Made for Motion KTR

Brake Systems

KTR-STOP®

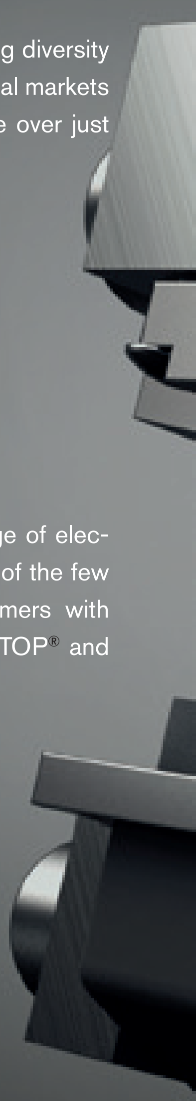
EMB-STOP

FUTURE WITH A SYSTEM.

KTR have consistently continued to extend their expertise in building systems over the past few decades. Today we are a leading manufacturer providing solutions with highest quality standards in the fields of drive technology, brake and cooling systems as well as hydraulic components to our global business partners.

So what would be more obvious than adapting our company name to this development? KTR Kupplungstechnik GmbH has become KTR Systems GmbH.

The change of name takes account of the growing diversity of our performance range demonstrating the global markets and our customers that we are prepared to take over just more responsibility in machines and plants.



WHOEVER TALKS ABOUT DRIVING MUST BE ABLE TO BRAKE.

Does it confuse you if a company having the slogan „Made for Motion“ provides brake systems as well? This is not the case with KTR. Being the leading supplier in the range of drive and fluid technology for industrial applications we make use of our technical know-how to develop suitable brake systems. The result is that KTR revolutionized the hydraulic brake triplicating the performance range of electromechanical brakes. Consequently KTR is one of the few manufacturers worldwide providing their customers with two different brake system: the hydraulic KTR-STOP® and the electromechanical EMB-STOP.

„You can only make big things happen bearing small details in mind.“

Andreas Nauen, CEO of KTR

The Competence Center for Brake Systems: That is where KTR brakes learn to grip better.

Opposites attract: the brake portfolio of the drive specialist

Driving and braking technology: What most companies consider as opposites, KTR estimates as an ideal supplement. Many years ago KTR started to project and distribute brakes. But you trust most in those things you developed yourselves. That is why KTR was not satisfied with distribution only, but made use of its decades of engineering experience to considerably improve the hydraulic brake system in many respects. By taking over EM Brake Systems in 2013, electromechanical brake systems have meanwhile completed KTR's portfolio. As a result KTR is in a position to provide the ideal brake system for every demand. Driving and braking technology from one single source - the customers are in good hands with KTR.

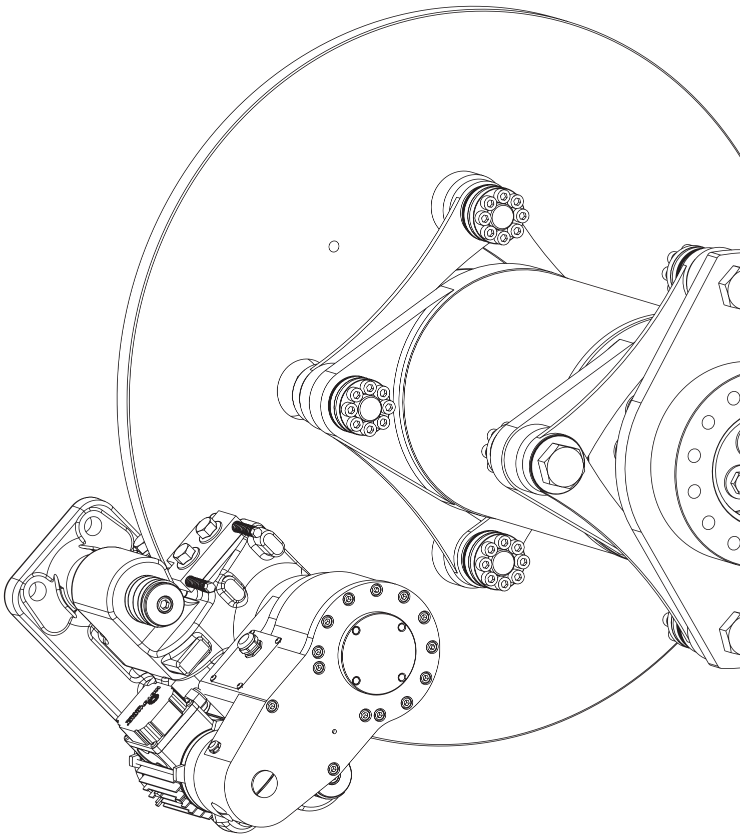
„What can actually not be slowed down? Our innovative capacity.“

Dr. Norbert Partmann, KTR Brake Systems

An innovative ambience for innovative ideas

KTR-STOP® and EMB-STOP – these two brake systems have been consolidated since 2014. We are specifically proud of the location: the „Competence Center for Brake Systems“. It is situated in Schloß Holte-Stukenbrock in east Westphalia and the head office of the new KTR Brake Systems GmbH.

By the way: The Competence Center well deserves its name. Since KTR develops all measures dealing with brake systems in these state-of-the-art premises. The brake components of both series are developed, designed and tested here. A special cryogenic cooling chamber allows for tests even with temperatures down to -50 °C making the brakes ready for wind and weather in this way.



IntelliRamp®: powerful braking, intelligent controlling

Everything is at your command. To make sure this is the case with braking as well, KTR provides its hydraulic and electronic brakes with IntelliRamp®, if requested. This electronic control system combines power with finesse allowing for controlled and coordinated braking processes. The core component is the control computer taking over all operations of calculation and monitoring that are necessary for controlling the brake systems. No matter if constant deceleration, constant time function or constant speed control is concerned: You make your choice as per your demands - the rest is carried out by IntelliRamp®. To make sure you still have the control of the braking process with critical conditions of the machine, too, the system, among others, has an uninterruptible power supply to allow for performing a full braking cycle in case of power failure. This makes the machine stop without having a longer period of standstill.

They keep whatever KTR promises: KTR-STOP® and EMB-STOP

Those who have a special problem do not need a general solution. One for all applications: This may sound good, but cannot always be applied. That is why KTR provides its customers solutions in terms of brakes that are tailor-made for individual demands.

KTR-STOP®: variable braking forces, manifold applications

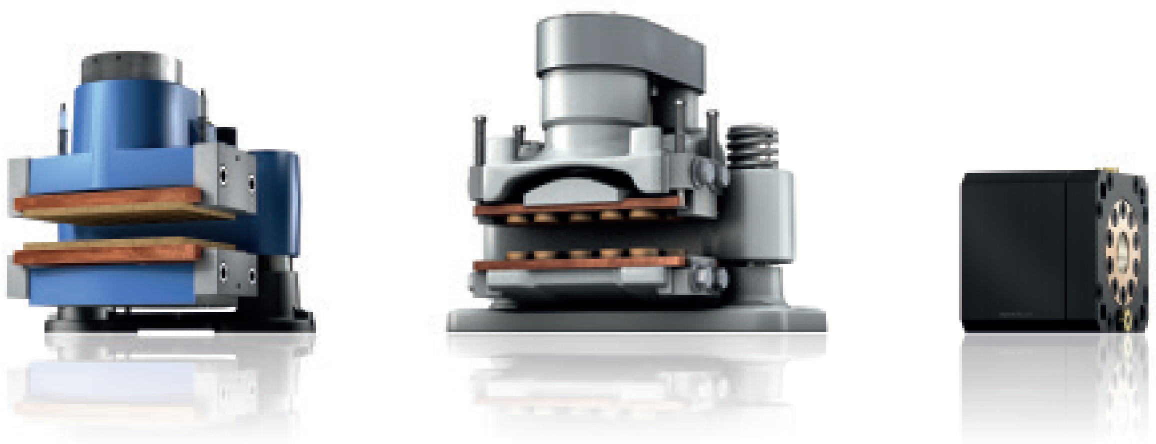
The KTR-STOP® brake system is actually a workaholic. Being a floating caliper brake it is based on the classic disk brake operating reliably, both with storm, iciness and salty sea air. Its resistance to aggressive and rough ambient conditions is not only limited to suitability for offshore applications: Even with the high thermal stress of foundries or the sulphureous air in copper mining KTR-STOP® operates reliably. To make sure it can work very hard under any conditions, it is fully encapsulated, among others, has integrated dirt scrapers and extra wearing rings.
This toughens KTR-STOP®, helps to reduce the operating costs and increase the service life. Thanks to additional guide systems and optimum material utilization - the brake pads can be worn off almost down to the base plate - KTR-STOP® only needs very few and short breaks for maintenance to be ready for operation immediately afterwards. Thus thoroughly a workaholic.

KTR-STOP® NC – definitely a good choice

Playing safe is an obligation in automation technology and in the field of machine tools. New machinery directives meanwhile specify brakes and clamping systems in many applications. KTR reacts promptly to amended demands by developing a plug-in braking and clamping system KTR-STOP® NC which can be retrofitted and which can easily be integrated in existing drives. The additional safety is not only limited to the clamping force and fail-safe operation: As a safety system KTR-STOP® NC compensates for axial load, in this way protecting the drive train from damage. Subject to its multifunctional applicability the passive clamping system is not limited to linear drives, but can be used as a stop system in quite different ranges of machine tools and robotics as well as general engineering. This makes KTR-STOP® NC a good idea for every application.

EMB-STOP: simple, active, unique

EMB-STOP aims high. It feels good at high altitudes and often operates reliably 135 metres above ground - in the huge wind energy plants which it was originally developed for. Different from its hydraulic counterpart EMB-STOP generates its braking force merely electromechanically. By doing without hydraulics maintenance work such as oil change and oil disposal can be done without: This makes EMB-STOP almost maintenance-free.
Meanwhile EMB-STOP has found its way back to earth and water long time ago. EMB-STOP brakes have been used as an efficient and fail-safe system solution in crane construction and mining, materials-handling technology as well as marine and offshore technology. This is not surprising, since they provide for a large contact pressure from 2.5 kN to 1,600 kN. This may increase softly and with control until the maximum braking power has been reached - which is the kind of stop and go treating the material most carefully.

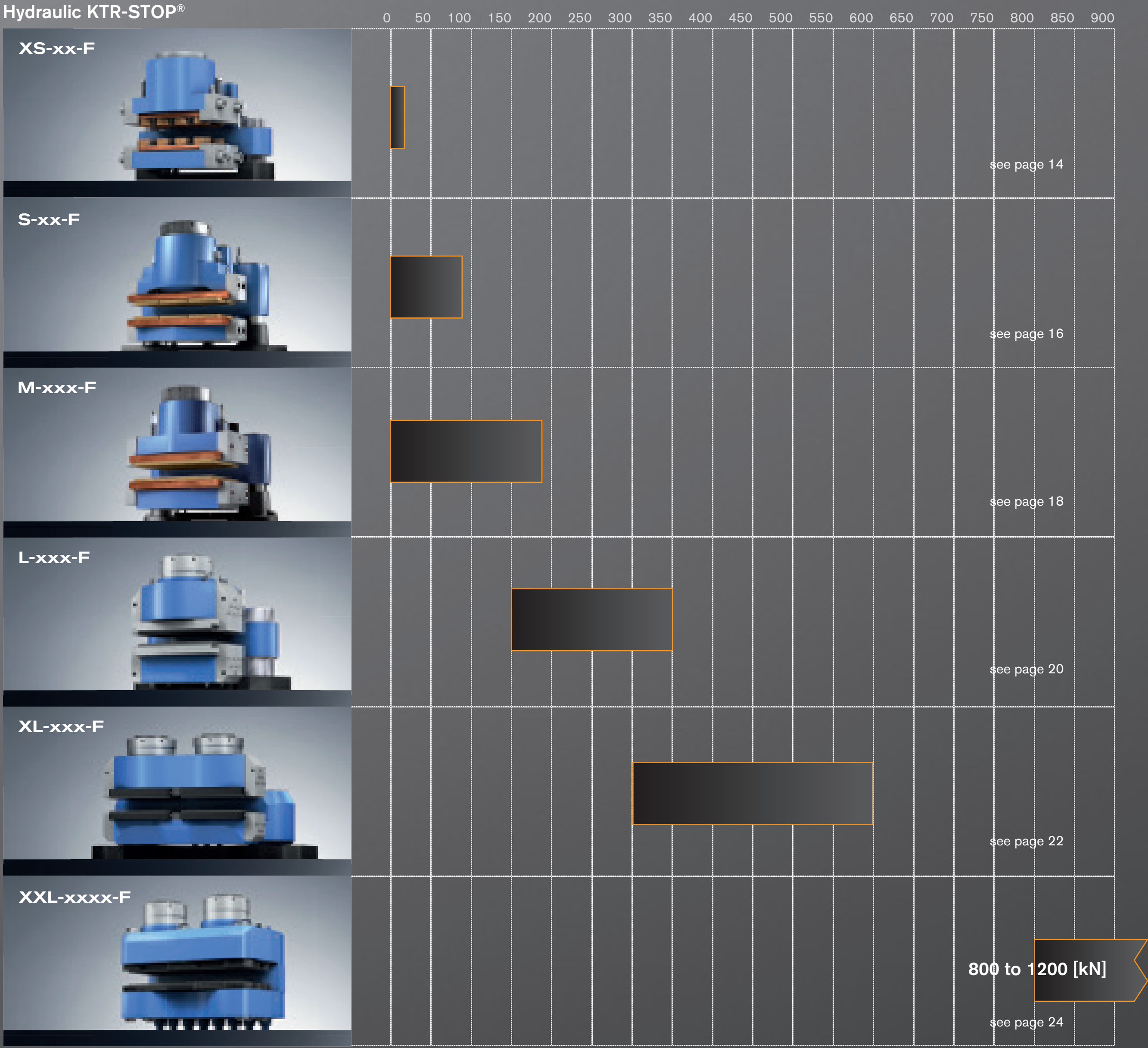


Clamping forces of brake systems

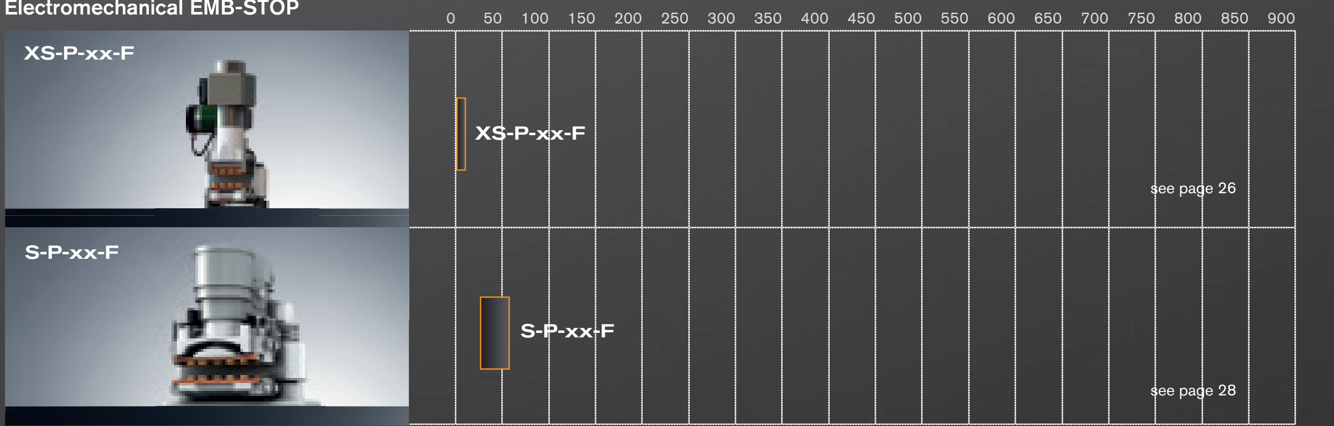
Passive floating caliper brake

Clamping forces [kN]

Hydraulic KTR-STOP®



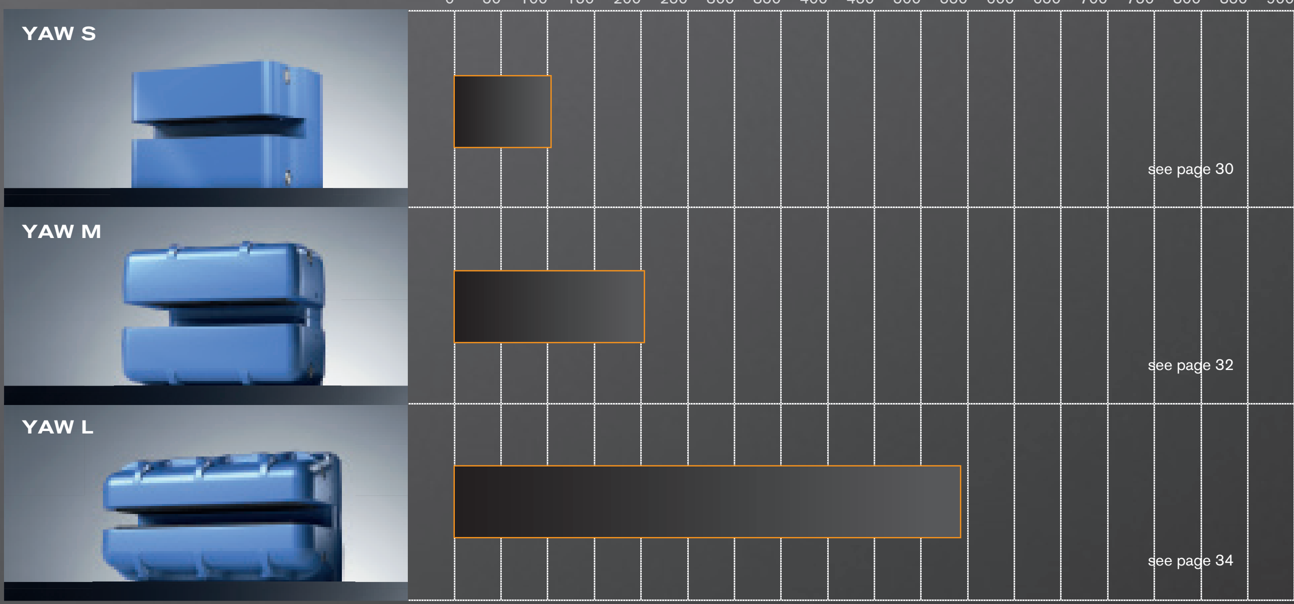
Electromechanical EMB-STOP



Yaw brakes

Hydraulic KTR-STOP®

Clamping forces [kN]



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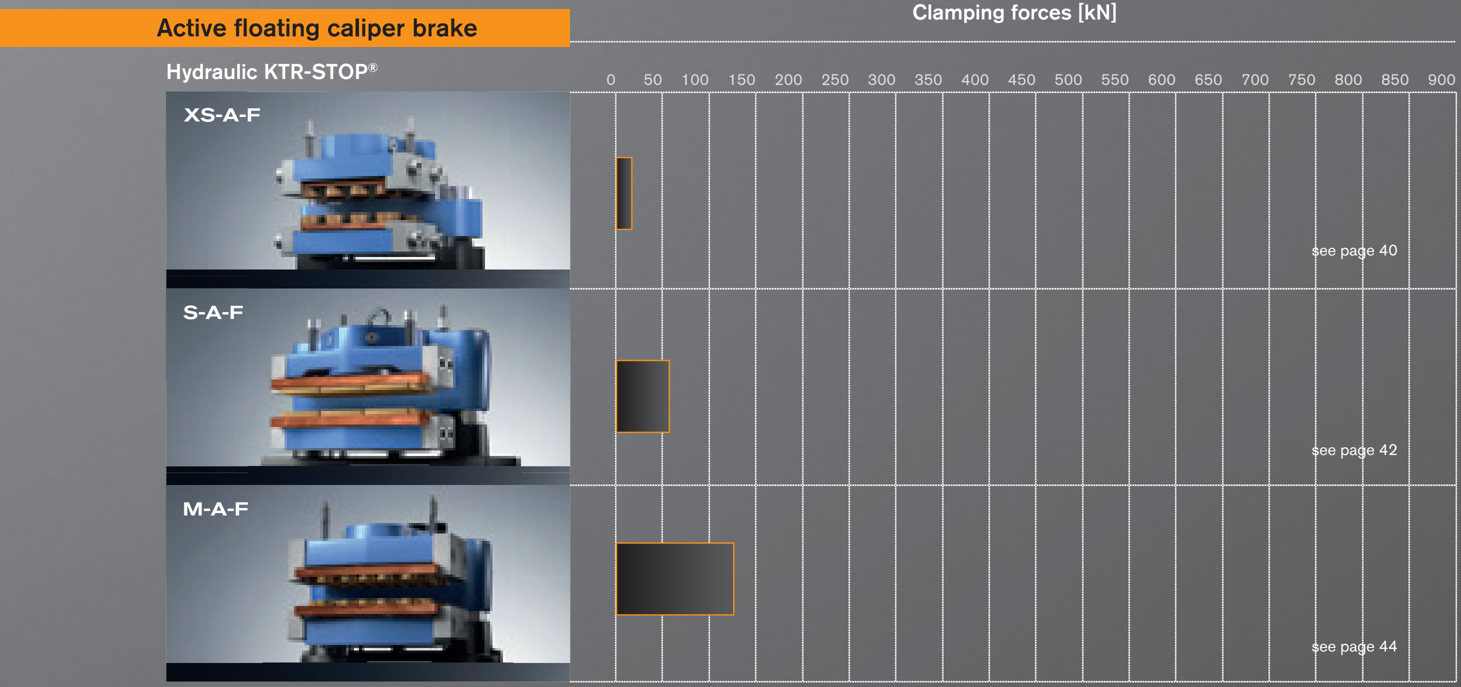
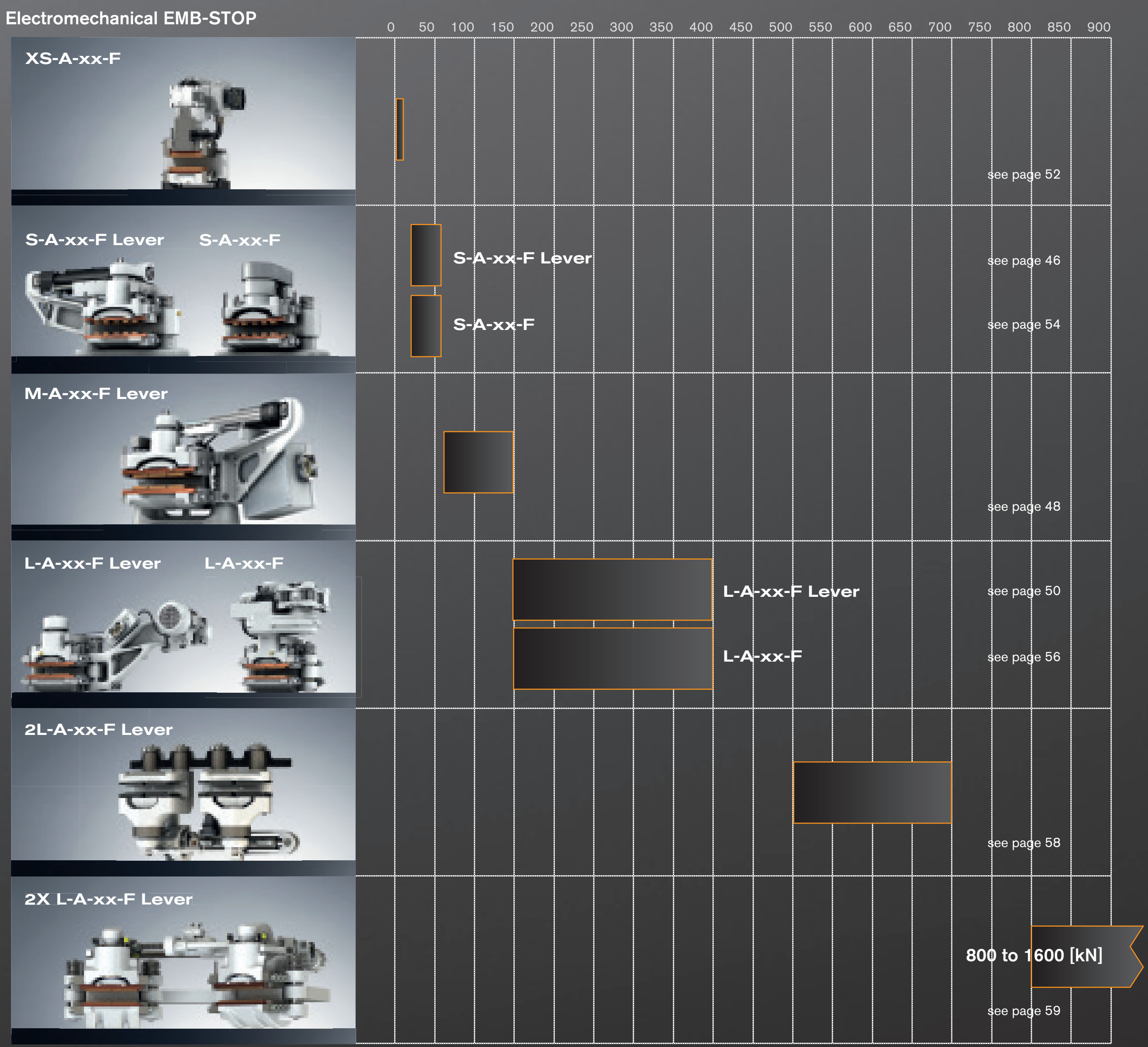
Clamping forces of brake systems

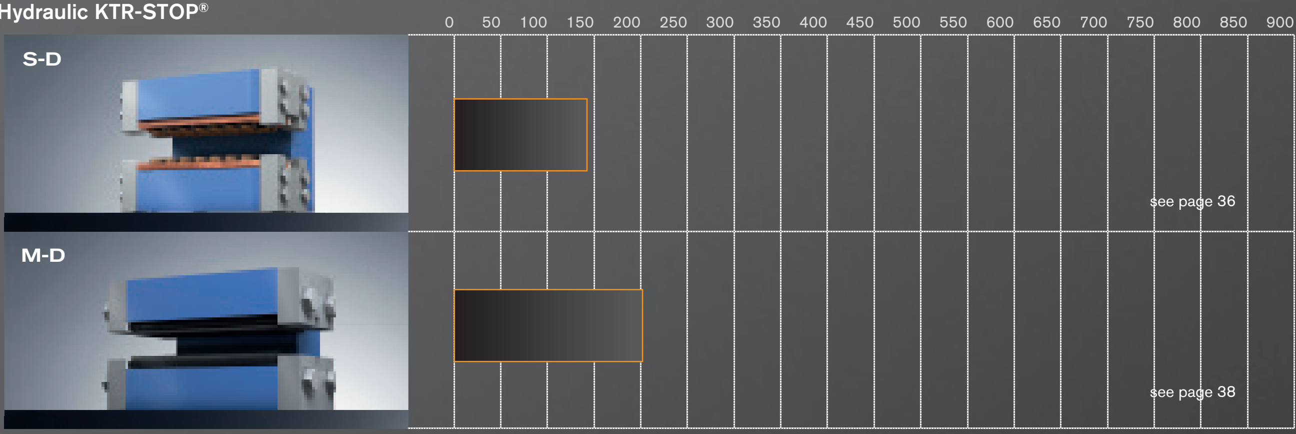


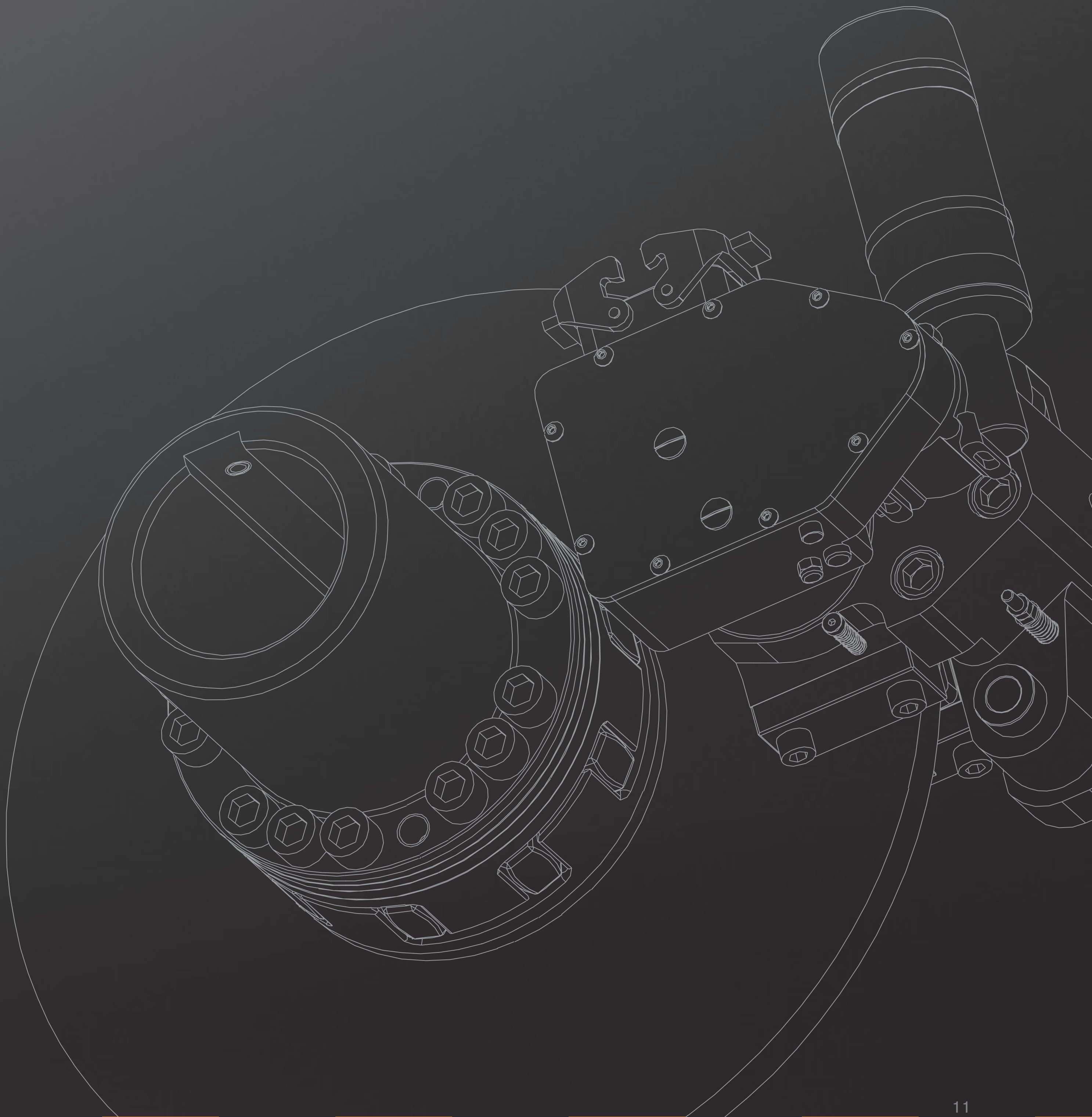


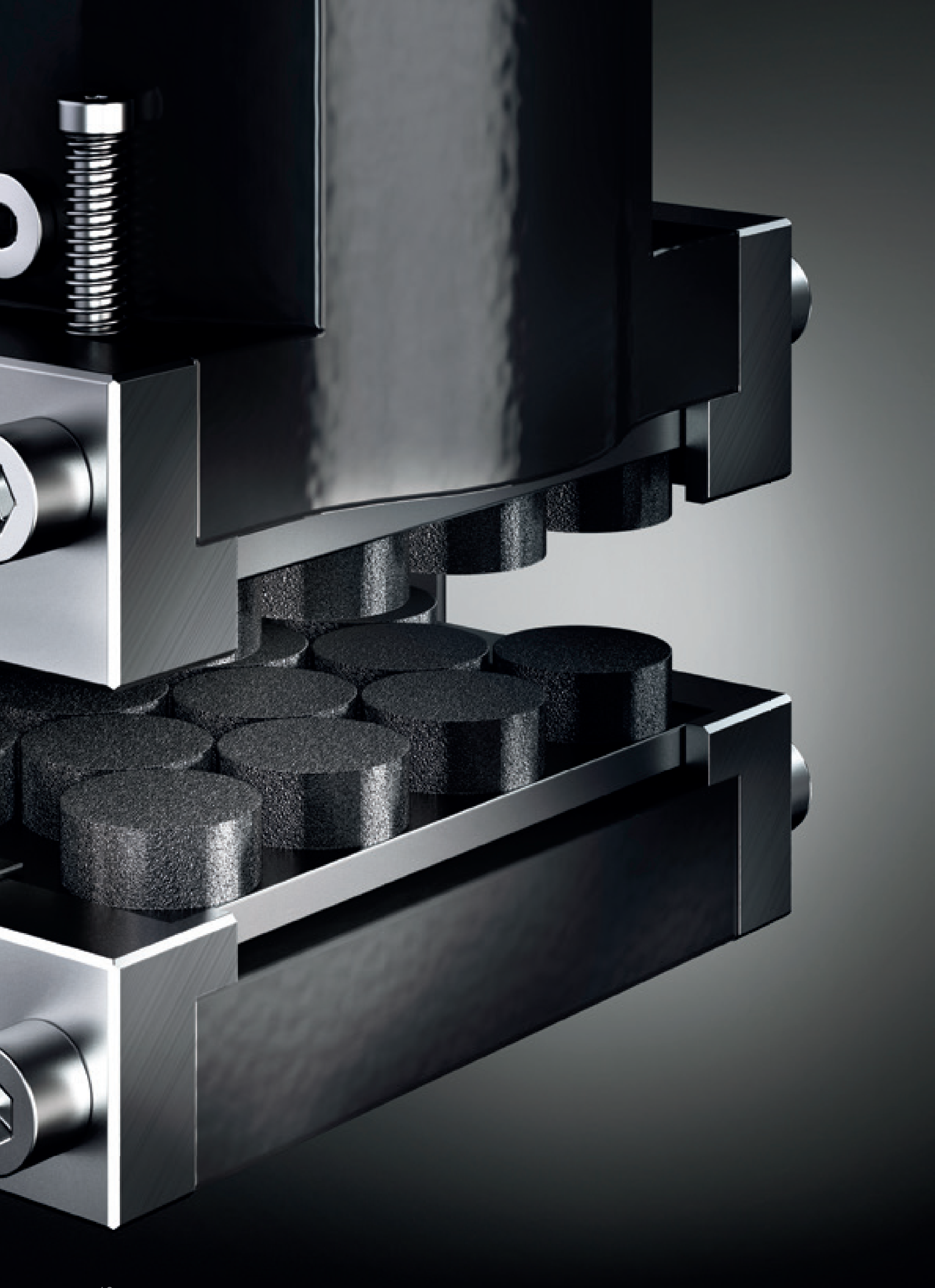
Active fixed caliper brakes

Hydraulic KTR-STOP®

Clamping forces [kN]







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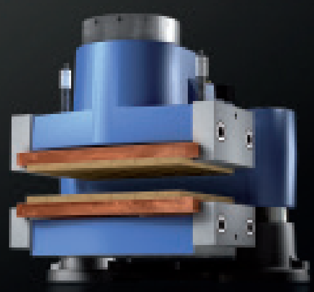
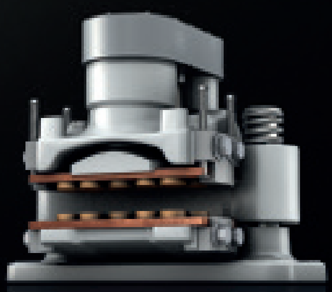
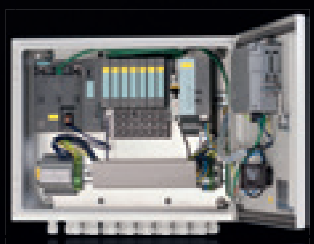


EMB-STOP

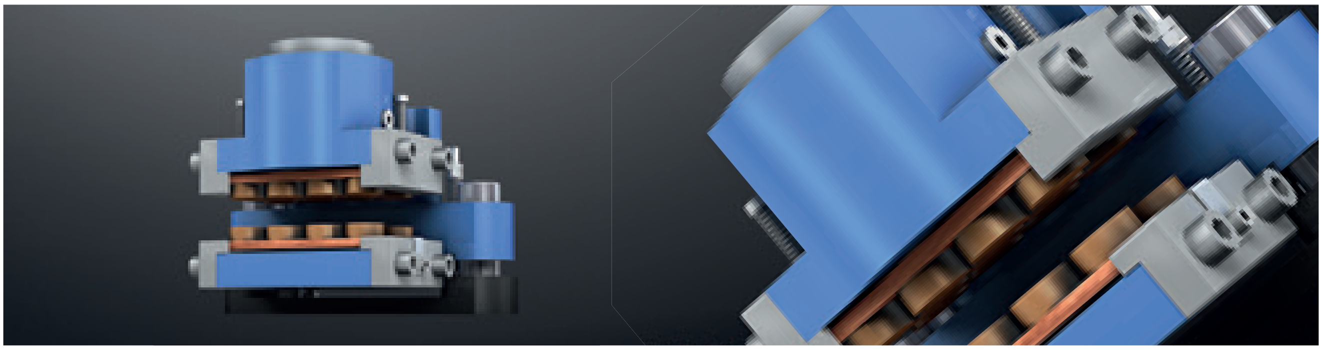


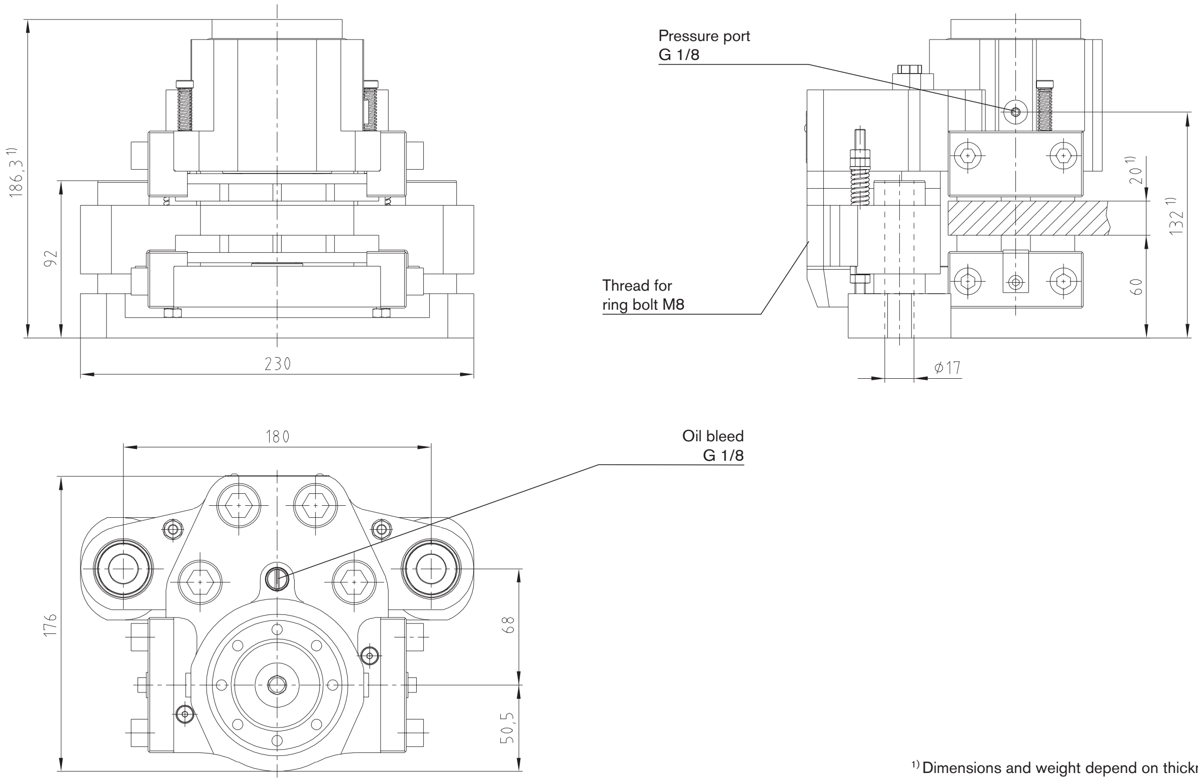
IntelliRamp®



KTR-STOP® NC

Hydraulic brake system





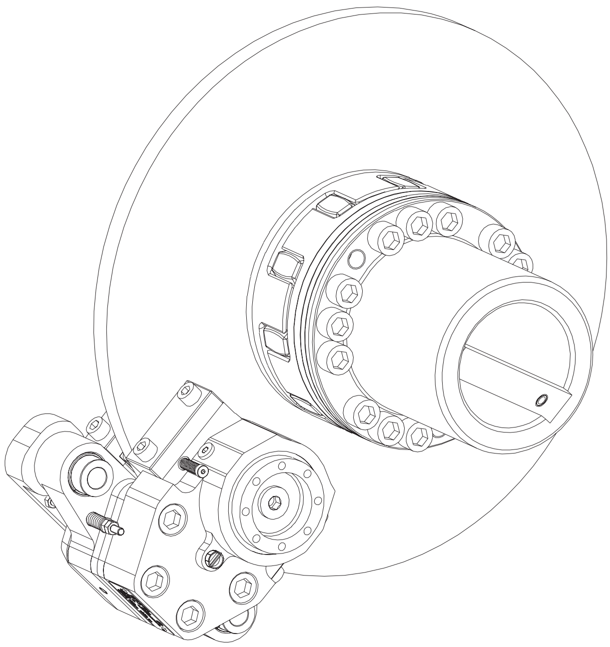
1) Dimensions and weight depend on thickness of brake disk.

KTR-STOP® XS-xx-F				
Total weight		approx. 20,5 kg	Max. operating pressure	200 bar
Width of brake pad		70 mm	Thickness of brake disk	10 mm - 30 mm
Surface of each brake pad	organic	8.000 mm²	Pressure port	G 1/8
	powder metal	5.800 mm²	Oil bleed	G 1/8
Max. wear of each brake pad		5 mm	Backlash on axles - towards mounting surface	5 mm
Nominal coefficient of friction 2)		μ = 0,4	Backlash on axles - away from mounting surface	5 mm
Total brake piston surface - complete brake		11 cm²	Min. diameter of brake disk ØD$_A$	300 mm
Volume with 1 mm stroke - complete brake		1,1 cm³	Operating temperature	-20 °C to +50 °C

Types of brakes							
Type of brake 3)	Clamping force F_C [kN]	Power loss 4) [%]	Opening pressure [bar]	Weight 1) [kg]	Braking torque [Nm] with brake disk Ø [mm]		
					315	560	800
KTR-STOP XS-3-F	3	5,5	40	20,5	270	560	850
KTR-STOP XS-6-F	6	6,5	80	20,5	540	1130	1710
KTR-STOP XS-9-F	9	12	130	20,5	820	1700	2570
KTR-STOP XS-12-F	12	11	160	20,5	1090	2270	3420
KTR-STOP XS-15-F	15	8	190	20,5	1370	2840	4280

2) The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.
3) Other types of brakes on request
4) With 1 mm stroke (0.5 mm wear of pad on each side)

Ordering example:	KTR-STOP®	XS	-	6	-	F	A	-	20
	KTR brake	Size of brake		Clamping force		Floater	Option		Thickness of brake disk

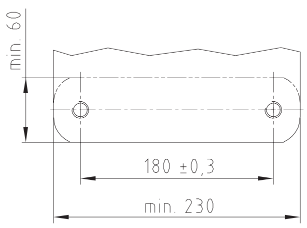


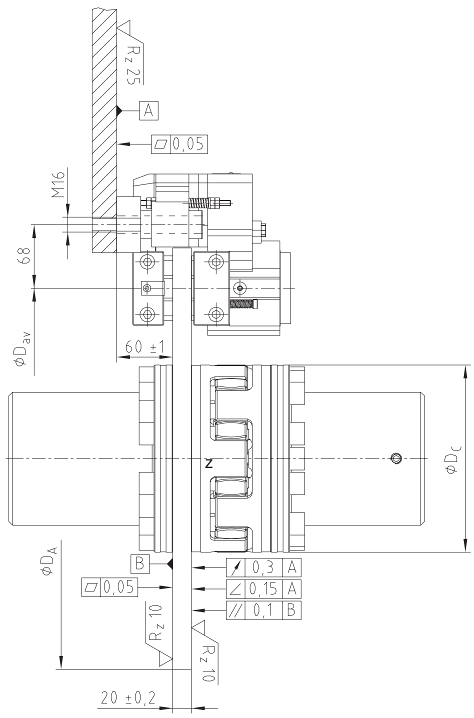
Calculation of brake disk

$$D_{Cmax} = D_A - 195$$

$$D_{av} = D_A - 86$$

Connection dimensions of brake





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

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

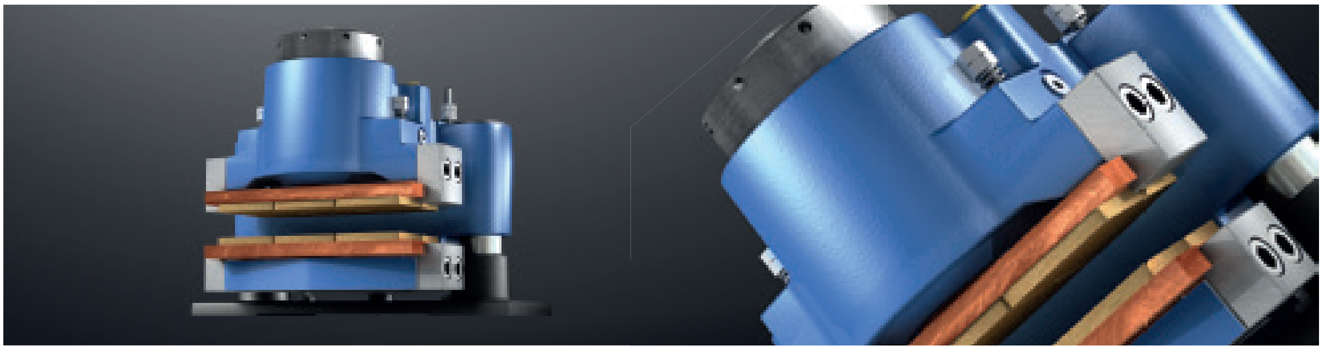
F_b = Braking force [kN]
F_c = Clamping force [kN]
M_b = Braking torque [kNm]
z = Number of brakes
D_{av} = Effective diameter of brake [m]

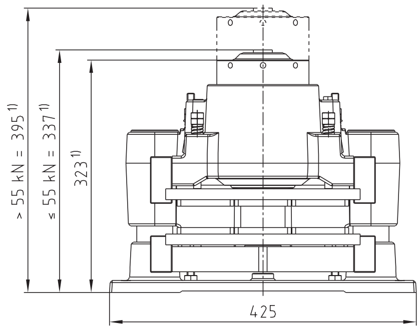
Optional

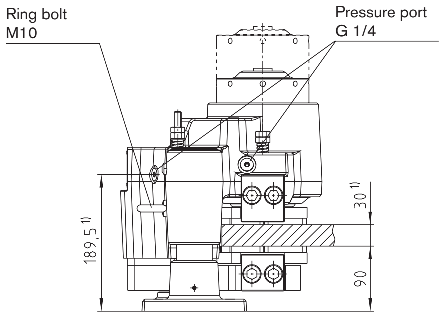
- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

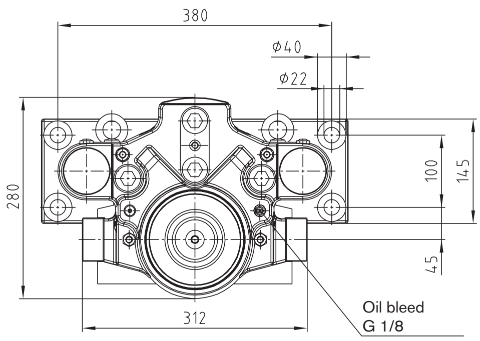
KTR-STOP® S-xx-F
Passive floating caliper brakes

Hydraulic brake system









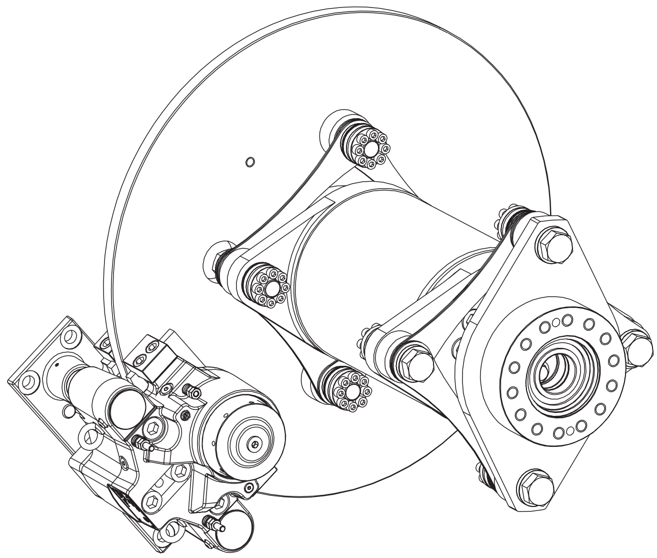
1) Dimensions and weight depend on thickness of brake disk.

KTR-STOP® S-xx-F				
Total weight		approx. 90 kg - 100 kg 1)	Max. operating pressure	200 bar
Width of brake pad		125 mm	Thickness of brake disk	20 mm - 40 mm
Surface of each brake pad	organic	28.700 mm²	Pressure port	G 1/4
	powder metal	26.800 mm²	Oil bleed	G 1/8
Max. wear of each brake pad		6 mm	Backlash on axles - towards mounting surface	5 mm
Nominal coefficient of friction 2)		μ = 0,4	Backlash on axles - away from mounting surface	10 mm
Total brake piston surface - complete brake		69 cm²	Min. diameter of brake disk $ØD_A$	500 mm
Volume with 1 mm stroke - complete brake		6,9 cm³	Operation temperature	-20 °C to +50 °C

Bremsentypen							
Type of brake 3)	Clamping force F_C [kN]	Power loss 4) [%]	Opening pressure [bar]	Weight 1) [kg]	Braking torque [Nm] with brake disk Ø [mm]		
					500	710	1000
KTR-STOP® S-20-F	20	4,5	40	90	2900	4600	6900
KTR-STOP® S-40-F	40	6,5	90	90	5900	9200	13900
KTR-STOP® S-60-F	60	7,0	130	100	8800	13900	20800
KTR-STOP® S-80-F	80	5,0	170	100	11800	18500	27800

2) The coefficient of friction each depends on the application or material of the brake, respectively. Please consult with KTR.
3) Other types of brakes on request
4) With 1 mm stroke (0.5 mm wear of pad on each side)

Ordering example:	KTR-STOP®	S	-	40	-	F	A	-	30
	KTR brake	Size of brake		Clamping force		Floater	Option		Thickness of brake disk



Calculation of brake disk

up to $ØD_A$ = 1000 mm

$D_{C\ max.} = D_A - 305$

$D_{av} = D_A - 130$

from $ØD_A$ = 1000 mm to $ØD_A$ = 1800 mm

$D_{C\ max.} = D_A - 295$

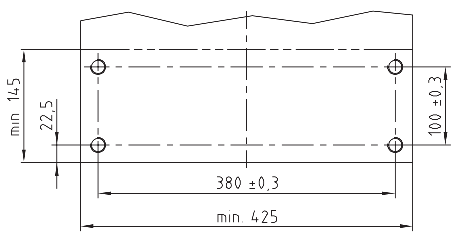
$D_{av} = D_A - 120$

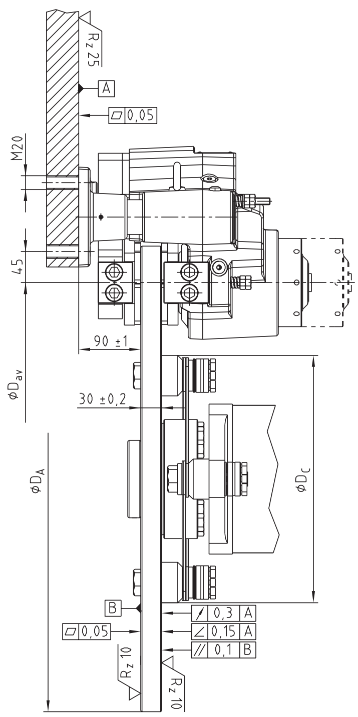
from $ØD_A$ = 1800 mm

$D_{C\ max.} = D_A - 285$

$D_{av} = D_A - 110$

Connection dimensions of brake





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

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

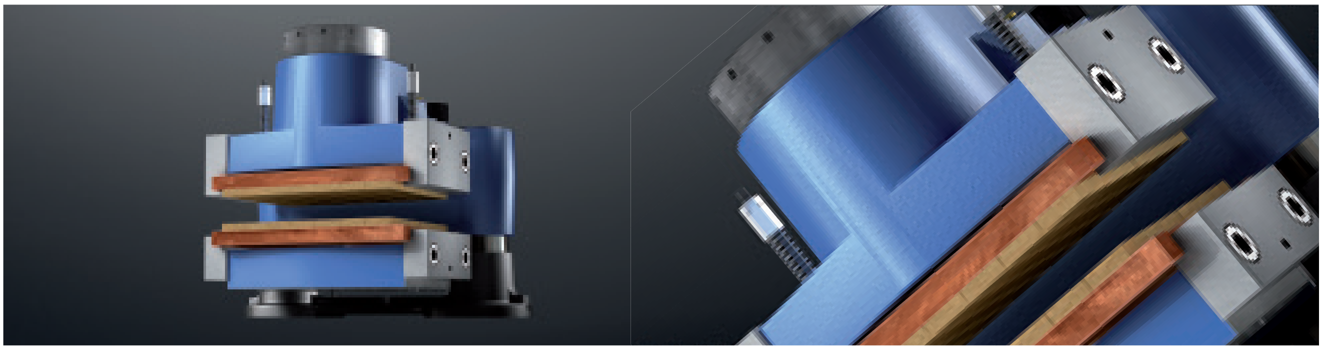
F_b = Braking force [kN]
F_c = Clamping force [kN]
M_b = Braking torque [kNm]
z = Number of brakes
D_{av} = Effective diameter of brake [m]

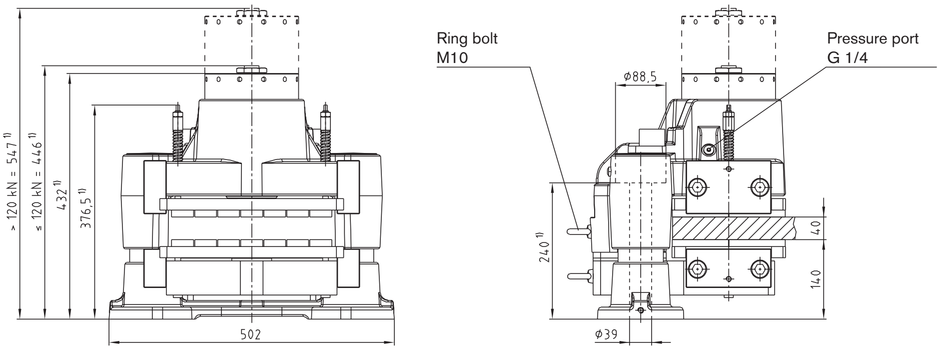
Optional

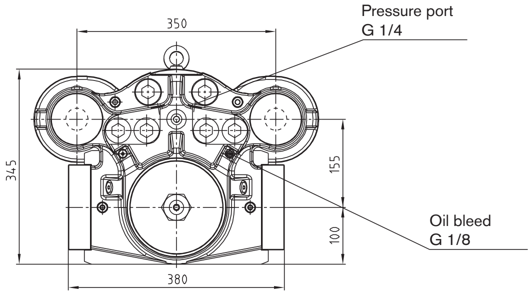
- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

KTR-STOP® M-xxx-F
Passive floating caliper brakes

Hydraulic brake system







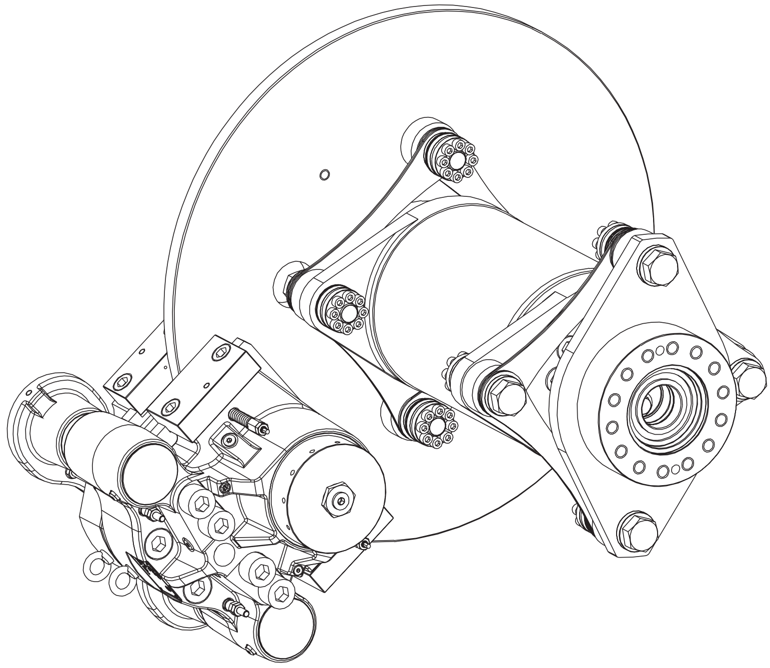
[1] Dimensions and weight depend on thickness of brake disk.

KTR-STOP® M-xxx-F			
Total weight	approx. 200 kg - 212 kg [1]	Max. operating pressure	200 bar
Width of brake pad	200 mm	Thickness of brake disk	25 mm - 50 mm
Surface of each brake pad organic	57.900 mm²	Pressure port	G 1/4
Sinter	53.500 mm²	Oil bleed	G 1/8
Max. wear of each brake pad	8 mm	Backlash on axles - towards mounting surface	5 mm
Nominal coefficient of friction [2]	μ = 0,4	Backlash on axles - away from mounting surface	below 120 kN = 10 mm
Total brake piston surface - complete brake	137,4 cm²		above 120 kN = 5 mm
Volume with 1 mm stroke - complete brake	13,74 cm³	Min. diameter of brake disk $ØD_A$	800 mm
		Operation temperature	-20 °C to +50 °C

Bremsentypen							
Type of brake [3]	Clamping force F_C [kN]	Power loss [4] [%]	Opening pressure [bar]	Weight [1] [kg]	Braking torque [Nm] with brake disk Ø [mm]		
					800	1500	2000
KTR-STOP® M-100-F	100	7,0	110	200	24000	52000	72000
KTR-STOP® M-120-F	120	8,5	130	200	28800	62400	86400
KTR-STOP® M-140-F	140	4,5	150	212	33600	72800	100800
KTR-STOP® M-160-F	160	7,0	180	212	38400	83200	115200
KTR-STOP® M-180-F	180	6,0	190	212	43200	93600	129600

[2] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.
[3] Other types of brakes on request
[4] With 1 mm stroke (0.5 mm wear of pad on each side)

Ordering example:	KTR-STOP®	M	-	100	-	F	A	-	40
	KTR brake	Size of brake		Clamping force		Floater	Option		Thickness of brake disk

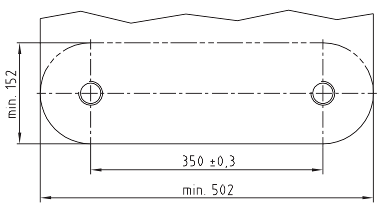


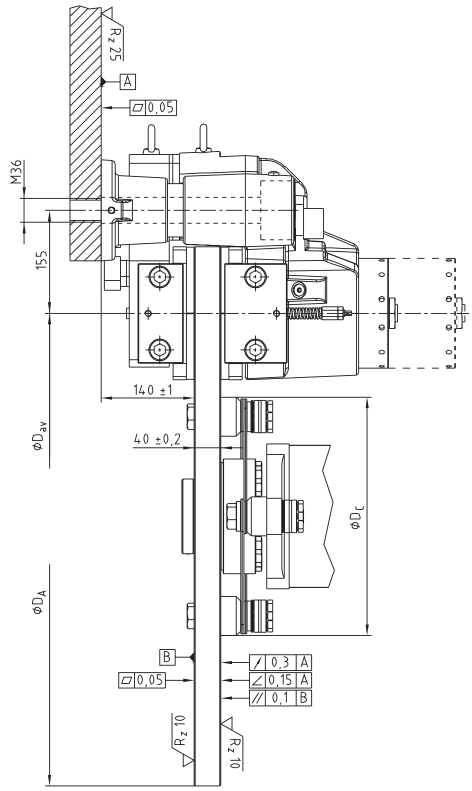
Calculation of brake disk

$D_{C\ max.} = D_A - 410$

$D_{av} = D_A - 200$

Connection dimensions of brake





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

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

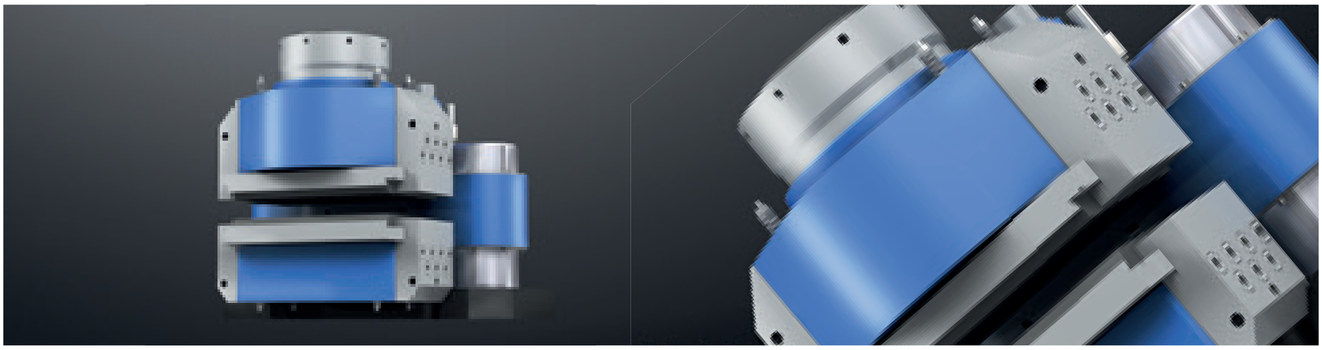
F_b = Braking force [kN]
F_c = Clamping force [kN]
M_b = Braking torque [kNm]
z = Number of brakes
D_{av} = Effective diameter of brake [m]

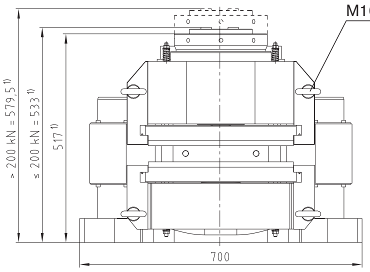
Optional

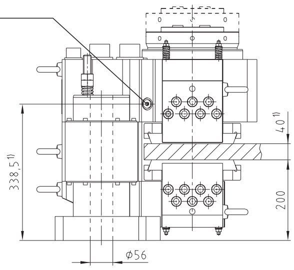
- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

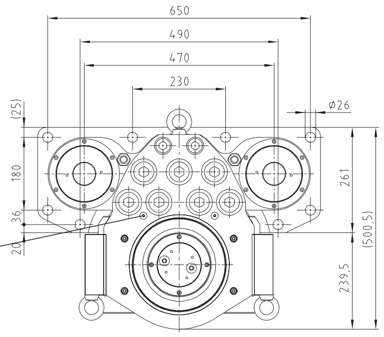
KTR-STOP® L-xxx-F
Passive floating caliper brakes

Hydraulic brake system









[1)] Dimensions and weight depend on the thickness of brake disk.

KTR-STOP® L-xxx-F			
Total weight	approx. 585 - 600 kg [1)]	Max. operating pressure	200 bar
Width of brake pad	240 mm	Thickness of brake disk	30 mm - 60 mm
Surface of each brake pad (organic/powder metal)	72.900 mm²	Pressure port	G 3/8
Max. wear of each brake pad	6 mm	Oil bleed	G 1/4
Nominal coefficient of friction [2)]	μ = 0,4	Backlash on axles - towards mounting surface	5 mm
Total brake piston surface - complete brake	267 cm²	Backlash on axles - away from mounting surface	10 mm
Volume with 1 mm stroke - complete brake	26,7 cm³	Min. diameter of brake disk $ØD_A$	1000 mm
		Operation temperature	-20 °C to +50 °C

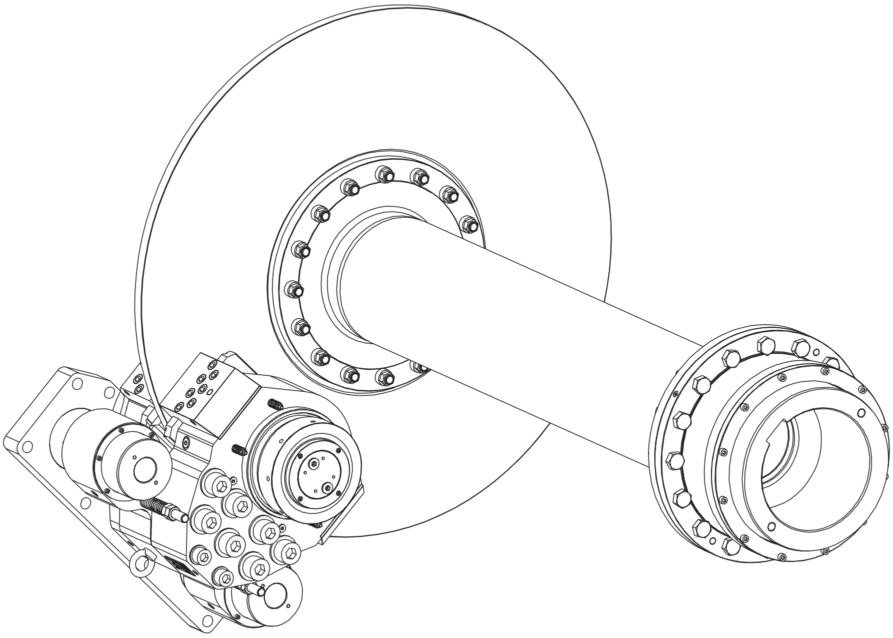
Bremsentypen

Type of brake [3)]	Clamping force F_C [kN]	Power loss [4)] [%]	Opening pressure [bar]	Weight [1)] [kg]	Braking torque [Nm] with brake disk Ø [mm]		
					1000	2000	3000
KTR-STOP® L-150	150	6,0	80	585	46000	106000	166000
KTR-STOP® L-200	200	5,0	110	585	61000	141000	221000
KTR-STOP® L-250	250	6,0	140	600	77000	177000	277000
KTR-STOP® L-300	300	5,0	170	600	92000	212000	332000
KTR-STOP® L-350	350	7,0	190	600	107000	247000	387000

[2)] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.
[3)] Other types of brakes on request
[4)] With 1 mm stroke (1 mm wear of pad on each side)

Ordering example:

KTR-STOP®	L	-	200	-	F	A	-	50
KTR brake	Size of brake		Clamping force		Floater	Option		Thickness of brake disk

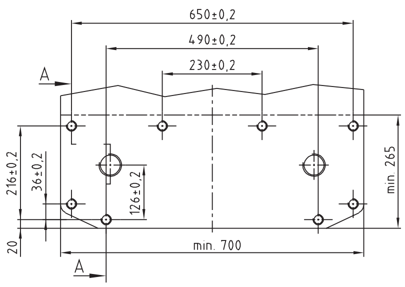


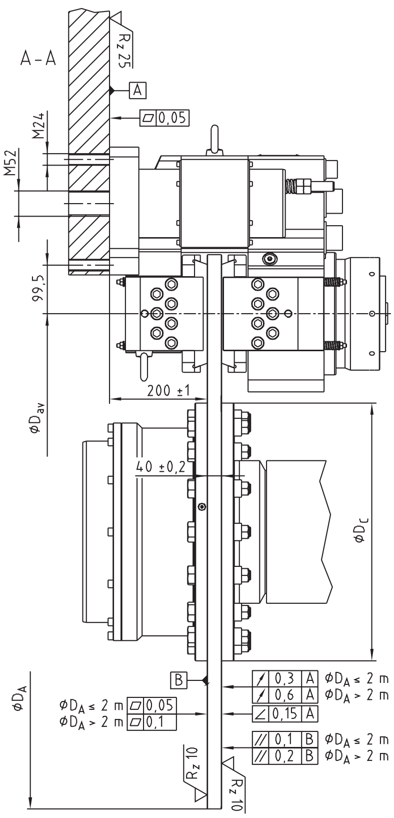
Calculation of brake disk

$D_{C\,max.} = D_A - 570$

$D_{av} = D_A - 230$

Connection dimensions of brake





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

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

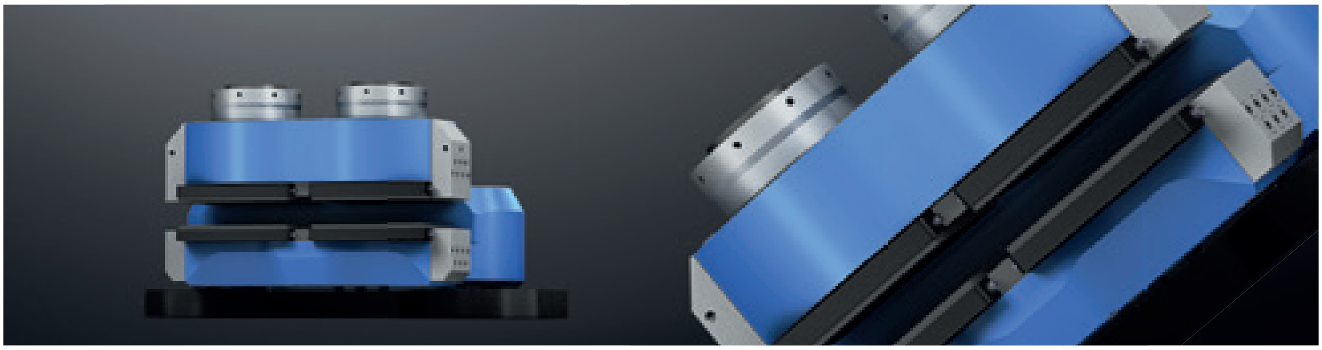
F_b = Braking force [kN]
F_c = Clamping force [kN]
M_b = Braking torque [kNm]

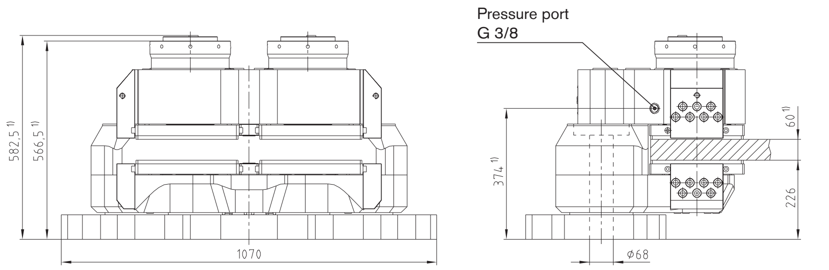
z = Number of brakes
D_{av} = Effective diameter of brake [m]

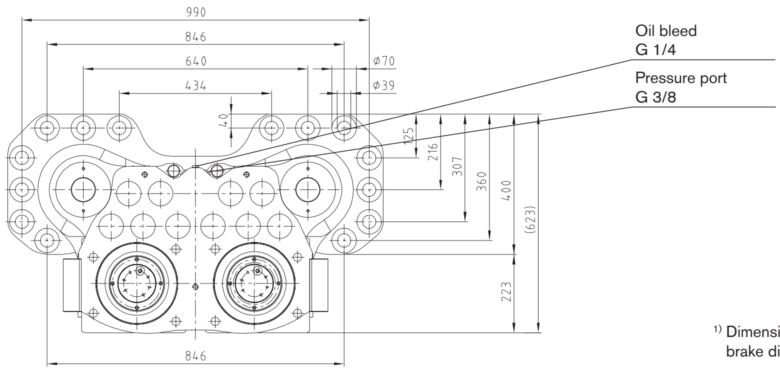
Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Hydraulic brake system







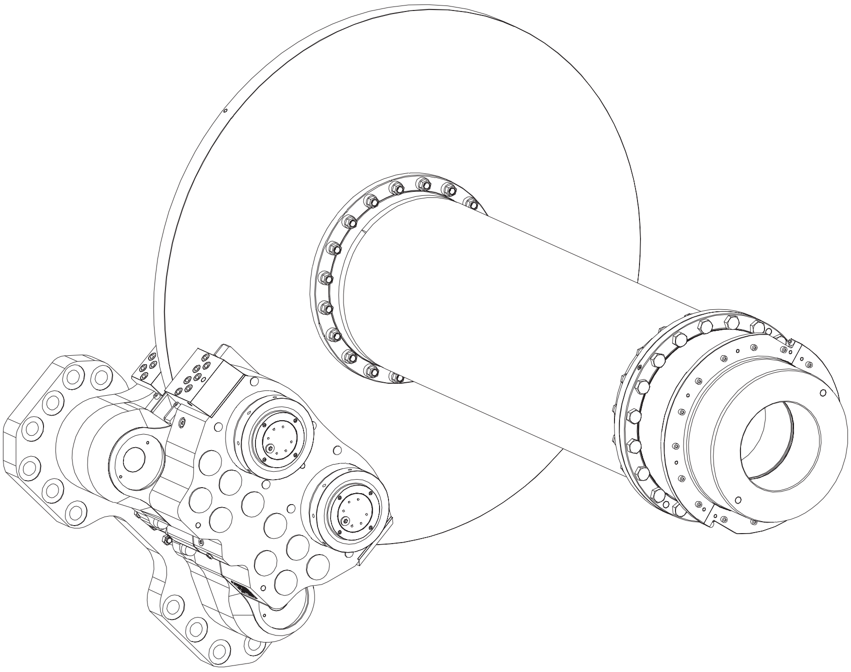
[1)] Dimensions and weight depend on the thickness of brake disk.

KTR-STOP® XL-xxx-F			
Total weight	approx. 1080 kg [1)]	Max. operating pressure	200 bar
Width of brake pad	270 mm	Thickness of brake disk	40 mm - 80 mm
Surface of each brake pad (organic/powder metal)	76.800 mm²	Pressure port	G 3/8
Max. wear of each brake pad	6 mm	Oil bleed	G 1/4
Nominal coefficient of friction [2)]	μ = 0,4	Backlash on axles - towards mounting surface	5 mm
Total brake piston surface - complete brake	452 cm²	Backlash on axles - away from mounting surface	10 mm
Volume with 1 mm stroke - complete brake	45,2 cm³	Min. diameter of brake disk $ØD_A$	1.500 mm
		Operation temperature	-20 °C to +50 °C

Bremsentypen							
Type of brake [3)]	Clamping force F_C [kN]	Power loss [4)] [%]	Opening pressure [bar]	Weight [1)] [kg]	Braking torque [Nm] with brake disk Ø [mm]		
					1500	3000	4000
KTR-STOP® XL-400-F	400	4,5	130	1080	198000	438000	598000
KTR-STOP® XL-500-F	500	7,5	160	1080	247000	547000	747000
KTR-STOP® XL-600-F	600	6	190	1080	296000	656000	896000

[1)] Weight depends on thickness of brake disk
[2)] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.
[3)] Other types of brakes on request
[4)] With 1 mm stroke (0.5 mm wear of pad on each side)

Ordering example:	KTR-STOP®	XL	-	600	-	F	A	-	60
	KTR brake	Size of brake		Clamping force		Floater	Option		Thickness of brake disk

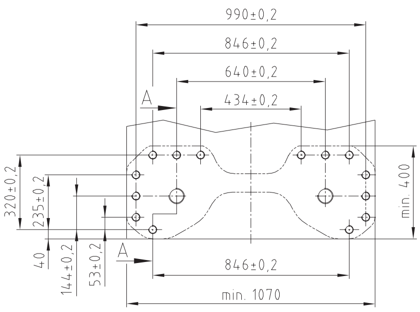


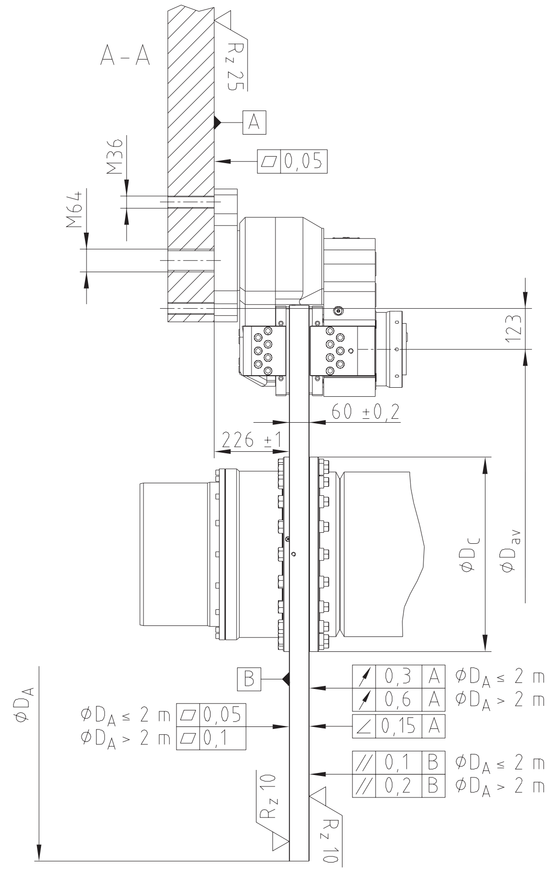
Calculation of brake disk

$D_{C\,max.} = D_A - 570$

$D_{av} = D_A - 230$

Connection dimensions of brake





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

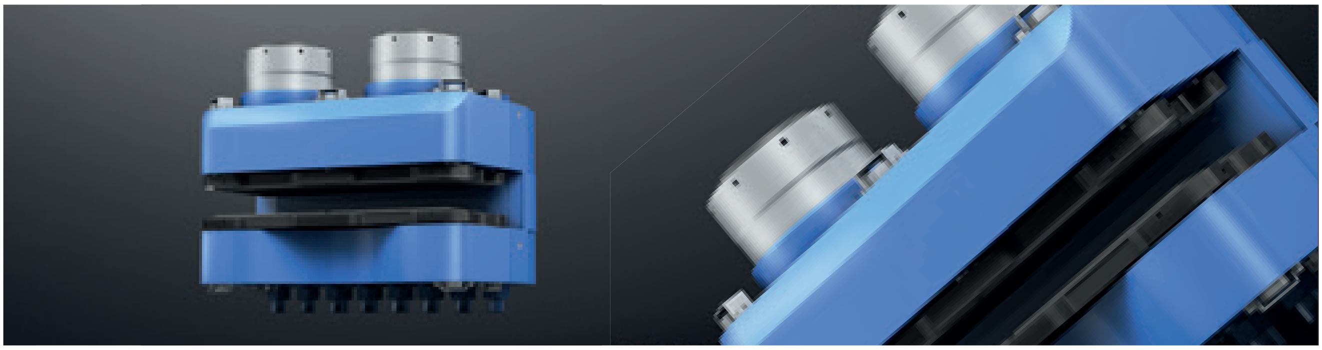
$M_b = z \cdot F_b \cdot \frac{D_{av}}{2}$

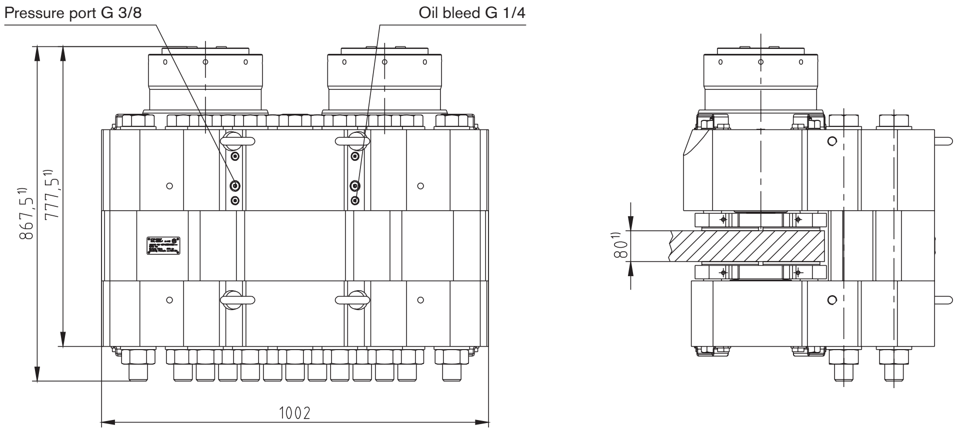
F_b	=	Braking force [kN]
F_c	=	Clamping force [kN]
M_b	=	Braking torque [kNm]
z	=	Number of brakes
D_{av}	=	Effective diameter of brake [m]

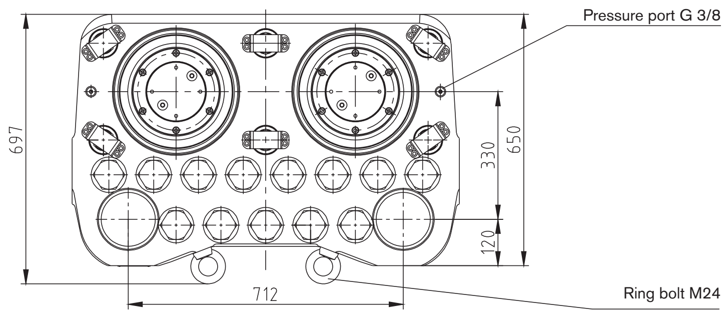
Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Hydraulic brake system







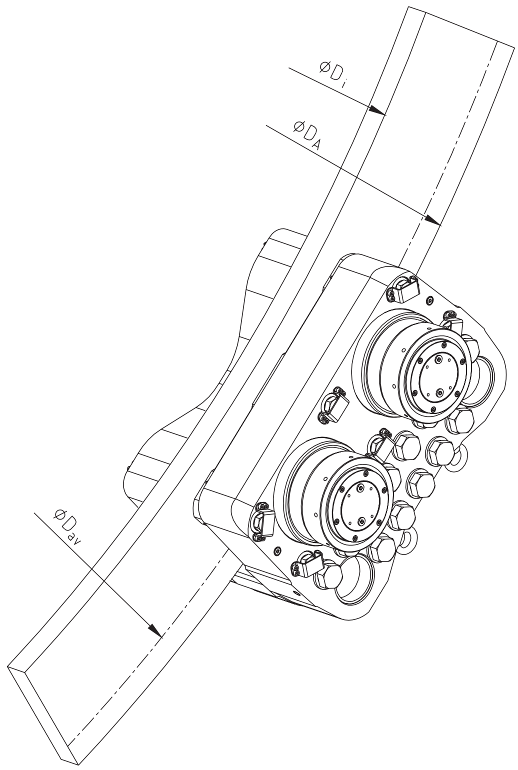
[1] Dimensions and weight depending on thickness of brake disk.

KTR-STOP® XXL-xxxx-F				
Total weight		approx. 2200 kg	Volume with 1 mm stroke - complete brake	92,4 cm³
Width of brake pad		340 mm	Max. operating pressure	220 bar
Surface of each brake pad	organic	238.700 mm²	Thickness of brake disk	60 mm - 120 mm
	powder metal	-	Pressure port	G 3/8
Max. wear of each brake pad		8 mm	Oil bleed	G 1/4
Nominal coefficient of friction [2]		μ = 0,4	Min. diameter of brake disk ØD_A	6.000 mm
Total brake piston surface - complete brake		924 cm²	Operation temperature	-20 °C to +50 °C

Bremsentypen				
Type of brake [3]	Clamping force F_C [kN]	Power loss [4] [%]	Opening pressure [bar]	Weight [1] [kg]
KTR-STOP® XXL-800-F	800	6	125	2200
KTR-STOP® XXL-1000-F	1000	4,5	150	2200
KTR-STOP® XXL-1200-F	1200	4	175	2200

[2] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.
[3] Other types of brakes on request
[4] With 1 mm stroke (0.5 mm wear of pad on each side)

Ordering example:	KTR-STOP®	XXL -	1000 -	F	A -	80
	KTR brake	Size of brake	Clamping force	Floater	Option	Thickness of brake disk



Calculation of brake disk

$D_{Cmax} = D_A - 780$

$D_{av} = D_A - 330$

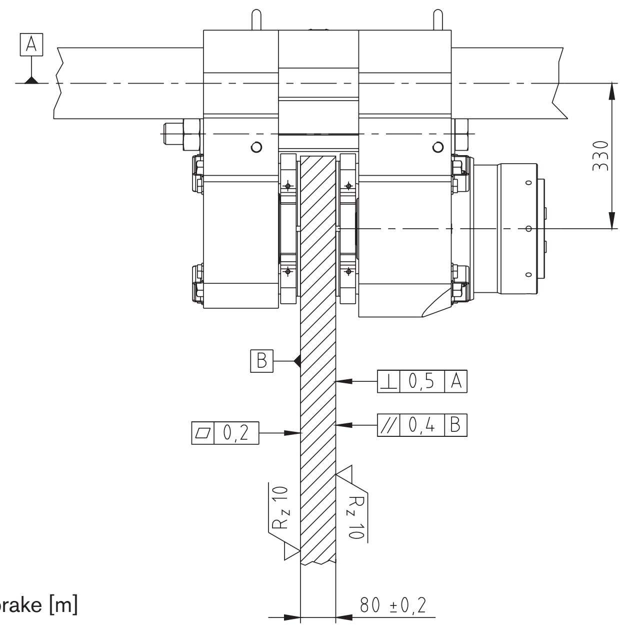
Connection dimensions of brake

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

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

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]

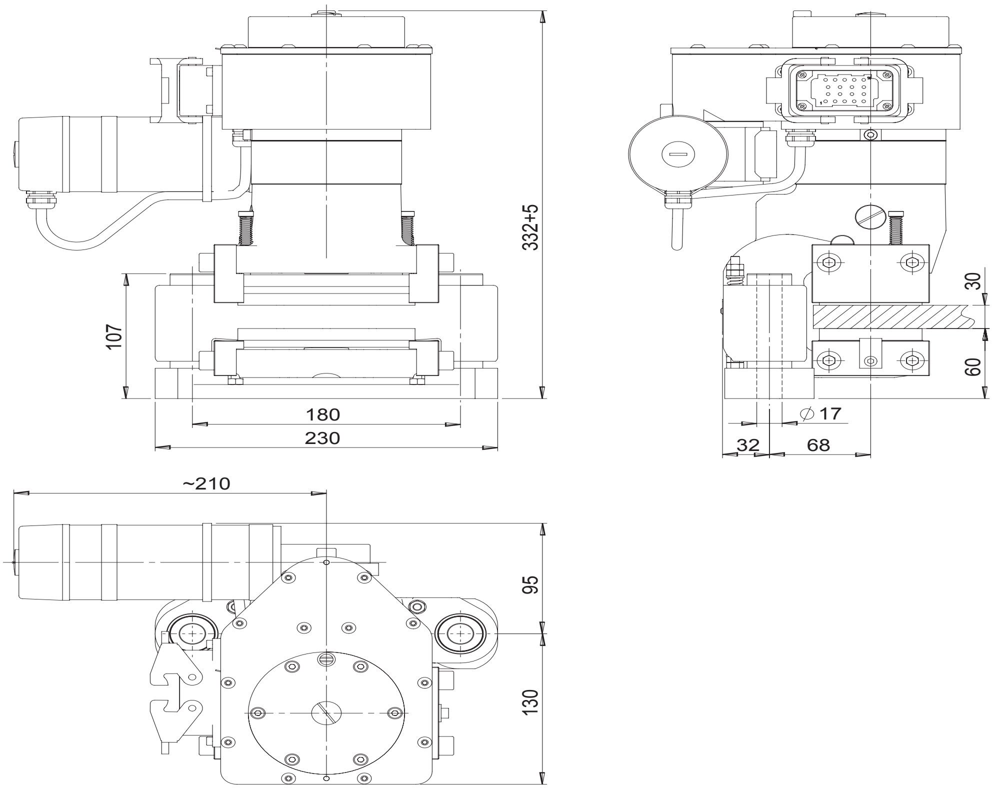


Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

EMB-STOP XS-P-xx-F
Passive floating caliper brakes

Electromechanical brake system



EMB-STOP XS-P-xx-F				
Total weight		approx. 28 kg	Thickness of brake disk	20 mm - 30 mm
Width of brake pad		70 mm	Operating voltage	400 VAC, 50 Hz
Surface of each brake pad	organic	8.000 mm²	Size of industrial connector	Han10B / HAN18EE (male)
	powder metal	5.800 mm²	Backlash on axles - towards mounting surface	5 mm
Wear of pad on each side (max.)		5 mm	Backlash on axles - away from mounting surface	5 mm
Coefficient of friction of pad, nominal value[2]		μ = 0,4	Min. diameter of brake disk ØDA	300 mm
Max. clamping force		12 kN	Operation temperature	-20 °C ... +50 °C
Power loss with 1mm stroke (0.5 on each side)		10%		

[1] Tolerances depending on air gap.
[2] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.

Calculation of braking force/braking torque

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

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

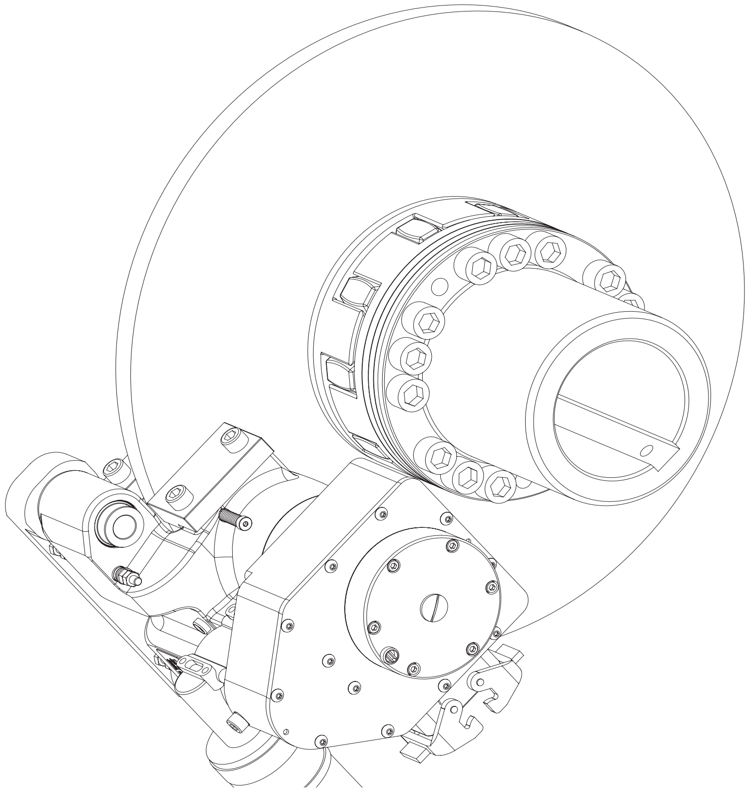
F_b = Braking force [kN]
F_c = Clamping force [kN]
M_b = Braking torque [kNm]
z = Number of brakes
D_{av} = Effective diameter of brake [m]

Ordering example:	EMB-STOP	XS	-	P	-	12	-	F	A	-	30
	EMB brake	Size of brake		Passive		Clamping force		Floating caliper („Floater“)	Option		Thickness of brake disk

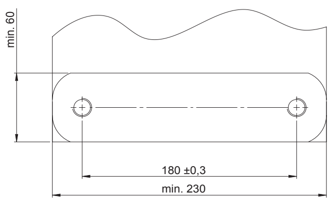
Calculation of brake disk

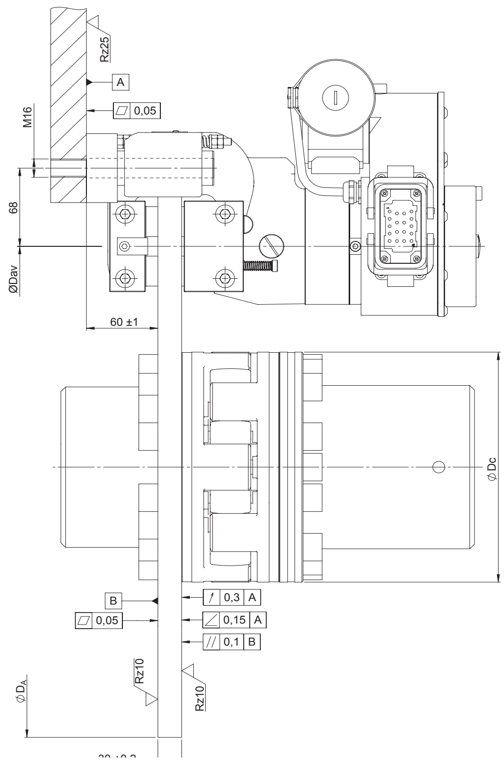
$$D_{Cmax} = D_A - 195$$

$$D_{av} = D_A - 86$$



Connection dimensions of brake

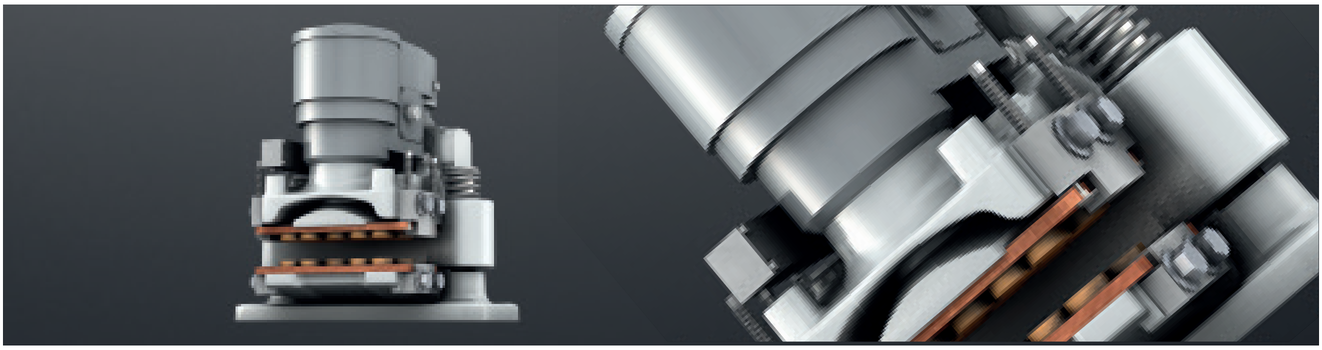


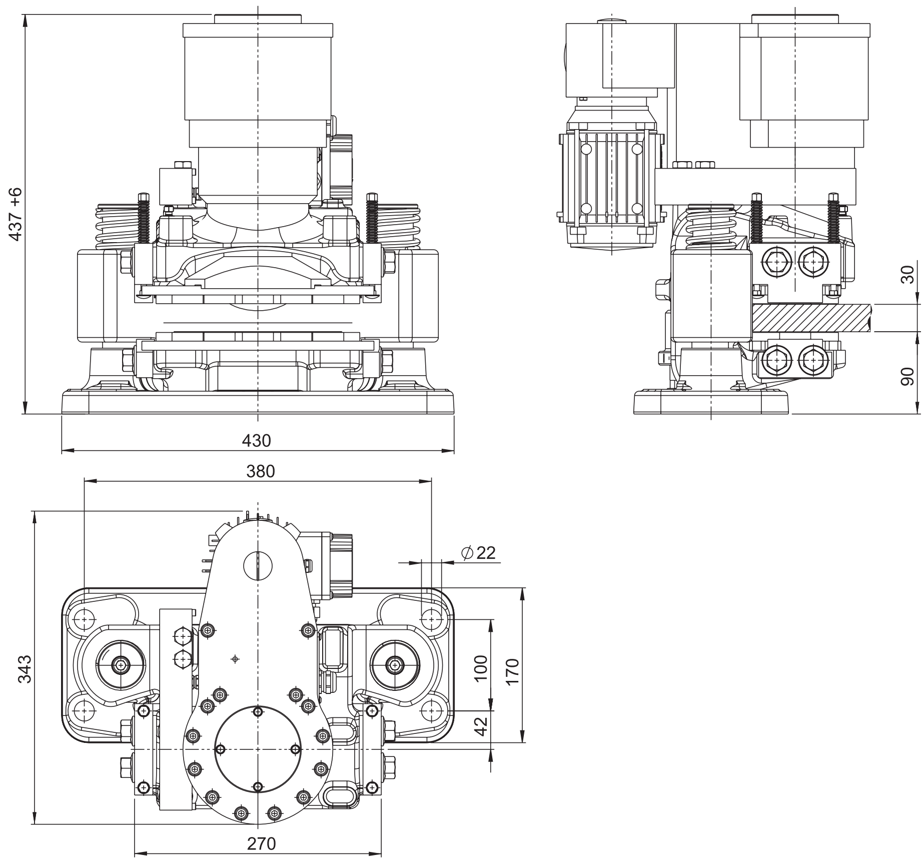


Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Electromechanical brake system





EMB-STOP S-P-xx-F	
Total weight	93 kg
Thickness of brake disk	25 - 35 mm
Wear of pad on each side (max.)	4 mm
Coefficient of friction of pad, nominal value [2)]	μ = 0,4
Clamping force, min.	30 kN
Clamping force, max.	50 kN
Operating temperature range	-30 to +50 °C
Motor output	250 W
Motor voltage	400 VAC
Voltage of electric signals	230 VAC / 24 VDC

[1)] Tolerances depending on air gap.
[2)] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.

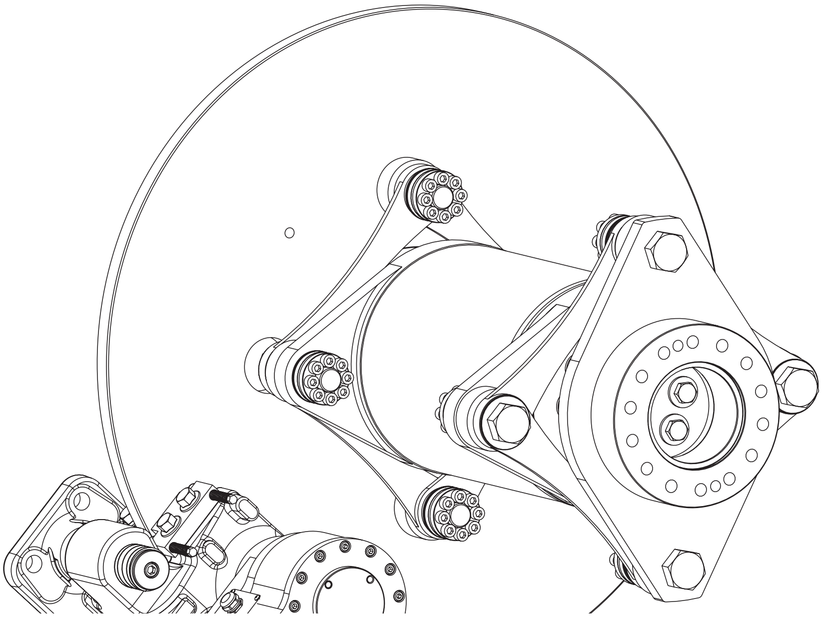
Calculation of braking force/braking torque

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

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

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]

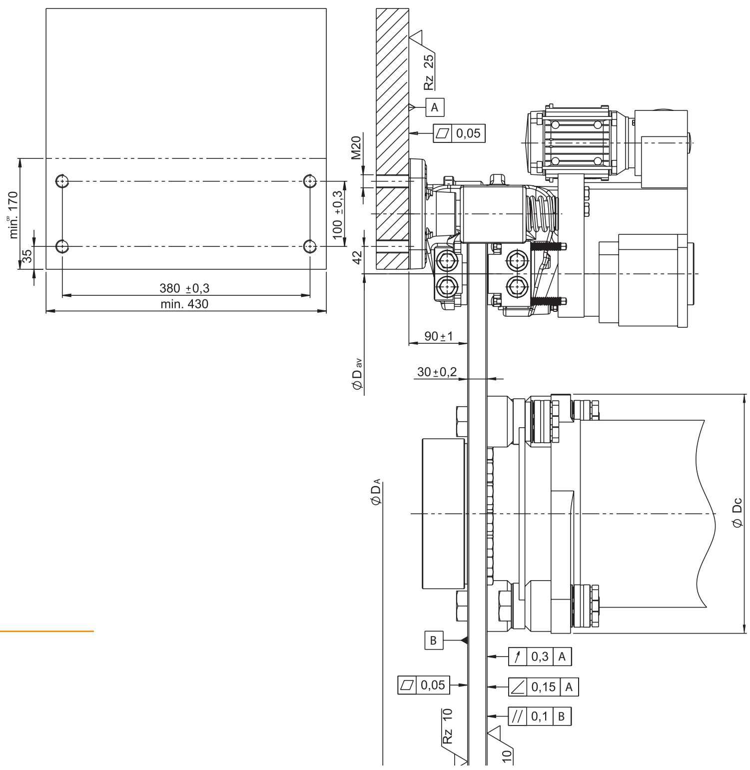
Ordering example:	EMB-STOP	S	-	P	-	50	-	F	A	-	30
	EMB brake	Size of brake		Passive		Clamping force		Floating caliper („Floater“)	Option		Thickness of brake disk



Calculation of brake disk

$ØD_A$ = 1800 ... 3000 mm	$ØD_A$ = 1000 ... 1800 mm	$ØD_A$ = 500 ... 1000 mm
$D_{av} = D_A - 130$	$D_{av} = D_A - 110$	$D_{av} = D_A - 105$

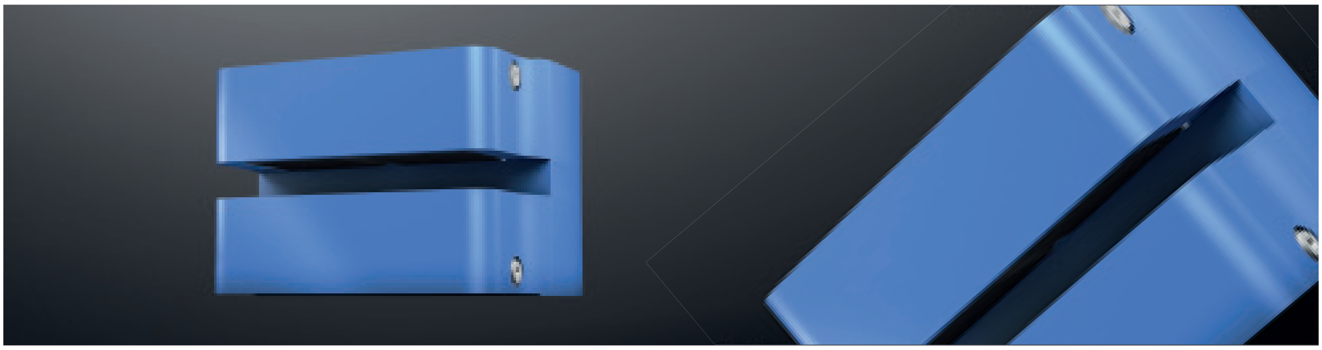
Connection dimensions of brake

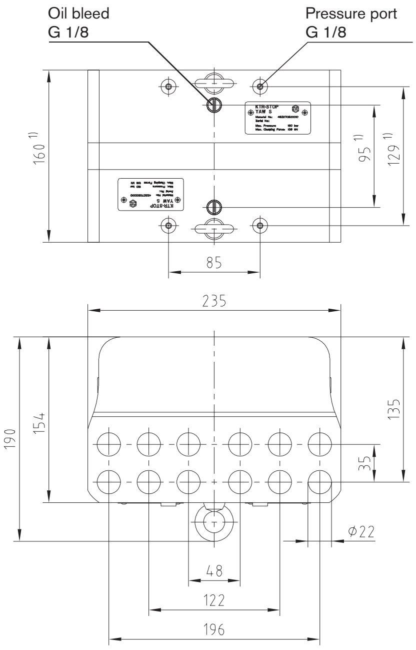


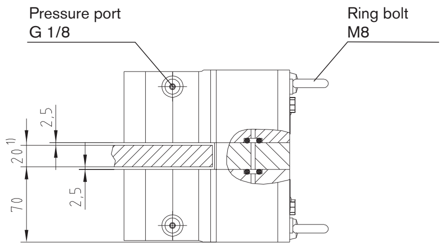
Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Hydraulic brake system







1) Dimensions and weight depend on the thickness of brake disk.

KTR-STOP® YAW S			
Total weight	approx. 31,5 kg 1)	Max. clamping force	106 kN
Width of brake pad	70 mm	Max. operating pressure (up to μ = 0.4)	160 bar
Surface of each brake pad	10.400 mm²	Thickness of brake disk3)	10 mm - 30 mm
Max. wear of each brake pad	6 mm (Material: organic)	Assembly of brake externally	400 mm
Nominal coefficient of friction 2)	μ = 0,4	Min. diameter of brake disk $ØD_A$	
Total brake piston surface - complete brake	133 cm²	Assembly of brake internally	700 mm
Volume with 1 mm stroke - complete brake	13,3 cm³	Min. diameter of brake disk $ØD_i$	
Pressure port	G 1/8	Operation temperature	-20 °C to +50 °C
Oil bleed	G 1/8		

2) The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.
3) Other thickness of disk on request.

Calculation of braking force/braking torque

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

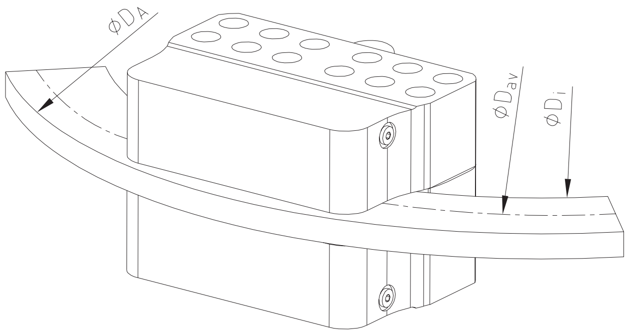
$$M_b = z \cdot F_b \cdot \frac{D_{av}}{2}$$

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]

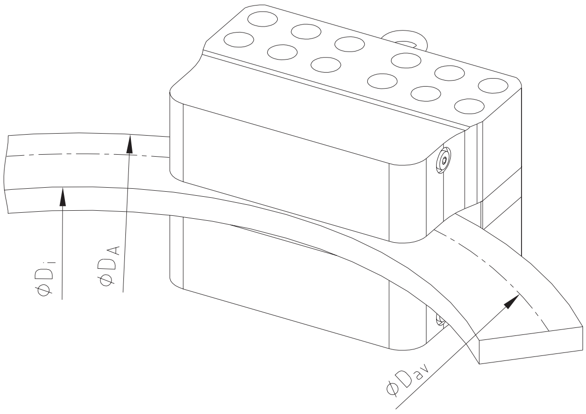
Ordering example:

KTR-STOP®	YAW S	A	- 20
KTR brake	Size of brake	Option	Thickness of brake disk

Assembly of brake internally



Assembly of brake externally



Calculation of brake disk

$$D_{i\,min.} = \sqrt{D_{av}^2 - 140 \cdot D_{av} + 44900}$$

$$D_{av} = \sqrt{D_i^2 - 40000} + 70$$

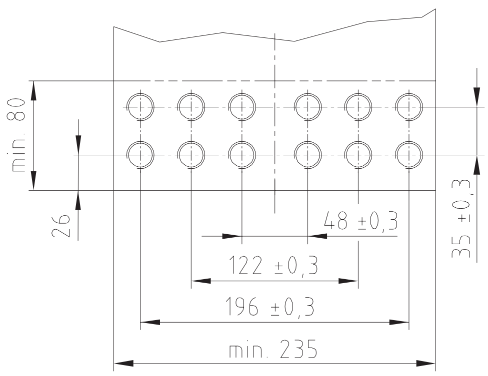
$$D_{A\,min.} = D_i + 170$$

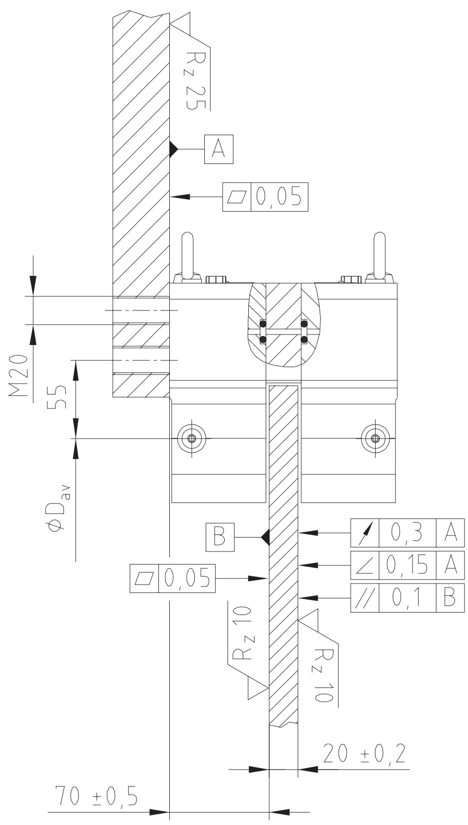
Calculation of brake disk

$$D_{av} = D_A - 70$$

$$D_{i\,max.} = D_A - 175$$

Connection dimensions of brake

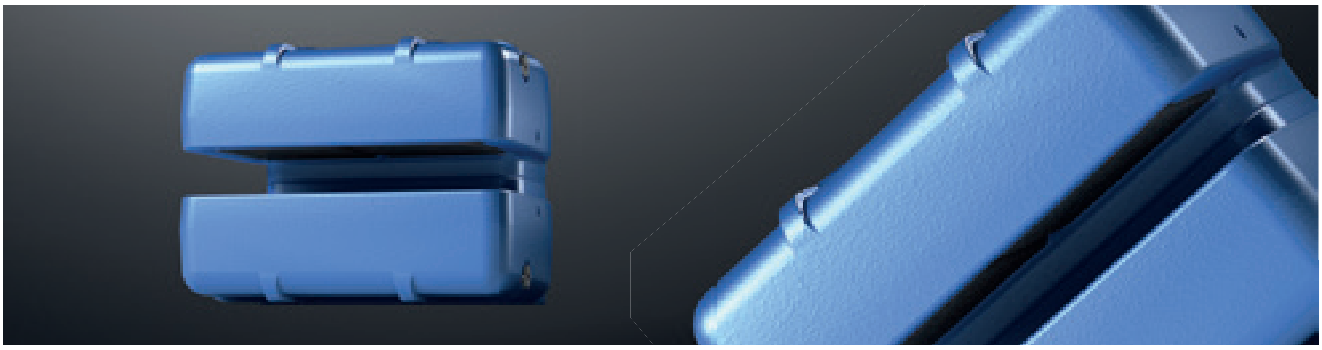


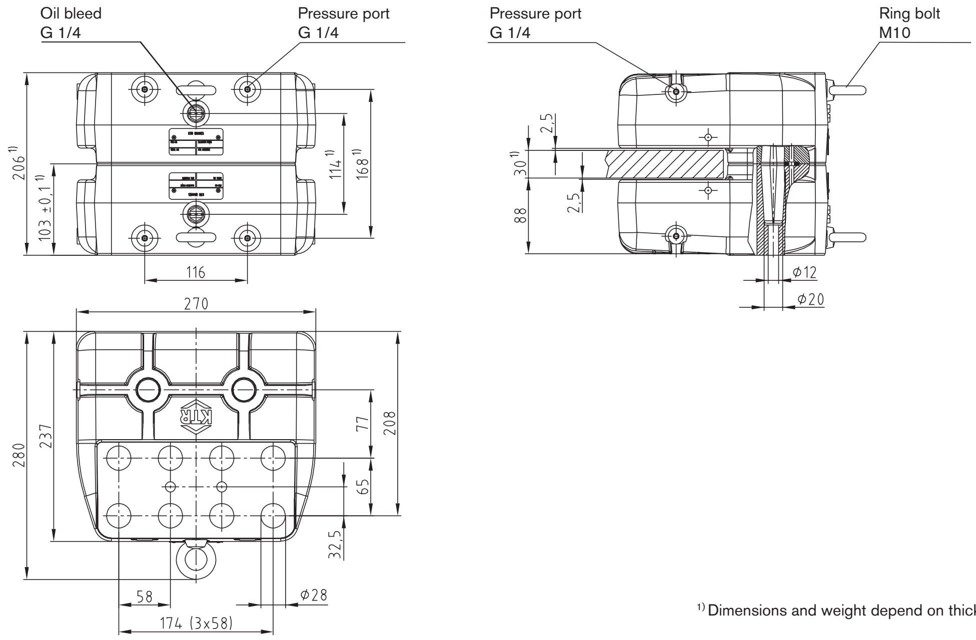


Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Hydraulic brake system





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

KTR-STOP® YAW M			
Total weight	approx. 63 kg 1)	Max. clamping force	203 kN
Width of brake pad	108 mm	Max. operating pressure (up to μ = 0.4)	160 bar
Surface of each brake pad	20.300 mm²	Thickness of brake disk3)	30 mm - 50 mm
Max. wear of each brake pad	7 mm (Material: organic)	Assembly of brake externally	500 mm
Nominal coefficient of friction 2)	μ = 0,4	Min. diameter of brake disk ØD$_A$	
Total brake piston surface - complete brake	254 cm²	Assembly of brake internally	900 mm
Volume with 1 mm stroke - complete brake	25,4 cm³	Min. diameter of brake disk ØD$_i$	
Pressure port	G 1/4	Operation temperature	-20 °C to +50 °C
Oil bleed	G 1/4		

2) The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.
3) Other thickness of disk on request.

Calculation of braking force/braking torque

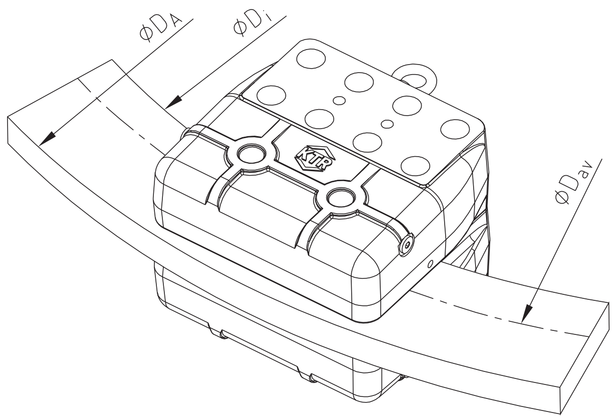
$$F_b = F_c \cdot 2 \cdot \mu$$

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

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]

Ordering example:	KTR-STOP®	YAW M	A -	30
	KTR brake	Size of brake	Option	Thickness of brake disk

Assembly of brake internally



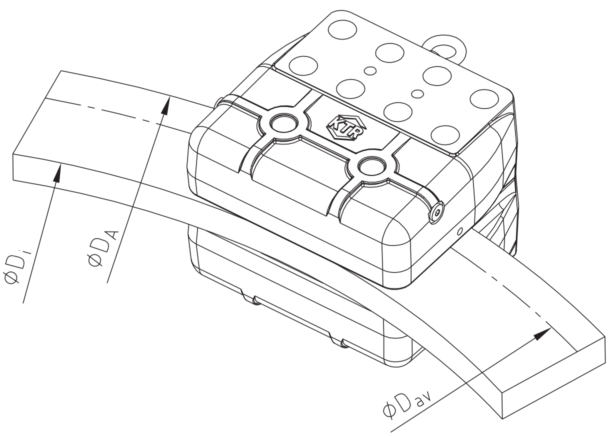
Calculation of brake disk

$D_{i\ min.} = \sqrt{D_{av}^2 - 200 \cdot D_{av} + 46000}$

$D_{av} = \sqrt{D_i^2 - 36000} + 100$

$D_{A\ min.} = D_i + 250$

Assembly of brake externally

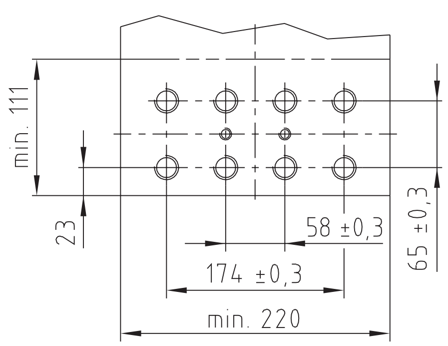


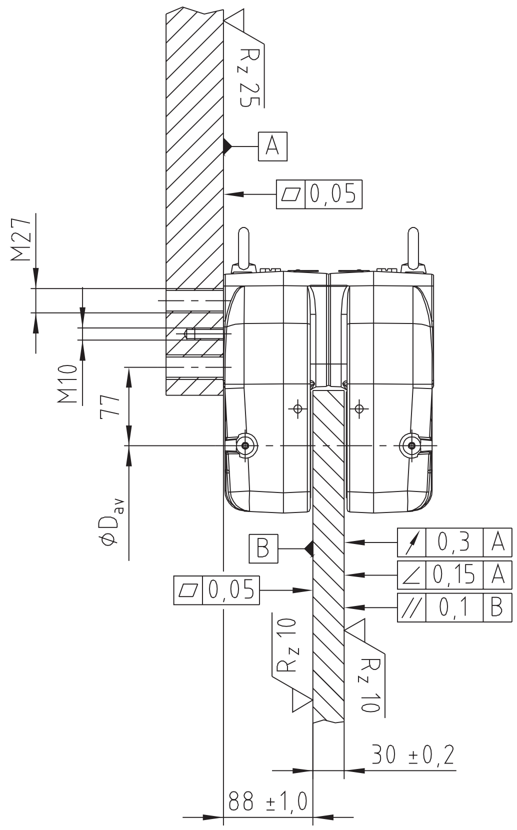
Calculation of brake disk

$D_{av} = D_A - 102$

$D_{i\ max.} = D_A - 240$

Connection dimensions of brake

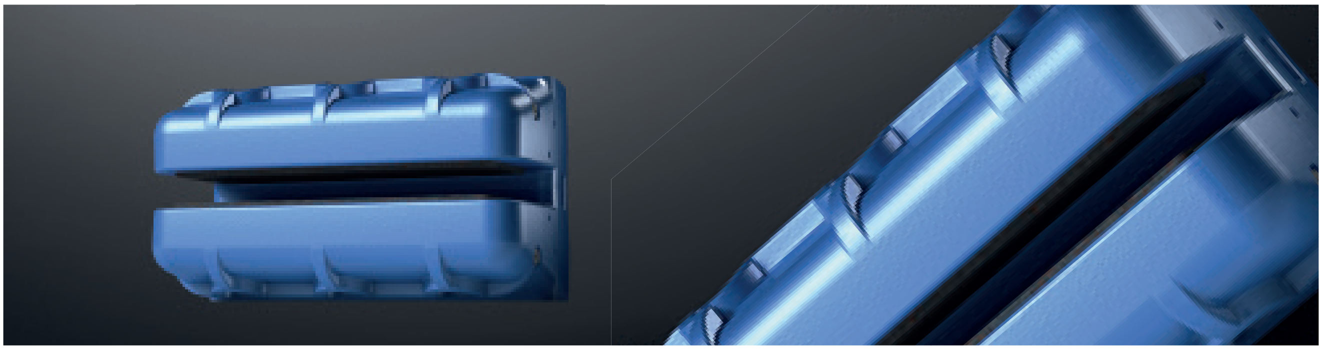


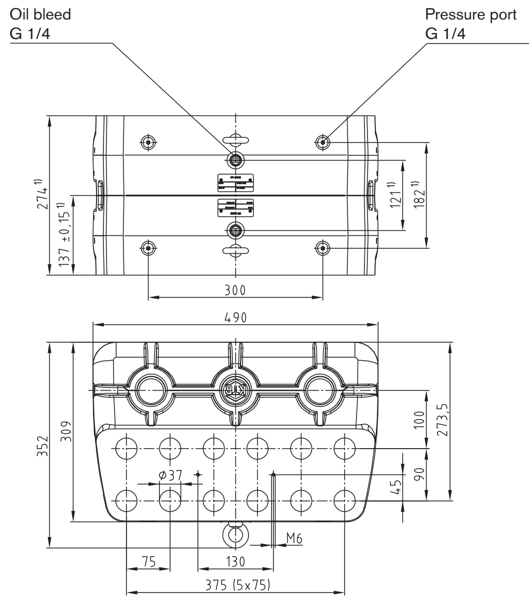


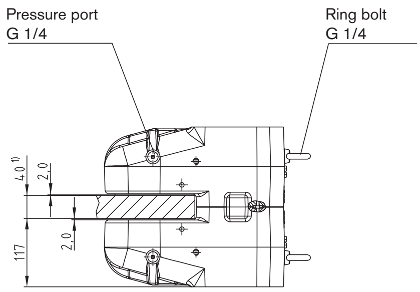
Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Hydraulic brake system







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

KTR-STOP® YAW L			
Total weight	approx. 176 kg 1)	Max. clamping force	542 kN
Width of brake pad	138 mm	Max. operating pressure (up to μ = 0.4)	160 bar
Surface of each brake pad	58.000 mm²	Thickness of brake disk3)	40 mm - 60 mm
Max. wear of each brake pad	7 mm (Material: organic)	Assembly of brake externally	2000 mm
Nominal coefficient of friction 2)	μ = 0,4	Min. diameter of brake disk ØD$_A$	
Total brake piston surface - complete brake	678 cm²	Assembly of brake internally	2500 mm
Volume with 1 mm stroke - complete brake	67,8 cm³	Min. diameter of brake disk ØD$_i$	
Pressure port	G 1/4	Operation temperature	-20 °C to +50 °C
Oil bleed	G 1/4		

2) The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.
3) Other thickness of disk on request.

Calculation of braking force/braking torque

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

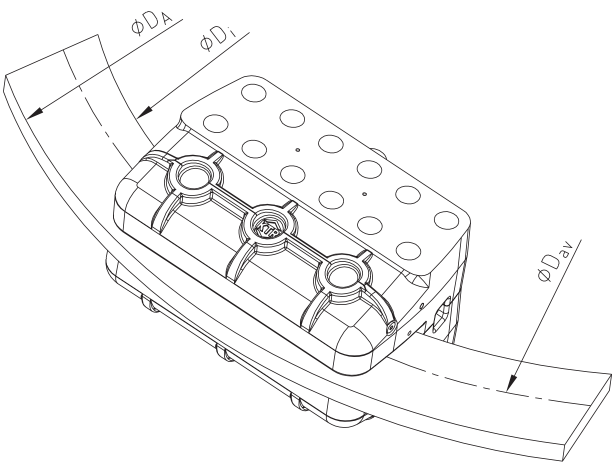
$$M_b = z \cdot F_b \cdot \frac{D_{av}}{2}$$

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]

Ordering example:

KTR-STOP®	YAW L	A -	40
KTR brake	Size of brake	Option	Thickness of brake disk

Assembly of brake internally



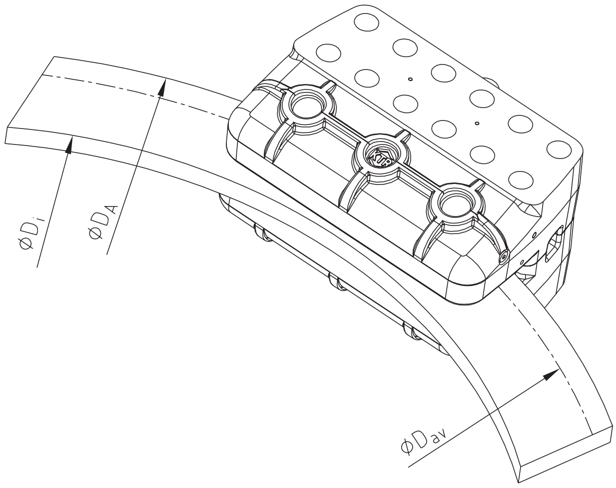
Calculation of brake disk

$$D_{i\,min.} = \sqrt{D_{av}^2 - 270 \cdot D_{av} + 200000}$$

$$D_{av} = \sqrt{D_i^2 - 180000} + 135$$

$$D_{A\,min.} = D_i + 320$$

Assembly of brake externally

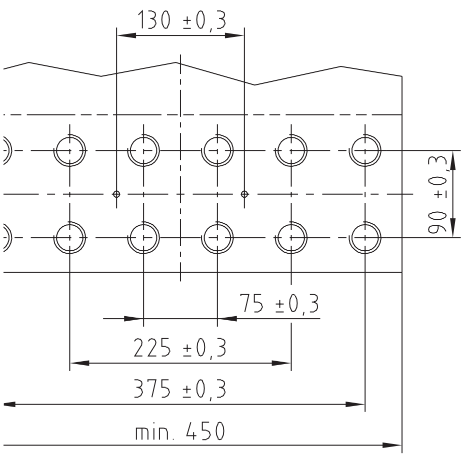


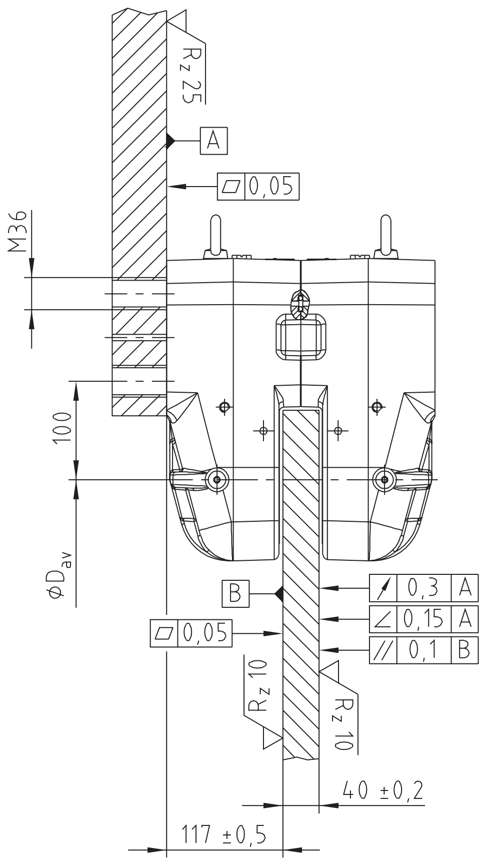
Calculation of brake disk

$$D_{av} = D_A - 136$$

$$D_{i\,max.} = D_A - 320$$

Connection dimensions of brake

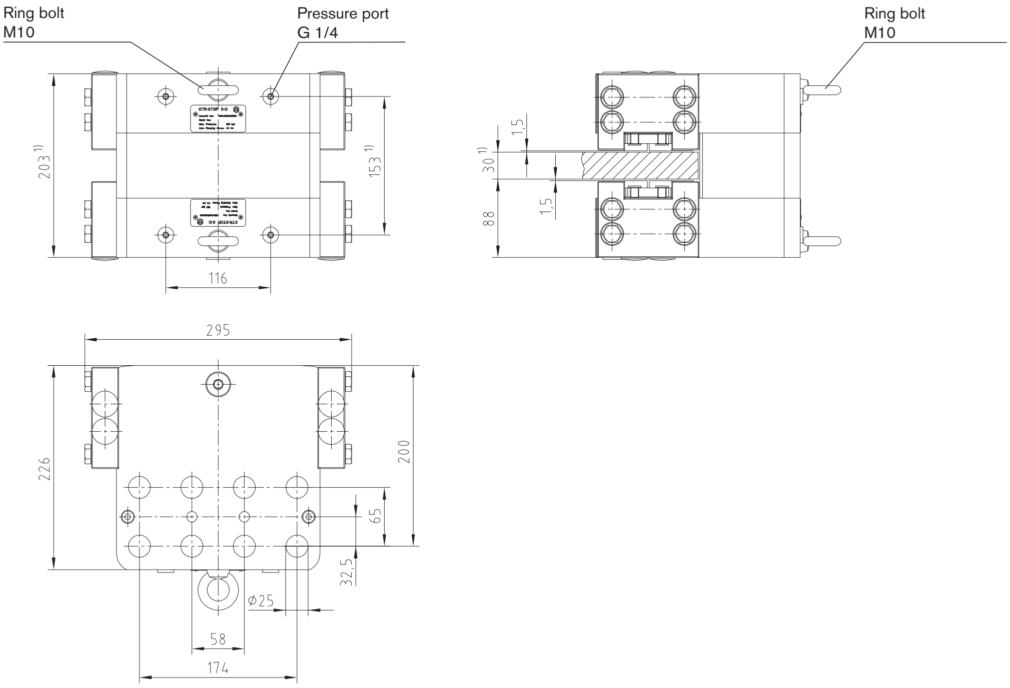




Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Hydraulic brake system



KTR-STOP® S-D				
Total weight		approx. 67,5 kg [1]	Max. clamping force	141 kN
Width of brake pad		110 mm	Max. operating pressure	160 bar
Surface of each brake pad	organic	21.000 mm²	Thickness of brake disk	20 mm - 40 mm
	powder metal	14.000 mm²	Pressure port	G 1/4
Max. wear of each brake pad		6 mm	Min. diameter of brake disk $ØD_A$	400 mm
Nominal coefficient of friction [2]		μ = 0,4	Operation temperature	-20 °C to +50 °C
Total brake piston surface - complete brake		177 cm²		
Volume with 1 mm stroke - complete brake		17,7 cm³		

[2] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.

Braking torque [Nm] with brake disk Ø [mm]			
Brake disk Ø [mm]	400	710	1000
Braking torque [Nm]	16900	34400	50700

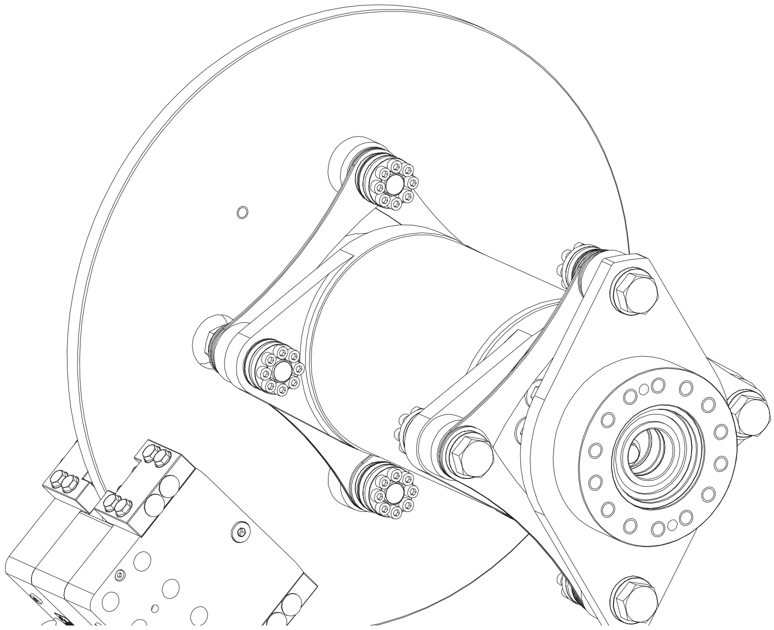
Calculation of braking force/braking torque

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

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

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]

Ordering example:	KTR-STOP®	S-D	A	- 30
	KTR brake	Size of brake	Option	Thickness of brake disk

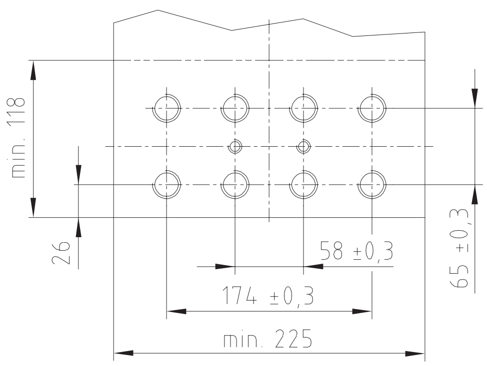


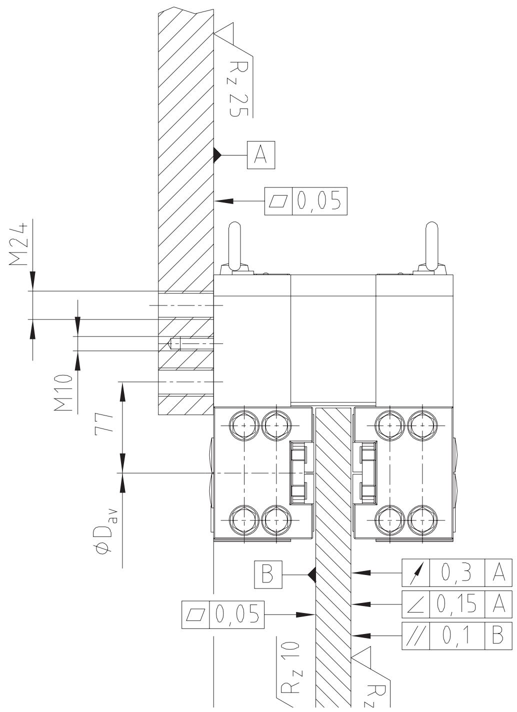
Calculation of brake disk

$$D_{C\ max.} = D_A - 230$$

$$D_{av} = D_A - 100$$

Connection dimensions of brake

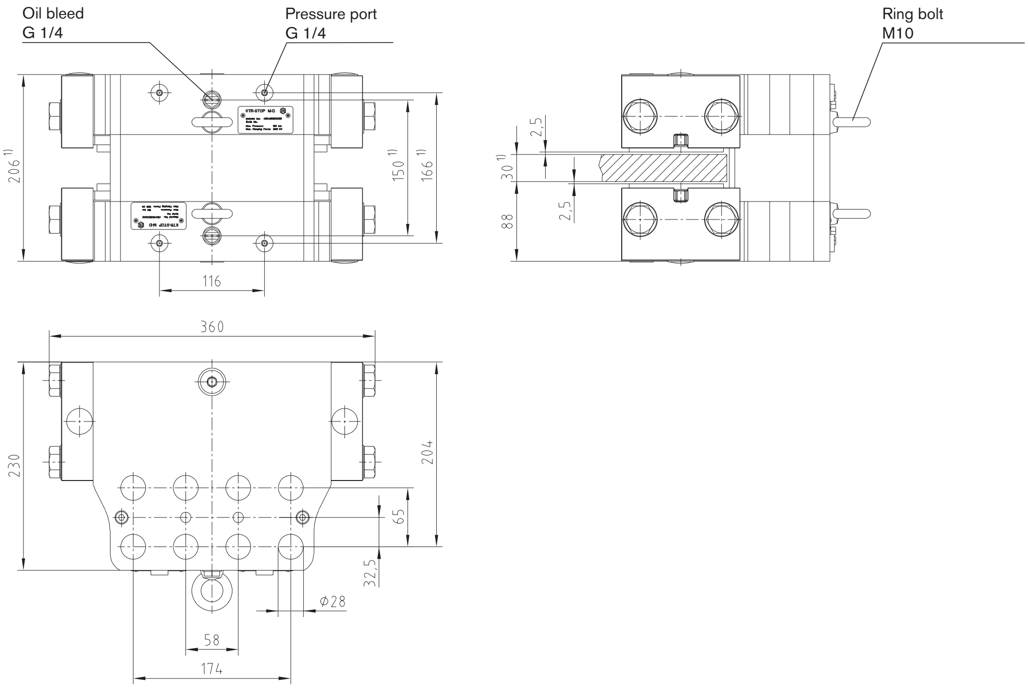




Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Hydraulic brake system



KTR-STOP® M-D				
Total weight		approx. 76 kg [1]	Max. clamping force	203 kN
Width of brake pad		110 mm	Max. operating pressure	160 bar
Surface of each brake pad	organic	26.000 mm²	Thickness of brake disk	20 mm - 40 mm
	powder metal	–	Pressure port	G 1/4
Max. wear of each brake pad		6 mm	Oil bleed	G 1/4
Nominal coefficient of friction [2]		µ = 0,4	Min. diameter of brake disk ØD_A	800 mm
Total brake piston surface - complete brake		254 cm²	Operation temperature	-20 °C to +50 °C
Volume with 1 mm stroke - complete brake		25,4 cm³		

[2] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.

Braking torque [Nm] with brake disk Ø [mm]			
Brake disk Ø [mm]	800	1500	2000
Braking torque [Nm]	56500	113300	153900

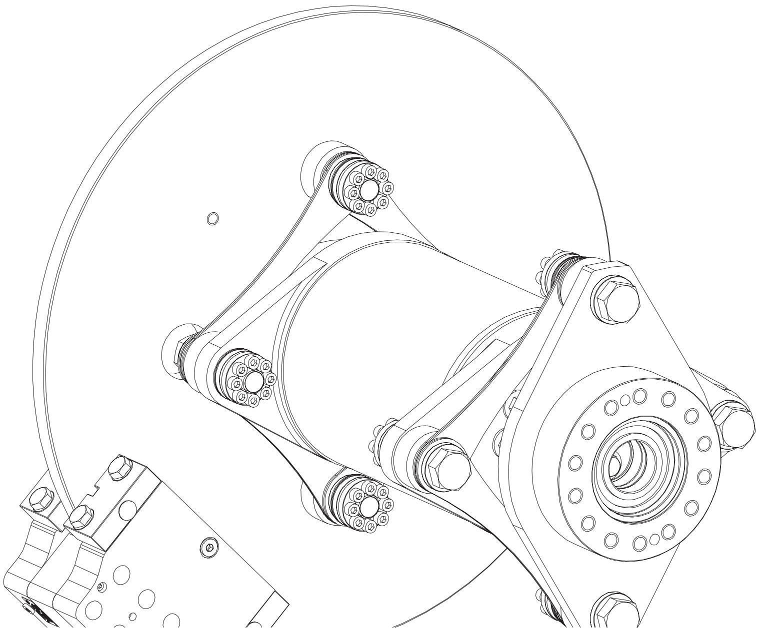
Calculation of braking force/braking torque

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

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

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]

Ordering example:	KTR-STOP®	M-D	A	- 30
	KTR brake	Size of brake	Option	Thickness of brake disk

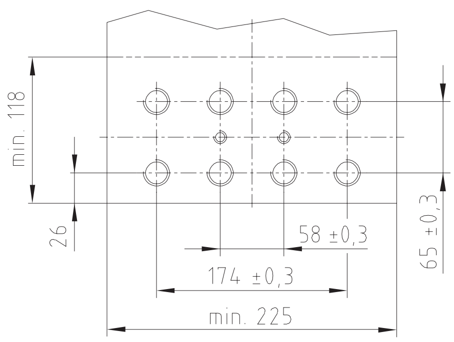


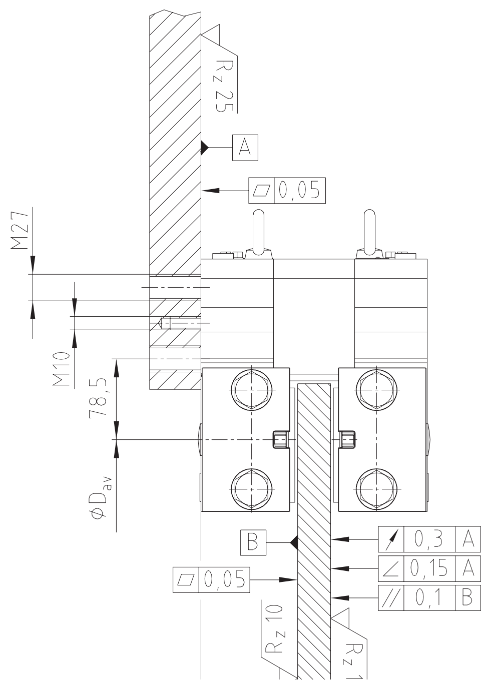
Calculation of brake disk

$D_{C\ max.} = D_A - 245$

$D_{av} = D_A - 104$

Connection dimensions of brake

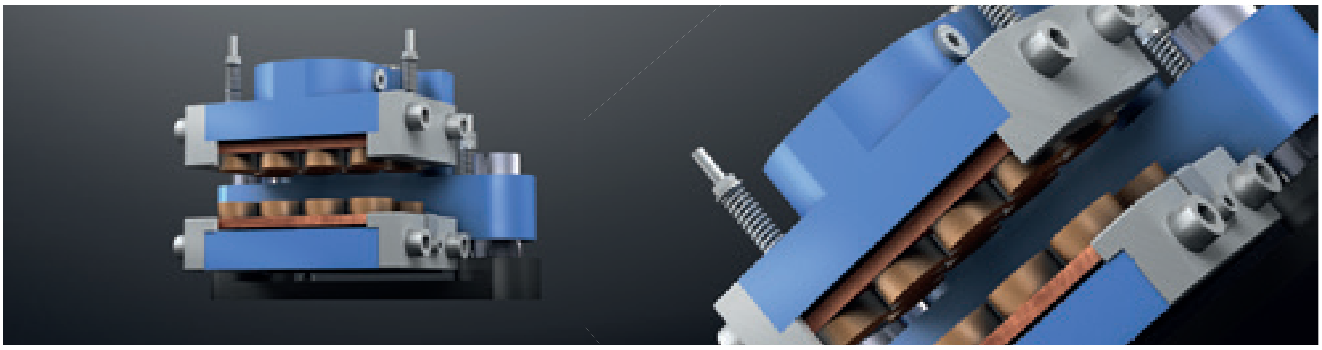


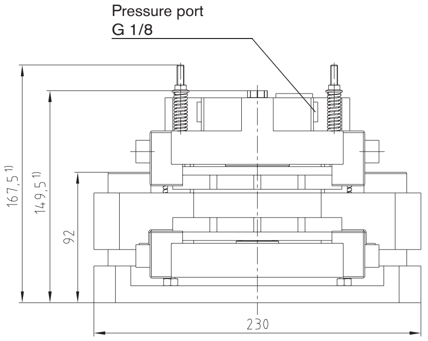


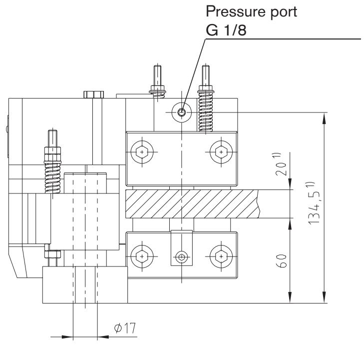
Optional

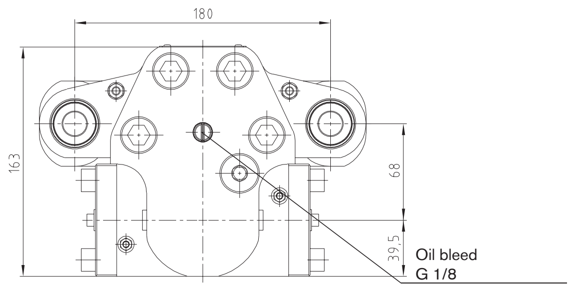
- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Hydraulic brake system









[1] Dimensions and weight depend on thickness of brake disk.

KTR-STOP® XS-A-F				
Total weight		approx. 18 kg [1]	Max. clamping force	16,5 kN
Width of brake pad		70 mm	Max. operating pressure	105 bar
Surface of each brake pad	organic	8.000 mm²	Thickness of brake disk	10 mm - 30 mm
	powder metal	5.800 mm²	Pressure port	G 1/8
Max. wear of each brake pad		5 mm	Oil bleed	G 1/8
Nominal coefficient of friction [2]		μ = 0,4	Backlash on axes - towards mounting surface	5 mm
Total brake piston surface - complete brake		15,9 cm²	Backlash on axes - away from mounting surface	5 mm
Volume with 1 mm stroke - complete brake		1,59 cm³	Min. diameter of brake disk $ØD_A$	300 mm
			Operation temperature	-20 °C to +50 °C

[2] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.

Braking torque [Nm] with brake disk Ø [mm]			
Brake disk Ø [mm]	315	560	800
Braking torque [Nm]	1510	3120	4710

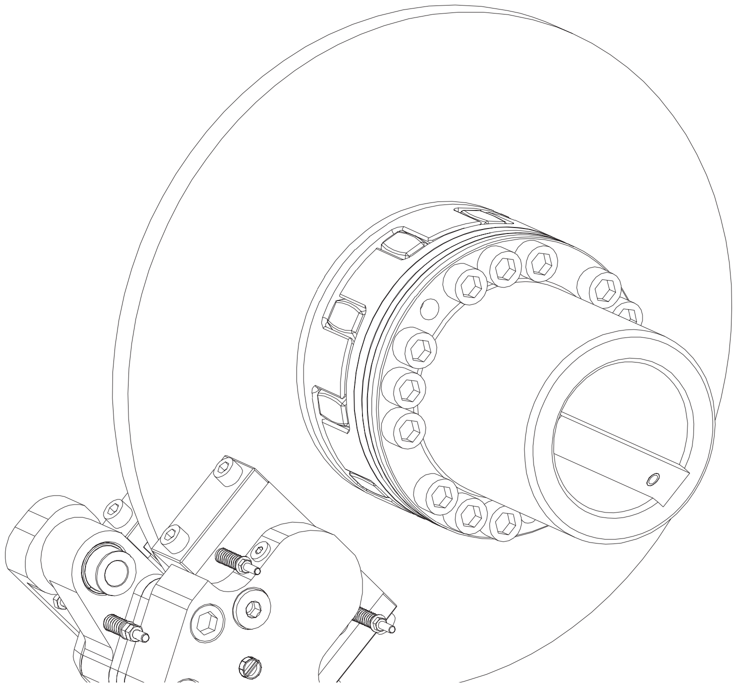
Calculation of braking force/braking torque

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

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

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]

Ordering example:	KTR-STOP®	XS	-	A	-	F	A	-	30
	KTR brake	Size of brake		Active		Floater	Option		Thickness of brake disk

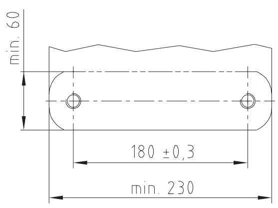


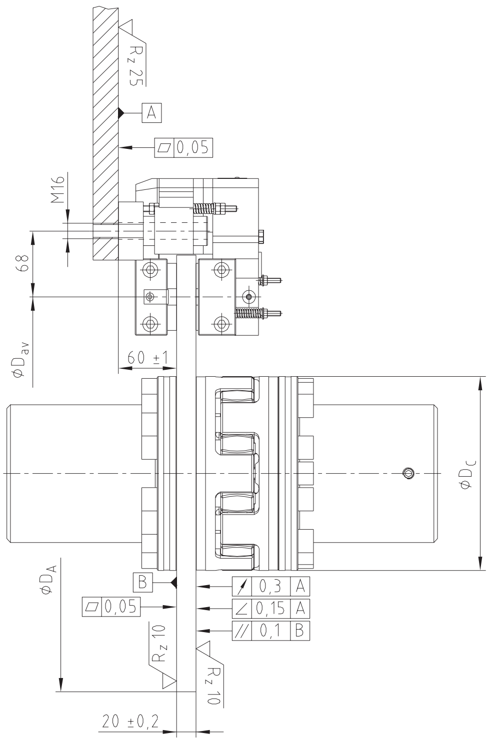
Calculation of brake disk

$$D_{C\ max.} = D_A - 195$$

$$D_{av} = D_A - 86$$

Connection dimensions of brake

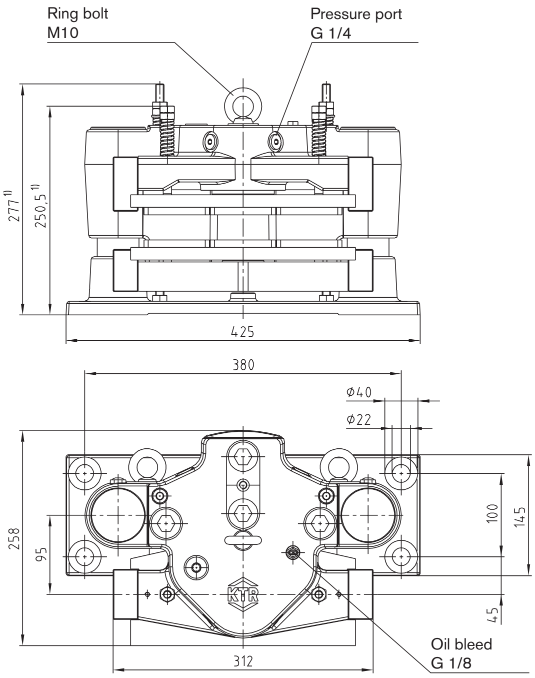


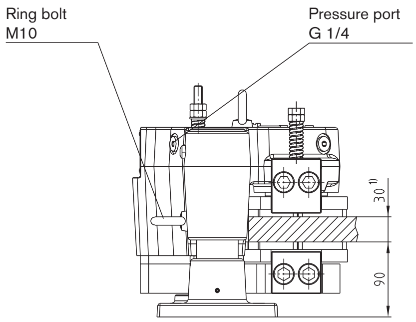


Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Hydraulic brake system





[1)] Dimensions and weight depend on thickness of brake disk.

KTR-STOP® S-A-F				
Total weight		approx. 76 kg [1)]	Max. clamping force	55 kN
Width of brake pad		125 mm	Max. operating pressure	125 bar
Surface of each brake pad	organic	28.700 mm²	Thickness of brake disk	20 mm - 40 mm
	powder metal	26.800 mm²	Pressure port	G 1/4
Max. wear of each brake pad		6 mm	Oil bleed	G 1/8
Nominal coefficient of friction [2)]		μ = 0,4	Backlash on axles - towards mounting surface	5 mm
Total brake piston surface - complete brake		44,2 cm²	Backlash on axles - away from mounting surface	10 mm
Volume with 1 mm stroke - complete brake		4,42 cm³	Min. diameter of brake disk $ØD_A$	500 mm
			Operation temperature	-20 °C to +50 °C

[2)] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.

Braking torque [Nm] with brake disk Ø [mm]			
Brake disk Ø [mm]	500	710	1000
Braking torque [Nm]	8100	12700	19100

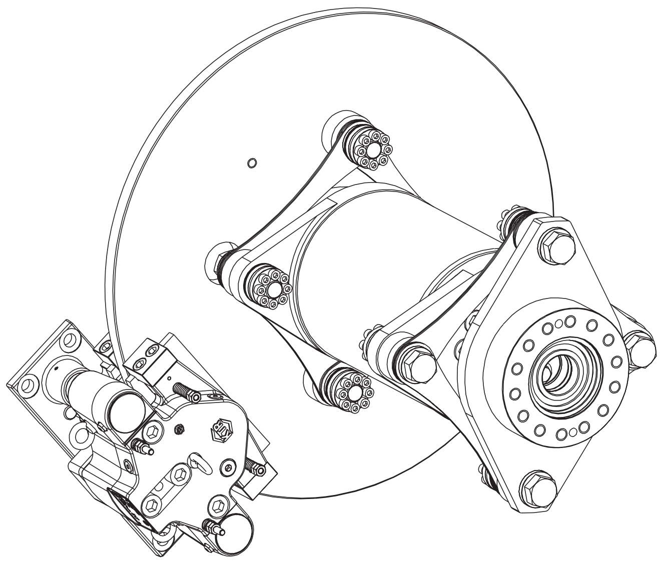
Calculation of braking force/braking torque

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

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

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]

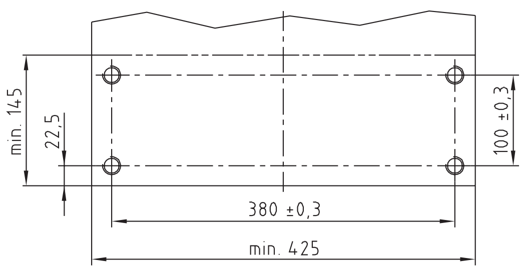
Ordering example:	KTR-STOP®	S	-	A	-	F	A	-	30
	KTR brake	Size of brake		Active		Floater	Option		Thickness of brake disk

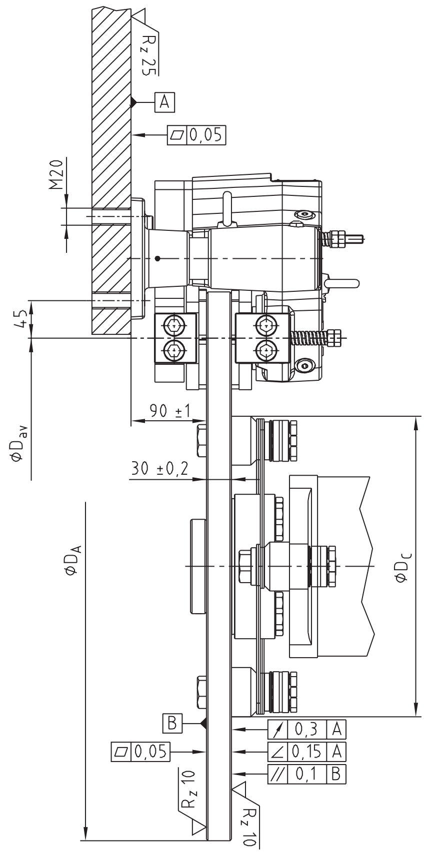


Calculation of brake disk

up to $ØD_A$ = 1000 mm	from $ØD_A$ = 1000 mm to $ØD_A$ = 1800 mm	from $ØD_A$ = 1800 mm
$D_{C\ max.} = D_A - 260$	$D_{C\ max.} = D_A - 250$	$D_{C\ max.} = D_A - 240$
$D_{av} = D_A - 130$	$D_{av} = D_A - 120$	$D_{av} = D_A - 110$

Connection dimensions of brake

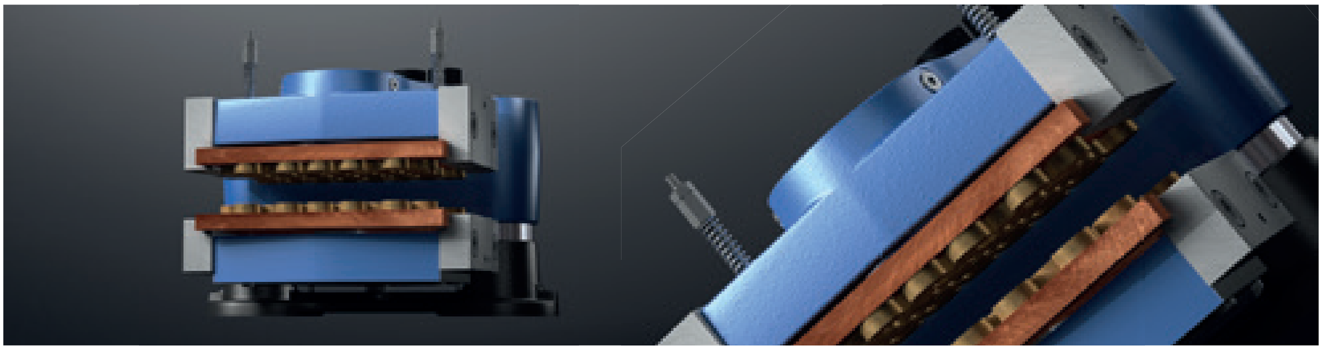


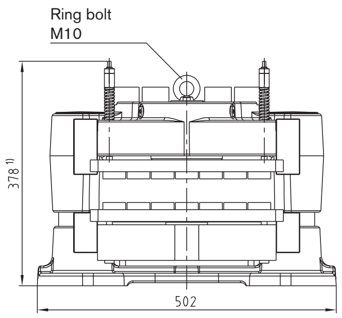


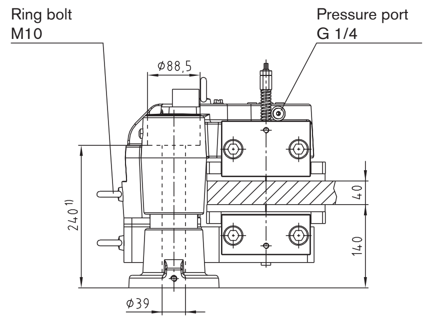
Optional

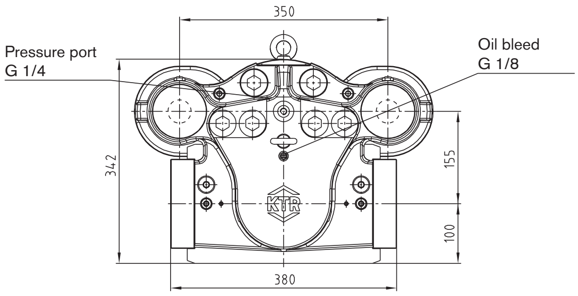
- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Hydraulic brake system









[1)] Dimensions and weight depend on thickness of brake disk.

KTR-STOP® M-A-F			
Total weight	approx. 172 kg [1)]	Max. clamping force	130 kN
Width of brake pad	200 mm	Max. operating pressure	115 bar
Surface of each brake pad organic	57.900 mm²	Thickness of brake disk	25 mm - 50 mm
powder metal	53.500 mm²	Pressure port	G 1/4
Max. wear of each brake pad	8 mm	Oil bleed	G 1/8
Nominal coefficient of friction [2)]	μ = 0,4	Backlash on axles - towards mounting surface	5 mm
Total brake piston surface - complete brake	113 cm²	Backlash on axles - away from mounting surface	10 mm
Volume with 1 mm stroke - complete brake	11,3 cm³	Min. diameter of brake disk $ØD_A$	800 mm
		Operation temperature	-20 °C to +50 °C

[2)] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.

Braking torque [Nm] with brake disk Ø [mm]			
Brake disk Ø [mm]	800	1500	2000
Braking torque [Nm]	31200	67600	93600

Calculation of braking force/braking torque

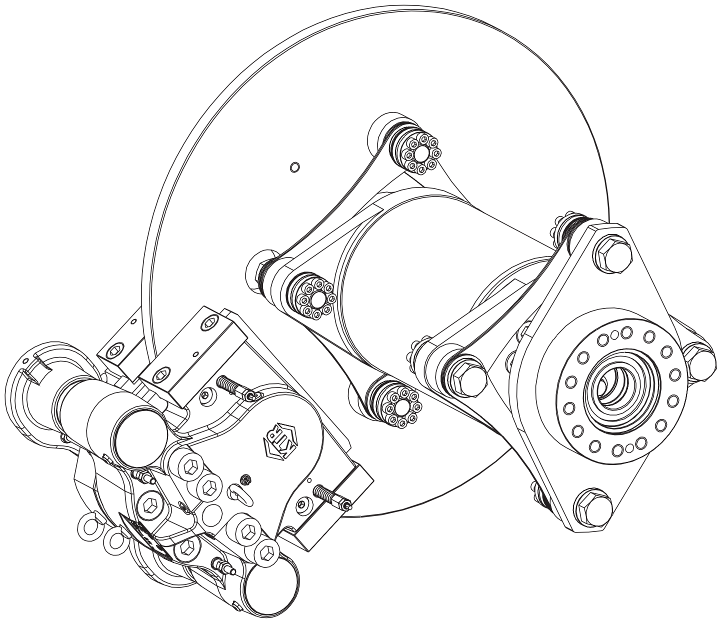
$$F_b = F_c \cdot 2 \cdot \mu$$

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

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]

Ordering example:

KTR-STOP®	M	-	A	-	F	A	-	40
KTR brake	Size of brake		Active		Floater	Option		Thickness of brake disk

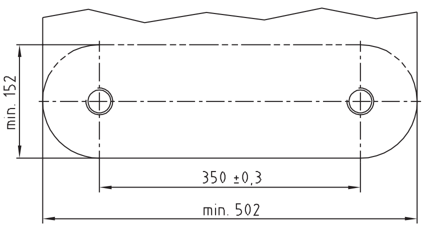


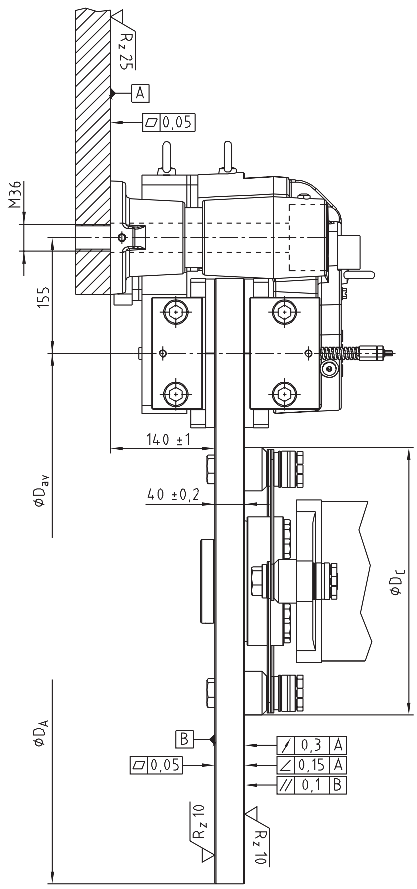
Calculation of brake disk

$D_{C\ max.} = D_A - 410$

$D_{av} = D_A - 200$

Connection dimensions of brake



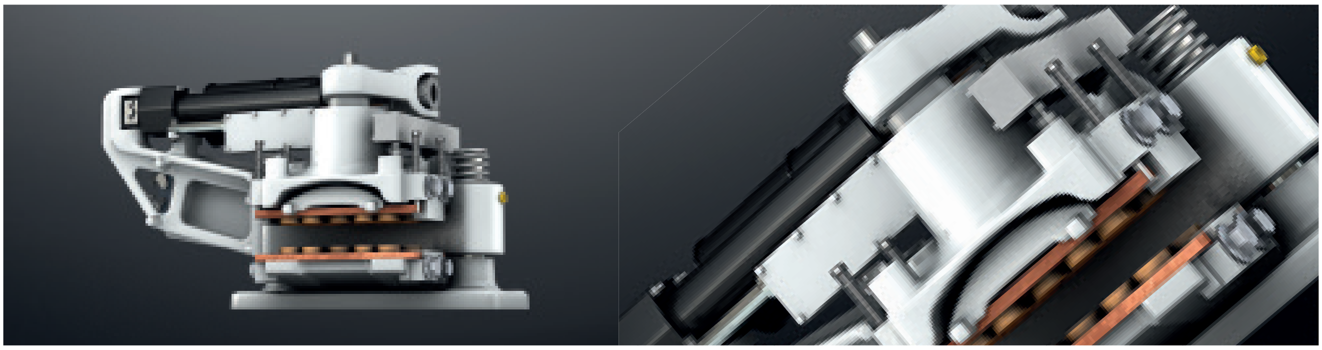


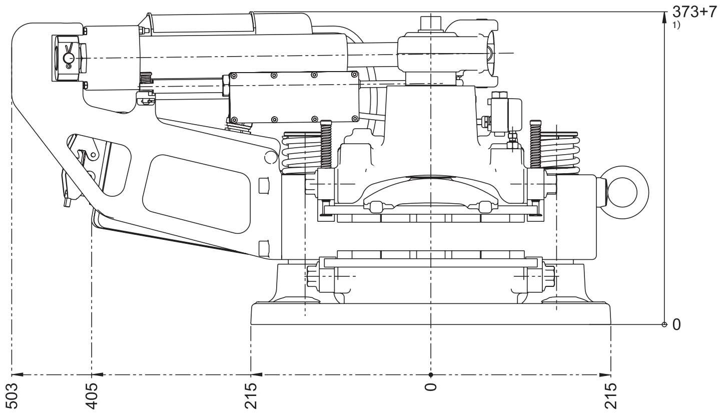
Optional

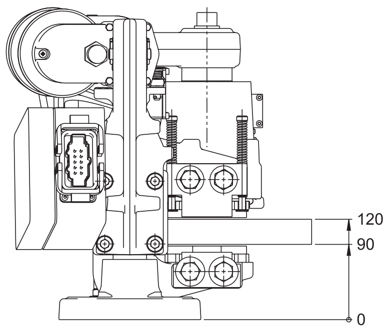
- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

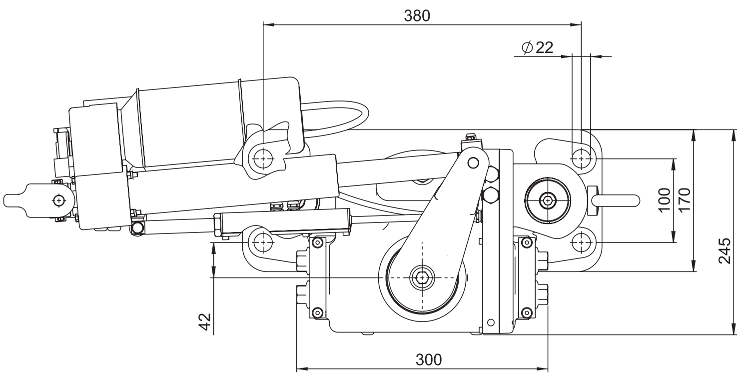
EMB-STOP S-A-xx-F Lever
Active floating caliper brakes

Electromechanical brake system









EMB-STOP S-A-xx-F Lever	
Total weight	90 kg
Thickness of brake disk	25 - 35 mm
Wear of pad on each side (max.)	4 mm
Coefficient of friction of pad, nominal value [2)]	μ = 0,4
Clamping force, min.	30 kN
Clamping force, max.	60 kN
Operating temperature range	-30 to +50 °C
Motor output	300 W
Motor voltage	230 VAC
Voltage of electric signals	230 VAC / 24 VDC

1) Tolerances depending on air gap.
2) The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.

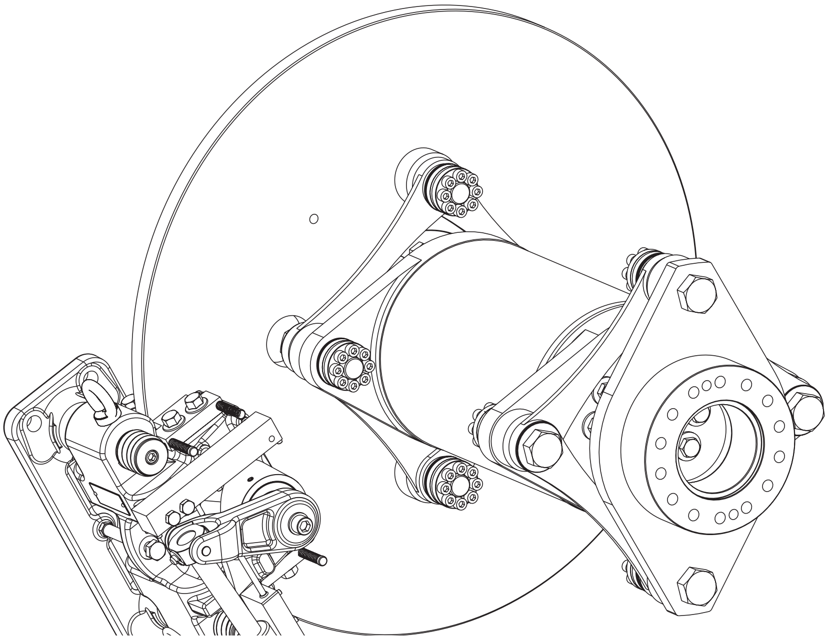
Calculation of braking force/braking torque

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

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

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]

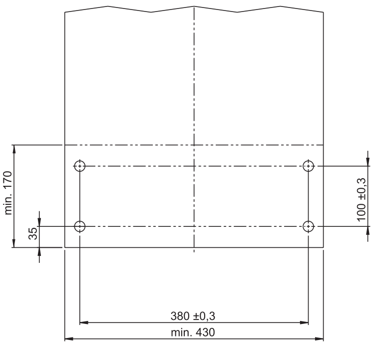
Ordering example:	EMB-STOP	S	-	A	-	50	-	F	L	-	30
	EMB brake	Size of brake		Active		Clamping force		Floating caliper („Floater“)	Option		Thickness of brake disk

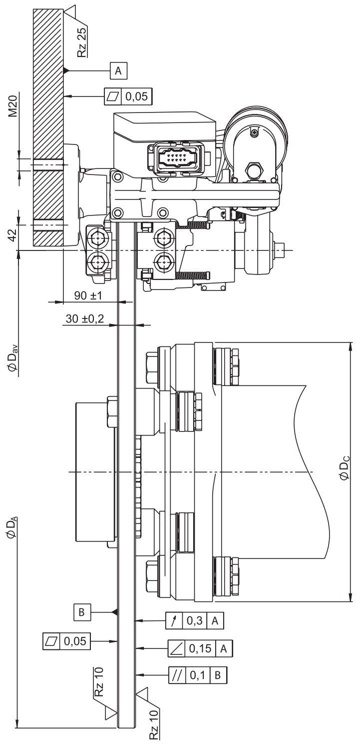


Calculation of brake disk

$ØD_A$ = 500 ... 1000 mm	$ØD_A$ = 1000 ... 1800 mm	$ØD_A$ = 1800 ... 3000 mm
$D_{C\ max.} = D_A - 130$	$D_{C\ max.} = D_A - 110$	$D_{C\ max.} = D_A - 105$

Connection dimensions of brake

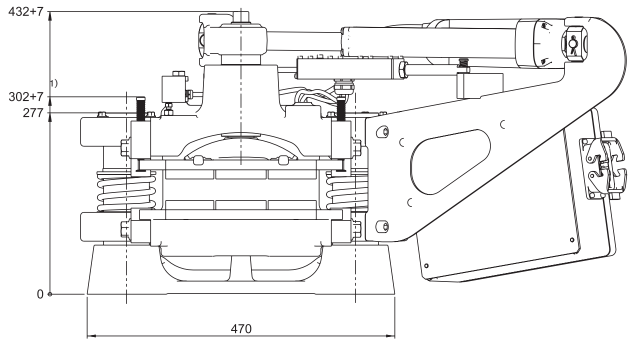


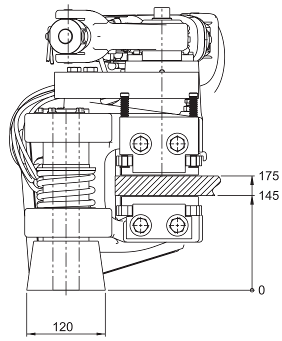


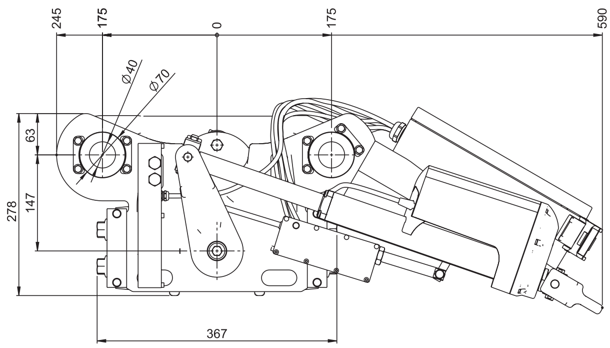
Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Electromechanical brake system







EMB-STOP M-A-xx-F Lever	
Total weight	115 kg
Thickness of brake disk	25 - 35 mm
Wear of pad on each side (max.)	4 mm
Coefficient of friction of pad, nominal value [2]	μ = 0,4
Clamping force, min.	80 kN
Clamping force, max.	125 kN
Operating temperature range	-30 to +50 °C
Motor output	300 W
Motor voltage	24 VDC
Voltage of electric signals	230 VAC / 24 VDC

[1] Tolerances depending on air gap.
[2] The coefficient of friction each depends on the application or material of the brake, respectively. Please consult with KTR.

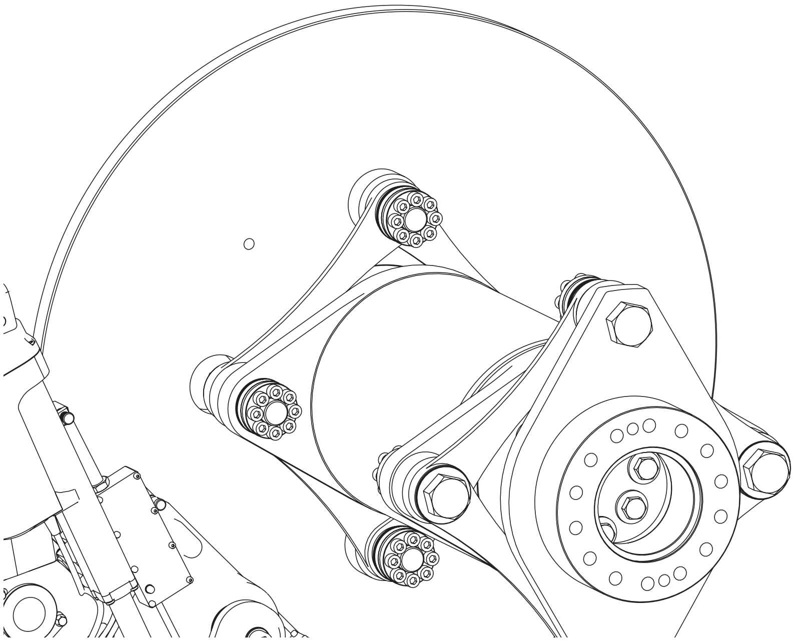
Calculation of braking force/braking torque

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

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

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]

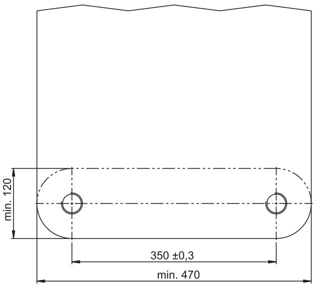
Ordering example:	EMB-STOP	M	-	A	-	125	-	F	L	-	35
	EMB brake	Size of brake		Active		Clamping force		Floating caliper („Floater“)	Option		Thickness of brake disk

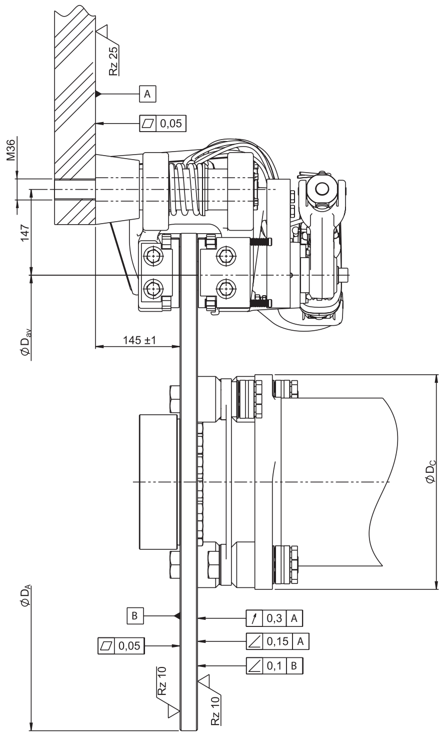


Calculation of brake disk
$ØD_A \geq 800$ mm

$$D_{av} = D_A - 130$$

Connection dimensions of brake

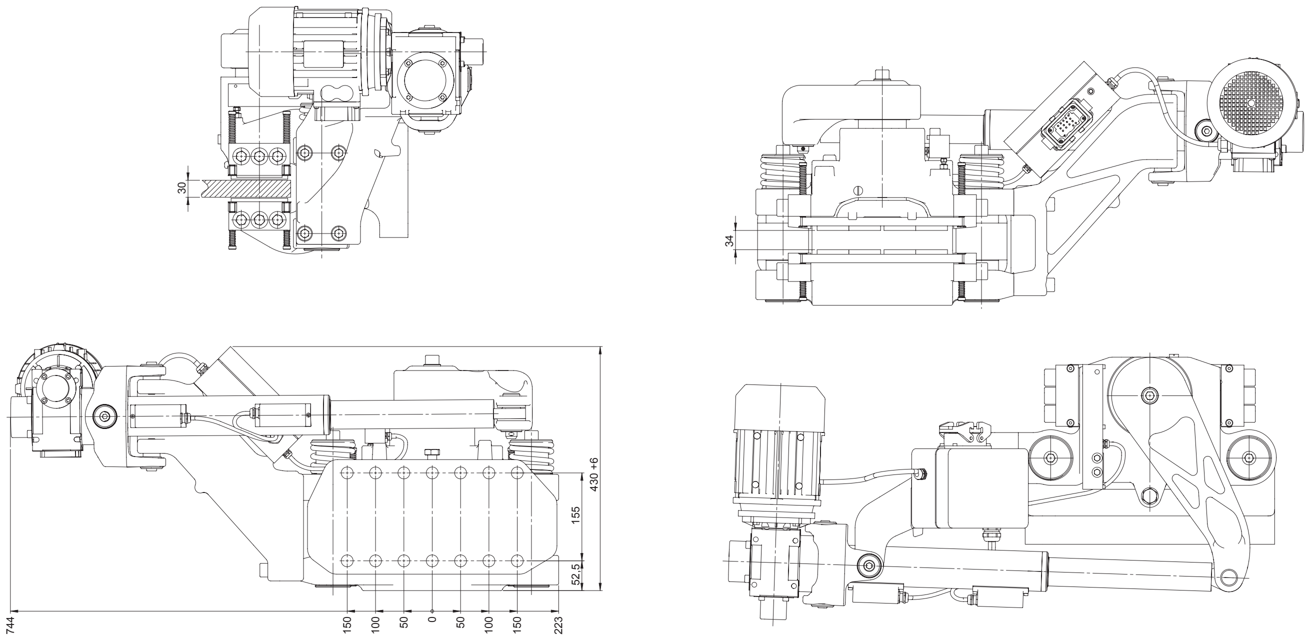




Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Electromechanical brake system



EMB-STOP L-A-xx-F Lever	
Total weight	280 kg
Thickness of brake disk	25 - 40 mm
Wear of pad on each side (max.)	5 mm
Coefficient of friction of pad, nominal value [2]	µ = 0,4
Clamping force, min.	125 kN
Clamping force, max.	375 kN
Operating temperature range	-30 to +50 °C
Motor output	1 100 W
Motor voltage	400 VAC
Voltage of electric signals	230 VAC / 24 VDC

[1] Tolerances depending on air gap.
[2] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.

Calculation of braking force/braking torque

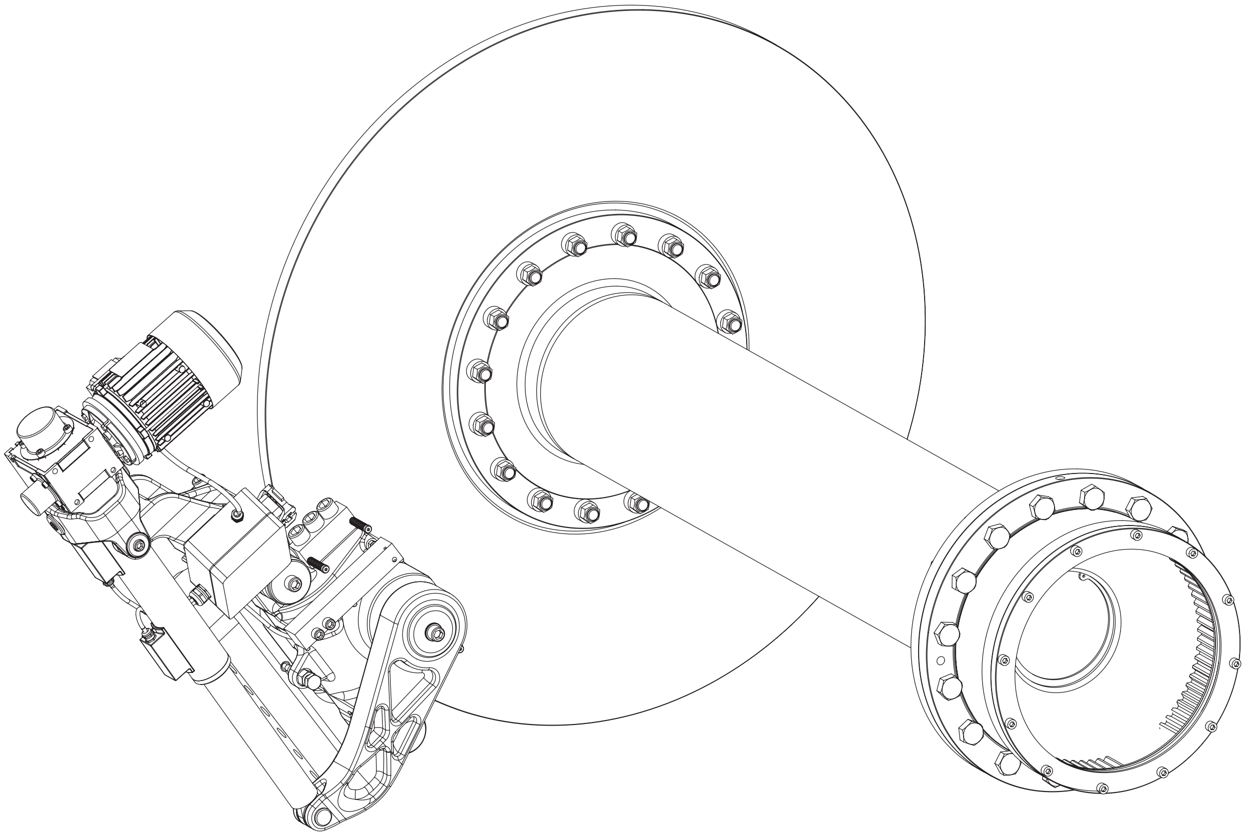
$$F_b = F_c \cdot 2 \cdot \mu$$

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

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]

Ordering example:

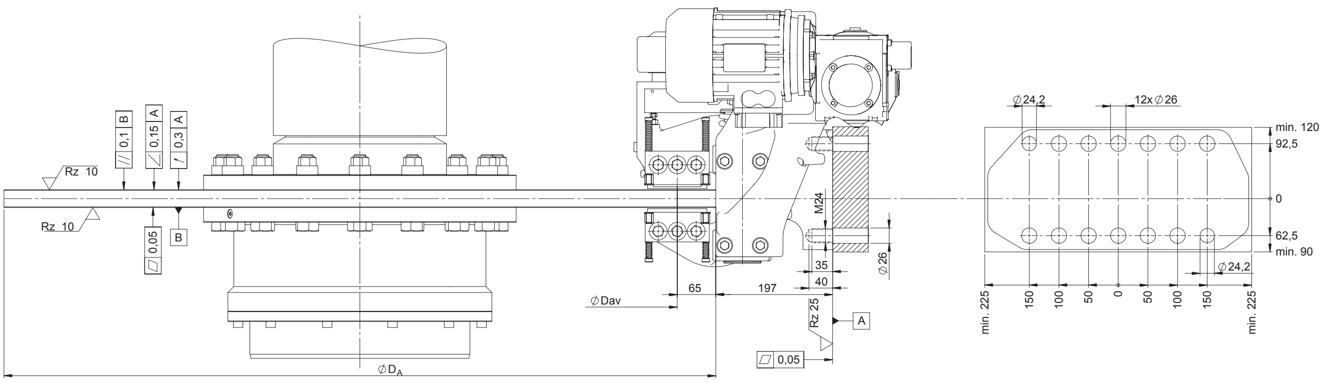
EMB-STOP	L	-	A	-	380	-	F	L	-	30
EMB brake	Size of brake		Active		Clamping force		Floating caliper („Floater“)	Option		Thickness of brake disk



Calculation of brake disk

$ØD_A \le 1800$ mm	$ØD_A > 1800$ mm
$D_{av} = D_A - 130$	$D_{av} = D_A - 120$

Connection dimensions of brake

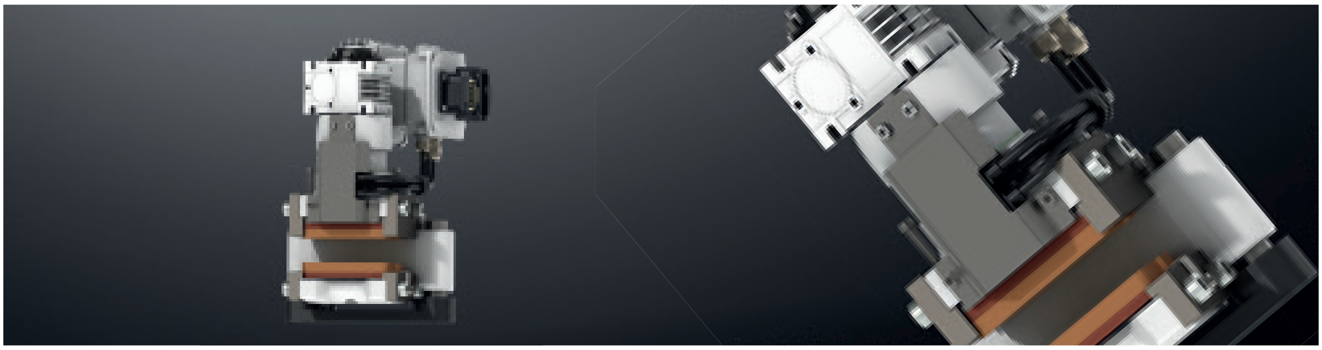


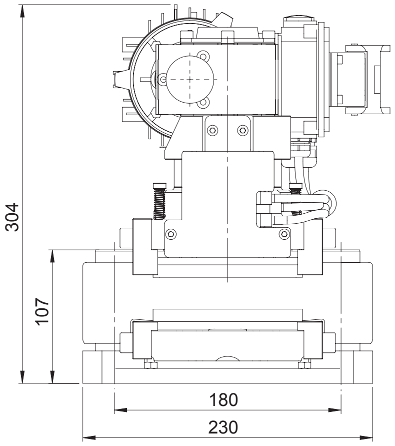
Optional

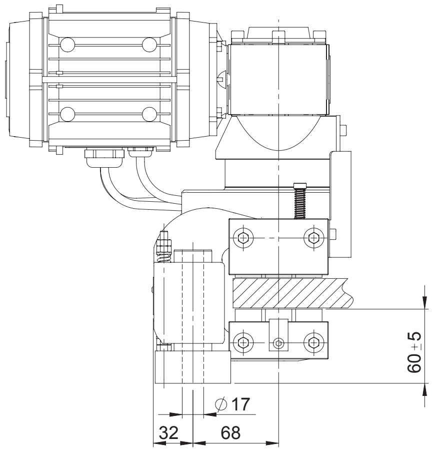
- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

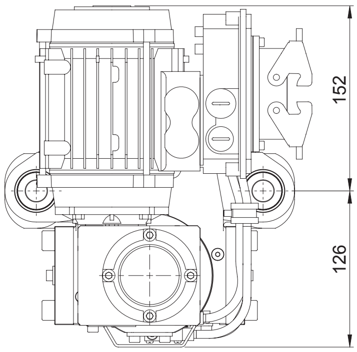
EMB-STOP XS-A-xx-F
Active floating caliper brakes

Electromechanical brake system









EMB-STOP XS-A-xx-F				
Total weight		approx. 25 kg	Thickness of brake disk	20 mm - 30 mm
Width of brake pad		70 mm	Operating voltage	400 VAC, 50 Hz
Surface of each brake pad	organic	8.000 mm²	Size of industrial connector	Han10B / HAN18EE (male)
	powder metal	5.800 mm²	Backlash on axes - towards mounting surface	5 mm
Wear of pad on each side (max.)		5 mm	Backlash on axes - away from mounting surface	5 mm
Coefficient of friction of pad, nominal value [2)]		μ = 0,4	Min. diameter of brake disk $Ø^{DA}$	300 mm
Max. clamping force		12 kN	Operation temperature	-20 °C ... +50 °C

[2)] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.

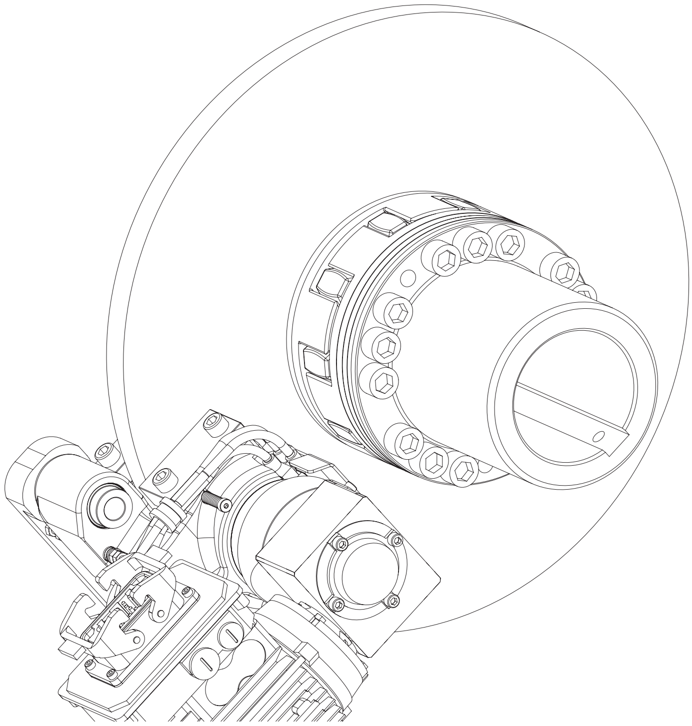
Calculation of braking force/braking torque

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

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

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]

Ordering example:	EMB-STOP	XS	-	A	-	12	-	F	A	-	30
	EMB brake	Size of brake		Active		Clamping force		Floating caliper („Floater“)	Option		Thickness of brake disk

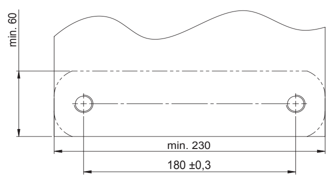


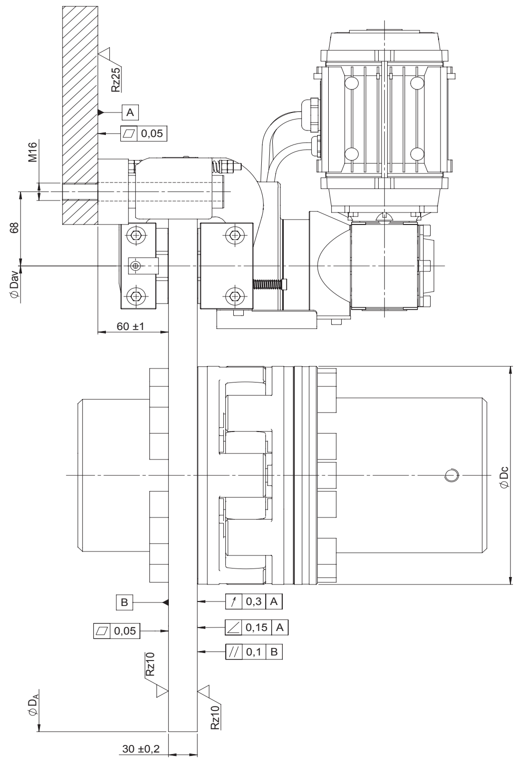
Calculation of brake disk

$$D_{C\,max.} = D_A - 195$$

$$D_{av} = D_A - 86$$

Connection dimensions of brake



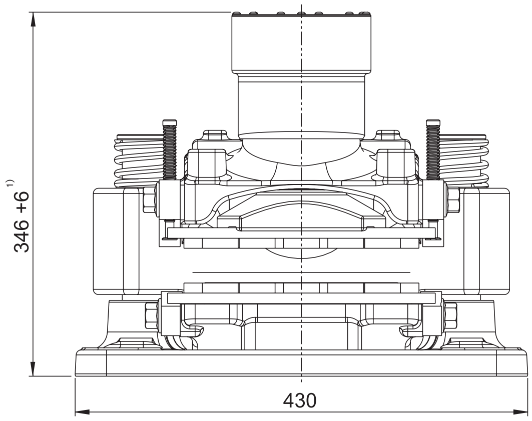


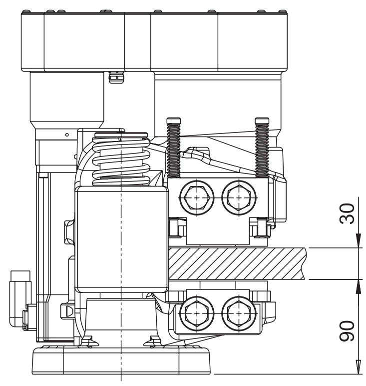
Optional

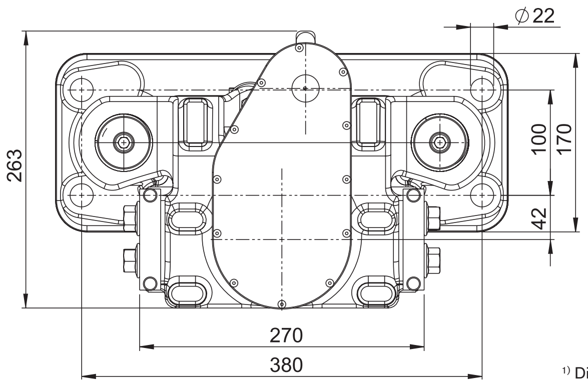
- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

EMB-STOP S-A-xx-F
Active floating caliper brakes

Electromechanical brake system







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

EMB-STOP S-A-xx-F	
Total weight	90 kg
Thickness of brake disk	25 - 35 mm
Wear of pad on each side (max.)	4 mm
Coefficient of friction of pad, nominal value [2)]	μ = 0,4
Clamping force, min.	30 kN
Clamping force, max.	60 kN
Operating temperature range	-30 to +50 °C
Motor output	250 W
Motor voltage	400 VAC
Voltage of electric signals	230 VAC / 24 VDC

2) The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.

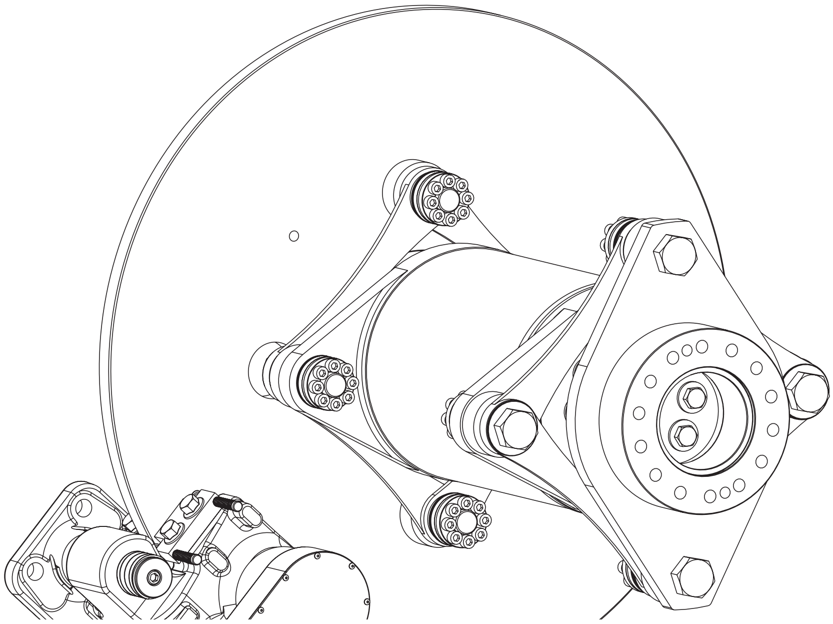
Calculation of braking force/braking torque

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

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

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]

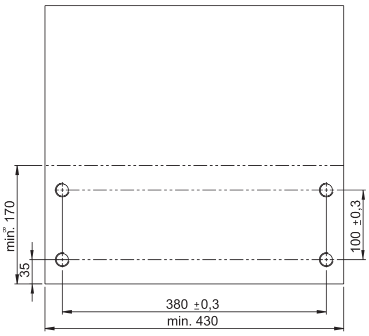
Ordering example:	EMB-STOP	S	-	A	-	50	-	F	A	-	30
	EMB brake	Size of brake		Active		Clamping force		Floating caliper („Floater“)	Option		Thickness of brake disk

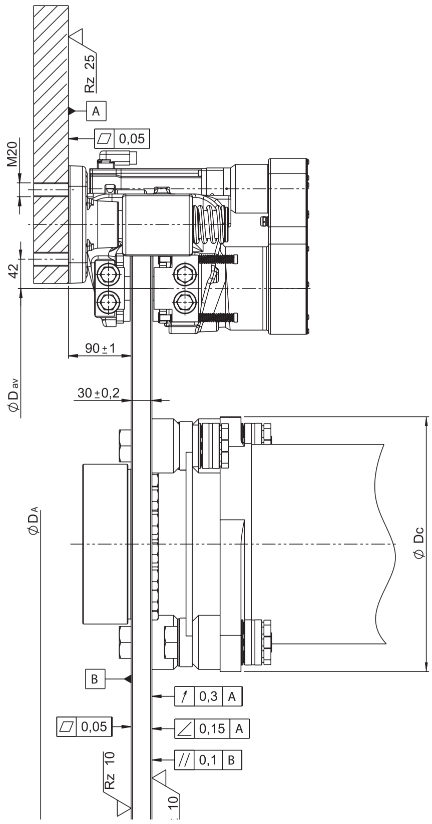


Calculation of brake disk

$ØD_A$ = 500 ... 1000 mm	$ØD_A$ = 1000 ... 1800 mm	$ØD_A$ = 1800 mm
$D_{av} = D_A - 130$	$D_{av} = D_A - 110$	$D_{av} = D_A - 105$

Connection dimensions of brake

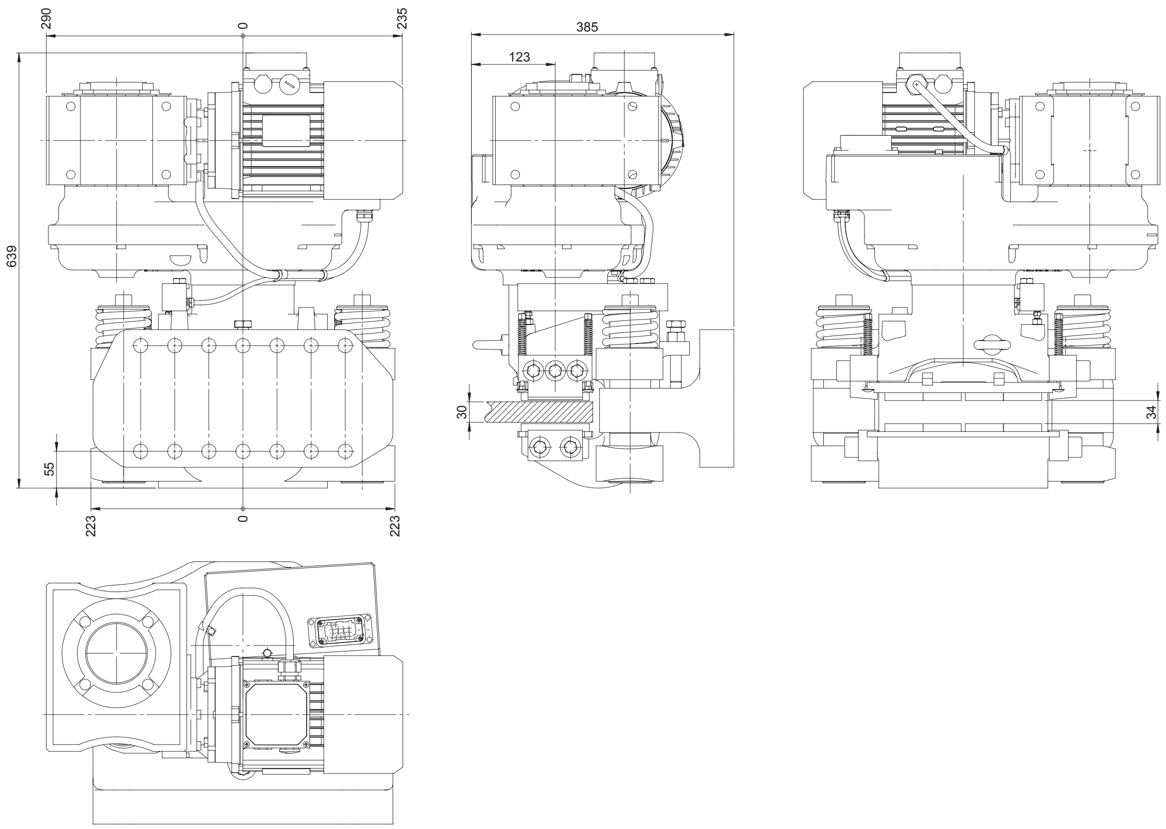




Optional

- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Electromechanical brake system



EMB-STOP L-A-xx-F	
Total weight	235 kg
Thickness of brake disk	25 - 40 mm
Wear of pad on each side (max.)	8 mm
Coefficient of friction of pad, nominal value [2)]	μ = 0,4
Clamping force, min.	125 kN
Clamping force, max.	375 kN
Operating temperature range	-30 to +50 °C
Motor output	1500 W
Motor voltage	400 VAC
Voltage of electric signals	230 VAC / 24 VDC

[2)] The coefficient of friction each depends on the application or material of the brake, respectively. Please consult with KTR.

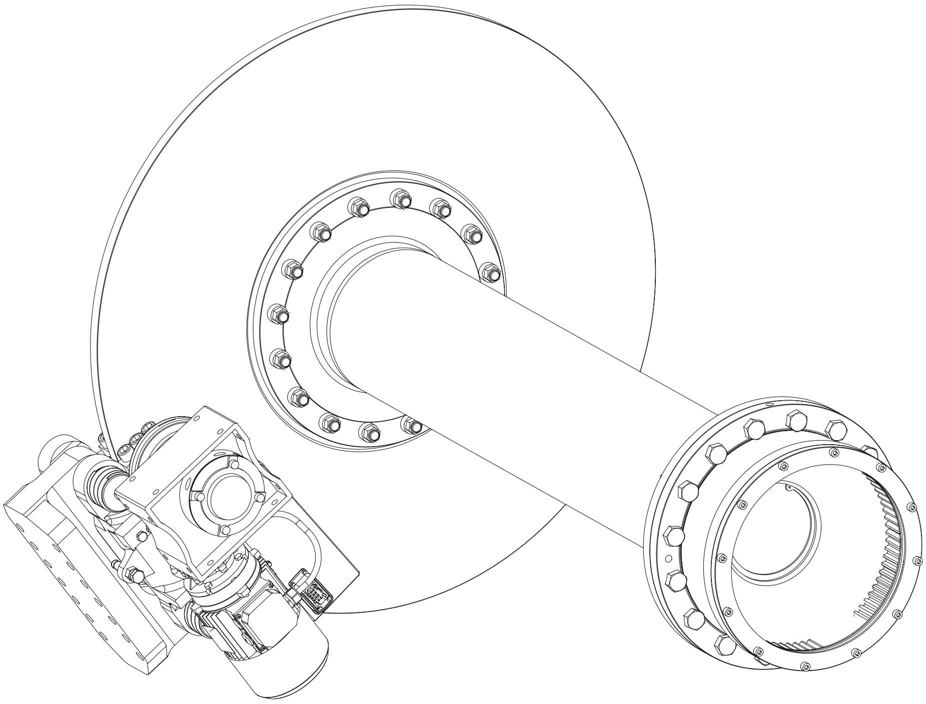
Calculation of braking force/braking torque

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

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

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]

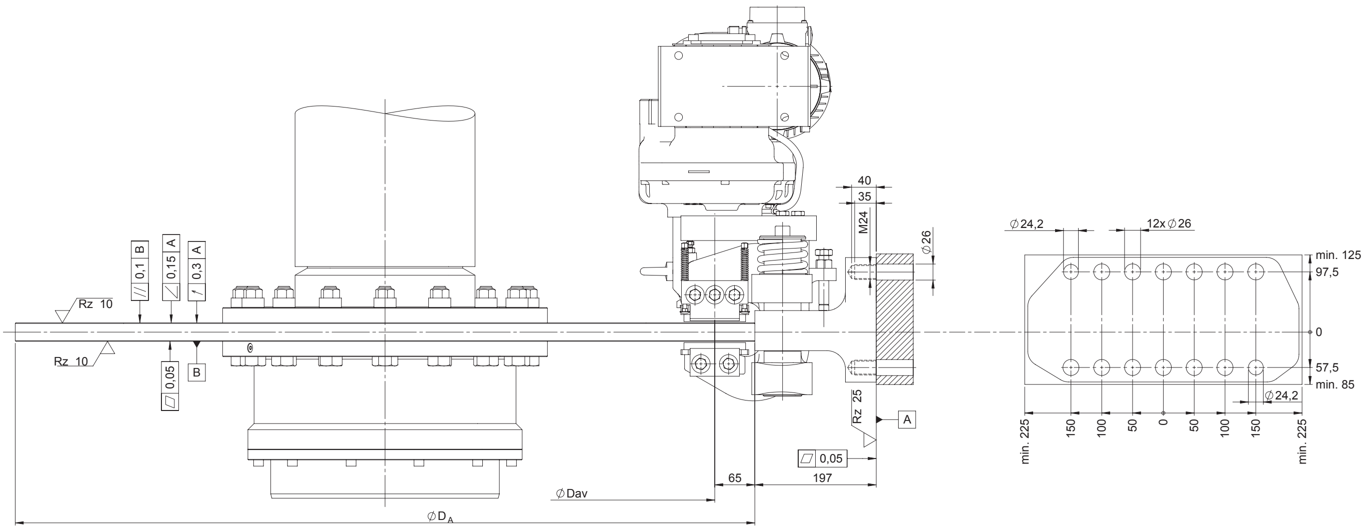
Ordering example:	EMB-STOP	L	-	A	-	380	-	F	A	-	30
	EMB brake	Size of brake		Active		Clamping force		Floating caliper („Floater“)	Option		Thickness of brake disk



Calculation of brake disk

$ØD_A \le 1800$ mm	$ØD_A > 1800$ mm
$D_{av} = D_A - 130$	$D_{av} = D_A - 120$

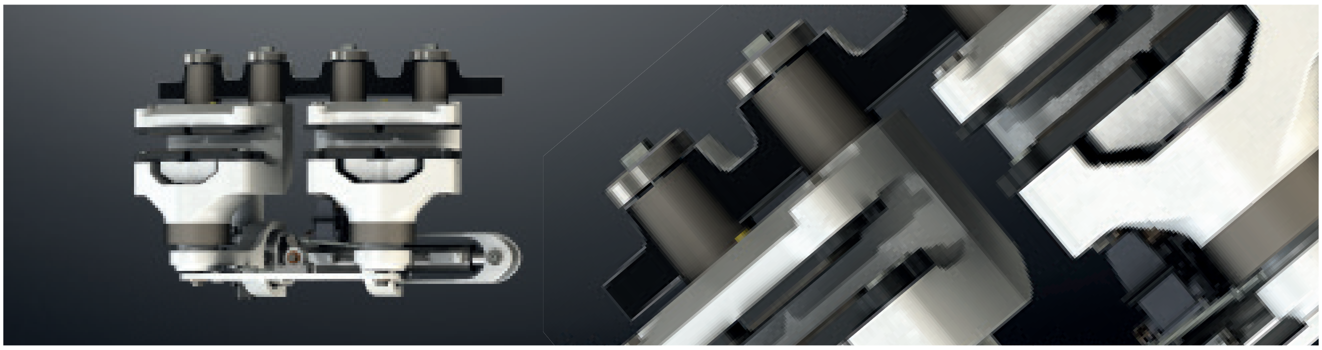
Connection dimensions of brake

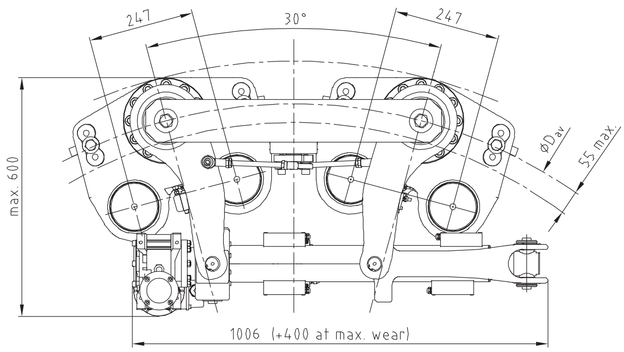


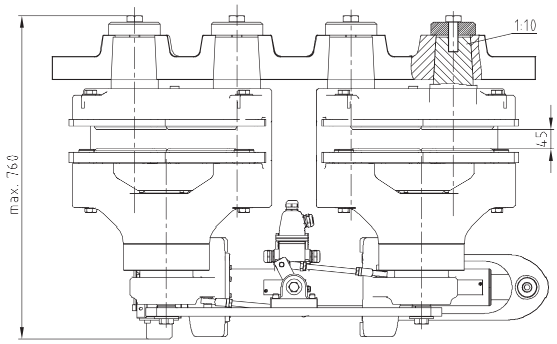
Optional

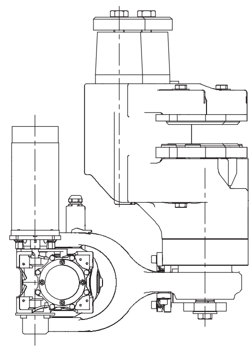
- Various colours available
- Sensor indicating wear of pad and condition
- Temperature sensor
- Alternative materials of brake pad

Electromechanical brake system









Einbauvorschlag. Andere Einbaumöglichkeiten auf Anfrage.

EMB-STOP 2L-A-xx-F Lever	
Total weight	600 kg
Thickness of brake disk	30 – 45 mm
Wear of pad on each side (max.)	3 mm
Coefficient of friction of pad, nominal value [1]	μ = 0,4
Clamping force, min.	500 kN (=2×250 kN)
Clamping force, max.	700 kN (=2×350 kN)
Operating temperature range	-30 to +50°C
Motor output	3000 W
Motor voltage [2]	24 VDC
Voltage of electric signals	230 VAC / 24 VDC

[1] The coefficient of friction each depends on the application or material of the brake pad, respectively. Please consult with KTR.
[2] Other supply voltages on request

Calculation of braking force/braking torque

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

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

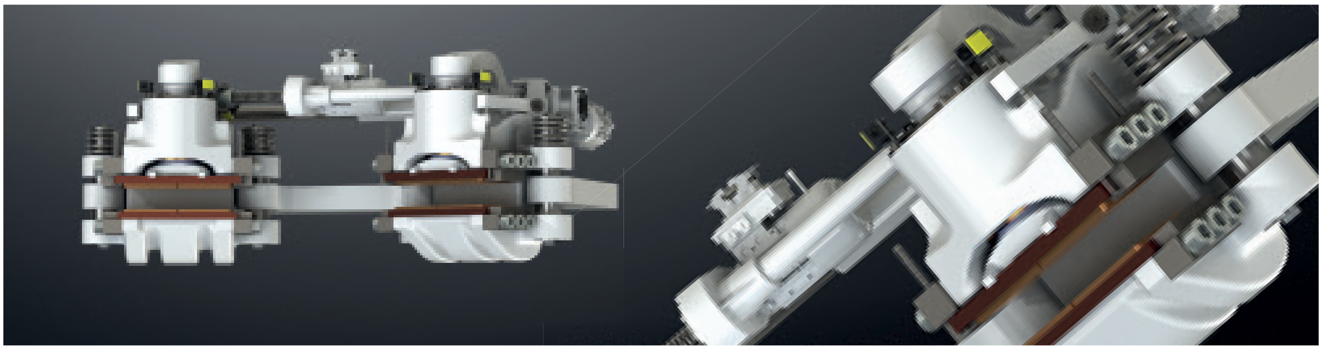
F_b = Braking force [kN]
F_c = Clamping force [kN]
M_b = Braking torque [kNm]
z = Number of brakes
D_{av} = Effective diameter of brake [m]

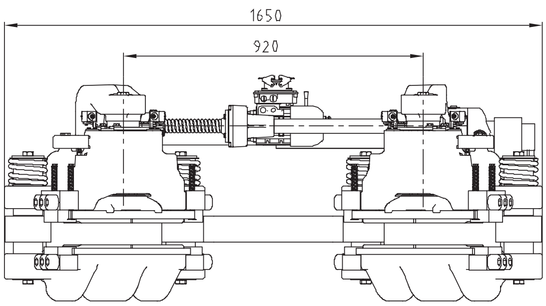
Ordering example:

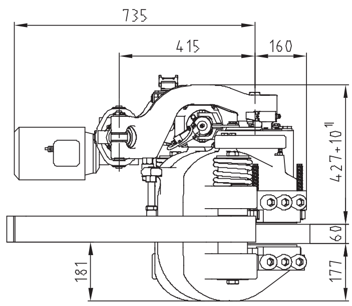
EMB-STOP	2L	-	A	-	700	-	F	L	-	45
EMB brake	Size of brake		Active		Clamping force		Floating caliper („Floater“)	Option		Thickness of brake disk

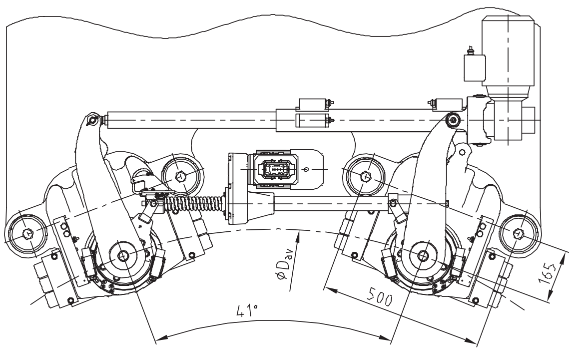
EMB-STOP 2XL-A-xx-F Lever
Active floating caliper brakes

Electromechanical brake system









[1] Toleranzen abhängig vom Lüftspiel
Einbauvorschlag. Andere Einbaumöglichkeiten auf Anfrage.

EMB-STOP 2XL-A-xx-F Lever	
Total weight	950 kg
Thickness of brake disk	50 – 60 mm
Wear of pad on each side (max.)	4 mm
Max. air gap on each side	4 mm
Coefficient of friction of pad, nominal value [2]	μ = 0,4
Clamping force, min.	800 kN (=2×400 kN)
Clamping force, max.	1600 kN (=2×800 kN)
Operating temperature range	-20 to +50°C
Connected load	3000 W
Motor voltage	400 VAC @ 50Hz
Voltage of electric signals	24 VDC

[2] The coefficient of friction each depends on the application or material of the brake, respectively. Please consult with KTR.

Calculation of braking force/braking torque

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

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

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]

Ordering example:

EMB-STOP	2XL	-	A	-	1600	-	F	L	-	60
EMB brake	Size of brake		Active		Clamping force		Floating caliper („Floater“)	Option		Thickness of brake disk

Description of product

IntelliRamp® is an electronic control system allowing for program-controlled, accurate braking processes. Being combined with IntelliRamp® our brakes are therefore suitable for the use in sophisticated applications:

- Ramp-supported braking process
  - Continuous deceleration operation
  - Continuous time operation
  - Continuous speed operation
- Excessive speed monitoring
- Reverse lock
- Joystick control
- Online remote operation

Operation and structure

The IntelliRamp® system controls the clamping force of the brake and the resulting braking force infinitely. This allows to control both hydraulic and electromechanical brakes sensitively complying with the operating instructions. The heart of the system is the control computer with its touchscreeen. It takes over all operations of calculation and monitoring that are necessary for controlling the brake systems. In addition IntelliRamp® controls and monitors the function of the power pack with a hydraulic brake system, too. For that purpose characteristic figures like oil level, oil temperature and hydraulic pressure are recorded by the system. The overall system, among others, has an uninterruptible power supply to allow for performing a full braking cycle in case of power failure. This will allow you to keep the full control of your brake system even with critical conditions of the machine while preventing damages from your machine.

Operation

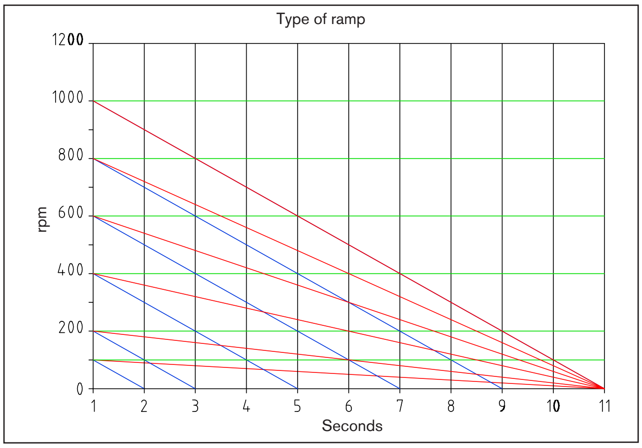
The control system is operated via touch screen with menu navigation. Other relays are not necessary which increases the availability and reliability of IntelliRamp® considerably. It goes without saying that many standard bus systems (e. g. Profibus, EtherCAT, etc.) are available as options for your communication as well.

Ramp-supported braking process

The ramp-supported braking process is activated by a signal safe from cable break. The process is performed via a closed control circuit covering speed versus time. Since a proportional control is not concerned here, the system is safe from power breakdown, i. e. it will work even if the power supply fails. The ramp is defined by a rated speed and a braking time taking this speed into account.
Since a speed which is almost zero cannot be measured accurately any longer, a braking process exists increasing the braking power to achieve the full figure from a certain speed within a period to be defined.
For the ramp a tolerance range is defined which a control is performed in. Falling below this range the brake unlocks, exceeding this range the brake locks fully. The tolerance range can be defined flexibly. The more precise the definition, the more accurate is the control , but at the same time the more nervous is the reaction.

In order to avoid impacts in the beginning of the braking process, the control automatically calculates the braking pressure that is theoretically necessary to reach the ramp required. This prevents too fierce braking.
IntelliRamp® allows to use three brake ramps which can each be programmed individually and which can be started irrespective of each other.

Scheme of the ramp-supported braking process



— Continuous deceleration:
With a higher speed the braking cycly takes longer, with a lower speed it takes shorter.

— Continuous time operation:
The same time is always kept which means that the brake engages further if the speed is higher.

— Continuous speed control:
An option to keep the device at a constant speed via the brake only.

Operation

Excessive speed monitoring:
The action of excessive speed reacts flexibly within defined excessive speed barriers. Two values can be defined by which either a message is given to the PLC, a brake ramp is activated or an emergency stop is activated immediately without performing any control of this braking process. The excessive speed control can be switched on and off.

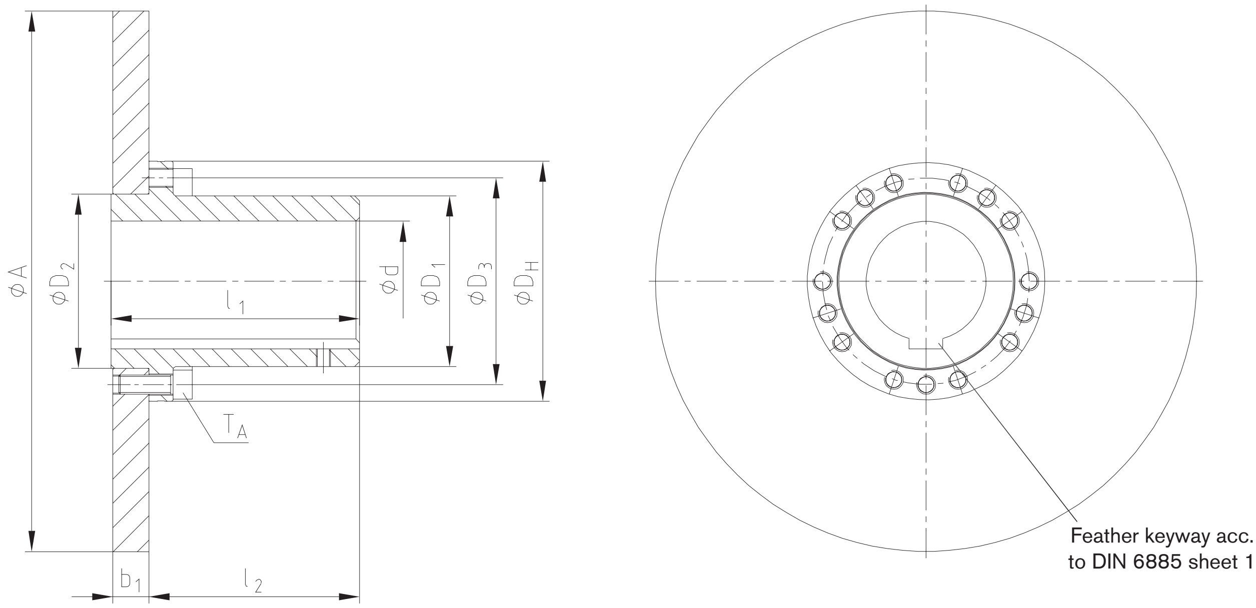
Reverse lock:
It allows for controlling the speed. In case of an unauthorised rotational direction of the system a braking process is activated or the starting of the machine is prevented. A definition of the number of starts preventing a re-start if the number is exceeded is to prevent the device from reversing in case of a fracture of the drive.

Joystick control:
This is an option to use the brake, as an example, like a car brake. The more the joystick travels, the more the brake engages.

Online remote operation:
The online remote operation allows both to call the status of the control via a network and to interfere. There is the option to program the control from a place far away.

KTR-STOP® NBS
Hubs with brake disks

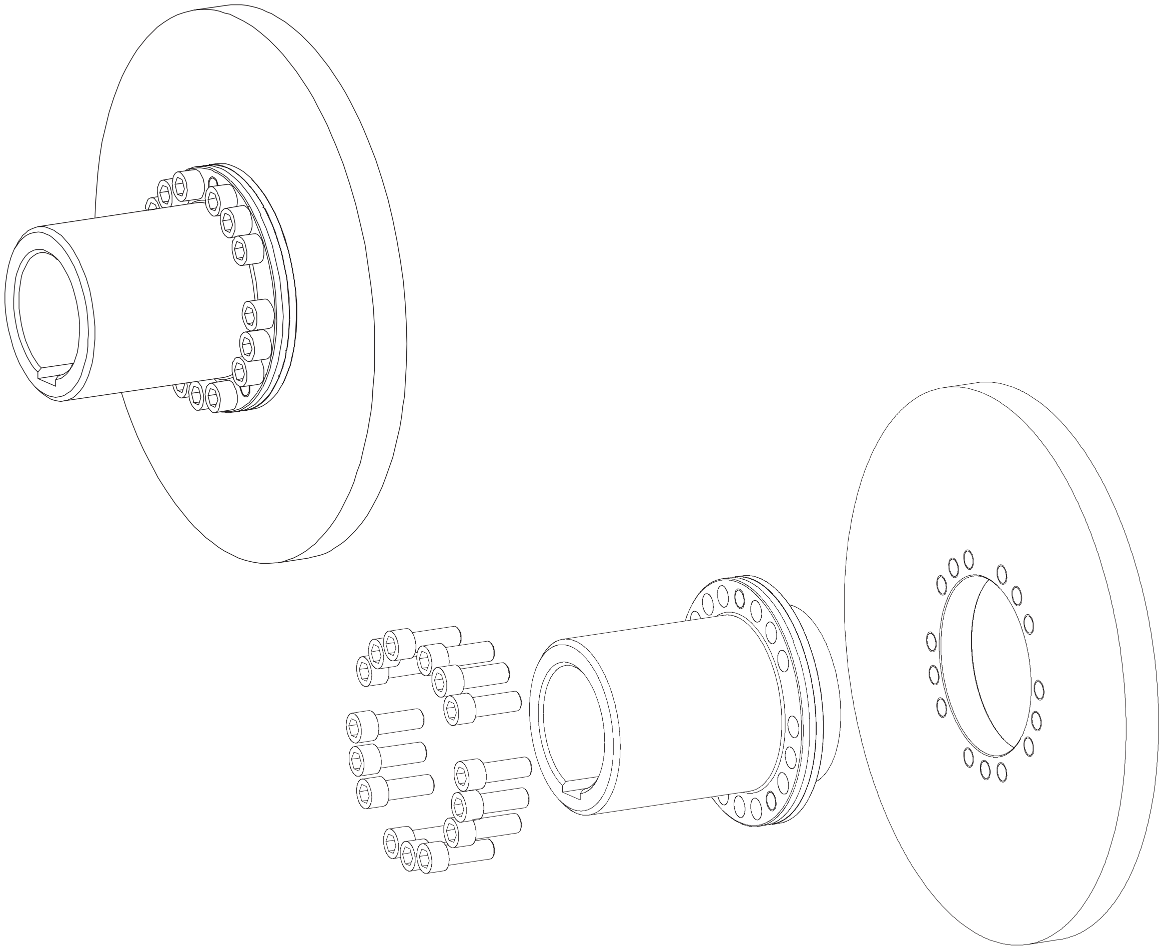
Description of product



KTR-STOP® NBS														
Size	Dimensions [mm]								Screws DIN EN ISO 4762				Max. braking torque [Nm] [1]
	Finish bore d		D_H	D_1	D_2	D_3	l_1	l_2	Thread M	Number z	Pitch	Tightening torque T_A [Nm]	
	min.	max.											
65	22	65	135	94	96	116	166	135	M10	12	16x22,5°	67	3000
75	30	75	160	108	112	136	166,5	135	M12	15		115	6700
90	40	100	200	142	145	172	206,5	175	M16	15		290	16000
100	46	110	225	158	165	195	206,5	175	M16	15		290	18700
110	60	125	255	178	180	218	212	180	M20	15		560	32700
125	60	145	290	206	215	252	212	180	M20	15	20x18°	560	38100
140	60	165	320	235	245	282	252,5	220	M20	15		560	42700
								210[2]				560	42700
160	80	190	370	270	280	325	252,5	220	M24	15		970	75200
								210[2]				970	75200
180	85	220	420	315	330	375	252,5	210[2]	M24	18	24x15°	970	10400

[1] Referring to screw connection of brake disk; the shaft-hub-connection has to be investigated separately by the customer.
[2] Dimension with a width of brake disk b_1 of 40 mm.

Ordering example:	KTR-STOP® NBS 110	800x30	Ø100
	Type/size	Brake disk Axb_1	Bore d

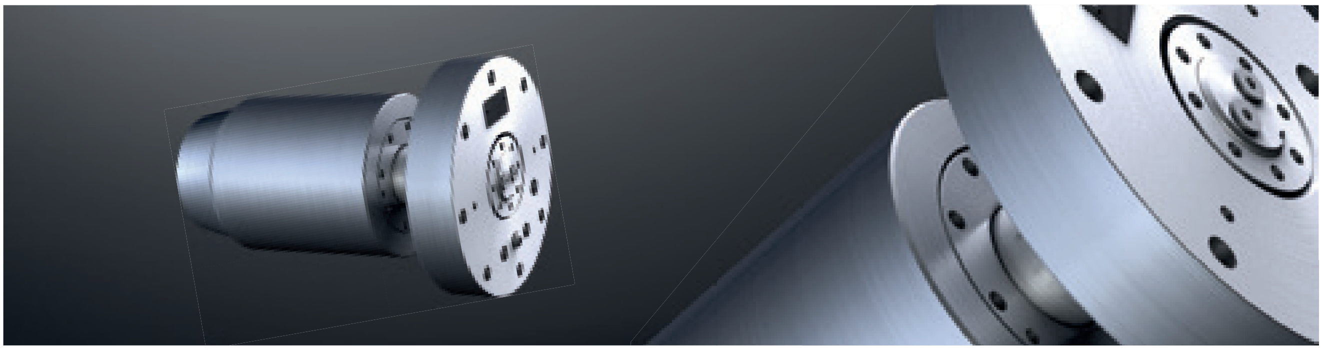


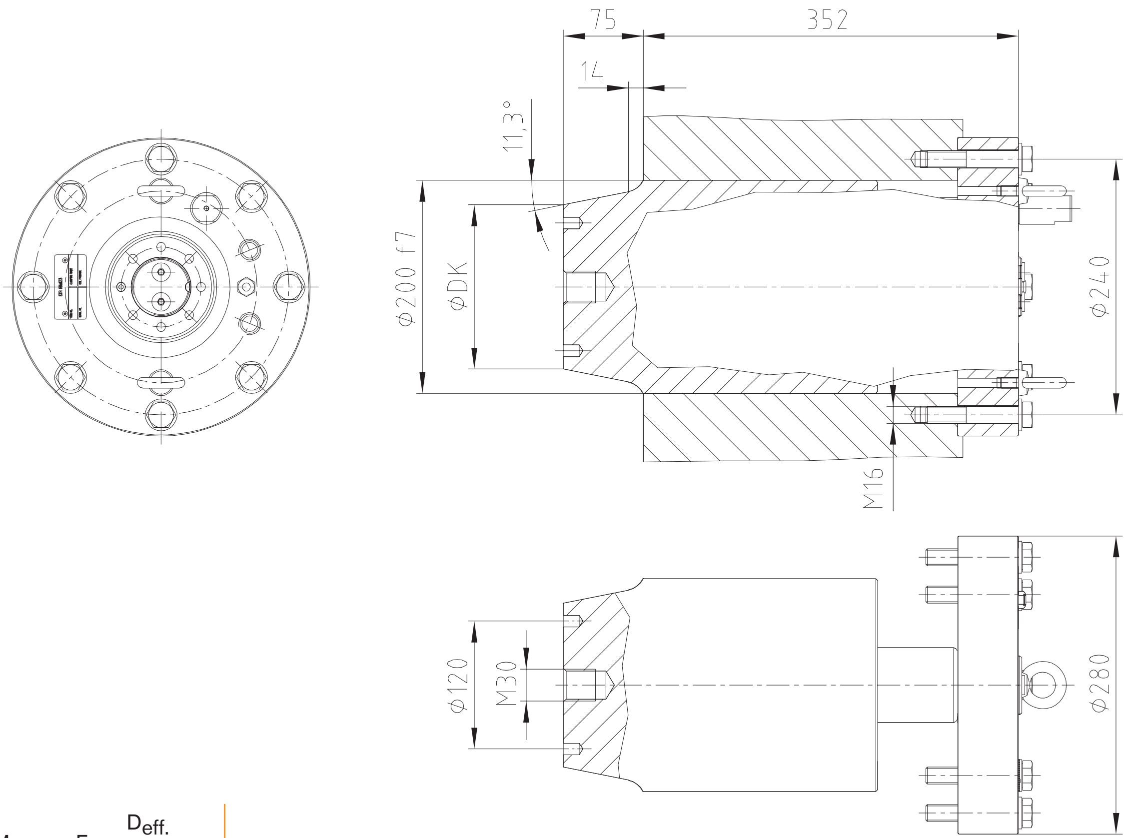
Brake disk ØAxb1 \ Size	Weight [kg] / Mass moment of inertia [kgm²] of hub with brake disk [1]								
	65	75	90	100	110	125	140	160	180
355x30	25,6								
	0,349								
400x30	31,4	33,4							
	0,556	0,566							
450x30	38,7	40,6	49,3						
	0,885	0,895	1,009						
500x30		48,7	58,1	59,0	64,1				
		1,354	1,506	1,439	1,511				
560x30			69,9	69,9	75,0				
			2,335	2,204	2,277				
630x30			85,3	84,1	89,2	96,6			
			3,703	3,468	3,540	3,681			
710x30					107,5	115,0	129,6	145,4	168,2
					5,603	5,743	6,002	6,490	7,390
800x30						138,2	152,8	168,6	191,4
						9,063	9,322	9,810	10,710
900x30							181,8	197,7	220,5
							14,586	15,073	15,973
900x40							224,3	239,0	260,0
							19,225	19,690	20,543
1000x40							267,6	282,2	303,2
							29,016	29,481	30,335

[1] Mass moment of inertia of hub with brake disk referring to maximum bore.

KTR-STOP® RL S
Rotor Lock

Hydraulic system





$$M_L = z \cdot F_L \cdot \frac{D_{eff.}}{2}$$

F_L = Shear force [kN]

M_L = Lock torque [kNm]

z = Number of Rotor Lock

$D_{eff.}$ = Pitch circle diameter of locking disk [m]

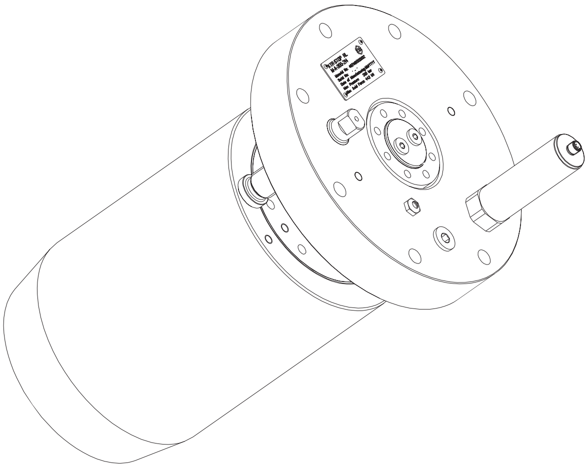
KTR-STOP® RL S			
Weight	ca. 90 kg	Piston diameter	120 mm
Max. stroke	80 mm	Piston surface fore stroke	113,10 cm^2
Max. lateral force [1]	2000 kN	Piston surface back stroke	74,61 cm^2
Max. operating pressure	250 bar	Oil volume per 1 mm stroke	11,3 cm^3
Max. force fore stroke F+	283 kN	Oil volume with 75 mm stroke (full stroke)	848,2 cm^3
Max. force back stroke F-	187 kN	Pressure port	G 1/4

[1] Please note that the shear force refers to the Rotor Lock only.

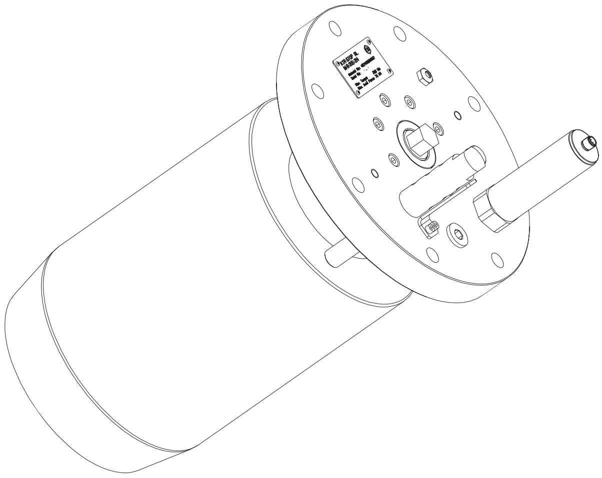
Ordering example:

KTR-STOP® RL	S	-	A	-	295	-	154
KTR Rotor Lock	Rotor Lock size		Option		Mounting length		Small taper diameter

Hydraulic version

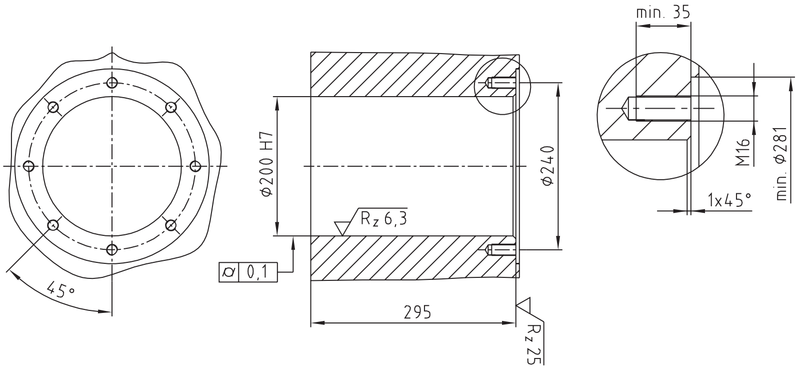


Mechanical version

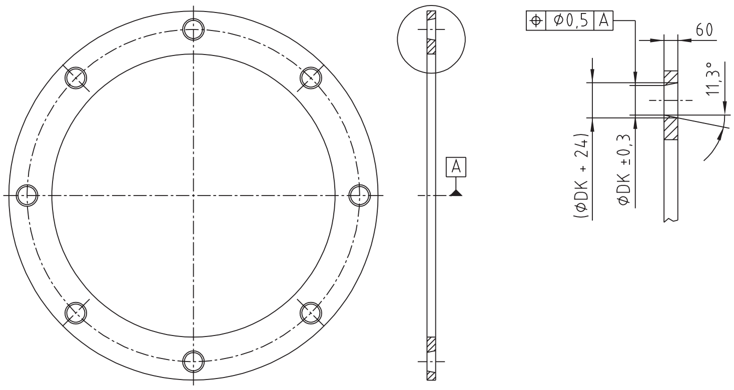


Connection dimensions

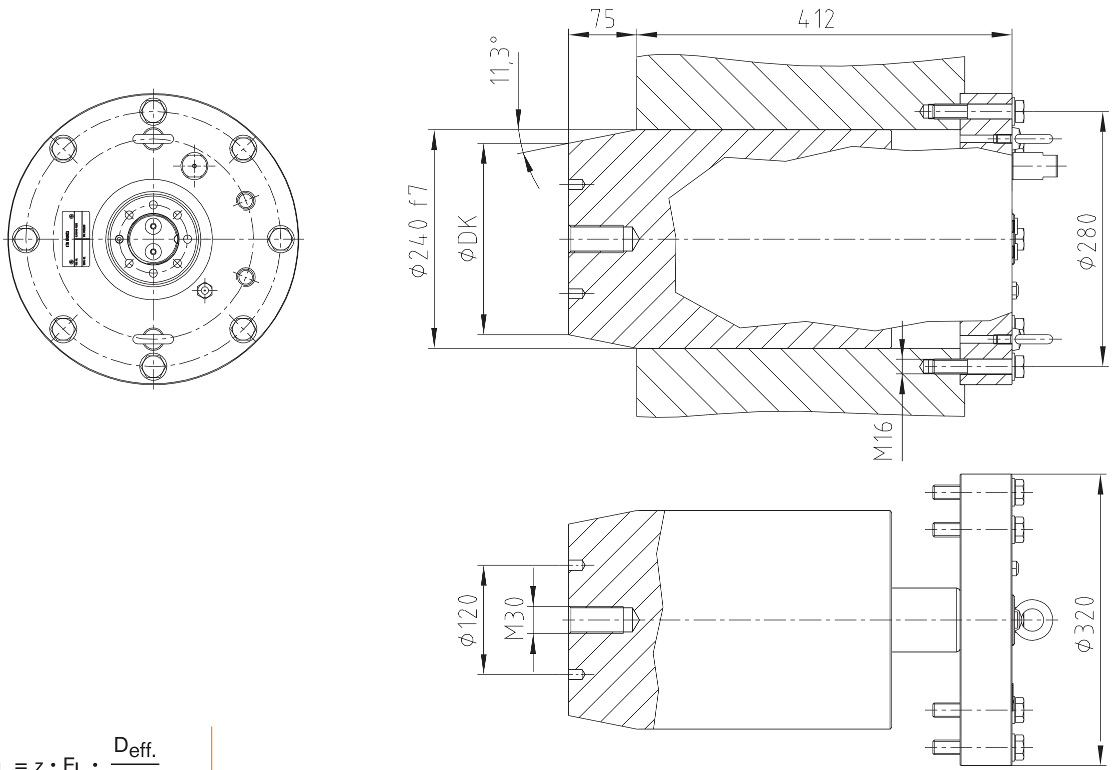
Housing



Locking disk



Hydraulic system



$$M_L = z \cdot F_L \cdot \frac{D_{eff.}}{2}$$

F_L = Shear force [kN]
M_L = Lock torque [kNm]
z = Number of Rotor Lock
$D_{eff.}$ = Pitch circle diameter of locking disk [m]

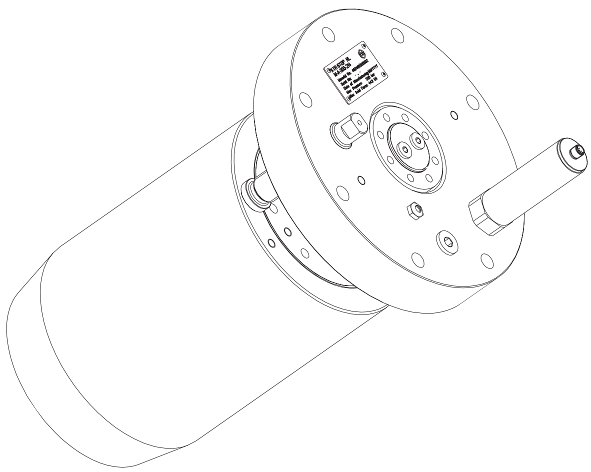
KTR-STOP® RL M			
Weight	approx. 150 kg	Piston diameter	120 mm
Max. stroke	80 mm	Piston surface fore stroke	113,10 cm²
Max. lateral force [1]	4000 kN	Piston surface back stroke	74,61 cm²
Max. operating pressure	250 bar	Oil volume per 1 mm stroke	11,3 cm³
Max. force fore stroke F+	283 kN	Oil volume with 75 mm stroke (full stroke)	848,2 cm³
Max. force back stroke F-	187 kN	Pressure port	G 1/4

[1] Please note that the shear force refers to the Rotor Lock only.

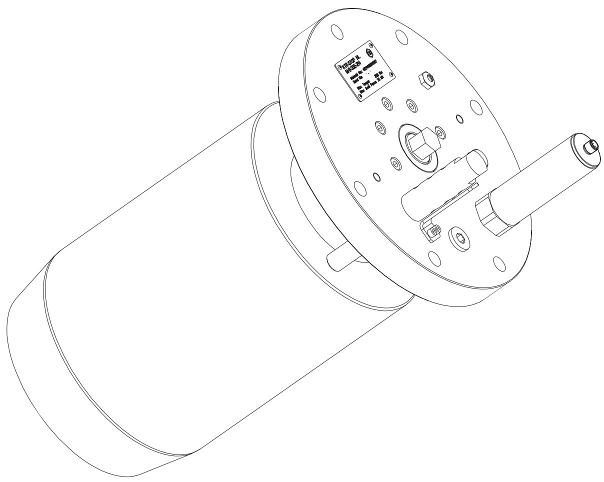
Ordering example:

KTR-STOP® RL	M	-	A	-	365	-	214
KTR Rotor Lock	Rotor Lock size		Option		Mounting length		Small taper diameter

Hydraulic version

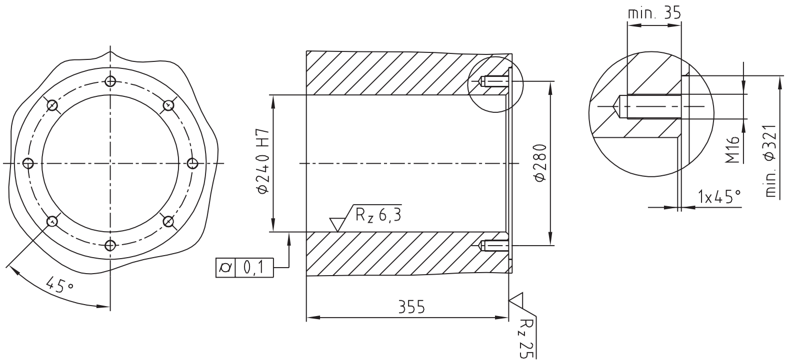


Mechanical version

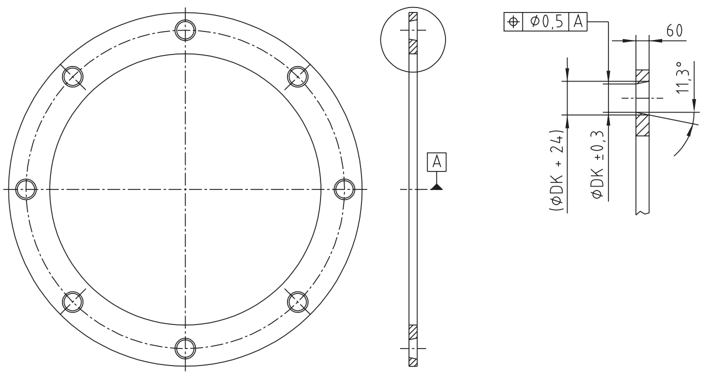


Connection dimensions

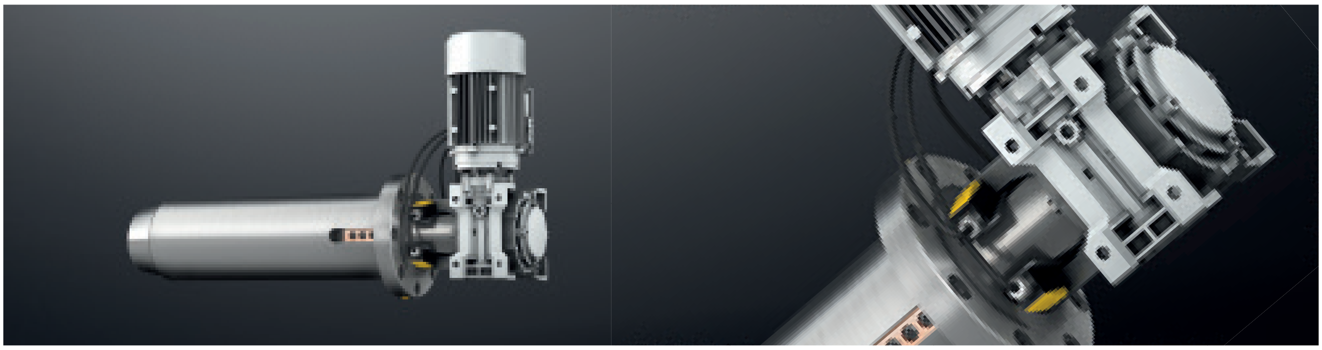
Housing

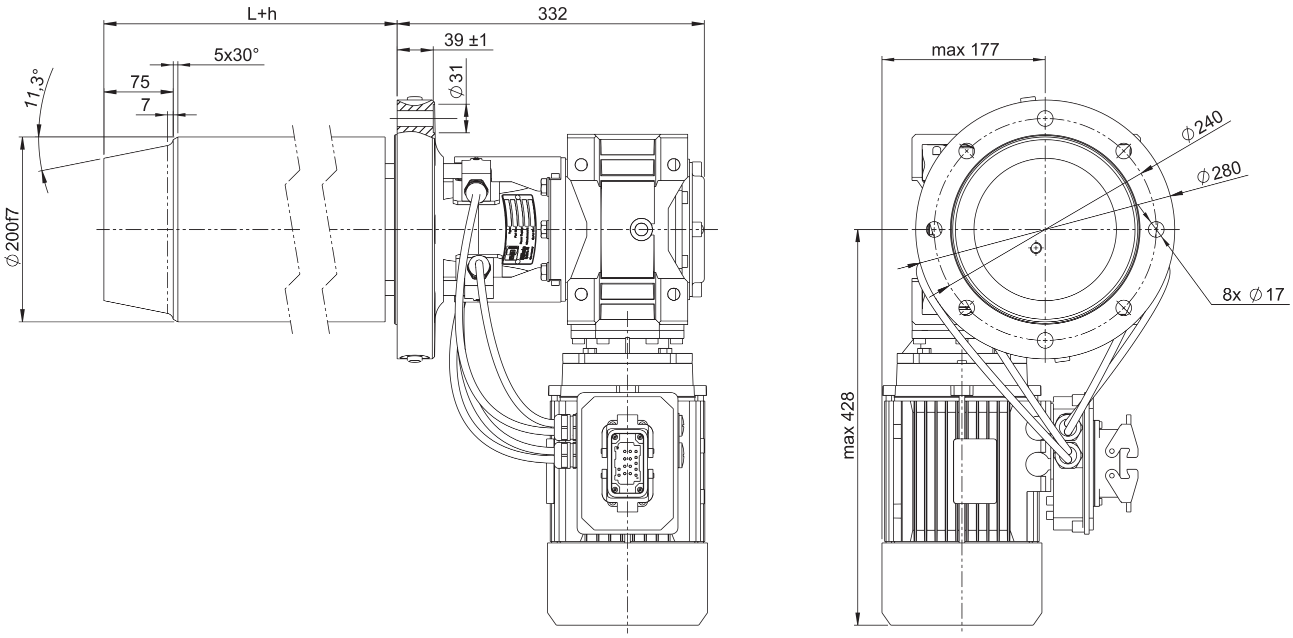


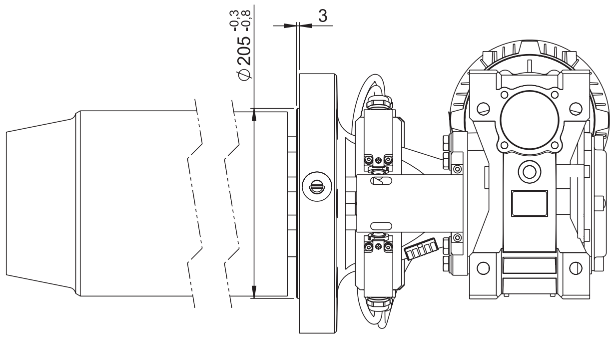
Locking disk



Electromechanical system



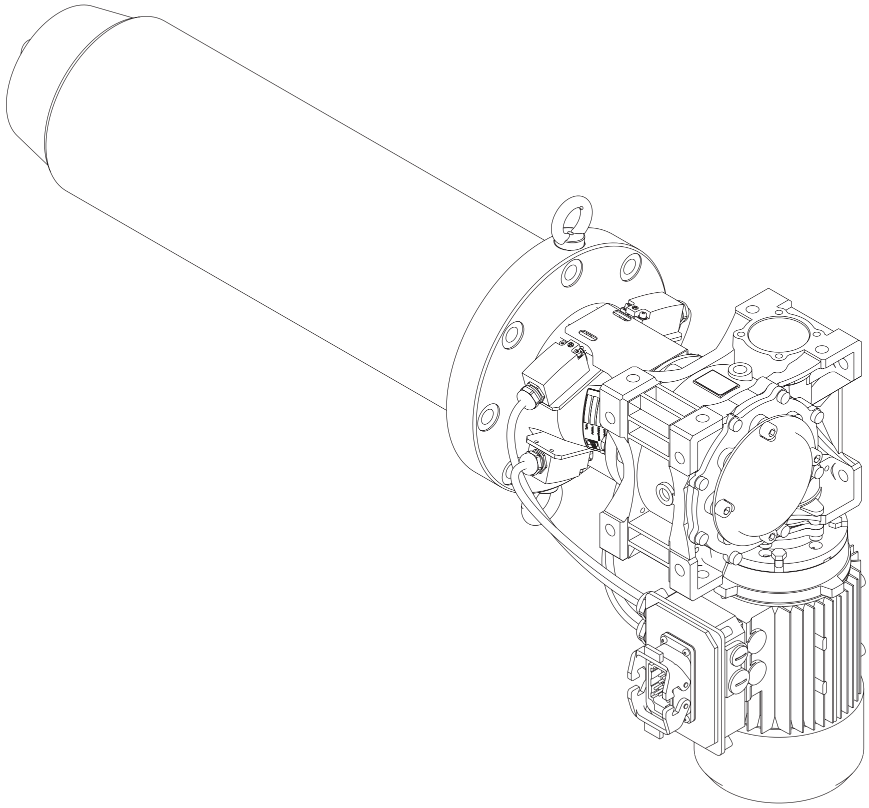




EMB-STOP RL S			
Stroke, max. (h)	75 mm	Motor output	1100 W
lateral force, max.[1]	2000 kN	Motor voltage	230 / 400 VAC
Pressure force, axial F+	160 kN	Voltage of electric signals	230 VAC / 24 VDC
Tensile force, axial F–	160 kN	Speed with 50 Hz	160 mm/min.
Total weight, ca.[2]	150 kg	Size of industrial connector	Han10B / HAN18EE (male)

[1] Please note that the shear force refers to the Rotor Lock only.
[2] Weight with L = 355.

Ordering example:	EMB-STOP RL	S	-	E	-	697	-	CON
	EMB Rotor Lock	Rotor Lock size		Electric operation		Mounting length (L)		Contact form (see table)



$$M_L = z \cdot F_L \cdot \frac{D_{eff.}}{2}$$

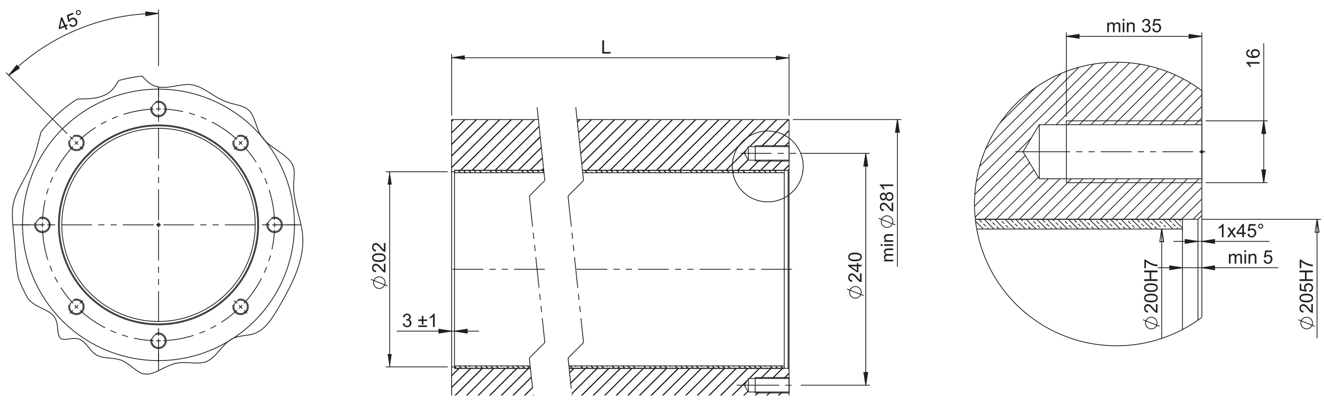
F_L = Shear force [kN]

M_L = Lock torque [kNm]

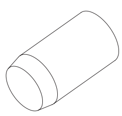
z = Number of Rotor Lock

$D_{eff.}$ = Pitch circle diameter of locking disk [m]

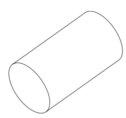
Connection dimensions



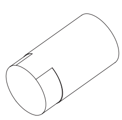
Type of contact	xxx
taper	CON
coradial	COR
cylindrical	CYL
trapezoid	TRA



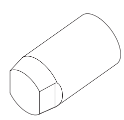
taper



cylindrical



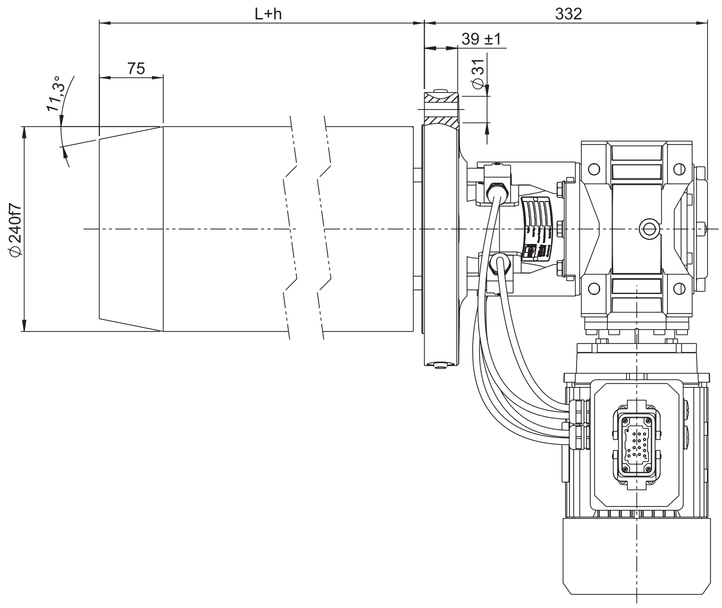
coradial

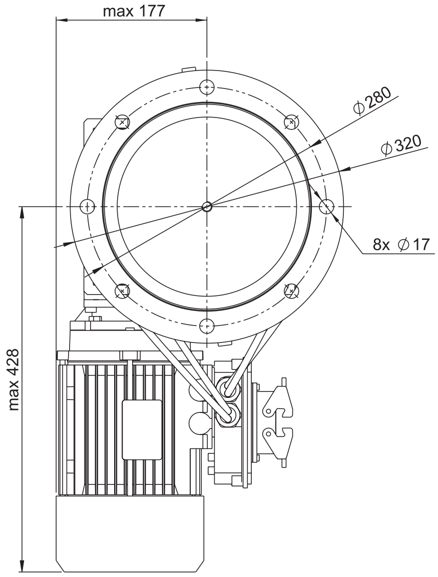


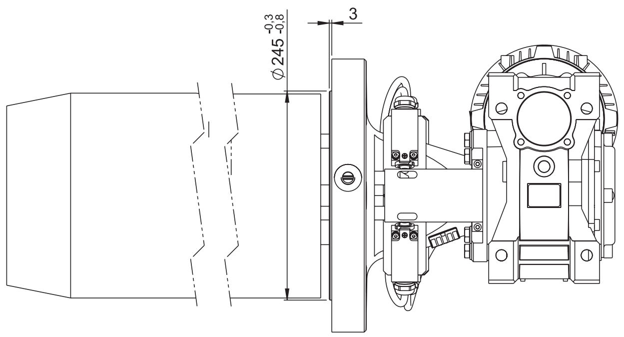
trapezoid

EMB-STOP RL M
Rotor Lock

Electromechanical system



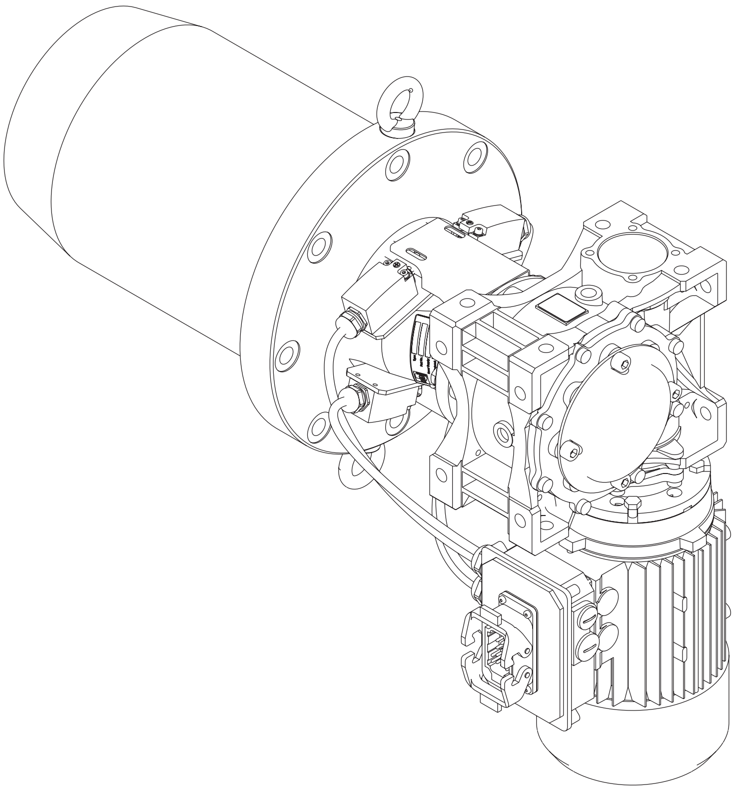




EMB-STOP RL M			
Stroke, max. (h)	75 mm	Motor output	1100 W
Lateral force, max.[1]	4000 kN	Motor voltage	400 VAC
Pressure force, axial F+	160 kN	Voltage of electric signals	230 VAC / 24 VDC
Tensile force, axial F–	160 kN	Speed with 50Hz	160 mm/min.
Total weight, ca.[2]	190 kg	Size of industrial connector	Han10B / HAN18EE (male)

[1] Please note that the shear force refers to the Rotor Lock only.
[2] Weight with L = 355.

Ordering example:	EMB-STOP RL	M	-	E	-	355	-	CON
	EMB Rotor Lock	Rotor Lock size		Electric operation		Mounting length (L)		Contact form (see table)



$$M_L = z \cdot F_L \cdot \frac{D_{eff.}}{2}$$

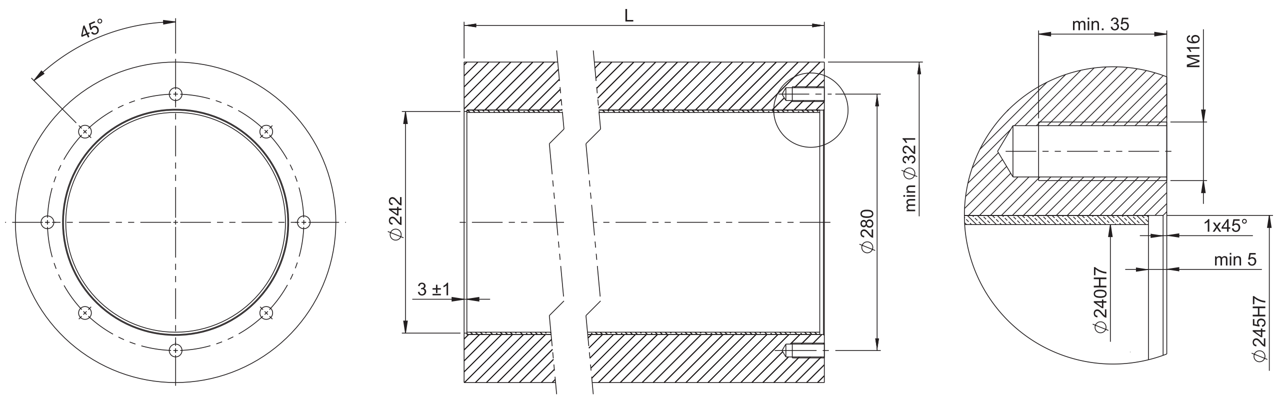
F_L = Shear force [kN]

M_L = Lock torque [kNm]

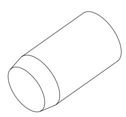
z = Number of Rotor Lock

$D_{eff.}$ = Pitch circle diameter of locking disk [m]

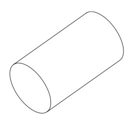
Connection dimensions



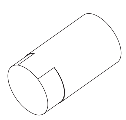
Type of contact	xxx
taper	CON
coradial	COR
cylindrical	CYL
trapezoid	TRA



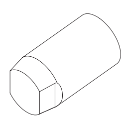
taper



cylindrical

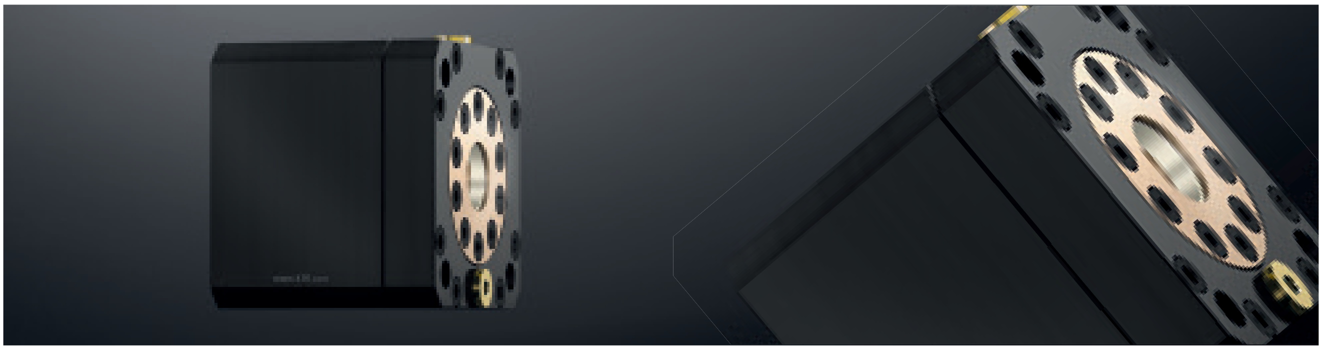


coradial



trapezoid

Safety clamping and braking system



Description of product:

The KTR-STOP® NC series is a passive clamping and braking system. It serves for generating a clamping/braking force respectively clamping/braking torque on a cylindrical piston rod or shaft. The result is a deceleration of the torsional rotation or holding at standstill.

Applications:

Machine tool
- Ball screws / positioning axles
- Rod guides

Drive technology
- Feed cylinders

General engineering
- Hoists, hydraulic presses
- Clamping of rods, pistons, shafts
- Lifting tables / scissor lifting tables
- Hydraulic lifts / hydraulic lifting devices

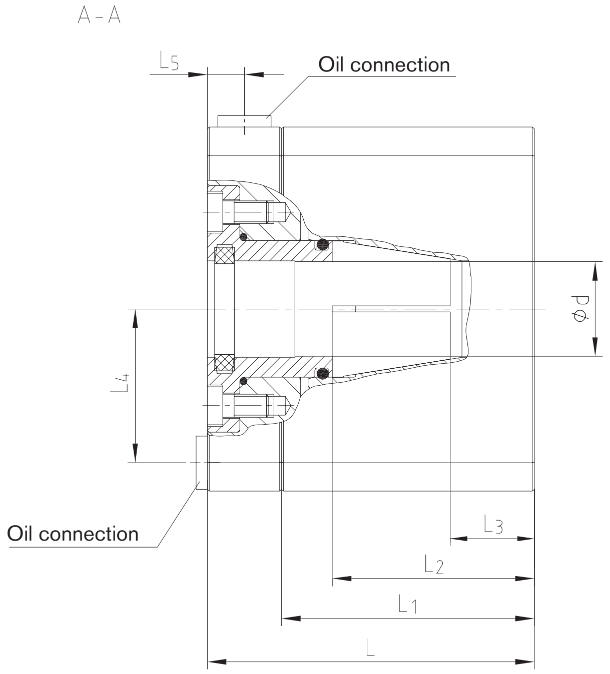
General
- Safety catches
- Blocking systems
- Systems that require additional securing

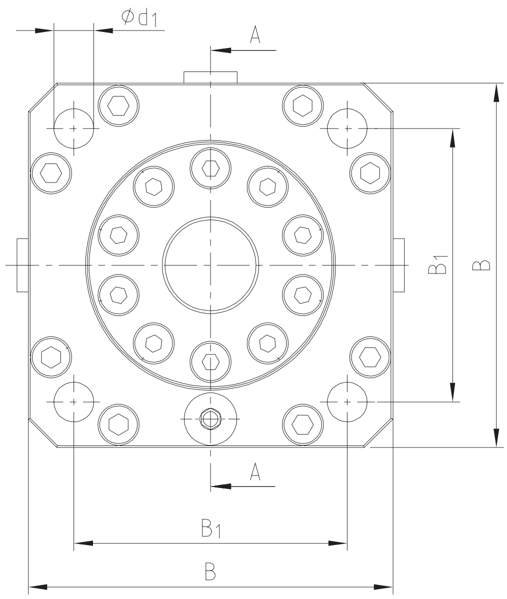
Product features:

- Passive clamping and braking system with fail-safe function
- System hydraulically released
- Compensating for axial load and torques
- Reduction of vibrations by increasing stiffness in spindle drives
- Clamping bush can be replaced
- Can be applied as an integrated solution or as a plug-in system
- Multifunctional applications (machine tools, general engineering,…)
- Clamping unlimited in time due to spring pressure storage
- Energy-efficient due to de-energized locking with unpressurized condition → spring pressure storage
- No generation of heat
- Operating principle of frictional connection

Ordering example:

KTR-STOP® NC	32	- 20	100 bar
Description	Size	Shaft diameter	Opening pressure





	Size	KTR-STOP® NC [1] Dimensions [mm] d[2]	d1	B	B1	L	L1	L2	L3	L4	L5	Weight [kg]	Oil connection [/]	"Open oil filling" [dm³]	Opening pressure 50 bar: Holding torque[3] [Nm]	Opening pressure 50 bar: "Axial lock force"[3] [N]	Opening pressure 70 bar: Holding torque[3] [Nm]	Opening pressure 70 bar: "Axial lock force"[3] [N]	Opening pressure 100 bar: Holding torque[3] [Nm]	Opening pressure 100 bar: "Axial lock force"[3] [N]
		12													12,5		16,5		27,5	
		15													15,5		20,5		34,5	
NEW	25	18	9	80x80	56,5	75	58	44,5	17,5	–	8,5	3,25	G 1/8	0,0055	18,5	2100	25	2750	41	4600
		20													20,5		27,5		45	
		22													22,5		30		50	
		18													35,5		50		75	
		20													40		56		83	
	32	22	10,5	96x96	72	86	66,5	53	19	40,5	10	5,25	G 1/8	0,011	43,5	4000	62	5600	91,5	8400
		24													47,5		67,5		100	
		25													50		70		105	
		22													60,5		97,5		120	
		24													66		105		130	
		25													69		110		135	
		28													77		125		155	
NEW	40	30	10,5	120x120	89	108	87,5	60	28	50	9,75	10	G 1/8	0,0137	82,5	5500	132,5	9000	165	11000
		32													88		142,5		175	
		34													93,5		150		185	
		35													96,5		155		190	
		36													100		160		200	
		25													130		200		300	
		28													145		225		335	
		30													155		240		355	
		32													165		257,5		380	
NEW	50	34	13,5	150x150	110	125	103,5	70	29	60	9,75	19	G 1/4	0,0311	175	10500	275	16250	405	24000
		35													182,5		280		415	
		36													190		290		430	
		38													200		305		450	
		40													210		325		475	
		36													205		365		530	
		38													215		385		560	
		40													230		405		590	
		42													240		425		615	
		44													250		445		645	
NEW	63	45	17,5	180x180	140	140	110	83,75	24,75	75	15	29,6	G 1/4	0,0498	255	11500	455	20500	660	29500
		46													265		465		675	
		48													275		485		705	
		50													285		505		735	
		52													300		525		765	
		54													310		545		795	
		55													315		555		810	

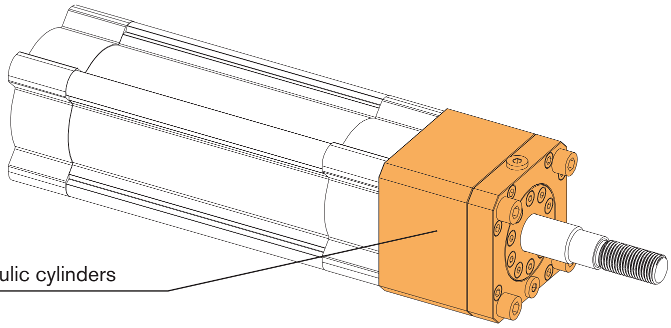
[1] All figures specified in the catalogue refer to a fit pair for shaft k6; bush D8; for other specifications see page 72
[2] Other bores on request
[3] Referring to a friction coefficient of µ =0.12

In addition to the standard portfolio customized solutions are available on request.

Safety clamping and braking system

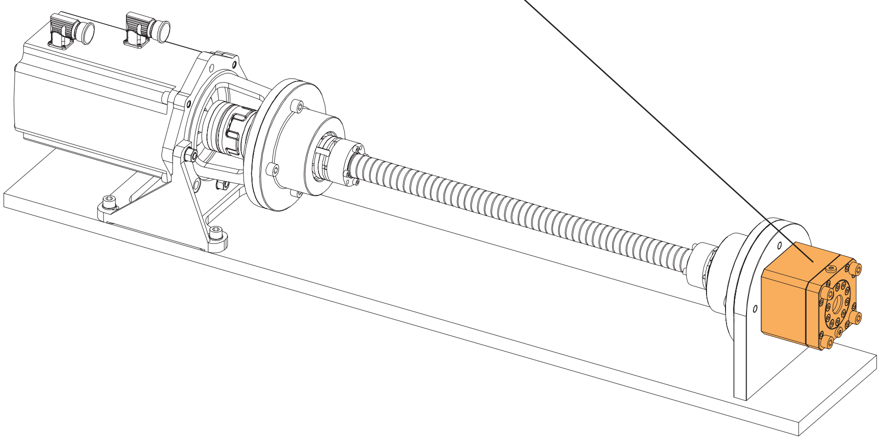
Demands on piston rod / ball screw		
	Steel, hard chrome plated	Hardened steel
Layer thickness	min. 20 µm	-
Hardness	-	min. HRC 60
Surface quality	Ra < 0,4 µm	
Yield point R_e	>. 400 N/mm²	
Tolerance of diameter	k6	

Examples of application and assembly:

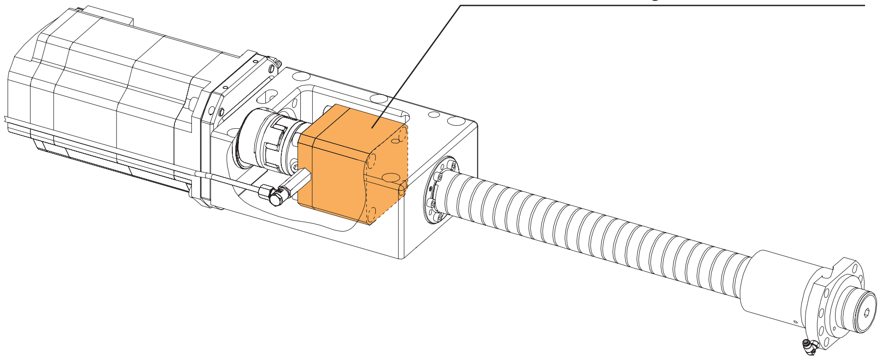


KTR-STOP® NC as a safety device for rods on hydraulic cylinders

KTR-STOP® NC as a plug-in solution



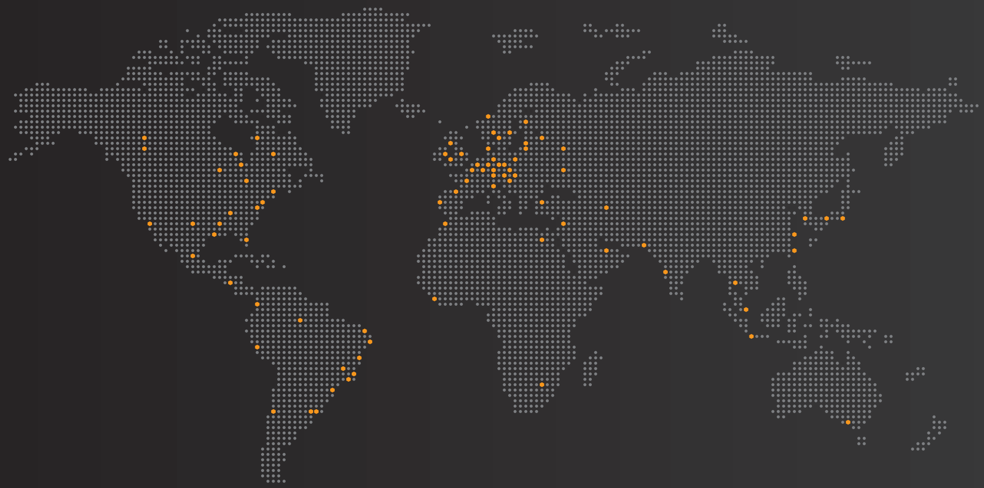
KTR-STOP® NC integrated in the drive train



Notes

Notizen

Notizen



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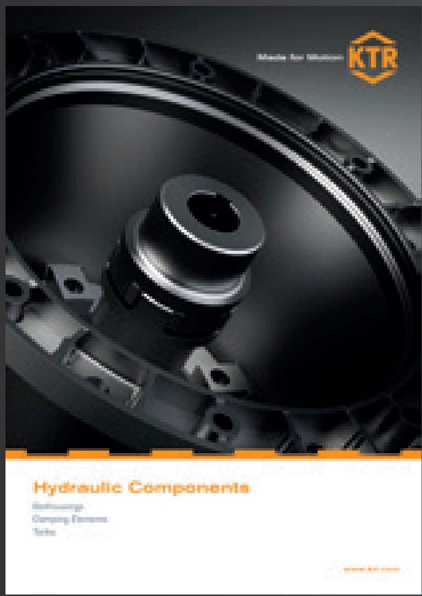
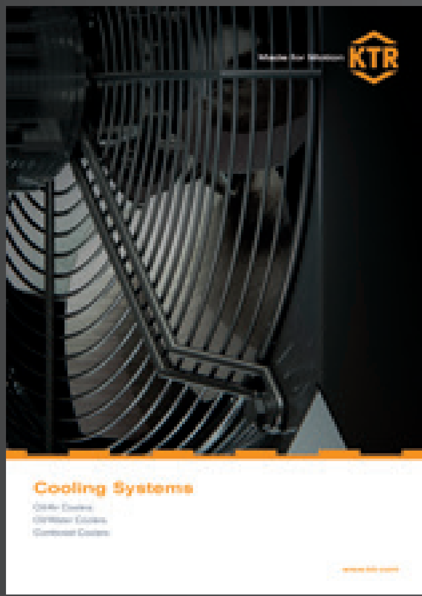
For all current representatives and sales partners please refer to www.ktr.com.

Summary of literature

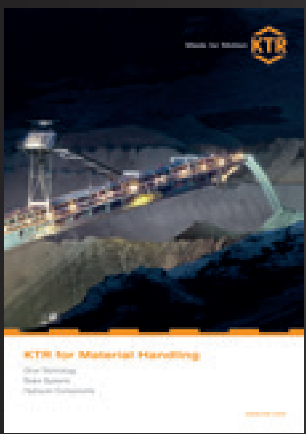
No matter if a perfect drive, a brake that takes effect, space-saving cooling or accurate hydraulics is required, if on land, by sea or at an airy height - KTR's product portfolio is just as manifold as its applications. The following catalogues and leaflets provide for a survey. Available at **www.ktr.com**

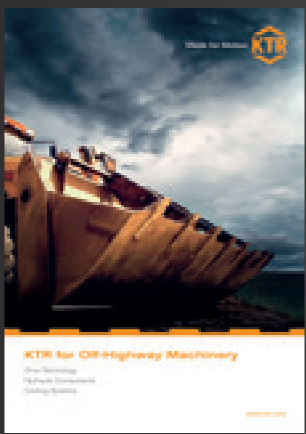
Product catalogues

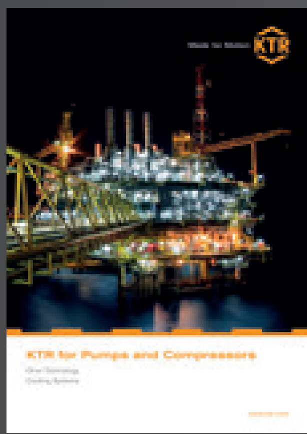


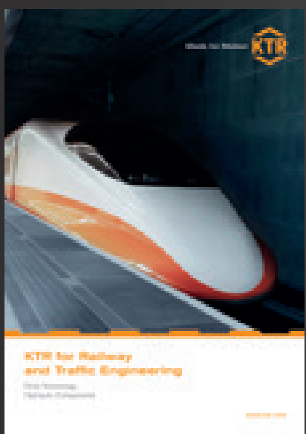


Industry catalogues









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