

KTR-STOP® S-A-F

S-A-F is a disk brake in an active design serving for transmitting a brake force onto a brake disk in order to decelerate or stop its rotation, respectively, or keep it at standstill.



The KTR brake system was designed to operate as a service brake/emergency stop brake on rotating brake disks. Please consult with KTR Kupplungstechnik for any other applications.

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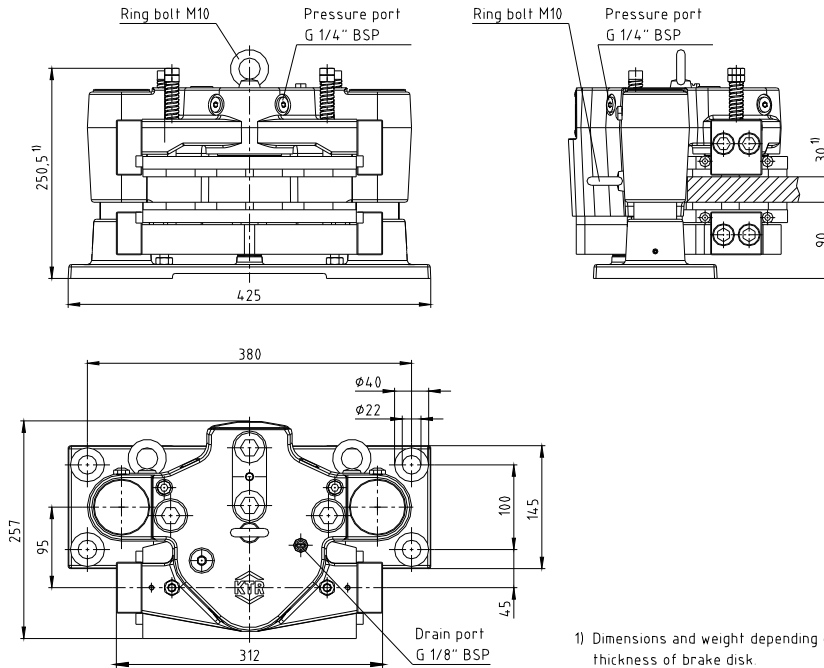
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1 Technical Data



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

Illustration 1:
KTR-STOP® S-A-F
(dimensional drawing)

Table 1: Technical Data

			S-A-F
Weight	[kg]		Approx. 76 ¹⁾
Width of brake pad	[mm]		125
Surface area of each brake pad	organic	[mm ²]	Approx. 29.000
	sintered	[mm ²]	20.000
Max. wear of each brake pad	[mm]		7
Nominal coefficient of friction	[μ =]		0,4
Total brake piston area – complete brake	[cm ²]		44,2
Volume for each brake caliper at 1 mm stroke	[cm ³]		4,42
Max. clamping force	[kN]		55
Max. operating pressure	[bar]		125
Thickness of brake disk	[mm]		20 - 40
Pressure port			1/4" BSP
Drain port			1/8" BSP
Floating range on axles	towards mounting surface	[mm]	5
	away from mounting surface	[mm]	10
Min. diameter of brake disk ØD _A	[mm]		500
Operating temperature	[°C]		-30 to + 40

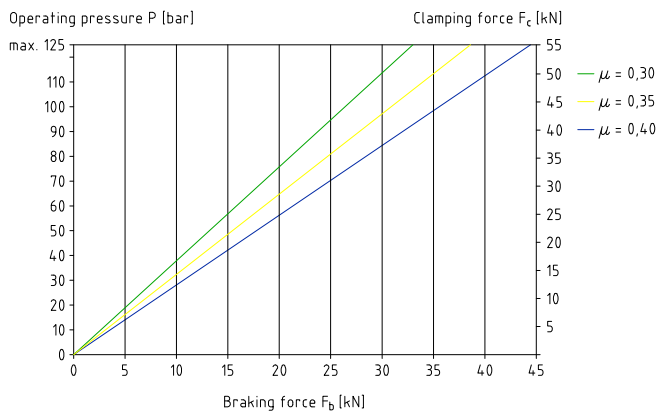


Illustration 2: diagram – KTR-STOP® S-A-F

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

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

- F_b = Braking force [kN]
- F_c = Clamping force [kN]
- M_b = Braking torque [kNm]
- z = Number of brakes
- D_A = Outside diameter of brake disk [m]
- 0,125 = Width of brake pad [m]

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1 Technical Data

Calculation of brake disk:

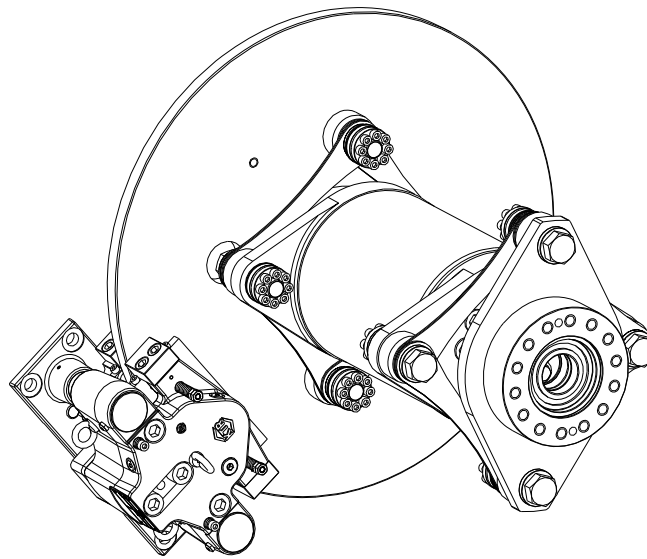


Illustration 3: assembly of brake

Table 2: Calculation of brake disk

up to $\varnothing D_A = 1500$ mm	from $\varnothing D_A = 1500$ mm up to $\varnothing D_A = 3000$ mm	from $\varnothing D_A = 3000$ mm
$D_{C \text{ max.}} = D_A - 260$	$D_{C \text{ max.}} = D_A - 250$	$D_{C \text{ max.}} = D_A - 240$
$D_{av} = D_A - 130$	$D_{av} = D_A - 120$	$D_{av} = D_A - 110$

Connection dimensions of brake

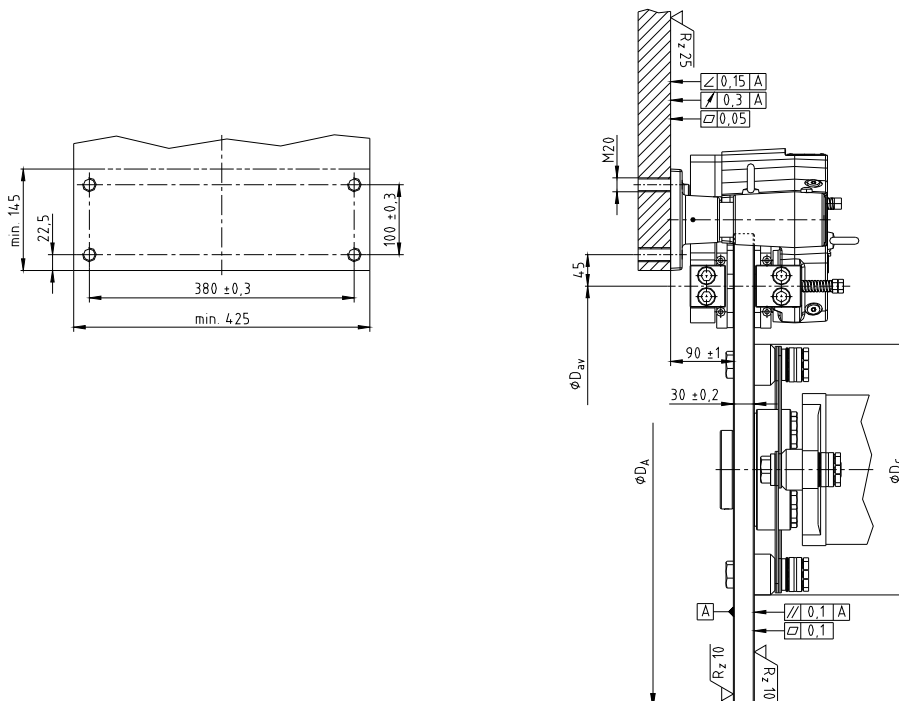


Illustration 4: KTR-STOP® S-A-F (connection dimensions)

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2 Hints

2.1 General Hints

Please read through these operating/assembly instructions carefully before you set the brake into operation. Please pay special attention to the safety instructions!

The operating-/mounting instructions are part of your product. Please keep them carefully.

The copyright for these operating-/mounting instructions remains with **KTR Kupplungstechnik GmbH**.

2.2 Safety and Advice Hints



DANGER!

Danger of injury to persons.



CAUTION!

Damages on the machine possible.



ATTENTION!

Pointing to important items.

2.3 General Hints of Danger



DANGER!

With assembly, operation and maintenance of the brake it has to be made sure that the entire drive train is protected against unintentional engagement. You can be seriously hurt by rotating parts. Please make absolutely sure to read through and observe the following safety instructions.

- All operations on and with the brake have to be performed taking into account "safety first".
- Please make sure to disengage the power pack before you perform your work.
- Protect the power pack against unintentional engagement, e. g. by providing hints at the place of engagement or removing the fuse for current supply.
- Do not touch the operation area of the brake as long as it is in operation.
- Please protect the brake against unintentional touch. Please provide for the necessary protection devices.
- Please make sure that the overall brake/hydraulic system is depressurized during maintenance operations.

2.4 Proper 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 to do so 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 do not take any warranty for resulting damages. To further develop the product we reserve the right for technical modifications.

The **Brake of type S-A-F** described in here corresponds to the technical status at the time of printing of these operating-/mounting instructions.

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3 Storage

The brake is delivered in a 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 avoid conglutination of the gaskets.



CAUTION!

The storage rooms may 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 there is no condensation. The best relative air humidity is less than 65%.

4 Assembly

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

4.1 Components of the Brakes

Components/group of components of brake – Type S-A-F

Component/component group	Quantity	Designation
1	1	Housing with single parts
2	1	Counter plate with single parts
3	1 ¹⁾	Distance plate
4	4	Cap screws DIN EN ISO 4762 – 10.9
5	1	Base plate with guide bolt
6	2	Centering system
7	2	Brake pad
8	2	Pad retraction set for housing
9	2	Pad retraction set for counter plate
10	1 ²⁾	Sensor

1) Number depends on the thickness of brake disk.

2) Optionally available

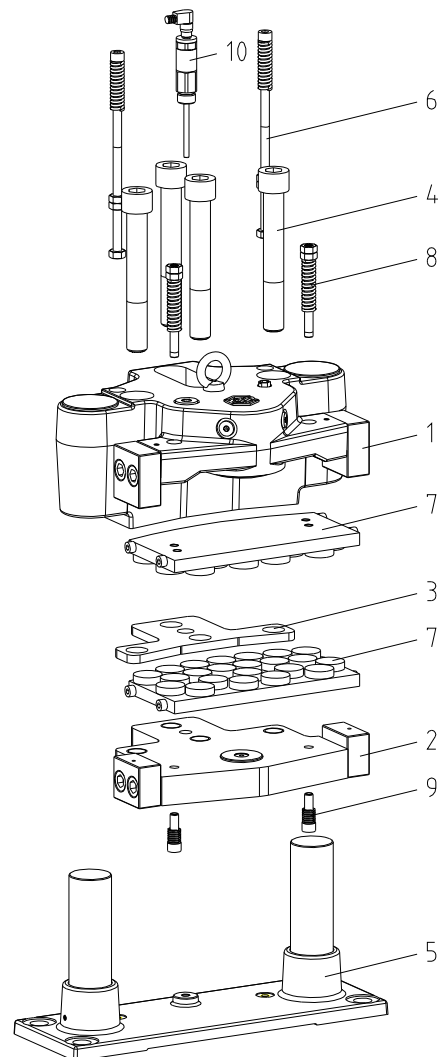


Illustration 5:
KTR-STOP® S-A-F



4 Assembly

4.1 Components of the Brakes

Group of components 1: Housing with single parts

Component	Quantity	Designation
1.1	1	Housing
1.2	1	Brake caliper
1.3	1	Seal
1.4	1	Scraper
1.5	4	Slide bearing
1.6	2	Scraper
1.7	2	Breather
1.8	2	Pad holder
1.9	4	Cap screws DIN EN ISO 4762 – 10.9
1.10	3	Ring bolt DIN 580
1.11	2	Sealing plug
1.12	4	Screw plug DIN 908
1.13	1	Screw plug DIN 908
1.14	1	Sealing plug

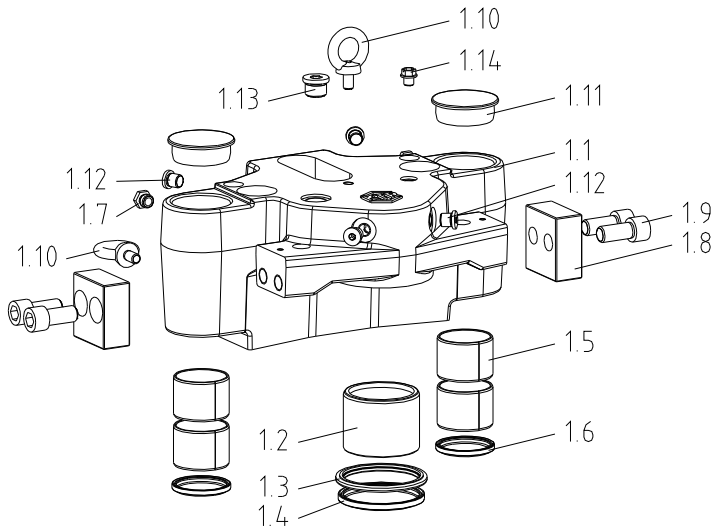


Illustration 6: housing with single parts

Group of components 2: Counter plate with single parts

Component	Quantity	Designation
2.1	1	Counter plate
2.2	2	Pad holder
2.3	4	Cap screws DIN EN ISO 4762 – 10.9

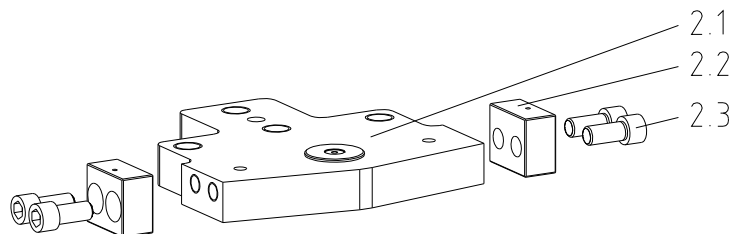


Illustration 7: counter plate with single parts

Group of components 5: Base plate with guide bolt

Component	Quantity	Designation
5.1	1	Base plate
5.2	2	Guide bolt
5.3	2	Clamping sleeve DIN EN ISO 8752
5.4	2	Clamping sleeve DIN EN ISO 8752

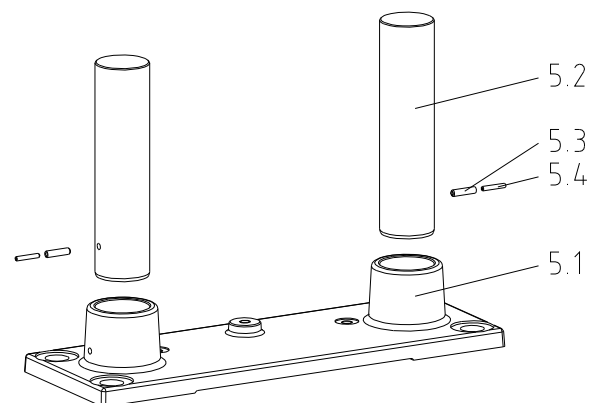


Illustration 8: base plate with guide bolt



4 Assembly

4.1 Components of the Brakes

**Group of components 6:
Centering system**

Component	Quantity	Designation
6.1	1	Pin
6.2	1	Pressure spring
6.3	3	Hexagon nut DIN EN ISO 4032

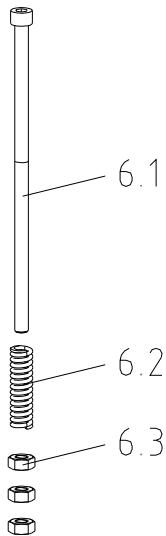


Illustration 9:
centering system

**Group of components 8:
Pad retraction set for housing**

Component	Quantity	Designation
8.1	1	Pin
8.2	1	Pressure spring
8.3	2	Hexagon nut DIN EN ISO 4032

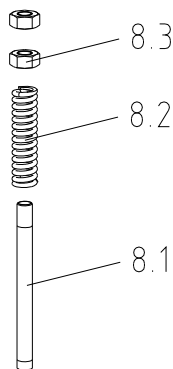


Illustration 10:
pad retraction set for housing

**Group of components 9:
Pad retraction set for counter plate**

Component	Quantity	Designation
9.1	1	Cap screws DIN EN ISO 4762 – 8.8
9.2	1	Pressure spring

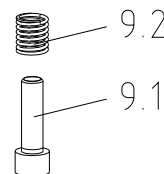


Illustration 11:
pad retraction set for
counter plate



4 Assembly

4.2 Preparation of Assembly



ATTENTION!

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

- The connection plate for the brake as well as the brake disk have to be inspected for dimensional accuracy. For that purpose please investigate the connection dimensions, connection surfaces and tolerances as mentioned in the drawing (see pictures 1, 3 and 4).
- Please clean and degrease the brake disk and mounting surfaces. The corrosion protection can easily be removed by means of solvents.



ATTENTION!

The connection between connection plate and brake is defined to be frictionally engaged. 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.



CAUTION!

Please pay attention to the manufacturer's instructions with regard to solvents.

4.3 Brake Pads



ATTENTION!

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

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

- organic material
- powder metal



CAUTION!

Brake pads made from organic material 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.

In contrast to organic brake pads, brake pads made from powder metal can be cleaned from grease and oil as long as they have not fully soaked with grease and oil.



ATTENTION!

We would recommend to keep the brake pads within their package as long as possible to protect them against any kind of dirt.



CAUTION!

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

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4 Assembly

4.4 Assembly of the Brakes



ATTENTION!

A split O-ring is mounted with a flag between the housing and the base plate as a transport lock. The transport lock needs to be removed before start of operation/mounting of the brake.

If the brake is supplied with a centering system, a transport lock is not provided.



DANGER!

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

On the back side or above the brake eye bolts are mounted serving for using lifting devices. The eye bolts should be disassembled after assembly of the brake and stored in a safe place.



CAUTION!

In order to avoid any damages on the brake, never twist a rope or any other lifting tool around damageable components such as sensors, centering systems, etc.



ATTENTION!

Before you start with the assembly please check if a sensor is mounted.

Please remove it before the assembly in order to avoid any damages.

- Insert the brake pads (component 7) fully into the housing or the counter plate, respectively.
- Applying for the housing only (component 1):
Press back the brake pad and the brake piston manually.



CAUTION!

Please make sure that at least one locking screw (component 1.12) is removed when turning back the brake piston. Afterwards re-assemble the locking screw.



ATTENTION!

If you want to use brake pads after having assembled the brake, it is necessary to disassemble the brake pad retainers (component 1.8 and 2.2) for that purpose.

- Assemble the pad retainer set for the counter plate (component 9) and turn in the screw (component 9.1). The pressure spring needs to be prestressed 8 mm ± 0,5 mm (about 5 revolutions).
- Screw the pin (component 8.1) hand-tight into the brake pad.
- Push the pressure spring (component 8.2) onto the pin.
- Mount the first hexagon nuts (component 8.3) onto the pin and turn them in. The pressure spring needs to be prestressed 10 mm ± 0,5 mm (about 7 revolutions). Afterwards counter the hexagon nut with the second hexagon nut.



ATTENTION!

Secure the screw connection (component 8.1 and 9.1) at the brake pad additionally against self-loosening, e. g. glueing with Loctite (medium-tight).

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4 Assembly

4.4 Assembly of the Brakes

- Insert the brake in the correct position to the connection plate. Secure the brake hand-tight by the screws for the time being.



ATTENTION!
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).

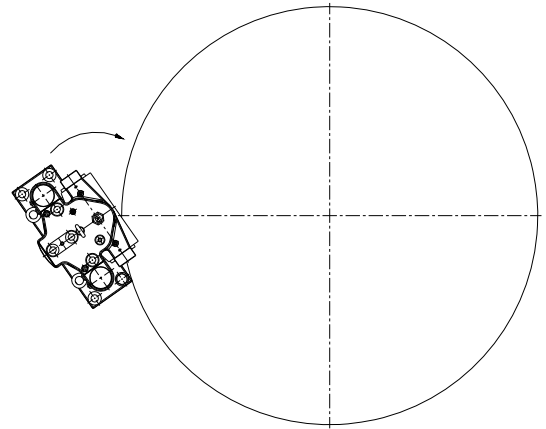


Illustration 12

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

Table 3: Tightening torques

Screw size	Tightening torque T_A [Nm]			
	10.9		12.9	
	Untreated and oiled	Greased with MoS ₂	Untreated and oiled	Greased with MoS ₂
M20	560	420	660	490

- Align the brake disk in centre to the brake.
- Please make sure that the brake disk can rotate freely while not touching the brake pads or the housing.



ATTENTION!
In order to avoid contact between the brake disk and the brake resulting from heat expansion, the distance of the brake according to table 2 needs to be adhered to.



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

- **Optional component**
Assemble the sensor (component 10) according to chapter 6.2.



4 Assembly

4.5 Setting/Re-adjustment of the Centering System



ATTENTION!

The centering system needs to be set with the initial assembly or on replacement of individual components, respectively. In this way it is secured that the gap between the brake disk and the brake pad on the side of the counter plate is set to the right value.

- Measure the gap between the brake disk and the brake pad on the side of the counter plate via a feeler gauge.
- Set the gap to the value indicated by screwing the hexagon nut marked with 1 in illustration 13 in the direction upwards or downwards.
- Counter the hexagon nut with the hexagon marked with 2 in illustration 13.



ATTENTION!

The centering system has to be re-adjusted regularly when the brake linings have worn off. For that purpose repeat the complete chapter *Setting/re-adjustment of the centering system*.

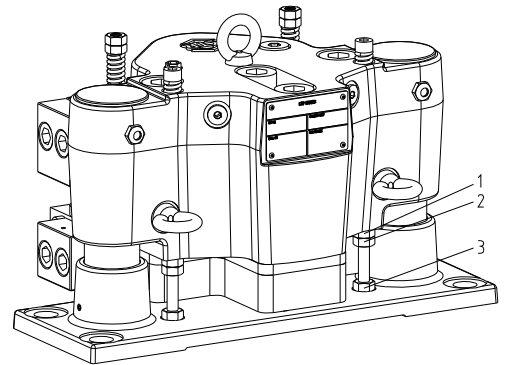


Illustration 13: setting of centering system

4.6 Pressure Connection of a Brake

- Connect the pressure oil pipe to one of the pressure oil pipes of the brake (see illustration 14 and 15). For that purpose remove the locking screw beforehand.
- Mount a miniature test ports to one of the venting holes or connect the venting hole to the hydraulic system via a hose (see illustration 14 and 15). For that purpose remove the locking screw beforehand.



ATTENTION!

The pressure connections on top serve for venting the brake. For a wash-up system please make use of one of the upper pressure connections.



CAUTION!

It is not recommended to use steel plugs for venting.

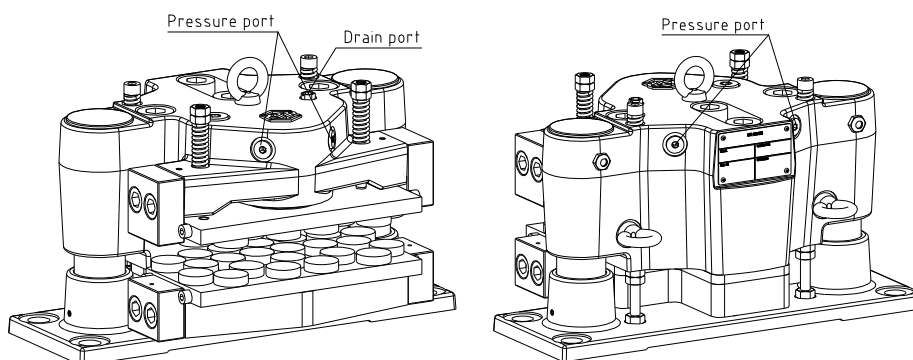


Illustration 14:
connections of the oil leakage pipes/pressure oil pipes

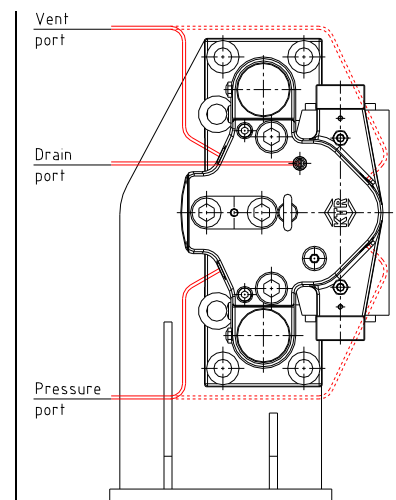


Illustration 15:
pressure connection of a brake



4 Assembly

4.6 Pressure Connection of a Brake

- Connect the oil leakage pipe to the brake (see illustration 14 and 15). For that purpose remove the locking screw beforehand.



ATTENTION!

In order to locate a leakage, it is recommended to use a collection container.



CAUTION!

Leakages have to be removed immediately. Oil which has escaped has to be removed properly, since oil remains may vaporize on hot components and ignite.



ATTENTION!

Please make sure that the connections and valves are adapted to the brakes with regard to pressure, flow rate, temperature and liquidity.

Moreover, we would recommend to use flexible hydraulic valves in order to not restrain potential movements of the brake.

4.7 Pressure Connections of Several Brakes



ATTENTION!

If several brakes are assembled we would recommend to connect the pressure connection 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 pipe to one of the pressure connections of the brake (see illustration 14, 16 and 17). For that purpose remove the locking screw beforehand.
- Mount a miniature test ports to one of the venting holes or connect the venting hole to the hydraulic system by means of a valve (see illustration 14, 16 and 17). For that purpose remove the locking screw.



ATTENTION!

The upper pressure connections serve for venting the brake. For a wash-up system please make use of one of the upper pressure connections.



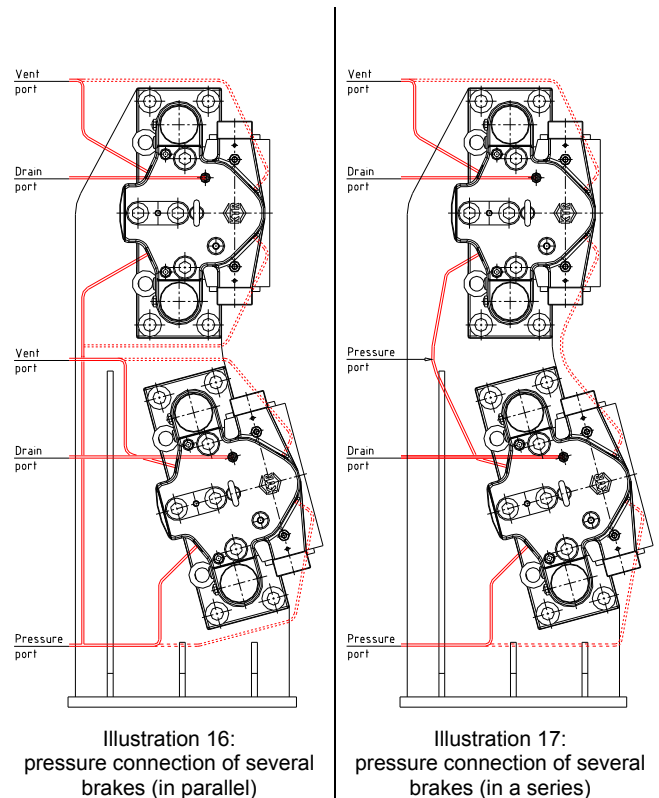
CAUTION!

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



CAUTION!

It is not recommended to use steel plugs for venting.



- Connect the oil leakage pipe to the brake (see illustration 14, 16 and 17). For that purpose remove the locking screw beforehand.



4 Assembly

4.7 Pressure Connections of Several Brakes



ATTENTION!

In order to locate a leakage, it is recommended to use a collection container on every single brake.



CAUTION!

Leakages have to be removed immediately. Oil which has escaped has to be removed properly, since oil remains may vaporize on hot components and ignite.



ATTENTION!

Please make sure that the connections and valves are adapted to the brakes with regard to pressure, flow rate, temperature and liquidity.

Moreover, we would recommend to use flexible hydraulic valves in order to not restrain potential movements of the brake.

4.8 Start-up of the Brakes



ATTENTION!

Before the start of operation and after each operation on the brake the hydraulic system has to be generally vented. By activating the pressure connections reciprocally several times you are in a position to vent the hydraulic system.

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



CAUTION!

Please make sure that there is sufficient liquid in the hydraulic system after venting (recommendation of liquid, see chapter 4.9).

- The active brake described in here does not require any gap to deventilate the brake or brake pads, respectively.
- Put pressure on the hydraulic system. This allows the brake pads to place onto the brake disk.



CAUTION!

The hydraulic system must never be operated at a higher pressure than the figures mentioned in the type plate or table 1. In case that any figures or types/sizes are modified, please contact KTR Kupplungstechnik.



CAUTION!

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.

- The brake pads have to be looped-in on the surface of the brake disk to achieve the rated coefficient of friction.



ATTENTION!

Corresponding instructions for loop-in are attached to the brake pads.

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4 Assembly

4.9 Recommendation of Fluids to be Used



ATTENTION!

Only those hydraulic fluids corresponding to the following criteria may be used (other manufacturers may be chosen).

KTR Kupplungstechnik recommends the following fluids:

Manufacturer	Standard		Special	
Mineral oil	-20 °C to +40 °C (-14 °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)
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
Synthetic oil	-20 °C to +40 °C (-14 °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)
Mobil	SHC 524	SHC 525	-	SHC 526
Bio oil ¹⁾	-20 °C to +30 °C (-14 °F to +86 °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)
Shell	Naturelle HF-E15	Naturelle HF-E32	-	Naturelle HF-E46

1) Purity: <200PPM water components in oil.
In general: Mineral hydraulic fluid as per DIN 51524 part 3.



ATTENTION!

The permissible operating temperatures from -20 °C to +60 °C (-14 °F to +140 °F) of the brake components have to be adhered to. For deviating operating temperatures please consult with KTR Kupplungstechnik.

Viscosity

We would recommend a viscosity range from 20 to 200 cSt of the hydraulic fluid with operating temperature.

Filtration

The oil in the system and the oil to be refilled need to be filtered in general.
To refill the oil we would recommend to use an offline filter.



ATTENTION!

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

The KTR hydraulic systems are provided with a 10-µm inline filter as a standard.

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

- NAS 1638, class 8
- ISO 4406, class 19/1 7/1 4.



ATTENTION!

We would recommend to replace the filters every 6 months, depending on the degree of dirt. After initial assembly activate the pressure connections of the brakes reciprocally several times (approx. 20 times) and replace the filter.

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4 Assembly

4.9 Recommendation of Fluids to be Used

Change of hydraulic fluid

Mineral oil: after 8.000 hours or once a year
Other fluids: after 2.000 hours or two times a year

The system has to be scavenged after each draining of the brake system.



CAUTION!

Unwelcome reactions may be produced by mixing different fluids or fluids of various manufacturers.



ATTENTION!

Please contact the manufacturer of mineral oils if you intend to switch to another hydraulic fluid.

4.10 Disassembly of the Brakes



CAUTION!

Please make sure that the entire brake system is depressurized.



DANGER!

Parts falling down may cause injury of persons or damage to the machine.
Secure the driving parts during assembly or disassembly.



ATTENTION!

If a sensor is used (component 10) it has to be removed before the disassembly of the brake.

- Please fully drain the hydraulic oil.
- Disconnect the leakage oil and oil pressure pipe 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 guarantee the operational readiness 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 under www.ktr.com.



ATTENTION!

KTR does not assume any liabilities or guarantees regarding the use of spare parts and accessories which are not provided by KTR and for the damages resulting herefrom.

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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 effective legal regulations and standards, 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**
Electric components have to be treated as electric 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



ATTENTION!

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



CAUTION!

Please make sure that the overall brake system is depressurized.



DANGER!

Parts falling down may cause injury of persons or damage to the machine.
Secure the driving parts during assembly or disassembly.

- Disassemble the brake pad retainer on one side (component 1.8 and 2.2).
- Remove the pad retainer sets (component 8 and 9).
- Replace the brake pads that have worn off. Insert the brake pads completely into the housing or the counter plate, respectively.
- Applying for the housing only (component 1):
Press the brake pad and brake piston back manually.



CAUTION!

Please make sure that the hydraulic fluid can drain off depressurized when turning back the brake piston.

- Assemble the brake pad retainer by each 2-off cap screws M16 - DIN EN ISO 4762 - 10.9 hand-tight for the time being. Tighten the screws at the tightening torque $T_A = 290 \text{ Nm}$.



ATTENTION!

Please make sure that the brake pad retainer of the housing is bigger than that of the counter plate.

- Assemble the pad retainer set of the counter plate (component 9) and turn in the screw (component 9.1). The pressure spring has to be prestressed 8 mm \pm 0,5 mm (about 5 revolutions).
- Screw the pin (component 8.1) hand-tight into the brake pad.
- Push the pressure spring (component 8.2) onto the pin.

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5 Maintenance

5.1 Replacement of Brake Pads

- Assemble the first hexagon nut (component 8.3) onto the pin and insert it. The pressure spring has to be prestressed 10 mm ± 0,5 mm (about 7 revolutions). Afterwards counter the hexagon nut with the second hexagon nut.



ATTENTION!

Secure the screw connection (component 8.1 and 9.1) at the brake pad additionally against self-loosening, e. g. glueing with Loctite (medium-tight).

- Please make sure that the brake disk can rotate freely without contacting the brake pads or the housing.



ATTENTION!

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. With this procedure the brake pad retainers do not have to be disassembled.



ATTENTION!

Please note chapter 4.4 *assembly of brake*.

- Before you reactivate the brake, see chapter 4.7 *start-up of brake*.

5.2 Maintenance of the Brakes / Replacement of Single Parts



ATTENTION!

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

- Disassemble the brake, see chapter 4.10 *disassembly of brake*.
- Remove the pad retainer sets (component 8 and 9).
- Take out the brake pads (component 7).
- Untighten the each 3-off hexagon nuts of the centering system (component 6) and unscrew the pins (component 6.1) from the base plate.
- Unscrew the hexagon nuts of the centering system (component 6) and take out the pins and pressure springs.
- Remove the housing along with the individual components (component 2) from the base plate (component 5).
- Disassemble the 4-off cap screws (component 4).
- Remove the housing along with the individual components (component 1) and the distance plate (component 3) from the counter plate.



CAUTION!

Inspect the components/assemblies 2, 3, 5 and 6 for any kind of damages; it may be necessary to replace the components. Afterwards remove dirt, grease and corrosion from the components.

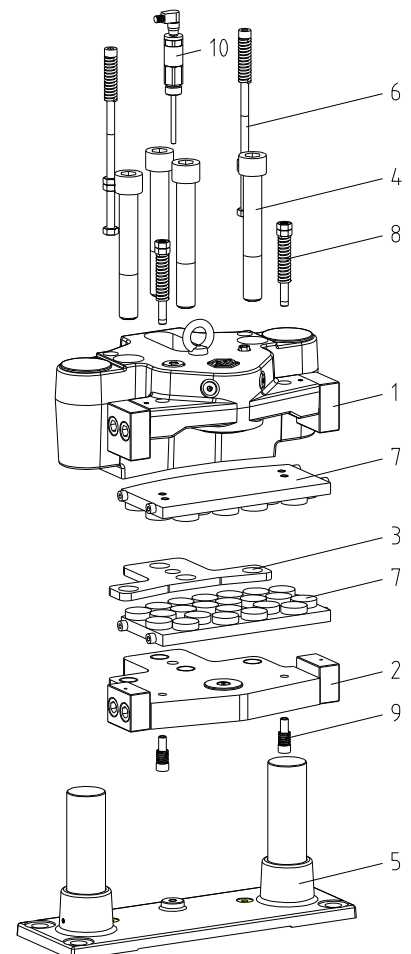


Illustration 18: KTR-STOP® S-A-F



5 Maintenance

5.2 Maintenance of the Brakes / Replacement of Single Parts

- Connect the hydraulics to a pressure connection (see illustration 14) of the housing and make sure that all other pressure connections are locked by locking screws.
- Press the brake piston (component 1.2) carefully out of the housing with some hydraulic pressure.
- Remove the gasket (component 1.3) and the scraper (component 1.4).

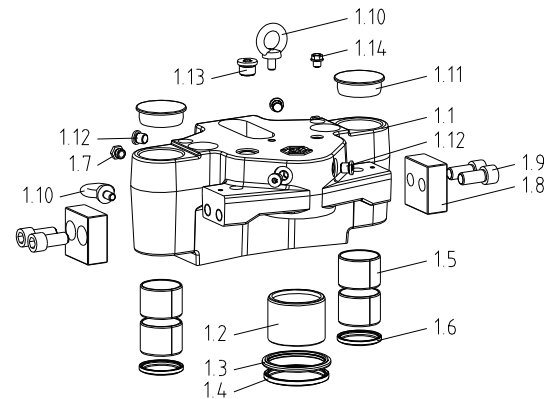


Illustration 19: housing with single parts



ATTENTION!
When removing the seals and scrapers please make sure that the keyways in the housing 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.



CAUTION!
Please pay attention to the manufacturer's instructions with regard to solvents.



CAUTION!
Inspect the slide bearings (component 1.59 and scrapers (component 1.6) for any kind of damages; if necessary, the components have to be replaced. Afterwards any kind of dirt, grease and corrosion have to be removed from the components.

- Insert a new gasket (component 1.3) and a new scraper (component 1.4) into the housing. For that purpose the components may be heart-shaped (see illustration 20).



CAUTION!
The seals and scrapers have to be installed in the right direction. For that purpose the sealing lips have to show in the opposite direction of the pressure room (see picture 21).



ATTENTION!
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 seals and scrapers with Molykote MoS₂ (see picture 21).

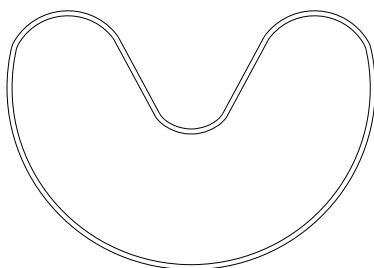


Illustration 20: assembly of seal and scraper

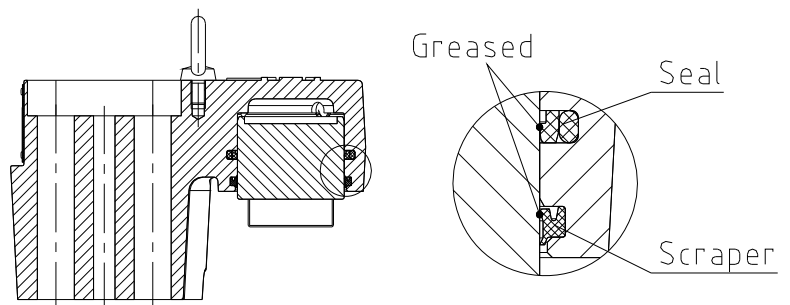


Illustration 21

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5 Maintenance

5.2 Maintenance of the Brakes / Replacement of Single Parts



CAUTION!

Inspect the surfaces of the brake pistons and the holes of the housing to make sure that they are neither scratched nor damaged, since the surfaces are either ground or polished. Such kind of damages may cause an earlier wear on the seals and scrapers and produce leakages.

- Insert the brake piston (component 1.2) into the housing and press it against a stop.
- **Depending on the thickness of brake disk:**
Put the distance plate (component 3) onto the counter plate.
- Lubricate the scraper (component 1.6) with Molykote MoS₂.
- Put the housing onto the distance plate.
- Screw the housing to the counter plate by means of the 4-off cap screws (component 4) at the tightening torque indicated $T_A = 840 \text{ Nm}$.
- Carefully put the pre-assembled unit onto the base plate with guide pins.
- Put the pins (component 6.1) into the housing via pressure springs (component 6.2).
- Screw each 3-off hexagon nuts (component 6.3) onto the pins of the centering system.
- Screw the pin (component 6.1) into the base plate.
- Counter the pin to the hexagon nut marked with 3 in illustration 22.
- Repeat chapters 4.2 to 4.8.

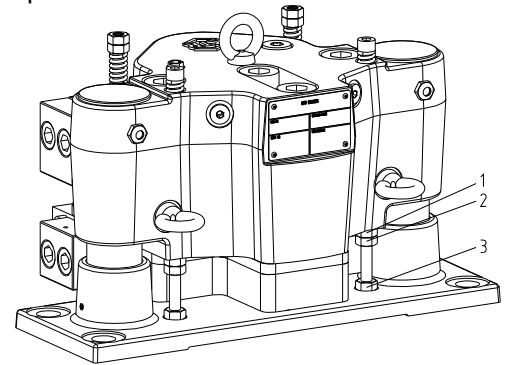


Illustration 22: setting of centering system

5.3 Maintenance and Service

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



ATTENTION!

If you realize any irregularities, please perform repairs accordingly.

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6 Accessories - Sensor

6.1 Technical Data „Pre/End Wear Sensor“

Funktion of sensor

Two micro switches are situated in the housing of the sensor. The distance pin activates the switches in two different positions.

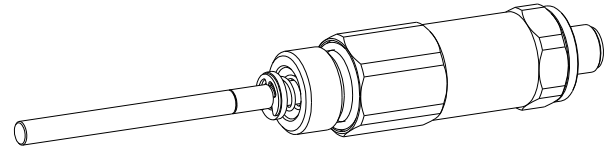


Illustration 23: pre/end wear sensor

Table 4: Switching status of status (switch S1) and wear behaviour (switch S2) depending on the activating status of the brake.

Status of brake	Status of brake lining	Switch S1	Switch S2
Brake not activated (unlocked)	in order	1 - 4	2 - 3
	worn off	1 - 4	2 - 3
Brake activated (locked)	in order	0	2 - 3
	worn off	0	2 - 5

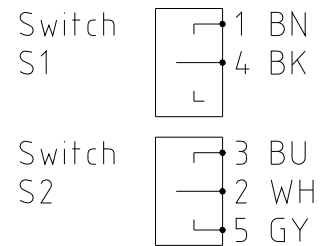


Illustration 24: switch position

Switch S2 only shows the wear status reliably when the brake is activated (locked). If the brake is not activated (unlocked), a statement about the wear condition cannot be given.



ATTENTION!

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



ATTENTION!

„Worn off“ is indicated as soon as the thickness of brake pad of 1 mm is fallen below. We would recommend to replace the brake pad by return.



CAUTION!

The brake pad needs to be replaced immediately if the signal indicating the status „worn off“ is given.

Fail-safe operation

A proper operation is only ensured if the pre/end wear sensor is wired properly. This would provide for a signal since a switch (NO) is locked which would normally be open.



CAUTION!

In case of damages like, for example, faulty cables, bad connections, etc. the signals need to disappear.

Technical data:

Operating temperature	- 40° C to + 85° C
Max. voltage	30 V DC/AC
Switching current	100 mA
Switching tolerance	± 0,3 mm
Protection class	IP 65 (mounted)
Width across flats	24 mm
Max. tightening torque G 1/2"	20 Nm
Max. tightening torque M12	hand-tight
Cable length	5 m, 10 m or 15 m
Material of cable	PUR
Dimension of cable	5 * 0,34 mm ²

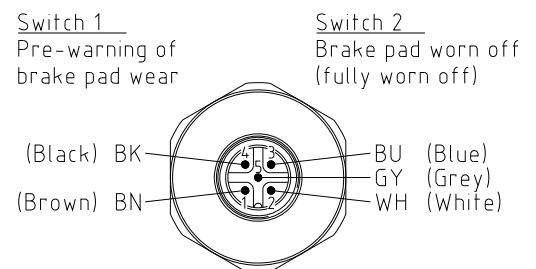


Illustration 25: pin assignment of plug connection

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6 Accessories - Sensor

6.2 Assembly/Start of Operation

- Remove the locking screw from the brake.
- Screw the sensor 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 connection (see illustration 25).

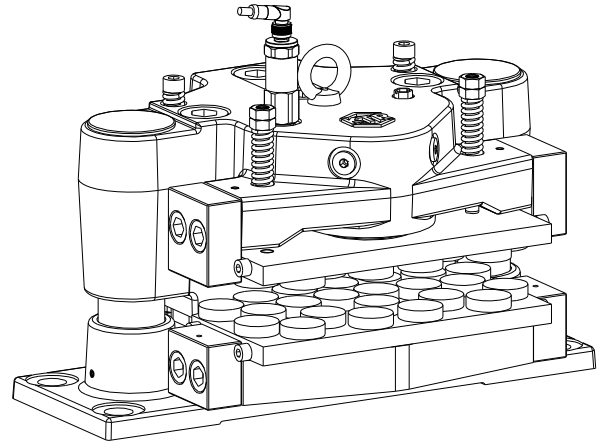


Illustration 26: assembly of pre/end wear sensor