

## General notes

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## Product data sheets

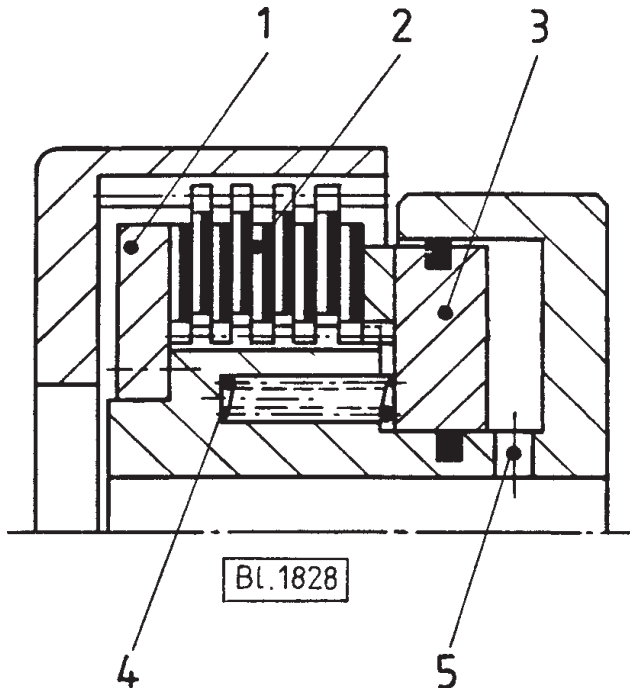
Torque ratings	<b>Series 0023, 0123</b>	5.13.00
Clutch/brake combined units	<b>Series 0023, 0123</b>	5.14.00
Multi-plate clutches	<b>Series 0127</b>	5.19.00
Multi-plate brakes	<b>Series 0128</b>	5.23.00
Multi-plate clutches for wet-running, standard version	<b>Series 0021-007</b>	5.27.00
Multi-plate clutches, with shoulder housing, version for high torques	<b>Series 0021-3.3</b>	5.29.00
Multi-plate clutches, with flange housing, version for high thermal loading	<b>Series 0002-8.1</b>	5.31.00
Multi-plate clutches, with shoulder housing, version for high thermal loading	<b>Series 0002-8.3</b>	5.32.00
Spring-applied multi-plate brakes, non-centering version	<b>Series 0022-..0/..9</b>	5.33.00
Spring-applied multi-plate brakes, centering version	<b>Series 0022-..1</b>	5.37.00
Spring-applied multi-plate brakes, version with two different internal centerings	<b>Series 0022-320/620</b>	5.41.00
HydroSec® safety multi-plate brake	<b>Series 0022-601</b>	5.43.00

## Accessories

Rotary inlets for pressure oil, single channel	<b>for series 0023, 0123</b>	5.45.00
Rotary inlets for pressure oil, two- and three-channel	<b>for series 0023, 0123</b>	5.46.00
Cover	<b>for series 0023, 0123, 0127</b>	5.49.00
Hydraulic press safety valve	<b>for series 0023, 0123, 0127, 0128</b>	5.51.00

## Clutches

### Operation



#### Clutch engagement

Pressure oil is led into the cylinder space of the clutch via the oil inlet (5). The piston (3) compresses the plates (2) against the stop plate (1), so that the clutch is frictionally engaged.

#### Disengagement

When the pressure oil is depressurized, the return springs (4) push the piston (3) back to its initial position so that the clutch is disengaged.

**Important:** In the case of clutches with a single piston, there is the risk that the clutch will be engaged unintentionally through the centrifugal force acting on the oil in the cylinder. Reliable disengagement of the clutch can only be ensured at speeds below the  $n_{\max \text{ cylinder}}$  stated.

#### Properties

Thanks to the large piston forces produced by the hydraulic actuation, hydraulically actuated multi-plate clutches can provide high torques from small dimensions. The oil-cooled plates with the friction combination steel/sinter are effectively wear-free; the small amount of running-in wear is compensated for automatically by the piston so that readjustment is not required.

#### Installation

In order to avoid oil leakage, the h6/H7 shaft tolerance that is recommended should be maintained. In order that engagement is carried out without delay, it is important that - amongst other things - the oil inlet holes in the shaft are of an adequate size. The volume of oil required by the clutch for engagement and the length of the piping should be taken into account when selecting the cross sections of the pressure oil pipes. Return-flow pipes are to be designed in such a way that the resistance is as low as possible. In order to prevent subsequent faults and **failure** of the hydraulic system, absolute **cleanliness** must be maintained during installation.

#### Pressure oil supply

The piston seals are metal rings with a rectangular section. There is only a limited amount of butt clearance but this nevertheless permits a small amount of oil to leak out, the amount of leakage being a function of the clutch size. For this reason care must be taken that the output of the pump is adequate for the size and number of clutches. The amount of oil required by the clutches should cover engagement and leakage under all operating conditions. It is essential that the full operating pressure is available at the end of each engagement process.

Where large quantities of oil are required for clutch engagement and where the frequency of engagement is low, consideration should be given to the use of an automatic double pump. When the clutch is engaged, only the small pump is in operation and circulates just the amount of oil that is required to maintain the oil pressure. Under certain circumstances the fitting of an accumulator upstream of the clutch fulfils the same purpose.

The design (size) and position of the oil tank should be selected in such a way that the heat generated during engagement and absorbed by the oil can be dissipated freely into the environment.

## Rotary inlets for pressure oil

A rotary inlet, the design of which is appropriate for each particular application, is required for introducing the pressure oil into the clutch shaft. You will find information on single-channel rotary inlets on page 5.43.00.

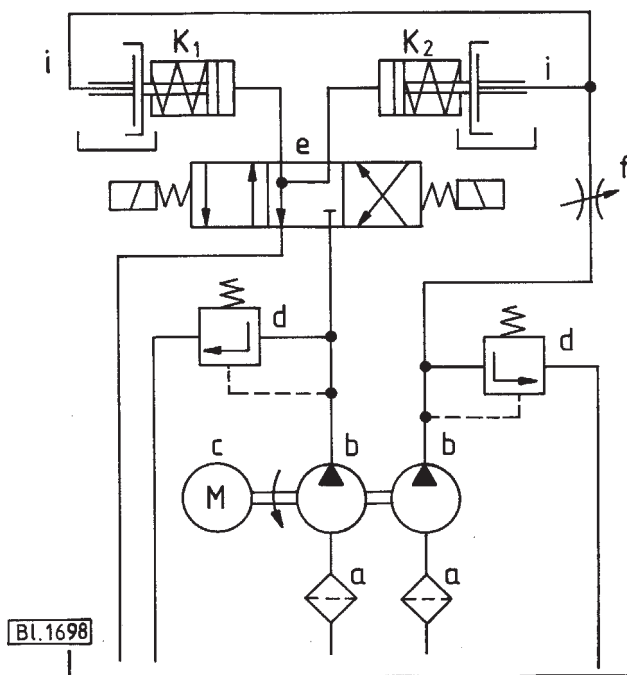
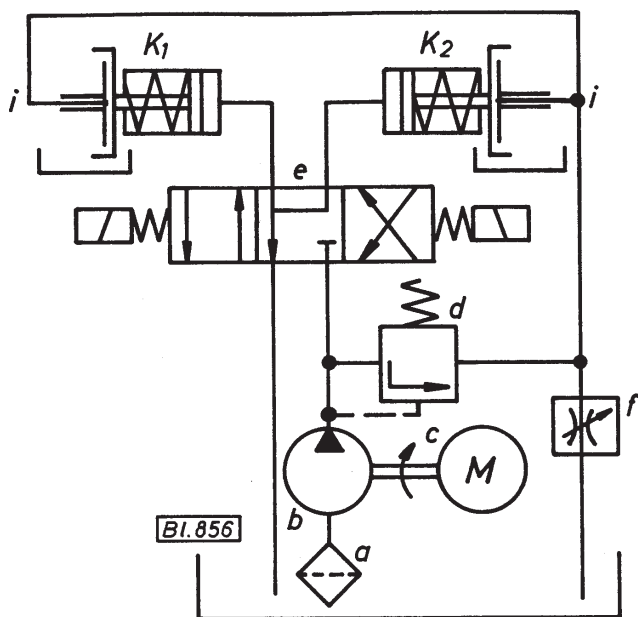
Catalogue section 9 "Rotary inlets" provides details on a wider selection of different rotary inlets.

In our **technical product information** for hydraulic clutches you will find comprehensive notes on the installation and maintenance of clutch systems.

## Circuit recommendations

- a Suction filter
- b Pump
- c Electric motor
- d Pressure relief valve
- e Directional control valve
- f Variable flow restrictor

- h Restrictor non-return valve
- i Internal lubrication line
- K<sub>1</sub> K<sub>2</sub> Clutch cylinders
- l Accumulator

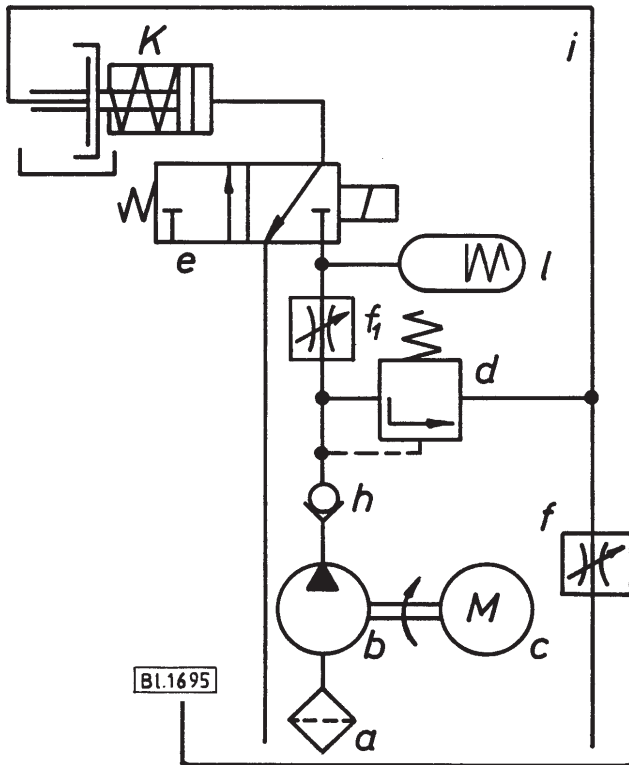


### Standard circuit

The suction pipe with filter (a) of a precision gear pump (b) is immersed in the oil bath of the machine. This pump delivers the oil to the directional control valve (e). When the clutch is engaged, the excess quantity of oil that is delivered flows via a pressure relief valve (d) into the internal lubrication line (i). The amount of cooling oil can be regulated with the variable restrictor (f).

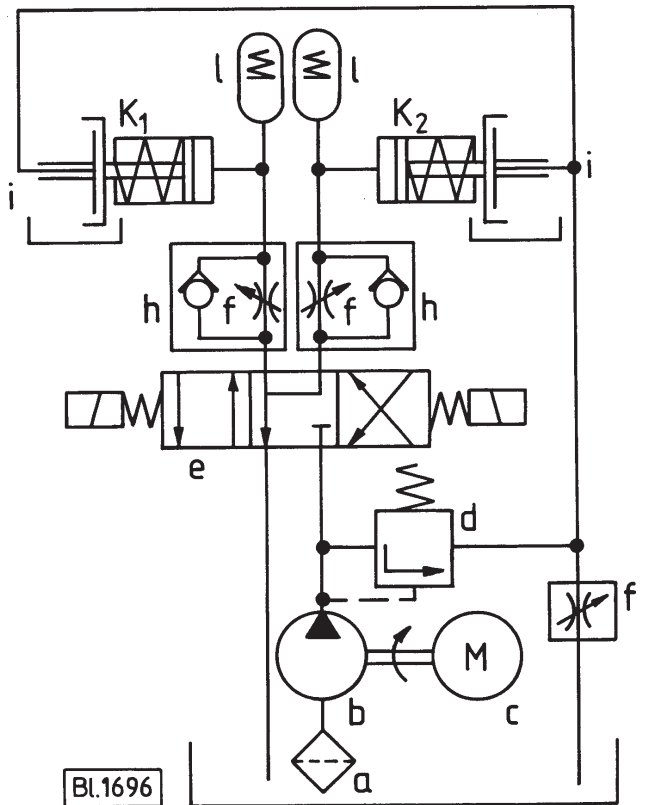
### Standard circuit for clutches requiring intensive internal oiling

If, as the result of the high level of friction work or the high frequency of engagement, the amount of heat generated by the clutch is high, an adequate amount of cooling oil is required to dissipate this heat. The circuit differs from the standard circuit in that it has a separate internal oil supply from a second pump.



### Circuit for delayed engagement

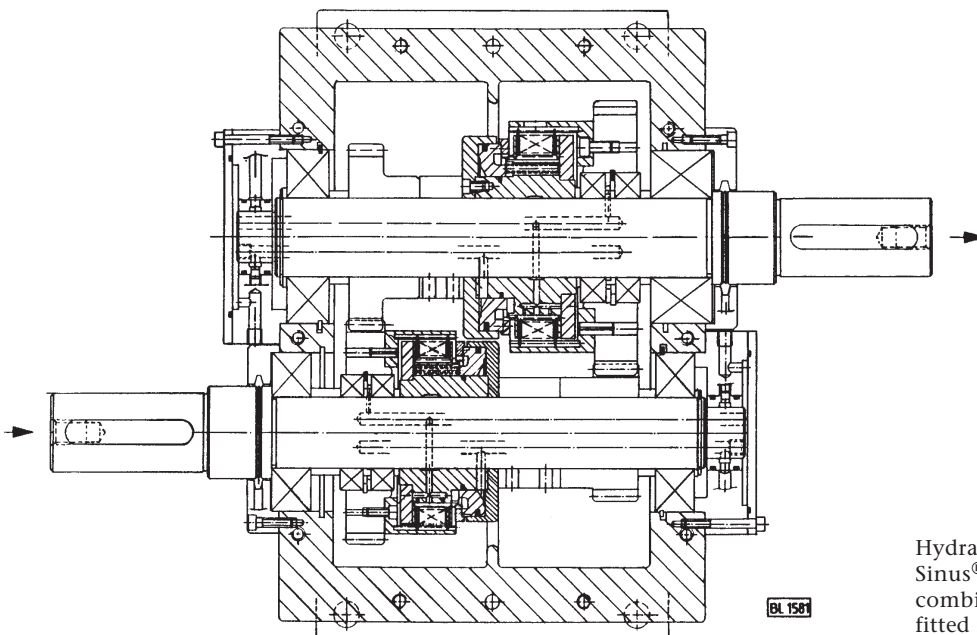
A throttle non-return valve (h) and a spring accumulator (l) are positioned downstream of the directional control valve. When the clutch is engaged, the restrictor and the volume of the accumulator, which has to be filled, reduce a delayed build-up of the clutch pressure and hence the clutch torque. The oil can flow rapidly out of the clutch when it is disengaged, via the non-return valve.



### Circuit for smooth engagement

This circuit contains, as additional items, a spring accumulator (l) and an adjustable restrictor (f<sub>1</sub>). When the clutch is engaged, the volume of oil in (l) brings the piston rapidly into contact with the plate stack. Restrictor (f<sub>1</sub>) determines the rate of the torque increase. The sizes of the spring accumulator and restrictor must be selected in accordance with the particular application.

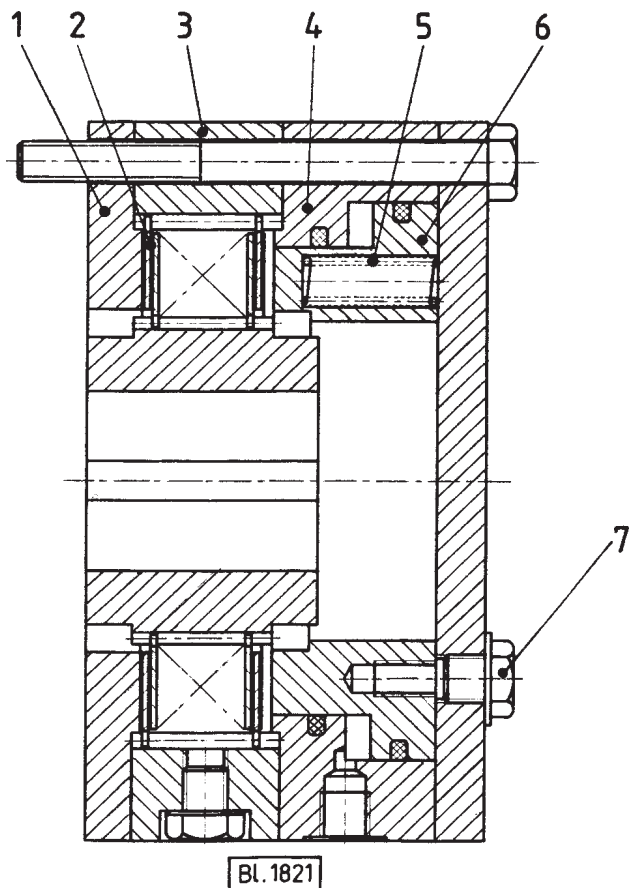
## Application example



Hydraulically actuated Ortlinghaus Sinus® multi-plate clutch, friction combination steel/sintered lining, fitted in a machine tool gearbox.

## Brakes

### Operation



### Braking

The brake is applied when it is in its de-energized state. The axial force of the springs (5) pushes the piston (6) which in turn compresses the plate stack (2) against the stop plate (1) so that a frictional connection is produced.

### Releasing of the brake

The pressure oil is fed into the brake through the non-rotating cylinder (4). The piston (6) moves against the pressure of the springs; the brake is released.

### Properties

Hydraulically released, spring-applied multi-plate brakes are characterised by the low amount of space they require, the low moment of inertia of the rotating parts and by the high application frequencies that can be permitted.

To a large extent they require no maintenance. Cylinder and piston are protected against rust as

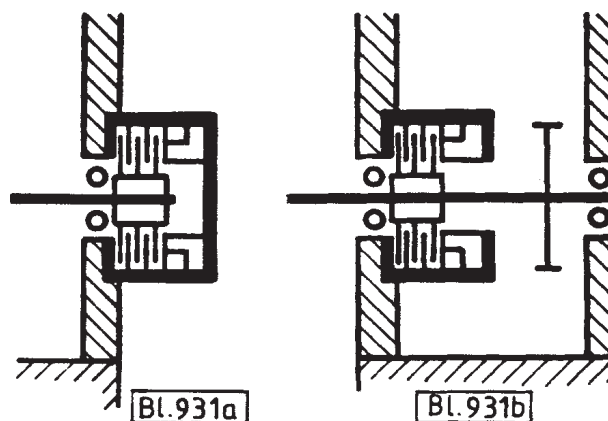
standard; further components can be protected against rust on request. The pressure to release the brakes lies between 10 and 50 bar; in addition they can be pressurised to a maximum of 320 bar for short periods of time. As a result of the spring-applied braking process which occurs automatically when either the oil is depressurised or the pressure oil supply fails, they can be used as safety brakes, in particular in lifting gear. In cases where the pressure oil supply fails, the brake can be released manually with the aid of the jacking screws (7).

### Installation

The oil feed pipes and the return lines must be of adequate dimensions if a delay-free application/releasing of the brake is to be ensured. The return lines should offer the least possible resistance to flow. If manual release of the brake is required using the jacking screws (7), the brake must be installed in such a way that there is sufficient space to access them. In order to prevent **faults** in the hydraulic system, it is important that absolute **cleanliness** is maintained during installation.

Different versions are available to suit different installation situations. These are shown in the following examples.

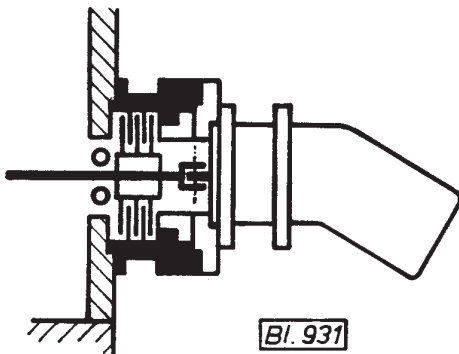
### Non-centering version, series 0022-..0/..9



This closed version can be fitted on an extended shaft journal outside the gearbox.

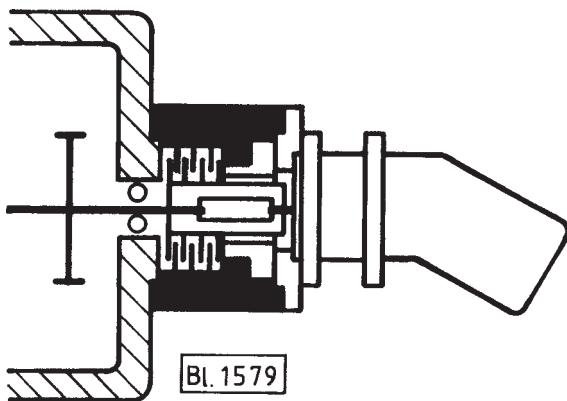
With the open flange as above, the brake can be fitted on a continuous shaft, e.g. inside a gearbox.

## Centering version, series 0022-..1



In this solid version with identical outer and inner centering, the forces generated by spring tension and piston pressure are supported within the brake. Bolts serve for fastening only, e.g. between hydraulic motor and gearbox. Perfect centering is guaranteed. All types of hydraulic motor can be fitted with the aid of an intermediate flange.

## Version with two different inner centerings, series 0022-320/620



This split version with two different inner centerings is used mainly when the input and output flanges are supplied by the customer.

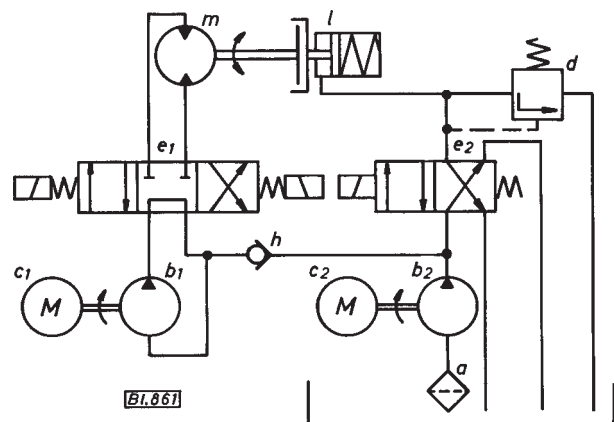
In our **technical product information** on hydraulically released, spring-applied brakes, you will find detailed information on the installation and maintenance of brake systems".

### Pressure oil supply

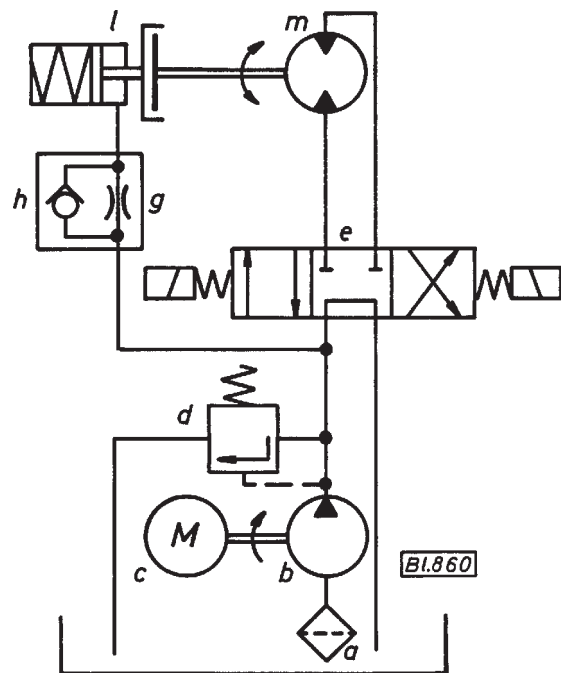
The brakes, piston and cylinder are sealed relative to one another in such a way that there is no leakage. As a result, the pressure oil supply only has to provide the volume of oil required for the disengagement operation. The quantity of oil necessary is determined by the size of the brake and the frequency with which the brake is to be released.

## Circuit proposals for hydraulically released, spring-applied multi-plate brakes on hydraulic motors

- a = Suction filter
- b, b<sub>1</sub>, b<sub>2</sub> = Pump
- c, c<sub>1</sub>, c<sub>2</sub> = Electric motor
- d = Pressure relief valve
- e, e<sub>1</sub>, e<sub>2</sub> = Directional control valve
- g = Restrictor (for damping pressure shocks)
- h = Non-return valve
- l = Brake
- m = Hydraulic motor

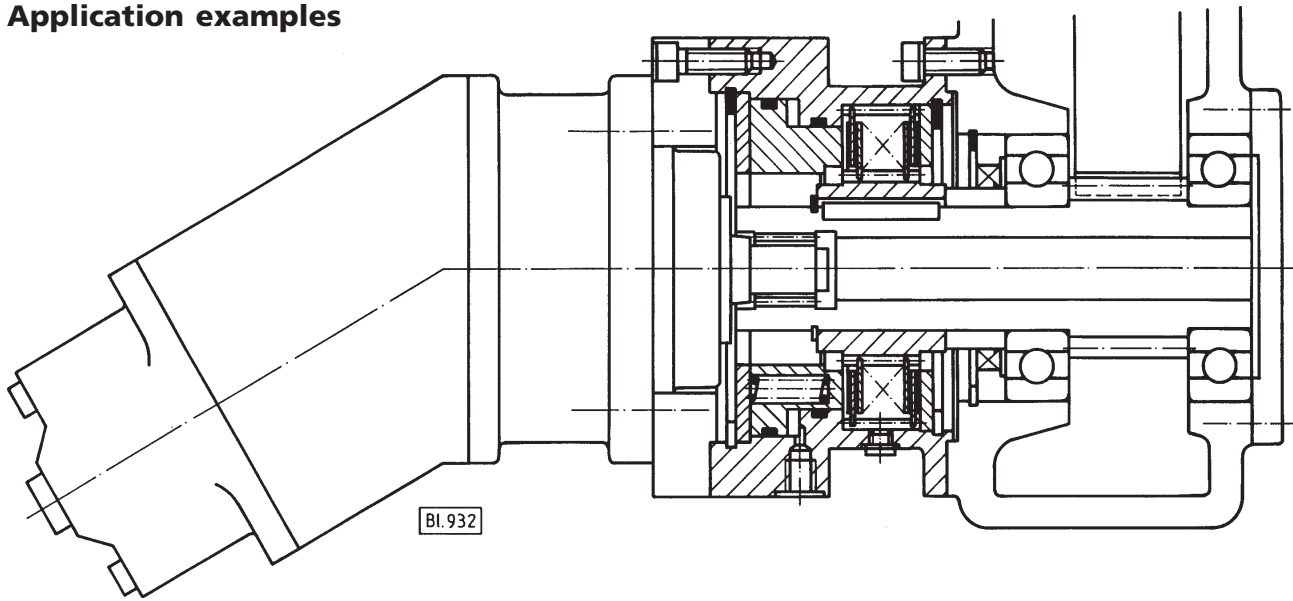


Closed circuit of hydraulic pump and motor. When the hydraulic motor is started with the aid of valve (e<sub>1</sub>), the auxiliary valve (e<sub>2</sub>) for releasing the brake, is also energised.

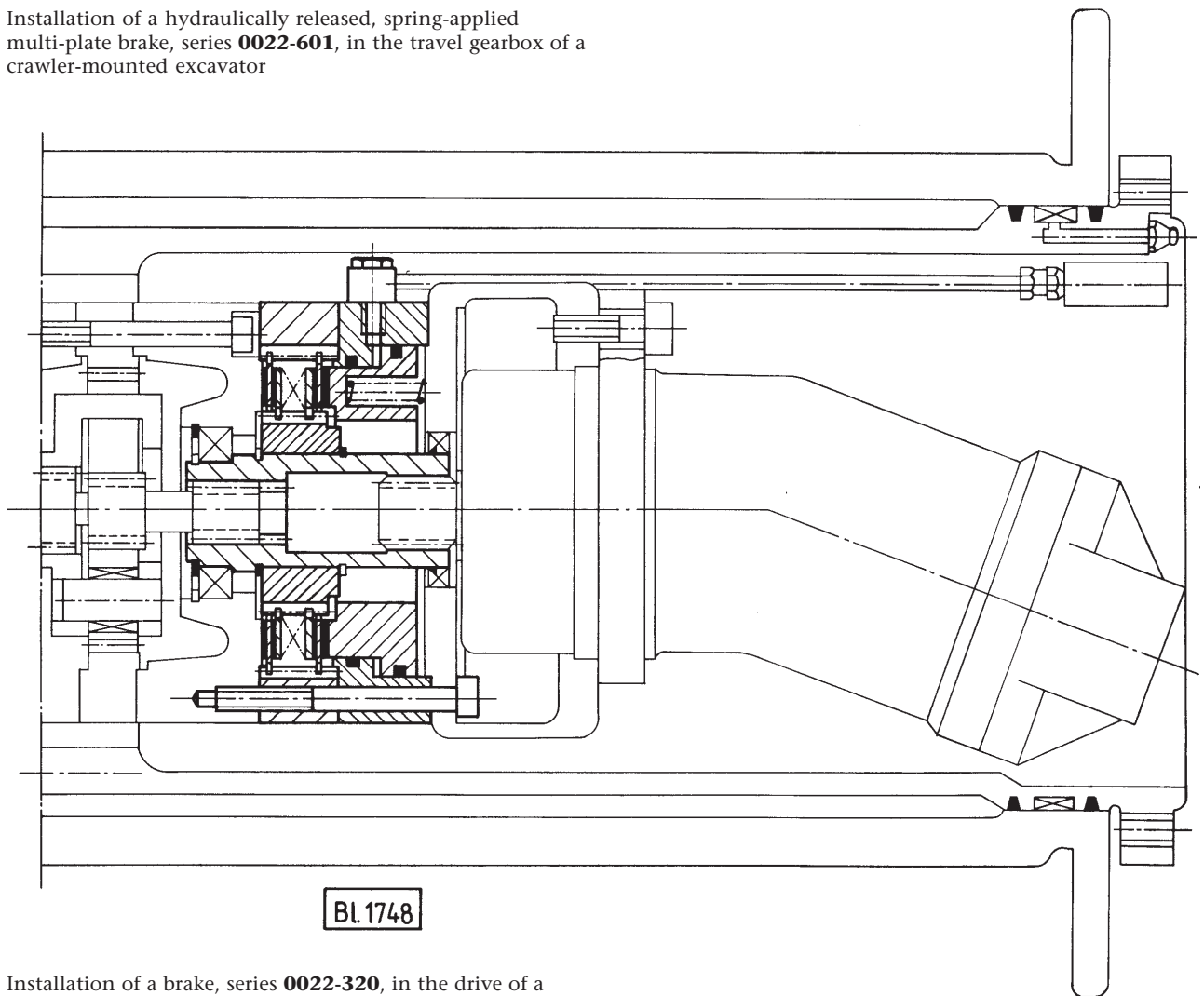


Open circuit for the hydraulic motor. The brake is kept released while the pump is being operated; the brake is applied when the system pressure falls.

## Application examples



Installation of a hydraulically released, spring-applied multi-plate brake, series **0022-601**, in the travel gearbox of a crawler-mounted excavator

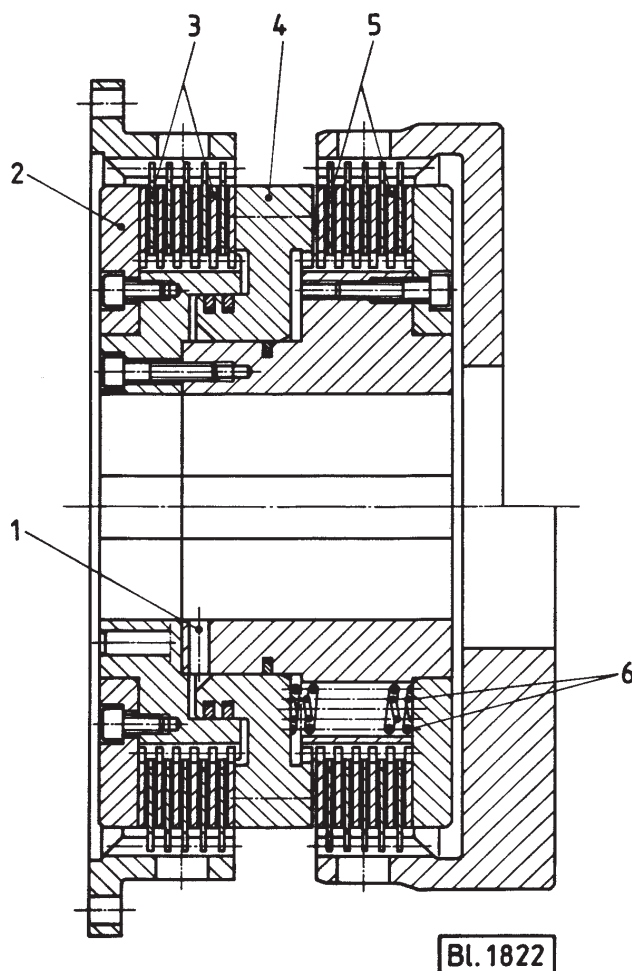


Installation of a brake, series **0022-320**, in the drive of a hoisting winch.

## Clutch/brake combined units

### Operation

**With these clutch/brake combined units, the clutch is engaged hydraulically and the brake is applied by spring pressure.**



### Braking

In the de-energized state, the piston (4), which lies between the plates (3/5) of the clutch and the brake, pushes - under the action of the springs (6) - the brake plates (3) against the stop plate (2); as a result frictional connection is given and the brake is applied.

### Engagement of the clutch

The piston (4) is subjected to pressure with pressure oil via the pressure oil inlet (1) (normally via the shaft and the clutch hub). It is moved away from the brake plates (3) until it makes contact on the clutch side, thus engaging the clutch. In the clutch/brake combined units, there is no overlap between the clutch and brake.

### Properties, areas of application

Hydraulically actuated clutch/brake combined units work exclusively with "wet-running", oil-cooled plates with the friction combination steel/sintered lining. The advantages of the actuation system with pressure oil at 60 bar, a multi-plate form of construction and oil-cooled friction combination steel/high performance sinter, lead to an extremely compact design with high output.

These combined units provide high torques at low moments of inertia, permit high switching frequencies and require very little maintenance. These clutch/brake combined units represent an alternative to the dry-running combined units. They have proved themselves over many years in applications where the pneumatic clutch/brake is not satisfactory. Since they run in a sealed housing, no particles can escape into the environment. In addition the operating noise level is very low.

With the help of these advantages, the hydraulic clutch/brake combined units have won for themselves a wide spectrum of applications in press and guillotine engineering, especially in the area of large presses. They are also to be found in embossing presses, deep-drawing presses and in other similar applications.

The international rules on safety for presses were taken into account during their design. The clutch/brake combined units have been recognized as safe by the German Employer's Liability Insurance Association and have been type-tested by the Swedish Industrial Safety Authority.

### Notes on installation

The clutch/brake combined units are normally enclosed in a housing which does not rotate. The pressure oil is fed in through the shaft and the clutch hub; the recommended shaft tolerance h6/H7 should be maintained in order to avoid oil losses. Due to the very high demands placed on clutch/brake combined units in terms of operating speed, precise repeatable braking angle and thermal capacity, great care must be taken when determining the size and design of the oil circuit. For this reason we strongly recommend that you make use of our many years of experience in optimizing the performance of press drives and ask our engineers for advice.



## Pressure oil and cooling oil supply

A hydraulic power pack is required to supply clutch/brake combined units with oil for actuation and cooling purposes. The size and design of this unit must be matched exactly to each particular application. In addition to the pressure and cooling oil pumps, Ortlinghaus hydraulic power packs contain all the actuation and safety elements that are needed for disruption-free operating (see section "Accessories").

The pressure oil under the operating pressure of 60 bar is introduced via a rotary inlet into the clutch shaft, from where it is led through the clutch hub into the cylinder; a part of the oil is used for lubricating and cooling the plates.

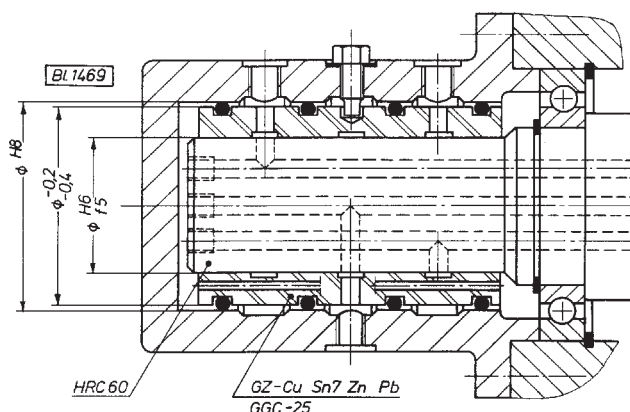
Since the piston seals (metal rings of rectangular section) permit oil to pass around them, there is a continuous flow of leakage and cooling oil. This oil is collected in the housing and should be allowed to drain back to the tank without restriction.

Where the thermal load is extremely high, it is often necessary to pass an additional flow of cooling oil through the housing; in this case a check should also be made as to whether a cooler should be provided to cool this volume of oil externally.

When designing the pressure and cooling oil supply circuits, particular attention must be paid to the thermal capacity of the complete drive, in order to ensure that a satisfactory equilibrium is established between the frictional heat developed and the dissipation of this heat.

## Rotary coupling

This design of rotary joint can be fitted onto the end of the shaft to take as many pipe connections as required. Sealing is by means of a floating bronze bush which is secured from turning, in the fixed housing, by a screw. This design allows the oil supply pipes to be connected directly into the inlet bores.



With regard to this please also study the sections which follow on "Rotary inlets" and "Application examples".

## Accessories

For the operating and actuating of hydraulically actuated clutches and brakes Ortlinghaus can supply an extensive range of accessories.

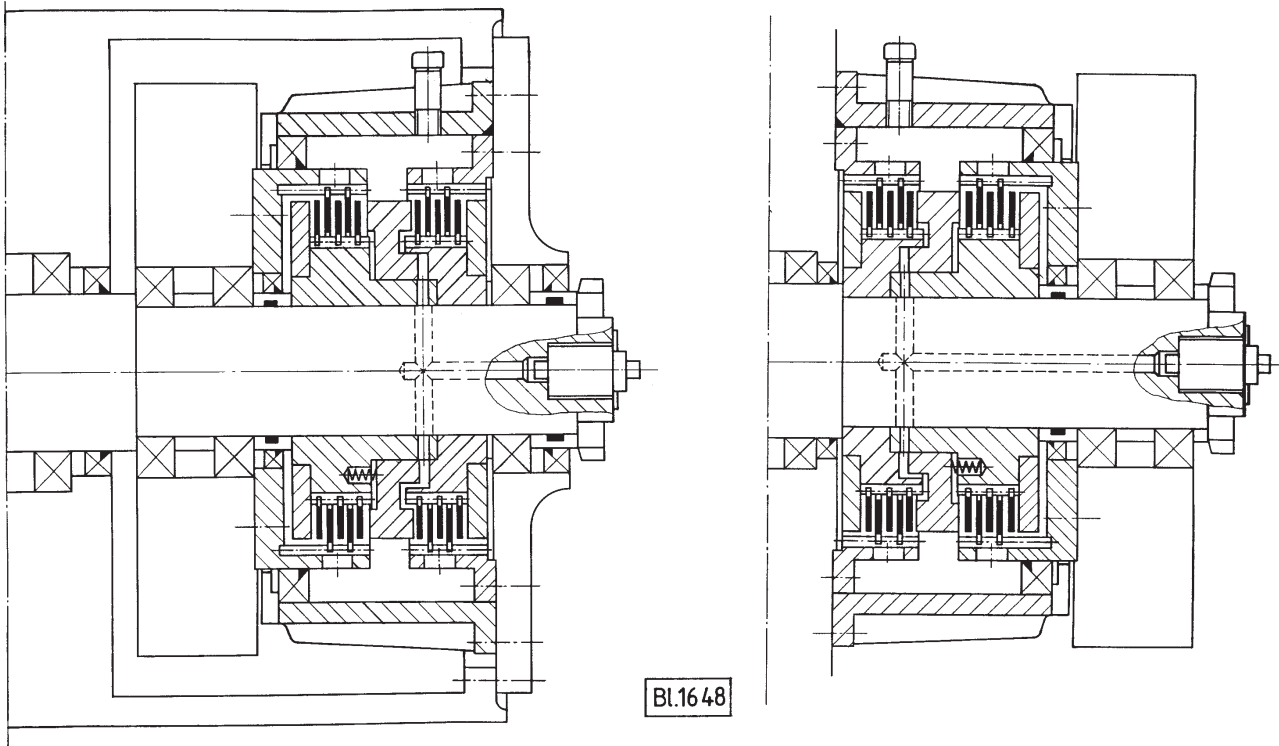
We can supply:

- rotary inlets
- press safety valves
- modular clutch-brake control systems
- complete installations for mounting
- complete hydraulic units, in particular for the actuation of clutch/brake combined units. These units also undertake the dissipation of frictional heat and are designed in thermal terms for each particular application.
- cooling units for the dissipation of frictional heat from the cooling oil, either oil/air or oil/water coolers
- housings for enclosing clutch/brake combined units oil-tight.

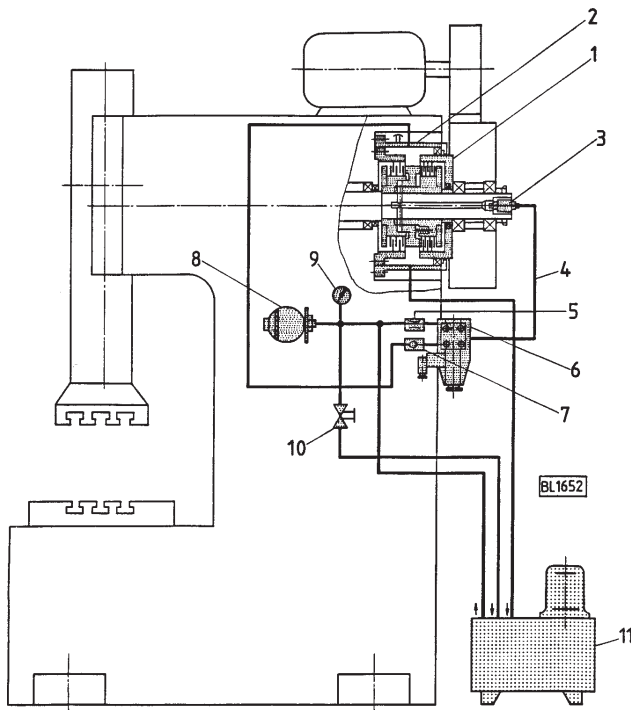
## Actuation systems for clutch/brake combined units

Many different hydraulic controls designs exist at Ortlinghaus for clutch-brake combined units. In particular is the use of these on high performance presses. Since it is not possible to represent these within the framework of this catalogue, please consult us about your particular requirement.

## Application examples



Ways of installing hydraulic clutch/brake combined units



- 1 Clutch/brake combined unit
- 2 Housing
- 3 Rotary inlet
- 4 Flexible hose
- 5 Throttle
- 6 Press safety valve
- 7 Check valve
- 8 Accumulator
- 9 Pressure gauge
- 10 Stopcock
- 11 Hydraulic unit

Principle of installing a hydraulic clutch/brake combined unit with control on an eccentric press

## Torque variations for clutch and brake

Series	Size	Series 0023-0../0123-0.. Spring pressure 24/27 bar *				Series 0023-1../0123-1.. Spring pressure 20/23 bar *			
		Clutch		Brake		Clutch		Brake	
		RF <sup>1)</sup>	M <sub>stat</sub> [Nm]	RF <sup>1)</sup>	M <sub>dyn</sub> [Nm]	RF <sup>1)</sup>	M <sub>stat</sub> [Nm]	RF <sup>1)</sup>	M <sub>dyn</sub> [Nm]
0023-....	63 standard	10	2500	10	1000	10	2600	10	830
0023-....	63 reinforced	16	4000	16	1600	16	4100	16	1330
0123-....	75 standard	12	6000	12	2400	12	6500	12	2000
0123-....	75 reinforced	18	9000	18	3600	18	9750	18	3000
0123-....	80 standard	12	12000	12	4800	12	12600	12	4000
0123-....	80 reinforced	18	18000	18	7200	18	18900	18	6000
0123-....	86 standard	12	24000	12	9600	12	25700	12	8000
0123-....	86 reinforced	18	36000	18	14400	18	38550	18	12000
0123-....	90 standard	12	48000	12	22000	12	54000	12	18500
0123-....	90 reinforced	18	72000	18	33000	18	81000	18	28000
0123-....	94 standard	14	110000	14	80000	14	135000	14	68000
0123-....	94 reinforced	20	160000	20	116000	20	190000	20	97000
0123-....	96 standard	14	225000	14	150000	14	265000	14	125000
0123-....	96 reinforced	20	325000	20	215000	20	380000	20	180000
0023-....	98 standard	10	315000	10	120000	10	350000	10	100000
0023-....	98 reinforced	20	630000	20	240000	20	700000	20	200000

Series	Size	Series 0023-2../0123-2.. Spring pressure 17 bar *				Series 0023-3../0123-3.. Spring pressure 13 bar *			
		Clutch		Brake		Clutch		Brake	
		RF <sup>1)</sup>	M <sub>stat</sub> [Nm]	RF <sup>1)</sup>	M <sub>dyn</sub> [Nm]	RF <sup>1)</sup>	M <sub>stat</sub> [Nm]	RF <sup>1)</sup>	M <sub>dyn</sub> [Nm]
0023-....	63 standard	10	2900	10	670	10	3150	10	500
0023-....	63 reinforced	16	4600	16	1070	16	5000	16	800
0123-....	75 standard	12	7250	12	1600	12	8000	12	1200
0123-....	75 reinforced	18	10900	18	2400	18	12000	18	1800
0123-....	80 standard	12	14100	12	3200	12	15600	12	2400
0123-....	80 reinforced	18	21100	18	4800	18	23400	18	3600
0123-....	86 standard	12	28700	12	6400	12	31700	12	4800
0123-....	86 reinforced	18	43000	18	9600	18	47500	18	7200
0123-....	90 standard	12	60000	12	14500	12	66000	12	10400
0123-....	90 reinforced	18	90000	18	21500	18	99000	18	15500
0123-....	94 standard	14	140000	14	54500	14	140000	14	41000
0123-....	94 reinforced	20	200000	20	77000	20	200000	20	58000
0123-....	96 standard	14	280000	14	100000	14	280000	14	75000
0123-....	96 reinforced	20	400000	20	145000	20	400000	20	105000
0023-....	98 standard	10	375000	10	80000	10	400000	10	60000
0023-....	98 reinforced	20	750000	20	160000	20	800000	20	120000

<sup>1)</sup> RF = frictional surfaces

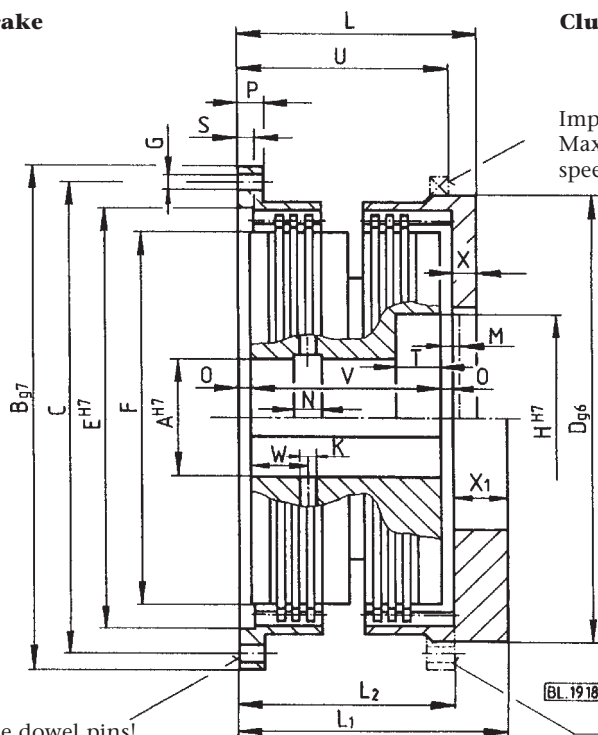
\*differs by sizes 94, 96 and 98

Standard and reinforced torques of clutch and brake can be combined with one another as required (see pages 5.14.00 to 5.19.00).

# Hydraulically actuated clutch/brake combined units

**Brake**

**Clutch**



Important!  
Max. permissible peripheral  
speed of the seal 10 m/s

M: fitting space necessary for  
Ringfeder RfN 7012 locking assembly

Provide dowel pins!

ØG flange housing only sizes 94 to 98

Series Size			0023 63	0123 75	0123 80	0123 86	0123 90	0123 94	0123 96	0023 98
M <sub>stat</sub>	clutch	Nm	2500	6000	12000	24000	48000	110000	225000	315000
M <sub>dyn</sub>	brake	Nm	1000	2400	4800	9600	22000	80000	150000	120000
Frictional surface clutch/brake			10/10	12/12	12/12	12/12	12/12	14/14	14/14	10/10
Operating pressure		bar	60+5	63+5	63+5	63+5	63+5	87+3	86+3	60+5
Spring return pressure		bar	24	27	27	27	27	47	45	24
n <sub>max</sub>		min <sup>-1</sup>	1700	1300	1000	850	700	500	415	350
Stroke volume		dm <sup>3</sup>	0,01	0,021	0,034	0,059	0,108	0,141	0,260	0,542
J		internal kgm <sup>2</sup>	0,12	0,3	1	2,55	6,75	31,8	96,4	210
Weight		kg	33	62	120	212	400			2245
Locking assembly RfN7012			-	95x135	130x180	160x210	200x260	-	-	-
ØA		prebored	45	60	70	100	115	150	180	220
ØA <sub>max</sub>		H7	75	95	130	160	200	250	310	375
Keyway			20x4,9	25x5,4	32x7,4	40x9,4	45x10,4	56x12,4	70x14,4	80x15,4
Diameters	B		260	330	425	500	630	800	990	1180
	C		245	310	400	470	590	750	930	1115
	D		230	290	380	440	560	710	-	-
	E		215	275	350	415	530	670	830	1000
	F		195	250	318	380	490	630	778	930
	G (12x30°)		9	11	14	18	22	30	33	36
	H		-	135	180	210	260	-	-	-
Length dimensions	K		6	7	10	12	15	19	24	28
	L		136	163	200	240	270	397	-	-
	L <sub>1</sub>		155	185	225	270	305	442	-	-
	L <sub>2</sub>		-	-	-	-	-	362	442	445
	M		-	11,5	14	14	16	-	-	-
	N		-	8	12	15	18	-	-	-
	O		5	5	5	5	5	5	10	10
	P		11	12	16	20	25	30	40	50
	S		6	6	6	6	6	6	10	-
	T		-	28	38	38	52	-	-	-
	U		115	140	180	205	230	352	-	-
	V		110	135	170	205	230	352	422	425
	W		31	36	48	60	65	113	139	125
	X		16	18	20	25	30	35	-	-
X <sub>1</sub>		35	40	45	55	65	80	-	-	

Dimensions **L/X** narrow cup housing

Dimensions **L<sub>1</sub>/X<sub>1</sub>** wide cup housing

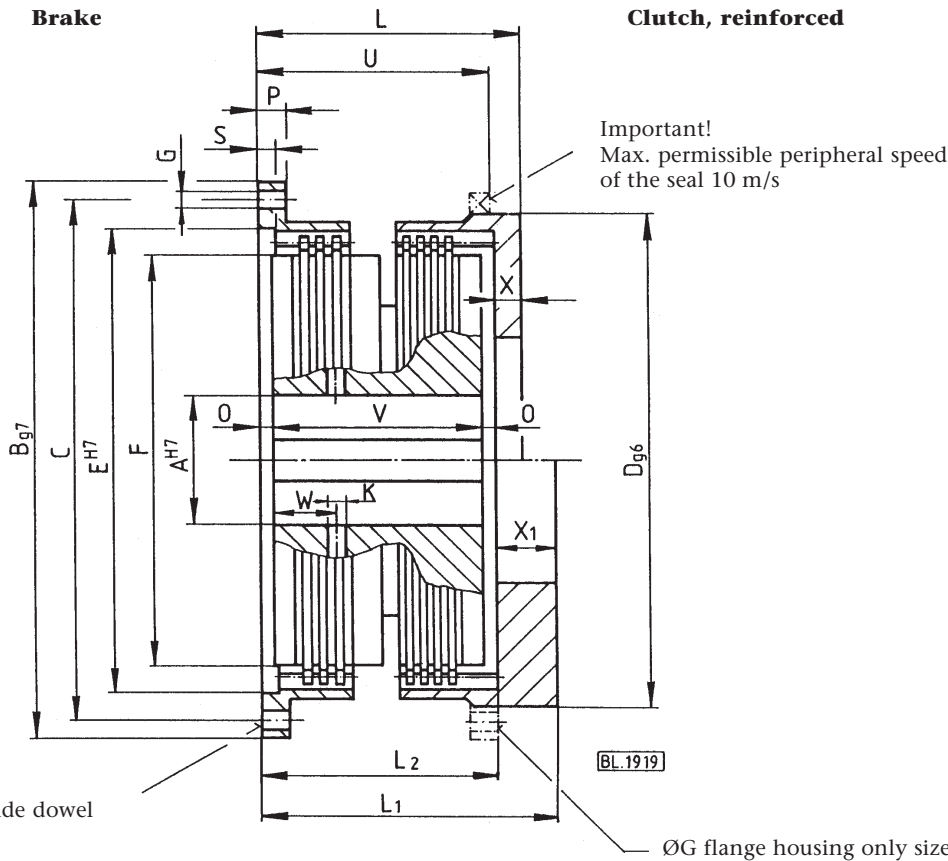
Dimensions **L<sub>2</sub>** clutch and brake with flange housing

Diameter **G** brake 12 x 30°, clutch 24 x 15°

For further torque variations see page 5.13.00

For rotary inlets for pressure oil see page 5.45.00

**Hydraulically actuated  
clutch/brake combined units**  
Clutch with reinforced torque



Series			0023	0123	0123	0123	0123	0123	0123	0023
Size			63	75	80	86	90	94	96	98
M <sub>stat</sub>	clutch	Nm	4000	9000	18000	36000	72000	160000	325000	630000
M <sub>dyn</sub>	brake	Nm	1000	2400	4800	9600	22000	80000	150000	120000
Frictional surface clutch/brake			16/10	18/12	18/12	18/12	18/12	20/14	20/14	20/10
Operating pressure		bar	60+5	63+5	63+5	63+5	63+5	87+3	86+3	60+5
Spring return pressure		bar	24	27	27	27	27	47	45	24
n <sub>max</sub>		min <sup>-1</sup>	1700	1300	1000	850	700	500	415	350
Stroke volume		dm <sup>3</sup>	0,014	0,029	0,047	0,083	0,147	0,186	0,340	0,84
J	internal	kgm <sup>2</sup>	0,129	0,333	1,1	2,85	7,55	35,4	107,2	255
Weight		kg	37	70	138	239	450			2720
ØA	prebored		45	60	70	100	115	150	180	220
ØA <sub>max</sub>	H7		75	95	130	160	200	250	310	375
Keyway			20x4,9	25x5,4	32x7,4	40x9,4	45x10,4	56x12,4	70x14,4	80x15,4
Diameters	B		260	330	425	500	630	800	990	1180
	C		245	310	400	470	590	750	930	1115
	D		230	290	380	440	560	710	-	-
	E		215	275	350	415	530	670	830	1000
	F		195	250	318	380	490	630	778	930
	G (12x30°)		9	11	14	18	22	30	33	36
Length dimensions	K		6	7	10	12	15	19	24	28
	L		152	184	226	272	306	444	-	-
	L <sub>1</sub>		171	206	251	302	341	489	-	-
	L <sub>2</sub>		-	-	-	-	-	409	496	552
	O		5	5	5	5	5	5	10	10
	P		11	12	16	20	25	30	40	50
	S		6	6	6	6	6	6	10	10
	U		131	161	205	237	266	399	-	-
	V		126	156	196	237	266	399	476	532
	W		31	36	48	60	65	113	139	125
	X		16	18	20	25	30	35	-	-
X <sub>1</sub>		35	40	45	55	65	80	-	-	

Dimensions **L/X** narrow cup housing

Dimensions **L<sub>1</sub>/X<sub>1</sub>** wide cup housing

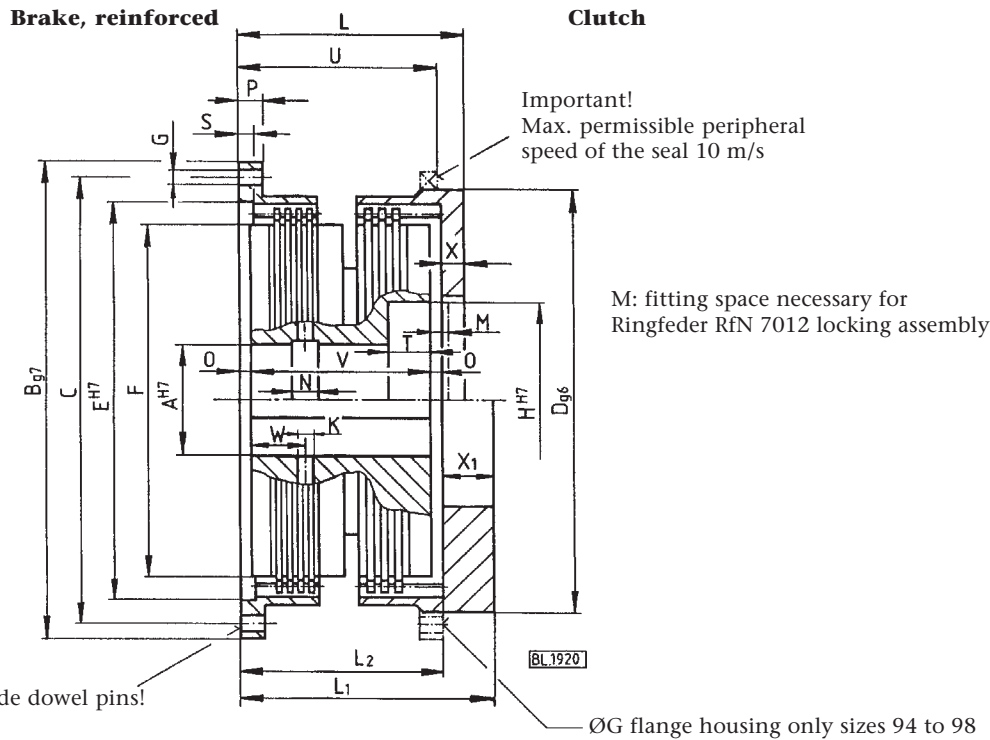
Dimensions **L<sub>2</sub>** clutch and brake with flange housing

Diameter **G** brake 12 x 30°, clutch 24 x 15°

For further torque variations see page 5.13.00

For rotary inlets for pressure oil see page 5.45.00

**Hydraulically actuated  
clutch/brake combined units  
Brake with reinforced torque**



Series Size			0023 63	0123 75	0123 80	0123 86	0123 90	0123 94	0123 96	0023 98
M <sub>stat</sub>	clutch	Nm	2500	6000	12000	24000	48000	110000	225000	315000
M <sub>dyn</sub>	brake	Nm	1600	3600	7200	14400	33000	116000	215000	240000
Frictional surface clutch/brake			10/16	12/18	12/18	12/18	12/18	14/20	14/20	10/20
Operating pressure		bar	60+5	63+5	63+5	63+5	63+5	87+3	86+3	60+5
Spring return pressure		bar	24	27	27	27	27	47	45	24
n <sub>max</sub>		min <sup>-1</sup>	1700	1300	1000	850	700	500	415	350
Stroke volume		dm <sup>3</sup>	0,014	0,029	0,047	0,083	0,147	0,186	0,340	0,84
J		internal kgm <sup>2</sup>	0,129	0,3333	1,1	2,85	7,55	35,4	107,2	255
Weight		kg	37	70	138	239	450			2720
Locking assembly RfN7012			-	95x135	130x180	160x210	200x260	-	-	-
ØA		prebored	45	60	70	100	115	150	180	220
ØA <sub>max</sub>		H7	75	95	130	160	200	250	310	375
Keyway			20x4,9	25x5,4	32x7,4	40x9,4	45x10,4	56x12,4	70x14,4	80x15,4
Diameters		B	260	330	425	500	630	800	990	1180
		C	245	310	400	470	590	750	930	1115
		D	230	290	380	440	560	710	-	-
		E	215	275	350	415	530	670	830	1000
		F	195	250	318	380	490	630	778	930
		G (12x30°)	9	11	14	18	22	30	33	36
		H	-	135	180	210	260	-	-	-
Length dimensions		L	152	184	226	272	307	443	-	-
		L <sub>1</sub>	171	206	251	302	342	488	-	-
		L <sub>2</sub>	-	-	-	-	-	408	496	552
		M	-	11,5	14	14	16	-	-	-
		N	-	8	12	15	18	-	-	-
		O	5	5	5	5	5	5	10	10
		P	11	12	16	20	25	30	40	50
		S	6	6	6	6	6	6	10	10
		T	-	28	38	38	52	-	-	-
		U	131	161	205	237	267	398	-	-
		V	126	156	196	237	266	398	476	532
		W	47	57	74	92	102	160	159	125
		X	16	18	20	25	30	35	-	-
		X <sub>1</sub>	35	40	45	55	65	80	-	-

Dimensions **L/X** narrow cup housing

Dimensions **L<sub>1</sub>/X<sub>1</sub>** wide cup housing

Dimensions **L<sub>2</sub>** clutch and brake with flange housing

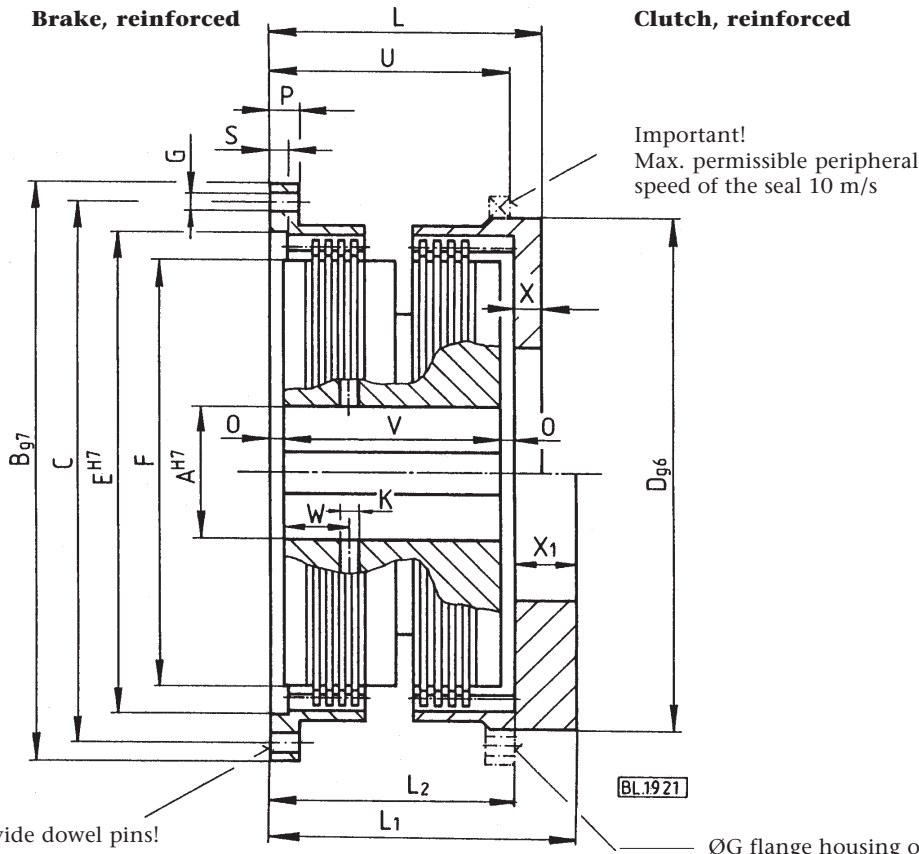
Diameter **G** brake 12 x 30°, clutch 24 x 15°

For further torque variations see page 5.13.00

For rotary inlets for pressure oil see page 5.45.00

**Hydraulically actuated  
clutch/brake combined units**  
Clutch and brake with reinforced torque

**Brake, reinforced** **Clutch, reinforced**



Provide dowel pins!

ØG flange housing only sizes 94 to 98

Series Size			<b>0023 63</b>	<b>0123 75</b>	<b>0123 80</b>	<b>0123 86</b>	<b>0123 90</b>	<b>0123 94</b>	<b>0123 96</b>	<b>0023 98</b>
M <sub>stat</sub>	clutch	Nm	4000	9000	18000	36000	72000	160000	325000	630000
M <sub>dyn</sub>	brake	Nm	1600	3600	7200	14400	33000	116000	215000	240000
Frictional surface clutch/brake			16/16	18/18	18/18	18/18	18/18	20/20	20/20	20/20
Operating pressure		bar	60+5	63+5	63+5	63+5	63+5	87+3	86+3	60+5
Spring return pressure		bar	24	27	27	27	27	47	45	24
n <sub>max</sub>		min <sup>-1</sup>	1700	1300	1000	850	700	500	415	350
Stroke volume		dm <sup>3</sup>	0,0014	0,029	0,047	0,083	0,147	0,186	0,340	0,84
J		internal kgm <sup>2</sup>	0,138	0,366	1,2	3,11	8,35	39	118	300
Weight		kg	44	78	156	266	500	-	-	-
ØA		prebored	45	60	70	100	115	150	180	220
ØA <sub>max</sub>		H7	75	95	130	160	200	250	310	375
Keyway			20x4,9	25x5,4	32x7,4	40x9,4	45x10,4	56x12,4	70x14,4	80x15,4
Diameters	B		260	330	425	500	630	800	990	1180
	C		245	310	400	470	590	750	930	1115
	D		230	290	380	440	560	710	-	-
	E		215	275	350	415	530	670	-	-
	F		195	250	318	380	490	630	830	1000
	G (12x30°)		9	11	14	18	22	30	33	36
Length dimensions	L		168	205	252	304	343	490	-	-
	L <sub>1</sub>		187	227	277	334	378	535	-	-
	L <sub>2</sub>		-	-	-	-	-	455	550	650
	O		5	5	5	5	5	5	10	10
	P		11	12	16	20	25	30	40	50
	S		6	6	6	6	6	6	10	10
	U		152	185	235	275	310	445	-	-
	V		142	177	222	269	303	445	530	640
	W		47	57	74	92	102	159	193	232
	X		16	18	20	25	30	35	-	-
	X <sub>1</sub>		35	40	45	55	65	80	-	-

Dimensions **L/X** narrow cup housing

Dimensions **L<sub>1</sub>/X<sub>1</sub>** wide cup housing

Dimensions **L<sub>2</sub>** clutch and brake with flange housing

Diameter **G** brake 12 x 30°, clutch 24 x 15°

For further torque variations see page 5.13.00

For rotary inlets for pressure oil see page 5.45.00

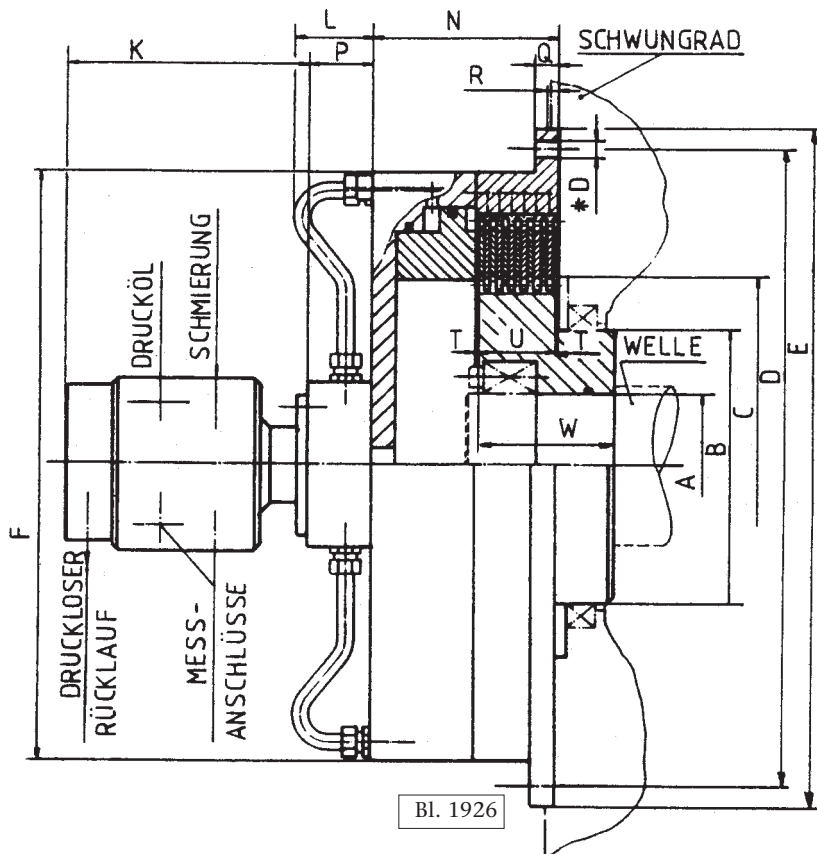
**Numbering table for design variations**

**0127- . 0 . -Size-010100**

0		12 Friction surfaces with oil inlet
1		16 Friction surfaces with oil inlet
2		20 Friction surfaces with oil inlet
3		24 Friction surfaces with oil inlet
7		20 Friction surfaces, oil inlet with proximity switch
	0	Hub with annular groove for tension sets
	1	Hub with keyway
	5	Hub prebored



# Hydraulically actuated multi-plate clutches



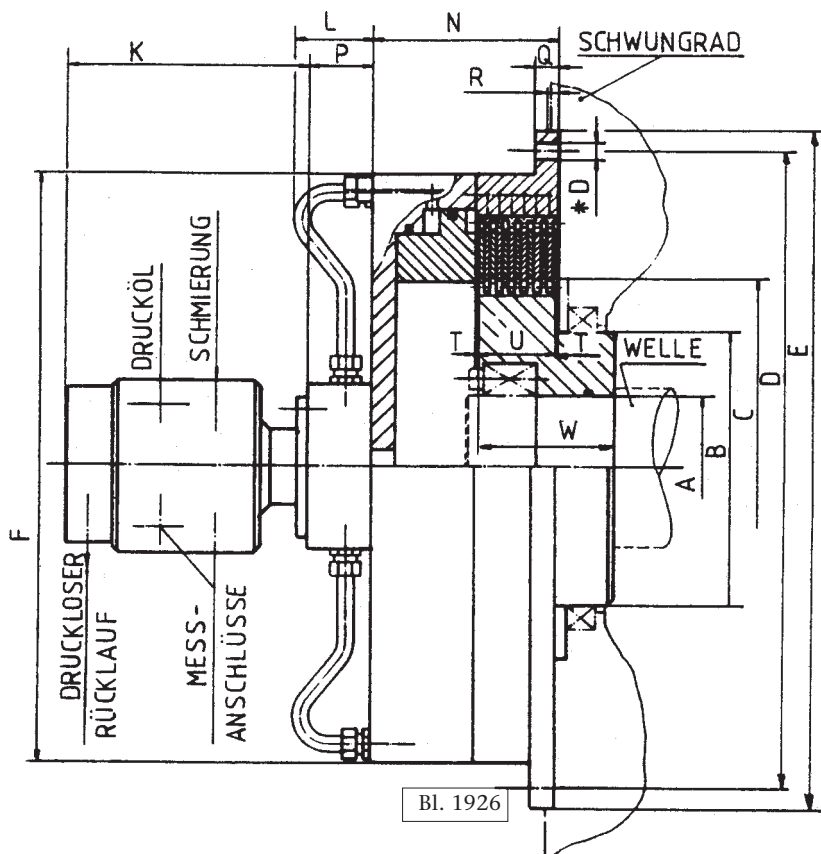
Schwungrag = flywheel  
 Druckloser Rücklauf = pressure free drain  
 Drucköl = pressure oil  
 Messanschlüsse = measuring ports  
 Schmierung = cooling oil  
 Welle = shaft

Series Size	0127....Size-010100												
	000-80	100-80	200-80	000-86	100-86	200-86	000-90	100-90	200-90	000-94	100-94	200-94	
Friction surface	12	16	20	12	16	20	12	16	20	12	16	20	
M <sub>ü</sub> Nm	15000	20000	25000	24000	32000	40000	50000	68000	85000	100000	136000	170000	
M <sub>s</sub> Nm	10000	13000	16000	14000	19000	24000	30000	40000	50000	60000	80000	100000	
n max min <sup>-1</sup>	1000			830			640			500			
Operating pressure bar	80+5			80+5			80+5			90+5			
Back pressure bar	~12			~12			~11			~13			
Stroke volume cm <sup>3</sup>	19	26	32	27	36	45	52	69	86	90	120	150	
J internal kgm <sup>2</sup>	0,27	0,35	0,43	0,73	0,94	1,14	2,35	3,00	3,66	8,4	10,8	13,3	
Weight approx. kg	113	127	141	196	221	244	319	360	402	651	747	843	
Diameters	A prebored	60		100			115			150			
	A max H7	140		190			250			320			
	B max	190		245			310			390			
	C	255		311			405			520			
	D	450		520			640			800			
	24 x *D	13		18			22			30			
	E g7	475		550			680			850			
F	410		488			600			750				
Length dimensions	K	180		260			260			308			
	L	63,5		71			71			93			
	N	138		142			168			223			
	P	40		55			55			66			
	Q	16		20			22			30			
	S	10		10			10			12			
	T	2		2			3			4			
	U	48	64	80	60	80	99,5	67	89	111	97	129	161
	W	80	96	112	102	122	141,5	120	142	164	161	193	225

# Hydraulically actuated multi-plate clutches

**Ortlinghaus** SEIT 1898

DIE TECHNIK DER KONTROLLIERTEN MOMENTE



Schwungrag = flywheel  
 Druckloser Rücklauf = pressure free drain  
 Drucköl = pressure oil  
 Messanschlüsse = measuring ports  
 Schmierung = cooling oil  
 Welle = shaft

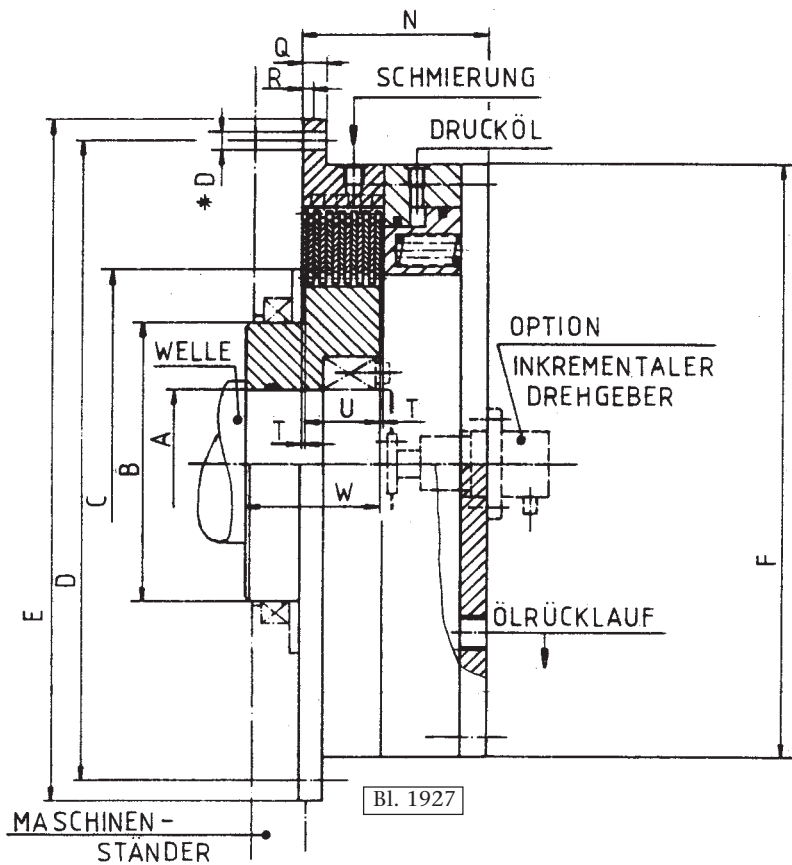
Series Size	0127-...-Size-010100						
	000-96	100-96	200-96	000-98	100-98	200-98	
Friction surface	12	16	20	12	16	20	
M <sub>ü</sub> Nm	200000	270000	340000	360000	480000	600000	
M <sub>s</sub> Nm	120000	160000	200000	210000	290000	360000	
n max min <sup>-1</sup>	537			448			
Operating pressure bar	90+5			90+5			
Back pressure bar	~21			~15			
Stroke volume cm <sup>3</sup>	175	233	292	270	360	450	
J internal kgm <sup>2</sup>	28	36,3	44,5	69,0	89,0	109,0	
Weight approx. kg	1200	1375	1550	2140	2350	2560	
Diameters	A prebored	180			220		
	A max H7	310			375		
	B max	500			600		
	C	645			765		
	D	1000			1165		
	24 x *D	31			39		
	E g7	1060			1230		
F	940			1100			
Length dimensions	K	470			470		
	L	92			103		
	N	276	313	350	320	362	404
	P	50			50		
	Q	40			50		
	S	16			20		
	T	4			4		
	U	113	150	187	142	184	226
	W	178	215	252	236	278	320

**Numbering table for design variations**

**0128- . 0 . -Size-010100**

0		12 friction surfaces
1		16 friction surfaces
2		20 friction surfaces
3		24 friction surfaces
5		12 friction surfaces, with incremental encodes
6		16 friction surfaces, with incremental encodes
7		20 friction surfaces, with incremental encodes
8		24 friction surfaces, with incremental encodes
	0	Hub with annular groove for tension sets
	1	Hub with keyway
	5	Hub prebored

**Hydraulically released  
spring-applied multi-plate brakes  
torque by max. Spring-applied**

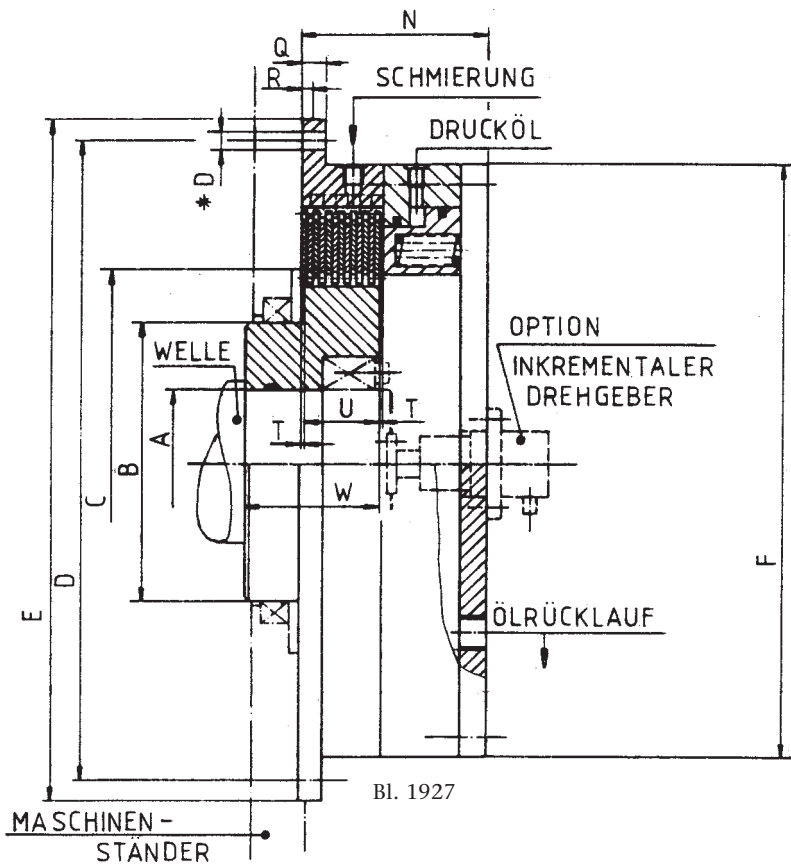


Schmierung = cooling oil  
Drucköl = pressure oil  
Inkrementaler Drehgeber = incremental encodes  
Ölrücklauf = oil drain  
Maschinenständer = machine frame  
Welle = shaft

Bl. 1927

Series Size	0128-...-Size-010100												
	000-80	100-80	200-80	000-86	100-86	200-86	000-90	100-90	200-90	000-94	100-94	200-94	
Friction surface	12	16	20	12	16	20	12	16	20	12	16	20	
M <sub>ü</sub> Nm	9000	12000	15000	16500	22000	27500	33000	44000	55000	68000	90000	110000	
M <sub>s</sub> Nm	5600	7500	9300	10000	13500	17000	20000	27000	34000	40000	55000	68000	
n max min <sup>-1</sup>	1000			830			640			500			
Operating pressure bar	80+5			80+5			80+5			90+5			
Spring return press. bar	~36			~45			~43			~47			
Stroke volume cm <sup>3</sup>	19	26	32	27	36	45	52	69	86	90	120	150	
J internal kgm <sup>2</sup>	0,27	0,35	0,43	0,73	0,94	1,14	2,35	3,00	3,66	8,4	10,8	13,3	
Weight approx. kg	99	114	128	163	188	211	290	331	372	599	694	790	
Diameters	A prebored	60			100			115			150		
	A max H7	140			190			250			320		
	B max	190			245			310			390		
	C	255			311			405			520		
	D	450			520			640			800		
	16 x *D	13			18			22			30		
	E g <sup>7</sup>	475			550			680			850		
F	410			488			600			750			
Length dimensions	N	122	138	154	142	162	181,5	168	190	212	223	255	287
	Q	16			20			22			30		
	R	10			10			10			12		
	T	2			2			3			4		
	U	48	64	80	60	80	99,5	67	89	111	97	129	161
	W	80	96	112	102	122	141,5	120	142	164	161	193	225

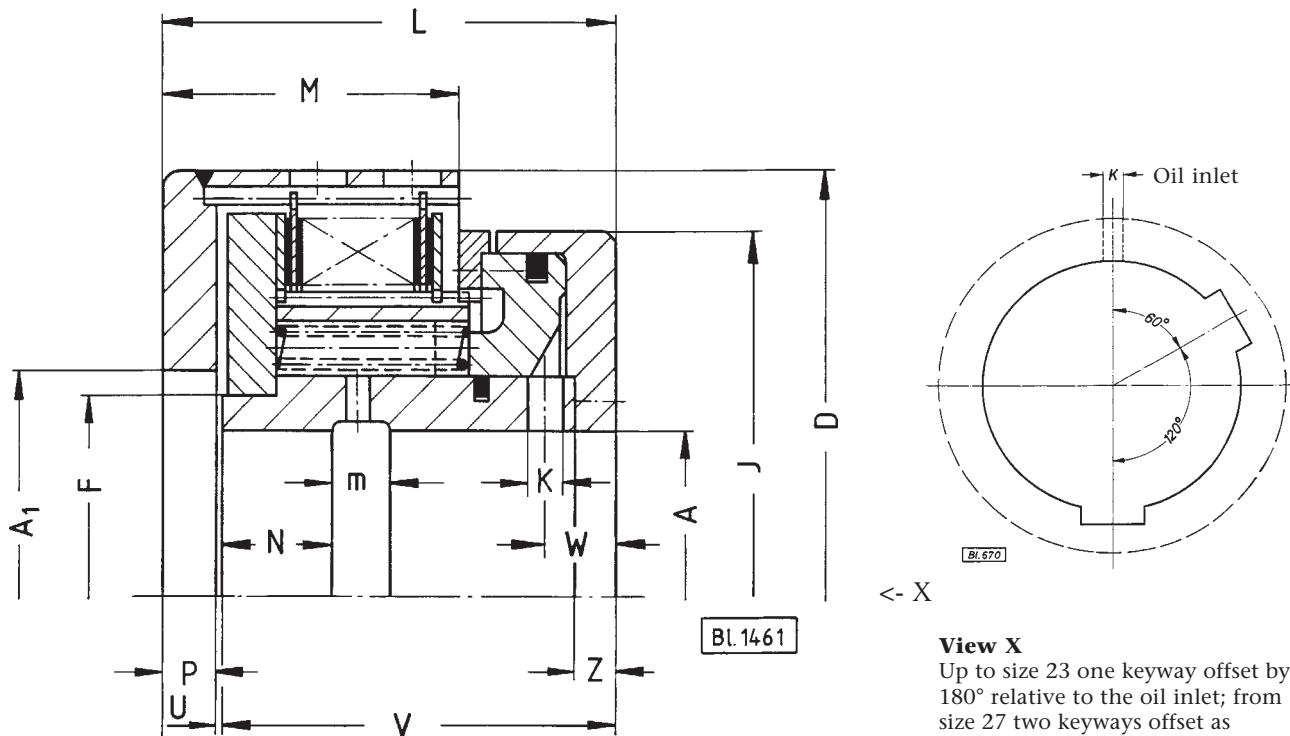
**Hydraulically released  
spring-applied multi-plate brakes  
torque by max. Spring-applied**



Schmierung = cooling oil  
Drucköl = pressure oil  
Inkrementaler Drehgeber = incremental encodes  
Ölrücklauf = oil drain  
Maschinenständer = machine frame  
Welle = shaft

Series Size	0128...-Size-010100						
	000-96	100-96	200-96	000-98	100-98	200-98	
Friction surface	12	16	20	12	16	20	
M <sub>ü</sub> Nm	134000	178000	220000	250000	340000	425000	
M <sub>s</sub> Nm	80000	110000	136000	150000	200000	250000	
n max min <sup>-1</sup>							
Operating pressure bar	90+5			90+5			
Spring return press. bar	~45			~52			
Stroke volume cm <sup>3</sup>	175	233	292	270	360	450	
J internal kgm <sup>2</sup>	28	36,3	44,5	69	89	109	
Weight approx. kg	1133	1308	1484	1766	2062	2334	
Diameters	A prebored	180			220		
	A max H7	310			375		
	B max	500			600		
	C	645			765		
	D	1000			1165		
	16 x *D	31			39		
	E g7	1060			1230		
Length dimensions	F	940			1100		
	N	269	306	343	316	358	400
	Q		40			50	
	R		16			20	
	T		4			4	
	U	113	150	187	142	184	226
	W	178	215	252	236	278	320

**Hydraulically actuated Sinus® multi-plate clutches**  
Standard version for wet-running



**View X**  
Up to size 23 one keyway offset by 180° relative to the oil inlet; from size 27 two keyways offset as shown relative to oil inlet.

Series Size		15	23	0021-007-Size-000000					43	47	55
Mdyn	Nm	200	280	400	560	800	1250	2000	4000		
Operating pressure	bar	18				20					
Back pressure	bar	2	2,6	3	4	4,7	4,5	4,8	5		
n max cylinder <sup>1)</sup>	min <sup>-1</sup>	5000	5000	5000	5000	5000	4300	3900	3100		
n rel. max <sup>2)</sup>	min <sup>-1</sup>	8700	7400	6700	5800	5200	4500	4100	3200		
Stroke volume	new condition	6	8	11	14	23	33	54	108		
	with max. wear	10	17	21	30	46	64	102	215		
J	internal	18,1	35,6	51,1	102,2	186,1	320,4	621,6	1951,9		
	external	10,8	27,2	48,2	80,4	168,7	270,8	468,2	1472,3		
Weight	approx. kg	2,4	3,6	4,7	6,7	10,2	13,7	20,3	41,3		
ØA	prebored	18	25	25	25	32	32	32	40		
ØA1	prebored	18	20	20	20	25	28	28	30		
ØA max	H7	38	45	48	60	65	70	75	82		
Keyway	DIN 6885	10x2,4	14x2,1	14x2,1	18x2,3	18x2,3	20x2,7	20x2,7	22x3,1		
Diameters	D	95	112	125	140	160	180	200	252		
	F	48	55	63	72	80	85	95	115		
	J	90	104	110	125	140	155	185	230		
	K	4	4,5	4,5	5,5	6	7	7	8		
Length dimensions	L	58	66	70	80	93	98	110	137		
	M	34	41	44	50	60	64	70	88		
	N	12	12	12	15	21	24	24	36		
	m	10	12	12	14	14	12	15	15		
	P	5	9	9	9	12	12	14	15		
	U	1	1	1	1	1	1	1	2		
	V	52	56	60	70	80	85	95	120		
	W	9	10	11	12	14,5	15	18	21		
Z	6	6,5	7,5	8	9	9	12	15			

1) Account must be taken of the possible back pressure  
2) Maximum relative speed of the inner and outer clutch parts taking into account the direction of rotation

**Friction combination** steel/sintered lining only for wet-running  
**Tolerances** for bore and keyway see section 1 "Technical information"

Versions with radial introduction of the oil available on request  
Further housing versions on request

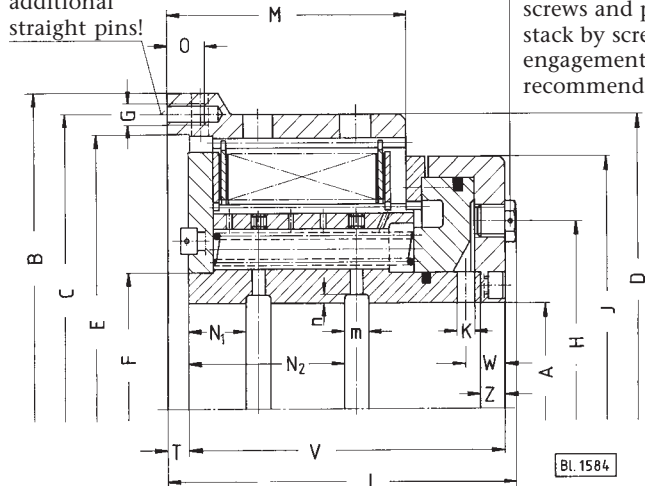
# Hydraulically actuated Sinus®-multi-plate clutches Version for high torques with shoulder housing

Series **0021-303**: without emergency engagement facility, standard version

Series **0021-333**: with emergency engagement facility, available on request

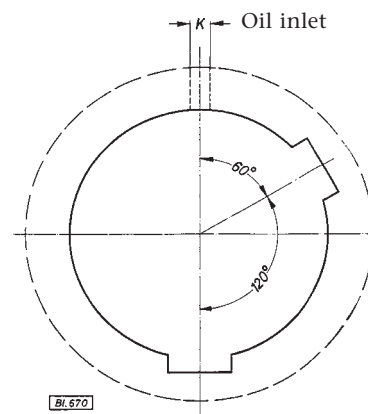
For version for high thermal loading, see series **0002**

Bores: provide additional straight pins!



### Emergency engagement, series 0021-333:

should the hydraulics fail, remove the plug screws and press the piston against the plate stack by screwing in the emergency engagement screws provided to the recommended torque.



Series Size		55	59	0021-3.3-Size-000000			72	75	78
				63	66				
M <sub>dyn</sub>	Nm	7000	11200	16000	22500	32000	45000	63000	
Operating pressure	bar	20		25					
Back pressure	bar	4,7	2,7	2,61	2,78	2,95	3,04	3	
n <sub>max cylinder</sub> <sup>1)</sup>	min <sup>-1</sup>	3100	2250	2000	1800	1600	1400	1250	
n <sub>rel. max</sub> <sup>2)</sup>	min <sup>-1</sup>	3200	3070	2725	2450	2095	1930	1710	
Stroke volume	new condition	0,177		0,261	0,342	0,466	0,67	0,881	
	with max. wear	0,225		0,423	0,583	0,809	1,116	1,493	
Internal oiling	min	5,8		8	10	14	16	21	
	max	17,5		25	31	41	50	62	
J	internal	0,25		0,52	0,85	1,62	2,7	5	
	external	0,23		0,45	0,82	1,41	2,3	3,9	
Weight	approx. kg	50	55	75	125	140	210	275	
ØA	prebored	40	50	50	70	80	80	100	
ØA max	H7	82	100	110	125	150	165	190	
Keyway	DIN 6885	22x3,1	28x6,4	28x6,4	32x7,4	36x8,4	40x9,4	45x10,4	
Diameters	B	285	300	330	365	415	455	505	
	C	260	280	310	340	390	430	480	
	D	260	280	310	345	395	430	485	
	E H7	245	260	290	320	370	405	455	
	F	115	130	145	165	200	220	250	
	G	12xM10	12xM10	12xM12	12xM14	18xM12	18xM14	18xM16	
	H	170	178	200	220	265	290	330	
	J	230	240	270	300	340	380	428	
	K	8	8	10	12	12	14	16	
	Length dimensions	L	173	171	186	203	228	254	284
M		117	117	125	134	150	165	188	
N <sub>1</sub>		34	30	34	36	42	45	53	
N <sub>2</sub>		79	76	83	88	100	110	127	
m		12	12	12	15	15	20	20	
n		4	4	4	5	5	6	6	
O		18	18	20	25	25	25	25	
T		10	10	10	10	10	10	10	
V		157	155	170	185	210	235	265	
W		21	19	23	27	29	32	36	
Z		15	12	15	18	20	21	24	

1) Account must be taken of the possible back pressure

2) Maximum relative speed of the inner and outer clutch parts taking into account the direction of rotation

**Friction combination** steel/sintered lining only for wet-running

**Tolerances** for bore and keyway see section 1 "Technical information"

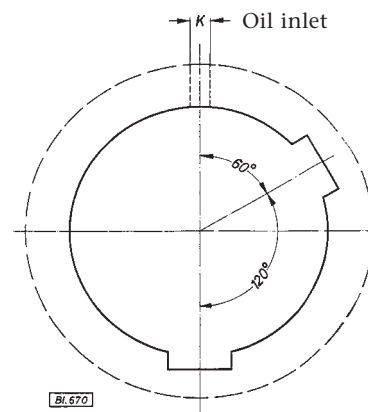
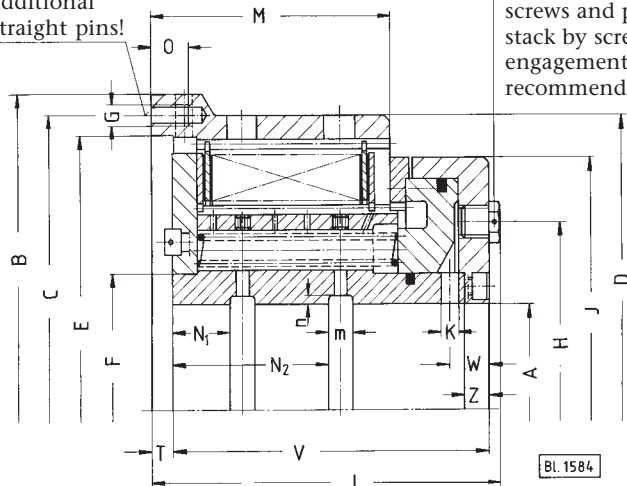
# Hydraulically actuated Sinus®-multi-plate clutches

## Version for high torques with shoulder housing

Series **0021-303**: without emergency engagement facility, standard version  
 Series **0021-333**: with emergency engagement facility, available on request  
 For version for high thermal loading, see series **0002**

Bores: provide additional straight pins!

**Emergency engagement, series 0021-333:**  
 should the hydraulics fail, remove the plug screws and press the piston against the plate stack by screwing in the emergency engagement screws provided to the recommended torque.



<- X

View X

Series Size	0021-3.3-Size-000000							
	79	81	85	89	91	94	96	
Mdyn	Nm	90000	125000	180000	250000	315000	450000	630000
Operating pressure	bar	25						
Back pressure	bar	2,84	2,6	2,6	2,8	3,1	2,73	2,83
n max cylinder <sup>1)</sup>	min <sup>-1</sup>	1150	1000	900	900	750	700	600
n rel. max <sup>2)</sup>	min <sup>-1</sup>	1555	1400	1245	1125	1000	890	815
Stroke volume	new condition	1,22	1,7	2,02	2,757	3,354	4,6	6,202
	with max. wear	2	2,88	3,88	5,31	6,709	9,2	12,403
Internal oiling	min	26	34	43	56	63	86	105
	max	78	100	128	167	190	260	315
J	internal	8,1	14	25	37	69,5	117,5	204,8
	external	6	9,5	18,5	26,5	48	70	104
Weight	approx.	360	480	650	900	1250	1650	2210
ØA	prebored	100	120	120	120	150	150	200
ØA max	H7	210	235	265	285	315	370	400
	Keyway DIN 6885	50x11,4	56x12,4	63x12,4	63x12,4	70x14,4	80x15,4	90x17,4
Diameters	B	560	620	700	785	860	970	1050
	C	530	585	660	740	820	920	1000
	D	530	585	660	740	820	920	1000
	E H7	500	550	620	695	780	870	955
	F	280	300	340	370	430	500	530
	G	18xM20	18xM24	18xM24	24xM24	24xM24	24xM27	24xM30
	H	365	405	460	500	560	675	725
	J	473	525	592	665	740	835	920
	K	17	18	20	20	22	24	28
	Length dimensions	L	309	334	369	394	431	481
M		208	224	245	250	264	294	320
N1		62	69	78	80	85	96	109
N2		144	157	174	176	188	212	237
m		20	20	20	20	20	20	20
n		7	8	9	9	10	10	10
O		30	36	36	36	40	45	50
T		10	10	10	10	10	10	10
V		290	315	350	375	400	450	500
W		42	44	51	53	55	62	69
Z		15	31	37	38	40	45	50

<sup>1)</sup> Account must be taken of the possible back pressure  
<sup>2)</sup> Maximum relative speed of the inner and outer clutch parts taking into account the direction of rotation

**Friction combination** steel/sintered lining only for wet-running  
**Tolerances** for bore and keyway see section 1 "Technical information"

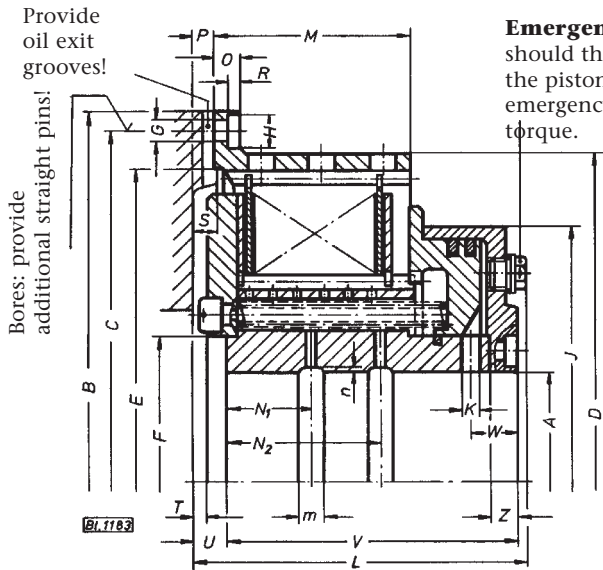


# Hydraulically actuated Sinus®-multi-plate clutches

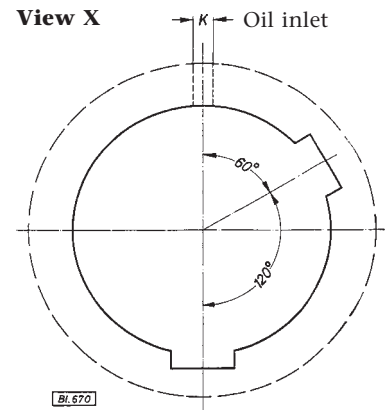
## Version for high thermal loading with flange housing



Series **0002-871**: without emergency engagement facility, standard version  
 Series **0002-881**: with emergency engagement facility, available on request  
 For version for higher torques and larger bores see series **0021**



**Emergency engagement, series 0002-881:**  
 should the hydraulics fail, remove the plug screws and press the piston against the plate stack by screwing in the emergency engagement screws provided to the recommended torque.



Series Size	0002-8.1-Size...000000													
	63-000	69-000	69-001	75-000	78-000	81-000	81-003	81-004	84-001	87-000	87-001			
Mdyn	Nm		9000	12000	17000	24000	37000	45000	60000	75000	102000	140000	175000	
Operating pressure	bar		24											
Back pressure	bar		2,8	2,2	2,2	2,6	1,6	1,7	1,7	1,7	1,5	1,7	1,6	
n max cylinder <sup>1)</sup>	min <sup>-1</sup>		2200	1800	1800	1500	1200	1000	1000	1000	800	750	750	
n rel. max <sup>2)</sup>	min <sup>-1</sup>		2900	2500	2500	2000	1800	1500	1500	1500	1300	1150	1150	
Stroke volume	new condition	dm <sup>3</sup>	0,173	0,211	0,288	0,352	0,51	0,625	0,865	1,057	1,409	1,772	2,303	
	with max. wear	dm <sup>3</sup>	0,38	0,538	0,653	0,812	1,148	1,537	1,826	2,018	3,003	3,898	4,784	
J	internal	kgm <sup>2</sup>	0,366	0,744	0,844	1,787	3,254	6,728	7,443	8,199	14,87	33,58	35,8	
	external	kgm <sup>2</sup>	0,348	0,821	1,043	1,677	3,391	5,919	7,139	8,29	12,83	25,79	30,06	
Weight	approx. kg		54,8	88,1	105,3	136,2	210	292	334	372	481	810	895	
ØA prebored			50	50	50	80	80	100	100	100	100	100	100	
ØA max	H7		90	110	110	150	165	180	180	180	245	260	260	
Keyway	DIN 6885		25x5,4	28x6,4	28x6,4	36x8,4	40x9,4	45x10,4	45x10,4	45x10,4	56x12,4	56x12,4	56x12,4	
Diameters	B		370	430	430	500	550	680	680	680	750	850	850	
	C		340	400	400	470	520	632	632	632	705	800	800	
	D		315	370	370	435	490	580	580	580	650	750	750	
	E		295H7	345H7	345H7	410H7	465H7	560 <sup>+0,2</sup> <sub>+0,1</sub>	560 <sup>+0,2</sup> <sub>+0,1</sub>	560 <sup>+0,2</sup> <sub>+0,1</sub>	620 <sup>+0,2</sup> <sub>+0,1</sub>	710 <sup>+0,2</sup> <sub>+0,1</sub>	710 <sup>+0,2</sup> <sub>+0,1</sub>	
	F		125	142	142	200	210	240	240	240	300	330	330	
	G		15	17	17	17	17	26	26	26	26	26	26	
	H		23,5	25,5	25,5	25,5	25,5	-	-	-	-	-	-	
	Number of holes		6	6	12	12	12	12	12	12	12	16	16	16
	J		270	290	290	350	380	460	460	460	460	535	630	630
	K		10	12	12	12	12	15	15	15	20	20	20	
Length dimensions	L		146	180	205	203	245	234	261	289	320	378	413	
	M		75	85	115	105	145	115	145	170	160	172	205	
	N <sub>1</sub> /N <sub>2</sub>		35/-	35/-	35/75	50/-	62/-	48/-	40/85	45/125	70/135	120/-	80/180	
	m x n		15x3	18x3	18x3	18x3	18x3	25x3	25x3	25x3	25x4	30x5	30x5	
	O		15	20	20	20	20	22	22	22	25	35	35	
	P		15	15	13	15	15	15	15	15	38	38	38	
	R		7,5	10	10	10	10	-	-	-	-	-	-	
	S		20	20	18	20	20	20	20	20	43	53	53	
	T		9,5	10	8	10	11	12,5	11	11	13	13	13	
	U		20	25	23	23	25	25	25	25	13	13	13	
	V		115	150	177	173	213	200	227	255	290	365	400	
	W		27	32	32	32	34	43	43	43	50	60	60	
	Z		18	18	18	19	20	26	26	26	30	40	40	

1) Account must be taken of the possible back pressure  
 2) Maximum relative speed of the inner and outer clutch parts taking into account the direction of rotation

**Friction combination** steel/sintered lining only for wet-running  
**Tolerances** for bore and keyway see section 1 "Technical information"

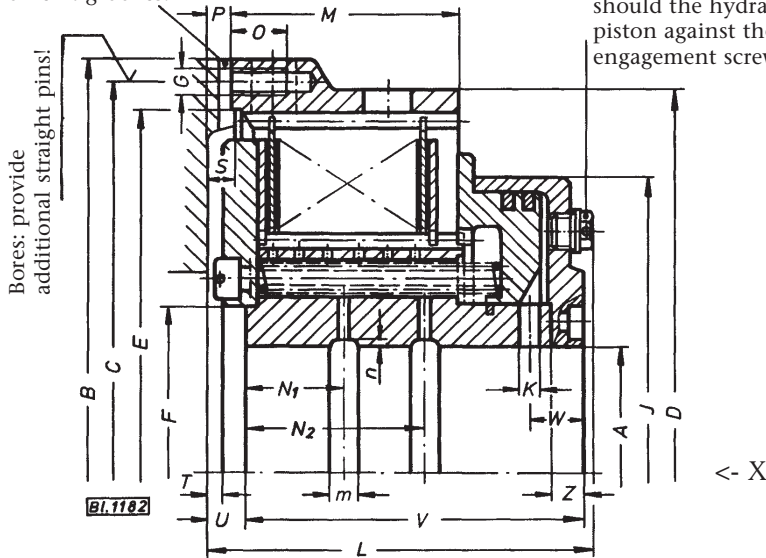
# Hydraulically actuated Sinus®-multi-plate clutches

## Version for high thermal loading with shoulder housing

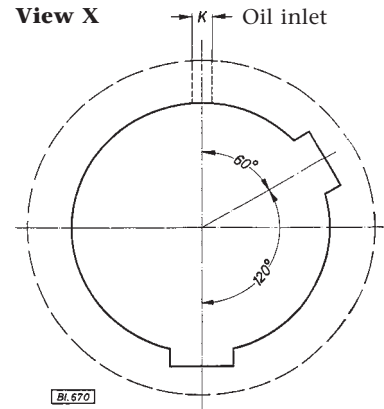


Series **0002-873**: without emergency engagement facility, standard version  
 Series **0002-883**: with emergency engagement facility, available on request  
 For version for higher torques and larger bores see series **0021**

Provide oil exit grooves!  
 Bore: provide additional straight pins!



**Emergency engagement, series 0002-883:**  
 should the hydraulics fail, remove the plug screws and press the piston against the plate stack by screwing in the emergency engagement screws provided to the recommended torque.



Series Size	0002-8.3-Size...000000											
	63-000	69-000	69-001	75-000	78-000	81-000	81-003	81-004	84-001	87-000	87-001	
Mdyn	Nm											
Operating pressure	bar											
Back pressure	bar											
n max cylinder <sup>1)</sup>	min <sup>-1</sup>											
n rel. max <sup>2)</sup>	min <sup>-1</sup>											
Stroke volume	new condition	dm <sup>3</sup>										
	with max. wear	dm <sup>3</sup>										
J	internal	kgm <sup>2</sup>										
	external	kgm <sup>2</sup>										
Weight	approx. kg											
ØA prebored	mm											
ØA max	mm											
Keyway	DIN 6885											
Diameters	B	mm										
	C	mm										
	D	mm										
	E	mm										
	F	mm										
	G	mm										
	J	mm										
Length dimensions	L	mm										
	M	mm										
	N <sub>1</sub> /N <sub>2</sub>	mm										
	m x n	mm										
	O	mm										
	P	mm										
	S	mm										
	T	mm										
	U	mm										
	V	mm										
	W	mm										
	Z	mm										

1) Account must be taken of the possible back pressure  
 2) Maximum relative speed of the inner and outer clutch parts taking into account the direction of rotation

**Friction combination** steel/sintered lining only for wet-running  
**Tolerances** for bore and keyway see section 1 "Technical information"

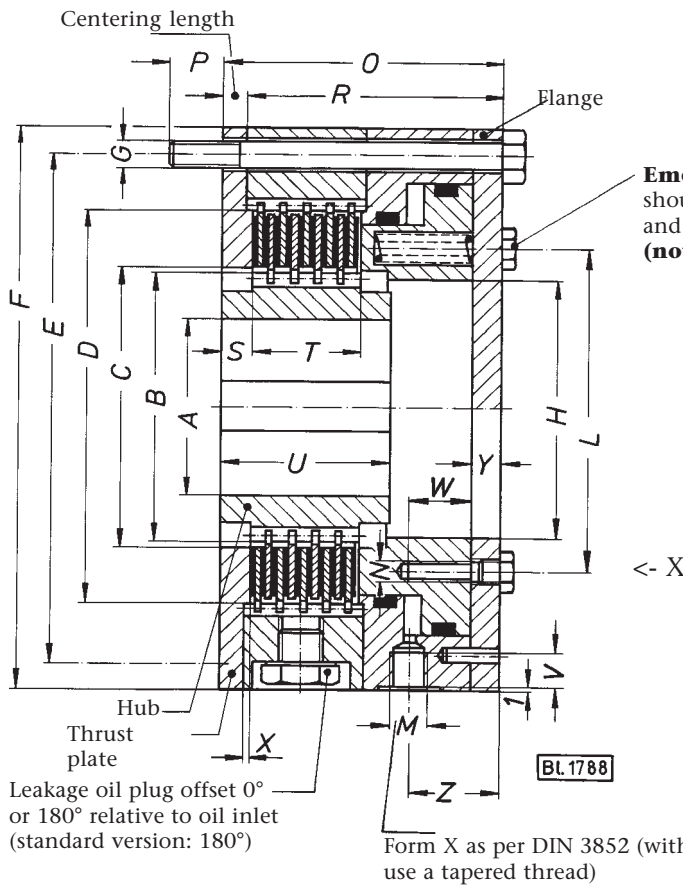
**Numbering table for design variation**

**0 - 022 - . . . -Size- 00. .00 dry-running  
.08 wet-running**

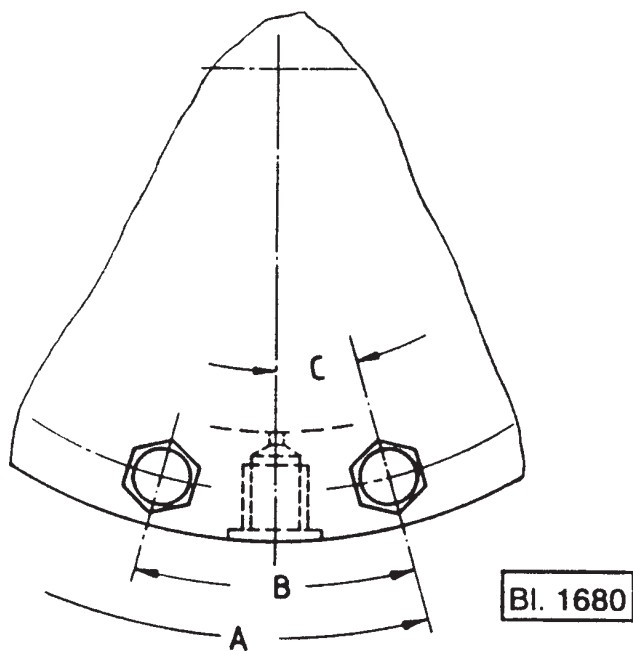


0			Closed version	with thrust plate	Torque standard	
1			Open version			
2			Closed version	without thrust plate		
3			Open version			
5			Closed version	with thrust plate		Torque strengthened and maximum
6			Open version			
7			Closed version	without thrust plate		
8			Open version			
	0		Pipe connection with metric thread		with hub	
	1		Pipe connection with inch thread			
	2		Pipe connection with metric thread		without hub	
	3		Pipe connection with inch thread			
		0	without flange			
		9	with flange			

**Hydraulically released  
spring-applied multi-plate brakes  
Non-centering version**



**View X**



Size	A	B	C
07	6x60°	60°	30°
11-15	6x60°	60°	15°
23-90	12x30°	30°	15°

# Hydraulically released spring-applied multi-plate brakes Non-centering version



Series Size		0022-...-Size-00200 <sup>1)</sup>														
		07	11	15	23	25	31	39	47	55	63	69	75	78	84	90
standard	M <sub>dyn</sub> dry Nm	50	60	120	170	250	400	650	1100	1800	3000	-	-	-	-	-
	M <sub>stat</sub> dry Nm	70	80	165	240	350	550	900	1500	2500	4100	-	-	-	-	-
	M <sub>dyn</sub> wet Nm	33	40	70	115	155	270	430	760	1165	1980	-	-	-	-	-
stenghtened	M <sub>stat</sub> wet Nm	50	60	120	175	230	400	645	1135	1750	2970	-	-	-	-	-
	Pressure <sup>2)</sup> min bar	15	19	19	12	12	12	12	12	12	12	-	-	-	-	-
	M <sub>dyn</sub> dry Nm	65	100	180	270	350	600	1000	1600	2600	4500	7150	13000	19300	33000	60000
maximum	M <sub>stat</sub> dry Nm	90	140	250	370	480	820	1350	2200	3600	6200	9820	17900	26600	46000	81500
	M <sub>dyn</sub> wet Nm	45	65	110	180	230	395	670	1100	1755	2880	4775	8650	12850	21870	39320
	M <sub>stat</sub> wet Nm	65	100	160	270	345	590	1000	1650	2635	4325	7180	13000	19300	32890	59130
Pressure <sup>2)</sup> min bar		20	28	28	18	18	18	18	18	18	18	24	27	23	18	22
Series Size		0022-...-Size-003.00 <sup>1)</sup>														
		07	11	15	23	25	31	39	47	55	63	69	75	78	84	90
bar	M <sub>dyn</sub> dry Nm	85	160	260	320	550	970	1320	2660	4300	6300	12110	20000	30000	55000	87500
	M <sub>stat</sub> dry Nm	120	220	360	450	760	1330	1810	3700	5900	8600	16660	27000	40500	75000	120000
	M <sub>dyn</sub> wet Nm	60	110	170	210	365	640	875	1750	2840	4165	7710	13080	19000	35470	58000
Operating pressure max bar	M <sub>stat</sub> wet Nm	90	170	255	320	550	965	1315	2630	4270	6265	11590	19670	28570	53342	87250
	Pressure <sup>2)</sup> min	22	40	50	25	34	30	25	32	34	32	38	38	32	30	32
	bar	300	320													
Speed max min <sup>-1</sup>		2,6	2,5	3,3	7,1	8	12	19	32	46	76	112	154	280	415	682
Stroke volume	new condition cm <sup>3</sup>	5,2	4	6,3	15,7	17	28	41	61	91	137	204	308	559	890	1365
	with max. wear cm <sup>3</sup>	0,6	1,5	3,25	7	14,25	25	65	175	550	1150	2600	7246	14079	50500	150000
J internal	kgcm <sup>2</sup>	2,2	3,5	6,5	7,8	11	16	21,5	30	45,5	66,5	130	234	319	550	810
Weight approx. kg		-	-	-	-	20	-	-	-	60	70	80	90	100	150	200
ØA	prebored	18	<b>30</b>	<b>30</b>	40	<b>45</b>	<b>55</b>	<b>65</b>	90	110	140	150	190	220	300	350
	A max H7 KeywayDIN 6885	6x	<b>8x</b>	<b>8x</b>	12x	<b>14x</b>	<b>16x</b>	<b>18x</b>	25x	28x	36x	36x	45x	50x	70x	80x
		2,8	<b>3,3</b>	<b>3,3</b>	2,2	<b>3,8</b>	<b>4,3</b>	<b>4,4</b>	5,4	6,4	8,4	8,4	10,4	11,4	14,4	15,4
Bores <sup>3)</sup>	A H7 KeywayDIN 6885		<b>25</b>	<b>25</b>	<b>35</b>	<b>40</b>	<b>50</b>	<b>60</b>								
			<b>8x</b>	<b>8x</b>	<b>10x</b>	<b>12x</b>	<b>14x</b>	<b>18x</b>								
			<b>3,3</b>	<b>3,3</b>	<b>3,3</b>	<b>3,3</b>	<b>3,8</b>	<b>4,4</b>								
Diameters	A H7 KeywayDIN 6885				<b>30</b>	<b>35</b>	<b>45</b>	<b>50</b>								
					<b>8x</b>	<b>10x</b>	<b>14x</b>	<b>14x</b>								
					<b>3,3</b>	<b>3,3</b>	<b>3,8</b>	<b>3,8</b>								
Length-dimensions	B d9	33	49,6	51,6	60	70	81,4	100	127	148	184	216	280	310	430	508
	C	35	52	54	62	72	85	102	132	155	188	220	285	315	435	520
	D H8	55	69	80	82,2	112	126	144	182	228	279	328	392	440	590	758
	E	73	90	100	115	135	160	185	220	265	315	370	440	510	665	860
	F f7	83	105	120	135	155	180	205	245	290	345	400	480	555	710	910
	G	M6	M6	M8	M8	M8	M10	M10	M12	M14	M16	M16	M20	M24	M24	M27
	H H7	27	45	45	52	65	80	95	120	140	180	205	240	270	390	520
	L	-	57	60	66	88	103	118	152	180	220	280	265	300	425	570
	N	-	M6	M6	M6	M8	M8	M8	M10	M12	M12	M12	M16	M16	M20	M20
	M <sup>4)</sup>		M10x1 G <sup>1</sup> /s				M12x1,5 G <sup>1</sup> /4						M16x1,5 G <sup>3</sup> /s		M22x1,5 G <sup>1</sup> /2	
Length-dimensions	O	59	67	77	81	90	95	100	110	135	145	165	195	220	255	300
	P	11	13	13	14	20	15	20	20	25	25	25	25	40	45	60
	R	54	61	69	73	82	86	91	99	122	130	148	173	198	233	268
	S	7	8	10	10	10	11	11	14	16	18	20	25	25	25	35
	T	21	22	24	25	32	33	38	40	58	59	70	77	97	105	130
	U	35	38	44	45	52	55	60	68	90	95	110	127	147	155	200
	V	8	9	12	13	13	13	13	13	13	13	14	14	14	18	18
	W	-	15	15	15	20	20	20	20	20	20	25	25	25	30	30
	X	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3
	Z	7	8	9	10	11	12	12	14	16	18	20	25	25	30	35
	21	24	27	30	32	34	34	38	41	46	53	62	66	88	95	

1) Friction combination for wet-running -.08

2) Min. disengaging pressure

3) Bore diameters shown in bold print available from stock

4) Tube thread G.... as per ISO 228/1 and/or BS 2779

**Friction combination**

steel/sintered lining

for wet- or dry-running

**Tolerances**

for bore and keyway see

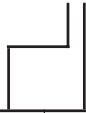
section 1

"Technical information"

**It is essential that you contact us before using  
brake fluids that are flame-resistant**

**Numbering table for design variation**

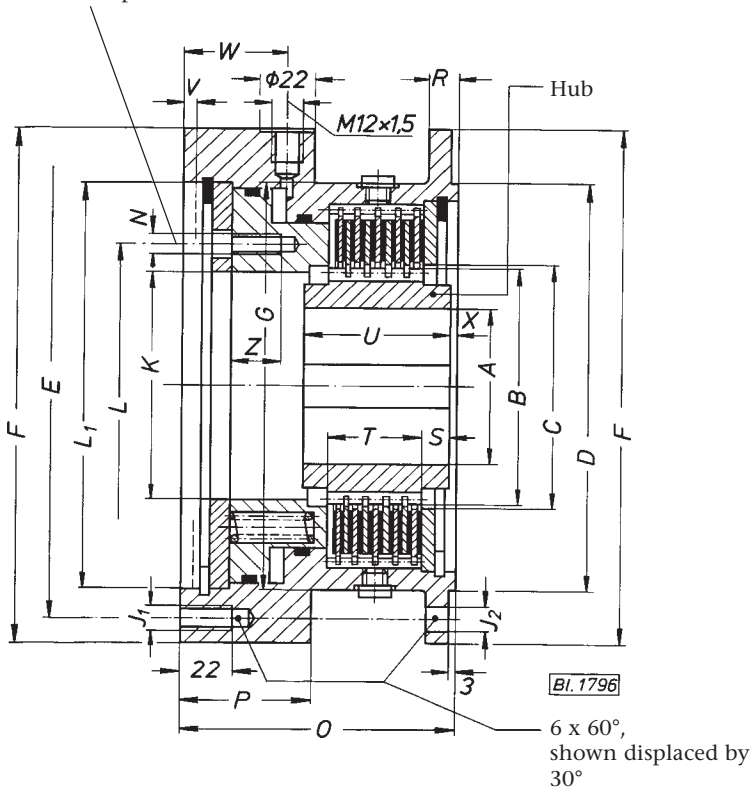
**0 - 022 - . . . 1 -Size- 00. .00 dry-running  
.08 wet-running**



1		Open version	Torque standard
6		Open version	Torque stengthened and maximum
	0	with hub	
	2	without hub	

**Version for identical external and internal centering**

**Emergency disengagement:**  
should the hydraulic pump fail,  
release the piston with the screws!



# Hydraulically released spring-applied multi-plate brakes Centering version

Series Size		0022-..1-Size-00000 <sup>1)</sup>					
		15	25	31	39	47	55
standard	M <sub>dyn</sub> dry-running Nm	120	250	400	650	1100	1800
	M <sub>stat</sub>	165	350	550	900	1500	2500
	M <sub>dyn</sub> wet-running Nm	70	155	270	430	760	1165
stenghtened	M <sub>dyn</sub> dry-running Nm	180	350	600	1000	1600	2600
	M <sub>stat</sub>	250	480	820	1350	2200	3600
	M <sub>dyn</sub> wet-running Nm	110	230	395	670	1100	1755
	M <sub>stat</sub>	160	345	590	1000	1650	2635
	Pressure <sup>2)</sup> min. bar	12	12	12	12	12	12
	Pressure <sup>2)</sup> min. bar	18	18	18	18	18	18
Series Size		0022-..1-Size-001.00 <sup>1)</sup>					
		15	25	31	39	47	55
maximum	M <sub>dyn</sub> dry-running Nm	260	550	970	1320	2660	4300
	M <sub>stat</sub>	360	760	1330	1810	3700	5900
	M <sub>dyn</sub> wet-running Nm	170	365	640	875	1750	2840
	M <sub>stat</sub>	255	550	965	1315	2630	4270
	Pressure <sup>2)</sup> min bar	27	34	30	25	32	34
Operating pressure max bar		320					
Speed max min <sup>-1</sup>		4300	3370	2800	2300	1900	1520
Stroke volume	new condition cm <sup>3</sup>	6,2	8	12	19	32	46
	with max. wear cm <sup>3</sup>	12	17	28	41	61	91
J	internal kgcm <sup>2</sup>	3,25	14,25	25	65	175	550
Weight	approx. kg	6,5	11	14	18,5	27	51
ØA	prebored	-	20	-	-	-	60
Recommended bores <sup>3)</sup>	A max H7 Keyway DIN 6885	<b>30</b>	<b>45</b>	<b>55</b>	<b>65</b>	90	110
	A H7 Keyway DIN 6885	<b>8x3,3</b>	<b>14x3,8</b>	<b>16x4,3</b>	<b>18x4,4</b>	25x5,4	28x6,4
	A H7 Keyway DIN 6885	<b>25</b>	<b>40</b>	<b>50</b>	<b>60</b>		
	A H7 Keyway DIN 6885	<b>8x3,3</b>	<b>12x3,3</b>	<b>14x3,8</b>	<b>18x4,4</b>		
	A H7 Keyway DIN 6885		<b>35</b>	<b>45</b>	<b>50</b>		
	A H7 Keyway DIN 6885		<b>10x3,3</b>	<b>14x3,8</b>	<b>14x3,8</b>		
Diameters	B d <sub>9</sub>	51,6	70	81,4	100	127	148
	C	54	72	85	102	132	155
	D g <sub>7</sub>	95	130	145	170	205	250
	E	120	155	170	195	230	290
	F	135	170	190	215	250	315
	G	103	136	149	172	210	265
	K	45	65	80	95	120	140
	J <sub>1</sub>	M8	M8	M10	M10	M10	M12
	J <sub>2</sub>	9	9	11	11	11	13
	L	60	88	103	118	152	180
	L <sub>1</sub> H <sub>7</sub>	95	130	145	170	205	250
N	M6	M8	M8	M8	M10	M12	
Length dimensions	O	84	100	104	112	122	150
	P	44	49	52	53	58	63
	R	10	11	12	13	13	15
	S	10	10	11	11	14	16
	T	24	32	33	38	40	58
	U	44	52	55	60	68	90
	V <sub>max</sub>	4	5	5	6	6	6
	W	32	38	40	42	46	50
	X	2	4	3	4	4	6
	Z	15	20	20	20	20	20

1) Friction combination for wet-running **-.08**

2) Min. disengaging pressure

3) Bore diameters shown in bold print available from stock

**Friction combination** steel/sintered lining

for wet- or dry-running

**Tolerances**

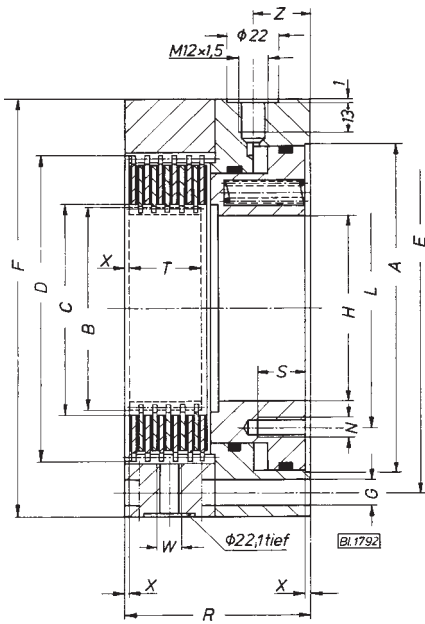
for bore and keyway see section 1  
"Technical information"

**It is essential that you contact us before using brake fluids that are flame-resistant**



# Hydraulically released spring-applied multi-plate brakes

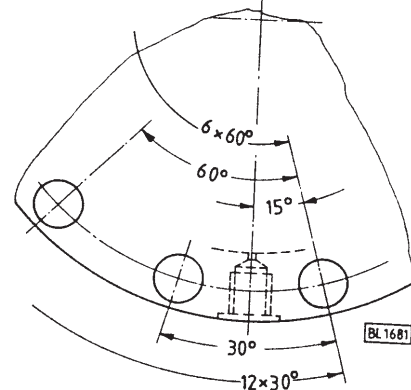
Version with two different internal centerings



<- X

This version is used in applications where special dimensions and centering of the adjacent parts are necessary.

**View X**  
(shown turned through 180°)



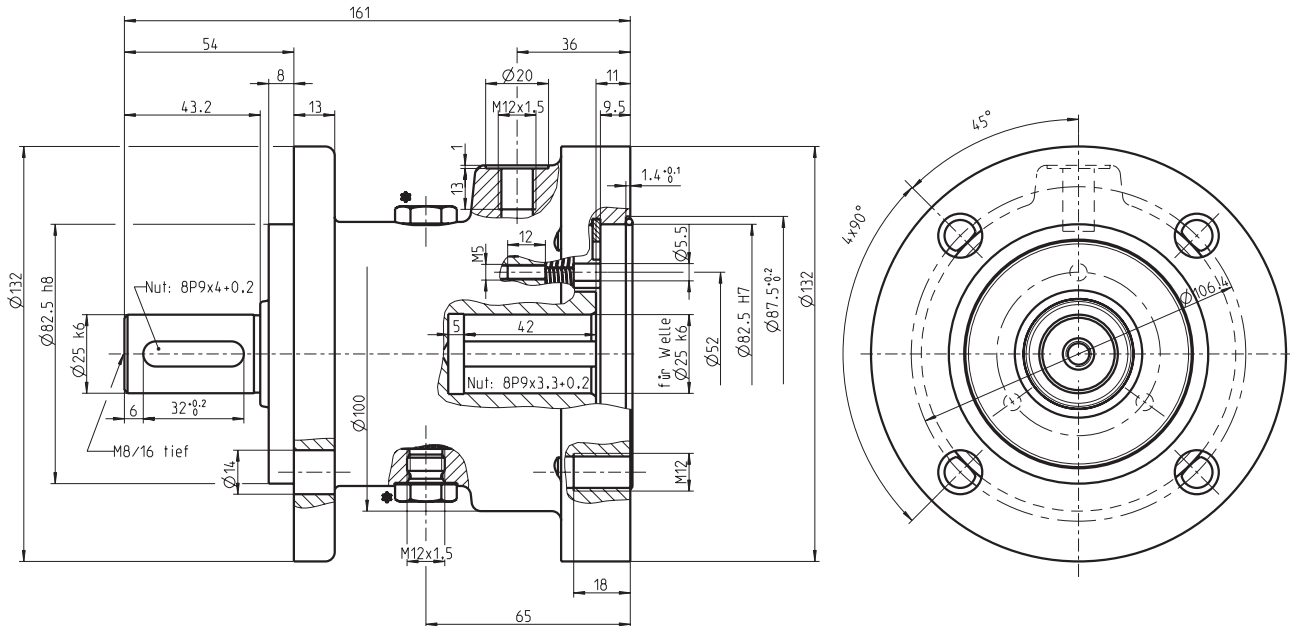
6 x 60° Size 15  
12 x 30° Size 23 and larger

Series Size				0022-320-Size-005050							
				15	23	25	31	39	47	55	63
standard	M <sub>dyn</sub>	dry-running	Nm	70	170	210	405	650	1140	1650	3090
	M <sub>stat</sub>			93	240	280	550	890	1570	2260	4250
	M <sub>dyn</sub>	wet-running	Nm	50	115	140	280	440	760	1100	2060
	M <sub>stat</sub>			70	170	210	405	650	1140	1650	3090
Disengaging pressure min.bar				11,5	12,5	15	12,5	13	17	12,5	13,5
Series Size				0022-620-Size-005050							
				15	23	25	31	39	47	55	63
strengthened	M <sub>dyn</sub>	dry-running	Nm	135	270	310	690	920	1660	2490	4480
	M <sub>stat</sub>			185	370	430	940	1265	2280	3420	6160
	M <sub>dyn</sub>	wet-running	Nm	90	180	210	460	610	1100	1660	2990
	M <sub>stat</sub>			135	270	310	690	920	1660	2490	4480
Disengaging pressure min.bar				20	19	22,5	21	18	24,5	18	19
Operating pressure max. bar				320							
Speed max. min <sup>-1</sup>				4300	4100	3370	2800	2300	1900	1520	1250
Stroke volume new condition cm <sup>3</sup>				2,95	7,14	6,59	14,6	17,5	20	62,5	68,7
with max. wear cm <sup>3</sup>				7,38	15,7	14,5	27,8	35	43,8	91	137,4
J internal kgcm <sup>2</sup>				1	1,9	4,2	13,4	38,9	96,9	296,7	623,9
Weight approx. kg				3,9	4,8	6,3	10,2	12,6	17,5	34	51
Diameters	A H7			86	100	115	142	163	192	242	290
	B -0,1			56	60	76	89	108	119	140	164
	C			57	62	78	92	110	132	155	189
	D H7			72,2	82,2	100,2	132	147,2	180,5	231,5	279,5
	E			100	115	130	160	180	210	265	315
	F			120	135	150	180	200	230	290	345
	G			9	9	9	11	11	13	13	17
	H			45	52	65	80	95	120	140	180
	L			57	66	82	103	118	152	180	220
	N			M6	M6	M6	M8	M8	M10	M12	M12
	W			M10 x 1						M12 x 1,5	
Length dimensions	R			63	65	70	78	84	90	111	115
	T			24	24,5	28	30	36,5	37	54	54
	X			2	2	2	2	2	3	3	3
	Z			21	22	21,5	24	26	27	28	31
	S			15	15	15	20	20	20	20	20
Tooth system	Reference profile	DIN		5480	5480	5480	867	5480	867	867	867
	Number of teeth	z		27	29	37	35	35	39	46	54
	Module	m		2	2	2	2,5	3	3	3	3
	Addendum modification	x-m		+0,1	+0,1	+0,1	-	+0,15	-	-	-
	Base tangent length	W-0,1		26,84	27,11	38,75	34,24	49,74	41,18	50,33	59,53
	Measurement over teeth	k		5	5	7	5	6	5	6	7
	Root diameter	df		51,4	55,7	71,5	81,1	101,3	109,1	130,1	154,1

**Friction combination** steel/sintered lining  
for wet- or dry-running

**It is essential that you contact us before using brake fluids that are flame-resistant**

This hydraulically released, spring-applied multi-plate brake is suitable for fitting to hydraulic motors of various makes.



\* additional connections for wet-running - variants 0022-601-20-...908

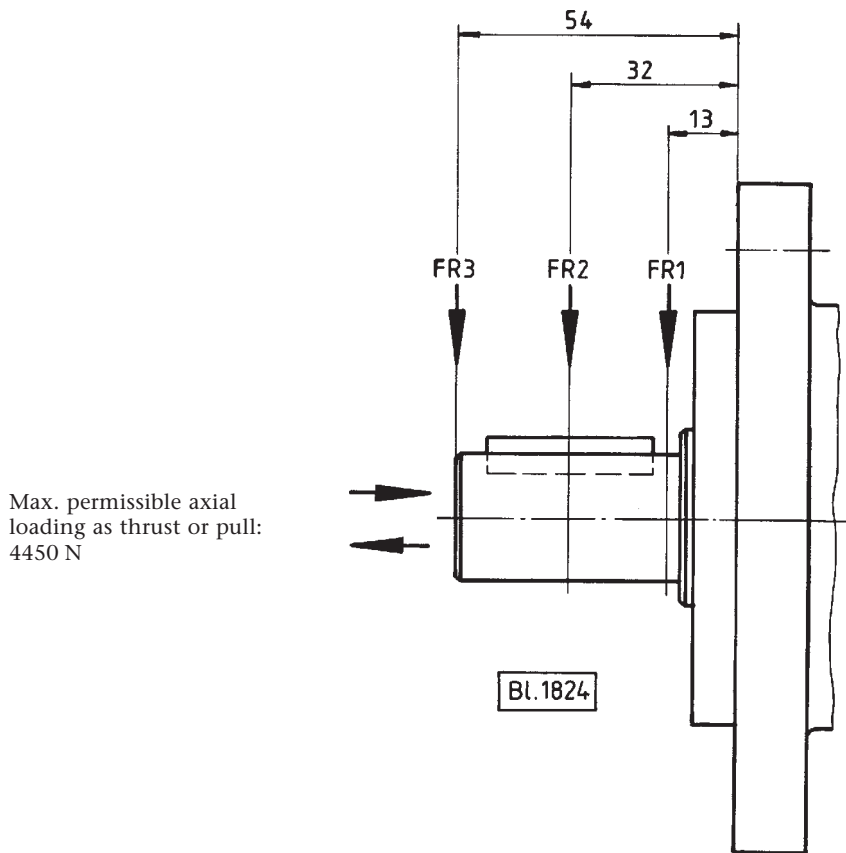
tief = depth  
 Nut = keyway  
 für Welle = for shaft  
 1) Other dimensions on request

Series	0022-601-20-...900			0022-601-20-...908			
	012	011	013	014	015	016	
	dry-running			wet-running			
Mstat	Nm	420	320	220	420	320	220
Mdyn	Nm	260	200	135	260	200	135
Disengaging pressure min	bar	31			31		
Operating pressure max	bar	220			220		
Stroke volume	new condition cm <sup>3</sup> with max. wear cm <sup>3</sup>	3,5 8			3,5 8		
J	internal kgcm <sup>2</sup>	3			3		
Weight	approx. kg	6,3			6,3		

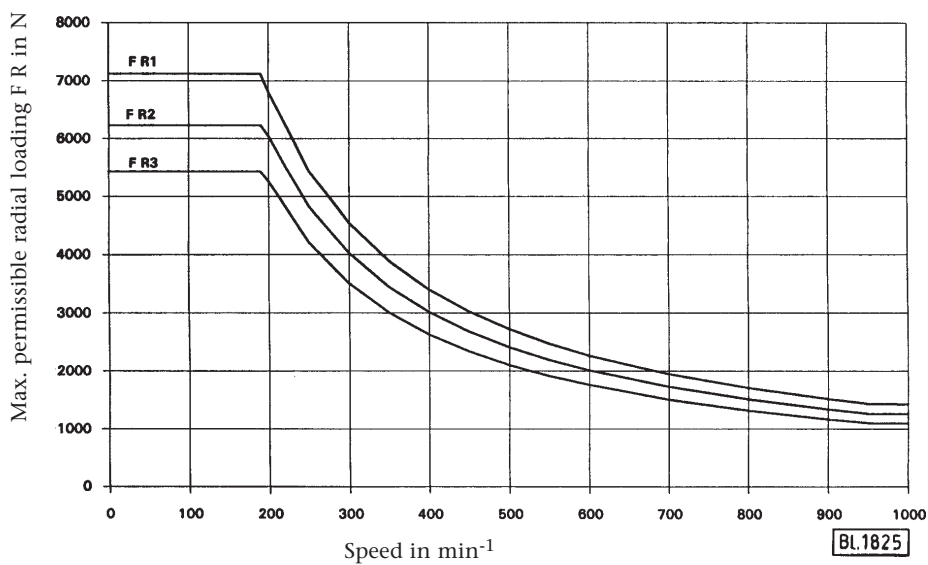
**Friction combination** steel/sintered lining

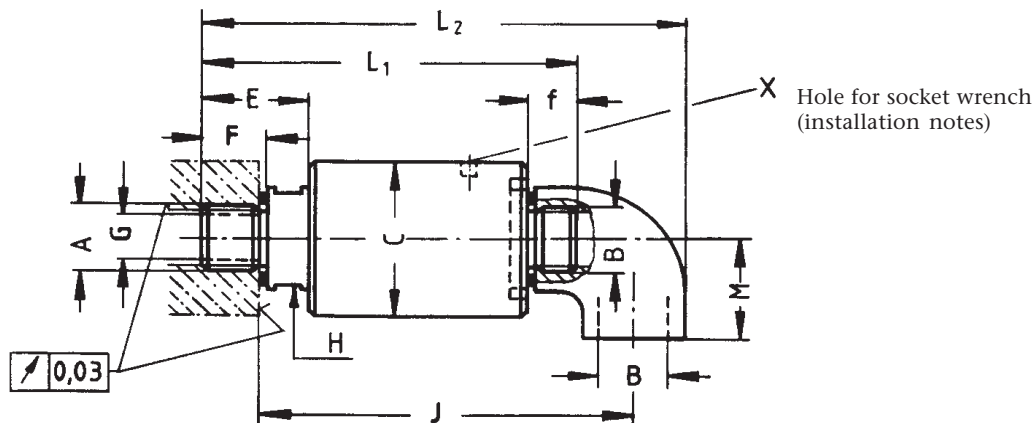
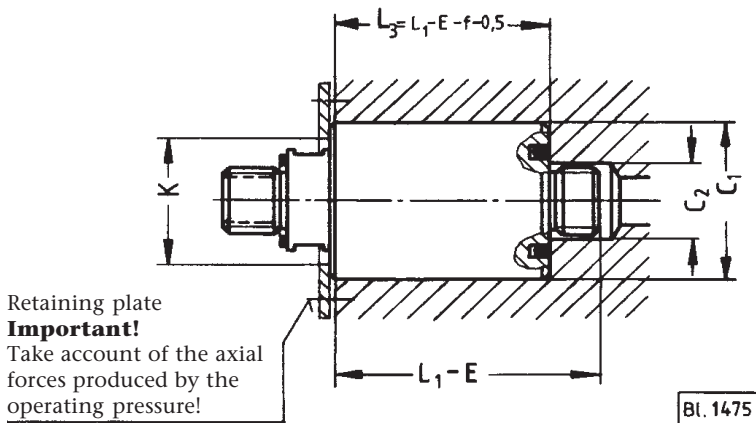
**Max. permissible temperature** 100° C at the seals

**Shaft loading**



**Max. permissible radial shaft loading**





Max. running tolerance of the end face and the thread 0.03 mm  
**This limit must be maintained!**

O-ring and elbow are part of the equipment supplied.

$p_{max} = 70 \text{ bar}$        $n_{max} = 1500 \text{ min}^{-1}$

Care should be taken that the max. permissible pressure and the max. permissible speed are not present at the same time.

Series	A <sup>1)</sup> Rotor thread	B <sup>1)</sup>	ØC h8	C1 F9 Hole	C2	L1	L2	L3 h11	E	F	f	G Rotor hole	H SW	J moun- ted	K	M	X Øhole nom.dia.
<b>0086-010-01-160</b>	G <sup>3/8</sup> A	G <sup>3/8</sup> A	42	42	18	93	119	54,5	26	16	12	9,5	19	93	32	25	<sup>4</sup> 40/42
<b>0086-010-02-160</b>	G <sup>1/2</sup> A	G <sup>1/2</sup> A	55	55	22	109	138	60,5	34	19	14	12,7	24	107	45	28	<sup>6</sup> 52/55
<b>0086-010-03-160</b>	G <sup>3/4</sup> A	G <sup>3/4</sup> A	63	63	28	122	158	71,5	34	19	16	17,5	30	124	53	33	<sup>6</sup> 58/62
<b>0086-010-04-160</b>	G1A	G1A	80	80	35	140	183	78,5	43	22	18	22,2	36	142	70	38	<sup>6</sup> 80/90

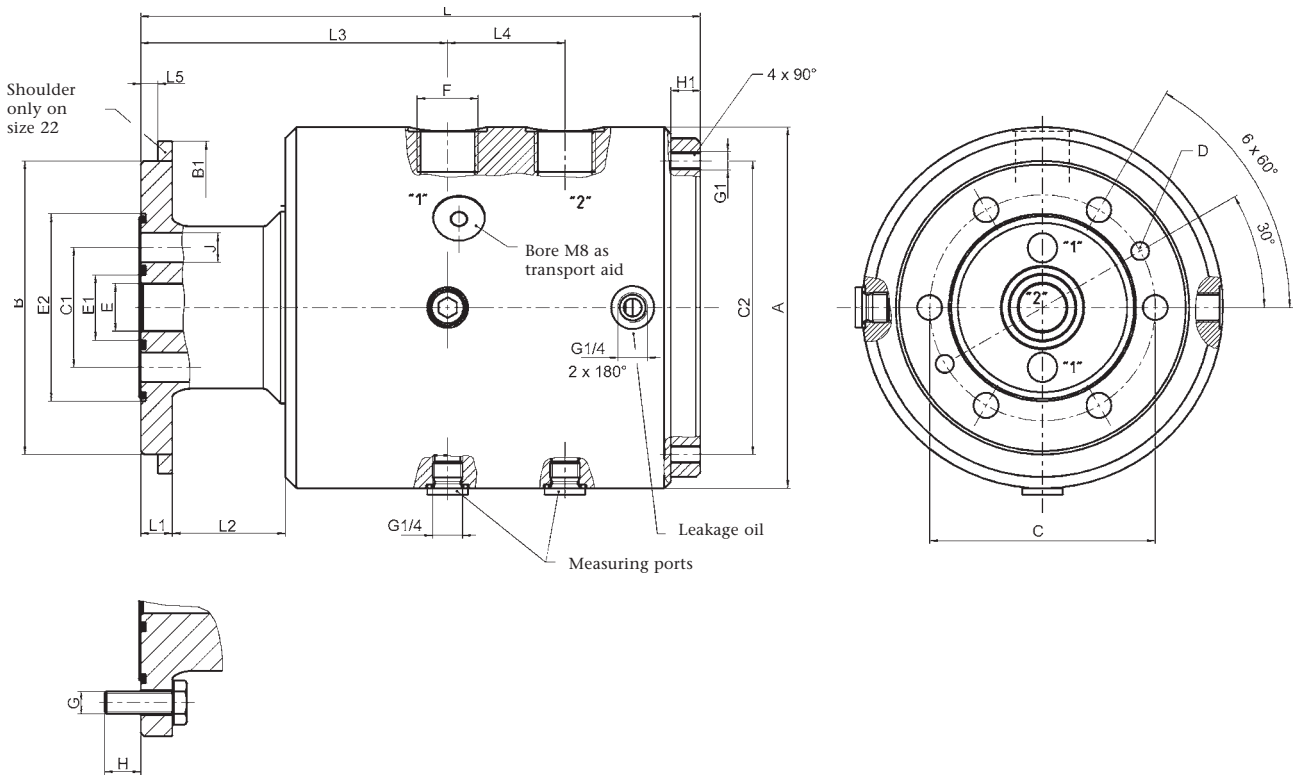
<sup>1)</sup> Tube thread G ... A as per ISO 228/1 and/or BS 2779

Installation notes:

Clamp hose or elbow in a vice, screw in and tighten up the inlet with a socket wrench; then screw rotor into the shaft.  
X = only for mounting type No. 2.

# Rotary inlets for pressure oil Two- channel

## Two-channel



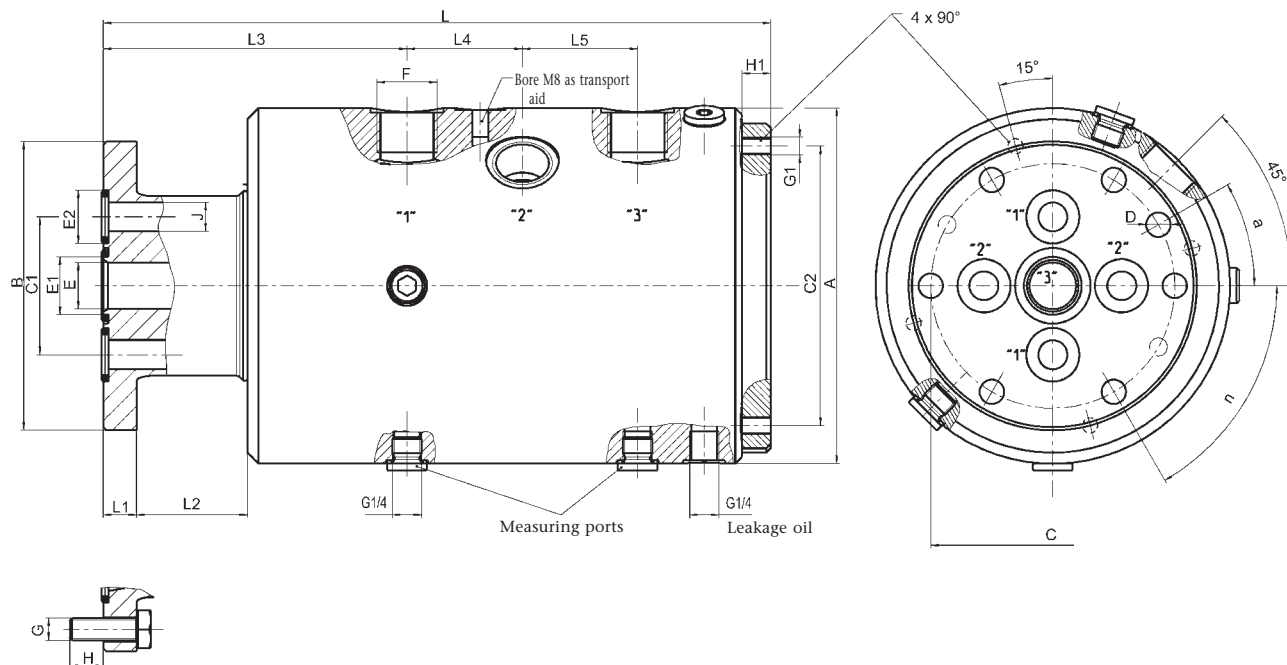
Series		0088-226-size-010040		
Size		22	27	35
n max	min <sup>-1</sup>	1500	1500	1500
p max	bar	100	100	100
Weight	approx. kg	6	19	30
Diameters	A	120	160	180
	B g7	81	130	150
	B1	85	-	-
	C	68	100	120
	C1	34	53	78
	C2	80	130	155
	D	6,2	8	10,1
	E	13	21	30
	E1	17	29	52,6
	E2	56,6	79	104
	G	M8	M10	M12
G1	M6	M8	M10	
F <sup>1)</sup>	G <sup>1/2</sup>	G <sup>3/4</sup>	G 1	
J	8	13	15	
Length dimensions	H	15	16	17
	H1	13	13	20
	L	165	248	288
	L1	10	14	18
	L2	33	50	53
	L3	88	136	153
	L4	33	52	64
L5	5	-	-	

The following form part of the equipment supplied:  
hexagonal screw DIN 933  
O-rings

<sup>1)</sup> Screw-in plug holes G ... shape X to DIN 3852 T2 (for cylindrical screwed plugs)

**The split seal system used is prone to leakage. Arrange the leakage pipe so that it points vertically downwards and allows unpressurised drainage.**

**Three-channel**



Series		<b>0088-326-Size-010040</b>	
Size		<b>27</b>	<b>35</b>
n max	min <sup>-1</sup>	1500	1500
p max	bar	100	100
Weight	approx. kg	19	30
Diameters	A	160	180
	B g7	130	150
	C	110	130
	C1	62	75
	C2	130	-
	D	11	11
	E	21	30
	E1	26	36
	E2	24	27
	F <sup>1)</sup>	G <sup>3/4</sup>	G 1
G	M10	M10	
G1	M8	-	
J	13	15	
Length dimensions	H	15	18
	H1	13	-
	L	301	355
	L1	15	17
	L2	50	57
	L3	137	156
Angle	n	6 x 60°	8 x 45°
	α	30°	25°

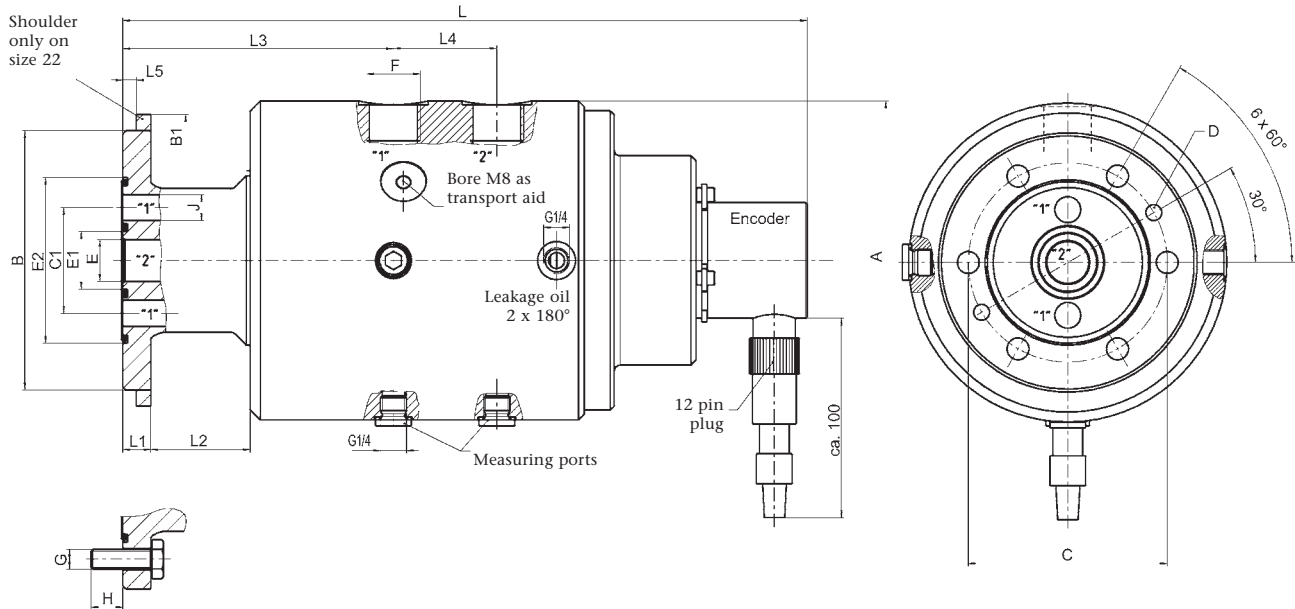
The following form part of the equipment supplied:  
 hexagonal screw DIN 933  
 O-rings

<sup>1)</sup> Screw-in plug holes G ... shape X to DIN 3852 T2 (for cylindrical screwed plugs)

**The split seal system used is prone to leakage. Arrange the leakage pipe so that it points vertically downwards and allows unpressurised drainage.**

# Rotary inlets for pressure oil

## Two-channel with incremental encodes



Series		0088-226-size-...041		
Size		22	27	35
n max	min <sup>-1</sup>	1500	1500	1500
p max	bar	70	70	70
Encodes	pulse per turn <sup>1)</sup>	2048		
Voltage	V DC	24		
Weight	ca. kg	8,5	22	34
Diameters	A	120	160	180
	B g7	81	130	150
	B1	85	-	-
	C	68	100	120
	C1	34	53	78
	D	6,2	8	10,1
	E	13	21	30
	E1	17	29	52,6
	E2	56,6	83	104
	F <sup>2)</sup>	G <sup>1/2</sup>	G <sup>3/4</sup>	G1
G	M8	M10	M12	
J	8	13	15	
Length dimensions	H	15	16	17
	L	264	344	386
	L1	10	14	18
	L2	33	50	53
	L3	88	136	153
	L4	33	52	64
L5	5	-	-	

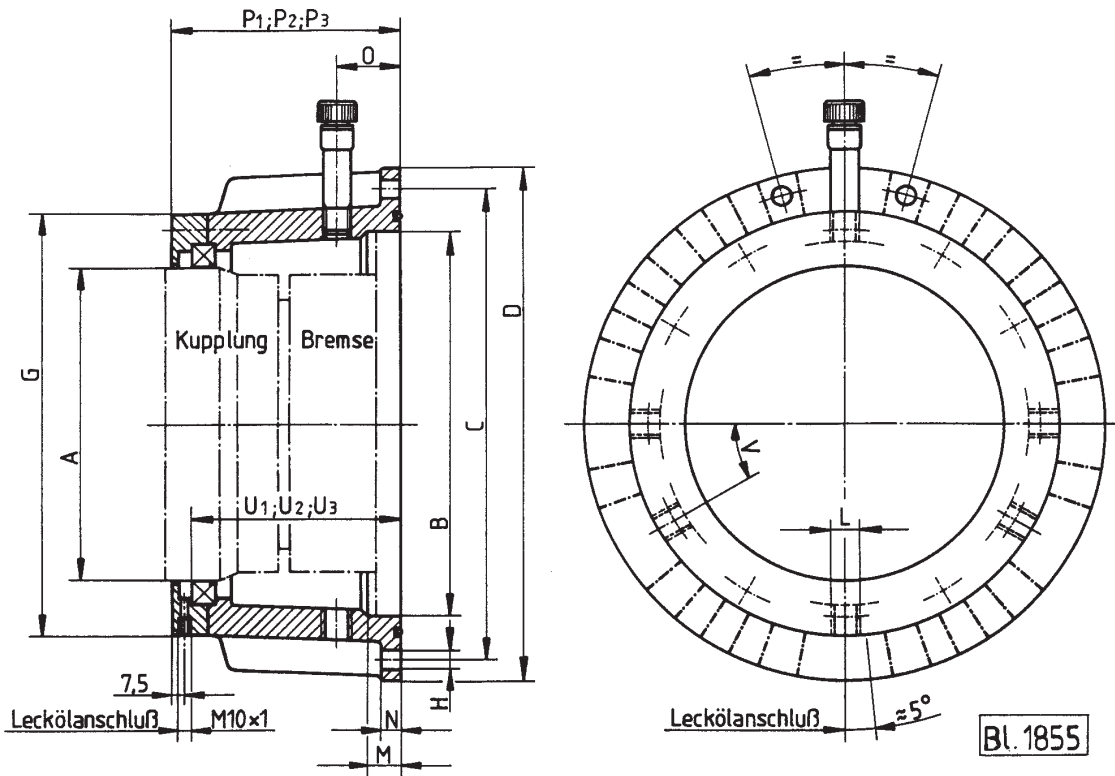
The following form part of the equipment supplied:  
hexagonal screw DIN 933  
O-rings  
12-pin plug

**1) Other numbers of pulse on request**

2) Screw-in plug holes G ... shape X to DIN 3852 T2 (for cylindrical screwed plugs)

**The split seal system used is prone to leakage. Arrange the leakage pipe so that it points vertically downwards and allows unpressurised drainage.**

**Three-channel version on request**



Kupplung = clutch  
Bremse = brake  
Leckölschluß = leakage port

Series Size		2023-152-Size-173 <sup>1)</sup> /183 <sup>2)</sup> /174 <sup>3)</sup>						
		52	63	75	80	86	90	94
n max *)	min <sup>-1</sup>	1000	830	660	500	430	340	275
Diameters	A	190	230	290	380	440	560	710
	B H7	220	260	330	425	500	630	800
	C	260	305	385	480	555	685	865
	D	275	325	410	505	580	710	895
	G	250	292	367	464	522	655	812
	H	6,6	9	11	11	11	11	13
Number of holes		8 x 45°	8 x 45°	8 x 45°	8 x 45°	12 x 30°	12 x 30°	12 x 30°
	L	G 3/4	G 3/4	G 1	G 1	G 1 1/4	G 1 1/4	G 2
Length dimensions	M	26	30	30	30	38	45	68
	N	10	11	12	14	15	16	18
	O	45	52	60	65	80	85	110
	P1	117	130	155	195	220	245	305
	P2	131	146	176	220	252	281	380
	P3	150	167	200	250	290	325	-
	U1	102	115	140	180	205	230	290
	U2	116	131	161	205	237	266	365
U3	135	152	185	235	275	310	-	
Angle	V	35°	35°	36°	36°	30°	30°	30°
Seal dimension		190 x	230 x	290 x	380 x	440 x	560 x	710 x
		220 x 15	260 x 15	330 x 18	420 x 20	480 x 20	610 x 20	760 x 20

\*) max. permissible peripheral speed at seal 10 m/s

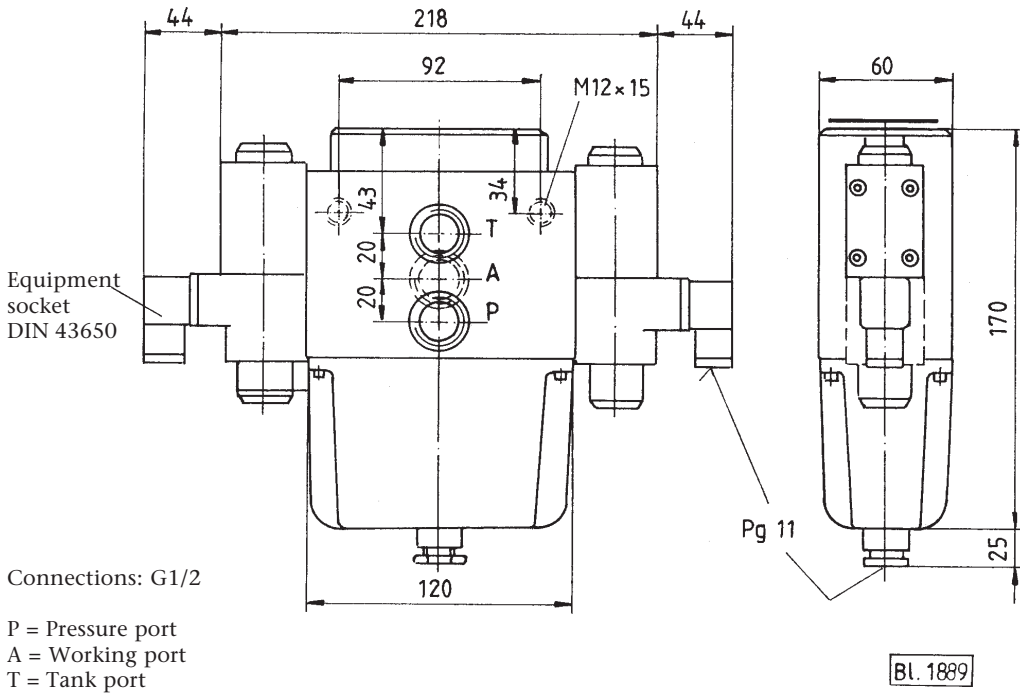
1) Clutch with 10/12/14 friction surface, brake with 10/12/14 friction surface

2) Clutch with 16/18/20 friction surface, brake with 10/12/14 friction surface

3) Clutch with 16/18/20 friction surface, brake with 16/18/20 friction surface

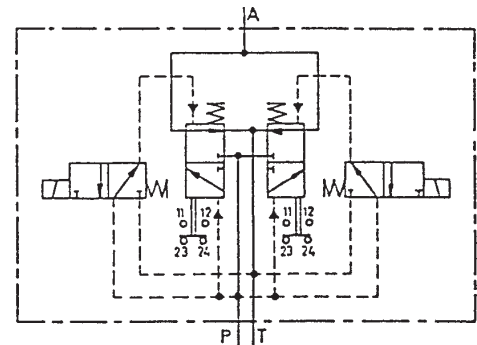


**Press Safety Valves (PSV)**  
Hydraulic pilot operated



Range		<b>-100000</b>	<b>0086-076-01-.....</b>	<b>-101000</b>	<b>-107000</b>	<b>-114000</b>
Voltage		24V, DC	220/230 V 50/60 Hz	110/115 V 50/60 Hz		205 DC
PSV Operating data						
Rated pressure	bar		100			
Min. pressure	bar		20			
Max. recommended flow	l/min		60			
approx. weight	kg		7,8			

Solenoids		DC	AC	
Power consumption	Pull in	W	33	128
	Holding	W	33	45
Switching frequency		Sw/hr	8000	3600
Relative operating time			100 % (continuous)	
Enclosure Class			IP 65	
Limit switches to show valve position			220 V, 10 A	



BL 1890

**Description**

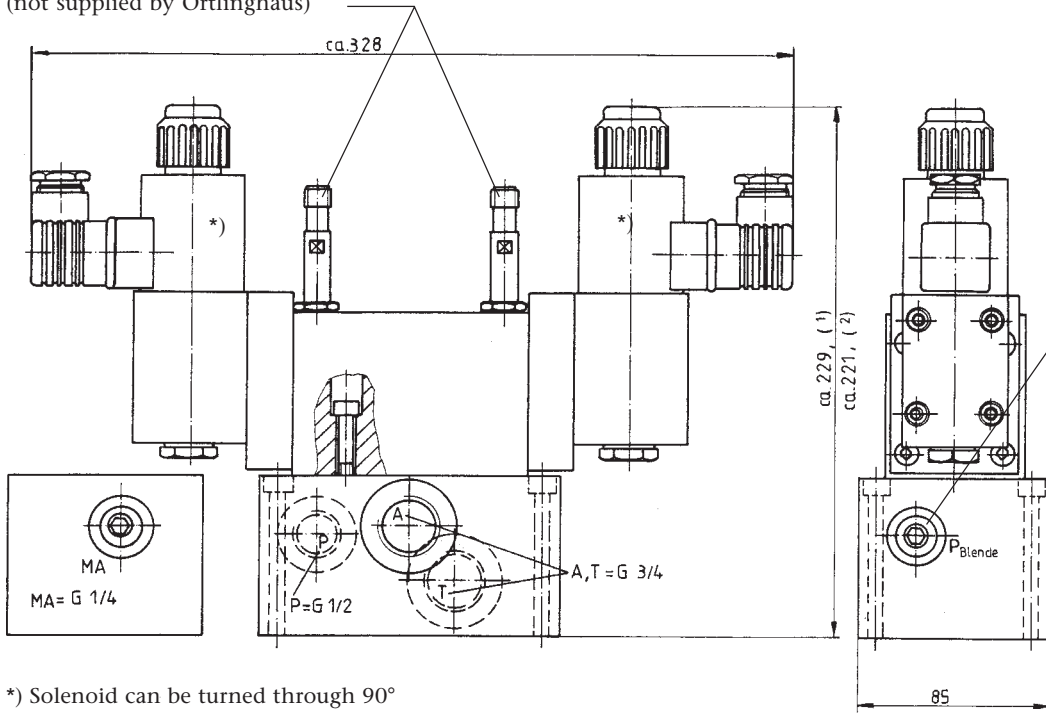
The PSV is used to actuate a hydraulic clutch or clutch/brake combined unit. It contains two 3/2 way valves switched in parallel whose main stages can be dynamically monitored by electrical limit switches. If monitoring of the valve is specified (UVV.6G, etc.) then the machine control unit should monitor whether both contacts respond within 100 ms of each other, during each operation.

If the delay in response is greater than this then no further operation must be allowed. The pertinent regulations by the BG must be compiled with (e.g. Bg-ZH 1/457). Pressure is only applied to the A port when both main valves have switched. If the valve fails to switch a build up of pressure in the A port is not possible.

**Press Safety Valves (PSV)**  
Hydraulic pilot operated

Plug connector for "Balluff" proximity switch:  
 angled plug BSK S 8-4 } with screwed  
 or straight plug BSK S 10-4 } connections  
 (not supplied by Ortlinghaus)

- 1) DC version
- 2) AC version



Connections:  
 A, T = G3/4  
 P = G1/2  
 MA = G1/4

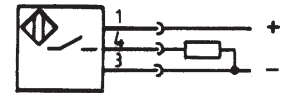
N.B.!

The PSV is shipped with a 2.5 mm orifice fitted. Before putting the clutch/brake combined unit into operation the orifice in the PSV should be changed over to the orifice supplied separately (to determine the size see the calculation).

\*) Solenoid can be turned through 90°

Range	<b>0086-096-12-.....</b>		
	<b>-010000</b>	<b>-070000</b>	<b>-080000</b>
Voltage	24V, DC	110/115 V 50/60 Hz	220/230 V 50/60 Hz
PSV Operating data:			
Rated pressure:	bar	100	
Min. Pressure:	bar	20	
Max. recommended flow	l/min	60	
approx weight	kg	9	

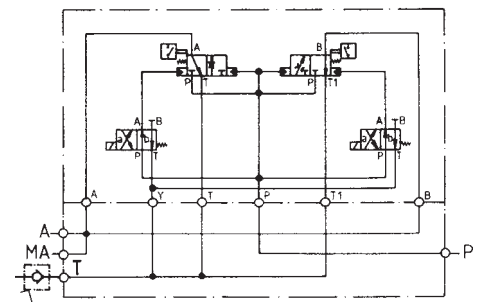
Bl.1891



Bl.1892

Connection circuit diagramm for inductive proximity switches

Solenoids	DC	AC
Power consumption Pull in	W	128
Holding	W	45
Switching frequency	Sw/hr	18000
Relative operating time	100 % (continuous)	
Enclosure Class	IP 65	
Inductive limit switches to show valve position	PNP normally open	
Working voltage	10-30 V, DC	



Check valve (max. 1 bar) required Bl.1893

**Description**

The PSV is used to actuate a hydraulic clutch or clutch/brake combined unit. It contains two 3/2 way valves switched in parallel whose main stages can be dynamically monitored by proximity switches. If monitoring of the valve is specified (UVV.6G, etc.) then the machine control unit should monitor whether both contracts respond within 100 ms of each other, during each operation.

If the delay in response is greater than this then no further operation must be allowed. The pertinent regulations by the BG must be compiled with (e.g. Bg-ZH 1/457). Pressure is only applied to the A port when both main valves have switched. If the valve fails to switch a build up of pressure in the A port is not possible.