

KTR-STOP® S-xx-F

S-xx-F is a spring-actuated brake in a floating calliper design serving to produce a brake force on a brake disk in order to decelerate a plant's movement or stop it, respectively, or keep it at standstill.



The KTR-STOP® S-xx-F brake 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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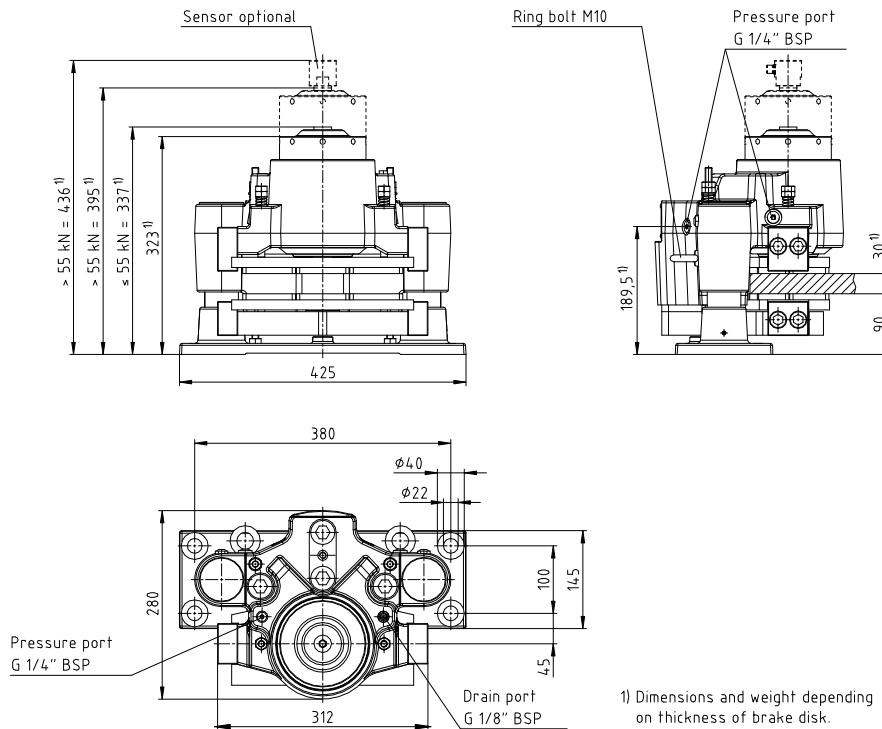
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1 Technical Data



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

Illustration 1: dimensional drawing

Table 1: Technical Data

		S-xx-F	
Weight	[kg]	Approx. 90 - 100 ¹⁾	
Width of brake pad	[mm]	125	
Surface area of each brake pad	organic	28.700	
	sintered	26.800	
Max. wear of each brake pad	[mm]	7	
Nominal coefficient of friction ²⁾	[μ =]	0,4	
Total brake piston area – complete brake	[cm ²]	69	
Volume for each brake caliper at 1 mm stroke	[cm ³]	6,9	
Max. operating pressure	[bar]	200	
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	

Table 2: Clamping force, loss of force, opening pressure and weight

Brake type ³⁾	Clamping force F _c [kN]	Loss of force ⁴⁾ [%]	Opening pressure [bar]	Weight ¹⁾ [kg]
KTR-STOP® S-20-F	20	4,5	40	90
KTR-STOP® S-40-F	40	6,5	90	90
KTR-STOP® S-60-F	60	7,0	130	100
KTR-STOP® S-80-F	80	5,0	170	100

²⁾ The friction coefficient each depends on the application or material of the brake pad; please consult with KTR.

³⁾ Other types on request

⁴⁾ With a stroke of 1 mm (0,5 mm wear of brake pad on each side)

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

$$M_b = z \cdot F_b \cdot \frac{D_{av}}{2}$$

- F_b = Braking force [kN]
- F_c = Clamping force [kN]
- M_b = Braking torque [kNm]
- z = Number of brakes
- D_{av} = Effective diameter of brake [m]

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1 Technical Data

Calculation of brake disk

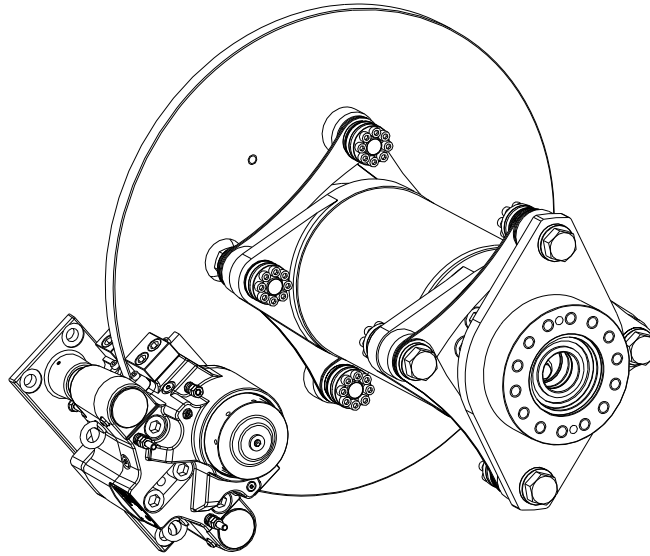


Illustration 2: assembly of brake

Table 3: Calculation of brake disk

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

Connection dimensions of brake

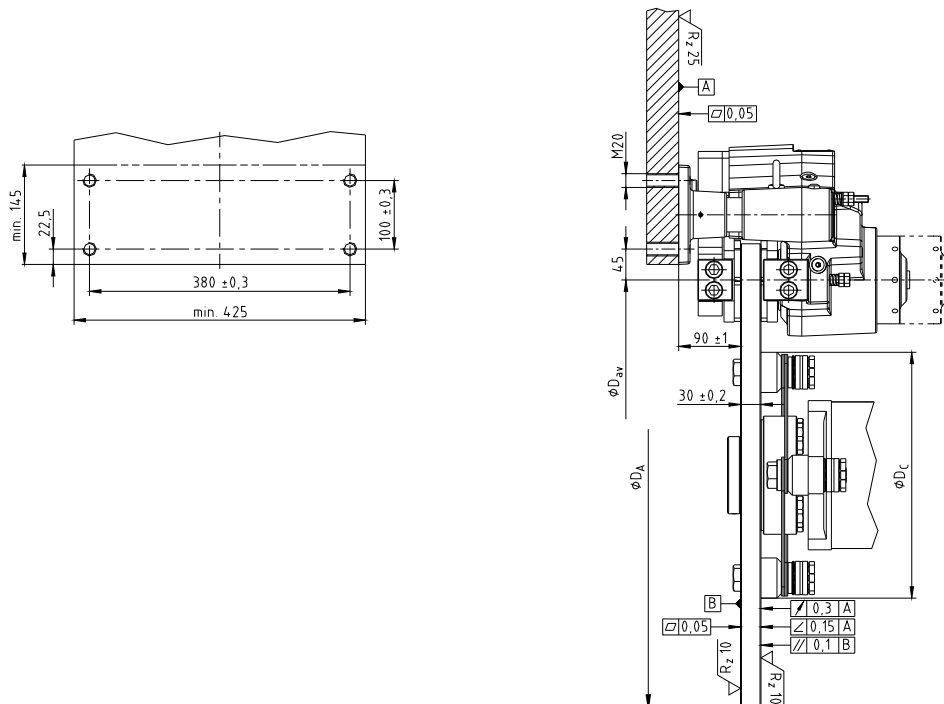


Illustration 3: connection dimensions

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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.

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-xx-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 seals.



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.



ATTENTION!

The brake is basically supplied with locking for mounting being assembled. The screw plug (component 1.15) is attached to the brake in bulk.

4.1 Components of the Brakes

Components/group of components of brake – Type S-xx-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

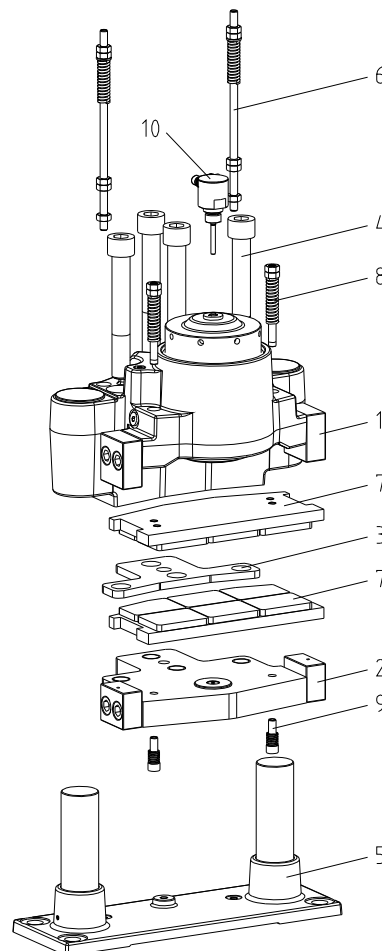


Illustration 4:
components/group of
components of brake

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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	4	Slide bearing
1.3	2	Scraper
1.4	1	Scraper
1.5	1	Guide ring
1.6	1	Seal
1.7	1	Brake caliper
1.8	1	Seal
1.9	1	Guide ring
1.10	1	Scraper
1.11	1	Disk spring package
1.12	1	Centre bolt
1.13	1	Adjusting nut
1.14	1	O-ring
1.15	1	Screw plug VSTI (acc. to DIN 908)
1.16	1	Sealing plug
1.17	1	Screw plug VSTI (acc. to DIN 908)
1.18	2	Sealing plug
1.19	2	Pad holder
1.20	4	Cap screws DIN EN ISO 4762 – 10.9
1.21	4	Screw plug VSTI (acc. to DIN 908)
1.22	2	Breather
1.23	2	Ring bolt DIN 580

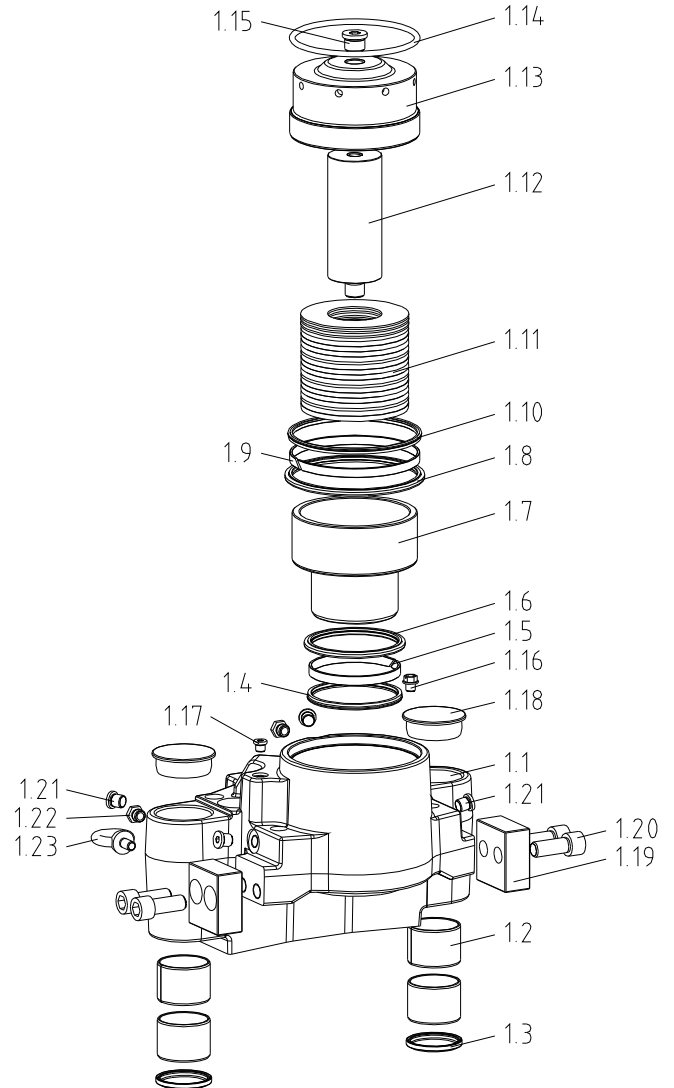


Illustration 5: housing with single parts

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

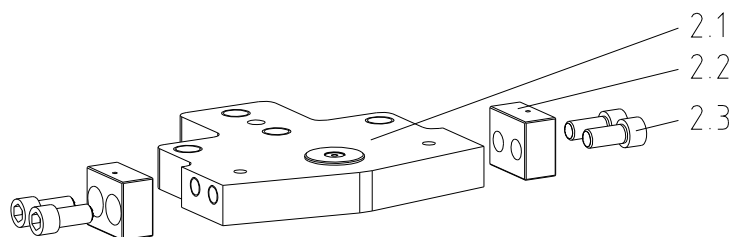


Illustration 6: counter plate with single parts



4 Assembly

4.1 Components of the Brakes

**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

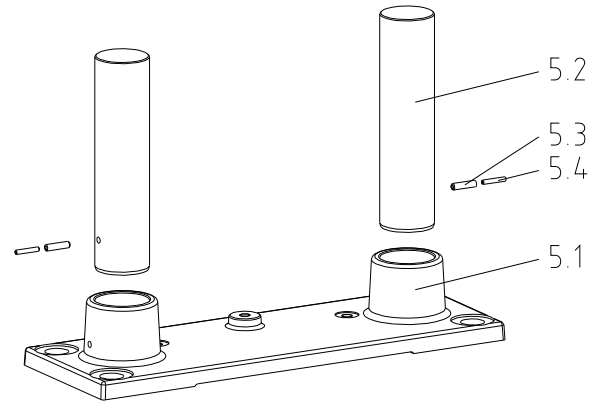


Illustration 7: base plate with guide bolt

**Group of components 6:
Centering system**

Component	Quantity	Designation
6.1	1	Pin
6.2	1	Pressure spring
6.3	5	Hexagon nut DIN EN ISO 4032
6.4	1	Disk

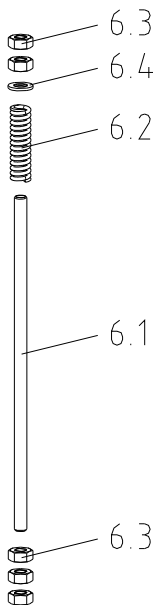


Illustration 8: centering system



4 Assembly

4.1 Components of the Brakes

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

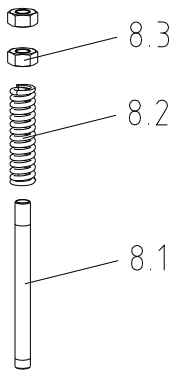


Illustration 9:
pad retraction set for housing

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

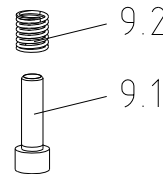


Illustration 10:
pad retraction set for
counter plate

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 illustrations 1 to 3 and table 3).
- 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 Assembly

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 of 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 of 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 in 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.

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 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.

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4 Assembly

4.4 Assembly of the Brakes

- Insert the brake pads (component 7) fully into the housing or the counter plate, respectively.



ATTENTION!

If you want to use brake pads after having assembled the brake, it is necessary to disassemble the brake pad retainers (component 1.19 and 2.2) for that purpose (chapter 5.1).

- Assemble the pad retraction set for the counter plate (component 9) by screwing the screw (component 9.1) into the brake pad. The pressure spring needs to be prestressed 8 mm ± 0,5 mm (about 5 revolutions).
- Screw the pin (component 8.1) hand-tight with the short thread side into the brake pad.
- Push the pressure spring (component 8.2) onto the pin.
- Assemble the first hexagon nut (component 8.3) onto the pin and screw it onto the pressure spring until being in contact. 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) on the brake pad additionally against self-loosening, e. g. glueing with Loctite (medium-tight).

- 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 11).

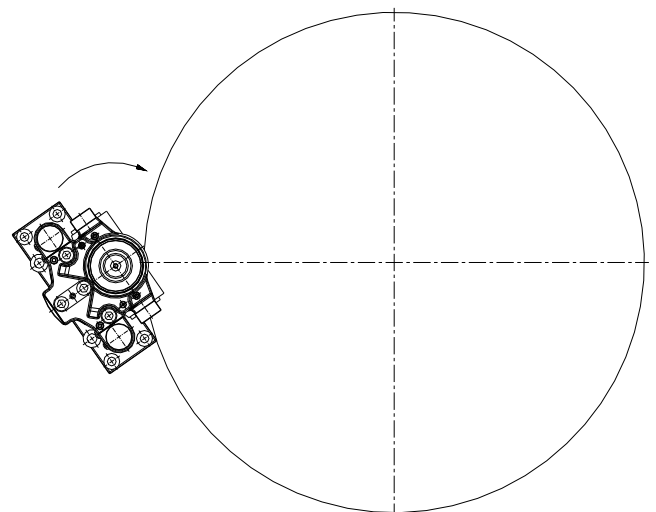


Illustration 11

- Screw the brake to the connection plate via 4 screws and tighten them evenly stepwise hydraulically at the tightening torque indicated (see table 4). For other tightening procedures please consult with KTR.

Table 4: 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 in centre to the brake disk.
- Please make sure that the brake disk can rotate freely while not touching the brake pads or the housing.



4 Assembly

4.4 Assembly of the Brakes



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 3 needs to be adhered to.



CAUTION!

Please make sure that the tolerances of the brake disk do not exceed the figures mentioned in illustration 3.

4.5 Setting/Re-adjustment of the Centering System



ATTENTION!

The centering system needs to be re-set with the initial assembly or after having replaced brake pads or components, respectively. Only in this way it is ensured that the gap between the brake disk and the brake pad on the side of the counter plate is adjusted to the right value and the pad does not touch on any side.



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*.

- 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 0,5 mm or the figure x requested (see illustration 12), respectively, by screwing the hexagon nut marked with 1 in illustration 13 either upwards or downwards.
- Counter the hexagon nut with the hexagon nut marked with 2 in illustration 13.

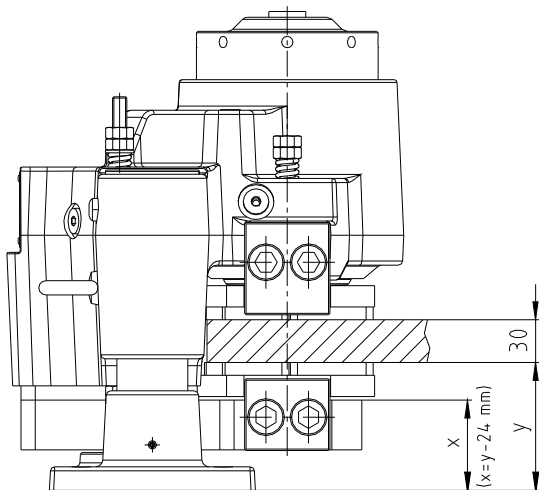


Illustration 12: setting of gap

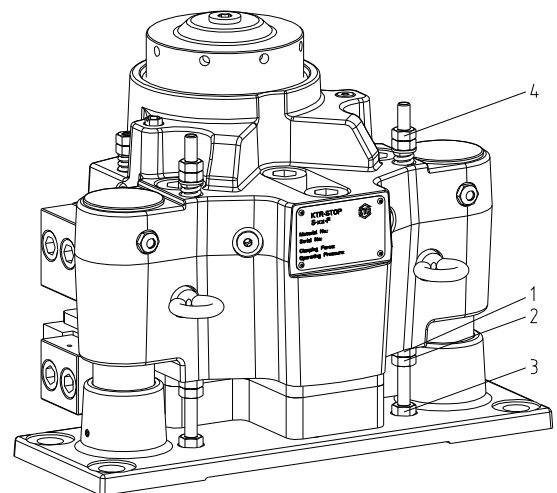


Illustration 13: setting of centering system



ATTENTION!

The gap between brake disk and brake pad needs to be 0,5 mm on both sides to ensure the brake power.

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4 Assembly

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 screw plug beforehand.
- Mount a miniature measuring coupling with a miniature measuring hose to the venting hole on the highest point (see illustration 14 and 15), for that purpose please remove the locking screw beforehand. Dissipate the end of the miniature measuring hose in a suitable collection container.



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.

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



ATTENTION!

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 produced, a pneumatic hose may be used, too. Please inspect the brake regularly for leakages.



CAUTION!

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

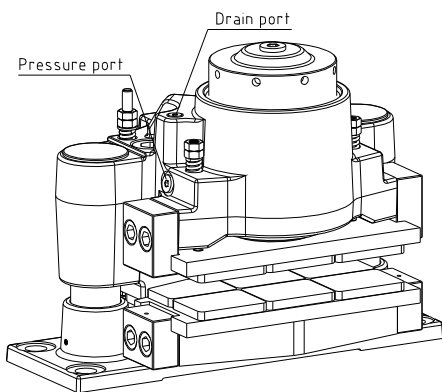


Illustration 14:
connections of the oil leakage pipes/pressure oil pipes

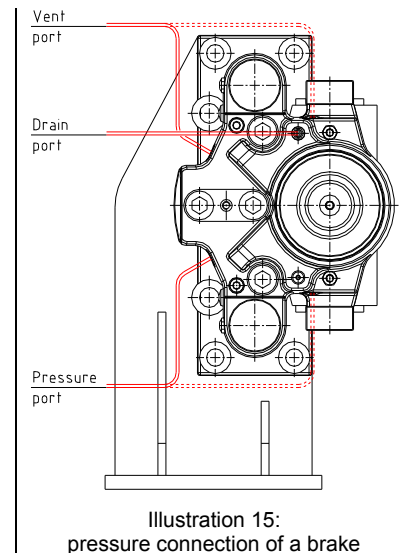
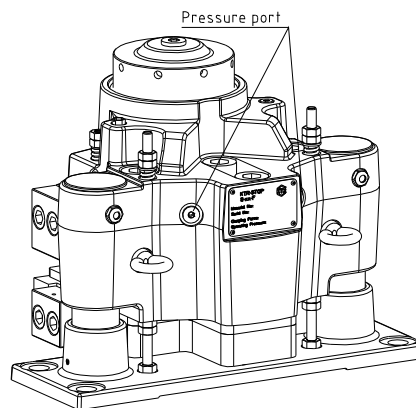


Illustration 15:
pressure connection of a brake



ATTENTION!

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



4 Assembly

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 screw plug beforehand.
- Mount a miniature measuring coupling with a miniature measuring hose to the venting hole on the highest point (see illustration 14, 16 and 17), for that purpose please remove the locking screw beforehand. Dissipate the end of the miniature measuring hose in a suitable collection container.



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 sealing plug beforehand.



ATTENTION!

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 produced, a pneumatic hose may be used, too. Please inspect the brake regularly for leakages.



CAUTION!

Extreme leakages have to be removed immediately. Oil which has escaped has to be removed completely, 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, you have to use flexible hydraulic tubes in order to not limit the motions of the brake. Any hoses which are situated close to mobile components should be secured or coated accordingly.

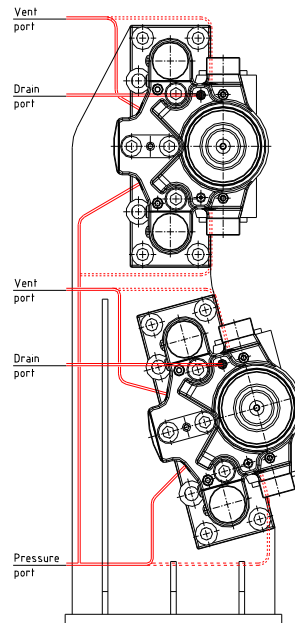


Illustration 16:
pressure connection of several
brakes (in parallel)

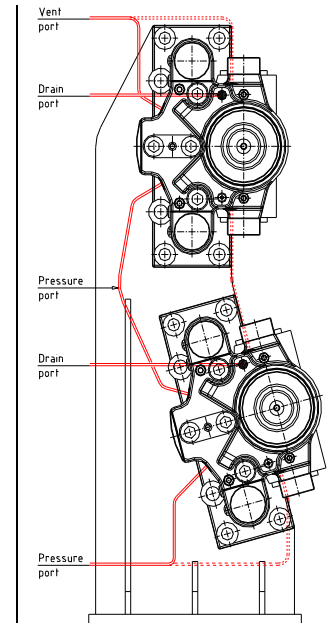


Illustration 17:
pressure connection of several
brakes (in a series)

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4 Assembly

4.8 Start-up of the Brakes



ATTENTION!

Before start-up and after any operation on the brake the hydraulic system needs to be basically vented.

Repeat the venting of the brake several times a year, 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 during and after the venting process (recommendation of liquid, see chapter 4.10).

- Switch on the hydraulic system for a short term to make sure that the brake is flushed with hydraulic oil. Repeat this process until a stream of clean oil dissipates from the miniature measuring hose.
- Remove the miniature measuring hose.



ATTENTION!

If the miniature measuring coupling is removed as well, the locking screw (component 1.18) needs to be screwed in the venting hole (see illustrations 14 to 17).

- Dispose of the hydraulic oil of the collection container as per chapter 4.13.
- Put the opening pressure (see table 2) on the hydraulic system to relieve the locking device for assembly.



CAUTION!

The hydraulic system must never be operated at a higher pressure than the figures mentioned in the type plate of the brake 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.

- Remove the screw with the disk (locking for mounting, see illustration 18) from the centre bolt (component 1.12).
- Screw the screw plug (component 1.15) into the adjusting nut (component 1.13).
- **Applying with the use of a sensor only:**
Mount the sensor (component 10) according to chapter 6.2 instead of the screw plug (component 1.15).
- The brake pads have to be looped-in on the surface of the brake disk to achieve the rated coefficient of friction.

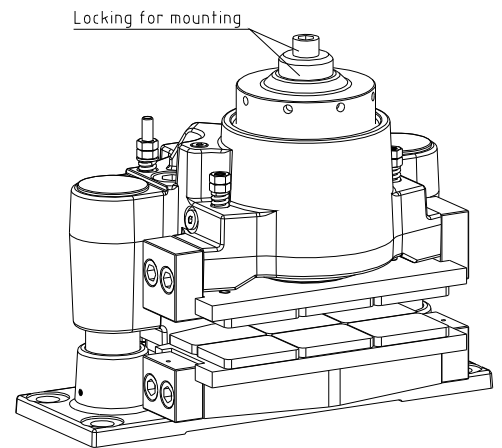


Illustration 18: locking for mounting



ATTENTION!

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



4 Assembly

4.9 Setting/re-adjustment of the brake



ATTENTION!

The brake needs to be set with the initial assembly or after having replaced the brake pads or components, respectively. Only in this way it is ensured that the brake has the clamping force indicated.



ATTENTION!

In case of wear of the brake pads the brake needs to be regularly re-adjusted. Before you re-adjust the brake, the centering system needs to be set first. For that purpose repeat the complete chapters *Setting/re-adjustment of the centering system* and afterwards *Setting/re-adjustment of the brake*.

- Remove the O-ring (component 1.14).
- Put the opening pressure (see table 2) on the hydraulic system to make sure that the brake pads are removed from the brake disk.



ATTENTION!

Please note chapter 4.8 *Start-up of brake*.

- Screw the screw with the disk (locking for mounting, see illustration 18) into the centre bolt (component 1.12).
- Release the pressure from the hydraulic system.
- Measure the gap between the brake disk and the brake pad on the housing side by means of a feeler gauge.
- Set the gap to 0,5 mm by screwing the setting nut (component 1.13) either upwards or downwards.
- **Applying for the re-adjustment of the brake only (wear of brake pad):**
With a wear of the brake pads (0,5 mm wear for each brake pad) of 1 mm the adjusting nut (component 1.13) needs to be screwed in by 1/2 revolution.
- Insert the O-ring (component 1.14) between the housing and the adjusting nut.

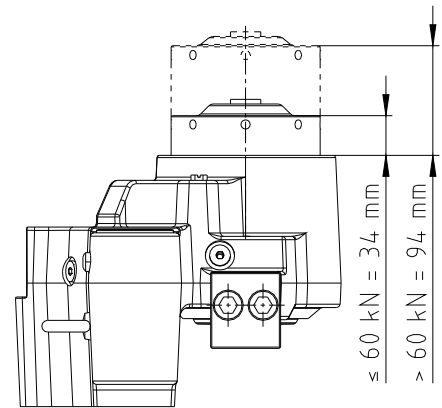


Illustration 19: setting of adjusting nut



ATTENTION!

The gap between brake disk and brake pad must be 0,5 mm on both sides to ensure the brake force.



4 Assembly

4.10 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	
	-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)
Mineral oil				
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				
Mobil	SHC 524	SHC 525	-	SHC 526
Bio oil ¹⁾				
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 (-4 °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 always have to be filtered, please observe the instructions of the hydraulic system manufacturer.

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

4.10 Recommendation of Fluids to be Used

Replacement 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.

4.11 Disassembly of the Brakes



DANGER!

In order to avoid any injuries of persons, please lock the brake by means of the locking for mounting.

- Remove the screw plug (component 1.15) or the sensor (component 10) from the adjusting nut (component 1.13).
- Please put the opening pressure (see table 2) on the hydraulic system.
- Screw the screw along with the washer (safety device for mounting, see illustration 18) hand-tight into the centre bolt (component 1.12).
- Discharge the pressure fully from the hydraulic system.



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.

- Remove the locking screw situated on the highest point (component 1.17) from the venting hole (see illustrations 14 to 17).
- Discharge the hydraulic oil fully from the brake.
- Dispose of the hydraulic oil as per chapter 4.13.
- Disconnect the leakage oil and oil pressure pipe from the brake.
- Screw the locking screws (component 1.21) in all pressure connections or venting holes (see illustrations 14 to 17).
- Remove the 4-off screws serving for fixing the brake to the connection plate.
- Take out the brake.



4 Assembly

4.12 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.

4.13 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.
- **Seals**
Seals 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.



DANGER!

In order to avoid any injuries of persons, please lock the brake by means of the locking for mounting.



DANGER!

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

- Remove the screw plug (component 1.15) or the sensor (component 10) from the adjusting nut (component 1.13).
- Please put the opening pressure (see table 2) on the hydraulic system.
- Screw the screw along with the washer (safety device for mounting, see illustration 18) hand-tight into the centre bolt (component 1.12).

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5 Maintenance

5.1 Replacement of Brake Pads

- Disassemble the brake pad retainer on one side (component 1.19 and 2.2).
- Remove the pad retainer sets (component 8 and 9).
- Replace the brake pads that have worn off. Insert the brake pads (component 7) completely into the housing or the counter plate, respectively.
- Assemble the brake pad retainer (component 1.19 and 2.2) by each 2-off cap screws (component 1.20 and 2.3) 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 brake pad retainer set for the counter plate (component 9) by screwing the screw (component 9.1) in the brake pad. The pressure spring has to be prestressed $8 \text{ mm} \pm 0,5 \text{ mm}$ (about 5 revolutions).
- Screw the pin (component 8.1) with the short thread side hand-tight in the brake pad.
- Push the pressure spring (component 8.2) onto the pin.
- Mount the first hexagon nut (component 8.3) onto the pin and screw it on until it is in contact with the pressure spring. The pressure spring has to be prestressed $10 \text{ mm} \pm 0,5 \text{ mm}$ (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).

- Repeat chapter 4.5 *Setting/re-adjustment of the counter system* and chapter 4.9 *Setting/re-adjustment of the brake*.
- 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 *Mounting of brake*.

- Before you reactivate the brake, see chapter 4.8 *start-up of brake*.



5 Maintenance

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 4.11 *disassembly of brake*.
- Remove the pad retainer sets (component 8 and 9).
- Take out the brake pads (component 7).
- Untighten each the two hexagon nuts on top of the centering system (component 6) and remove them together with the distance sleeve and the pressure spring.
- Remove the housing (component 1) with the counter plate (component 2) from the guide pins (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.

- Remove the O-ring (component 1.14).
- Set the adjusting nut (component 1.13) to the right dimension (see illustration 21).
- Connect the hydraulics to a pressure connection (see illustration 14) of the housing and make sure that all other pressure connections are locked by screw plugs.
- Please put the opening pressure (see table 2) on the hydraulic system.
- Remove the screw with the disk (locking for mounting, see illustration 18) from the centre bolt (component 1.12).
- Discharge the pressure from the hydraulic system.

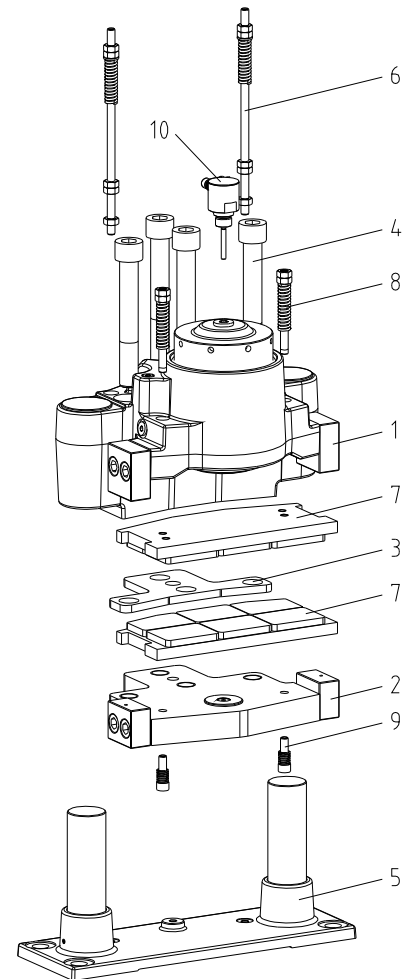


Illustration 20: KTR-STOP® S-xx-F

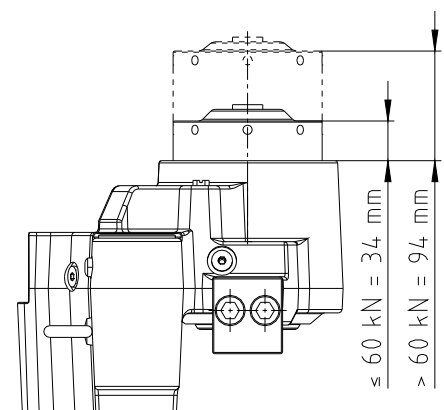


Illustration 21: setting of adjusting nut



5 Maintenance

5.2 Maintenance of the Brakes / Replacement of Single Parts

- Unscrew the setting nut (component 1.13) from the housing.
- Remove the set of disk springs (component 1.11).



ATTENTION!

Please make use of a support to ensure that you can provide for the same arrangement of disk springs, disk and adjustment washer(s) with the re-assembly of the brake.

- Press the brake piston (component 1.7) carefully out of the housing with some hydraulic pressure.
- Remove the seals (component 1.6 and 1.8), scrapers (component 1.4 and 1.10) and guide rings (component 1.5 and 1.9).



ATTENTION!

When removing the seals, scrapers and guide rings 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 1.2), scrapers (component 1.3) and centre bolts (component 1.12) 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 new seals (component 1.6 and 1.8), scrapers (component 1.4 and 1.10) and guide rings (component 1.5 and 1.9) into the housing. For that purpose the components may be heart-shaped (see illustration 23).



CAUTION!

The seals and scrapers have to be installed in the right direction (see illustration 24).



ATTENTION!

With a new assembly basically new seals, scrapers and guide rings have to be used, since their operativeness is no longer ensured due to wear and damages.

- Grease the seals, scrapers and guide rings with hydraulic oil (see illustration 24).



CAUTION!

Oils and greases with additives of molybdenum disulfide or zinc sulfide must not be used.

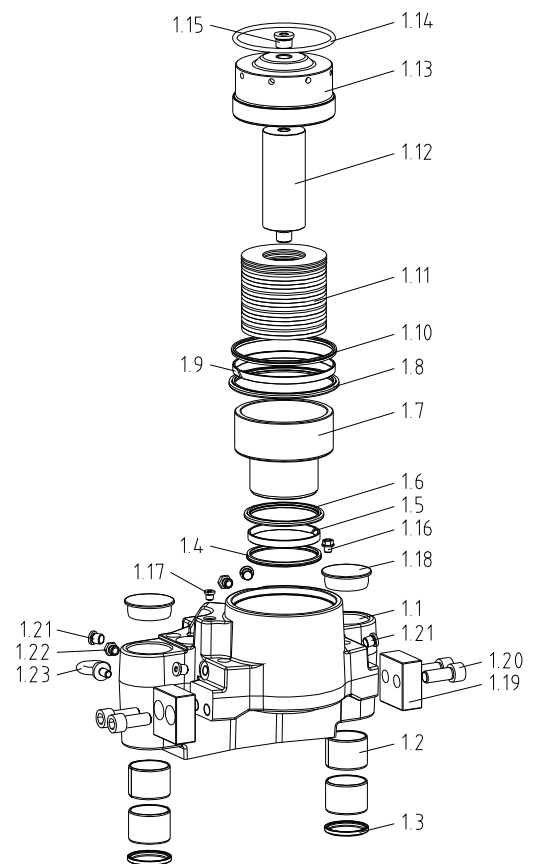


Illustration 22: housing with single parts



5 Maintenance

5.2 Maintenance of the Brakes / Replacement of Single Parts

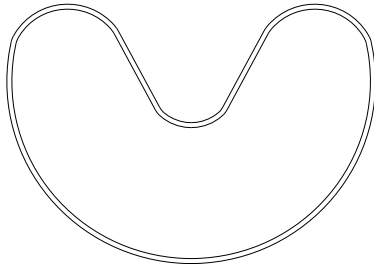


Illustration 23: assembly of seal and scraper

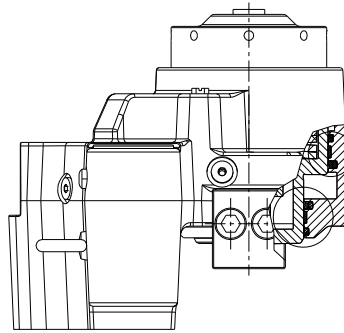
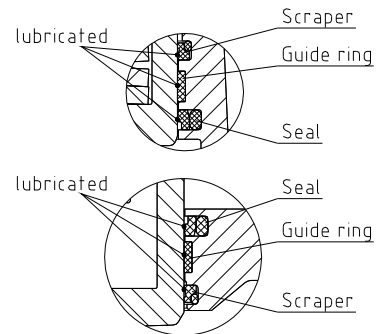


Illustration 24



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, scrapers and guide rings and produce leakages.

- Insert the brake piston (component 1.7) into the housing and press it against a stop.
- Push the set of disk springs (component 1.11) on the centre bolt (component 1.12). Please make sure that the disks are on top.



ATTENTION!

Grease the disk springs properly with Molykote MoS₂.

Please make sure that the set of disk springs is mounting in the same arrangement as it has been supplied.

If a new set of disk springs is used, the condition of supply needs to be adhered to in detail.

- Screw the setting nut (component 1.13) in the housing and set it to the right dimension (see illustration 21).
- Please put the opening pressure (see table 2) on the hydraulic system.
- Screw the screw along with the washer (safety device for mounting, see illustration 18) hand-tight into the centre bolt (component 1.12).
- Discharge the pressure from the hydraulic system.
- Insert a new O-ring (component 1.14) between the housing and the setting nut.
- **Depending on the thickness of brake disk:**
Put the distance plate (component 3) onto the counter plate.
- Put the housing on the distance plate or counter plate, respectively.
- Screw the housing to the counter plates by means of the 4 cap screws (component 4) and tighten them evenly stepwise hydraulically at the tightening torque $T_A = 840 \text{ Nm}$ indicated.
For other tightening processes please consult with KTR.
- When you have disassembled the pin of the centering system (component 6), screw each the lower 3-off hexagon nuts on the pin. Afterwards screw the pin in the base plate against a stop.



5 Maintenance

5.2 Maintenance of the Brakes / Replacement of Single Parts

- Counter the pin with the hexagon nut marked with 3 in illustration 26.
- Grease the scraper (component 1.3) with hydraulic oil.
- Put the pre-assembled unit carefully on the guide pins.



ATTENTION!

Please make sure not to damage the centering system (component 6).

- Set the gap between brake disk and brake pad to 0,5 mm or the requested value x (see illustration 25) by screwing the hexagon nut marked with 1 in illustration 26 upwards or downwards.
- Counter the hexagon nut with the hexagon nut marked with 2 in illustration 26.
- Push the pressure spring (component 6.2) and the disk (component 6.4) onto the pin of the centering system. Screw on the two hexagon nuts (component 6.3) until they have got in contact with the disk.
- The pressure spring needs to be prestressed 13 mm. A distance of 10 mm needs to be kept between the housing and the distance sleeve (see illustration 25). Counter the hexagon nut with the hexagon nut marked with 4 in illustration 26.
- Repeat chapters 4.2 to 4.9.

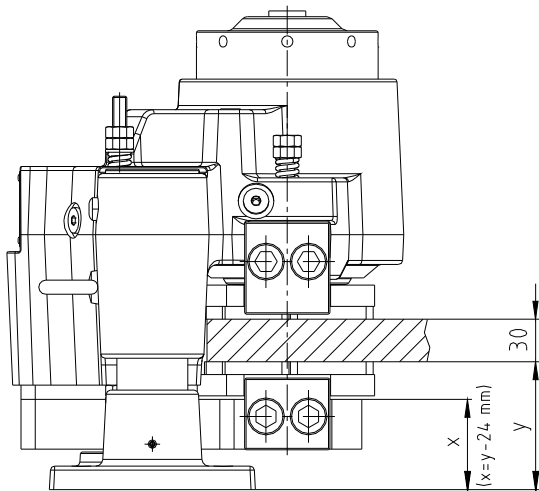


Illustration 25: setting of gap

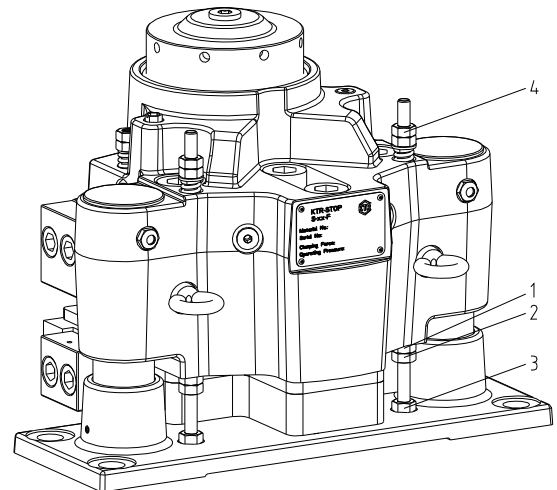


Illustration 26: setting of centering system

5.3 Maintenance and Service

KTR-STOP® S-xx-F is a low-maintenance brake. We recommend to perform a visual inspection and an operational testing 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 „State/wear sensor“

Function of sensor

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

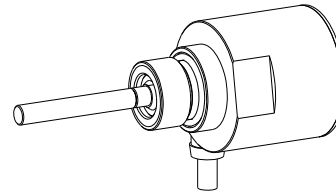


Illustration 27:
state/wear
sensor

Table 5: 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 (state signal on/off) ¹⁾	Switch S2 (wear signal) ¹⁾	
		1 - 4 ²⁾	2 - 3 ²⁾	2 - 5 ²⁾
Sensor not mounted	-	0	0	1
Brake not activated (unlocked)	-	1	1	0
Brake activated (locked)	No wear	0	1	0
	Readjustment necessary	0	0	1

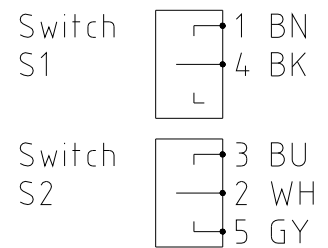


Illustration 28: switch position

¹⁾ Status of brake
on = brake open
off = brake close

²⁾ Switch position
0 = open
1 = close

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!

„Readjustment necessary“ is displayed as soon as the brake pad has worn off in a way that resetting has become necessary.



CAUTION!

The brake pad has to be reset immediately when the signal of status „readjustment necessary“ is activated.

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



6 Accessories - Sensor

6.1 Technical Data „State/wear sensor“

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
Cable length	5 m, 10 m or 15 m
Material of cable	PUR
Dimension of cable	5 * 0,34 mm ²

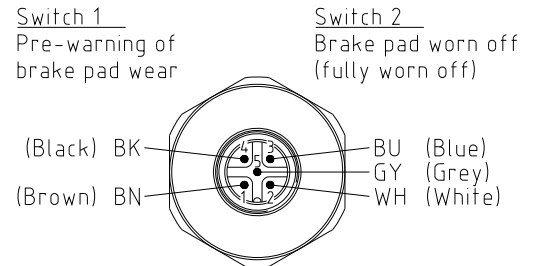


Illustration 29: pin assignment of plug connection

6.2 Assembly / Start of Operation

- Remove the screw plug (component 1.15) from the adjusting nut (component 1.13).
- Screw the sensor in the adjusting nut hand-tight for the time being (see illustration 30).
- Tighten the sensor at the tightening torque
 $T_A = 20 \text{ Nm}$.
- Provide for the electric connection according to the plug connection (see illustration 29).

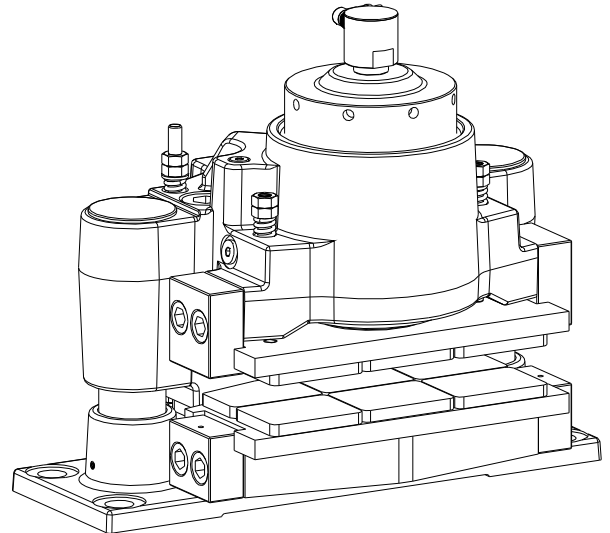


Illustration 30: assembly of state/wear sensor