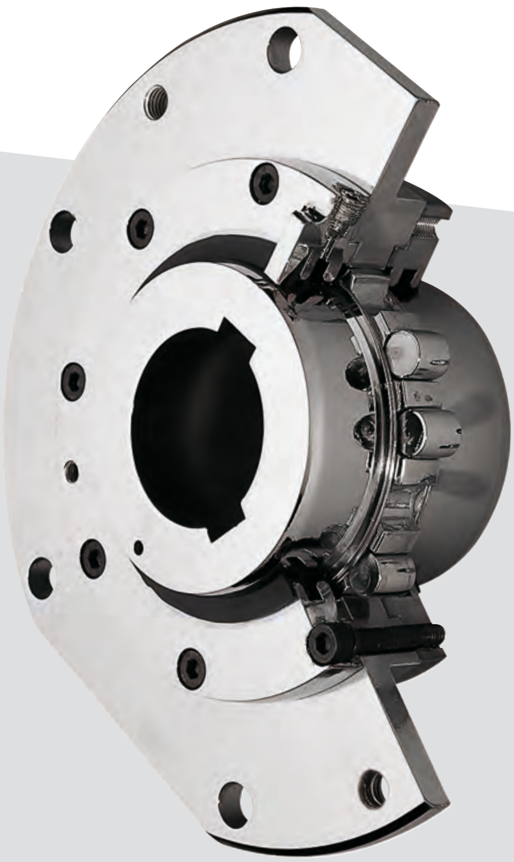
SOLUTIONS FOR POWER TRANSMISSION

Barrel coupling

TCB / TCB-HD

JAURE®



EMERSON™
Industrial Automation

JAURE®.

Experience, innovation
and close cooperation
with leading international
companies.

JAURE S.A. is a leading supplier of couplings and power transmission solutions. Experience, manufacturing program, innovation and close cooperation with leading International companies in the business enables JAURE® to provide customized solutions to our customers.

For 50 years, JAURE® has developed couplings for the most demanding applications in marine, wind energy, steel, railway and paper industries among others.

Our manufacturing program covers a complete range without boundaries in power and speed, and we continue developing new products for future challenges.

JAURE S.A. is part of Emerson Industrial Automation. The integration has strengthened JAURE's brand presence worldwide and has added application expertise to provide answers, products and service to our customers on a global basis.

Application

JAURE® TCB barrel couplings are recommended for installation in crane lifting mechanisms, to connect the cable drum with the gearbox output shaft, as well as in winch conveyors and platform hoists.

When the gearbox output shaft is rigidly connected to the drum in a lifting mechanism, supported between points (Fig. 1), this originates a statically indeterminate case. This type of mounting requires special care in alignment and levelling, which is difficult to achieve in practice.

Mounting inaccuracies, as well as deformation in structures and wear in moving parts, lead to enormous additional forces, above all in the gearbox output shaft, which as a result of alternative bending loads can lead to breakage due to fatigue and faults in bearings and gear wheels.

In the recommended mounting (Fig. 2) the barrel coupling, which is installed between the gearbox and cable drum, performs the function of an articulated joint, thus making the connection statically determinate and avoiding the occurrence of high bending moments.

Figure 5 shows the mounting of the barrel coupling in a lifting mechanism. Considering the fact that this coupling allows axial displacement, a self-adjusting bearing must be mounted, fixed laterally, at the opposite end of the drum shaft in order to withstand the axial forces that may be generated.

As a special application, the TCB barrel coupling can be designed as an articulated joint that withstands axial forces by itself (type TCBA, see page 19).

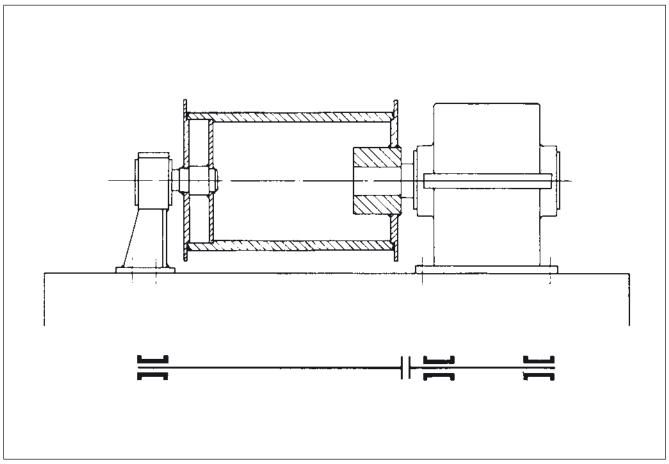


Fig. n.º 1.
Rigid mounting of gearbox-drum connection. Support at three points.

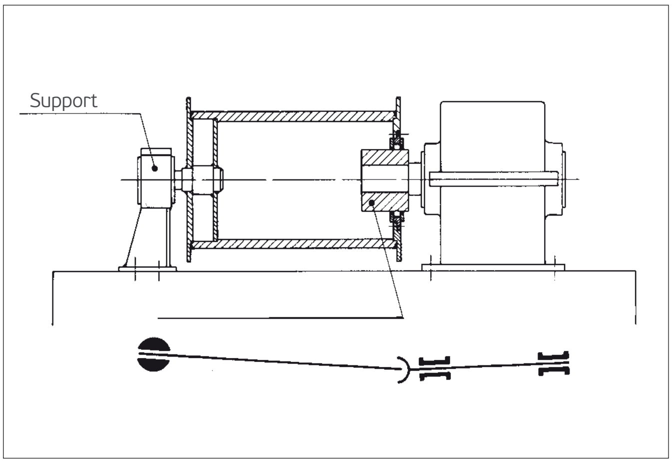


Fig. n.º 2.
Mounting with barrel coupling.

Part list

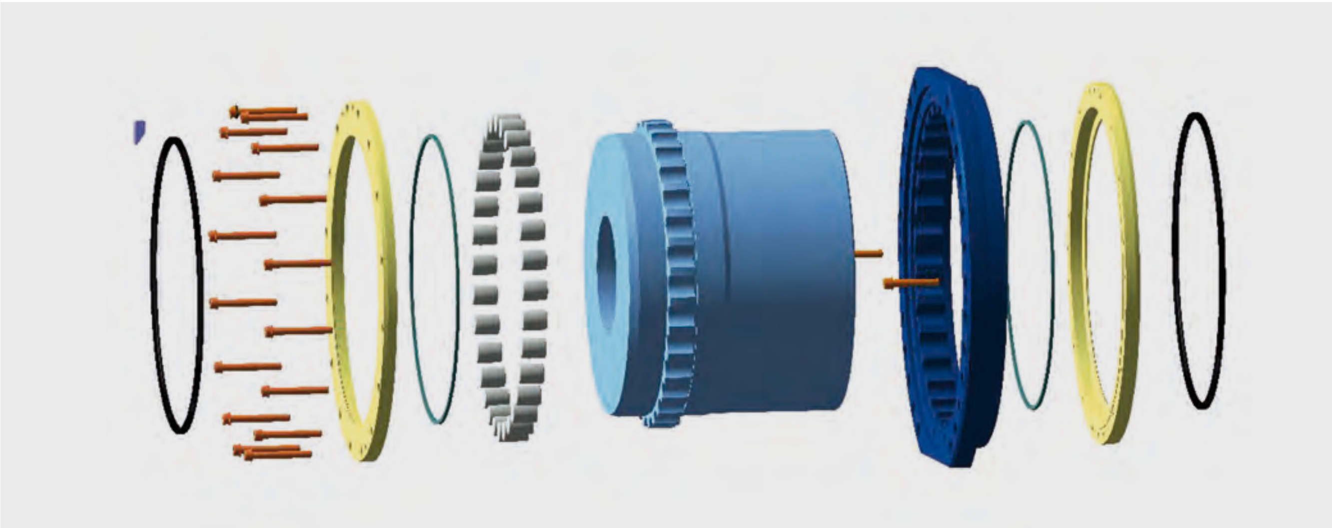


Fig. n.º 3.

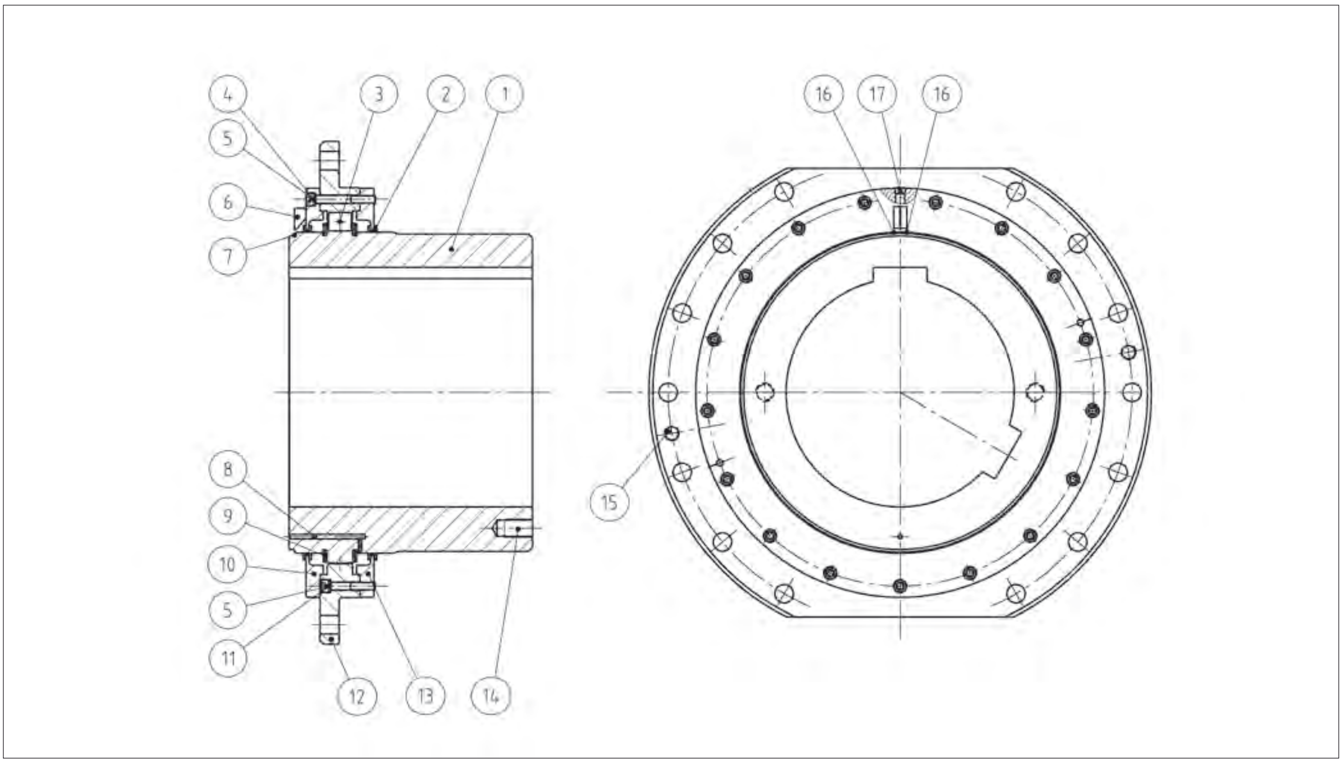


Fig. n.º 4.

1. HUB
2. SPECIAL SEAL
3. BARREL
4. ALLEN SCREW (LONG)
5. GROWER WASHER
6. INDICATOR
7. AXIAL ADJUSTMENT INDICATOR
8. GREASE OVERFLOW
9. BARREL GUIDE RINGS
10. OUTER COVER
11. ALLEN SCREW (SHORT)
12. SLEEVE
13. INNER COVER
14. PULLER HOLES
15. PULLER HOLES
16. WEAR LIMIT GROOVES
17. LUBRICATION POINT

Description and characteristics

The barrel coupling consists of a sleeve provided with semicircular toothing around its internal diameter and a hub that is externally toothed in a similar way. A series of cylindrical barrels, of hardened steel, are inserted in the holes formed by this toothing to act as power transmission elements.

Covers with their corresponding special seals serve to assure the perfect tightness of the inner zone, preventing the penetration of dust and guaranteeing the continuity of the necessary lubrication. Two double-lamina elastic rings mounted on the hub, one on each side of the toothing, limit the axial displacement of the barrels.

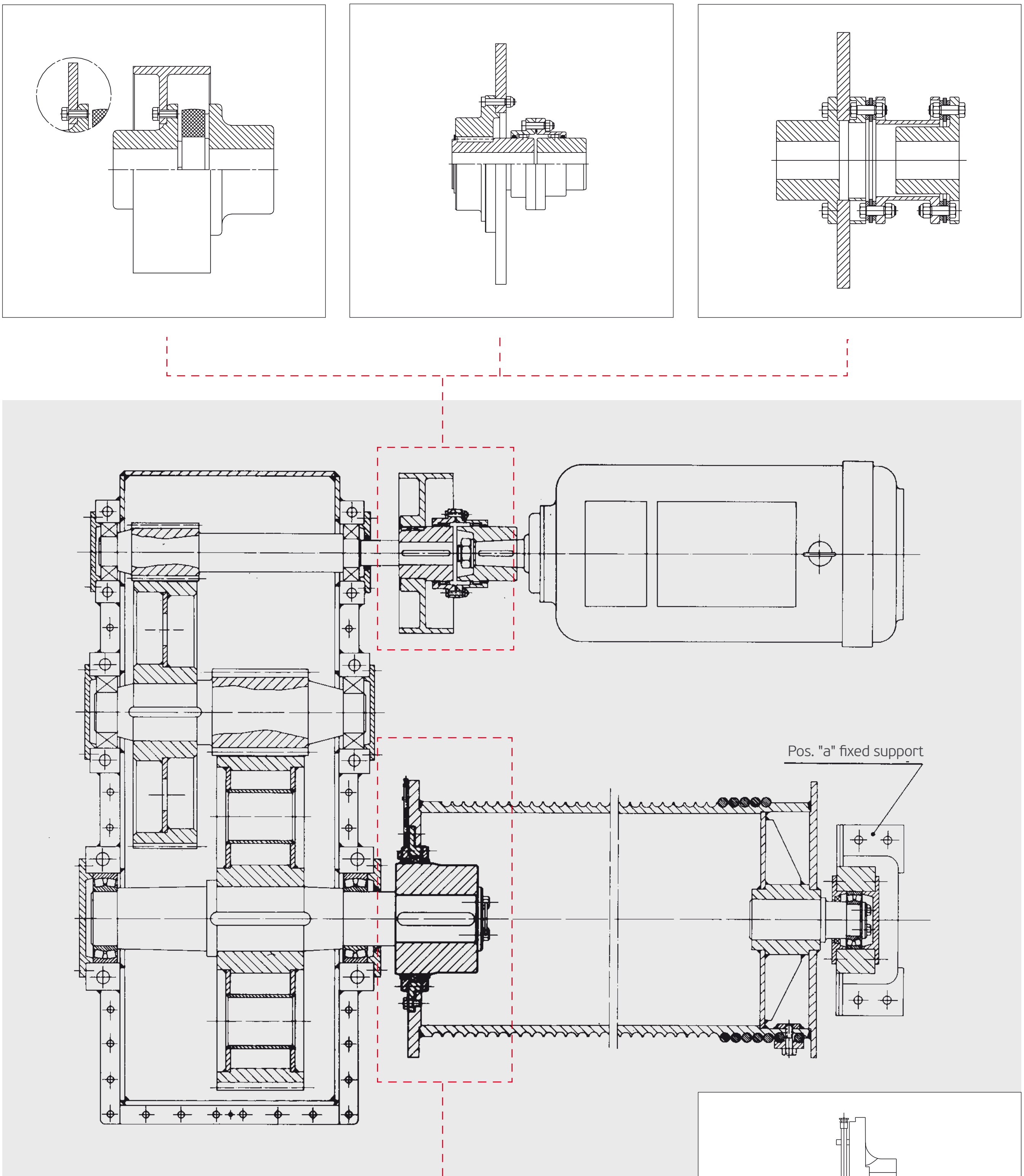
The convex shape of the barrels and the internal spaces of the toothing allows the oscillation of the hub relative to the sleeve, compensating angular misalignments of ± 1º 30' and an axial displacement that varies between ± 3 mm and ± 8 mm (see Table 5, page 14).

Torque is transmitted to the drum's receiving flange, generally by two diametrically opposed flat driving surfaces, located at the periphery of the coupling flange, and also by means of a series of bolts which, at the same time, serve as connection with the drum.

Other connection systems, such as adjusted spring pins or similar, can also be used following the adequate preparation of the flanges (see TCB with special flange on page 20).

The described design is appropriate for bearing large radial loads, as these are distributed over large barrel support surfaces. In the same way, this design also minimises the effect of alternative bending of the torque on the toothing, the latter being robust thanks to its low height and large bottom section. In addition to this, due to the effect of a "crush polishing" of the hardened barrel on the tooth profile, its wear resistance is appreciably improved.

An indicator located on the outer cover (Pos. 10, Fig. 4), which moves relative to the marks provided on the hub as a function of wear, permits control of internal wear of the toothing without the need to disassemble any part of the coupling. The same indicator also serves to control the axial position of the sleeve relative to the hub. Optionally, an electronic wear indicator can be installed for remote control (for more details see page 22).



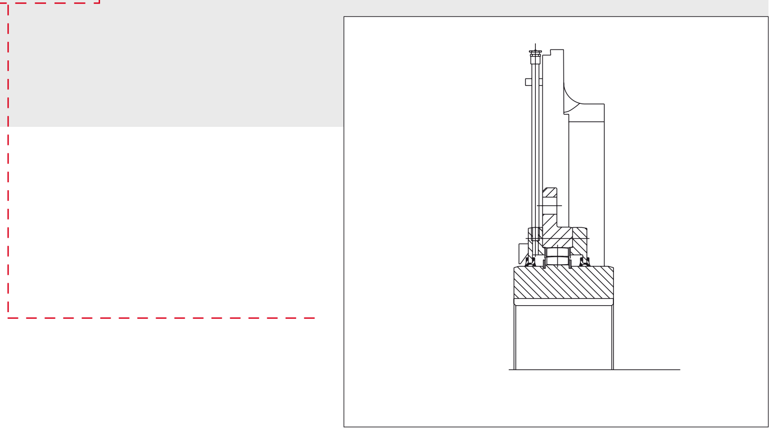
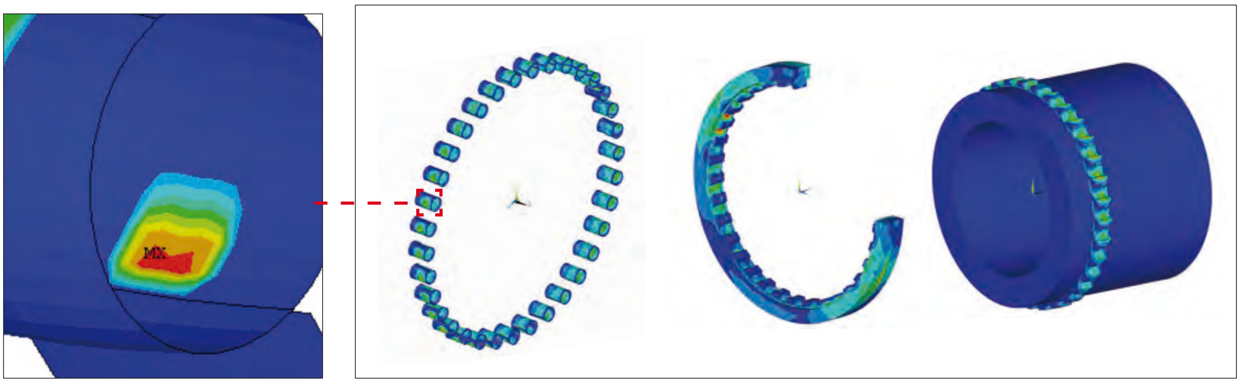


Fig. n.º 5.
Mounting of the barrel coupling in a lifting mechanism.

New

1. TCB-HD

- TCB-HD is an improvement over the previous TCB-S.
- The TCB-HD is fully interchangeable with TCB-S.
- Upgrade of materials.
- Detailed calculations with finite element analysis (FEA) have been performed.
- Maximum boreshaft diameter "d" has been increased.
- Nominal torque has been increased.
- Allowable radial loads have increased.
- Increasing the range: Two bigger sizes now available.



2. More precise details for type TCBA and TCB/TCB-HD splined

3. Optionally available an electronic wear control device (see page 23)

Advantages between HOIST GEAR and BARREL COUPLINGS

To use a barrel coupling instead of a gear coupling will bring a significant decrease in needed room for the coupling. A barrel coupling is quite narrower than the corresponding gear coupling, and besides the barrel coupling is partly positioned inside the drum.

Due to the barrel and gear profile, barrel couplings are subjected to much lower bending stress on the root of the teeth.

Therefore, increased safety factor is obtained against bending and peak radial loads.

As barrel couplings have increased contact area, the radial load is better distributed and hence the life of the coupling is increased. See graph below comparing stresses due to the radial load. This radial load is even better distributed with coupling wear.

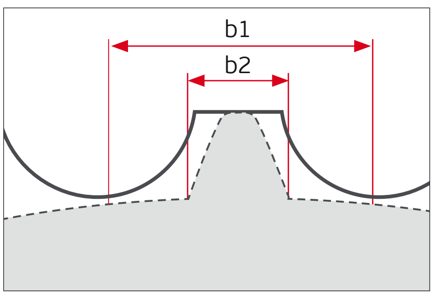


Fig. n.º 6.
Technical modifications reserved.
$b_1 \geq 2 \cdot b_2$

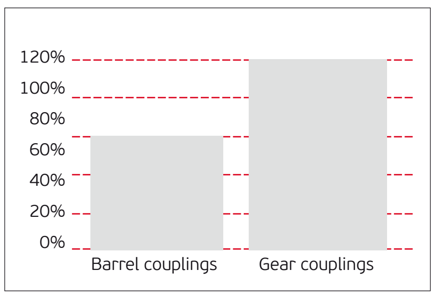


Fig. n.º 7.
Radial stress in the coupling for a given radial force (%).

Selection of coupling size

The required coupling size depends on:

1. Nominal transmission torque T
2. Radial load F to be withstood by the coupling.
3. Geometric check of the gearbox shaft.

1. Nominal transmission torque T (Nm)

1.1. BASED ON INSTALLED POWER P_i(kW)

①

$$T = 9550 \cdot \frac{P_i}{n} \cdot K_1$$

WHERE:

P_i (kW)= max. installed power of the motor

n (rpm)= drum turning speed

K_1= operating factor (see Table 1)

Table n.º 1. **Operating factor K_1, according to cable transmission group**

GROUP DIN 15020	1B m	1A m	2 m	3 m	4 m	5 m
GROUP FEM (1970)	IB	IA	II	III	IV	V
GROUP FEM (1987)	M1, M2, M3	M4	M5	M6	M7	M8
GROUP BS 466 (1984)	M1, M2, M3	M4	M5	M6	M7	M8
Operating factor K_1	1, 12	1,25	1,40	1,60	1,80	2

1.2. Based on consumed power P_c(kW)

②

$$P_c = \frac{F_p \cdot V_r}{60.000}$$

③

$$T = \frac{P_c \cdot 9550}{n} \cdot K_1$$

④

$$T = F_p \cdot \frac{D}{2} \cdot K_1$$

WHERE:

P_c (kW)= max. power consumed by the motor

F_p (N)= drum static pull, including cable and pulley efficiency in Newtons (see Equation 6)

V_r (m/min)= drum cable lifting raten

n (rpm)= drum turning speed

D (m)= drum pitch diameter

K_1= operating factor (see Table 1)

Having obtained the transmission torque T (Nm) to be withstood by the coupling, by means of the installed or consumed power, this mustbe less than the coupling's nominal torque TN (Nm), shown in Table 5.

After this, it is necessary to confirm the selection on the basis of the radial load to be withstood.

2. Radial load F to be withstood by the coupling

Radial load is understood to be the fraction of the load that must be withstood by the coupling due to the pull of the load and the hoisting tackle. As the coupling constitutes one of the drum's two supports, it must withstand a fraction of the total load.

Different examples of hoist tackle configurations.

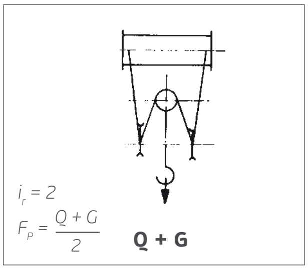


Fig. n.º 8.
Twin hoist, 2 sheaves. Double line to drum.

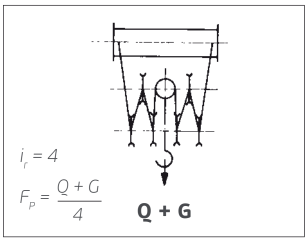


Fig. n.º 9.
Twin hoist, 4 sheaves. Double line to drum.

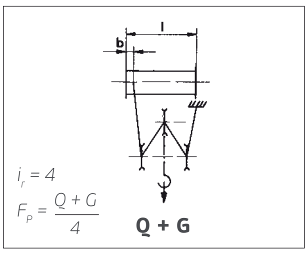


Fig. n.º 10.
Hoist, 2 sheaves. Single line to drum.

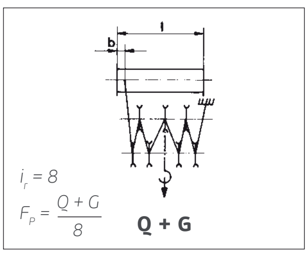


Fig. n.º 11.
Hoist, 4 sheaves. Single line to drum.

Prior to calculating the radial load F, it is necessary to obtain the static pull in the drum F_P:

2.1. DETERMINATION OF STATIC PULL IN THE DRUM F_P:

The static pull in the drum is given by:

⑤

$$F_p = \frac{Q + G}{i_r \cdot K_2}$$

This static pull is modified if cable and pulley efficiency is taken into account according to Table 2.

⑥

$$F_p = \frac{Q + G}{i_r}$$

WHERE:

Q (N) = max. load on hook

G (N) = weight of hoist tackle and cables

K_2 = operating factor of drum and hoist tackle efficiency (see Table 2)

i_r = transmission ratio = $\frac{\text{Total number of lines}}{\text{Number of lines leaving the drum}}$

Table n.º 2. **Operating factor K_2 according to drum and tackle efficiency**

Hoist tackle reduction i_r	**2**	**3**	**4**	**5**	**6**	**7**	**8**
K_2, with bronze bearings	0,92	0,90	0,88	0,86	0,84	0,83	0,81
K_2, with ball bearings	0,97	0,96	0,95	0,94	0,93	0,92	0,91

2.2. CALCULATION OF RADIAL LOAD

Having obtained the static pull, it is necessary to calculate the radial load F (N) by means of the following equation:

For examples corresponding to Fig. 8 and Fig. 9 (systems with double line to drum):

⑦

$$F = \frac{F_p}{2} + \frac{w}{2}$$

For examples corresponding to Fig. 10 and Fig. 11 (systems with single line to drum):

⑧

$$F = [\, F_p\,(1 - \frac{b}{l})\,] + \frac{w}{2}$$

WHERE:

F_p (N)= Static pull of drum, including cable and pulley efficiency

b (mm)= Shortest possible distance from cable in drum to the geometric centre axis of barrels in the coupling.

l (mm)= Distance between drum supports

w (N)= Own weight of drum with cables and parts of the coupling

Having obtained the radial load F, it is necessary to check that the admissible radial load F_r of the selected coupling (see Table 4) is greater than F.

2.3. OPTION OF CORRECTED RADIAL LOAD F_A.

In the event that the transmission torque T is lower than the nominal torque of the preselected coupling TN, but the radial load F to bewithstood by the coupling is greater than the admissible catalogue load F_r for this size of coupling, it is then possible to make a finalverification, to check whether the coupling can withstand a radial load F_A which is higher than the coupling's admissible load F_r indicated inthe catalogue:

⑨

$$F_A = F_r + [\,(TN - T) \cdot C\,]$$

C= Compensation factor, variable according to coupling size (see Table 3).

Table nº 3. **Value of C according to coupling size.**

Coupling size	25	50	75	100	130	160	200	300	400	500	600
Factor C	10,3	9	8	7,2	6,4	5,8	5,2	4,8	4,1	3,7	3,4
Coupling size	**1000**	**1500**	**2100**	**2600**	**3400**	**4200**	**6200**	**8200**	**9200**	**10200**	
Factor C	3,0	2,6	2,5	2,4	2,2	2,0	1,8	1,6	1,5	1,3	

Compensation is only applicable to the radial load, not to the torque.

3. Geometric check of gearbox shaft

A check must also be made that the diameter of the gearbox shaft is smaller than the maximum admissible diameter (dmax) for each coupling size, according to Table 5. These values are valid for shafts with keyways according to DIN 6885/1. Additionally, the stress on keyways must be checked.

For other types of fixing, such as spline shafts according to DIN 5480, mounting with interference, etc., please consult our Technical Department.

EXAMPLE

Q = 300000 N *(useful load to be lifted)*
G = 10000 N *(hoist weight)*
w = 14000 N *(weight of drum and cables)*
P_i = 30 kW *(motor power)*
V_r = 5 m/min *(hook lifting rate)*
n = 8 rpm *(drum turning rate)*
D = 800 mm *(drum diameter)*

LAYOUT *(Fig. n.º 10)*

i_r = 4 *Hoist reduction*
K_1 = 1.6 *(Group III)*
K_2 = 0.95 *(Drum and hoist efficiency)*
b = 400 mm *(distance between cable and coupling)*
l = 1200 mm *(drum length)*
d = 200 mm *(gearbox output shaft, with cotter)*

3.1. CALCULATION OF NOMINAL TRANSMISSION TORQUE T (Nm)

3.1.1. Based on installed power P_i(kW), according to Equation 1:

⑩

$$T = \frac{9550 \cdot P_1}{n} \cdot K_1 = \frac{9550 \cdot 30}{8} \cdot 1{,}60 = 57300 \text{ Nm}$$

3.1.2. Based on consumed power P_c(kW):

According to Equation 6.

⑪

$$F_p = \frac{Q + G}{i_r \cdot K_2} = \frac{300000 + 10000}{4 \cdot 0{,}95} = 81600 \text{ N}$$

The consumed power P_c is given by Equation 2:

⑫

$$P_c = \frac{F_p \cdot V_r}{60000} = \frac{81600 \cdot 20}{60000} = 27{,}2 \text{ kW}$$

Table n.º 4.
Conversion table

1 mm	0,0394 inch
1 inch	25,4 mm
1 m	39,4 inch 3.283 ft
1 kg	2,2046 lb (weight)
1 lb (wt)	0,4536 kg
1 N	0,2248 lbs (force)
1 lb (f)	4,4482 N
1 Nm	0,7376 lb-ft
1 lb-ft	1,3558 Nm
1 kgm	23,76 lb-ft
1 lb-ft	0,1382 kgm
1 kW	1,34 HP
1 HP	0,746 kW

Thus, the transmission torque T is:

(13)

$$T = \frac{9550 \cdot P_c}{n} \cdot K_1 = \frac{27{,}2 \cdot 9550}{8} \cdot 1{,}6 = 51950 \text{ Nm}$$

Preselected size: TCB – 600 TN= 70000 Nm.

Higher than the torque calculated by means of installed power: 57300 Nm and higher than the torque calculated by means of consumed power: 51950 Nm.

3.2. CALCULATION OF RADIAL LOAD F TO BE WITHSTOOD BY THE COUPLING:

Using Equation 14:

(14)

$$F = [\, F_p \,(1 - \frac{b}{l}\,)\,] + \frac{w}{2} =$$

$$[\, 81600\,(1- \frac{400}{1200}\,)\,] + \frac{14000}{2} = 61400 \text{ N}$$

The preselected size TCB – 600 withstands a radial load F_r= 115000 N (see Table 5) higher than that obtained of 61400 N.

3.2.1. Option of corrected radial load F_A:

Let us suppose that the radial load F_r turns out to be 130000 N. In this case, in a preliminary selection, this load is greater than that featured in the catalogue for the TCB – 600. It is possible to make a second check by means of the corrected radial load F_A, prior to selecting a larger coupling size, according to Equation 9:

(15)

$$F_A = F_r + [(T_N - T) \cdot C] = 115000 +$$

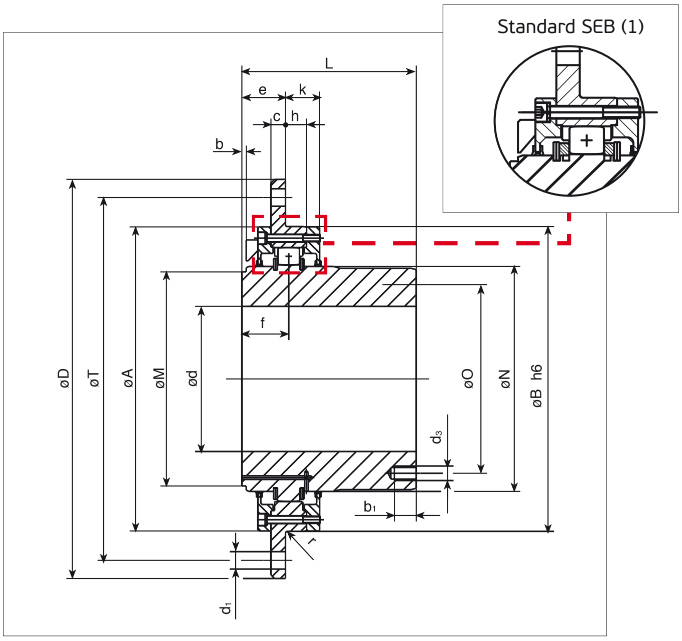
$$[(70000 - 51950\,) \cdot 3{,}4] = 176370 \text{ N}$$

The coupling could withstand a radial load F_A of up to 176370 N, for the transmission data considered. As 176370 N > 130000 N, the selection of TCB – 600 would be correct.

3.3. GEOMETRIC CHECK OF GEARBOX SHAFT

According to Table 5, d_{max}= 205 mm > 200 mm (existing shaft diameter). Furthermore, a check should be made that the specific pressure in the keyway is acceptable.

Diameters and parameters **Standard TCB**



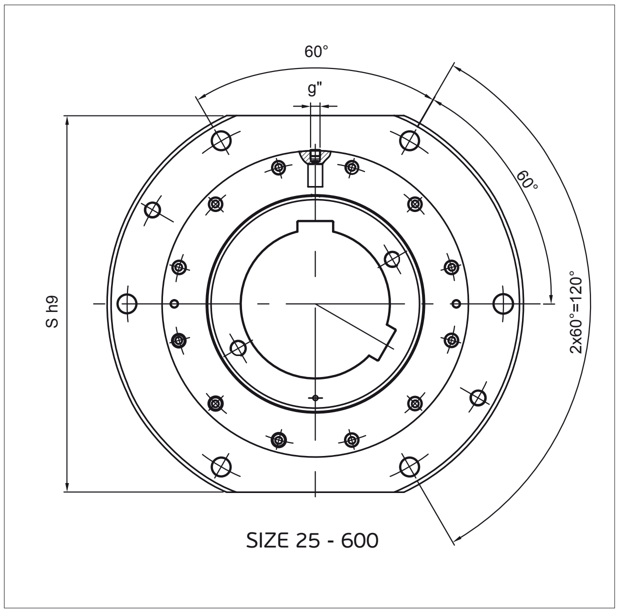
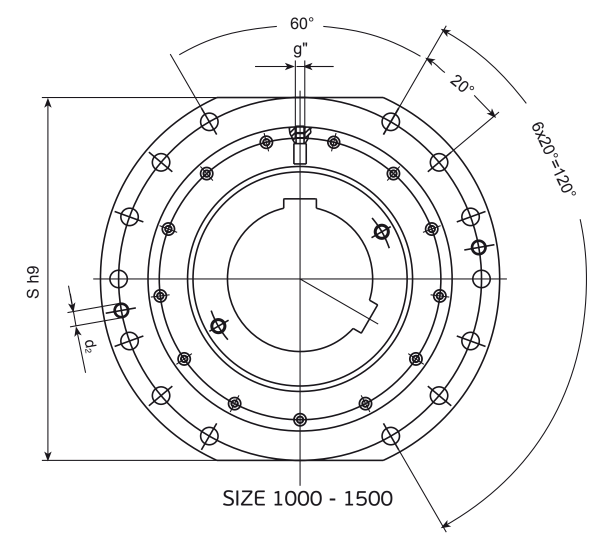


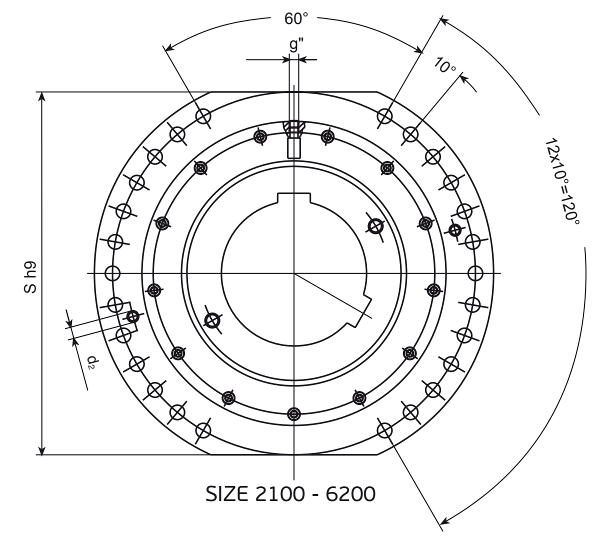
Table n.º 5.

TCB Size	Selection Standard SEB (1)	TN (Nm)	Fr admissible radial load (N)	(2) d max. [mm]	d min. [mm]	D [mm]	L [mm]	L min. [mm]	M [mm]	N [mm]	A [mm]	B [mm]
25	-	4500	14500	68	38	250	95	85	90	95	159	160
50	-	6000	16500	80	48	280	100	85	105	110	179	180
75	-	7500	18500	90	58	320	110	95	120	125	199	200
100	-	9000	20000	100	58	340	125	95	135	140	219	220
130	-	15500	31000	115	78	360	130	95	150	160	239	240
160	-	19500	35000	130	78	380	145	95	170	180	259	260
200	SG 130	24000	38500	136	98	400	170	95	190	200	279	280
300	-	28000	42000	156	98	420	175	95	210	220	309	310
400	SG 140	38000	49000	185	98	450	185	120	250	260	339	340
500	-	61400	92000	215	98	510	220	125	290	300	399	400
600	SG 185	70000	115000	235	118	550	240	125	302	312	419	420
1000	SG 200	120000	125000	250	138	580	260	130	341	351	449	450
1500	SG 240	180000	150000	295	158	650	315	140	405	415	529	530
2100	-	250000	221000	305	168	665	330	145	418	428	544	545
2600	SG 270	310000	250000	315	168	680	350	145	432	443	559	560
3400	SG 315	400000	300000	340	198	710	380	165	455	475	599	600
4200	SG 355	500000	340000	385	228	780	410	165	524	539	669	670
6200	SG 400	685000	380000	430	258	850	450	165	583	603	729	730

1) Option with standard SEB666212 January 91.
2) Maximum bore diameters for execution with keyways according to DIN 6885/1. For other types of connections consult our Technical Department.
3) Aproximate weight.
g = lubrication point.
Up to size 160: R. 1/8" Gas, above size 200: R. 1/4" Gas.
For sizes 3400, 4200 and 6200 nipple is located in front face cover.



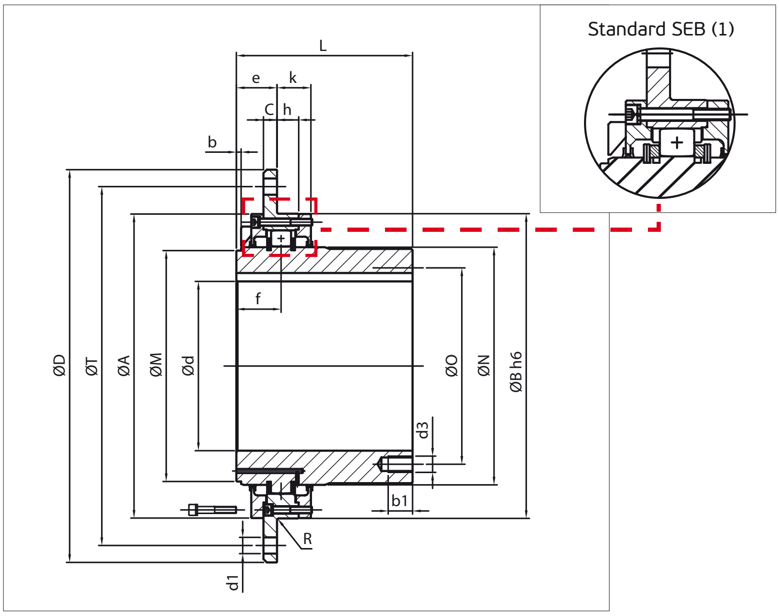
SIZE 1000 - 1500



SIZE 2100 - 6200

S [mm]	e [mm]	f [mm]	C [mm]	R [mm]	h [mm]	k [mm]	T [mm]	d1 [mm]	d2	O [mm]	b [mm]	d3 [mm]	b1 [mm]	Max. axial displacement [+ -\mm]	(3) weight [kg]
220	42	44	12	2,5	16	31	220	15	M 12	-	5	-	-	3	12
250	42	44	12	2,5	16	31	250	15	M 12	-	5	-	-	3	19
280	45	46	15	2,5	17	32	280	19	M 16	-	5	-	-	4	23
300	45	46	15	2,5	17	32	300	19	M 16	-	5	-	-	4	27
320	45	47	15	2,5	19	34	320	19	M 16	-	5	-	-	4	33
340	45	47	15	2,5	19	34	340	19	M 16	-	5	-	-	4	42
360	45	47	15	2,5	19	34	360	19	M 16	168	5	M 16	24	4	54
380	45	47	15	2,5	19	34	380	19	M 16	188	5	M 16	24	4	70
400	60	61	20	2,5	22	40	400	24	M 20	215	9	M 20	30	4	95
460	60	61	20	2,5	22	40	460	24	M 20	255	7	M 20	30	6	146
500	60	61	20	2,5	22	40	500	24	M 20	270	7	M 20	30	6	162
530	60	61	20	2,5	22	40	530	24	M 20	300	7	M 24	36	6	195
580	65	66	25	2,5	27	45	600	24	M 20	350	7	M 24	36	6	305
590	65	70	25	4	35	53	615	24	M 20	365	7	M 30	45	6	320
600	65	69,5	25	4	35	52	630	24	M 20	375	7	M 30	45	6	360
640	81	85	35	4	35	59	660	28	M 24	395	10	M 30	45	8	408
700	81	85	35	4	35	59	730	28	M 24	445	10	M 30	45	8	580
760	81	85	35	4	35	59	800	28	M 24	500	10	M 30	45	8	715

Dimensions and parameters **TCB-HD**



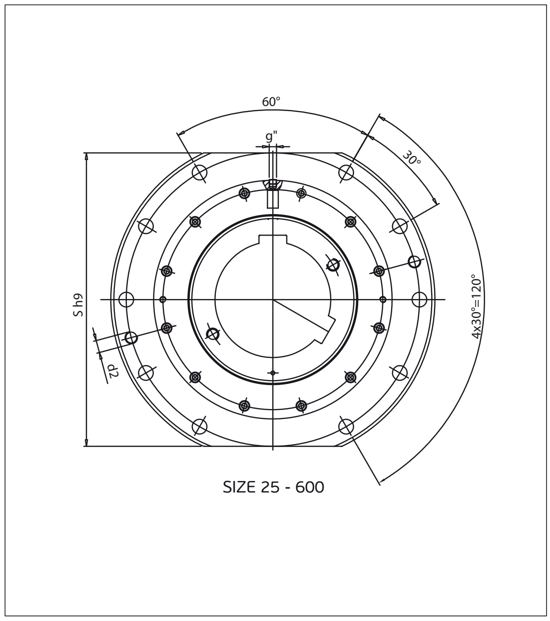
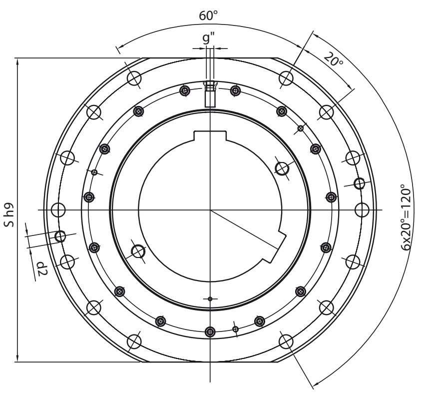


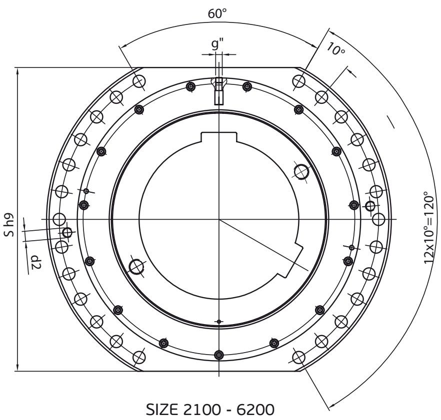
Table n.º 6.

TCB-HD Size	Selection Standard SEB (1)	TN (Nm)	Fr admissible radial load (N)	(2) d max. [mm]	d min. [mm]	D [mm]	L [mm]	L min. [mm]	M [mm]	N [mm]	A [mm]	B [mm]
25	-	6700	17500	68	38	250	95	85	90	95	159	160
50	-	8300	19500	80	48	280	100	85	105	110	179	180
75	-	10500	21000	90	58	320	110	95	120	125	199	200
100	-	14800	27000	100	58	340	125	95	135	140	219	220
130	-	20800	37000	115	78	360	130	95	150	160	239	240
160	-	26000	41000	130	78	380	145	95	170	180	259	260
200	SG 130	30000	45000	136	98	400	170	95	190	200	279	280
300	-	38000	52000	156	98	420	175	95	210	220	309	310
400	SG 140	52000	75000	185	98	450	185	120	250	260	339	340
500	-	90000	117000	215	98	510	220	132	290	300	399	400
600	SG 185	125000	130000	235	118	550	240	132	302	312	419	420
1000	SG 200	170000	145000	250	138	580	260	140	341	351	449	450
1500	SG 240	230000	175000	295	158	650	315	143	405	415	529	530
2100	-	350000	265000	305	168	665	330	153	418	428	544	545
2600	SG 270	410000	310000	315	168	680	350	153	432	443	559	560
3400	SG 315	500000	350000	340	198	710	380	170	455	475	599	600
4200	SG 355	625000	400000	385	228	780	410	170	524	539	669	670
6200	SG 400	770000	470000	430	258	850	450	170	583	603	729	730
8200	-	900000	525000	455	255	940	500	191	614	634	796	800
9200	-	1050000	550000	500	255	1025	500	191	674	694	856	860
10200	-	1300000	600000	560	270	1120	500	191	761	781	946	950

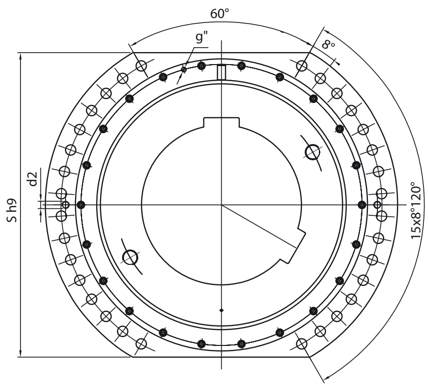
1) Option with standard SEB666212 January 91.
2) Maximum bore diameters for execution with keyways according to DIN 6885/1. For other types of connections consult our Technical Department.
3) Aproximate weight.
g = lubrication point.
Up to size 300: R1/8" Gas, from size 400 up to size 6200: R1/4" Gas, from size 8200 and over: R.1/8" Gas.
For sizes 3400, 4200 and 6200 nipple is located in front face cover.



SIZE 1000 - 1500



SIZE 2100 - 6200



SIZE 8200 - 10200

S [mm]	e [mm]	f [mm]	C [mm]	R [mm]	h [mm]	k [mm]	T [mm]	d1 [mm]	d2	O [mm]	b [mm]	d3 [mm]	b1 [mm]	Max.axial displacement [+ -\mm]	(3) weight [kg]
220	42	44	12	2,5	16	31	220	15	M 12	-	5	-	-	3	12
250	42	44	12	2,5	16	31	250	15	M 12	-	5	-	-	3	19
280	45	46	15	2,5	17	32	280	19	M 16	-	5	-	-	4	23
300	45	46	15	2,5	17	32	300	19	M 16	-	5	-	-	4	27
320	45	47	15	2,5	19	34	320	19	M 16	-	5	-	-	4	33
340	45	47	15	2,5	19	34	340	19	M 16	-	5	-	-	4	42
360	45	47	15	2,5	19	34	360	19	M 16	168	5	M 16	24	4	54
380	45	47	15	2,5	19	34	380	19	M 16	188	5	M 16	24	4	70
400	60	61	20	2,5	22	40	400	24	M 20	215	9	M 20	30	4	95
460	60	65	20	2,5	30	48	460	24	M 20	255	7	M 20	30	6	146
500	60	65	20	2,5	30	48	500	24	M 20	270	7	M 20	30	6	162
530	60	66	20	2,5	32	50	530	24	M 20	290	7	M 24	36	6	195
580	65	67,5	25	2,5	30	48	600	24	M 20	350	7	M 24	36	6	305
590	65	74	25	4	43	61	615	24	M 20	365	7	M 30	50	6	330
600	65	74	25	4	43	61	630	24	M 20	375	7	M 30	50	6	360
640	81	87,5	35	4	40	64	660	28	M 20	395	10	M 30	50	8	408
700	81	87,5	35	4	40	64	730	28	M 20	445	10	M 30	50	8	580
760	81	87,5	35	4	40	64	800	28	M 20	500	10	M 30	50	8	715
830	86	92	40	4	50	71	875	28	M 20	570	5	M 30	50	10	1245
900	86	92	40	4	50	71	945	34	M 20	630	5	M 30	45	10	1517
1000	86	92	40	4	50	73	1040	34	M 20	660	5	M 36	54	10	1628

TCB / TCB-HD with splined shaft

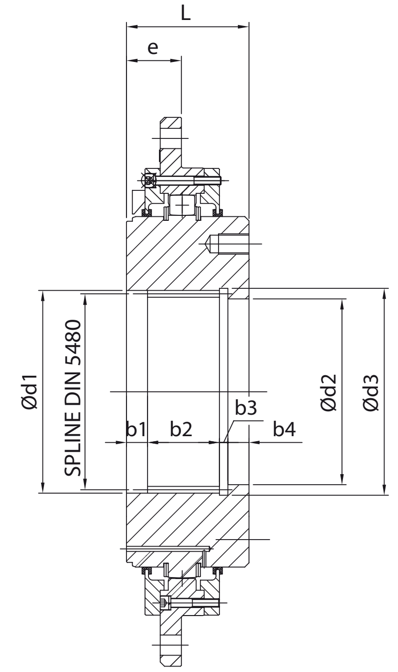


Fig. n.º 12.

Table n.º 7.

TCB & TCB-HD with spline	L [mm]	e [mm]	SPLINE (DIN-5480)	d1 (H7) [mm]	d2 (H7) [mm]	b1 [mm]	b2 [mm]	b3 [mm]	b4 [mm]
200	95	45	N100x5x30x18x9H	100	85	15	55	10	15
300	95	45	N140x5x30x26x9H	140	125	15	55	10	15
400	120	60	N180x8x30x21x9H	180	160	15	75	10	20
500	125	60	N180x8x30x21x9H	180	160	20	75	10	20
600	125	60	N180x8x30x21x9H	180	160	20	75	10	20
1000	130	60	N200x8x30x24x9H	200	180	20	80	10	20
1500	145	65	N240x8x30x28x9H	240	220	25	85	10	25
2100	145	65	N240x8x30x28x9H	240	220	25	85	10	25
2600	153	65	N300x8x30x36x9H	300	280	30	83	10	30
3400	170	81	N300x8x30x36x9H	300	280	30	100	10	30
4200	170	81	N340x8x30x41x9H	340	320	30	100	10	30
6200	170	81	N340x8x30x41x9H	340	320	30	100	10	30
8200	191	86	N400x8x30x48x9H	400	380	35	111	10	35
9200	191	86	N440x8x30x54x9H	440	420	35	111	10	35
10200	191	86	N500x10x30x48x9H	500	475	35	111	10	35

The geometry of the splined shaft can be adapted to customer's requirements.

TCBA / TCBA-HD

This design is used for transmitting the axial load from the gearbox to the drum and finally to the bearing support. This design lets the axial load to be stood by the support bearing at the other side of the drum. This may bring quite often important savings, because the gearbox' bearings will not have to stand any axial load.

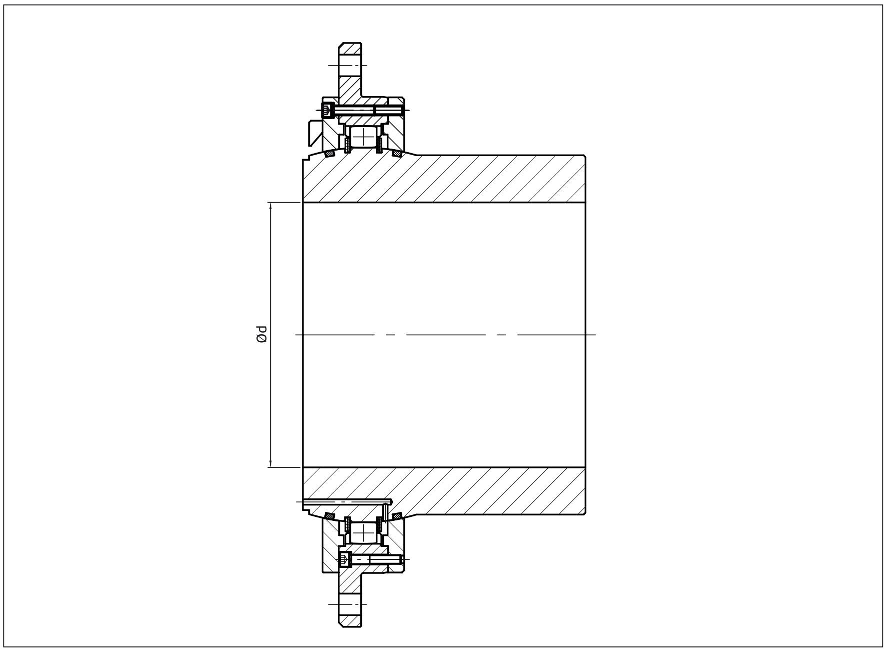


Fig. n.º 13.

Table n.º 8.

Fa maximal axial load (N)		
SIZE	**Max axial (KN) load**	**d max, (Keyed connection) [mm]**
200	60	135
300	65	150
400	76	178
500	95	215
600	112	217
1000	130	250
1500	147	295
2100	121	305
2600	130	315
3400	201	340
4200	226	378
6200	251	425
8200	277	445
9200	302	490
10200	327	520

Alternative constructions

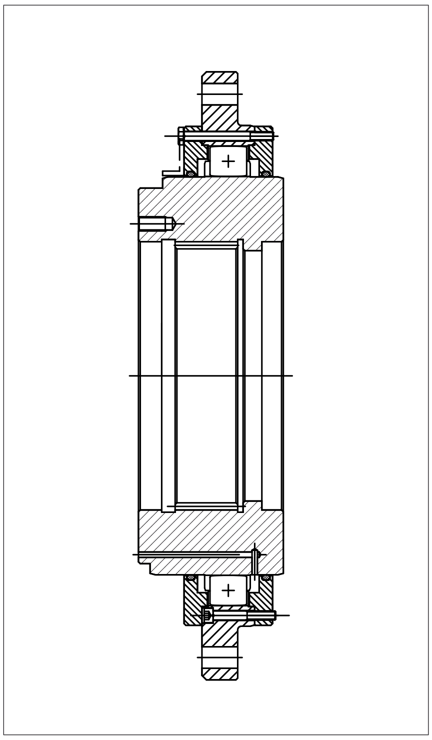


Fig. n.º 19.
TYPE TCBN

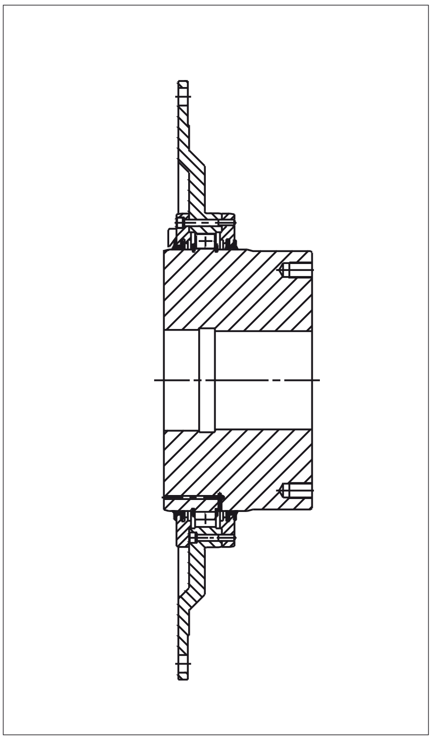


Fig. n.º 20.
TYPE TCB with special flange.

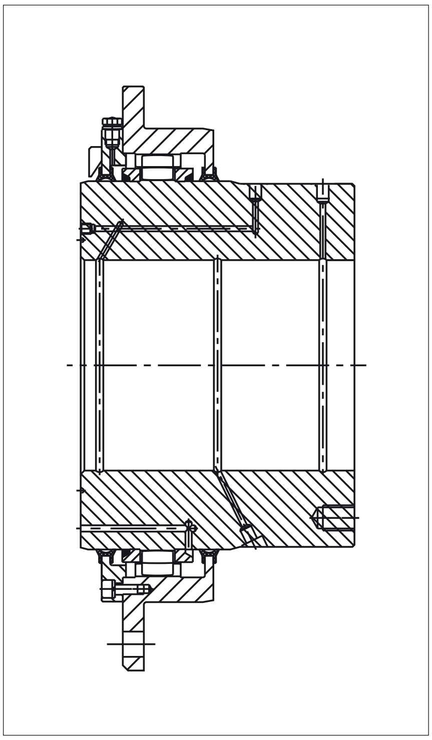


Fig. n.º 21.
TYPE TCB - SIDMAR
(standard SIDMAR BR3 - 550, 01-10-89 Rev. D)

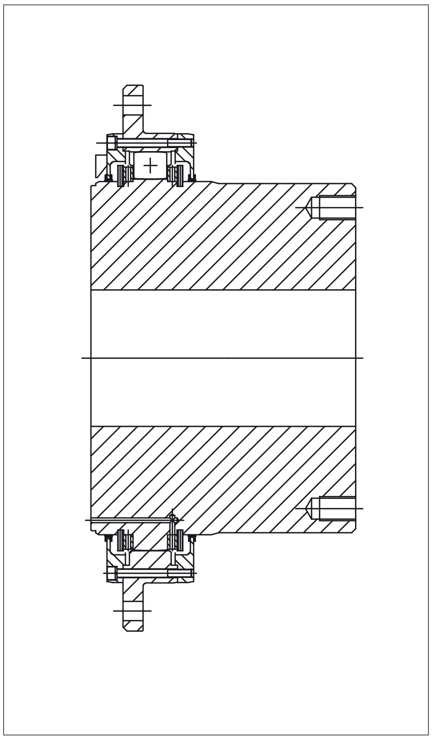


Fig. n.º 22.
TYPE TCB - SEB
(standard SEB - 666212 January 91)

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Cable drum details

The quality of the flange material will be S355JR acc. to EN-10025-2 or higher.

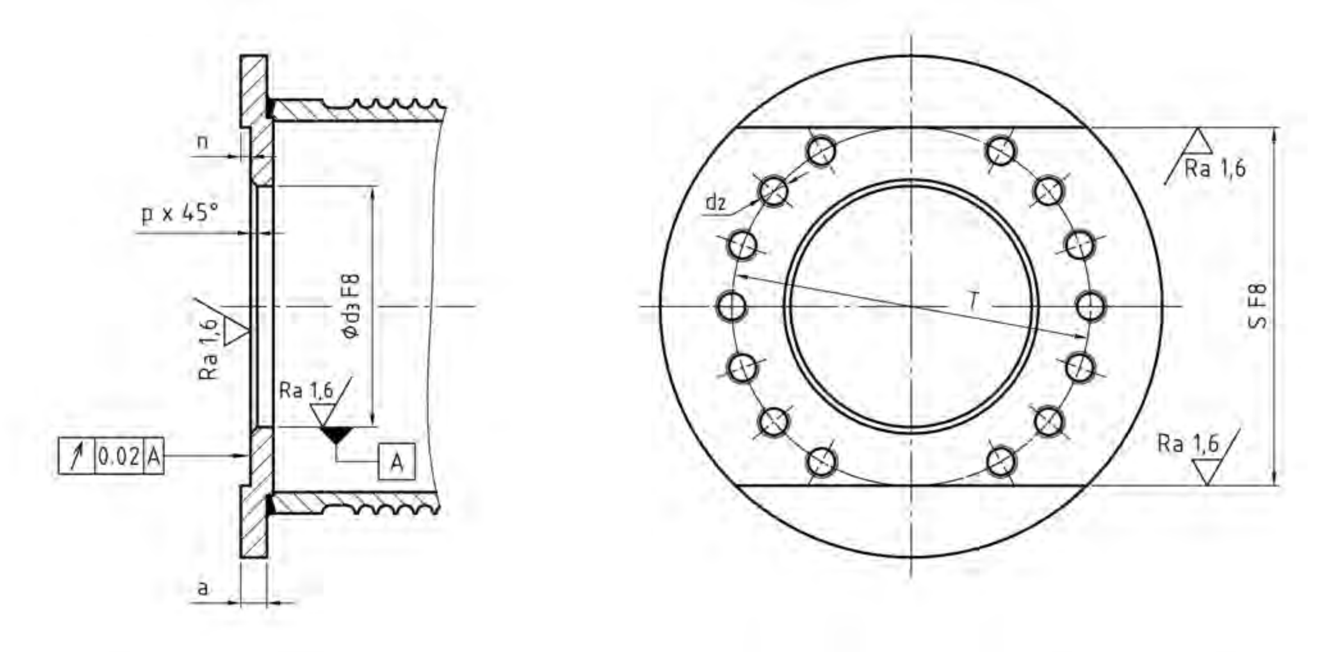


Fig. n.º 14.
Coupling side flange for cable drum.

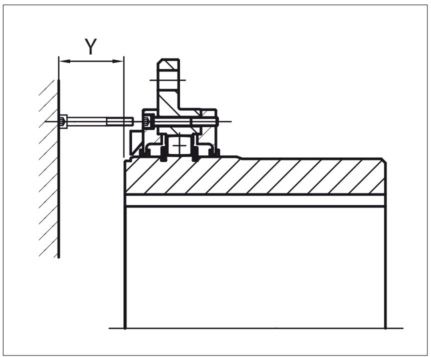


Fig. n.º 15.
Distance necessary screw removal.

Table n.º 10. **Y distance**

Coupling size	**25 50**	**75 300**	**400 1000**
Min. Y [mm]	50	55	70
Coupling size	**1500**	**2100 6200**	**8200 10200**
Min. Y [mm]	80	90	120

Table n.º 9. **General Dimensions**

Type TCB/ TCB - HD	**T [mm]**	**S F8 [mm]**	**a min. [mm]**	**d_2**	**d_3 F8 [mm]**	**p [mm]**	**n min. [mm]**
25	220	220	25	M 12	160	3	10
50	250	250	25	M 12	180	3	10
75	280	280	25	M 16	200	3	10
100	300	300	25	M 16	220	3	10
130	320	320	25	M 16	240	3	10
160	340	340	25	M 16	260	3	10
200	360	360	25	M 16	280	3	10
300	380	380	25	M 16	310	3	10
400	400	400	30	M 20	340	3	10
500	460	460	30	M 20	400	3	10
600	500	500	30	M 20	420	3	10
1000	530	530	40	M 20	450	3	20
1500	600	580	50	M 20	530	3	25
2100	615	590	50	M 20	545	5	25
2600	630	600	60	M 24	560	5	25
3400	660	640	60	M 24	600	5	35
4200	730	700	60	M 24	670	5	35
6200	800	760	60	M 24	730	5	35
8200	875	830	70	M 24	800	6	40
9200	945	900	70	M 30	860	6	40
10200	1040	1000	70	M 30	950	6	40

Wear indicator

One big advantage of barrel couplings compared to other types of couplings is the ability to perform preventative maintenance using a wear indicator. The design of barrel couplings allows them to tolerate a greater amount of wear without appreciable decrease in operating capacity, which makes it possible to more easily monitor wear.

Although some manufacturers provide wear indicators for gear couplings, the small amount of wear allowed for this type of coupling makes them unreliable and overly complex to use for preventative maintenance purposes.

The amount of wear in the barrel coupling can be inspected using the wear indicator by comparing the location of the center mark to the two outer marks on the sleeve, as shown in Figure 16. When this center mark, reaches either of the outer marks, it is then time to replace the coupling. Recommended wear limit values (m/2) are found in Table 11.

The recommended wear limits shown in Table 11 are for applications in which the load is applied in only one direction (example: crane hoists). In the case where the coupling is loaded in both directions (examples: travelling, looper cars in steel mills), then the recommended wear limits are HALF the values shown in Table 11. Unless otherwise specified in the customer's order, the wear indicator marks on the coupling will be equal to the values shown in Table 11.

Table n.º 11. Control of coupling wear

Coupling size	25	50	75	100	130	160	200	300	400	500	600
Max. wear m/2 [mm]	4	4	4	4	6	6	6	6	6	8	8
Coupling size	1000	1500	2100	2600	3400	4200	6200	8200	9200	10200	
Max. wear m/2 [mm]	8	8	8	8	8	8	8	8	8	8	

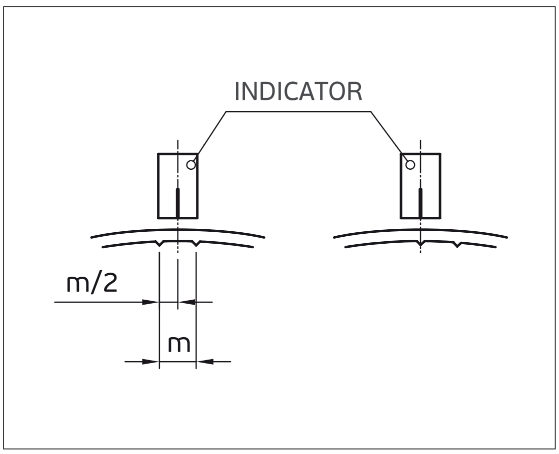


Fig. n.º16.
Wear indicator

Electronic wear indicator

NEW

An electronic wear indicator feature is also available. This feature allows the user to monitor wear remotely. So, in addition to the visual wear indicator, an electronic wear indicator can be connected either to the operator's control system or to an optional display unit to allow continuous or periodic monitoring of the barrel coupling wear.

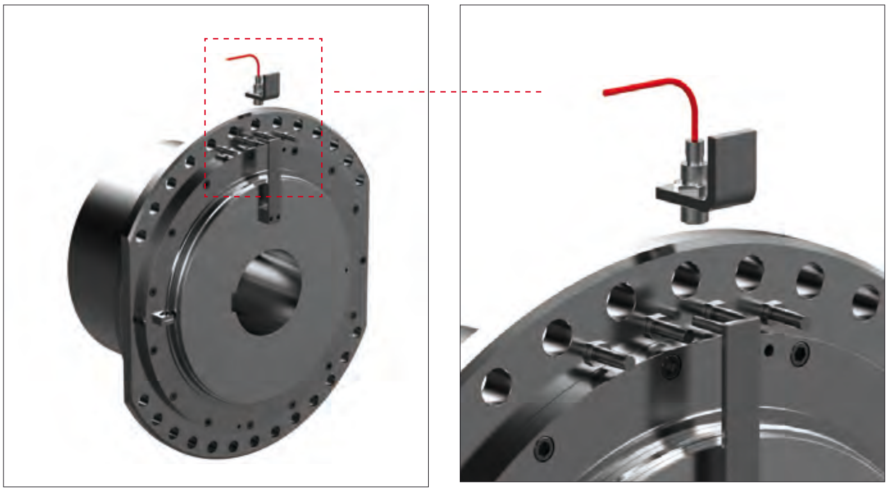


Fig. nº. 17.
Electronic indicator

- Real time wear indicator: shows real progressive wear magnitude against wear limit.
- Reliable and accurate wear value, even in max. misalignment working conditions.
- Gives alarm once max. wear limit is reached.
- Can give direct signal to crane PLC.
- Can be placed inside crane control panel.
- In very dusty working atmosphere positively tested.

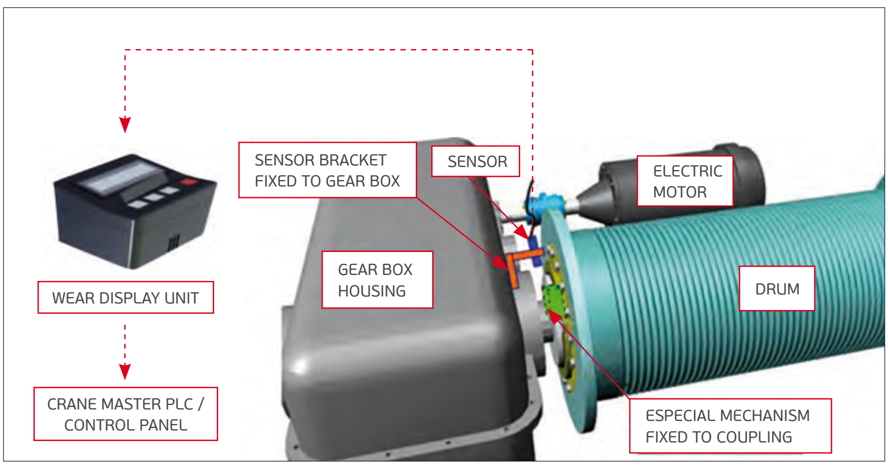
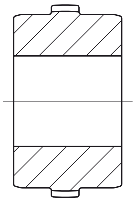
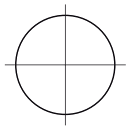


Fig. nº. 18.
TCB New Electronic Wear Indicator.

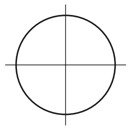
ADDITIONAL INFORMATION

Shaft connection types

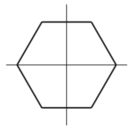




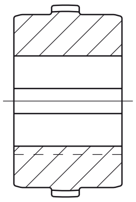
A00
PILOT

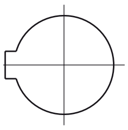


A01
CYLINDRICAL

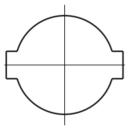


A02
HEXAGONAL

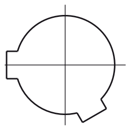




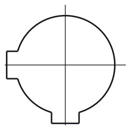
B01
ONE KEYWAY



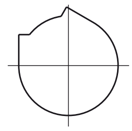
B02
TWO KEYWAYS
AT 180º



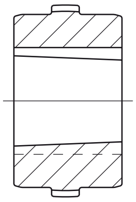
B03
TWO KEYWAYS
AT 120º

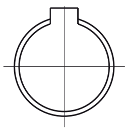


B04
TWO KEYWAYS
AT 90º

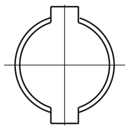


B05
TWO TANGENCIAL
KEYWAYS AT 120º

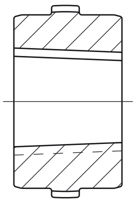


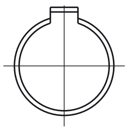


C01
CONICAL BORE
ONE STRAIGTH
KEYWAY

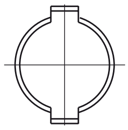


C02
CONICAL BORE
TWO STRAIGTH
KEYWAYS

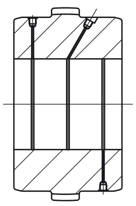




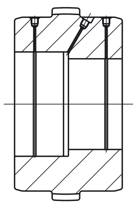
D01
CONICAL BORE
ONE TAPERED
KEYWAY



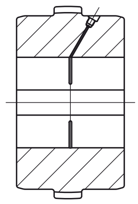
D02
CONICAL BORE TWO TAPERED
KEYWAYS



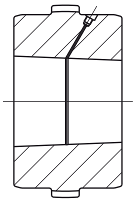
E01
SHRINK FIT



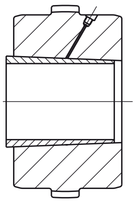
E02
SHRINK FIT
WITH TWO
DIAMETERS



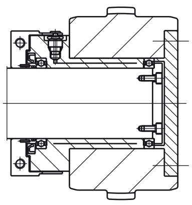
E03
SHRINK FIT
AND KEYWAY



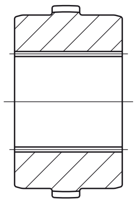
F01
TAPERED
SHRINK FIT



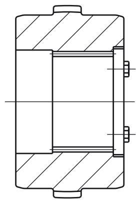
F02
WITH
CONICAL
SLEEVE



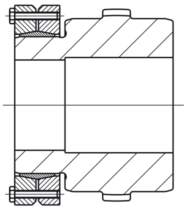
F03
WITH
SAFESET®



G01
ACCORDING
DIN 5480



G02
ACCORDING
DIN 5480
WITH CENTERING
DIAMETER



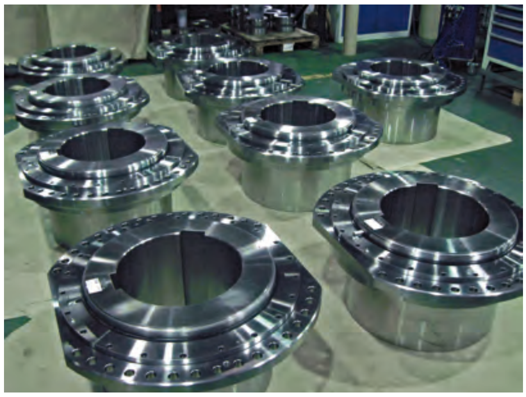
G03
WITH
CLAMPING
RING

Applications

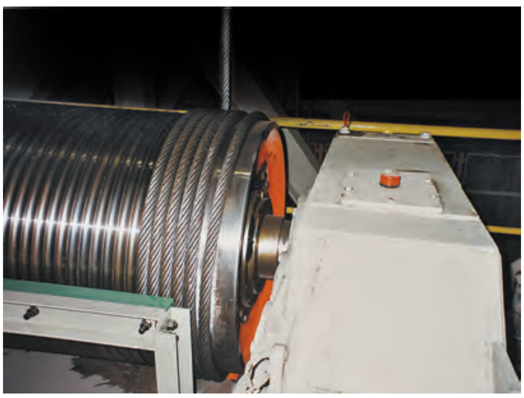
Set of barrel couplings.

Machining of barrel coupling´s hub.

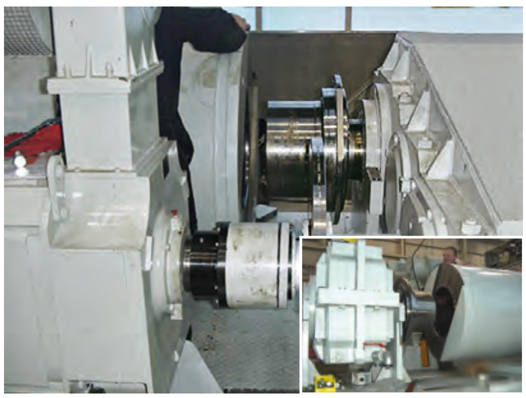
Different barrel coupling sizes.



Set of TCB-HD 8200 couplings.



Hoisting mechanism in a steel picking line.



Barrel and gear coupling with brake disc.

Applications

Travelling crane in steel plant.

Harbour crane for ship loading.

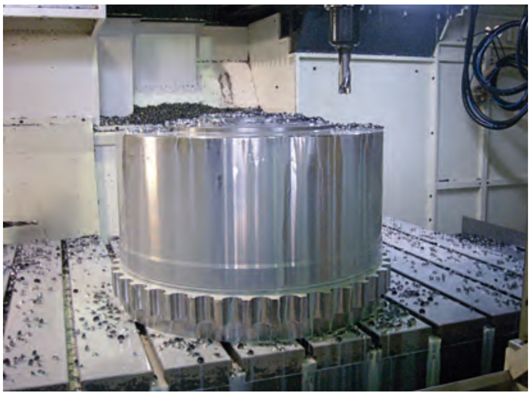
Harbour cranes for ship loading.

Travelling crane for industry applications.

Harbour cranes for ship loading.

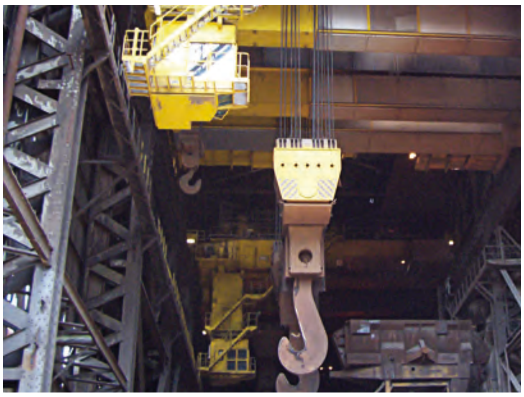
Rubber tyred Gantry crane.

Applications



Machining hub TCB-HD-10200.

Assembly TCB-HD-10200.



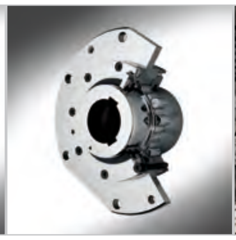
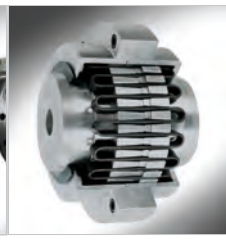
Travelling crane in steel mill.

Ship to shore cranes.

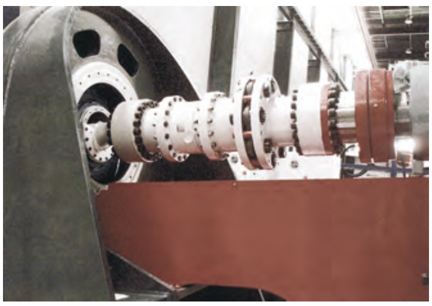
Ship to shore cranes.

Ship to shore cranes.

Jaure manufacturing program

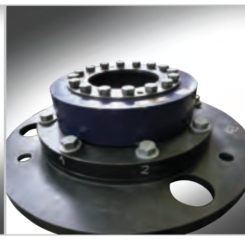
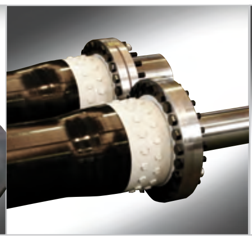
					
Product Brand Name	**MT**	**LAMIDISC ®**	**TCB / TCB-S**	**AL-S / AL-SD / ALD**	**RECORD**
Type & Description	Gear	Disc pack	Barrel (drum type)	Gear spindles	Grid / spring type
INDUSTRY APPLICATION					
Metals & Heavy duty	•	•	•	•	•
Minerals & Mills	•	•	•		•
Crane & Hoisting	•	•	•		•
Pulp & Paper	•	•			•
Petrochemical / Oil & Gas	•	•			•
Cooling Towers		•			
Machine Tools		•			
Marine	•	•	•		
Wind Turbines		•			•
Test Benches	•	•			
Railway	•	•			

Special safety heavy duty gas nitrided gears



LAMIDISC® Safety coupling on test bench Incl. SAFESET® (SAFESET® from VOITH TURBO)

Type Approvals (Marine & Wind).

					
JAUFLEX®	**IXILFLEX®**	**COMPOLINK®**	**JFTL TORQUE LIMITER**	**JCFS**	**JHC**
Elastic	Elastic Link	Composite Link	Torque Limiter	Composite Shafts	Hydraulic fit (shaft couplings)
•			•		•
•			•		•
•			•		
•	•	•		•	
•		•		•	
		•		•	
•		•		•	
•	•	•	•	•	•
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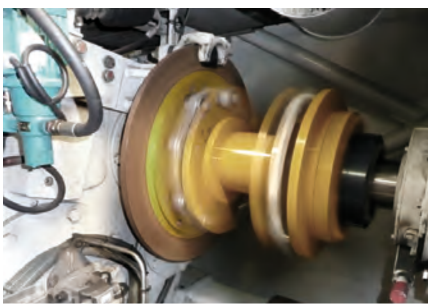
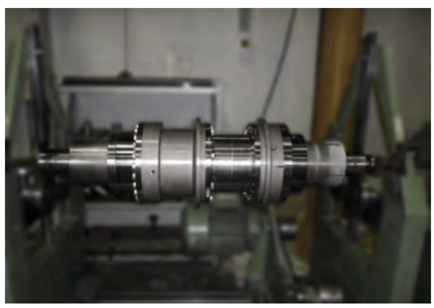
	•	•		•	•
	•	•	•		

Carbon Fibre Shaft combined with LAMIDISC® coupling.



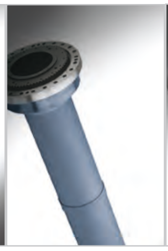
Torque monitoring on wind turbines.



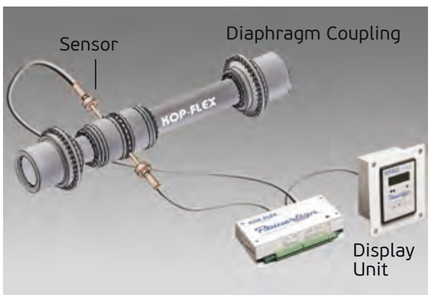
Double-gear couplings for railway.

Kop-Flex & Jaure manufacturing program

COUPLINGS

Product Brand Name	**MAX-C ®**	**HIGH PERFORMANCE PROGRAM**			**KOPFLEX GREASE**	**SERVICE**
Type & Description	Heavy duty elastic coupling	GEAR	DISC	DIAPHRAGM	Gear coupling / spindle grease	Repair & maintenance program
INDUSTRY APPLICATION						
Metals & Heavy duty	•				•	•
Minerals & Mills	•				•	•
Crane & Hoisting	•				•	•
Pulp & Paper					•	•
Petrochemical / Oil & Gas	•	•	•	•	•	•
Cooling Towers					•	•
Machine Tools					•	•
Marine	•	•	•	•	•	•
Wind Turbines	•				•	•
Test Benches	•	•	•	•	•	•
Railway	•	•			•	•



Powerlign® Torque Monitoring.


High Performance Solutions.

Global presence

MANUFACTURING FACILITIES & ENGINEERING CENTERS

JAURE® & KOP-FLEX® engineered couplings are designed, manufactured, sold and serviced woldwide, with service provided from specification right through to installation.

All JAURE® & KOP-FLEX® facilities around the globe are state of the art, with access to a large and experienced engineering staff focused on providing solutions for our customers´ requirements.

A dedicated global sales and service team assists you to find the best choice and manage all your coupling needs.

JAURE®. Zizurkil. Spain.

Pune, India.

Nove Mesto, Slovakia.

Zhangzhou, China.

KOP-FLEX®. Baltimore, USA.

Rexdale / Toronto, Canada.

Apocadaca, México.