


KTR-STOP® L light-xxx A-xx-xx

L light-xxx A-xx-xx is a spring-actuated brake in a fixed calliper design serving to generate a brake force onto a brake disk in order to decelerate a plant's movement or stop it, respectively, or keep it at standstill.

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The KTR-STOP® L light-xxx A-xx-xx brake was designed to operate as a service brake and emergency stop brake. For any other applications please consult with KTR.

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Please observe protection note ISO 16016.	Drawn: 2020-09-25 Shg/Wie Verified: 2020-11-05 Shg	Replacing: KTR-N dated 2019-11-21 Replaced by:
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1 Technical data

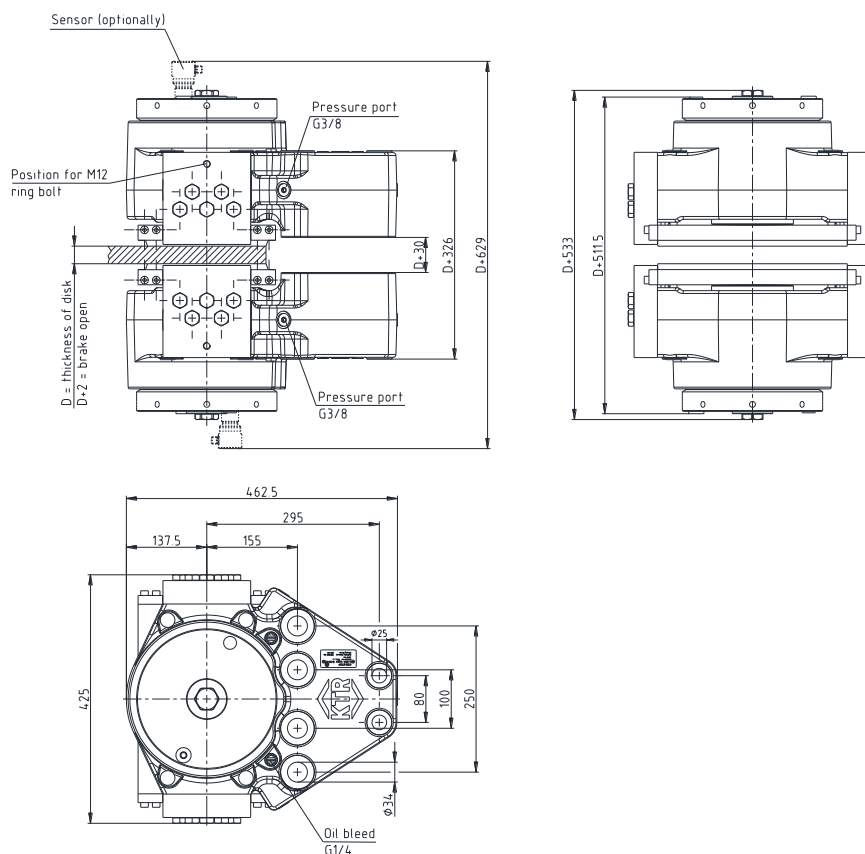


Illustration 1: Dimensional drawing

Table 1: Technical data

			L light-xxx A-xx-xx		
Weight	[kg]		312		
Width of brake pad	[mm]		324		
Surface of each brake pad	organic	[mm ²]	65,600		
Max. wear of each brake pad		[mm]	10		
Rated coefficient of friction ¹⁾		[μ =]	0.4		
Total brake piston surface - complete brake		[cm ²]	279.2		
Volume with 1 mm stroke - complete brake		[cm ³]	27.92		
Max. operating pressure		[bar]	200		
Min. thickness of brake disk		[mm]	40		
Min. diameter of brake disk		[mm]	1000		
Pressure connection			G3/8		
Oil bleed			G1/4		
Operating temperature		[°C]	-20 to +50		

1) The friction coefficient each depends on the application; please consult with KTR.

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

Brake type	Clamping force F _c [kN]	Loss of power ²⁾ [%]	Opening pressure [bar]	Braking torque [Nm] with brake disk Ø [mm]		
				1000	2000	3000
KTR-STOP® L light-100	100	3.6	95	30800	70800	110800
KTR-STOP® L light-120	120	3.2	105	36900	84900	132900
KTR-STOP® L light-140	140	8.2	130	43100	99100	155100
KTR-STOP® L light-160	160	7.8	170	49200	113200	177200
KTR-STOP® L light-180	180	7.8	175	55400	127400	199400
KTR-STOP® L light-200	200	7.1	185	61600	141600	221600
KTR-STOP® L light-220	220	6.2	200	67700	155700	243700

²⁾ With a stroke of 1 mm (1 mm wear of brake pad)

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

F_b = Brake power [kN]
F_c = Clamping force [kN]

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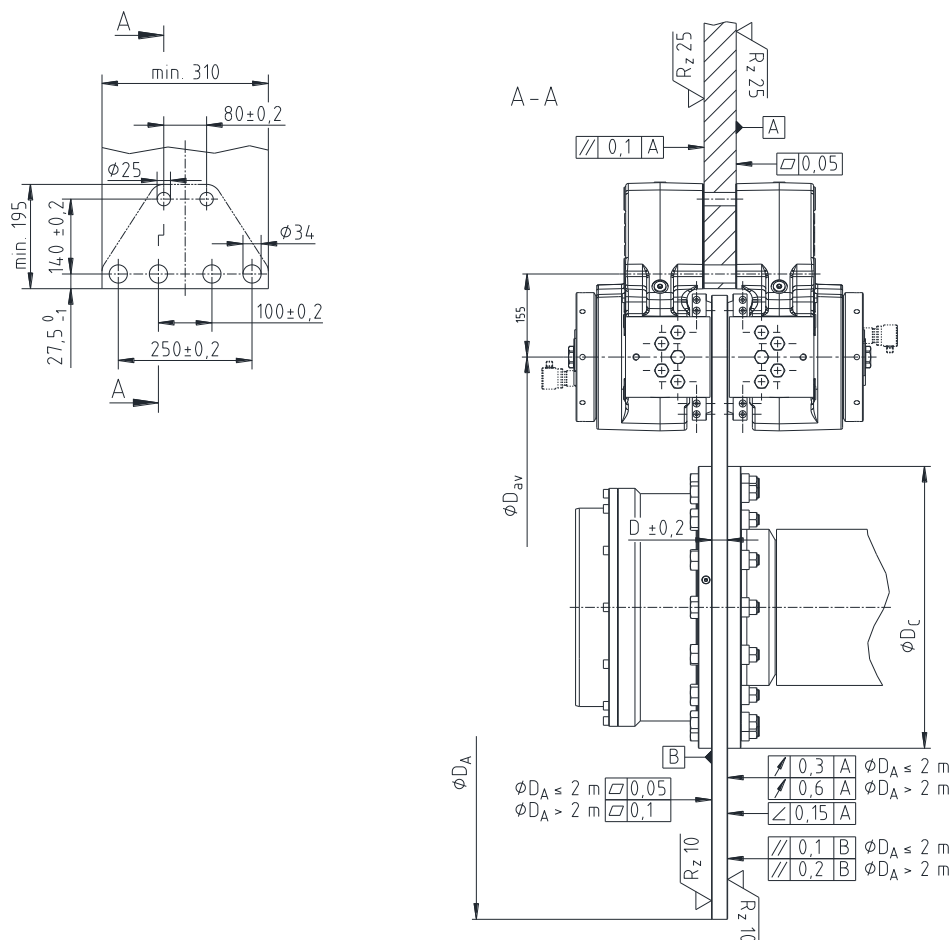
**1 Technical data****Connection dimensions of brake**

Illustration 2: Connection dimensions

2 Advice**2.1 General advice**

Please read carefully through these operating/assembly instructions 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 Advice****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.
- Secure the brake against accidental contact. Provide for the necessary protection devices.
- 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
- are technically qualified and specifically trained
- 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 L light-xxx A-xx-xx** described in here corresponds to the technical status at the time of printing of these operating/assembly instructions.

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 for 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 number and kind of transport. Unless otherwise contractually agreed, packaging will follow the in-house packaging specifications of KTR.

**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/component assemblies of brake – Type L light-xxx A-xx-xx**

Component/ subassembly	Quantity	Description
1	2	Housing with components
2	2	Brake pad
3	8	Pad retraction set
4	2 ¹⁾	Sensor housing
5	2 ¹⁾	Sensor

¹⁾ Optionally available

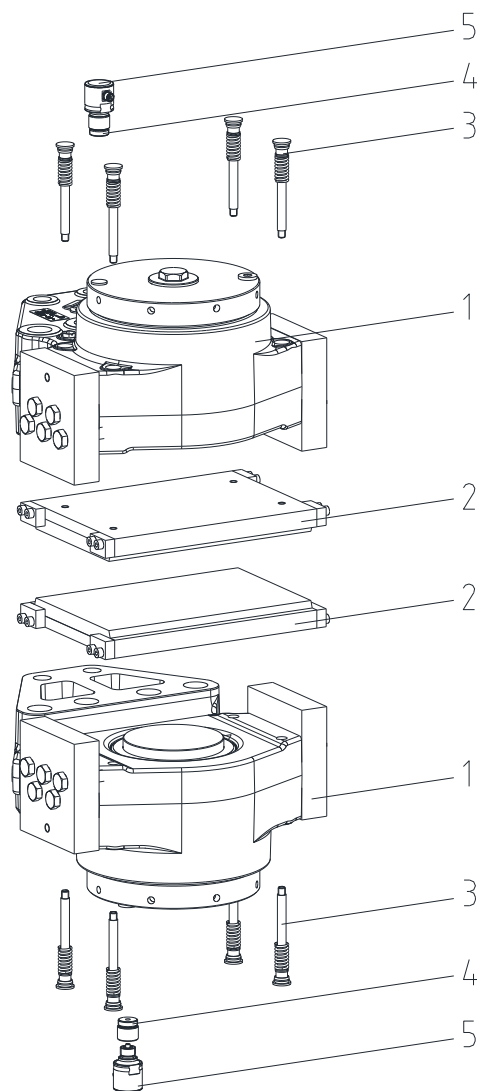


Illustration 3: Components/subassemblies of brake

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

Component	Quantity	Description
1.1	1	Housing
1.2	1	Scraper
1.3	1	Gasket
1.4	1	Scraper
1.5	1	Gasket
1.6	1	Housing cover
1.7	1	Brake piston
1.8	1	Pressure cylinder
1.9	1	Pipe
1.10	1	Cap screw DIN EN ISO 4762
1.11	1	Centering sleeve
1.12	1	Set of disk springs
1.13	1	Centering pin
1.14	1	O-ring
1.15	1	Sealing plug
1.16	1	O-ring
1.17	1	O-ring
1.18	1	O-ring
1.19	1	Sealing plug
1.20	1	Screw plug VSTI (acc. to DIN 908)
1.21	1	
1.22	1	Cover
1.23	2	Pad retainer
1.24	10	Hexagon screw DIN EN ISO 4014
1.25	3	Screw plug VSTI (acc. to DIN 908)
1.26	2	Screw cap
1.27	1	O-ring

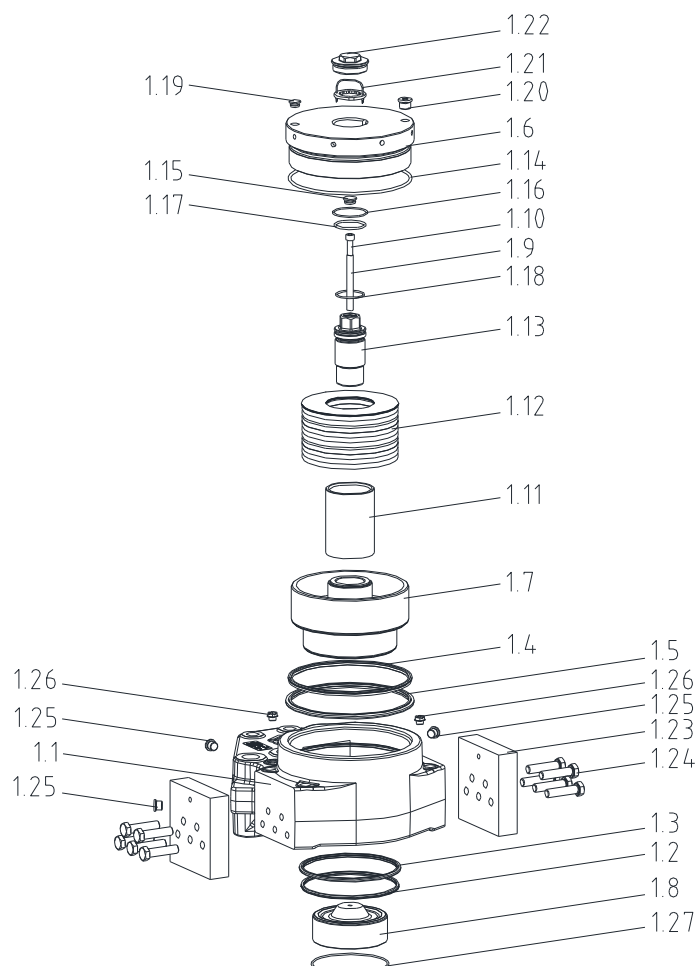


Illustration 4: Housing with single parts

Subassembly 2: Brake pad

Component	Quantity	Description
2.1	1	Plate for brake pad
2.2	1	Pad for brake pad
2.3	4	Pad retainer
2.4	8	Cap screw DIN EN ISO 4762

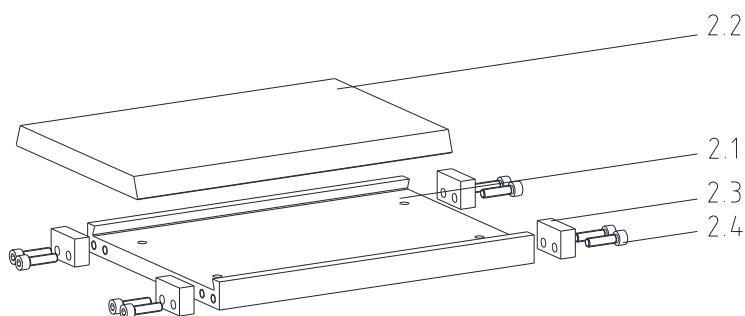


Illustration 5: Brake pad

**4 Assembly****4.1 Components of the brake****Subassembly 3: Pad retraction set**

Component	Quantity	Description
3.1	1	Cap screw DIN EN ISO 4762
3.2	1	Pipe
3.3	1	Pressure spring
3.4	2	Disk
3.5	1	Sealing plug

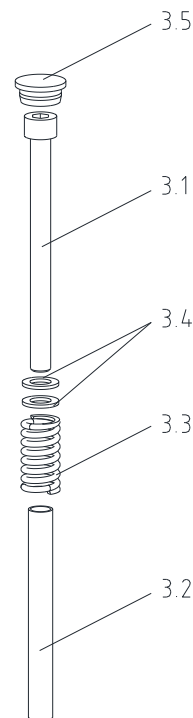


Illustration 6: Pad retraction set

4.2 Preparation of assembly

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


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



The connection between connection plate or stand 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.



Observe the manufacturer's instructions regarding the use of solvents.

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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 corresponding 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



If one half of the brake has to be mounted under pressure (without transport lock) for reasons of space, please consult with KTR.



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

In the pad retainers there are M12 threads for using lifting devices. The eye bolts should be disassembled 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 any other lifting tool around damageable components such as sensors, etc.



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.



It is not recommended to use steel plugs for venting.

- Insert the brake pads (subassembly 2) fully into the brake.



If you want to insert brake pads after having assembled the brake, it is necessary to disassemble the pad retainers (component 1.23) for that purpose (chapter 5.1).

- Mount the pad retraction sets (subassembly 3) by screwing the screw (component 3.1) with the disk (component 3.4), pipe (component 3.2) and pressure spring (component 3.3) into the brake pad.
- Hand-tighten the screw.
- Assemble the sealing plug (component 3.5)

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

Secure the screw connection (component 3.1) on the brake pad additionally against working loose, e. g. conglutinating with Loctite (average strength).

- Insert the first half of the brake (component 1) in the correct position to the connection plate or stand, respectively (see illustration 7).
- Insert one of the 6-off connection screws into the brake until the face of the connection screw is flush with the rear connection plate respectively stand.



You should preferably insert the connection screw marked with 1 in illustration 7.

- Insert the second half of the brake in the correct position to the connection plate or stand, respectively.
- Push the connection screw screwed in before through the second half of the brake and align it symmetrically.
- Fasten the connection screw at the tightening torques specified in table 3.
- Repeat this process until the total of 6-off connection screws have been mounted.

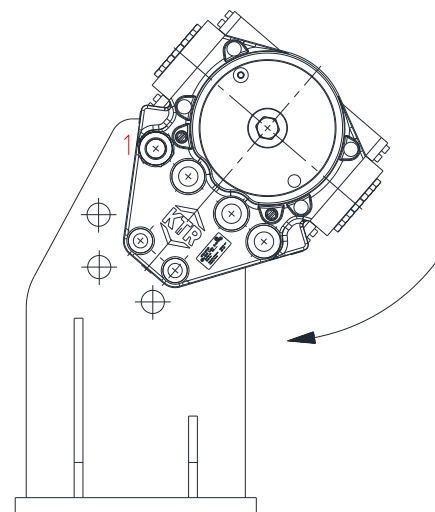


Illustration 7

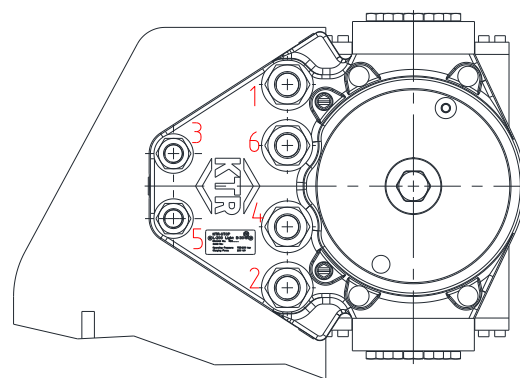


Illustration 8



To facilitate the assembly it is possible to fix the position of the brake by one connection screw only first. Swing in the brake until the balance of the threaded pins can be assembled, too (see illustration 7).

Table 3: Tightening torques

Screw size	Tightening torque T_A [Nm] - 10.9 Untreated and oiled	Tightening torque T_A [Nm] - 10.9 Greased with MoS ₂
M33	2,392	2015
M24	890	754



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



Make sure that the tolerances of the brake disk do not exceed the figures specified in illustration 2.



Pressure ports for the housings must be connected symmetrically. It is not allowed to connect two housings in one brake in series.

**4 Assembly****4.5 Pressure port of a brake**

- Connect the pressure oil line to one of the pressure ports of the brake (see illustration 9 and 10). For that purpose remove the screw plug beforehand.



The hydraulic lines have to be flushed before connecting to the brake to prevent any particles from penetrating the brake. If the lines are not flushed 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 9 and 10), 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 connections on top serve for venting the brake. For a flushing system make use of one of the pressure connections on top.



Always connect the brake consisting of two halves to a pressure line (see illustration 10), since the brake disk is loaded with the full braking power on one side in case if one half of the brake fails.



It is not recommended to use steel plugs for venting.

- Connect the leakage oil line to the brake (see illustration 9 and 10). For that purpose remove the sealing plugs beforehand.



If no leakage oil line is connected, a vacuum may be generated inside the brake which will damage the gaskets.



Never give any pressure on the leakage oil line. Gaskets and scrapers will be destroyed in this way.



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



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.

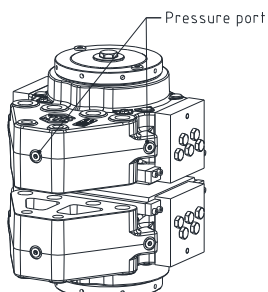


Illustration 9: Connections of the leakage oil lines/pressure lines

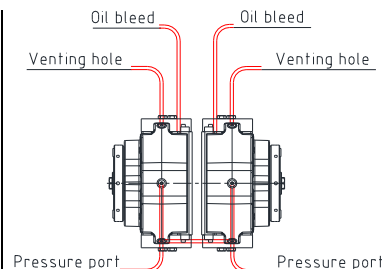
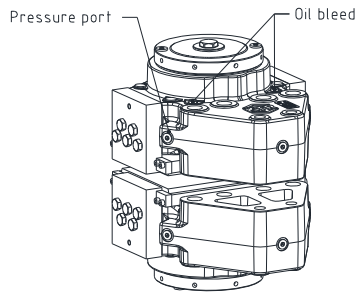


Illustration 10: Pressure connection of a brake



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****4.6 Pressure connection of several brakes**

If several brakes are assembled we recommend to connect the pressure connection for each brake individually (in parallel) (see illustration 11).

Please note, if several brakes are connected in a series (see illustration 12), the braking effect of all following brakes may become effective slightly delayed.

- Connect the pressure oil line to the pressure connections of the brake (see illustration 10, 11 and 12). For that purpose remove the screw plugs beforehand.



The hydraulic lines have to be flushed before connecting to the brake to prevent any particles from penetrating the brake. If the lines are not flushed 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 10, 11 and 12), for that purpose the screw plug needs to be removed beforehand. Discharge the end of the miniature measuring hose in a suitable collection container.

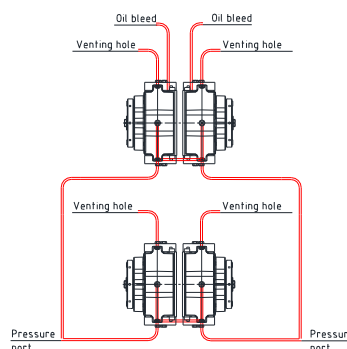


Illustration 11: Pressure connection of several brakes (in parallel)

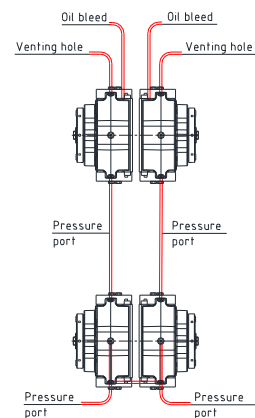


Illustration 12: Pressure connection of several brakes (in a series)



The pressure connection on top serves for venting the brake. For a flushing system make use of one of the pressure connections on top.



Always connect the brake consisting of two halves to a pressure line (see illustration 11 and 12), since the brake disk is loaded with the full braking power on one side in case if one half of the brake fails.



With the parallel connection of brakes (see illustration 11) each brake needs to be vented individually.



It is not recommended to use steel plugs for venting.

- Connect the leakage oil pipe to the brake (see illustration 10, 11 and 12). For that purpose remove the sealing plugs beforehand.



If no leakage oil line is connected, a vacuum may be generated inside the brake which will damage the gaskets.



Never give any pressure on the leakage oil line. Gaskets and scrapers will be destroyed in this way.



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

**4 Assembly****4.6 Pressure connection of several brakes**

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.

4.7 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.



Please make sure that there is sufficient liquid in the hydraulic system during and after the venting process.

- Switch on the hydraulic system for a short while 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.



If the miniature measuring coupling is removed as well, the screw plug needs to be screwed in the venting hole (see illustrations 11 and 12).

- Dispose of the hydraulic oil of the collection container.
- Put the opening pressure onto the hydraulic system.
- Measure the gap between the brake disk and the brake pad on both sides via a feeler gauge.
- Set the gap to 1 mm by rotating the centering pin (component 1.13) via the external hexagon key width across flats 36.



The hydraulic system must never be operated at a higher pressure than the figures specified in the type plate of the brake. If any figures or types/sizes are changed, please consult with KTR.



Never keep your fingers between brake disk and brake when applying 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.

- Mount the sensor instead of the screw plug.
- The brake pads have to be ground in on the surface of the brake disk to achieve the nominal coefficient of friction.

**4 Assembly****4.8 Setting/Re-setting of the brake**

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



In case of wear of the brake pads the brake needs to be regularly reset.

- Remove the sensor.
- Put the opening pressure onto the hydraulic system.



Please note chapter 4.7 *Start-up of brake*.

- Remove the screw plug (component 1.22) and the safety plate (component 1.21) on both sides.



Tilting of the safety plate can be untightened by rotating the centering pin (component 1.13) by 2°- 3°.

- Measure the gap between the brake disk and the brake pad on both sides via a feeler gauge.
- Set the gap to 1 mm by rotating the centering pin (component 1.13) via the external hexagon key width across flats 36.
- **Applying for resetting of the brake only (wear of brake pad):**
With a wear of the brake pads (1 mm wear for each brake pad) of 2 mm the centering pin needs to be screwed in by 1/3 revolution.
- Screw in the safety plate (component 1.21) onto the centering pin (component 1.13) on both sides.
- Screw in the screw plug (component 1.22) into the housing cover (component 1.6) against a stop.

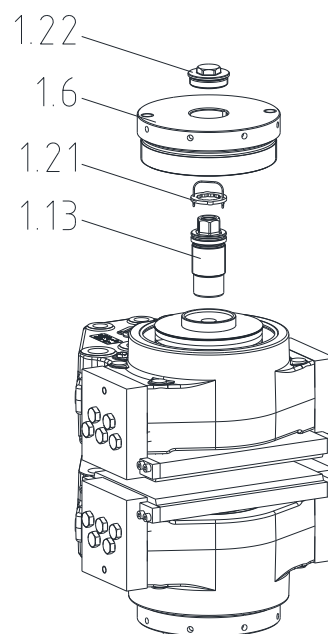


Illustration 13: Setting/re-setting of the brake



The gap between brake disk and brake pad needs to be 1 mm on both sides to ensure the brake power.

- Assemble the sensor.

4 Assembly

4.9 Recommendation of liquids to be used



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

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

Manufacturer	Standard		Special	
Mineral oil	-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 S2 VX32	Tellus S2 VX46	Tellus S4 VX32	Tellus S2 VX68
Mobil	DTE 10 Excel 32	DTE 10 Excel 46	-	DTE 10 Excel 68



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

Viscosity

We would recommend a viscosity range from 20 to 220 mm²/s (cSt) of the hydraulic liquid with operating temperature. The viscosity during starting should not exceed 500 mm²/s and the viscosity during operation should not fall below 12 mm²/s.

Filtration

When filling and re-filling the hydraulic system and replacing the hydraulic liquid, 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.



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 class are permitted:

- ISO 4406, class 18/16/13

Maintenance operations on the hydraulic system

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

The system has to be flushed or vented after each replacement of the hydraulic liquid.



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



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

**4 Assembly****4.10 Disassembly of the brake**

In order to avoid any personal injuries, protect the brake by means of the assembly lock.

- Put the opening pressure (see table 2) onto the hydraulic system. Make sure the brake is fully opened or the brake piston (component 1.7) fully bears on the stop of the housing cover (component 1.6).
- Remove the sensor (component 4 and 5).
- Remove the screw plug (component 1.22) and the safety plate (component 1.21) on both sides.



Rotating the centering pin by 2° to 3° allows to untighten the safety plate (component 1.21) more easily.

- Rotate the centering pin (component 1.13) counterclockwise by means of the external hexagon key width across flats 36. Make sure the centering pin is fully untightened against a stop.
- Release the pressure fully from the hydraulic system.



Make sure that the entire brake system is depressurized.



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

- Disconnect the leakage oil and pressure oil line from the brake.
- Drain the hydraulic oil completely from the brake.
- Dispose of the hydraulic oil as per chapter 4.12.
- Screw the screw plugs (component 1.25 and 1.26) in all pressure connections.
- Disassemble all fastening hexagon nuts and washers.
- Take out both halves of the brake (component 1).

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.



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.



Replace the brake pads in both halves of the brake simultaneously.



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 applying 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.

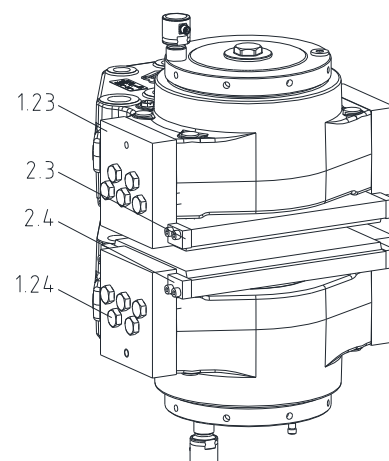


Illustration 14: Replacement of brake pads

- Disassemble the pad retainers (component 1.23) on one side mutually.
- Remove the two pad retainers (component 2.3) on one side mutually.
- Replace the brake pads that have worn off by pushing only the pad out of respectively into the plate.
- Hand-tighten the pad retainers (component 1.23) mutually by each 5 hexagon screws (component 1.24) first. Tighten the screws at the tightening torque $T_A = 302 \text{ Nm}$.
- Hand-tighten the pad retainers (component 2.3) on both sides by each 2-off cap screws (component 2.4) first. Tighten the screws at the tightening torque $T_A = 36 \text{ Nm}$.
- Repeat chapter 2.4 *Setting/re-setting of the brake*
- Make sure that the brake disk can rotate freely while not touching the brake pads or the housing.



Please note chapter 2 *Assembly of the brake*.

- Before you reactivate the brake, observe chapter 2.3 *Start-up of the brake*.

**5 Maintenance****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 4.10 *Disassembly of the brake*.
- Remove the pad retraction sets (component 3).
- Take out the brake pad (component 2).
- Remove the O-ring (component 1.14).
- Connect the brake to the hydraulic system or a hydraulic hand pump.
- Rotate the centering pin (component 1.13) counterclockwise by means of the external hexagon key width across flats 36. Make sure the centering pin is fully untightened against a stop.



Make sure that the entire brake system is depressurized.

- Screw the housing cover (component 1.6) fully out of the housing (component 1.1).
- Remove the housing cover (component 1.6) and the set of disk springs (component 1.12).



Make use of a tool to ensure the same arrangement of disk springs, washer and adjustment washer(s) with re-assembly of the brake.

- Press the brake piston (component 1.7) with the centering sleeve (component 1.11), the centering pin (component 1.13) and the pressure cylinder (component 1.8) carefully out of the housing (component 1.1) by means of some hydraulic pressure.



Inspect the components/subassemblies 1 and 14 for any kind of damages; it may be necessary to replace the components. Afterwards remove dirt, grease and corrosion from the components.

- Remove the gaskets (component 1.3 and 1.5) and the scraper (component 1.2 and 1.4).



When removing the gaskets and scrapers 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.



Observe the manufacturer's instructions regarding the use of solvents.

- Insert new gaskets (component 1.3 and 1.5) and scrapers (component 1.2 and 1.4) into the housing (component 1.1). For that purpose the components may be heart-shaped (see illustration 16).



The gasket and scraper have to be installed in the right direction (see illustration 17).

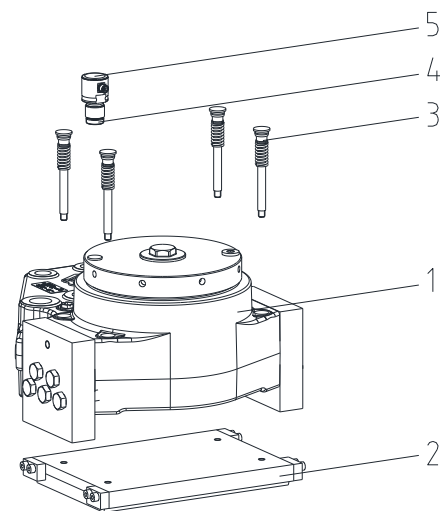


Illustration 15: KTR-STOP® L light-xxx A-xx-xx
(Half of brake)

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

With reassembly 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 scrapers with hydraulic oil (see illustration 17).



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

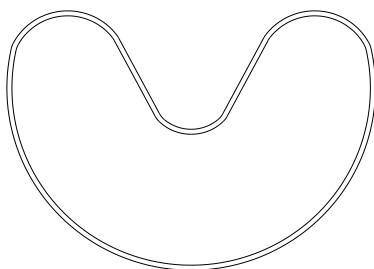


Illustration 16: Assembly of gasket and scraper

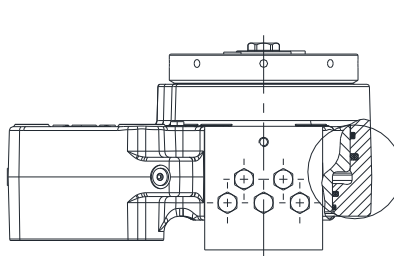
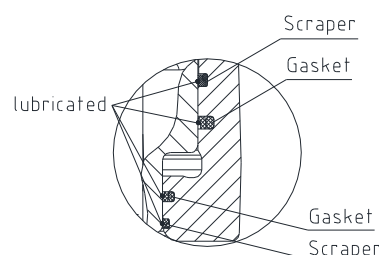


Illustration 17



Inspect the surfaces of the brake piston (component 1.7) and the hole of the sleeve in the housing (component 1.1) 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 1.7) with the centering sleeve (component 1.11), the centering pin (component 1.13) and the pressure cylinder (component 1.8) into the housing and press it against a stop.



A mounting device may be necessary; for that purpose please consult with KTR.

- Push the set of disk springs (component 1.12) on the centering sleeve (component 1.11) up to the brake piston (component 1.9).



Lubricate the disk springs properly with Molykote MoS₂.

Make sure that the set of disk springs is remounted in the same arrangement as it was supplied.

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

- Insert a new O-ring (component 1.14) between the housing cover (component 1.13) and the housing (component 1.1).
- Screw the screw plug (component 1.25) into all pressure connections.
- Insert the brake pads (component 2) fully into the brake (subassembly 1).



If you want to insert brake pads after having assembled the brake, it is necessary to disassemble the pad retainers (component 1.25) for that purpose (chapter 5.1).

- Push the washers (component 3.4) on the cap screw (component 3.1).
- Set the pipe (component 3.2) and the pressure spring (component 3.3) on the pin.
- Screw the pad retraction sets (component 3) into the housing (component 1.1) against a stop.

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

- Seal the bores via the sealing plugs (component 3.5).



Secure the screw connection (subassembly 3) on the brake pad additionally against working loose, e. g. conglutinating with Loctite (average strength).

- Repeat chapter 4.8 *Setting/re-setting of the brake*



Please note chapter 4.4 *Assembly of brake*.

- Before you reactivate the brake, please observe chapter 4.7 *Start-up of the brakes*.

5.3 Maintenance and service

KTR-STOP® L light-xxx A-xx-xx 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 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.

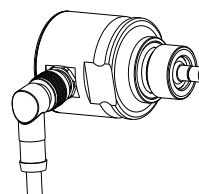


Illustration 18:
State/wear
sensor

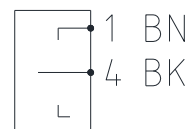
Table 4: Switching status of status (switch S1) and wear switch (switch S2) depending on the activating status of the brake.

Status of brake	Condition of brake pad	Switch S1 (status 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
	Resetting necessary	0	0	1

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

²⁾ Switch position
0 = open
1 = locked

Switch S1



Switch S2



Illustration 19: Switch position

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

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 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, the signal (2 - 3) is present.



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



The brake pad has to be reset as soon as the status of the signal (2 - 5) „re-adjustment necessary“ is activated.

Brake pads having a balance of pad height of less than 13.5 mm have to be replaced by return. Please note chapter 5.1 *Replacement of brake pads*.

Fail-safe operation

A proper operating condition 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.



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
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 ²

Switch 1
Pre-warning of
brake pad wear

Switch 2
Wear of brake pad
(fully worn off)

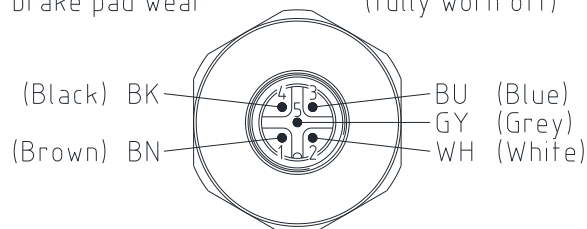


Illustration 20: Pin assignment of plug-in connection

6.2 Assembly / start-up

- Remove the screw plug (component 1.20) from the connection cover (component 1.6).
- Mount the sensor housing (component 4) in the housing cover (component 1.6).
- Hand-tighten the sensor in the sensor housing (component 4) first (see illustration 21).
- Tighten the sensor at the tightening torque $T_A = 20 \text{ Nm}$.



In case of heavy vibrations the sensor has to be secured against working loose.

- Provide for the electric connection according to the plug-in connection (see illustration 20).

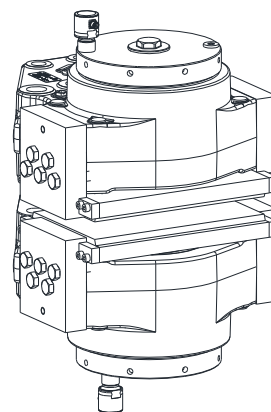


Illustration 21: Assembly of state/wear sensor