Sheet:</b> 6 of 24 <b>Edition:</b> 6
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### 3 Storage, transport and packaging

#### 3.1 Storage

The brake is delivered in preserved condition and can be stored in a closed, dry place during 12 months. With favourable storage conditions its properties remain unchanged up to 12 months. If the brake is stored over a longer period exceeding 12 months as well as after each transport the corrosion protection needs to be renewed and the brake has to be activated over the full braking distance in order to prevent the gaskets from sticking together.



**The storage rooms must not include any ozone-generating devices like e. g. fluorescent light sources, mercury-vapour lamps or electrical high-voltage appliances. Humid storage rooms are not suitable. Please make sure that condensation is not generated. The best relative air humidity is less than 65 %.**

#### 3.2 Transport and packaging



**In order to avoid any injuries and any kind of damage please always make use of proper transport and lifting equipment.**

The brake is packed differently each depending on quantity and kind of transport. Unless otherwise contractually agreed, packaging will follow the in-house packaging specifications of KTR.

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**4 Assembly**

The brake is supplied in pre-assembled condition. Before assembly the brake has to be inspected for completeness.

**4.1 Components of the brake****Components/subassemblies of brake – Type S-A-F B-xx**

Component/component assembly	Quantity	Description
1	1	Caliper with components
2	1 <sup>1)</sup>	Distance plate
3	1	Base plate with guide pin
4	2	Centering system outside
5	1	Centering system inside
6	2	Pad retraction set movable side
7	2	Brake pad
8	2	Pad retraction set on fixed side
9	1 <sup>2)</sup>	Sensor

1) Quantity depends on thickness of brake disk.

2) Optionally available

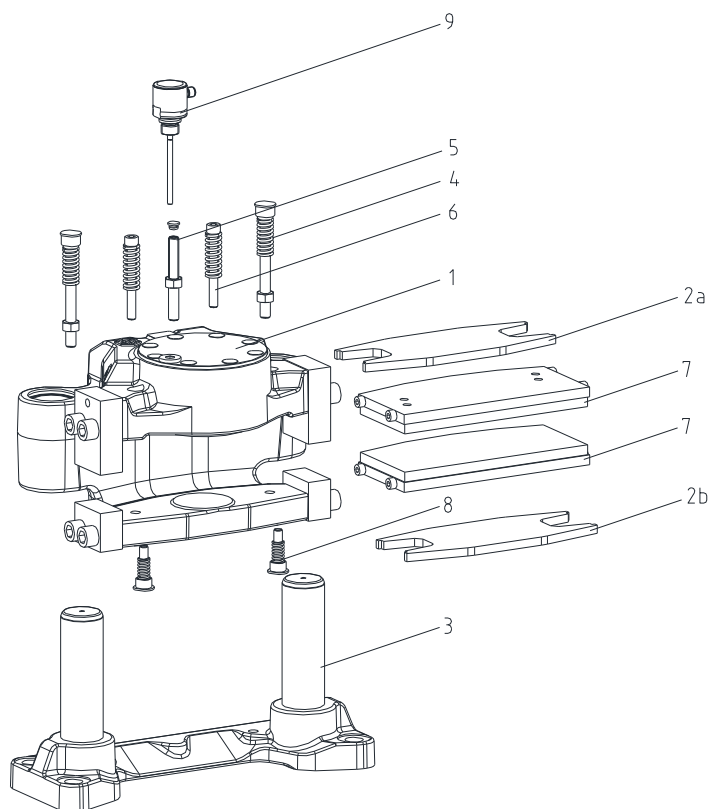


Illustration 5: Components/subassemblies of brake

**Component 2: Quantity and position of the spacer plate**

Thickness of brake disk	Quantity of spacer plates	
	On top (Pos.2a)	At the bottom (Pos.2b)
20	1	1
30	1	-
40	-	-

**4 Assembly****4.1 Components of the brake****Subassembly 1: Caliper with components**

Component	Quantity	Description
1.1	1	Brake caliper (incl. piston cover)
1.2	4	DU bushing
1.3	2	Pad retainer
1.4	2	Pad retainer
1.5	8	Cap screw DIN EN ISO 4762 - 10.9
1.6	4	Screw plug VSTI (acc. to DIN 908)
1.7	1	Drain plug
1.8	1	Brake piston
1.9	1	Scraper
1.10	1	Gasket
1.11	1	Screw plug VSTI (acc. to DIN 908)

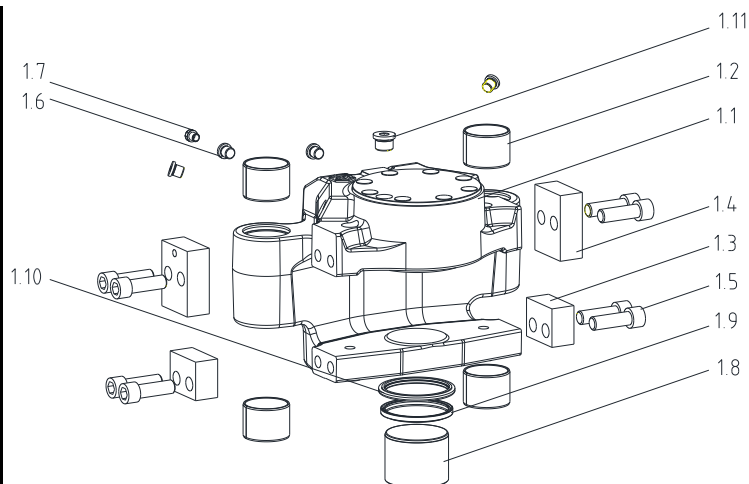


Illustration 6: Caliper with components

**Subassembly 3: Base plate with guide pin**

Component	Quantity	Description
3.1	1	Base plate
3.2	2	Guide pin
3.3	2	Disk
3.4	2	Cap screw DIN EN ISO 4762 - 10.9

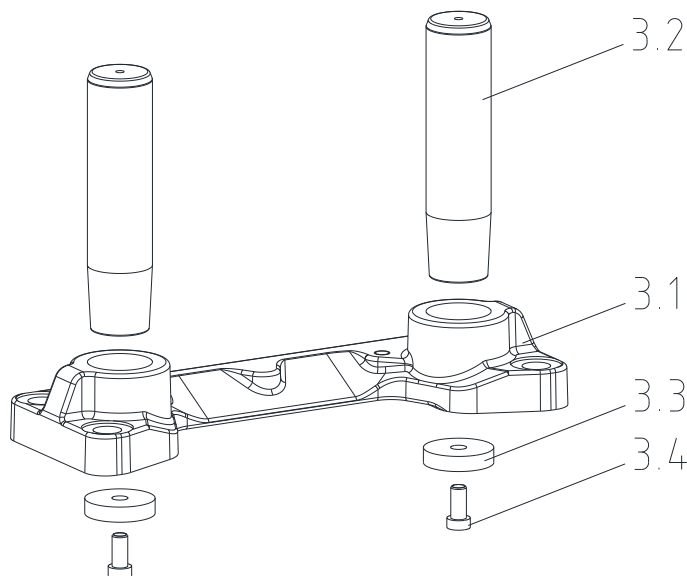


Illustration 7: Base plate with guide pin



**4 Assembly****4.1 Components of the brake****Subassembly 4: Centering system outside**

Component	Quantity	Description
4.1	1	Cap screw DIN EN ISO 4762 - 10.9
4.2	1	Pressure spring
4.3	1	Hexagon nut DIN EN ISO 4032
4.4	1	Drain plug

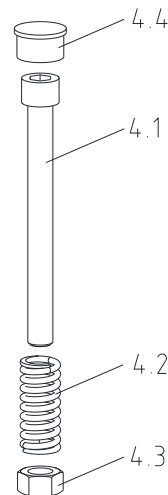


Illustration 8: Centering system outside

**Subassembly 5: Centering system inside**

Component	Quantity	Description
5.1	1	Pin
5.2	1	Hexagon nut DIN EN ISO 4032
5.3	1	Drain plug

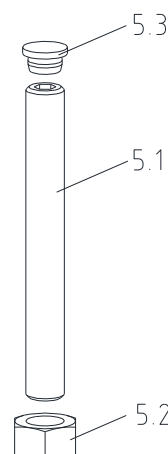


Illustration 9: Centering system inside

**Subassembly 6: Pad retraction set movable side**

Component	Quantity	Description
6.1	1	Cap screw DIN EN ISO 4762 - 10.9
6.2	1	Pressure spring

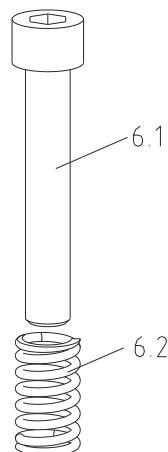


Illustration 10: Pad retraction set of brake caliper

**4 Assembly****4.1 Components of the brake****Subassembly 8: Pad retraction set fixed side**

Component	Quantity	Description
7.1	1	Cap screw DIN EN ISO 4762 - 10.9
7.2	1	Pressure spring
7.3	1	Sealing plug

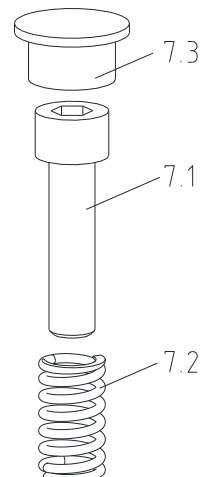


Illustration 11: Pad retraction set

**4.2 Preparation of assembly**

To ensure the full braking power, the preparation for assembly needs to be carefully performed.

- The connection plate for the brake as well as the brake disk have to be inspected for dimensional accuracy. For that purpose investigate the connection dimensions, connection surfaces and tolerances as specified in the drawing (see illustrations 1 to 4 and table 2).
- Clean and degrease the brake disk and mounting surfaces. Dirt can easily be removed by means of solvents.



The connection between connection surface and brake is defined as frictional contact. Any residues of oil, dirt and corrosion protection reduce the coefficient of friction. As a result the operation of the brake and the full braking power are no longer ensured.



Please observe the manufacturer's instructions regarding the use of solvents.

 <b>KTR-Group</b>	<b>KTR-STOP® S-A-F B-xx</b> <b>Operating/Assembly instructions</b>	<b>KTR-N</b> 44591 EN <b>Sheet:</b> 11 of 24 <b>Edition:</b> 6
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## 4 Assembly

### 4.3 Brake pads



**KTR supplies brake pads free from asbestos and lead only.**  
**If requested, we will provide you with the respective certificates.**

The brake pads are each adapted to the application and delivered accordingly.  
They can be distinguished as follows:

- organic material
- powder metal



**Brake pads are highly sensitive to grease and oil which means that they cannot be cleaned.**  
**Brake pads having such kind of dirt need to be replaced and disposed of.**



**We would recommend to store the brake pads in their package as long as possible to protect them from any kind of dirt.**



**Brake pads which have worn off to the wear limit have to be replaced immediately. Make sure to replace by original parts only.**

### 4.4 Assembly of the brake



**In order to avoid any injuries please always make use of proper lifting equipment.**



**The brake is mainly selected for mounting on vertically aligned brake disks (see illustration 4). With horizontally aligned brake disks (see illustration 1) the brake may only be aligned upright.**

M10 threads are installed in the pad retainer to fasten an eye bolt serving to use lifting tools. The eye bolt is to be dismantled after assembly of the brake and stored in a safe place.



**In order to avoid any damages on the brake, never twist a rope or another lifting tool around damageable components.**



**Before you start with the assembly please check if a sensor has been mounted.**  
**Please remove it before assembly in order to avoid any damages.**

- Insert the brake pads (component 7) fully into the brake caliper.
- Applying for the movable side only:  
Push back the brake pad and brake piston manually.



**Please make sure that at least one screw plug (component 1.6) is removed when moving back the brake piston. Afterwards re-assemble the screw plug.**



**If you want to use brake pads after having assembled the brake, it is necessary to disassemble the pad holder (component 1.14 and 1.15) for that purpose (chapter 5.1).**

- Mount the pad retraction set on the movable side (component 8) by shifting the pressure spring (component 8.2) onto the pin (component 8.1). Screw the pin with the pressure spring into the brake pad against a stop.
- Repeat this process with the pad retraction set on the fixed side of caliper (component 6).

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**4 Assembly****4.4 Assembly of the brake**

Secure the screw connection (component 6.1 and 8.1) on the brake pad additionally against working loose, e. g. conglomerating with Loctite (average strength).

- Insert the brake in the correct position towards the connection plate. Hand-tighten the brake via the screws for the time being.



To facilitate the assembly it is possible to fix the position of the brake by one screw only for the time being. Swing in the brake until the balance of the screws can be assembled, too (see illustration 12).

- Screw the brake to the connection plate by means of 4 screws and tighten them evenly gradually at the tightening torque specified (see table 3).

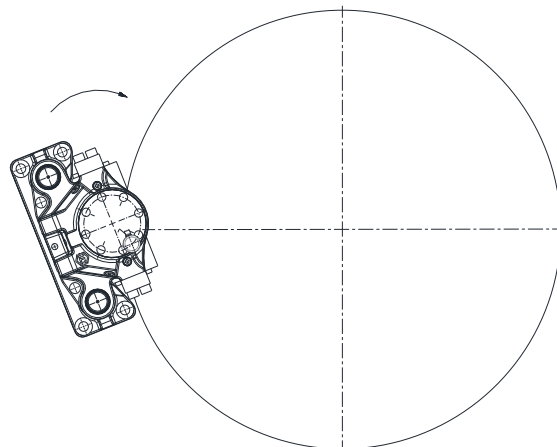


Illustration 12

**Table 3: Tightening torques**

Screw size	Tightening torque $T_A$ [Nm]			
	10.9		12.9	
	Untreated and oiled	Greased with $\text{MoS}_2$	Untreated and oiled	Greased with $\text{MoS}_2$
M20	560	420	660	490

- Align the brake in centre to the brake disk.
- Make sure that the brake disk can rotate freely while not touching the brake pads or the caliper.
- Re-assemble the sealing plugs (component 7.3).



In order to avoid any contact between the brake disk and the brake resulting from thermal expansion, the distance of the brake according to table 2 needs to be observed.



Please make sure that the tolerances of the brake disk do not exceed the figures specified in illustration 4.

- Optional component:  
Assemble the sensor (component 9) according to chapter 6.2.

**4 Assembly****4.5 Setting/resetting of the centering system**

The centering systems need to be reset with initial assembly or after having replaced brake pads or single parts, respectively. This is the only way to ensure that the gap between the brake disk and the brake pad on the bottom side is set to the right value and the pad does not touch on any side.



The centering systems need to be regularly reset with wear of the brake pads. For that purpose repeat the complete chapter *Setting/resetting of the centering system*.

- Measure the gap between the brake disk and the brake pad on the bottom side via a feeler gauge.
- Set the gap to the requested value by screwing the pin (component 5.1) either upwards or downwards.
- Secure the pin (component 5.1) via the hexagon nut (component 5.2).
- Screw the cap screws (component 4.1) into the base plate (component 3.1). The screw depth in the base plate must be 20 mm (only valid with a thickness of brake disk of 20 mm: screwing depth must be 30 mm).
- Seal the bores via the sealing plugs (component 4.4 and 5.3).

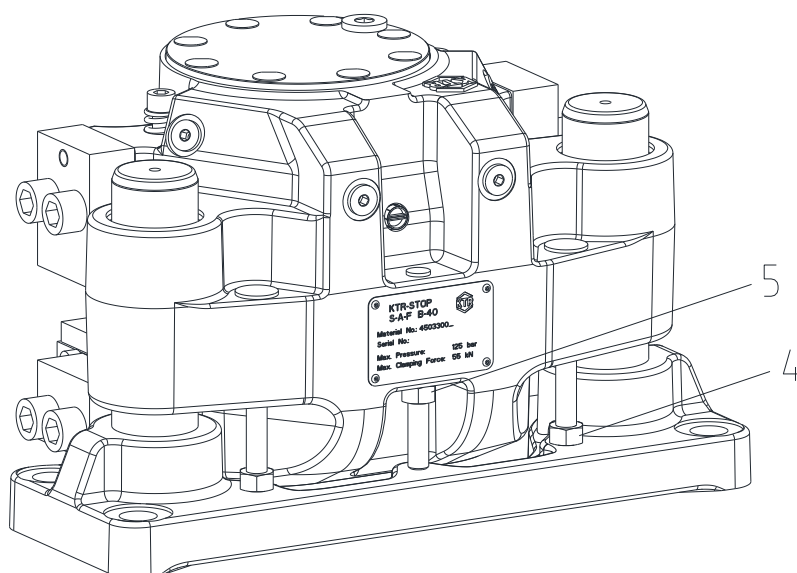


Illustration 13: Setting of centering system

**4 Assembly****4.6 Pressure port of a brake**

- Connect the pressure oil line to one of the pressure ports of the brake (see illustration 14 and 15). For that purpose remove the screw plug beforehand.



**The hydraulic lines have to be rinsed before connecting to the brake to prevent any particles from getting into the brake. If the lines are not rinsed sufficiently, the gaskets may be damaged and the operation of the brake is no longer ensured.**

- Mount a miniature measuring coupling with a miniature measuring hose to the venting hole (see illustration 14 and 15), for that purpose the screw plug needs to be removed beforehand. Discharge the end of the miniature measuring hose in a suitable collection container.



**The pressure port on top serves for venting the brake. For a wash-up system please make use of the pressure port on top.**



**It is not recommended to use steel plugs for venting.**

- Connect the drain line to the brake (see illustration 14 and 15). For that purpose remove the drain plug beforehand.



**In order to locate a leakage immediately, it is recommended to use a transparent hose and collection container. Since higher pressures (5 bar at the maximum) are not generated, a pneumatic hose may be used, too. Please regularly inspect the brake for leakages.**



**Severe leakages have to be removed immediately. Oil which has escaped has to be completely removed, since oil remains may vaporize on hot components and ignite.**

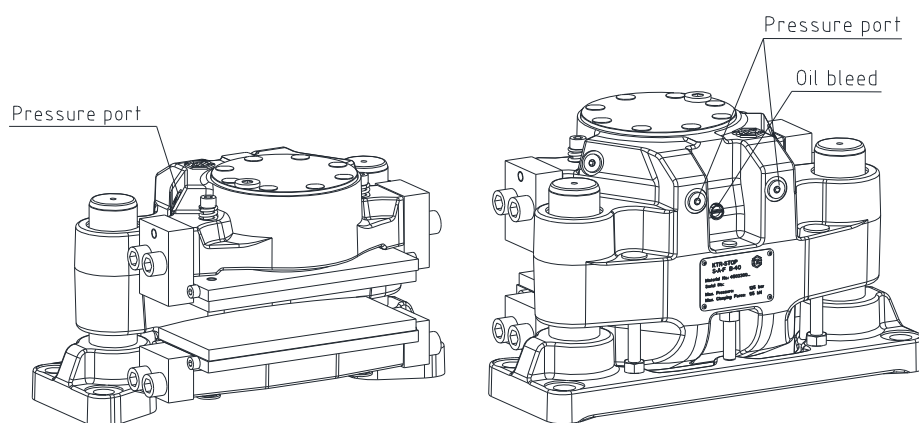


Illustration 14: Connections of the drain lines/pressure lines

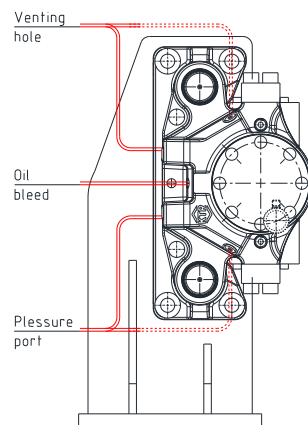


Illustration 15: Pressure port of a brake



**Please make sure that the connections and hoses are adapted to the brakes with regard to pressure, flow rate, temperature and liquid. Moreover, you have to use flexible hydraulic hoses in order to not limit the motions of the brake. Any hoses which are located close to mobile components should be secured or coated accordingly.**

**4 Assembly****4.7 Pressure port of several brakes**

If several brakes are assembled we recommend to connect the pressure port for each brake individually (in parallel) (see illustration 16).

Please note, if several brakes are connected in a series (see illustration 17), the braking effect of all following brakes may become effective slightly delayed.

- Connect the pressure oil line to one of the pressure ports of the brake (see illustration 15, 16 and 17). For that purpose remove the screw plug beforehand.



**The hydraulic lines have to be rinsed before connecting to the brake to prevent any particles from getting into the brake. If the lines are not rinsed sufficiently, the gaskets may be damaged and the operation of the brake is no longer ensured.**

- Mount a miniature measuring coupling with a miniature measuring hose to the venting hole (see illustration 14, 16 and 17), for that purpose the screw plug needs to be removed beforehand. Discharge the end of the miniature measuring hose in a suitable collection container.

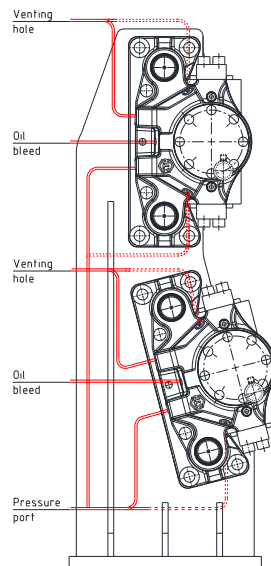


Illustration 16: Pressure port of several brakes (in parallel)

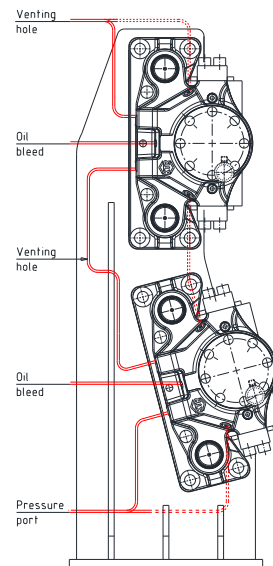


Illustration 17: Pressure port of several brakes (in a series)



**The pressure port on top serves for venting the brake. For a wash-up system please make use of the pressure port on top.**



**With the parallel connection of brakes (see illustration 16) each brake needs to be vented individually.**



**It is not recommended to use steel plugs for venting.**

- Connect the drain line to the brake (see illustration 14, 16 and 17). For that purpose remove the sealing plug beforehand.



**In order to locate a leakage immediately, it is recommended to use a transparent hose and collection container. Since higher pressures (5 bar at the maximum) are not generated, a pneumatic hose may be used, too. Please regularly inspect the brake for leakages.**



**Severe leakages have to be removed immediately. Oil which has escaped has to be completely removed, since oil remains may vaporize on hot components and ignite.**



**Please make sure that the connections and hoses are adapted to the brakes with regard to pressure, flow rate, temperature and liquid. Moreover, you have to use flexible hydraulic hoses in order to not limit the motions of the brake. Any hoses which are located close to mobile components should be secured or coated accordingly.**

**4 Assembly****4.8 Start-up of the brake**

Before start-up and after each operation on the brake the hydraulic system has to be generally vented.

Repeat venting the brake several times a year, since any air in the hydraulic system may affect the operation of the brake and the plant.



Make sure that there is sufficient liquid in the hydraulic system during and after the venting process (recommendation of liquid, see chapter 4.10).

- Put some pressure on the hydraulic system. This will allow the brake pads to fit onto the brake disk.
- **Applying with the use of a sensor only:**  
Mount the sensor (component 9) according to chapter 6.2 instead of the screw plug (component 1.20).
- The brake pads have to be ground in on the surface of the brake disk to achieve the nominal coefficient of friction.



Please observe the instructions for grinding-in according to KTR-N.

**4.9 Recommendation of fluids to be used**

You may only use mineral hydraulic fluids meeting the specifications of DIN 51524. KTR recommends those fluids corresponding to DIN 51524-3.

KTR recommends the following fluids (other manufacturers may be selected):

Manufacturer	Standard		Special	
<i>Mineral oil</i>	- 20 °C to + 40 °C (- 4 °F to 104 °F)	+ 10 °C to + 60 °C (+ 50 °F to + 140 °F)	- 30 °C to + 20 °C (- 22 °F to 68 °F)	+ 30 °C to + 70 °C (+ 86 °F to + 158 °F)
Castrol	Hyspin HVI 32	Hyspin HVI 46	-	Hyspin HVI 68
Shell	Tellus TX32	Tellus TX46	Tellus Artic	Tellus TX68
Mobil	DTE 13M	DTE 15M	-	DTE 16M
Hydro Texaco	Rando HDZ32	Rando HDZ46	Rando Ashless 8401	Rando HDZ68
Valvoline	Ultramax HVLP32	Ultramax HVLP46	-	Ultramax HVLP68



The permissible operating temperatures of brake components from - 20 °C to + 60 °C (- 4 °F to + 140 °F) have to be observed. For deviating operating temperatures please consult with KTR.

**Viscosity**

We would recommend a viscosity range from 20 to 220 mm<sup>2</sup>/s (cSt) of the hydraulic fluid with operating temperature. The viscosity during starting should not exceed 500 mm<sup>2</sup>/s and the viscosity during operation should not fall below 12 mm<sup>2</sup>/s.

**Filtration**

When filling and re-filling the hydraulic system and replacing the hydraulic fluid, the oil needs to be filtered. For that purpose use an offline filter or a respective fill unit. In addition we would recommend to use an inline filter.



**4 Assembly****4.9 Recommendation of fluids to be used**

The service life of the brake system is extended depending on the degree of purity of the oil.

As a standard the KTR basic power packs are equipped with a 10-µm-inline filter.

In order to ensure the reliability of the system, only those oils originating from the following purity classes are permitted:

- ISO 4406, class 18/16/13

**Maintenance operations on the hydraulic system**

In order to ensure a smooth operation of the overall system, the maintenance operations on the hydraulic system (inspection of level and degree of dirt, replacing the hydraulic fluid or filter elements, etc.) have to be performed as per the manufacturer's operating instructions.

The system has to be rinsed or vented after each replacement of the hydraulic fluid.



**Adverse reactions may be generated by mixing different fluids or fluids of various manufacturers.**



**Please contact the manufacturer of mineral oils if you intend to replace the hydraulic fluid.**

**4.10 Disassembly of the brake**

**Please make sure that the entire brake/hydraulic system is depressurized.**



**Parts released or falling down may cause injury to persons or damage on the machine. Secure the components before disassembly.**



**If a sensor is used (component 9) it has to be removed before the brake is disassembled.**

- Drain the hydraulic oil completely from the brake.
- Dispose of the hydraulic oil as per chapter 4.13.
- Disconnect the drain and pressure oil line from the brake.
- Remove the 4-off screws serving for fixing the brake to the connection plate.
- Take out the brake.

**4.11 Spares inventory, customer service addresses**

A basic requirement to ensure the readiness for use of the brake is a stock of the most important spare parts on site.

Contact addresses of the KTR partners for spare parts and orders can be obtained from the KTR homepage at [www.ktr.com](http://www.ktr.com).



**KTR does not assume any liability or warranty for the use of spare parts and accessories which are not provided by KTR and for the damages which may incur as a result.**

**4 Assembly****4.12 Disposal**

In respect of environmental protection we would ask you to dispose of the products on termination of their service life in accordance with the legal regulations and standards that apply, respectively.

- **Metal or brake pads, respectively**  
Brake pads and any other metal parts have to be cleaned and disposed of by scrap metal.
- **Gaskets**  
Gaskets can be disposed of by residual waste.
- **Sensors**  
Electrical components have to be treated as electrical waste.
- **Hydraulic oil**  
Hydraulic oils have to be collected in suitable tanks and disposed of by a waste disposal company.

**5 Maintenance****5.1 Replacement of brake pads**

Brake pads having a balance of pad height of less than 2 mm have to be replaced by return.



Parts released or falling down may cause injury to persons or damage on the machine.  
Secure the components before disassembly.



Never keep your fingers between brake disk and brake when locking the brake in order to prevent serious injuries of your hands. Before every maintenance operation please make sure that the brake is fully secured against activating.

- Disassemble the pad holders on one side (component 1.14 and 1.15).
- Remove the pad retracting sets (component 6 and 8).
- Replace the brake pads that have worn off. Insert the brake pads (component 7) fully into the brake caliper or the distance plate, respectively.
- Applying for the movable side only:  
Push back the brake pad and brake piston manually.



Please make sure that at least one screw plug (component 1.6) is removed when moving back the brake piston. Afterwards re-assemble the screw plug.

- Hand-tighten the pad holders (component 1.14 and 1.15) by each 2-off cap screws (component 1.11) for the time being. Tighten the screws at the tightening torque  $T_A = 302 \text{ Nm}$ .



Please make sure that the pad holders of the housing have various heights.

- Mount the pad retraction set on the movable side (component 8) by shifting the pressure spring (component 8.2) onto the pin (component 8.1). Screw the pin with the pressure spring into the brake pad against a stop.
- Repeat this process with the pad retraction set on the fixed side of caliper (component 6).

**5 Maintenance****5.1 Replacement of brake pads**

Secure the screw connection (component 6.1 and 8.1) on the brake pad additionally against working loose, e. g. conglomerating with Loctite (average strength).

- Repeat chapter 4.5 *Setting/re-adjustment of the centering system* and chapter 4.9 *Setting/re-adjustment of the brake*.
- Please make sure that the brake disk can rotate freely while not touching the brake pads or the brake caliper.



To facilitate the replacement of the brake pads you can unscrew the screws of the connection plate and remove 3 out of the 4 screws alternatively. Swing the brake out of its position.



Please note chapter 4.4 *Assembly of the brake*.

- Before you reactivate the brake, please observe chapter 4.8 *Start-up of the brake*.

**5.2 Maintenance of the brake / replacement of single parts**

To ensure the full braking power, both disassembly and assembly have to be performed at the highest level of purity.

- Disassemble the brake, please observe chapter 4.11 *Disassembly of the brake*.
- Remove the pad retracting sets (component 6 and 8).
- Take out the brake pads (component 7) and the distance plates (component 2).
- Remove the sealing plugs from the external centering system (component 4.4). Untighten the hexagon nuts (component 4.3) and unscrew the cap screws (component 4.1) from the base plate.
- Remove the brake caliper (component 1) from the guide pin (component 3).



Inspect the components/component assemblies 2, 3 and 4 for any kind of damage; it may be necessary to replace the components.  
Afterwards remove dirt, grease and corrosion from the components.

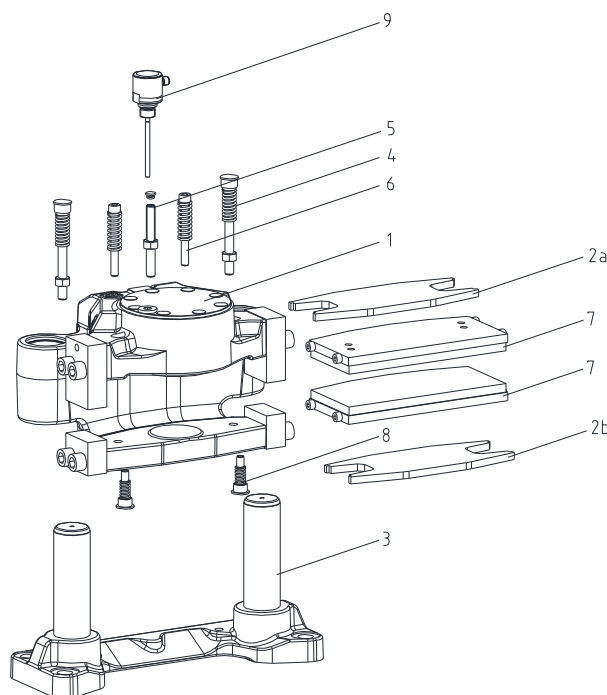


Illustration 18: KTR-STOP® S-A-F B-xx

**5 Maintenance****5.2 Maintenance of the brake / replacement of single parts**

- Connect the hydraulics to a pressure port (see illustration 14) of the caliper and make sure that all other pressure ports are locked by screw plugs.
- Press the brake piston (component 1.8) carefully out of the brake caliper (if necessary, use some hydraulic oil).
- Remove the gasket (component 1.10) and the scraper (component 1.9).



**When removing the gaskets and scrapers please make sure that the keyways in the caliper are not damaged.**

- The components have to be cleaned from dirt, grease and corrosion protection. The components can easily be cleaned by means of solvents. Afterwards dry the components.



**Please observe the manufacturer's instructions regarding the use of solvents.**



**Inspect the DU bushes (component 1.18), scrapers (component 1.19) and centering pins (component 1.8) for any kind of damage; if necessary, the components have to be replaced. Afterwards remove dirt, grease and corrosion from the components.**

- Insert new gaskets (component 1.10) and scrapers (component 1.9) into the caliper. For that purpose the components may be heart-shaped (see illustration 20).



**The gasket and scraper have to be installed in the right direction (see illustration 21).**



**With a new assembly of the brake piston basically new gaskets and scrapers have to be used, since their operativeness is no longer ensured due to wear and damages.**

- Grease the gaskets and the scraper with hydraulic oil (see illustration 21).

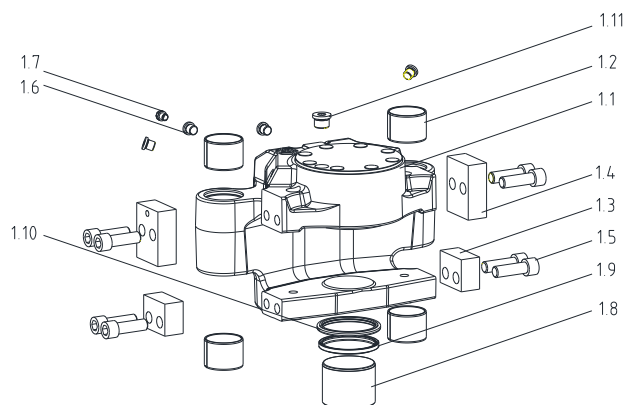


Illustration 19: Caliper with single parts

**5 Maintenance****5.2 Maintenance of the brake / replacement of single parts**

Oils and greases containing molybdenum disulphite or zinc sulphite additives must not be used.

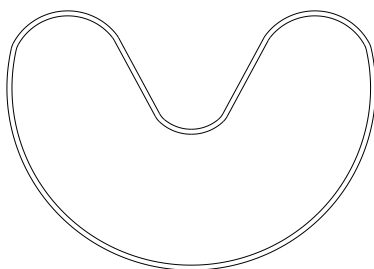


Illustration 20: Assembly of gasket and scraper

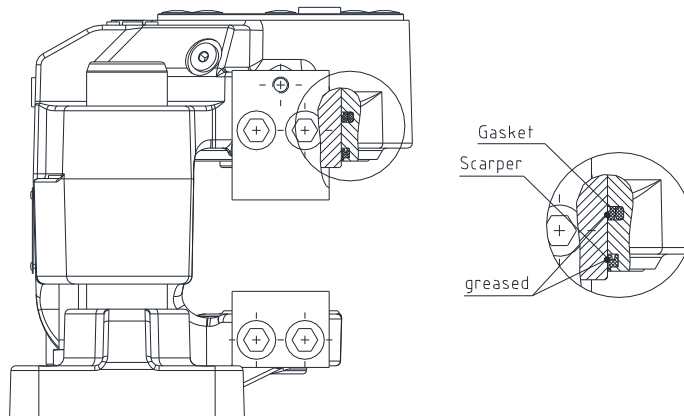


Illustration 21



**Inspect the surfaces of the brake piston and the hole of the piston cover to make sure that they are neither scratched nor damaged, since the surfaces are either ground or polished. Such kind of damages may cause earlier wear on the gaskets and scrapers and generate leakages.**

- Insert the brake piston (component 1.8) into the caliper and press it against a stop.
- **Depending on the thickness of brake disk:**  
Fit the spacer plate (component 2). Please conclude position and number of spacer plate from the customer drawing.
- After having disassembled the pin of the internal centering system (component 5.1), screw the pin (component 5.1) into the brake caliper. Afterwards screw the hexagon nuts (component 5.2) onto the pin.
- Fit the pre-assembled unit carefully onto the guide pins.



**Please make sure that the centering system (component 5) is not damaged.**

**5 Maintenance****5.2 Maintenance of the brake / replacement of single parts**

- Shift the cap screws (component 4.1) with the pressure springs (component 4.2) into the brake caliper. Screw the hexagon nut (component 4.3) onto the cap screw (component 4.1).
- Secure the pin (component 5.1) via the hexagon nut (component 5.2).
- Screw the cap screws (component 4.1) into the base plate (component 3.1). The screw depth in the base plate must be 20 mm (only valid with a thickness of brake disk of 20 mm: screwing depth must be 30 mm).
- Seal the bores via the sealing plugs (component 4.4 and 5.3).
- Repeat chapters 4.2 to 4.8.

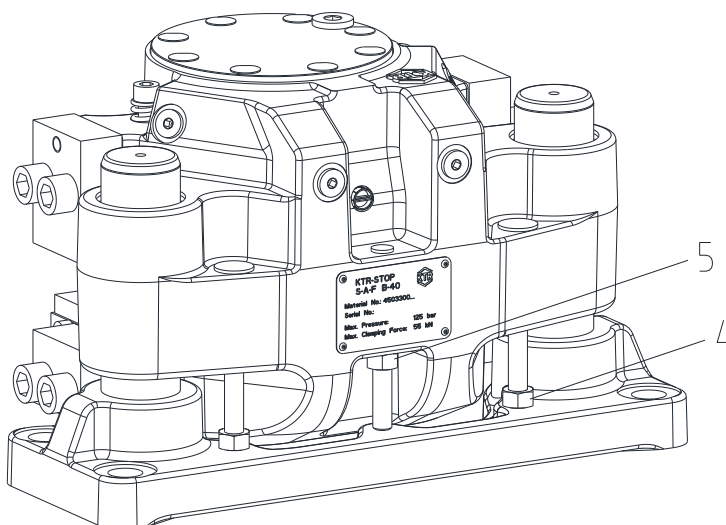


Illustration 22: Setting of centering system

**5.3 Maintenance and service**

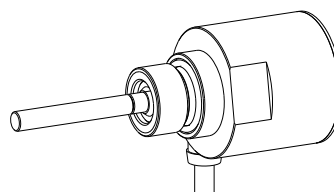
KTR-STOP® S-A-F B-xx is a low-maintenance brake. We recommend to perform a visual inspection and a functional test on the brake **at least once a year**. Here you should put special emphasis on leakages, corrosion, wear of brake pads and the condition of the screw connections.



**If you realize any irregularities, please perform repairs accordingly.**

**6 Accessories - Sensor****6.1 Technical Data „State/wear sensor“****Operation of sensor**

There are two micro switches in the housing of the sensor. The spacer pin activates the switches in two different positions.

Illustration 23:  
State/wear sensor**Table 4: Switching status of pre- (switch S1) and end wear switch (switch S2) depending on the activating status of the brake.**

Status of brake	Status of brake pad	Switch S1	Switch S2	
		1 - 4 <sup>1)</sup>	2 - 3 <sup>2)</sup>	2 - 5 <sup>2)</sup>
Sensor not mounted	-	0	0	1
Brake not activated (unlocked)	-	1	1	0
Brake activated (locked)	No wear	1	1	0
	Pre-wear	0	1	0
	End wear	0	0	1

1) Condition of brake  
on = no wear  
off = pre-wear

2) Switch position  
0 = unlocked  
1 = locked

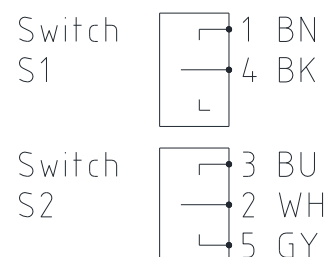


Illustration 24: Switch position

The sensor only shows the wear status reliably when the brake is activated (locked). If the brake is not activated (unlocked), a statement about the condition of wear cannot be given.



**The wear of the brake pad is only measured if the brake is activated. If the brake is not activated, there is no signal.**



**"Pre-wear" is indicated as soon as the brake pad has worn off so that the brake pads need to be replaced.**



**The brake pad needs to be replaced immediately if the signal indicating the status „end wear“ is displayed. Please note chapter 5.1 *Replacement of brake pads*.**

**Fail-safe operation**

A proper operation is only ensured if the state/wear sensor is wired properly. This provides a signal since a switch (NO) is locked which is normally unlocked.

**Technical data:**

Operating temperature	- 40 °C to + 85 °C
Max. voltage	30 V DC/AC
Switching current	100 mA
Protection class	IP 65 (mounted)
Width across flats	24 mm
Max. tightening torque G 1/2	20 Nm
Max. tightening torque M12	hand-tight
Length of cable	5 m, 10 m or 15 m
Material of cable	PUR
Dimension of cable	5 * 0.34 mm <sup>2</sup>

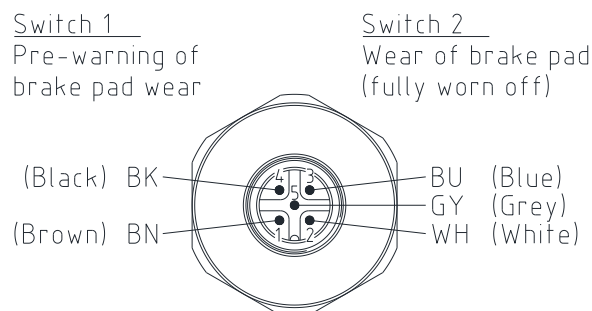


Illustration 25: Pin assignment of plug-in connection

**6 Accessories - Sensor****6.2 Assembly / start-up**

- Remove the screw plug (component 1.20) from the setting nut (component 1.7).
- Screw the sensor (component 9) hand-tight into the brake for the time being (see illustration 26).
- Tighten the sensor at the tightening torque  $T_A = 20 \text{ Nm}$ .
- Provide for the electric connection according to the plug-in connection (see illustration 25).

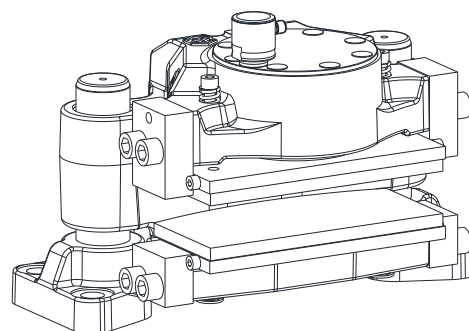


Illustration 26: Assembly of state/wear sensor