SKF Couplings

Contents

SKF Couplings

Flexible couplings are devices used to mechanically connect two shafts to transmit power from one shaft to the other. They are also able to compensate for shaft misalignment in a torsionally rigid way. Misalignment can be angular, parallel or skew. This is particularly important for applications where misalignment could affect the velocity and acceleration of the driven shaft. The performance of the coupling depends largely upon how it is installed, aligned and maintained.

In response to industry's ultimate need to produce more with less, SKF has combined its knowledge and experience with the latest technology to develop solutions for a variety of applications and operating conditions. Whether the goal is to design equipment that provides more customer value, or to improve overall profitability, SKF's experience and expertise can help you meet your goals.

SKF offers a wide range of standard and customised coupling products. SKF Couplings cover a wide range of coupling types, sizes and capacity ratings for many applications and factory environments.

For large, heavy duty applications, SKF has large size couplings. These couplings, which provide optimum contact with the shaft, can accommodate high torque values, while reducing power loss and minimizing the effects of misalignment.

SKF Grid Couplings

In high output (kW) and high torque applications where vibration, shock loads and misalignment occur, SKF Grid Couplings are an excellent choice.

The unique design of the grid and hub teeth enable these couplings to accommodate movement and stresses from all three planes, which can reduce vibration levels by as much as 30%.

The tapered grid element is manufactured from a high strength alloy steel. The grid, which, is the primary wear component of the coupling is designed for quick and easy replacement. Unlike other couplings, the hubs and other components are not disturbed. This makes realignment unnecessary and further reduces downtime and maintenance costs.

Selection

Standard selection method

This selection procedure can be used for most motor, turbine, or engine driven applications. The following information is required to select an SKF grid coupling:

- Torque – power [kW]
- Speed [r/min]
- Type of equipment and application
- Shaft diameters
- Shaft gaps
- Physical space limitation
- Special bore or finish information

Exceptions to use of the standard selection method are for high peak loads and brake applications. For these, use the formula selection method or contact SKF.

1 Determine system torque
If torque is not given, use the following formula to calculate for torque (T)

$$\text{System torque} = \frac{\text{Power [kW]} \times 9\,549}{\text{Speed [r/min]}}$$

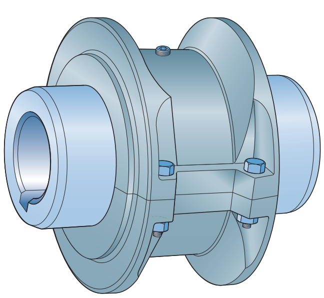
2 Service factor
Determine the service factor from **tables 7** and **8** on **pages 60** and **61**.

3 Coupling rating
Determine the required minimum coupling rating as shown below:

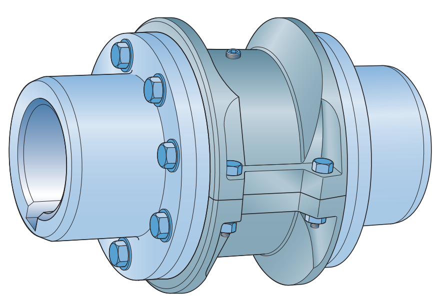
Coupling rating =
service factor × torque [Nm]

4 Size
Select the appropriate coupling from the torque column of the product tables on **pages 12** to **14** with a value that is equal to or greater than that determined in **step 3** above and check that the chosen coupling can accommodate both driving and driven shafts.

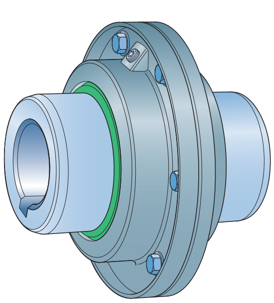
5 Other considerations
Possible other restrictions might be speed [r/min], bore, gap and dimensions.



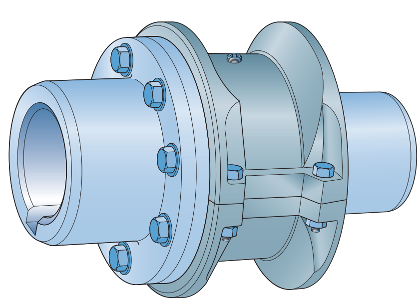
Horizontal split cover → ***page 12***



Full spacer → ***page 14***



Vertical split cover → ***page 13***



Half spacer → ***page 15***

Standard selection example

Select a coupling to connect a 30 kW, 1 440 r/min electric motor that is driving a boiler feed pump. The motor shaft diameter is 55 mm, pump shaft diameter is 45 mm. Shaft extensions are 140 mm and 110 mm. The coupling to be selected will replace a gear type coupling with a 3 mm gap.

1 Determine system torque

System torque [Nm] =

$$\frac{30 \text{ kW} \times 9\,549}{1\,440 \text{ r/min}} = 199 \text{ Nm}$$

2 Service factor

From **table 7** on **page 60** = 1,50

3 Required coupling rating

1,5 × 199 Nm = 298,5 Nm

4 Size

From product tables on **page 12**, the coupling size 1060 is the proper selection based on the torque rating of 684 Nm which exceeds the required minimum rating of 298,5 Nm as well as accommodating driving and driven shaft diameter requirements.

5 Other considerations

The speed capacity of 4 500 (coupling size 1060) exceeds the required speed of 1 440 r/min. The maximum bore capacity of 57 mm exceeds the required shaft diameters of 55 mm and 45 mm. The resulting service factor is 2,29. This will provide a very good service life for the coupling and a high level of reliability.

Formula method

The standard selection method can be used for most coupling selections. However, the formula method, should be used for:

- high peak loads
- brake applications (if a brake wheel is to be an integral part of the coupling)

By including the system's peak torque, frequency, duty cycle and brake torque ratings, a more accurate result will be obtained.

1 High peak loads

Use one of the following formulas (A, B, or C) for:

– Motors with higher than normal torque characteristics.
– Applications with intermittent operations resulting in shock loads.
– Inertia effects due to frequent stops and starts or repetitive high peak torques.

Peak torque is the maximum torque that can exist in the system. Select a coupling with a torque rating equal to or exceeding the selection torque values obtained from the formulas below.

A Non-reversing peak torque selection

Torque [Nm] = system peak torque

or

Selection torque [Nm] =

$$\frac{\text{System peak kW} \times 9\,549}{\text{r/min}}$$

B Reversing high peak torque

Selection torque [Nm] =

$$\frac{2 \times \text{system peak torque}}{\text{r/min}}$$

C Occasional peak torques (non-reversing)

If a system peak torque occurs less than 1 000 times during the expected coupling life, use the following formula:

Selection torque [Nm] =
0,5 × system peak torque

or

Selection torque [Nm] =

$$\frac{0{,}5 \times \text{system peak kW} \times 9\,549}{\text{r/min}}$$

2 Brake applications

If the torque rating of the brake exceeds the motor torque, use the brake rating as follows:

Selection Torque [Nm] =
Brake torque rating × service factor.

Formula selection example

High peak load

Select a coupling for reversing service to connect a gear drive low speed shaft to a metal forming mill drive. The electric motor rating is 30 kW and the system peak torque at the coupling is estimated to be 9 000 Nm. Coupling speed is 66 r/min at the gear drive output with a shaft gap (between ends) of 180 mm.

1 Type

Refer to product tables on **pages 12 to 14** and select the appropriate coupling type.

2 Required minimum coupling rating

Use the reversing high peak torque formula in step 1B.

2 × 9 000 Nm = 18 000 Nm =
Selection torque

3 Size

From product table on **page 12**, size 1130 with a torque rating of 19 900 which exceeds the selection torque of 18 000 Nm.

4 Other considerations

Grid coupling size 1130 has a maximum "DBSE" dimension (distance between shaft ends) of 205 mm; the shaft hub has a maximum bore of 190 mm.

Note

See product table on **page 12**. The T hub has a maximum bore of 170 mm and the allowable speed of 1 800 r/min.

Engineering data

For additional useful information on grid couplings, such as an interchange guide, misalignment capability, puller bolt hole, inertia and standard stock spacer lengths data, please refer to **tables 1** to **6**.

Table 1

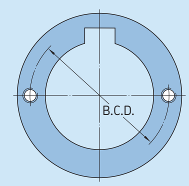
SKF grid coupling interchange guide

Horizontal split cover

SKF	Falk	Morse/ Browning	Dodge	Kop-Flex	Lovejoy	Bibby
PHE 1020TGHRSB	1020T10	GF2020H	1020T10	1020H	1020	2020H
PHE 1030TGHRSB	1030T10	GF2030H	1030T10	1030H	1030	2030H
PHE 1040TGHRSB	1040T10	GF2040H	1040T10	1040H	1040	2040H
PHE 1050TGHRSB	1050T10	GF2050H	1050T10	1050H	1050	2050H
PHE 1060TGHRSB	1060T10	GF2060H	1060T10	1060H	1060	2060H
PHE 1070TGHRSB	1070T10	GF2070H	1070T10	1070H	1070	2070H
PHE 1080TGHRSB	1080T10	GF2080H	1080T10	1080H	1080	2080H
PHE 1090TGHRSB	1090T10	GF2090H	1090T10	1090H	1090	2090H
PHE 1100TGHRSB	1100T10	GF2100H	1100T10	1100H	1100	2100H
PHE 1110TGHRSB	1110T10	GF2110H	1110T10	1110H	1110	2110H
PHE 1120TGHRSB	1120T10	GF2120H	1120T10	1120H	1120	2120H
PHE 1130TGHRSB	1130T10	GF2130H	1130T10	1130H	1130	2130H
PHE 1140TGHRSB	1140T10	GF2140H	1140T10	1140H	1140	2140H
PHE 1150TGHRSB	1150T10	–	–	–	1150	–
PHE 1160TGHRSB	1160T10	–	–	–	1160	–
PHE 1170TGHRSB	1170T10	–	–	–	1170	–
PHE 1180TGHRSB	1180T10	–	–	–	1180	–
PHE 1190TGHRSB	1190T10	–	–	–	1190	–
PHE 1200TGHRSB	1200T10	–	–	–	1200	–

Table 3

Puller bolt hole data



Size	B.C.D.	Bolt	Size	B.C.D.	Bolt
–	mm	–	–	mm	–
PHE 1070TGRSB	74	M8	**PHE 1140TGRSB**	205	M16
PHE 1080TGRSB	89,5	M8	**PHE 1150TGRSB**	227,5	M20
PHE 1090TGRSB	106	M10	**PHE 1160TGRSB**	260	M20
PHE 1100TGRSB	121,5	M10	**PHE 1170TGRSB**	306	M24
PHE 1110TGRSB	136,5	M10	**PHE 1180TGRSB**	341	M30
PHE 1120TGRSB	150,5	M12	**PHE 1190TGRSB**	393	M30
PHE 1130TGRSB	185	M16	**PHE 1200TGRSB**	414	M30

Table 2

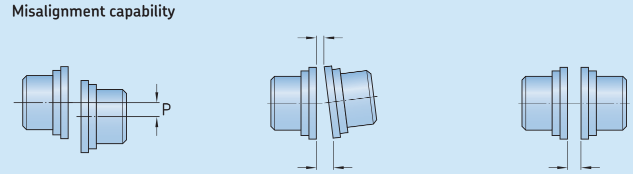
SKF grid coupling interchange guide

Vertical split cover

SKF	Falk	Morse/ Browning	Dodge	Kop-Flex	Lovejoy	Bibby
PHE 1020TGVRSB	1020T20	GF2020V	1020T20	1020V	1020	2020 V
PHE 1030TGVRSB	1030T20	GF2030V	1030T20	1030V	1030	2030 V
PHE 1040TGVRSB	1040T20	GF2040V	1040T20	1040V	1040	2040 V
PHE 1050TGVRSB	1050T20	GF2050V	1050T20	1050V	1050	2050 V
PHE 1060TGVRSB	1060T20	GF2060V	1060T20	1060V	1060	2060 V
PHE 1070TGVRSB	1070T20	GF2070V	1070T20	1070V	1070	2070 V
PHE 1080TGVRSB	1080T20	GF2080V	1080T20	1080V	1080	2080 V
PHE 1090TGVRSB	1090T20	GF2090V	1090T20	1090V	1090	2090 V
PHE 1100TGVRSB	1100T20	GF2100V	1100T20	1100V	1100	2100 V
PHE 1110TGVRSB	1110T20	GF2110V	1110T20	1110V	1110	2110 V
PHE 1120TGVRSB	1120T20	GF2120V	1120T20	1120V	1120	2120 V
PHE 1130TGVRSB	1130T20	GF2130V	1130T20	1130V	1130	2130 V
PHE 1140TGVRSB	1140T20	GF2140V	1140T20	1140V	1140	2140 V
PHE 1150TGVRSB	1150T20	–	–	–	1150	–
PHE 1160TGVRSB	1160T20	–	–	–	1160	–
PHE 1170TGVRSB	1170T20	–	–	–	1170	–
PHE 1180TGVRSB	1180T20	–	–	–	1180	–
PHE 1190TGVRSB	1190T20	–	–	–	1190	–
PHE 1200TGVRSB	1200T20	–	–	–	1200	–

Table 4

Misalignment capability



Size	Recommended installation		Operating		Normal gap	Tightening torque
	Parallel offset P	Angular 1/16°	Parallel offset P	Angular 1/4°	± 10%	
–	mm	–	–	mm	–	Nm
1020	0,15	0,06	0,30	0,24	3	11,30
1030	0,15	0,07	0,30	0,29	3	11,30
1040	0,15	0,08	0,30	0,32	3	11,30
1050	0,20	0,10	0,40	0,39	3	22,60
1060	0,20	0,11	0,40	0,45	3	22,60
1070	0,20	0,12	0,40	0,50	3	22,60
1080	0,20	0,15	0,40	0,61	3	22,60
1090	0,20	0,17	0,40	0,70	3	22,60
1100	0,25	0,20	0,50	0,82	4,50	35,00
1110	0,25	0,22	0,50	0,90	4,50	35,00
1120	0,28	0,25	0,56	1,01	6	73,00
1130	0,28	0,30	0,56	1,19	6	73,00
1140	0,28	0,33	0,56	1,34	6	73,00
1150	0,30	0,39	0,60	1,56	6	73,40
1160	0,30	0,44	0,60	1,77	6	73,40
1170	0,30	0,50	0,60	2,00	6	146,90
1180	0,38	0,56	0,76	2,26	6	146,90
1190	0,38	0,61	0,76	2,44	6	146,90
1200	0,38	0,68	0,76	2,72	6	259,90

Table 5

Full spacer coupling

TGFS Standard stock spacer lengths (DBSE = Distance between shaft ends)

DBSE		**Pump std**	**Coupling size**										
			1020	1030	1040	1050	1060	1070	1080	1080	1090	1100	1110
mm	in.	–	–										
89	**3.50**	ANSI	X	X	X	–	–	–	–	–	–	–	–
100	**3.94**	ISO	X	X	X	–	–	–	–	–	–	–	–
108	**4.25**	MISC	X	X	X								
111	**4.38**	ANSI	X	X	X	X	–	–	–	–	–	–	–
119	**4.69**	MISC	X	X	X	X	–	–	–	–	–	–	–
127	**5.00**	ANSI	X	X	X	X	X	X	–	–	–	–	–
133	**5.22**	MISC	–	–	X	–	–	–	–	–	–	–	–
137	**5.38**	MISC	–	X	X	–	–	–	–	–	–	–	–
140	**5.51**	ISO	X	X	X	X	X	X	–	–	–	–	–
144	**5.66**	MISC	–	X	X	–	–	–	–	–	–	–	–
148	**5.81**	MISC	–	X	X	X	–	–	–	–	–	–	–
152	**5.97**	MISC	–	–	X	X	–	–	–	–	–	–	–
155	**6.12**	MISC	–	X	X	X	X	X	–	–	–	–	–
176	**6.94**	MISC	X	X	X	X	X	–	–	–	–	–	–
178	**7.00**	ANSI	–	–	–	–	–	X	X	–	–	–	–
180	**7.09**	ISO	–	–	X	X	–	X	X	X	–	–	–
184	**7.25**	ANSI	–	X	X	X	X	X	X	X	–	–	–
203	**8.00**	MISC	–	–	–	–	–	–	–	–	X	–	–
218	**8.59**	MISC	–	–	–	–	–	–	X	–	–	–	–
219	**8.62**	MISC	–	–	–	–	X	X	–	–	–	–	–
226	**8.88**	MISC	–	–	–	–	–	–	–	–	X	–	–
248	**9.75**	ANSI	–	–	–	–	X	X	X	X	X	X	–
250	**9.84**	ISO	–	–	–	–	–	–	–	–	X	X	–
252	**9.94**	MISC	–	–	–	–	–	–	X	–	–	–	–
282	**11.09**	MISC	–	–	–	–	–	–	X	–	–	–	–
311	**12.25**	ANSI	–	–	–	–	X	X	X	X	–	–	–
357	**14.05**	MISC	–	–	–	–	–	–	–	–	–	X	–

Table 6

Moment of inertia

Size	Horizontal	Vertical
–	kg/m²	kg/m²
1020	0,0014	0,0016
1030	0,0022	0,0024
1040	0,0033	0,0035
1050	0,0072	0,0074
1060	0,012	0,011
1070	0,019	0,017
1080	0,045	0,042
1090	0,079	0,079
1100	0,179	0,179
1110	0,270	0,270
1120	0,512	0,486
1130	0,99	1,065
1140	1,85	1,89
1150	3,49	3,29
1160	5,82	6,01
1170	10,41	10,42
1180	18,30	–
1190	26,17	–
1200	43,55	–

The values are based on hubs with no bore.

Table 7

Order data

Coupling type –	**Hubs** Solid bore	**Qty**	Bored to size*	**Cover** **Qty**	–	**Grid** **Qty**	–	**Spacer hub set** **Qty**	(… = DBSE dimension)	**Qty**
Horizontal split cover	PHE 1050TGRSB	2 or	PHE 1050TG … MM	2	PHE 1050TGHCOVER	1	PHE 1050TGGRID	1	–	–
Vertical split cover	PHE 1050TGRSB	2 or	PHE 1050TG … MM	2	PHE 1050TGVCOVER	1	PHE 1050TGGRID	1	–	–
Full spacer	PHE 1050TG-SHRSB	2 or	PHE 1050TG-SH … MM	2	PHE 1050TGHCOVER	1	PHE 1050TGGRID	1	PHE 1050TGFS-SPACERX … MM	1
Half spacer	PHE 1050TG-SHRSB	1 or	PHE 1050TG-SH … MM	1	PHE 1050TGHCOVER	1	PHE 1050TGGRID	1	PHE 1050TGHS-SPACERX … MM	1

***** For bored to size designations, add bore size. For example, PHE 1050TG25MM

Order data

Full spacer and half spacer coupling types

Full spacer

Each complete coupling consists of: 2 hubs, 1 grid, 1 cover and 1 spacer hub set. The cover assembly kit is supplied with the cover. The spacer hub assembly kit is supplied with the spacer hub set.

Example: the following components should be ordered for a complete 1050 full spacer grid coupling with solid bore and a DBSE dimension of 155 mm (DBSE = distance between the shaft ends).

2 ea. PHE 1050TGS-SHRSB
1 ea. PHE 1050TGGRID
1 ea. PHE 1050TGHCOVER
1 ea. PHE 1050TGFS-SPACERX155MM

The following components should be ordered for a complete 1050 full spacer grid coupling, bored to size.

1 ea. PHE 1050TGS-SHX30MM
1 ea. PHE 1050TG-SHX40MM
1 ea. PHE 1050TGGRID
1 ea. PHE 1050TGHCOVER
1 ea. PHE 1050TGFS-SPACERX155MM

Half spacer

The following components should be ordered for a complete 1050TG half spacer grid coupling with solid bore and a DBSE dimension of 89 mm.

1 ea. PHE 1050TGS-SHRSB
1 ea. PHE 1050TGRSB
1 ea. PHE 1050TGGRID
1 ea. PHE 1050TGHCOVER
1 ea. PHE 1050TGHS-SPACERX89MM

Horizontal and vertical cover types

Each complete coupling consists of: 2 hubs, 1 grid and 1 cover. The assembly kit is supplied with the cover and includes oil seals, gasket, bolts and lock-nuts. To order the assembly kit separately, please use the basic number and add TGHKIT for the horizontal cover or TGVKIT for the vertical cover (e.g.: PHE 1050TGHKIT)

Example: the following components should be ordered for a complete 1050 horizontal grid coupling with a solid bore.

2 ea. PHE 1050TGRSB
1 ea. PHE 1050TGGRID
1 ea. PHE 1050TGHCOVER
(PHE 1050TGVCOVER for vertical cover)

The following components should be ordered for a complete 1050 horizontal grid coupling, bored to size.

1 ea. PHE 1050TGX30MM
1 ea. PHE 1050TGX40MM
1 ea. PHE 1050TGGRID
1 ea. PHE 1050TGHCOVER

Note: For coupling sizes 1020 to 1090, SKF will supply the requested bore size with a clearance fit and standard keyways unless otherwise specified. For sizes 1100 and above, interference fit with standard keyways will be supplied unless otherwise specified.

Installation

The performance of the coupling depends largely upon how it is installed, aligned and maintained.

SKF Grid Couplings are designed to operate in either a horizontal or a vertical position without modification.

1 Mount the seals and the hubs
Clean all metal parts using non-flammable solvent and check hubs, shafts and keyways for burrs and remove if necessary. Lightly coat the seals with grease and place well back on the shafts before mounting the hubs. Mount the hubs on their respective shafts so that each hub face is flush with the end of the shafts (**1**).

2 Gap and angular alignment
Using a feeler gauge equal in thickness to the gap specified in **table 4** on **page 6**. Insert the gauge as shown in image **2** to the same depth at 90° intervals and measure the clearance between the gauge and hub face. The difference in the minimum and the maximum measurements must not exceed the angular limits specified in **table 4** on **page 6**.

3 Offset alignment
Align the two hubs so that a straight edge rests squarely on both hubs and also at 90° intervals (**3**). The clearance must not exceed the parallel offset installation limits specified in **table 4** on **page 6**. Tighten all foundation bolts and repeat **steps 2** and **3**. Realign the application if necessary.

4 Mount the grid
Pack the gap and all of the grooves in the two hubs with a specified lubricant (→ **page 62**) before mounting the grid. Fit the grid over the hubs by starting at one cut end, work the coils of the grid tooth by tooth in one direction and seat firmly as you go with a soft mallet (**4**).

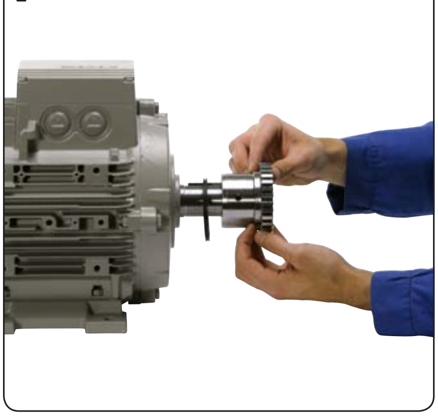
5 Pack with grease and assemble the covers
Pack the spaces between and around the grid with as much lubricant as possible and wipe off the excess so that it is flush with the top of the grid (**5**). Position the seals on hubs so they line up with the grooves in the cover. Position gaskets on the flanges of the lower cover half and assemble the covers so that the match marks are on the same side. Push gaskets in until they stop against the seals and secure cover halves with the fasteners provided and tighten them accordingly. Make sure that the gaskets stay in position during this tightening procedure (**7**). Once the coupling is completely assembled, remove both of the lubrication plugs in the cover and insert a lubrication fitting. Then, pump in the appropriate lubricant until it is forced out of the opposite lubrication hole (**8**). Replace the two lubrication plugs and the installation is complete.

Grid removal

Whenever it is necessary to replace the grid, first remove the cover halves and set aside. Beginning at the cut end of the grid, carefully insert a screwdriver into the loop (**9**). Using the hub teeth for leverage, gradually pry the grid up, alternating sides while working around the coupling.

SKF does not recommend re-using the removed grid.

1



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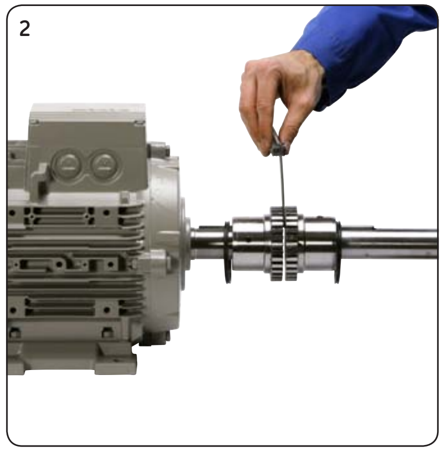

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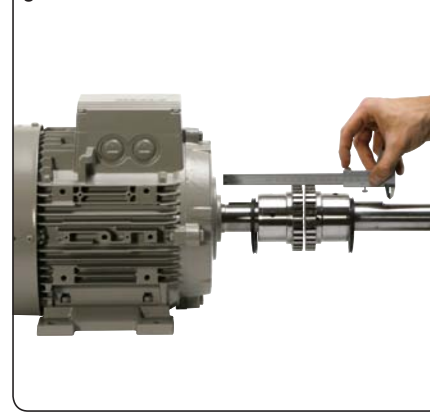

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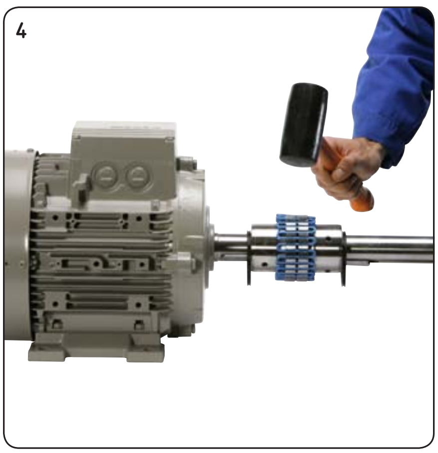

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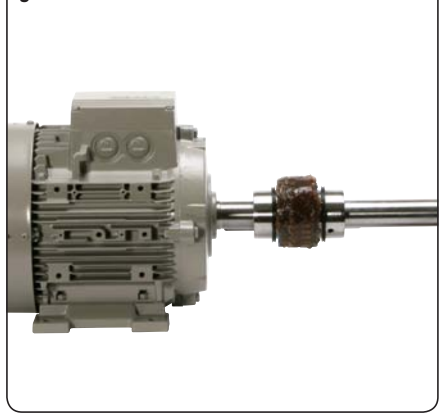

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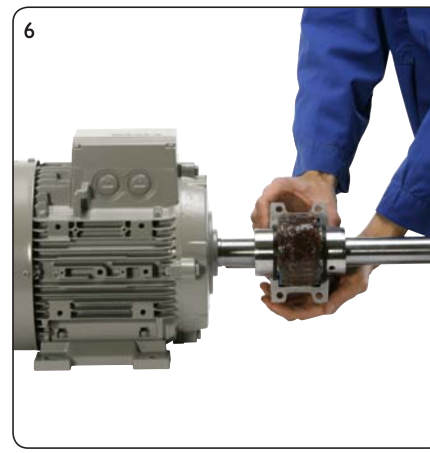

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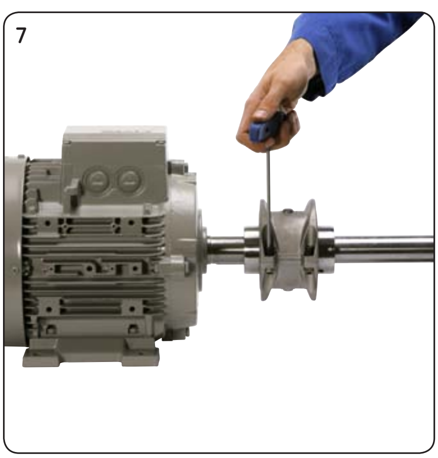

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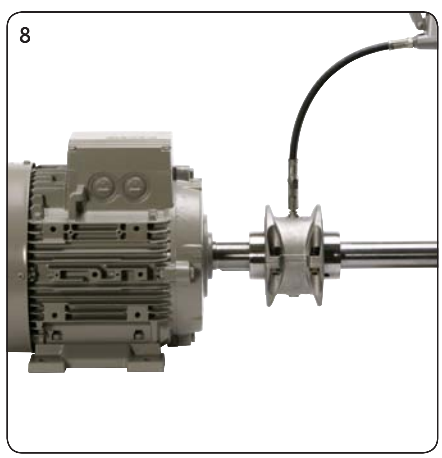

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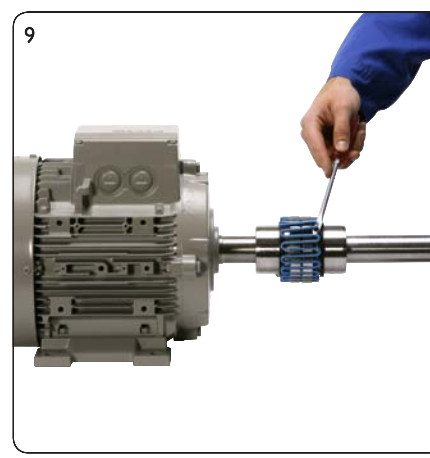
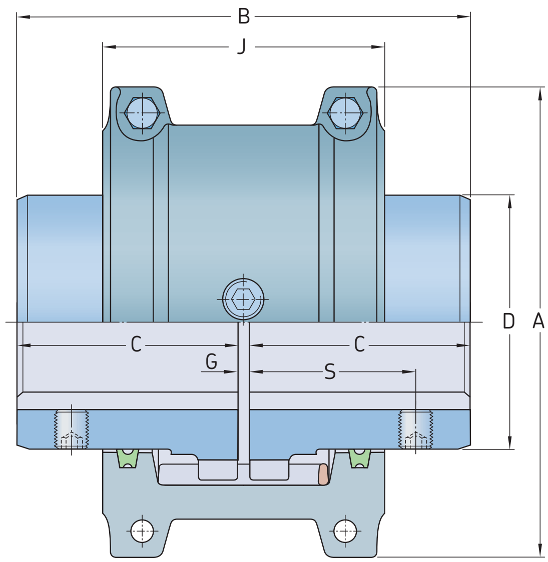
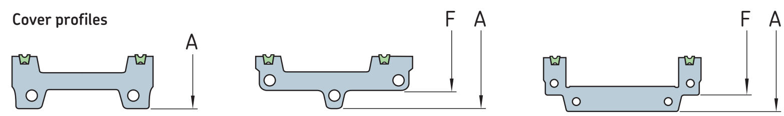


Horizontal split cover



Cover profiles

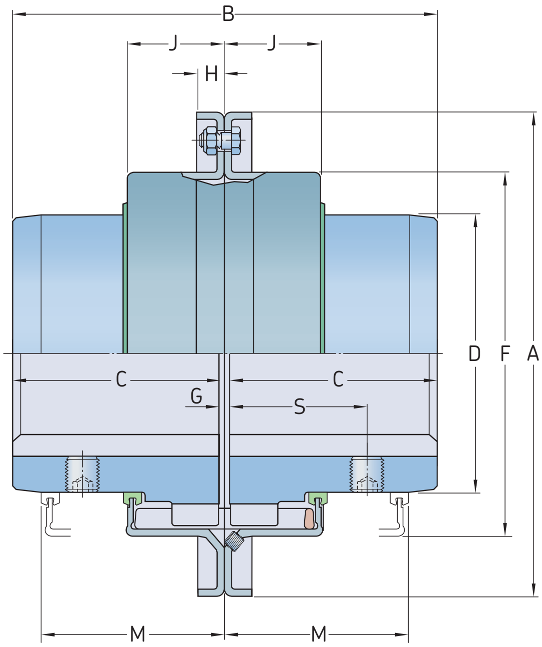


Sizes 1020–1140 Sizes 1150–1200 Sizes 1210–1220

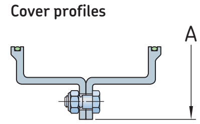
Size	Power per 100 r/min	Rated torque	Max speed	Bore diameter		Dimensions							G gap			Lubricant weight	Coupling weight without bore
				min.	max.	A	B	C	D	J	F	S	min.	Normal	max.		
–	kW	Nm	r/min	mm		mm							mm			kg	kg
1020 TGH	0,54	52	4 500	12	30	101,6	98,2	47,5	39,7	66	–	39,1	1,5	3	4,5	0,027	1,9
1030 TGH	1,6	149	4 500	12	36	110	98,2	47,5	49,2	68,3	–	39,1	1,5	3	4,5	0,040	2,6
1040 TGH	2,6	249	4 500	12	44	117,5	104,6	50,8	57,2	70	–	40,1	1,5	3	4,5	0,054	3,4
1050 TGH	4,6	435	4 500	12	50	138	123,6	60,3	66,7	79,5	–	44,7	1,5	3	4,5	0,068	5,4
1060 TGH	7,2	684	4 500	19	57	150,5	130,0	63,5	76,2	92	–	52,3	1,5	3	4,5	0,086	7,3
1070 TGH	10,4	994	4 125	19	65	161,9	155,4	76,2	87,3	95	–	53,8	1,5	3	4,5	0,113	10
1080 TGH	21,5	2 050	3 600	27	79	194	180,8	88,9	104,8	116	–	64,5	1,5	3	6	0,172	18
1090 TGH	39,0	3 730	3 600	27	95	213	199,8	98,4	123,8	122	–	71,6	1,5	3	6	0,254	25
1100 TGH	65,7	6 280	2 440	41	107	250	246,2	120,6	142,1	155,5	–	–	1,5	5	9,5	0,426	42
1110 TGH	97,6	9 320	2 250	41	117	270	259,0	127,0	160,3	161,5	–	–	1,5	5	9,5	0,508	54
1120 TGH	143,0	13 700	2 025	60	136	308	304,4	149,2	179,4	191,5	–	–	1,5	6	12,5	0,735	81
1130 TGH	208,0	19 900	1 800	66	165	346	329,8	161,9	217,5	195	–	–	1,5	6	12,5	0,907	121
1140 TGH	299,0	28 600	1 650	66	184	384	374,4	184,2	254,0	201	–	–	1,5	6	12,5	1,13	178
1150 TGH	416,0	39 800	1 500	108	203	453,1	371,8	182,9	269,2	271,3	391,2	–	1,5	6	12,5	1,95	234
1160 TGH	586,0	55 900	1 350	120	228	501,4	402,2	198,1	304,8	278,9	436,9	–	1,5	6	12,5	2,81	317
1170 TGH	781,0	74 600	1 225	133	279	566,4	437,8	215,9	355,6	304,3	487,2	–	1,5	6	12,5	3,49	448
1180 TGH	1 080,0	103 000	1 100	152	311	629,9	483,6	238,8	393,7	321,1	554,7	–	1,5	6	12,5	3,76	619
1190 TGH	1 430,0	137 000	1 050	152	339	675,6	524,2	259,1	436,9	325,1	607,8	–	1,5	6	12,5	4,40	776
1200 TGH	1 950,0	186 000	900	177	361	756,9	564,8	279,4	497,8	355,6	660,4	–	1,5	6	12,5	5,62	1 057
1210 TGH	2 611,0	249 000	820	177	390	844,5	622,3	304,8	533,4	431,8	750,8	–	1,5	6	12,7	10,5	1 425
1220 TGH	3 523,0	336 000	730	203	420	920,7	662,9	325,1	571,5	490,2	822,2	–	1,5	6	12,7	16,1	1 785

Horizontal split cover couplings are high performance, general purpose and easy to maintain. The grid is designed to be replaced without disturbing any other component in the drive.

Vertical split cover



Cover profiles

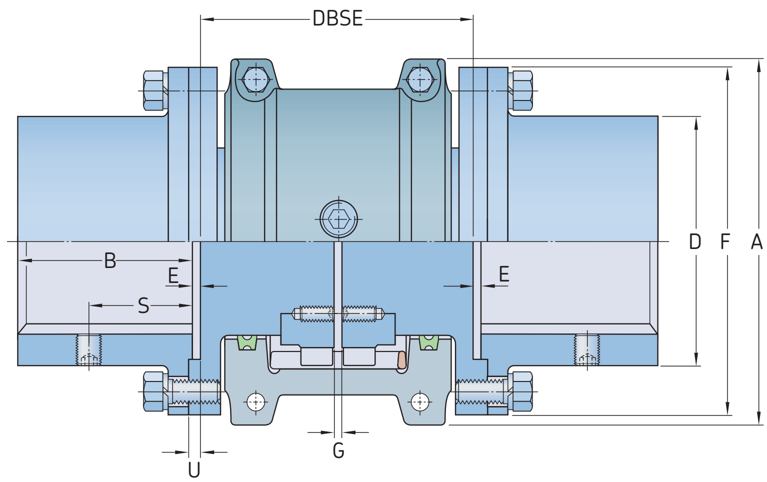


Sizes 1020 - 1140

Size	Power per 100 r/min	Rated torque	Max speed	Bore diameter		Dimensions									G gap			Lubricant weight	Coupling weight without bore
				min.	max.	A	B	C	D	F	H	J	M	S	min.	Normal	Max.		
–	kW	Nm	r/min	mm		mm									mm			kg	kg
1020 TGV	0,54	52	6 000	12	30	111,1	98,0	47,5	39,7	64,3	9,7	24,2	47,8	39,1	1,5	3	4,5	0,027	2,0
1030 TGV	1,6	149	6 000	12	36	120,7	98,0	47,5	49,2	73,8	9,7	25,0	47,8	39,1	1,5	3	4,5	0,040	2,6
1040 TGV	2,6	249	6 000	12	44	128,5	104,6	50,8	57,2	81,8	9,7	25,7	50,8	40,1	1,5	3	4,5	0,054	3,4
1050 TGV	4,6	435	6 000	12	50	147,6	123,6	60,3	66,7	97,6	11,9	31,2	60,5	44,7	1,5	3	4,5	0,068	5,4
1060 TGV	7,2	684	6 000	19	57	162,0	130,0	63,5	76,2	111,1	12,7	32,2	63,5	52,3	1,5	3	4,5	0,086	7,3
1070 TGV	10,4	994	5 500	19	65	173,0	155,4	76,2	87,3	122,3	12,7	33,7	66,5	53,8	1,5	3	4,5	0,113	10
1080 TGV	21,5	2 050	4 750	27	79	200,0	180,8	88,9	104,8	149,2	12,7	44,2	88,9	64,5	1,5	3	6	0,172	18
1090 TGV	39,0	3 730	4 000	27	95	231,8	199,8	98,4	123,8	168,3	12,7	47,7	95,2	71,6	1,5	3	6	0,254	25
1100 TGV	65,7	6 280	3 250	41	107	266,7	245,7	120,6	142,1	198,0	15,7	60,0	120,7	–	1,5	5	9,5	0,426	42
1110 TGV	97,6	9 320	3 000	41	117	285,8	258,5	127,0	160,3	216,3	16,0	64,2	124,0	–	1,5	5	9,5	0,508	54
1120 TGV	143,0	13 700	2 700	60	136	319,0	304,4	149,2	179,4	245,5	17,5	73,4	142,7	–	1,5	6	12,5	0,735	81
1130 TGV	208,0	19 900	2 400	66	165	377,8	329,8	161,9	217,5	283,8	20,6	75,1	146,0	–	1,5	6	12,5	0,907	122
1140 TGV	299,0	28 600	2 200	66	184	416,0	371,6	184,2	254,0	321,9	20,6	78,2	155,4	–	1,5	6	12,5	1,13	180
1150 TGV	416,0	39 800	2 000	108	203	476,3	371,8	182,9	269,2	374,4	19,3	106,9	203,2	–	1,5	6	12,5	1,95	230
1160 TGV	586,0	55 900	1 750	120	228	533,4	402,2	198,1	304,8	423,9	30,0	114,3	215,9	–	1,5	6	12,5	2,81	321
1170 TGV	781,0	74 600	1 600	133	279	584,2	437,8	215,9	355,6	474,7	30,0	119,4	226,1	–	1,5	6	12,5	3,49	448
1180 TGV	1 080,0	103 000	1 400	152	311	630,0	483,6	238,8	393,7	–	–	130,0	265,0	–	1,5	6	12,5	3,76	591
1190 TGV	1 430,0	137 000	1 300	152	339	685,0	524,2	259,1	436,9	–	–	135,0	275,0	–	1,5	6	12,5	4,40	761
1200 TGV	1 950,0	186 000	1 100	177	361	737,0	564,8	279,4	497,8	–	–	145,0	295,0	–	1,5	6	12,5	5,62	1 021

Vertical split cover couplings are high performance, general purpose and easy to maintain.
The grid is designed to be replaced without disturbing any other component in the drive. The vertical cover allows for higher running speeds.

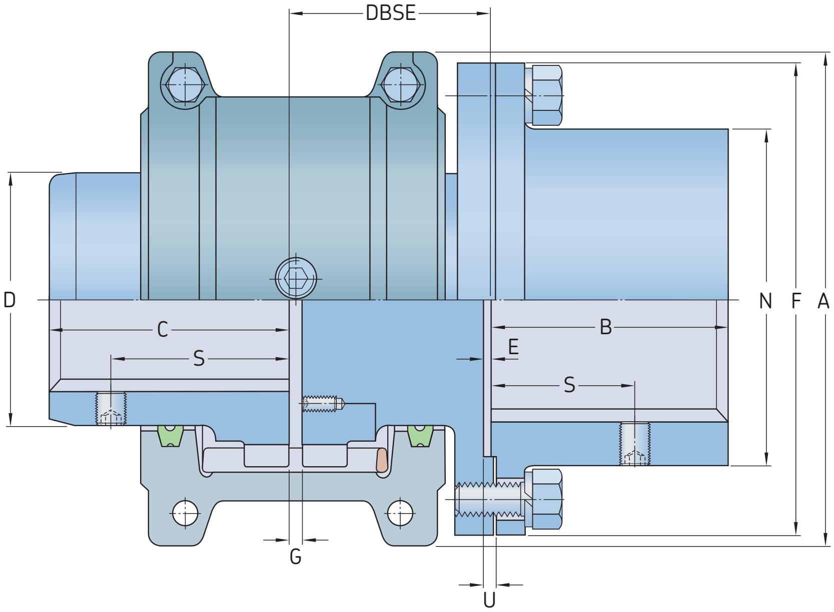
Full spacer



Size	Power per 100 r/min	Rated torque	Max speed	Bore diameter		Dimensions									G gap		Flange bolts	Lubricant weight	Coupling weight without bore and min. DBSE
				min.	max.	A	B	DBSE min.	DBSE max.	D	E	F	S	U	min.	Normal	Quantity		
–	kW	Nm	r/min	mm		mm									mm			kg	kg
1020 TGFS	0,54	52	3 600	12	35	101,6	35	89	203	52	0,8	86	27,4	1,8	1,5	5	4	0,027	3,9
1030 TGFS	1,6	149	3 600	12	43	110	41	89	216	59	0,8	94	31,5	1,8	1,5	5	8	0,040	5,2
1040 TGFS	2,6	249	3 600	12	56	117,5	54	89	216	78	0,8	113	27,4	1,8	1,5	5	8	0,054	8,4
1050 TGFS	4,6	435	3 600	12	67	138	60	112	216	87	0,8	126	40,6	1,8	1,5	5	8	0,068	12,8
1060 TGFS	7,2	684	3 600	19	80	150,5	73	127	330	103	1,8	145	43,2	2,8	1,5	5	8	0,086	20,5
1070 TGFS	10,4	994	3 600	19	85	161,9	79	127	330	109	1,8	153	46,7	2,8	1,5	5	12	0,113	24,8
1080 TGFS	21,5	2 050	3 600	27	95	194	89	184	406	122	1,8	178	49,8	2,8	1,5	5	12	0,172	40
1090 TGFS	39,0	3 730	3 600	27	110	213	102	184	406	142	1,8	210	56,9	2,8	1,5	5	12	0,254	60
1100 TGFS	65,7	6 280	2 440	41	130	250	90	203	406	171	1,6	251	–	3,2	1,5	6,5	12	0,426	90,2
1110 TGFS	97,6	9 320	2 250	41	150	270	104	210	406	196	1,6	277	–	3,2	1,5	6,5	12	0,508	119
1120 TGFS	143,0	13 700	2 025	60	170	308	119	246	406	225	1,6	319	–	4	1,5	9,5	12	0,735	178
1130 TGFS	208,0	19 900	1 800	66	190	346	135	257	406	238	1,6	346	–	4	1,5	9,5	12	0,907	237
1140 TGFS	299,0	28 600	1 650	66	210	384	152	267	406	266	1,6	386	–	4	1,5	9,5	12	1,13	327
1150 TGFS	416,0	39 800	1 500	108	270	453,1	173	345	371	334	5,1	425	–	–	1,5	9,5	14	1,95	462
1160 TGFS	586,0	55 900	1 350	120	290	501,4	186	356	406	366	6,6	457	–	–	1,5	9,5	14	2,81	566
1170 TGFS	781,0	74 600	1 225	133	340	566,4	220	384	445	425	8,4	527	–	–	1,5	9,5	16	3,49	856
1180 TGFS	1 080,0	103 000	1 100	133	340	629,9	249	400	490	451	5,1	591	–	8,1	1,5	9,5	16	3,76	1 135
1190 TGFS	1 430,0	137 000	1 050	152	380	675,6	276	411	530	508	5,1	660	–	8,1	1,5	9,5	18	4,40	1 525
1200 TGFS	1 950,0	186 000	900	177	400	756,9	305	445	575	530	6,1	711	–	9,1	1,5	9,5	18	5,62	1 910

SKF horizontal split cover full spacer couplings are designed to accommodate long distances between the shafts that are to be connected.
This coupling gives you the added advantage of being able to drop out the entire centre section of the coupling for easy service. This coupling is an ideal choice for pumps.

Half spacer



Size	Power per 100 r/min	Rated torque	Max speed	Bore diameter min.	Bore diameter max.	Max shaft hub	Dimensions A	B	C	D	DBSE min.	DBSE max.	N	E	F	S shaft hub	S T hub	U	G gap min.	G gap normal	Flange bolts Quantity	Lubricant weight	Coupling weight without bore
–	kW	Nm	r/min	mm			mm												mm			kg	kg
1020 TGHS	0,54	52	3 600	12	30	35	101,6	35	47,5	39,7	45	102	52	0,8	86	27,4	39,1	1,8	1,5	3	4	0,027	2,9
1030 TGHS	1,6	149	3 600	12	36	43	110	41	47,5	49,2	45	109	59	0,8	94	31,5	39,1	1,8	1,5	3	8	0,040	3,9
1040 TGHS	2,6	249	3 600	12	44	56	117,5	54	50,8	57,2	45	109	78	0,8	113	27,4	40,1	1,8	1,5	3	8	0,054	5,9
1050 TGHS	4,6	435	3 600	12	50	67	138	60	60,3	66,7	57	109	87	0,8	126	40,6	44,7	1,8	1,5	3	8	0,068	9,1
1060 TGHS	7,2	684	3 600	19	57	80	150,5	73	63,5	76,2	64	166	103	1,8	145	43,2	52,3	2,8	1,5	3	8	0,086	14
1070 TGHS	10,4	994	3 600	19	65	85	161,9	79	76,2	87,3	64	166	109	1,8	153	46,7	53,8	2,8	1,5	3	12	0,113	17,6
1080 TGHS	21,5	2 050	3 600	27	79	95	194	89	88,9	104,8	93	204	122	1,8	178	49,8	64,5	2,8	1,5	3	12	0,172	29
1090 TGHS	39,0	3 730	3 600	27	95	110	213	102	98,4	123,8	93	204	142	1,8	210	56,9	71,6	2,8	1,5	3	12	0,254	42,8
1100 TGHS	65,7	6 280	2 440	41	107	130	250	90	120,6	142,1	103	205	171	1,6	251	–	–	3,2	1,5	5	12	0,426	66
1110 TGHS	97,6	9 320	2 250	41	117	150	270	104	127,0	160,3	106	205	196	1,6	277	–	–	3,2	1,5	5	12	0,508	84,5
1120 TGHS	143,0	13 700	2 025	60	136	170	308	119	149,2	179,4	125	205	225	1,6	319	–	–	4	1,5	6	12	0,735	129
1130 TGHS	208,0	19 900	1 800	66	165	190	346	135	161,9	217,5	130	205	238	1,6	346	–	–	4	1,5	6	12	0,907	179
1140 TGHS	299,0	28 600	1 650	66	184	210	384	152	184,2	254,0	135	205	266	1,6	386	–	–	4	1,5	6	12	1,13	252
1150 TGHS	416,0	39 800	1 500	108	203	270	453,1	173	182,9	269,2	175	187	334	5,1	425	–	–	–	1,5	6	14	1,95	348
1160 TGHS	586,0	55 900	1 350	120	228	290	501,4	186	198,1	304,8	180	205	366	6,6	457	–	–	–	1,5	6	14	2,81	441
1170 TGHS	781,0	74 600	1 225	133	279	340	566,4	220	215,9	355,6	194	224	425	8,4	527	–	–	–	1,5	6	16	3,49	652
1180 TGHS	1 080,0	103 000	1 100	133	311	340	629,9	249	238,8	393,7	202	247	451	5,1	591	–	–	8,1	1,5	6	16	3,76	877
1190 TGHS	1 430,0	137 000	1 050	152	339	380	675,6	276	259,1	436,9	207	267	508	5,1	660	–	–	8,1	1,5	6	18	4,40	1 150
1200 TGHS	1950,0	186 000	900	177	361	400	756,9	305	279,4	497,8	224	289	530	6,1	711	–	–	9,1	1,5	6	18	5,62	1484

SKF horizontal split cover half spacer couplings are designed to be used where there is no need to accommodate long distances between the shafts. It provides an economical alternative to the full spacer and is an ideal choice for pumps.

Grid couplings with taper bush hub option

In addition to the standard plain bore hub that is offered with the GEAR and GRID couplings, there is the option to offer a TAPER BUSH as a MTO (machined) product.

In such circumstances there must be a RE-RATING of the coupling capacity, along with the reduction in the LTB hub width.

The taper bush is normally mounted from the inner face of the coupling (Type F or FLANGED side configuration), but may, in certain sizes, be able to mounted in the external ("H"or HUB) configuration. (However as the hub diameter at the non-grid end is significantly reduced, a check on the location of the setscrews should be made, to avoid any stress fracture).

The following table may be used as a general guide as to what bush fits the grid coupling hub, and by how much the LTB hub is reduced from the standard length (C).

Fig. 1

GRID Hub with Taper bush Type F – internal mount configuration shown.

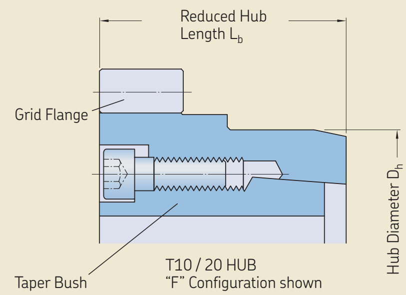


Table 1

SKF Grid Coupling Ref (PHE****)	Taper Bush Details[1)] SKF Taper Bush Size (PHF****)	Bush Torque Capacity (Nm)[2)]	Bore Range (mm)[3)]	Reduced Hub Length (L_b)	Hub Length Reduction from standard	Hub Dia. Ø D_h (mm)
PHE 1020TGHTB	Not available with taper bush optionoption					
PHE 1030TGHTB	PHF TB1108	147	13 – 25	45	2.5	49.2
PHE 1040TGHTB	PHF TB 1108	147	13 – 25	45	5.8	57.2
PHE 1050TGHTB	PHF TB 1215	405	13 – 32	50	10.3	66.7
PHE 1060TGHTB	PHF TB 1615	485	13 – 42	55	8.5	76.2
PHE 1070TGHTB	PHF TB 2012	810	13 – 50	55	21.2	87.3
PHE 1080TGHTB	PHF TB 2525	1275	25 – 65	70	18.9	104.8
PHE 1090TGHTB	PHF TB 3030	2710	24 – 80	83	15.4	123.8
PHE 1100TGHTB	PHF TB 3030	2710	24 – 80	90	30.6	142.1
PHE 1110TGHTB	PHF TB 3535	5060	32 – 91	95	32	160.3
PHE 1120TGHTB	PHF TB 4040	8727	37 – 103	115	34.2	179.4

[1)] Bore capacities are based on standard ISO keyway dimensions to ISO773 (DIN6885/1) unless otherwise stated. For full Coupling dimensions and technical details, refer to page 12.
[2)] The limitations in the couplings' torque capacity with when fitted with a taper bush, is based on the maximum recommended torque for the relevant taper bush, with a standard keyway. For this reason it becomes impractical, and uneconomical, to offer the larger sizes with a taper-bush option.
[3)] Couplings with either or the SKF "FX" type (friction locking), or with QD bushing options are also available on some sizes, on a MTO basis. Please refer to SKFPT.

Gear and grid metallic couplings with braking capability

With regards to the SKF range of couplings, both the **gear** and the **grid** may be adapted for use in braking systems... typically **disc** or to a lesser extent nowadays **drum** or **shoe** type brakes.

The selection of the coupling however needs to be modified to allow for the peak loads encountered during braking (retardation). More often than not, it will be the retarding torque imposed by the brake actuation that will determine the required coupling (subject of course to the maximum shaft capacity).

For brake type **grid** couplings, the brake disc (or drum / shoe) would typically be mounted to the DriveN (braked) machine. As the **gear** coupling is symmetrical, either hub can be the DriveR or DriveN.

To determine the capacity required for a **dynamic** brake application

(1a) M_{TB} =

$$= \frac{kW \times 60 \times 10^3}{2 \times \pi \; r/min} = \times 2{,}0 \; [Nm]$$

which may be simplified to:

(1b) M_{TB} =

$$= \frac{kW \times 9550}{r/min} = \times 2{,}0 \; [Nm]$$

Additionally, where the inertias involved (I) are known or can be determined (referenced to the brake position), and the braking deceleration time, in rads/sec (α) are known, the torque maybe be also determined from

(1c) $M_{TB} = I \times \alpha \times 2{,}0 \; [Nm]$

The Coupling capacity [MTNOM.] from the catalogue must be greater than the figures obtained in 1(a), 1(b) or 1(c) above.

(2) $M_{TNOM.} = M_{TB} \; [Nm]$

Note: Where the brake is only being used as a HOLDING brake, i.e. the system is bought to a stop by other means, prior to application of the brake... standard coupling selection procedures may be used.

(a) **grid coupling** with Brake Disc (schematic only)

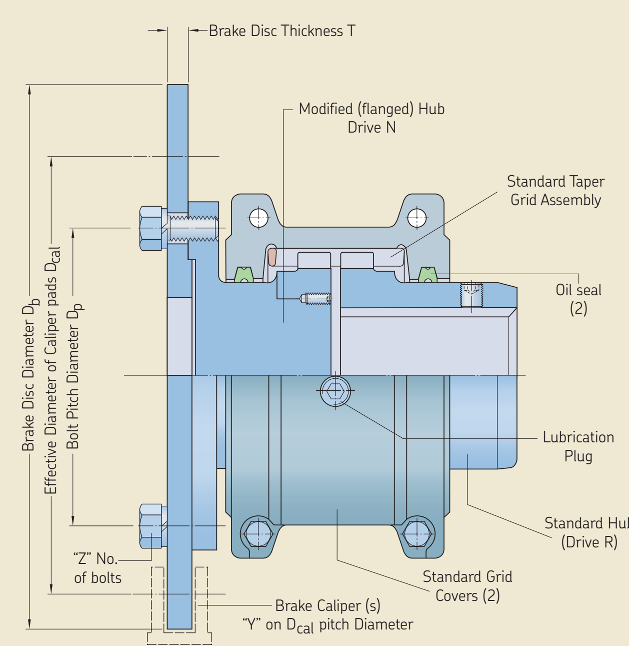
The GRID coupling, typically, will consist of the following SKF components:

A major advantage of using the **grid** type coupling (TGH) is that the covers are horizontally split, thus allowing ease of access to the grid, for replacement. No additional axial spacing is required... something that can be critical, as brake calipers and actuator mechanisms can take up space

Table 1

Part	Description	SKF Part No (typical)
1 ×	Standard hub	PHE XXXXTGH...MM
1 ×	Modified hub, with flange	PHE XXXXTGHFLG...MM
1 ×	Standard (horizontal) cover set	PHE XXXXTGHCOVER
1 ×	Grid set	PHE XXXXTGGRID
1 ×	Disc (Db dia. x T thick)... (...or customer supply)	PHE XXXXTGDISC...MM
1 ×	Bolt set (for brake disc)... 'Z' No. of bolts	PHE XXXXTGDBOLT

Fig. 1



(b) **gear coupling** (Double engagement) with Brake Disc (schematic only)

Note: The brake disc spigot arrangement may vary to that illustrated depending on size

The **gear** coupling (Double Engagement [1]), shown in **table 3**

The symmetrical arrangement of the **gear** coupling allows the hubs to on either the DriveR or DriveN (braked) shafts. Subject to the braking torque, the only deviation from standard **gear** coupling components, is the extended length of the fitted bolts. Some axial allowance is required for maintenance, as the covers have to be removed for inspection.

Note:

a. Brake disc dimensioning

- In general the coupling selection for **dynamic braking** should be no less than 200% of the running (INSTAL) torque, unless a full analysis of the inertias involved are known, along with the desired stopping time.
- The diameter of the brake disc (Db), will be determined from the required torque, and the calipers' force at the effective diameter (Dcal in the above diagrams) at which the caliper unit (or units) will engage.
- Multiple calipers, typically no more than two, are generally set at 1800 apart. The thickness of the disc, and whether plain, or ventilated, will also be determined by
  – the inertias Σsum I (kgm²) being retarded, relative to the brake position, and
  – the stopping time t_s (in seconds) required

b. Brake disc (general)

- International standards, such as DIN 15435, have tables of recommended diameters and thicknesses (or widths) for both **disc** and **drum** (**shoe**) type brakes. (Many brake-system manufacturers also have their own "factory'" standards).
- Disc material will vary depending on the application, capacity and the amount of energy that is required to be dissipated during engagement. Typically however, they are made of Spheroidal Graphite (nodular) cast iron (e.g. DIN GGG40, AISI 60-40-18; JIS FCD400).
- Thickness variation all over should be <0.05 mm total, and a surface finish of ≤0.002 µm.

Fig. 2

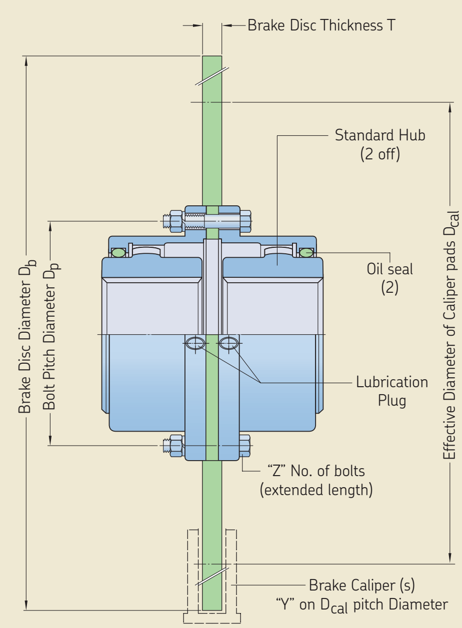


Table 2

Typical grid coupling brake rating capacities (M_{TMAX})

SKF Coupling Size (PHE 1XXXTGHBD)	Nominal Standard Disc O/Dia. D_b x T	Max. Brake Rating of Coupling M_{TMAX} (Nm)
1020TGHBD	200 x 6.4	10.8
1030TGHBD	250 x 6.4	35.2
1040TGHBD	250 x 6.4	65
1050TGHBD	250 x 6.4	118
1060TGHBD	305 x 6.4	208.8
1070TGHBD	305 x 6.4	330
1080TGHBD	305 x 6.4	637
1090TGHBD	405 x 13	1,085
1100TGHBD	405 x 13	1,898
1110TGHBD	450 x 13	2,847
1120TGHBD	510 x 13	4,339
1130TGHBD	560 x 13	6,493
1140TGHBD	610 x 13	8,813

Larger Sizes available on request. (Refer SKF_PT-Inquiry)

Table 3

Part	Description	SKF Part No (typical)
2 ×	**Standard hubs (if finish bored and keyed...**	PHE XXXXTGH...MM PHE XXGCX***MM (*insert bore)
2 ×	**Covers**	PHE XXGCCOVER
1 ×	**Brake Assembly Kit (extended bolts, nuts etc...) Incl. 1 x Bolt set (for brake disc)... with 'z' No. of bolts 2 x seal / 1 x gasket kit**	PHE XXGCBDKIT
1 ×	**Disc (D_b dia. x T thick)... (...or customer supply)**	PHE XXXXTGDISC...MM

[1] In slower applications, and / or when alignment is good, the use of the SINGLE ENGAGEMENT GEAR coupling may be a more economical option.
In such cases, only 1 x PHE XXXGCRSB and 1 x PHE XXXGCCOVER is required.
Additionally, 1 x PHE XXXGCSERSB is required.
This hub is normally positioned on the DriveN side of the brake disc.

Table 4

Typical grid coupling brake rating capacities (M_{TMAX})

SKF Coupling Size (PHE XXGCBD)	Nominal Standard Disc O/Dia. D_b x T	Max. Brake Rating of Coupling M_{TMAX} (Nm)
PHE 10GCBD	Disc diameter D_b and thickness T to customers' specification.	250
PHE 15GCBD		569
PHE 20GCBD		1050
PHE 25GCBD		1895
PHE 30GCBD	(Refer to SKF PTP)	3115
PHE 35GCBD		4810
PHE 40GCBD		7315
PHE 45GCBD		10,025
PHE 50GCBD		13,550
PHE 55GCBD		17,780
PHE 60GCBD		23,030
PHE 70GCBD		33,465

Larger Sizes available on request. (Refer SKF_PT-Inquiry)

SKF Gear Couplings

Very high-torque ratings, along with unparalleled bore capacities, give this coupling a great advantage over other types of couplings. SKF Gear Couplings are rated up to 555 000 Nm with a maximum bore of 4 495 mm. This is a heavy duty coupling with incredible design flexibility, making it an economical choice for many applications.

The unique design of the gear couplings tooth crowning dramatically reduces backlash and radial clearance. The hub bore capacities are the largest in the industry, allowing for low cost and long service life.

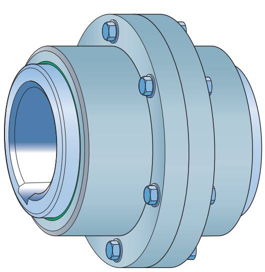
Selection

Standard selection method

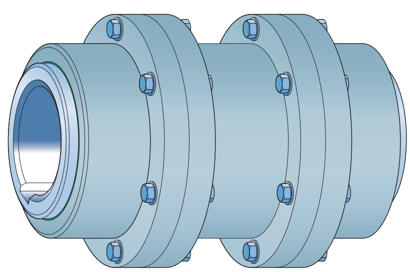
This selection procedure can be used for most motor, turbine, or engine driven applications. The following information is required to select an SKF gear coupling:

- Torque – Power [kW]
- Speed [r/min]
- Type of equipment and application
- Shaft diameters
- Shaft gaps
- Physical space limitation
- Special bore or finish information

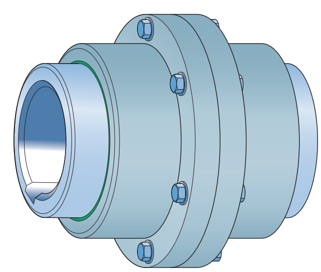
Exceptions to use of the standard selection method are for high peak loads and brake applications. For these, use the formula selection method or contact SKF.



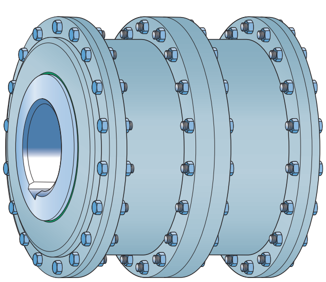
Double engagement → ***page 22***



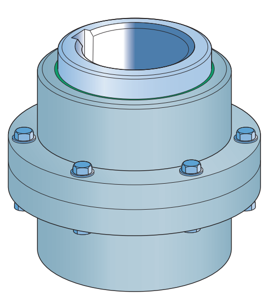
Double engagement spacer → ***page 24***



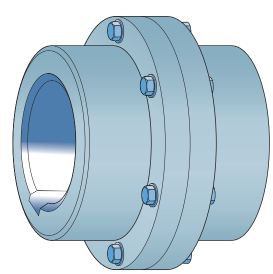
Slide single and double engagement → ***page 26*** *and* ***27***



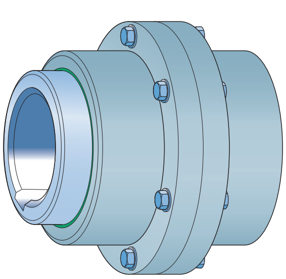
Double engagement → ***page 22***



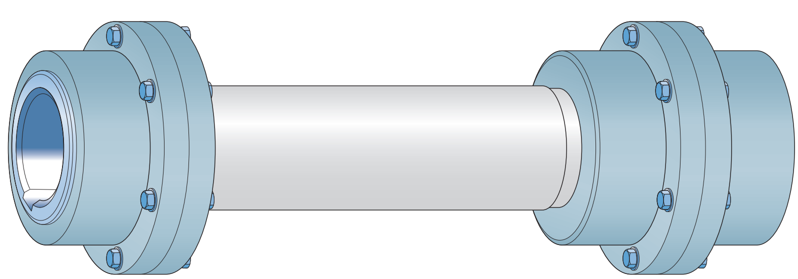
Vertical double engagement → ***page 25***



Rigid flanged sleeve → ***page 28***



Single engagement → ***page 23***



Floating and vertical shaft single engagement → ***page 32*** *and* ***33***

1 Determine system torque
If torque is not given, use the following formula to calculate for torque (T)

System torque [Nm]=

$$\frac{\text{Power [kW]} \times 9\,549}{\text{Speed [r/min]}}$$

2 Service factor
Determine the service factor with **tables 7** and **8** on **pages 60** and **61**.

3 Coupling rating
Determine the required minimum coupling rating as shown below:

Coupling rating =
service factor × torque [Nm]

4 Size
Select the appropriate coupling from the torque column of the product tables on pages 22 to 28 with a value that is equal to or greater than that determined in step 3 above and check that the chosen coupling can accommodate both driving and driven shafts.

5 Other considerations
Possible other restrictions might be speed [r/min], bore, gap and dimensions.

Standard selection example

Select a coupling to connect the low speed shaft of an ore conveyor drive to a speed reducer. The 350 kW, 1 440 r/min electric motor is driving the reducer with an output speed of 38 r/min. The reducer low speed shaft diameter is 215 mm, the conveyor head shaft is 225 mm. Shaft extensions are both 280 mm.

1 Determine system torque
System torque [Nm] =

$$\frac{350\text{ kW} \times 9\,549}{38\text{ r/min}} = 87\,997\text{ Nm}$$

2 Service factor
From **table 7** on **page 60** = 1,00

3 Required coupling rating
1,00 × 87 951 Nm = 87 951 Nm

4 Size
From product table on **page 22**, the coupling size 60 is the proper selection based on the torque rating of 90 400 Nm which exceeds the required minimum rating of 87 951 Nm.

5 Other considerations
The speed capacity of 2 450 (coupling size 60) exceeds the required speed of 38 r/min. The maximum bore capacity of 244 mm exceeds the required shaft diameters of 215 mm and 225 mm. The minimum required shaft length (J) of 169 mm is exceeded by the equipment's shaft extensions of 280 mm. The resulting service factor is 1,03.

Formula method

The standard selection method can be used for most coupling selections. However, the formula method should be used for:

- high peak loads
- brake applications (If a brake wheel is to be an integral part of the coupling)

By including the system's peak torque, frequency, duty cycle and brake torque ratings, a more accurate result will be obtained.

1 High peak loads
Use one of the following formulas (A, B, or C) for:

- Motors with higher than normal torque characteristics.
- Applications with intermittent operations shock loading.
- Inertia effects due to frequent stops and starts or repetitive high peak torques.

Peak torque is the maximum torque that can exist in the system. Select a coupling with a torque rating equal to or exceeding the selection torque from the relevant formula below.

A Non-reversing peak torque
Selection torque [Nm] =
System peak torque

or

Selection torque [Nm] =

$$\frac{\text{System peak kW} \times 9\,549}{\text{r/min}}$$

B Reversing high peak torque
Selection torque [Nm] =

$$\frac{1{,}5 \times \text{system peak torque}}{\text{r/min}}$$

C Occasional peak torques (non-reversing)
If a system peak torque occurs less than 1 000 times during the expected coupling life, use the following formula:

Selection torque [Nm] =
0,5 × system peak torque

or

Selection torque [Nm] =

$$\frac{0{,}5 \times \text{system peak kW} \times 9\,549}{\text{r/min}}$$

2 Brake applications
If the torque rating of the brake exceeds the motor torque, use the brake rating as follows:

Selection torque [Nm] =
Brake torque rating × Service factor.

Formula selection example

High peak load

Select a coupling for reversing service to connect a gear drive low speed shaft to a metal forming mill drive. The electric motor rating is 30 kW and the system peak torque estimated to be 9 000 Nm. Coupling speed is 66 r/min at the motor base speed. The drive shaft diameter is 90 mm. The metal forming mill drive shaft diameter is 120 mm.

1 Type
Refer to **page 20** and select the appropriate coupling type.

2 Required minimum coupling rating
Use the reversing high peak torque formula in step 1B.

1,5 × 9 000 Nm = 13 500 Nm = Selection torque

3 Size
From product table on **page 22**, size 35 with a torque rating of 18 500 exceeds the selection torque of 13 500 Nm.

4 Other considerations
Gear coupling size 35 has a maximum bore capacity of 124 mm from product table on **page 22** and the allowable speed of 3 900 r/min exceeds the equipment requirements.

Engineering data

These maximum operating alignment limits are each based on $^3/_4°$ per flex half coupling. Combined values of parallel and angular misalignment should not exceed $^3/_4°$. Type GC slide couplings are limited to $^1/_4°$ per flex half.

Do not use single engagement couplings to compensate for parallel offset misalignment.

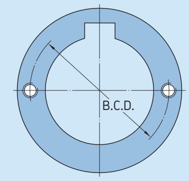
For additional information about gear couplings, such as puller bolt hole data, please refer to **tables 1** and **2**.

Order data

A complete gear coupling consists of: 2 hubs, 2 covers and 1 assembly kit. Coupling size 80 and above consists of: 2 hubs, 1 male cover, 1 female cover and 1 assembly kit. For more detailed information on ordering specific gear couplings, refer to **table 3**.

Table 1

Puller bolt hole data

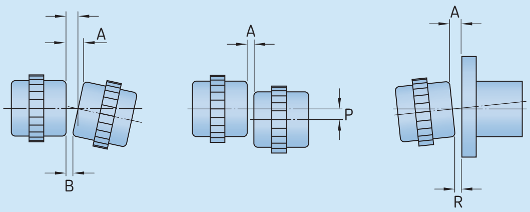


Size Flex hub	B.C.D.	Bolt size
–	mm	–
10	–	–
15	–	–
20	89	M8
25	112	M10
30	128	M10
35	152	M12
40	181	M16
45	200	M16
50	216	M20
55	235	M20
60	268	M20
70	305	M24
80	318	M24
90	356	M30
100	394	M30
110	426	M30
120	498	M30

Bore tolerances recommended.
Steel couplings hub.

Table 2

Misalignment capability



Size	Double engagement Installation maximum Parallel offset (P)	 Angular offset (A–B)	 Operating maximum* Parallel offset (P)	 Angular offset (A–B)	 Coupling gap Normal gap +/– 10%	Single engagement Installation maximum Angular offset (A–B)	 Operating maximum* Angular offset (A–B)	 Coupling gap Normal gap +/– 10%
–	mm		mm		mm	mm	mm	mm
10	0,05	0,15	0,66	1,8	3	0,15	0,89	4
15	0,08	0,18	0,86	2,26	3	0,18	1,14	4
20	0,08	0,23	1,02	2,74	3	0,23	1,37	4
25	0,10	0,28	1,27	3,43	5	0,28	1,70	5
30	0,13	0,33	1,52	3,99	5	0,33	2,01	5
35	0,15	0,38	1,83	4,65	6	0,38	2,34	6
40	0,18	0,46	2,13	5,49	6	0,46	2,74	7
45	0,20	0,51	2,39	6,15	8	0,51	3,07	8
50	0,23	0,56	2,72	6,65	8	0,56	3,33	9
55	0,28	0,61	3,12	7,32	8	0,61	3,66	9
60	0,28	0,66	3,35	7,98	8	0,66	3,99	10
70	0,33	0,79	3,94	9,32	10	0,79	4,65	13
80	0,41	0,81	2,46	4,83	10	0,81	2,41	13
90	0,43	0,91	2,64	5,49	13	0,91	2,74	14
100	0,48	1,02	2,97	6,15	13	1,02	3,07	16
110	0,56	1,14	3,30	6,81	13	1,14	3,40	16
120	0,58	1,24	3,50	7,49	13	1,24	3,73	16

Table 3

Order data

Coupling type	Hubs	Qty	Cover	Qty	Assembly kit	Qty	Spacer/floating tube and kits ... = DBSE dimension	Qty
Double engagement	PHE 50GCRSB	2	PHE 50GCCOVER	2	PHE 50GCKIT	1	–	–
Size 80 and above	PHE 80GCRSB –	2 –	PHE 80GCMCOVER PHE 80GCFCOVER	1 1	PHE 80GCKIT –	1 –	PHE 80GCRRING –	1 –
Single engagement	PHE 50GCSERSB PHE 50GCRSB	1 1	PHE 50GCCOVER –	2 –	PHE 50GCKIT –	1 –	– –	– –
Size 80 and above	PHE 80GCSERSB PHE 80GCRSB	1 1	PHE 80GCMCOVER PHE 80GCFCOVER	1 1	PHE 80GCKIT –	1 –	– –	– –
Double engagement spacer	PHE 50GCRSB	2	PHE 50GCCOVER	2	PHE 50GCKIT	2	PHE 50GCSPACER ... MM	1
Double engagement slide type 1, 2, 3 Note: each type ordered with all components is a complete coupling	PHE 50GCSLT1RSB PHE 50GCSLT2RSB PHE 50GCSLT3RSB	2 2 2	PHE 50GCLT1COVER PHE 50GCLT2COVER PHE 50GCLT3COVER	2 2 2	PHE 50GCKIT PHE 50GCKIT PHE 50GCKIT	1 1 1	PHE 50GCCPLATE PHE 50GCCPLATE PHE 50GCCPLATE PHE 50GCLT3DISC	1 1 1 1
Single engagement slide type 3 and 2 Note: each type ordered with all components is a complete coupling	PHE 50GCSLT2RSB PHE 50GCSERSB PHE 50GCSLT3RSB PHE 50GCSERSB	1 1 1 1	PHE 50GCLT2COVER – PHE 50GCLT3COVER –	2 – 2 –	PHE 50GCKIT – PHE 50GCKIT –	1 – 1 –	– – – –	– – – –
Single engagement floating shaft	PHE 50GCFSERSB PHE 50GCRSB	2 2	PHE 50GCCOVER –	2 –	PHE 50GCKIT –	2 –	PHE 50GCFSHAFT ... MM –	1
Double engagement vertical	PHE 50GCVRSB	2	PHE 50GCVCOVER	2	PHE 50GCKIT	1	50GCVCTRKIT	1
Single engagement vertical	PHE 50GCVRSB PHE 50GCSERSB	1 1	PHE 50GCVCOVER –	2 –	PHE 50GCKIT –	1 –	50GCVCTRKIT –	– –
Single engagement vertical floating	PHE 50GCVRSB PHE 50GCFSERSB PHE 50GCVRSB PHE 50GCSERSB	2 2 1 1	PHE 50GCVCOVER PHE 50GCVCOVER –	2 2 –	PHE 50GCKIT PHE 50GCKIT –	2 2 –	50GCVCTRKIT PHE 50GCFSHAFT ... MM –	2 1 –
Rigid flanged sleeve	PHE 50GCRRSB	2	–	–	PHE 50GCRKIT	1	PHE 50GCRRING	1

For bored to size designations, add bore size in mm. For example: PHE 50GCX500MM.
For shrouded bolt covers use cover number, e.g. PHE 50SGCCOVER and PHE 50SGCKIT for the assembly kit.
The assembly kit includes oil seals, gasket, bolts and lock-nuts.

Installation

The performance of the coupling depends largely upon how it is installed, aligned and maintained.

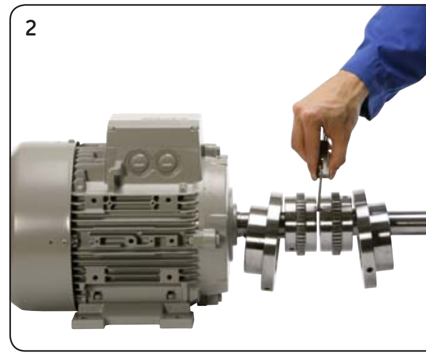
1 Mount the flanged sleeves with the seal rings before the hubs
Clean all metal parts using non-flammable solvent and check hubs, shafts and keyways for burrs and remove if necessary. Lightly coat the seals with grease and place well back on the shafts before mounting the hubs. Mount the hubs on their respective shafts so that each hub face is flush with the end of the shaft unless otherwise indicated (**1**).

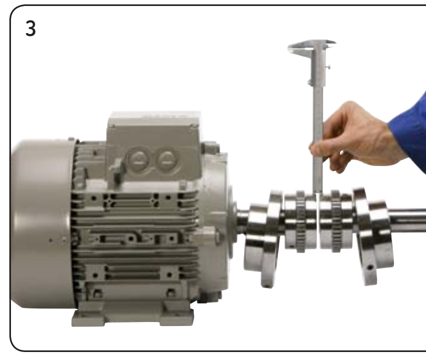
2 Gap and angular alignment
Use a feeler gauge equal in thickness to the gap specified in **table 3** on **page 19**. Insert the gauge as shown in image **2** to the same depth at 90° intervals and measure the clearance between the gauge and hub face. The difference in the minimum and the maximum measurements must not exceed the angular limits specified in **table 3** on **page 19**.

3 Offset alignment
Align the two hubs so that a straight edge rests squarely on both hubs as in image **3**, and also at 90° intervals. The clearance must not exceed the parallel offset installation limits specified in **table 3** on **page 19**. Tighten all foundation bolts (**4**) and repeat steps 2 and 3. Realign the coupling if necessary.

4 Pack with grease and assemble the sleeves
Pack the gears of the hubs with grease. Insert the gasket between the sleeves and position the sleeves with the lubrication holes approximately 90° apart. Then push the sleeves into position and using the supplied fasteners, bolt the sleeves together. Once the coupling is assembled, remove the lubrication plugs from the sleeves. Insert a grease fitting in one of the holes and pump grease into the sleeve until it is forced out of the opposite lubrication holes (**5**). Replace the lubrication plugs. The installation is complete.

1


2


3


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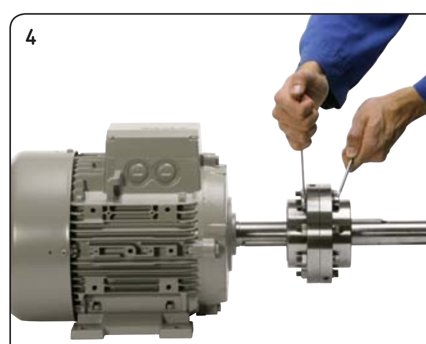

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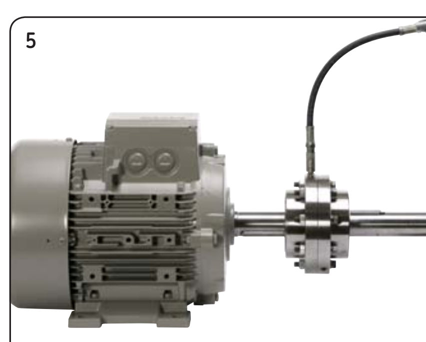
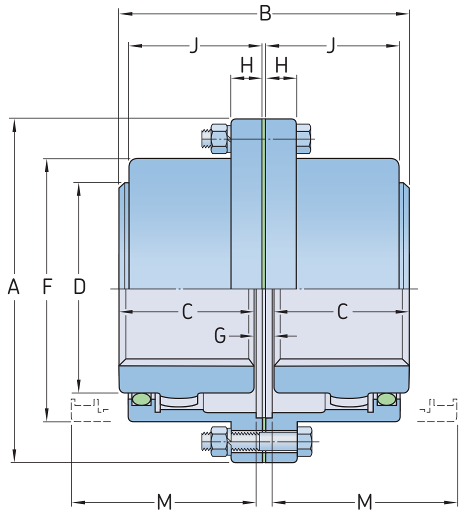
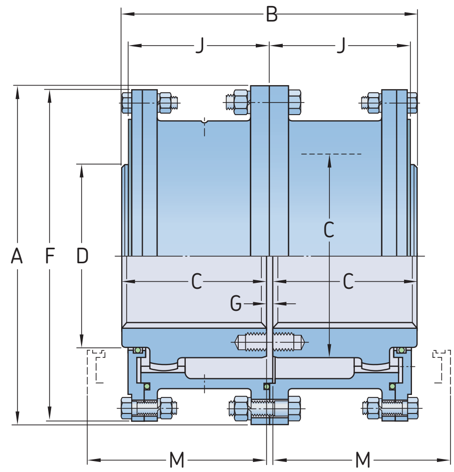


Large size gear couplings



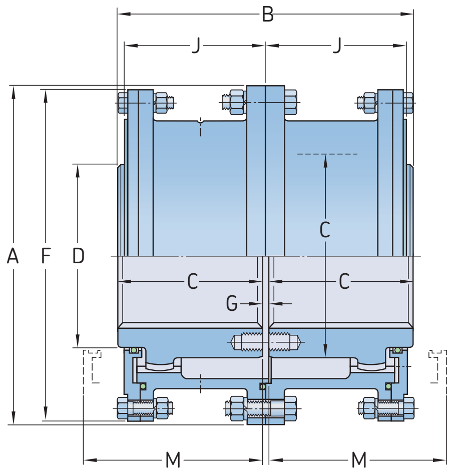
Size 10–70



Size 80–120

Size	Est. Weight	Rated torque	Max speed	Bore diameter		Dimensions								G gap	Lubricant weight	Coupling weight without bore
						A	B	C	D	F	J	M	?			
				min.	max.									min.		
–	kg	Nm	r/min	mm		mm								mm	kg	kg
130GC	2595	719	1075	165	440	911	762	371	584	886	367	435		19		
140GC	3107	911	920	175	460	966	806	393	635	940	378	457		19		
150GC	3765	1100	770	190	490	1029	857	419	686	1003	408	483		19		
160GC	4708	1310	650	250	525	1111	908	441	736	1086	419	502		25		
180GC	6260	1660	480	285	600	1219	940	457	838	1194	435	521		25		
200GC	8582	2140	370	315	660	1359	1099	536	927	1308	514	635		25		
220GC	11685	2720	290	345	725	1511	1194	584	1016	1474	565	686		25		
240GC	14606	3470	270	380	810	1632	1283	628	1130	1581	607	724		25		
260GC	17799	4490	250	410	880	1746	1372	673	1232	1695	648	775		25		
280GC	21192	5840	230	445	950	1867	1410	693	1334	1803	667	794		25		
300GC	24807	6760	220	475	1025	1975	1448	711	1435	1911	686	800		25		

1) Dimensions are converted from the original imperial inch design and may have been rounded for convenience. Certified drawings should be requested before installation. Bore tolerances will be K7 unless stated otherwise. Key width (b) tolerance will be P9 (close fit).
2) The maximum bores listed are for standard keyways to DIN6883/1 (up to and including 500mm only). Above 500mm bore, keyway dimensions MUST be specified as not covered by international standards. Shallow keys, when required, will be to DIN6885/3
3) Weights are given, in kg, with minimum listed bore, excluding lubricant..
4) 'M' dimension is minimum clearance required for alignment purposes



Size 80–300

In some applications it is not possible to go up in coupling size to accommodate a specific torque requirement, usually due to dimensional restraints or operating speeds.

For coupling sizes, generally over Size PHE80GC, there are two possibilities to increase the torque capacity of the SKF Gear Coupling.

1. Heat treatment of the standard carbon steel hubs and cover sets (Type 'HT'). (Note: this can NOT be done retrospectively)
2. The use of alloy steel, heat treated, to improve capacity by between 35–40% (Type 'XP')

The correct selection and use of the relevant SERVICE FACTORS however is critical in these series, and should be referred to SKF PTP for full application analysis.

Conversely, higher speeds may also be obtained if the units are dynamically balanced.(This should be mandatory over the standard speeds indicated in the tables).

Size	Est. Weight[3]	Max speed[2]	Bore diameter		Nom. Torque (kNm) (Service Factor = 1.00)		
					Standard	Heat treated (HT)[1]	Alloy (XT)[1]
			min.	max.			
–	kg	r/min	mm		Mat'l: C45	Mat'l: C45 HT	Mat'l: 4140 HT
80GC	703	1750	101	266	170	203.8	233.7
90GC	984	1550	114	290	226	271.2	315
100GC	1302	1450	127	320	310	372	442.4
110GC	1678	1330	139	373	413	495.6	608.9
120GC	2114	1200	152	400	555	666	776.7
130GC	2595	1075	165	440	719	862.1	924.6
140GC	3107	920	175	460	911	1,092.5	1,138
150GC	3765	770	190	490	1100	1320	1,351
160GC	4708	650	250	525	1310	1570	1,635
180GC	6260	480	285	600	1660	1992	2,133
200GC	8582	370	315	660	2140	2568	2,845
220GC	11685	290	345	725	2720	3264	3,556
240GC	14606	270	380	810	3470	4164	4,481
260GC	17799	250	410	880	4490	5388	5,476
280GC	21192	230	445	950	5840	7008	6,757
300GC	24807	220	475	1025	6760	8112	8,179

[1] The figures for the HT and XP are indicative only.
Applications for the HT and XP series couplings should be referred to SKF PTP for confirmation of both capacity and suitably for the specific application.
[2] Bore tolerances will be K7 unless stated otherwise. Key width (b) tolerance will be P9 (close fit). The maximum bores listed are for standard keyways to DIN6883/1 (up to and including 500mm only). Above 500mm bore, keyway dimensions MUST be specified as not covered by international standards. Shallow keys, when required, will be to DIN6885/3.
[3] Weights are given, in kg, with the minimum listed bore, and excluding lubricant.

Gear couplings with optional taper bush hub

In addition to the standard plain bore hub that is offered with the **gear** and **grid** couplings, there is the option to offer a **taper bush** as a **mto** product.

In such circumstances there must be a RE-RATING of the coupling capacity, along with the possible reduction in the LTB hub width. The limitations in the capacity are based on the maximum recommended torque for the relevant bushing, with a standard keyway.

The taper-bush is normally mounted from the inner face of the coupling (Type F configuration) or sometimes referred to as "inboard" side), but may also be able to mounted in the external ("H") configuration (or "outboard"). As the flex half's for the **agma** compliant couplings may also be interchanged, a combination of 'F' and 'H' hub can also be used where mounting conditions permit (e.g. FF, HH or FH / HF combinations...).

The following table may be used as a general guide as to what bush fits where, and by how much, if any, the LTB hub may have to be reduced from the standard (catalogue) length.

Note: As GEAR couplings traditionally offer the highest torque capacity v diameter ratio of any coupling, the range available with a Taper Bush hub is limited, as it becomes uneconomical to use this system when the derating of the coupling (due to the taper-bush limitation) falls well below the capability of the coupling with standard shaft connections.

Fig. 1A

Gear Hub with Taper bush Type "F" (inboard) configuration shown.

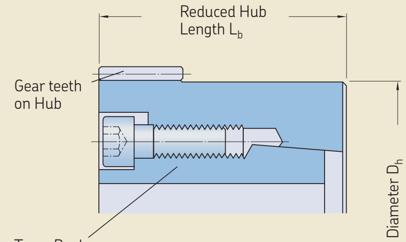


Fig. 1B

GRID Hub with Taper bush Type F – internal mount configuration shown.

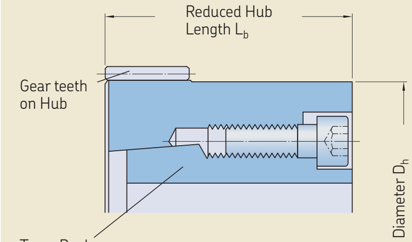


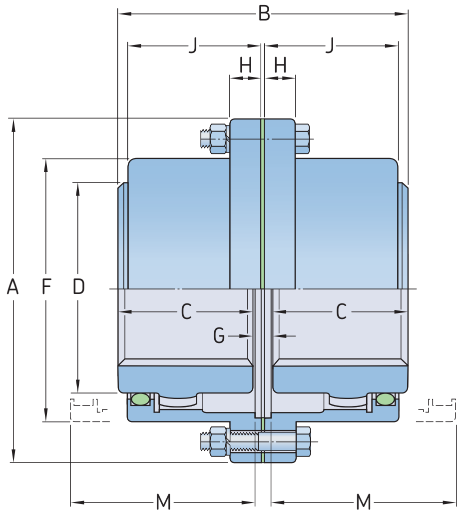
Table 1

SKF gear couplings (AGMA) with taper bush ('F' or 'H' mounting)

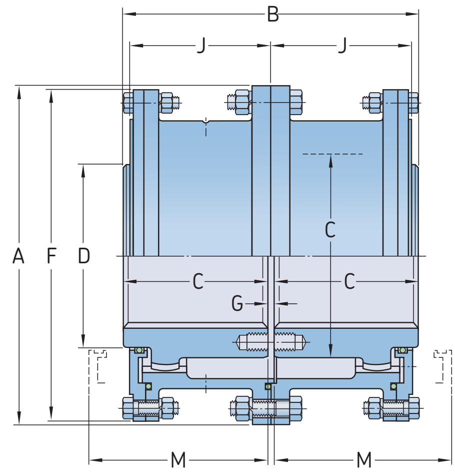
SKF GEAR Coupling Ref (PHE****)	SKF Taper Bush Size (PHF ****)	Nom. Torque Capacity (Nm)	Bore Range (mm) [1]	Nom. Hub Length Lb (mm)	Hub Dia $ØD_h$ (mm)
PHE 10GCTB...	1215	405	13 – 32	43	69
PHE 15GCTB...	1615	485	13 – 42	53	88
PHE 20GCTB...	2012	810	13 – 50	62	105
PHE 25GCTB...	2525	1275	25 – 65	77	131
PHE 30GCTB...	3030	2710	24 – 80	91	152
PHE 35 GCTB...	3535	5060	32 – 91	107	178
PHE 40GCTB...	4040	8727	37 – 103	121	210

[1] The Taper bush combination may be used in full FLEX-FLEX or FLEX-RIGID configuration.
Check RIGID hub dimensions on page 28.

Double engagement



Size 10 to 70

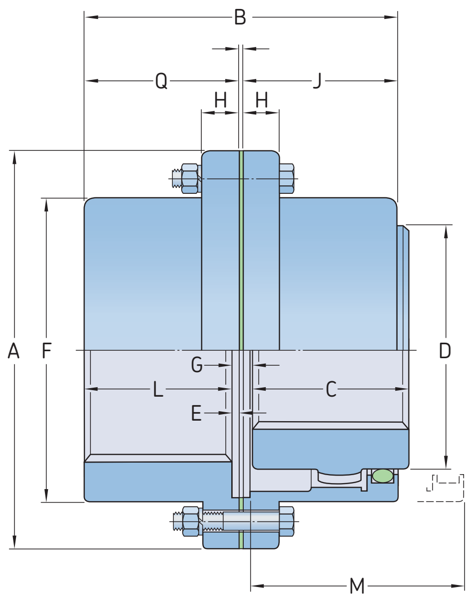


Size 80 to 120

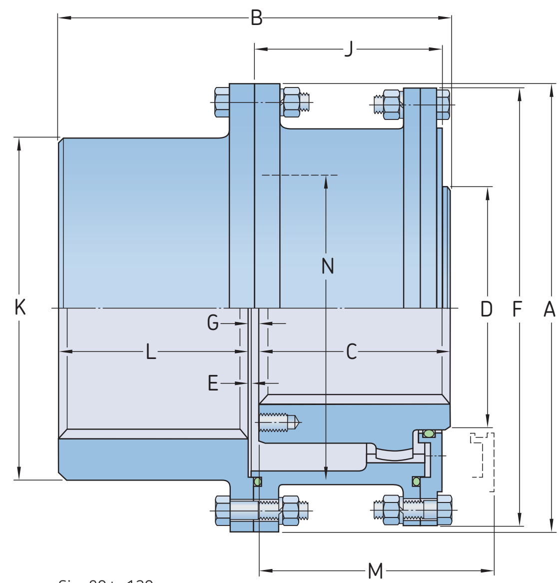
Size	Power per 100 r/min	Rated torque	Max speed	Bore diameter		Dimensions								G gap	Lubricant weight	Coupling weight without bore
				min.	max.	A	B	C	D	F	H	J	M[1]	min.		
–	kW	Nm	r/min	mm		mm								mm	kg	kg
10 GC	11,9	1 139	8 000	13	48	116	89	43	69	84	14	39	51	3	0,04	5
15 GC	24,6	2 350	6 500	19	60	152	101	49	86	105	19	48	61	3	0,07	9
20 GC	44,7	4 270	5 600	25	73	178	127	62	105	126	19	59	77	3	0,12	16
25 GC	78,3	7 474	5 000	32	92	213	159	77	131	155	21,8	72	92	5	0,23	29
30 GC	127	12 100	4 400	38	105	240	187	91	152	180	21,8	84	107	5	0,36	43
35 GC	194	18 500	3 900	51	124	279	218	106	178	211	28,4	98	130	6	0,54	68
40 GC	321	30 609	3 600	64	146	318	248	121	210	245	28,4	111	145	6	0,91	97
45 GC	440	42 000	3 200	76	165	346	278	135	235	274	28,4	123	166	8	1,04	136
50 GC	593	56 600	2 900	89	178	389	314	153	254	306	38,1	141	183	8	1,77	190
55 GC	775	74 030	2 650	102	197	425	344	168	279	334	38,1	158	204	8	2,22	249
60 GC	947	90 400	2 450	114	222	457	384	188	305	366	25,4	169	229	8	3,18	306
70 GC	1 420	135 000	2 150	127	254	527	452	221	343	425	28,4	196	267	10	4,35	485
80 GC	1 780	170 000	1 750	102	279	591	508	249	356	572	–	243	300	10	9,53	703
90 GC	2 360	226 000	1 550	114	305	660	565	276	394	641	–	265	327	13	12,25	984
100 GC	3 250	310 000	1 450	127	343	711	623	305	445	699	–	294	356	13	14,97	1 302
110 GC	4 320	413 000	1 330	140	387	775	679	333	495	749	–	322	384	13	17,69	1 678
120 GC	5 810	555 000	1 200	152	425	838	719	353	546	826	–	341	403	13	20,87	2 114

[1] Minimum clearance required for aligning coupling.

Double engagement couplings are designed for most horizontal, close coupled applications. This coupling accommodates both offset and angular misalignment, as well as end float. Applications include: fans, pumps, steel and paper mill drives, cranes and conveyors.



Size 10 to 70



Size 80 to 120

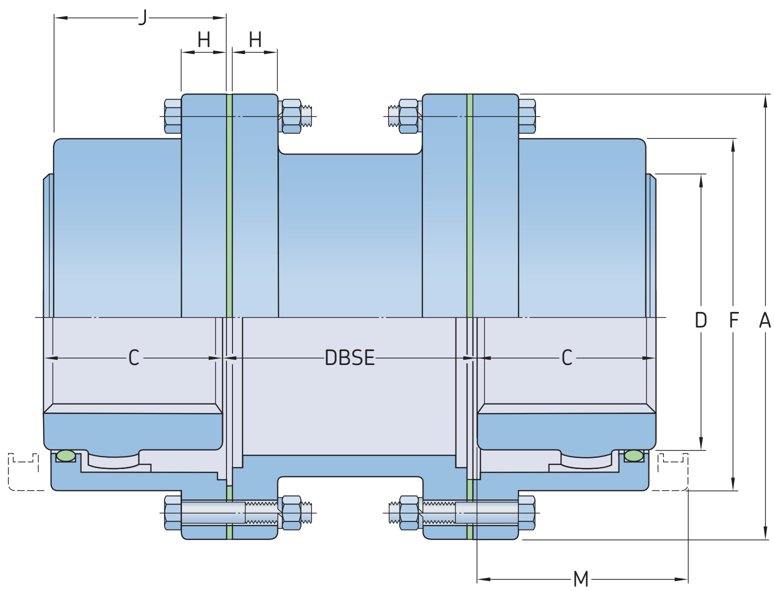
Size	Power per 100 r/min	Rated torque	Max speed	Bore diameter max. (flex hub)	max. (se hub)	min.	Dimensions A	B	C	D	E	F	H	J	K[1]	L	M[2]	Q	G gap min.	Lubricant weight	Coupling weight without bore
–	kW	Nm	r/min	mm			mm												mm	kg	kg
10 GCSE	11,9	1 139	8 000	48	60	13	116	87	43	69	2,5	84	14	39	–	40	51	42	4	0,02	4,5
15 GCSE	24,6	2 350	6 500	60	75	19	152	99	49	86	2,5	105	19	48	–	46	61	49	4	0,04	9,1
20 GCSE	44,7	4 270	5 600	73	92	25	178	124	62	105	2,5	126	19	59	–	58	77	61	4	0,07	15,9
25 GCSE	78,3	7 474	5 000	92	111	32	213	156	77	131	2,5	155	21,8	72	–	74	92	76	5	0,12	27,2
30 GCSE	127	12 100	4 400	105	130	38	240	184	91	152	2,5	180	21,8	84	–	88	107	90	5	0,18	43,1
35 GCSE	194	18 500	3 900	124	149	51	279	213,5	106	178	2,5	211	28,4	98	–	102	130	105	6	0,27	61,2
40 GCSE	321	30 609	3 600	146	171	64	318	243	121	210	4,1	245	28,4	111	–	115	145	119	7	0,47	99,8
45 GCSE	440	42 000	3 200	165	194	76	346	274	135	235	4,1	274	28,4	123	–	131	166	135	8	0,57	136,1
50 GCSE	593	56 600	2 900	178	222	89	389	309	153	254	5,1	306	38,1	141	–	147	183	152	9	0,91	195,0
55 GCSE	775	74 030	2 650	197	248	102	425	350	168	279	5,1	334	38,1	158	–	173	204	178	9	1,13	263,1
60 GCSE	947	90 400	2 450	222	267	114	457	384	188	305	6,6	366	25,4	169	–	186	229	193	10	1,70	324,3
70 GCSE	1 420	135 000	2 150	254	305	127	527	454	221	343	8,4	425	28,4	196	–	220	267	229	13	2,27	508
80 GCSE	1 780	170 000	1 750	279	343	102	591	511	249	356	–	572	–	243	450,8	249	300	–	13	4,99	698,5
90 GCSE	2 360	226 000	1 550	305	381	114	660	566	276	394	–	641	–	265	508,0	276	327	–	14	6,35	984,3
100 GCSE	3 250	310 000	1 450	343	406	127	711	626	305	445	–	699	–	294	530,4	305	356	–	16	7,71	1 251,9
110 GCSE	4 320	413 000	1 330	387	445	140	775	682	333	495	–	749	–	322	584,2	333	384	–	16	9,07	1 637,5
120 GCSE	5 810	555 000	1 200	425	495	152	838	722	353	546	–	826	–	341	647,7	353	403	–	16	10,89	2 077,5

[1] May be an "as cast" version depending on coupling size and bore.
[2] Minimum clearance required for aligning coupling.

These single engagement couplings are not designed for floating shaft applications and only accommodate angular misalignment.
For floating shaft applications, please, refer to **page 32** and **33**.

Double engagement

Spacer



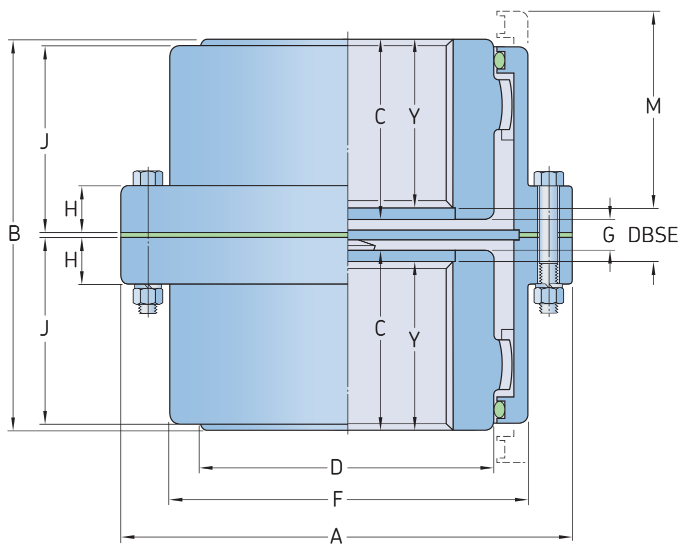
Size	Power per 100 r/min	Rated torque	Max speed	DBSE		Bore diameter		Dimensions							Lubricant weight	Coupling weight without bore and min. DBSE
				min	max.	min.	max.	A	C	D	F	H	J	M1)		
–	kW	Nm	r/min	mm		mm		mm							kg	kg
10 GCS	11,9	1 139	7 000	83	311	13	48	116	43	69	84	14	39	51	0,04	6,8
15 GCS	24,6	2 350	5 500	83	311	19	60	152	49	86	105	19	48	61	0,07	13,6
20 GCS	44,7	4 270	4 600	83	311	25	73	178	62	105	126	19	59	77	0,12	20,4
25 GCS	78,3	7 474	4 000	95	311	32	92	213	77	131	155	21,8	72	92	0,23	38,6
30 GCS	127	12 100	3 600	95	311	38	105	240	91	152	180	21,8	84	107	0,36	54,4
35 GCS	194	18 500	3 100	120	311	51	124	279	106	178	211	28,4	98	130	0,54	88,5
40 GCS	321	30 609	2 800	120	311	64	146	318	121	210	245	28,4	111	145	0,91	122,5
45 GCS	440	42 000	2 600	120	311	76	165	346	135	235	274	28,4	123	166	1,04	165,6
50 GCS	593	56 600	2 400	146	311	89	178	389	153	254	306	38,1	141	183	1,77	238,1
55 GCS	775	74 030	2 200	146	311	102	197	425	168	279	334	38,1	158	204	2,22	306,2
60 GCS	947	90 400	2 100	146	311	114	222	457	188	305	366	25,4	169	229	3,18	358,3
70 GCS	1 420	135 000	1 800	146	311	127	254	527	221	343	425	28,4	196	267	4,35	562,5

1) Minimum clearance required for aligning coupling.

Double engagement spacer couplings are designed for pump and compressor applications.
The coupling consists of a standard double engagement coupling and a spacer tube which is available in various lengths.

Double engagement

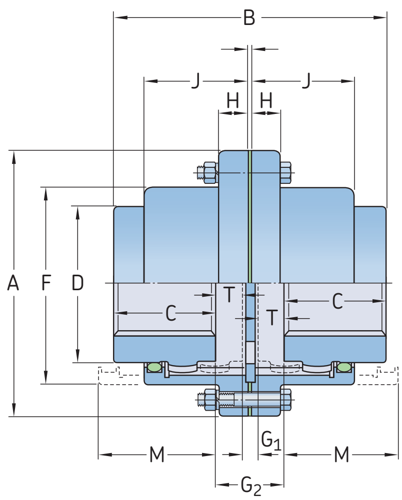
Vertical



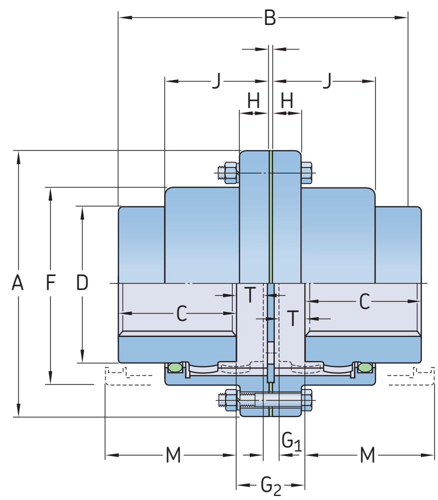
Size	Power per 100 r/min	Rated torque	Max speed	Bore diameter max.	Bore diameter min.	Dimensions A	B	C	D	F	H	J	M[1]	Y	DBSE	G gap min.	Lubricant weight	Coupling weight without bore
–	kW	Nm	r/min	mm		mm										mm	kg	kg
10 GCV	11,9	1 139	8 000	13	48	116	89	43	69	84	14	39	51	32,5	24	11	0,04	5
15 GCV	24,6	2 350	6 500	19	60	152	101	49	86	105	19	48	61	38,6	24	11	0,07	9
20 GCV	44,7	4 270	5 600	25	73	178	127	62	105	126	19	59	77	51,3	24	11	0,12	16
25 GCV	78,3	7 474	5 000	32	92	213	159	77	131	155	21,8	72	92	65,3	26	14	0,23	29
30 GCV	127	12 100	4 400	38	105	240	187	91	152	180	21,8	84	107	79,8	26	14	0,36	43
35 GCV	194	18 500	3 900	51	124	279	218	106	178	211	28,4	98	130	94,0	30	18	0,54	68
40 GCV	321	30 609	3 600	64	146	318	248	121	210	245	28,4	111	145	105,9	35	22	0,91	97
45 GCV	440	42 000	3 200	76	165	346	278	135	235	274	28,4	123	166	116,3	44	25	1,04	136
50 GCV	593	56 600	2 900	89	178	389	314	153	254	306	38,1	141	183	134,6	44	25	1,77	190
55 GCV	775	74 030	2 650	102	197	425	344	168	279	334	38,1	158	204	149,6	44	25	2,22	249
60 GCV	947	90 400	2 450	114	222	457	384	188	305	366	25,4	169	229	168,1	48	29	3,18	306
70 GCV	1 420	135 000	2 150	127	254	527	452	221	343	425	28,4	196	267	194,8	61	35	4,35	485

[1] Minimum clearance required for aligning coupling.

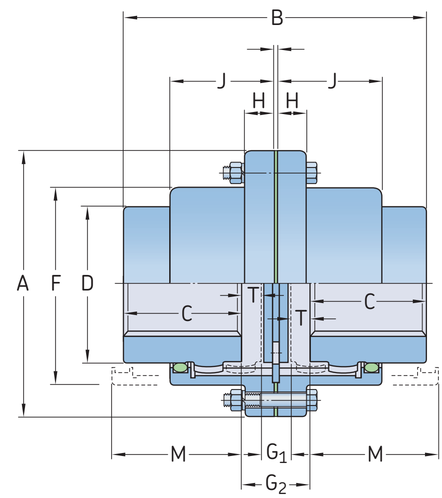
Double engagement
Slide



Type 1



Type 2



Type 3

Size	Power per 100 r/min	Rated torque	Max speed	Bore diameter		Dimensions						Lubricant weight	Coupling weight without bore
				min.	max.	A	C	D	F	H	J		
–	kW	Nm	r/min	mm								kg	kg
10 GCSL	11,9	1 139	5 300	13	48	116	43	69	84	14	39	0,02	5
15 GCSL	24,6	2 350	4 300	19	60	152	49	86	105	19	48	0,04	9
20 GCSL	44,7	4 270	3 700	25	73	178	62	105	126	19	59	0,06	16
25 GCSL	78,3	7 474	3 300	32	92	213	77	131	155	21,8	72	0,11	29
30 GCSL	127	12 100	2 900	38	105	240	91	152	180	21,8	84	0,18	43
35 GCSL	194	18 500	2 600	51	124	279	106	178	211	28,4	98	0,27	68
40 GCSL	321	30 609	2 400	64	146	318	121	210	245	28,4	111	0,45	97
45 GCSL	440	42 000	2 100	76	165	346	135	235	274	28,4	123	0,51	136
50 GCSL	593	56 600	1 900	89	178	389	153	254	306	38,1	141	0,91	190
55 GCSL	775	74 030	1 800	102	197	425	168	279	334	38,1	158	1,13	249
60 GCSL	947	90 400	1 600	114	222	457	188	305	366	25,4	169	1,19	306
70 GCSL	1420	135 000	1 400	127	254	527	221	343	425	28,4	196	2,18	485

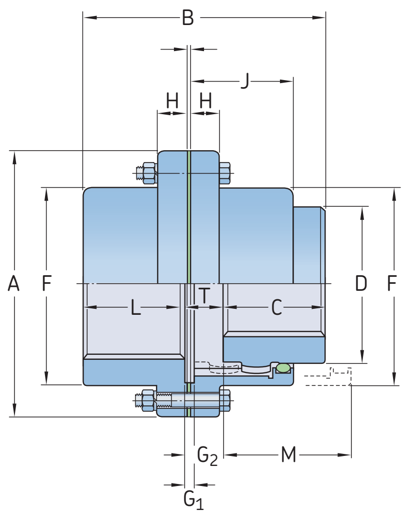
Size	Type 1						Type 2						Type 3					
	B max.	M[1)]	T max. Half	Total	G_1 gap	G_2 gap	B max.	M[1)]	T max. Half	Total	G_1 gap	G_2 gap	B max.	M[1)]	T max. Half	Total	G_1 gap	G_2 gap
–	mm						mm						mm					
10 GCSL	96	54	13	26	8	10	126	58	16	32	8	40	96	54	2	4	6	10
15 GCSL	127	60	10	20	8	29	152	69	23	46	8	54	127	60	7,5	15	14	29
20 GCSL	151	77	9	18	8	27	186	84	27	54	8	62	151	77	10	20	7	27
25 GCSL	188	93	12	24	9	34	231	102	34	68	9	78	188	93	6	12	21	34
30 GCSL	227	108	18	36	9	45	263	118	36	72	9	81	227	108	11,5	23	22	45
35 GCSL	274	124	25	50	11	61	313	135	45	90	11	102	274	124	14	28	33	61
40 GCSL	320	138	32	64	15	79	364	155	54	108	15	121	320	138	16	32	47	79
45 GCSL	355	154	35	70	16	86	406	163	60	120	16	136	355	154	19	38	47	86
50 GCSL	408	175	42	82	18	102	460	189	68	136	18	153	408	175	20,5	41	61	102
55 GCSL	470	191	58	116	18	134	510	221	78	156	18	174	470	191	21	42	92	134
60 GCSL	504	212	53	424	21	127	563	227	83	166	21	187	504	212	24,5	49	78	127
70 GCSL	592	245	62	490	26	150	669	235	99	198	26	223	592	245	27	54	96	150

[1)] Minimum clearance required for aligning coupling.

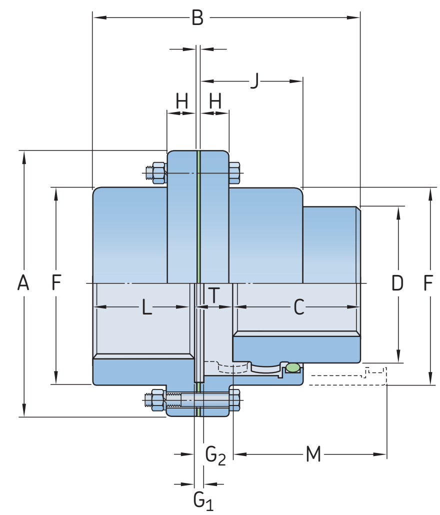
Larger sizes available: contact SKF for details.
Double engagement slide couplings are designed for horizontal close coupled applications and are designed to accommodate thermal expansion of the shaft and large mechanical vibratory screens.
These couplings are available with 3 different ranges of axial capabilities.

Single engagement

Slide



Type 1



Type 2

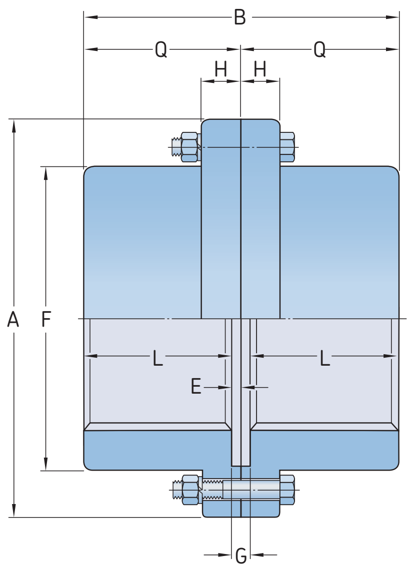
Size	Power per 100 r/min	Rated torque	Max speed	Bore diameter max. (flex hub)	max. (se hub)	min.	Dimensions A	C	D	F	H	J	L	Lubricant weight	Coupling weight without bore
–	kW	Nm	r/min	mm										kg	kg
10 GCSL	11,9	1 139	5 300	48	60	13	116	43	69	84	14	39	40	0,01	5
15 GCSL	24,6	2 350	4 300	60	75	19	152	49	86	105	19	48	46	0,02	9
20 GCSL	44,7	4 270	3 700	73	92	25	178	62	105	126	19	59	58	0,04	16
25 GCSL	78,3	7 474	3 300	92	111	32	213	77	131	155	21,8	72	74	0,06	29
30 GCSL	127	12 100	2 900	105	130	38	240	91	152	180	21,8	84	88	0,11	43
35 GCSL	194	18 500	2 600	124	149	51	279	106	178	211	28,4	98	102	0,18	68
40 GCSL	321	30 609	2 400	146	171	64	318	121	210	245	28,4	111	115	0,27	97
45 GCSL	440	42 000	2 100	165	194	76	346	135	235	274	28,4	123	131	0,34	136
50 GCSL	593	56 600	1 900	178	222	89	389	153	254	306	38,1	141	147	0,54	195
55 GCSL	775	74 030	1 800	197	248	102	425	168	279	334	38,1	158	173	0,73	263
60 GCSL	947	90 400	1 600	222	267	114	457	188	305	366	25,4	169	186	0,96	324
70 GCSL	1 420	135 000	1 400	254	305	127	527	221	343	425	28,4	196	220	1,36	510

Size	Type 1 B max.	M1)	T max.	G_1 gap	G_2 gap	Type 2 B max.	M1)	T max.	G_1 gap	G_2 gap
–	mm					mm				
10 GCSL	90	54	3,6	4	8	105	58	18,5	4	23
15 GCSL	112	60	12,7	4	17	125	69	25,4	4	30
20 GCSL	136	77	11,7	4	16	154	84	29,5	4	34
25 GCSL	170	93	14,5	5	19	192	102	36,3	5	41
30 GCSL	204	108	20,1	5	25	222	118	38,1	5	43
35 GCSL	241	124	27,2	6	33	262	135	47,8	6	53
40 GCSL	279	138	36,3	7	43	300	155	57,4	7	65
45 GCSL	315	154	38,9	8	47	338	163	64	8	72
50 GCSL	356	175	47	9	56	382	189	72,6	9	81
55 GCSL	412,5	191	63	9	72	433	221	83,1	9	92
60 GCSL	445	212	59,7	10	70	475	227	89,4	10	100
70 GCSL	524	245	70,4	13	83	560	235	106,7	13	119

1) Minimum clearance required for aligning coupling.

Larger sizes available: contact SKF for details.
These couplings are available with 3 different ranges of axial capabilities.

Rigid flanged sleeve



Size	Power per 100 r/min	Rated torque	Max speed	Bore diameter		Dimensions							Gap	Coupling weight without bore
				min.	max.	A	B	E	F	H	L	Q	G	
–	kW	Nm	r/min	mm									mm	kg
10 GCR	11,9	1 139	8 000	13	60	116	84,5	2,5	84	14	40	39	5	5
15 GCR	24,6	2 350	6 500	19	75	152	97,5	2,5	105	19	46	48	5	9
20 GCR	44,7	4 270	5 600	25	92	178	122	2,5	126	19	58,5	59	5	16
25 GCR	78,3	7 474	5 000	32	111	213	152,5	2,5	155	21,8	73,5	72	5	28
30 GCR	127	12 100	4 400	38	130	240	181	2,5	180	21,8	88	84	5	43
35 GCR	194	18 500	3 900	51	149	279	209	2,5	211	28,4	102	98	5	68
40 GCR	321	30 609	3 600	64	171	318	239	4,1	245	28,4	115	111	8	102
45 GCR	440	42 000	3 200	76	194	346	269	4,1	274	28,4	130,5	123	8	140
50 GCR	593	56 600	2 900	89	222	389	305	5,1	306	38,1	147,5	141	10	205
55 GCR	775	74 030	2 650	102	248	425	355,5	5,1	334	38,1	172,5	158	10	280
60 GCR	947	90 400	2 450	114	267	457	386	6,6	366	25,4	186,5	169	13	335
70 GCR	1 420	135 000	2 150	127	305	527	457	8,4	425	28,4	220	196	17	536
80 GCR	1 780	170 000	1 750	102	343	591	514	8	572	31,5	249	243	16	703
90 GCR	2 360	226 000	1 550	114	381	660	568	8	641	38	276	265	16	984
100 GCR	3 250	310 000	1 450	127	406	711	629	9,7	699	44,2	305	294	19	1 210
110 GCR	4 320	413 000	1 330	140	445	775	686	9,7	749	50,8	333	322	19	1 610
120 GCR	5 810	555 000	1 200	152	495	838	724	9,7	826	53,8	353	341	19	2 114

Rigid flanged sleeve couplings are designed for horizontal, close coupled applications. These are excellent high torque couplings to use where their is no need to accommadate misalignment.

Floating shaft gear couplings

The SKF floating shaft coupling consists of two standard single engagement couplings, two gap discs and a connector shaft.

A floating shaft can eliminate the requirement for additional bearing supports along the spanning shaft because the shaft is supported at the ends by connected equipment through the single engagement couplings.

Flex hubs on floating shafts

Assembly of the flex hubs on the floating shaft allows for easier replacement in case of coupling wear and allows the rigid hubs with their larger bore capacities to be used on the connected equipment shafts. This often allows for smaller coupling sizes in the design. See drawings on **page 33**.

Rigid hubs on floating shaft

When the rigid hubs are on the floating shaft, shorter shaft spans can be used since no cover drawback is required. Since the flex hubs are on the outboard side, the points of articulation are further apart, thus allowing for greater offset misalignment. See drawings on **page 33**.

Table 4

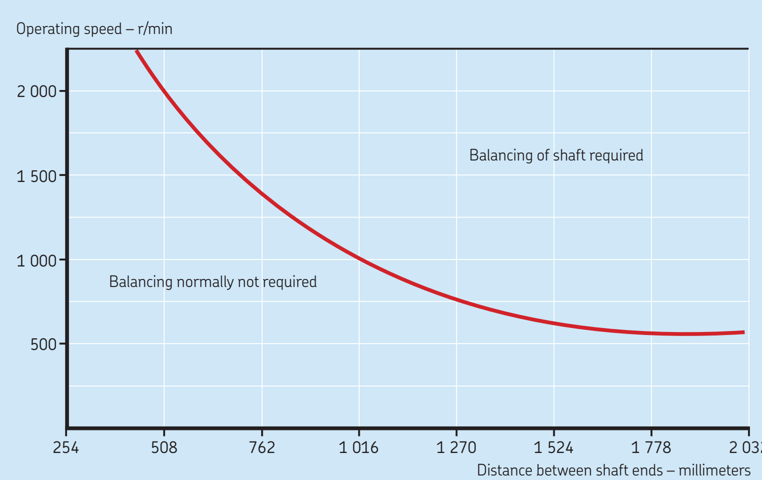
Floating shaft data

Size	Assembly rated torque	SB diameter	SD diameter	Max DBSE for r/min						
				1 750	1 430	1 170	870	720	580	< 540
–	Nm	mm	mm	mm						
10	493	38	40	1 371	1 524	1 676	1 955	2 159	2 387	2 463
	1 139	47,5	51	1 549	1 727	1 905	2 209	2 438	2 717	2 794
15	1 169	51	54	1 600	1 778	1 955	2 286	2 514	2 794	2 870
	2 350	60,3	76	1 752	1 930	2 133	2 463	2 717	3 022	3 124
20	2 282	63,5	66,5	1 778	1 981	2 184	2 540	2 794	3 098	3 200
	4 270	73	95	1 905	2 108	2 336	2 717	2 971	3 327	3 429
25	4 463	79,5	82,5	1 981	2 209	2 438	2 819	3 098	3 454	3 556
	7 474	92	95	2 133	2 362	2 616	3 022	3 237	3 708	3 835
30	8 508	98,5	101,5	2 209	2 438	2 692	3 124	3 454	3 835	3 962
	12 100	105	127	2 260	2 514	2 794	3 225	3 556	3 962	4 064
35	13 333	114	120,5	2 413	2 667	2 946	3 403	3 759	4 191	4 292
	18 500	124	146	2 463	2 717	3 022	3 505	3 860	4 292	4 419
40	24 327	139,5	146	2 641	2 921	3 251	3 759	4 140	4 597	4 749
	30 609	146	165	2 692	2 997	3 302	3 835	4 216	4 699	4 851
45	31 581	152,5	165	2 819	3 124	3 454	3 987	4 394	4 902	5 029
	42 000	171,5	203	3 124	3 454	3 810	4 445	4 876	5 435	5 588
50	37 886	162	165	2 819	3 124	3 454	3 987	4 394	4 902	5 029
	56 600	187,5	203	3 124	3 454	3 810	4 445	4 876	5 435	5 588
55	37 886	162	165	2 819	3 124	3 454	3 987	4 394	4 902	5 029
	74 030	200	203	3 124	3 454	3 810	4 445	4 876	5 435	5 588
60	71 410	200	203	3 124	3 454	3 810	4 445	4 876	5 435	5 588
	90 404	216	217,5	3 225	3 581	3 962	4 597	5 054	5 613	5 791
70	71 410	200	203	3 124	3 454	3 810	4 445	4 876	5 435	5 588
	13 5000	241,5	243	3 403	3 784	4 191	4 851	5 334	5 943	6 121

Assembly torque ratings are limited by the coupling size, shaft end diameter or both.
Interpolate for intermediate speeds. The maximum DBSE is based on 70% of the critical speed.

Diagram 1

Balancing requirements



Solid floating shaft selection

Single engagement type GCSE and GCSEV couplings are used with floating shafts in either horizontal or vertical applications. For vertical applications, select a type V coupling for the lower assembly. Select floating shaft couplings as follows:

1 Use the standard or formula selection methods and see product tables on **page 32** and **33** to select the coupling. Record the system torque from the standard method or the selection torque from formula method.

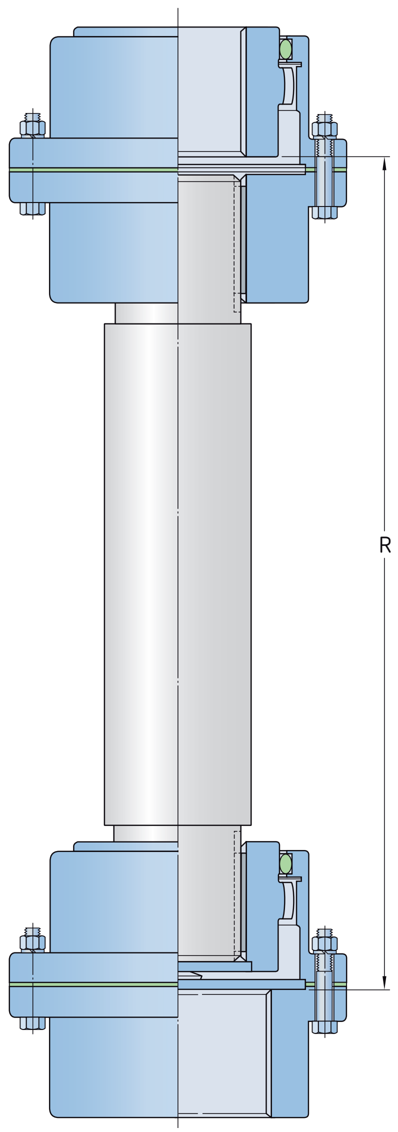
2 Select the shaft diameter from product tables on **pages 32** and **33** that has an assembly torque rating equal to or greater than the system or the selection torque determined in the coupling selection.

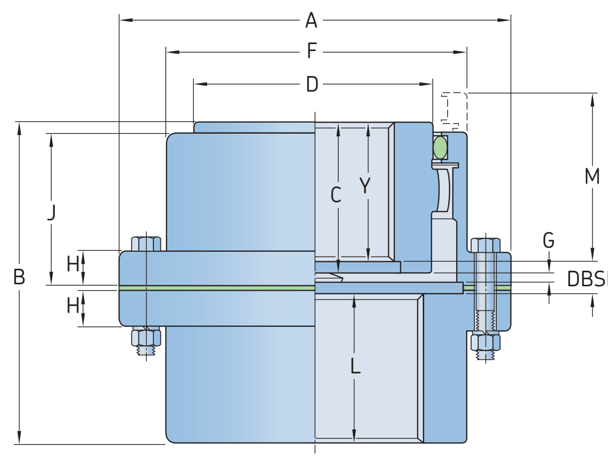
3 Check the maximum "DBSE" for the shaft diameter you selected and the running speed for the shaft length required from product tables on **page 32** and **33**. Refer to the graph in **diagram 1** on **page 30** to determine if the shaft requires balancing.

4 If the application shaft length exceeds the maximum "DBSE" listed, you must select the next larger shaft diameter or the next larger size coupling.

Single engagement

Vertical and floating shaft





Size	Power per 100 r/min	Rated torque	Max speed	Bore diameter			Dimensions												Gap	Lubricant weight	Coupling weight without bore
				max. (flex hub)	max. (se hub)	min.	A	B	C	D	F	H	J	L	M	R	Y	DBSE	G		
–	kW	Nm	r/min	mm			mm												mm	kg	kg
10 GCV	11,9	1 139	7 000	48	60	13	116	87	43	69	84	14	39	40	51	132	32,5	14,7	4	0,02	4,5
15 GCV	24,6	2 350	5 500	60	75	19	152	99	49	86	105	19	48	46	61	152	38,6	14,7	4	0,04	9,1
20 GCV	44,7	4 270	4 600	73	92	25	178	124	62	105	126	19	59	58	77	183	51,3	14,7	4	0,07	15,9
25 GCV	78,3	7 474	4 000	92	111	32	213	156	77	131	155	21,8	72	74	92	218	65,3	16,3	5	0,12	27,2
30 GCV	127	12 100	3 600	105	130	38	240	184	91	152	180	21,8	84	88	107	248	79,8	16,3	5	0,18	43,1
35 GCV	194	18 500	3 100	124	149	51	279	213,5	106	178	211	28,4	98	102	130	298	94,0	18,0	6	0,27	61,2
40 GCV	321	30 609	2 800	146	171	64	318	243	121	210	245	28,4	111	115	145	340	105,9	22,0	7	0,47	99,8
45 GCV	440	42 000	2 600	165	194	76	346	274	135	235	274	28,4	123	131	166	388	116,3	26,7	8	0,57	136,1
50 GCV	593	56 600	2 400	178	222	89	389	309	153	254	306	38,1	141	147	183	424	134,6	27,7	9	0,91	195,0
55 GCV	775	74 030	2 200	197	248	102	425	350	168	279	334	38,1	158	173	204	464	149,6	27,7	9	1,13	263,1
60 GCV	947	90 400	2 100	222	267	114	457	384	188	305	366	25,4	169	186	229	522	168,1	30,9	10	1,70	324,3
70 GCV	1 420	135 000	1 800	254	305	127	527	454	221	343	425	28,4	196	220	267	615	194,8	39,1	13	2,27	508

SKF Flex Couplings

SKF Flex Couplings are designed to accommodate misalignment and shock loads and dampen vibration levels. These easy to install, maintenance-free couplings are available with either a machined-to-size or tapered bore.

Couplings with a tapered bore can be Face (F) mounted or Hub (H) mounted. The more versatile Reversible (R) design can be either face or hub mounted depending on the application. These couplings are also available with a tapered bushing.

SKF Flex Couplings consist of 2 flanges and 1 tyre. The flanges are phosphate coated for improved corrosion resistance. The addition of a standard sized spacer flange can be used to accommodate applications where it is advantageous to move either shaft axially without disturbing either driving or driven machines.

SKF Flex tyres are available in natural rubber compounds for applications ranging from –50 to +50 °C. Chloroprene rubber compounds should be used in applications where exposure to greases and oils are likely. These compounds can accommodate temperatures ranging from –15 to +70 °C. The chloroprene tyres should be used where fire-resistance and anti-static (F.R.A.S.) properties are required.

Selection

1 Service factor
Determine the required service factor from **tables 7** and **8** on **pages 60** and **61**.

2 Design power
Multiply the normal running power by the service factor. This gives the design power for coupling selection.

3 Coupling size
Using the data from **table 1** on **page 35**, find the speed rating for a coupling that has a power that is greater than the design power. The required SKF Flex coupling is listed at the head of the column.

4 Bore size
Using product tables on **page 38** and **39**, check if the chosen flanges can accommodate both the driving and driven shafts.

Example

A SKF Flex coupling is required to transmit 30 kW from an electric motor running at 1 440 r/min to a centrifugal pump for 14 hours per day. The diameter of the motor shaft is 30 mm. The diameter of the pump shaft is 25 mm. A tapered bore is required.

1 Service factor
The appropriate service factor is 1. See **tables 7** and **8** on **pages 60** and **61**.

2 Design power
Design power = 30 **×** 1 = 30 kW

3 Coupling size
By searching for 1 440 r/min in **table 1** on **page 35**, the first power figure to exceed the required 30 kW in step (2) is 37,70 kW. The size of the coupling is 70.

4 Bore size
By referring to product tables on **page 38** and **39**, it can be seen that both shaft diameters fall within the bore range available. Please note that for this coupling the bore sizes for the Face and Hub design are different.

Engineering data

Power ratings

Maximum torque figures should be treated as short duration overload ratings occurring in circumstances such as direct-on-line starting.

For speeds not shown, calculate the nominal torque for the design application using the formula below and select a coupling based on the nominal torque ratings.

$$\text{Nominal torque (Nm)} = \frac{\text{Design power (kW)} \times 9\,549}{\text{r/min}}$$

For additional information about SKF Flex Couplings, see **table 1** and **2**.

Table 1

Power ratings (kW)

Speed	Coupling size														
	40	50	60	70	80	90	100	110	120	140	160	180	200	220	250
r/min	kW														
50	0,13	0,35	0,66	1,31	1,96	2,62	3,53	4,58	6,96	12,17	19,74	32,83	48,82	60,73	76,83
100	0,25	0,69	1,33	2,62	3,93	5,24	7,07	9,16	13,93	24,35	39,48	65,65	97,64	121,47	153,66
200	0,50	1,38	2,66	5,24	7,85	10,47	14,14	18,32	27,85	48,69	78,95	131,31	195,29	242,93	307,33
300	0,75	2,07	3,99	7,85	11,78	15,71	21,20	27,49	41,78	73,04	118,43	196,96	292,93	364,40	460,99
400	1,01	2,76	5,32	10,47	15,71	20,94	28,27	36,65	55,71	97,38	157,91	262,62	390,58	485,86	614,66
500	1,26	3,46	6,65	13,09	19,63	26,18	35,34	45,81	69,63	121,73	197,38	328,27	488,22	607,33	768,32
600	1,51	4,15	7,98	15,71	23,56	31,41	42,41	54,97	83,56	146,07	236,86	393,93	585,86	728,80	921,99
700	1,76	4,84	9,31	18,32	27,49	36,65	49,48	64,14	97,49	170,42	276,34	459,58	683,51	850,26	1 075,65
720	1,81	4,98	9,57	18,85	28,27	37,70	50,89	65,97	100,27	175,29	284,23	472,71	703,04	874,55	1 106,39
800	2,01	5,53	10,64	20,94	31,41	41,88	56,54	73,30	111,41	194,76	315,81	525,24	781,15	971,73	1 229,32
900	2,26	6,22	11,97	23,56	35,34	47,12	63,61	82,46	125,34	219,11	355,29	590,89	878,80	1 093,19	1 382,98
960	2,41	6,63	12,77	25,13	37,70	50,26	67,85	87,96	133,70	233,72	378,97	630,28	937,38	1 166,07	1 475,18
1 000	2,51	6,91	13,30	26,18	39,27	52,36	70,68	91,62	139,27	243,46	394,76	656,54	976,44	1 214,66	1 536,65
1 200	3,02	8,29	15,96	31,41	47,12	62,83	84,82	109,95	167,12	292,15	473,72	787,85	1 171,73	–	–
1 400	3,52	9,68	18,62	36,65	54,97	73,30	98,95	128,27	194,97	340,84	552,67	919,16	–	–	–
1 440	3,62	9,95	19,15	37,70	56,54	75,39	101,78	131,94	200,54	350,58	568,46	945,42	–	–	–
1 600	4,02	11,06	21,28	41,88	62,83	83,77	113,09	146,60	222,83	389,53	631,62	–	–	–	–
1 800	4,52	12,44	23,94	47,12	70,68	94,24	127,23	164,92	250,68	438,22	–	–	–	–	–
2 000	5,03	13,82	26,60	52,36	78,53	104,71	141,36	183,25	278,53	–	–	–	–	–	–
2 200	5,53	15,20	29,26	57,59	86,39	115,18	155,50	201,57	–	–	–	–	–	–	–
2 400	6,03	16,59	31,92	62,83	94,24	125,65	169,63	–	–	–	–	–	–	–	–
2 600	6,53	17,97	34,58	68,06	102,09	136,13	183,77	–	–	–	–	–	–	–	–
2 800	7,04	19,35	37,24	73,30	109,95	146,60	–	–	–	–	–	–	–	–	–
2 880	7,24	19,90	38,30	75,39	113,09	150,79	–	–	–	–	–	–	–	–	–
3 000	7,54	20,73	39,90	78,53	117,80	157,07	–	–	–	–	–	–	–	–	–
3 600	9,05	24,88	47,87	94,24	–	–	–	–	–	–	–	–	–	–	–
Nominal torque (Nm)	24	66	127	250	375	500	675	875	1 330	2 325	3 770	6 270	9 325	11 600	14 675
Max torque (Nm)	64	160	318	487	759	1 096	1 517	2 137	3 547	5 642	9 339	16 455	23 508	33 125	42 740

Table 2

Assembled coupling characteristics

Coupling size	Maximum speed	Mass	Inertia	Torsional stiffness	Misalignment			Nominal torque	Max torque	Screw size	Clamping screw torque
					Angular	Parallel	Axial				
–	r/min	kg	kg/m²	Nm/°	°	mm		Nm	Nm	–	Nm
40	4 500	0,1	0,00074	5	4	1,1	1,3	24	64	M6	15
50	4 500	0,3	0,00115	13	4	1,3	1,7	66	160	M6	15
60	4 000	0,5	0,0052	26	4	1,6	2,0	127	318	M6	15
70	3 600	0,7	0,009	41	4	1,9	2,3	250	487	M8	24
80	3 100	1,0	0,017	63	4	2,1	2,6	375	759	M8	24
90	3 000	1,1	0,031	91	4	2,4	3,0	500	1 096	M10	40
100	2 600	1,1	0,054	126	4	2,6	3,3	675	1 517	M10	40
110	2 300	1,4	0,078	178	4	2,9	3,7	875	2 137	M10	40
120	2 050	2,3	0,013	296	4	3,2	4,0	1 330	3 547	M12	50
140	1 800	2,6	0,255	470	4	3,7	4,6	2 325	5 642	M12	55
160	1 600	3,4	0,380	778	4	4,2	5,3	3 770	9 339	M16	80
180	1 500	7,7	0,847	1 371	4	4,8	6,0	6 270	16 455	M16	105
200	1 300	8,0	1,281	1 959	4	5,3	6,6	9 325	23 508	M16	120
220	1 100	10,0	2,104	2 760	4	5,8	7,3	11 600	33 125	M20	165
250	1 000	15,0	3,505	3 562	4	6,6	8,2	14 675	42 740	M20	165

Order data

A complete SKF Flex coupling consists of:
2 flanges and 1 tyre.

For additional information about ordering a coupling see **table 3.**

Table 3

Order data

Coupling type	Flanges	Qty	Element	Qty	Spacer shaft	Qty	Spacer flange and shaft[1]	Qty	Ring kit	Qty
RSB both sides	PHE F70RSBFLG	2	PHE F70NRTYRE	1	–	–	–	–	–	–
	PHE F70FRTYRE	–	–		–	–	–	–	–	–
RSB/F combination	PHE F70RSBFLG	1	PHE F70NRTYRE or	1	–	–	–	–	–	–
	PHE F70FTBFLG	1	PHE F70FRTYRE	–	PHF TB2012X…MM	1	PHE SM25–…DBSE	1	PHF 2517X…MM	1
RSB/H combination	PHE F70RSBFLG	1	PHE F70NRTYRE or	1	–	–	–	–	–	–
	PHE F70HTBFLG	1	PHE F70FRTYRE		PHF TB1610X…MM	1	PHE SM25–…DBSE	1	PHF 2517X…MM	1
F/F Combination	PHE F70FTBFLG	2	PHE F70NRTYRE or	1	PHF TB2012X…MM	1	PHE SM25–…DBSE	1	PHF 2517X…MM	1
	PHE F70FTBFLG	2	PHE F70FRTYRE	–	PHF TB2012X…MM	1	–	–	–	–
H/H Combination	PHE F70HTBFLG	1	PHE F70NRTYRE or	1	PHF TB1610X…MM	1	PHE SM25–…DBSE	1	PHF 2517X…MM	1
	PHE F70HTBFLG	1	PHE F70FRTYRE		PHF TB1610X…MM	1	–	–	–	–
F/H Combination	PHE F70FTBFLG	1	PHE F70NRTYRE or	1	PHF TB1610X…MM	1	PHE SM25–…DBSE	1	PHF 2517X…MM	1
	PHE F70HTBFLG	1	PHE F70FRTYRE		PHF TB2012X…MM	1	–	–	–	–
Reversible	PHE F70RTBFLG	2	PHE 50GCCOVER	2	PHF TB1610X…MM	2	–	–	–	–

[1] To complete designation add distance between shaft ends. PHE SM25-100DBSE.

An SKF Flex coupling consists of 2 flanges and 1 tyre. An SKF Flex Spacer Coupling consists of 2 flanges, 1 tyre and 1 spacer (spacer part number consists of spacer shaft and rigid flange).

Installation

1 All metal components should be cleaned. Be sure to remove the protective coating on the flange bores. The tapered bushings should be placed into the flanges and the screws lightly tightened.

2 If internal clamping rings are being used (size 40–60), position them onto the shaft (**1**). Place the flanges next to the clamping ring on each shaft and position them so that dimension M is obtained between the flange faces (→ **table 4**).

Where tapered bushings are used, see separate fitting instructions supplied with the taper bushes.

Flanges with external clamping rings (sizes 70–250) should have the clamping rings fitted when installing, engaging only two or three of the threads of each screw at this time. These flanges should be positioned so that M is obtained by measuring the gap between the flange faces.

3 If shaft end float is to occur, locate the shafts at mid-position of end float when checking dimension M. Note that shaft ends may project beyond the faces of the flanges if required. In these cases, allow sufficient space between shaft ends for end float and misalignment.

4 Parallel alignment should be checked by placing a straight edge across the flanges at various points around the circumference (**3**). Angular alignment is checked by measuring the gap between the flanges at several positions around the circumference. Align the coupling as accurately as possible, particularly on high-speed applications.

5 Spread the tyre side walls apart and fit over the coupling flanges, making sure that the tyre beads seat properly on the flanges and clamping rings. To make sure that the tyre sits properly in position, it may be necessary to strike the outside diameter of the tyre with a small mallet (**4**). When the tyre is correctly positioned there, should be a gap between the ends of the tyre as shown in **table 5** (**5**).

6 Tighten clamping ring screws (**6**) alternately and evenly (half turn at a time), working round each flange until the required screw torque is achieved (→ **table 4**).

Table 4

SKF Flex coupling assembly data

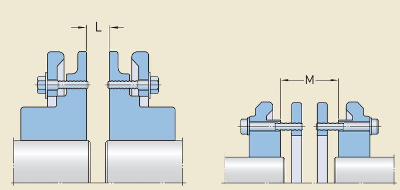
Coupling size	M size	Screw size	Clamping screw torque
–	mm	–	Nm
F40[1]	22	M6	15
F50[1]	25	M6	15
F60[1]	33	M6	15
F70	23	M8	24
F80	25	M8	24
F90	27	M10	40
F100	27	M10	40
F110	25	M10	40
F120	29	M12	50
F140	32	M12	55
F160	30	M16	80
F180	46	M16	105
F200	48	M16	120
F220	55	M20	165
F250	59	M20	165

[1] Hexagon socket caphead clamping screws on these sizes

Table 5

SKF Flex coupling tyre gap

Coupling size	Tyre gap
–	mm
F40 to F60	2
F70 to F120	3
F140 and F160	5
F180 to F250	6



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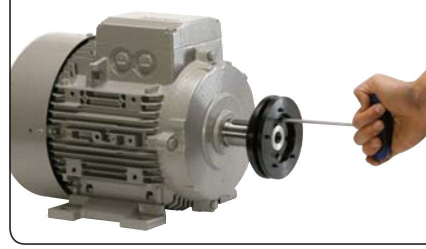

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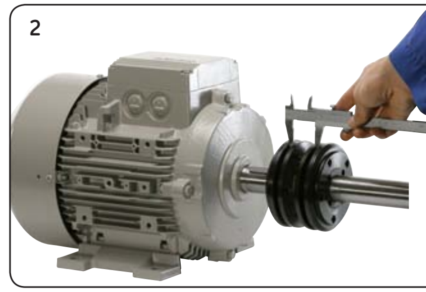

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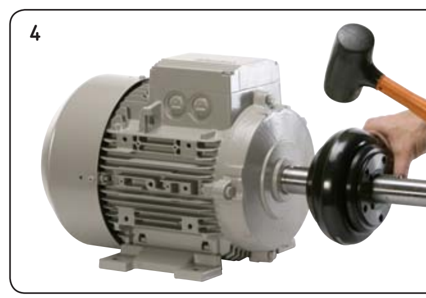

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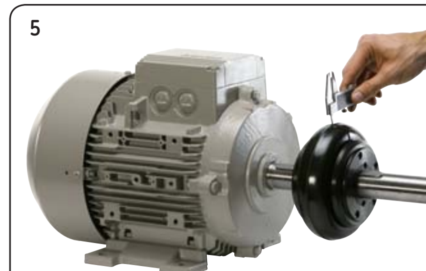
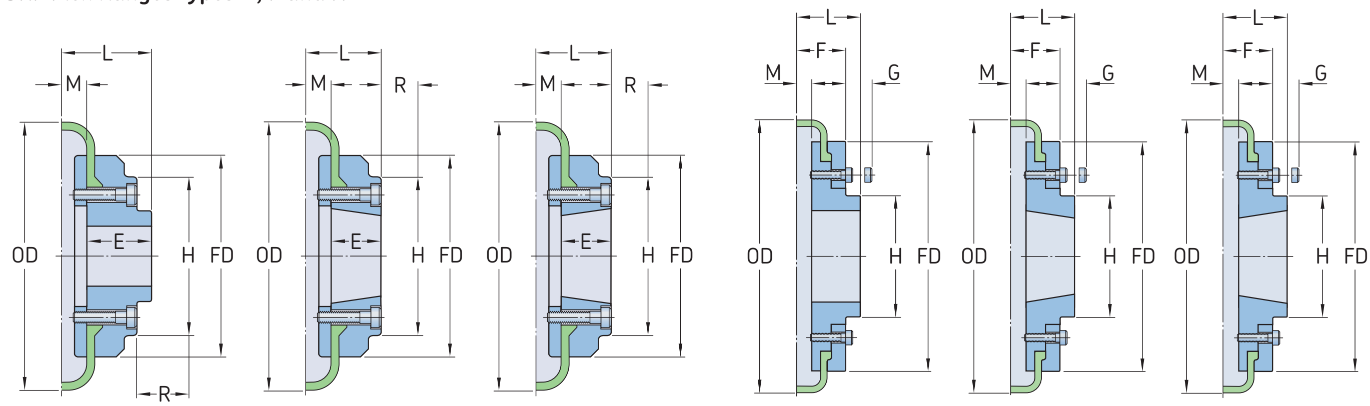


6


SKF Flex flanges types B, F and H

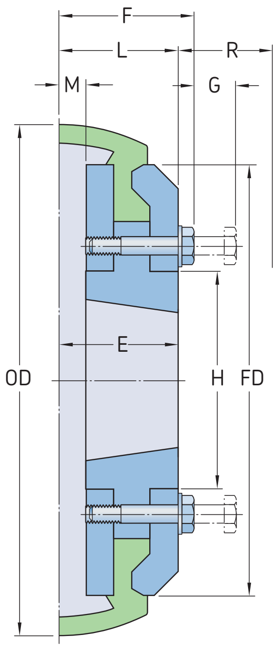


Size 40 to 60: Type B, Type F, Type H

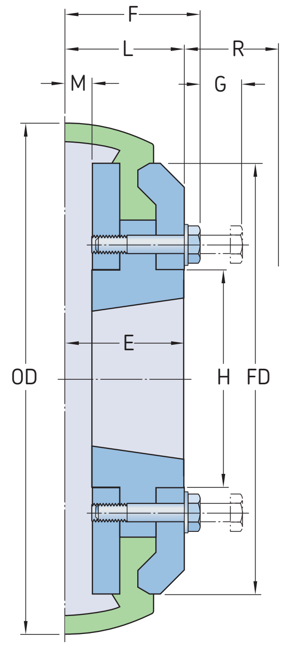
Size 70 to 250: Type B, Type F, Type H

Size	Type	Bush No.	Dimensions Bore Min.	Max.	Types F & H L	E	Type B L	E	Key screw	OD	FD	H	F	R[1]	G[2]	M	Mass	Inertia	Designation	Tyre designation Natural	F.R.A.S
mm	–	–	mm														kg	kg/m²	–		
40	B	–	–	30	–	–	33,0	22	M5	104	82	–	–	29	–	11,0	0,80	0,00074	**PHE F40RSBFLG**	**PHE F40NRTYRE**	**PHE F40FRTYRE**
40	F	1008	9	25	33,0	22	–	–	–	104	82	–	–	29	–	11,0	0,80	0,00074	**PHE F40FTBFLG**	**PHE F40NRTYRE**	**PHE F40FRTYRE**
40	H	1008	9	25	33,0	22	–	–	–	104	82	–	–	29	–	11,0	0,80	0,00074	**PHE F40HTBFLG**	**PHE F40NRTYRE**	**PHE F40FRTYRE**
50	B	–	–	38	–	–	45,0	32	M5	133	100	79	–	38	–	12,5	1,20	0,00115	**PHE F50RSBFLG**	**PHE F50NRTYRE**	**PHE F50FRTYRE**
50	F	1210	11	32	37,5	25	–	–	–	133	100	79	–	38	–	12,5	1,20	0,00115	**PHE F50FTBFLG**	**PHE F50NRTYRE**	**PHE F50FRTYRE**
50	H	1210	11	32	37,5	25	–	–	–	133	100	79	–	38	–	12,5	1,20	0,00115	**PHE F50HTBFLG**	**PHE F50NRTYRE**	**PHE F50FRTYRE**
60	B	–	–	45	–	–	55,0	38	M6	165	125	70	–	38	–	16,5	2,00	0,0052	**PHE F60RSBFLG**	**PHE F60NRTYRE**	**PHE F60FRTYRE**
60	F	1610	14	42	41,5	25	–	–	–	165	125	103	–	38	–	16,5	2,00	0,0052	**PHE F60FTBFLG**	**PHE F60NRTYRE**	**PHE F60FRTYRE**
60	H	1610	14	42	41,5	25	–	–	–	165	125	103	–	38	–	16,5	2,00	0,0052	**PHE F60HTBFLG**	**PHE F60NRTYRE**	**PHE F60FRTYRE**
70	B	–	–	60	–	–	47,0	35	M10	187	142	80	50	–	13	11,5	3,10	0,009	**PHE F70RSBFLG**	**PHE F70NRTYRE**	**PHE F70FRTYRE**
70	F	2012	14	50	43,5	32	–	–	–	187	142	80	50	42	13	11,5	3,10	0,009	**PHE F70FTBFLG**	**PHE F70NRTYRE**	**PHE F70FRTYRE**
70	H	1610	14	42	36,5	25	–	–	–	187	142	80	50	38	13	11,5	3,00	0,009	**PHE F70HTBFLG**	**PHE F70NRTYRE**	**PHE F70FRTYRE**
80	B	–	–	63	–	–	55,0	42	M10	211	165	98	54	–	16	12,5	4,90	0,018	**PHE F80RSBFLG**	**PHE F80NRTYRE**	**PHE F80FRTYRE**
80	F	2517	16	60	57,5	45	–	–	–	211	165	98	54	48	16	12,5	4,90	0,018	**PHE F80FTBFLG**	**PHE F80NRTYRE**	**PHE F80FRTYRE**
80	H	2012	14	50	44,5	32	–	–	–	211	165	98	54	32	16	12,5	4,60	0,017	**PHE F80HTBFLG**	**PHE F80NRTYRE**	**PHE F80FRTYRE**
90	B	–	–	75	–	–	62,5	49	M12	235	187	112	60	–	16	13,5	7,10	0,032	**PHE F90RSBFLG**	**PHE F90NRTYRE**	**PHE F90FRTYRE**
90	F	2517	16	60	58,5	45	–	–	–	235	187	108	60	48	16	13,5	7,00	0,031	**PHE F90FTBFLG**	**PHE F90NRTYRE**	**PHE F90FRTYRE**
90	H	2517	16	60	58,5	45	–	–	–	235	187	108	60	48	16	13,5	7,00	0,031	**PHE F90HTBFLG**	**PHE F90NRTYRE**	**PHE F90FRTYRE**
100	B	–	–	80	–	–	69,5	56	M12	254	214	125	62	–	16	13,5	9,90	0,055	**PHE F100RSBFLG**	**PHE F100NRTYRE**	**PHE F100FRTYRE**
100	F	3020	25	75	64,5	51	–	–	–	254	214	120	62	55	16	13,5	9,90	0,055	**PHE F100FTBFLG**	**PHE F100NRTYRE**	**PHE F100FRTYRE**
100	H	2517	16	60	58,5	45	–	–	–	254	214	113	62	48	16	13,5	9,40	0,054	**PHE F100HTBFLG**	**PHE F100NRTYRE**	**PHE F100FRTYRE**
110	B	–	–	90	–	–	75,5	63	M12	279	232	128	62	–	16	12,5	12,50	0,081	**PHE F110RSBFLG**	**PHE F110NRTYRE**	**PHE F110FRTYRE**
110	F	3020	25	75	63,5	51	–	–	–	279	232	134	62	55	16	12,5	11,70	0,078	**PHE F110FTBFLG**	**PHE F110NRTYRE**	**PHE F110FRTYRE**
110	H	3020	25	75	63,5	51	–	–	–	279	232	134	62	55	16	12,5	11,70	0,078	**PHE F110HTBFLG**	**PHE F110NRTYRE**	**PHE F110FRTYRE**
120	B	–	–	100	–	–	84,5	70	M16	314	262	143	67	–	16	14,5	16,90	0,137	**PHE F120RSBFLG**	**PHE F120NRTYRE**	**PHE F120FRTYRE**
120	F	3525	35	100	79,5	65	–	–	–	314	262	140	67	67	16	14,5	16,50	0,137	**PHE F120FTBFLG**	**PHE F120NRTYRE**	**PHE F120FRTYRE**
120	H	3020	25	75	65,5	51	–	–	–	314	262	140	67	55	16	14,5	15,90	0,130	**PHE F120HTBFLG**	**PHE F120NRTYRE**	**PHE F120FRTYRE**
140	B	–	–	125	–	–	110,5	94	M20	3,59	312,5	180	73	–	17	16,0	22,20	0,254	**PHE F140RSBFLG**	**PHE F140NRTYRE**	**PHE F140FRTYRE**
140	F	3525	35	100	81,0	65	–	–	–	359	312,5	180	73	67	17	16,0	22,30	0,255	**PHE F140FTBFLG**	**PHE F140NRTYRE**	**PHE F140FRTYRE**
140	H	3525	35	100	81,0	65	–	–	–	359	312,5	180	73	67	17	16,0	22,30	0,255	**PHE F140HTBFLG**	**PHE F140NRTYRE**	**PHE F140FRTYRE**
160	B	–	–	140	–	–	117,0	102	M20	402	348	197	78	–	19	15,0	35,80	0,469	**PHE F160RSBFLG**	**PHE F160NRTYRE**	**PHE F160FRTYRE**
160	F	4030	40	115	91,0	76	–	–	–	402	348	197	78	80	19	15,0	32,50	0,380	**PHE F160FTBFLG**	**PHE F160NRTYRE**	**PHE F160FRTYRE**
160	H	4030	40	115	91,0	76	–	–	–	402	348	197	78	80	19	15,0	32,50	0,380	**PHE F160HTBFLG**	**PHE F160NRTYRE**	**PHE F160FRTYRE**
180	B	–	–	150	–	–	137,0	114	M20	470	396	205	94	–	19	23,0	49,10	0,871	**PHE F180RSBFLG**	**PHE F180NRTYRE**	**PHE F180FRTYRE**
180	F	4535	55	125	112,0	89	–	–	–	470	396	205	94	89	19	23,0	42,20	0,847	**PHE F180FTBFLG**	**PHE F180NRTYRE**	**PHE F180FRTYRE**
180	H	4535	55	125	112,0	89	–	–	–	470	396	205	94	89	19	23,0	42,20	0,847	**PHE F180HTBFLG**	**PHE F180NRTYRE**	**PHE F180FRTYRE**
200	B	–	–	150	–	–	138,0	114	M20	508	432	205	103	–	19	24,0	58,20	1,301	**PHE F200RSBFLG**	**PHE F200NRTYRE**	**PHE F200FRTYRE**
200	F	4535	55	125	113,0	89	–	–	–	508	432	205	103	89	19	24,0	53,60	1,281	**PHE F200FTBFLG**	**PHE F200NRTYRE**	**PHE F200FRTYRE**
200	H	4535	55	125	113,0	89	–	–	–	508	432	205	103	89	19	24,0	53,60	1,281	**PHE F200HTBFLG**	**PHE F200NRTYRE**	**PHE F200FRTYRE**
220	B	–	–	160	–	–	154,5	127	M20	562	472	224	118	–	20	27,5	79,60	2,142	**PHE F220RSBFLG**	**PHE F220NRTYRE**	**PHE F220FRTYRE**
220	F	5040	70	125	129,5	102	–	–	–	562	472	224	118	92	20	27,5	72,00	2,104	**PHE F220FTBFLG**	**PHE F220NRTYRE**	**PHE F220FRTYRE**
220	H	5040	70	125	129,5	102	–	–	–	562	472	224	118	92	20	27,5	72,00	2,104	**PHE F220HTBFLG**	**PHE F220NRTYRE**	**PHE F220FRTYRE**
250	B	–	–	190	–	–	161,5	132	M20	628	532	254	125	–	25	29,5	104,00	3,505	**PHE F250RSBFLG**	**PHE F250NRTYRE**	**PHE F250FRTYRE**

[1] Is the clearance required to allow tightening of the clamping screws and the tapered bushing. Use of a shortened wrench will reduce this dimension.
[2] The amount by which the clamping screws need to be withdrawn to release the tyre.
For coupling sizes 70, 80, 100 and 120 "F" flanges require a larger bushing than "H" flanges.
Mass and inertia figures are for a single flange with midrange bore and include clamping ring, screws, washers and half tyre.



Position A



Position B

Size	Bush No.	Dimensions												Mass	Inertia	Designation
		Bore Min.	Max.	L	E	R	Key screw	OD	FD	H	F	G2)	M			
–	–	mm												kg	kg/m²	–
70	1610	14	42	37	25	42	M8	187	142	80	44,25	13	11,5	3	0,009	**PHE F70RTBFLG**
80	2012	14	50	45,5	32	48	M8	211	165	98	52,75	16	12,5	4,6	0,017	**PHE F80RTBFLG**
90	2517	16	60	58,5	45	48	M10	235	187	112	67,86	16	13,5	7	0,031	**PHE F90RTBFLG**
100	2517	16	60	59,5	45	55	M10	254	214	125	68,86	16	13,5	9,4	0,054	**PHE F100RTBFLG**
110	3020	25	75	64,5	51	55	M10	279	232	134	73,68	16	12,5	11,7	0,078	**PHE F110RTBFLG**
120	3020	25	75	66,5	51	67	M12	314	262	140	77,18	16	14,5	15,9	0,13	**PHE F120RTBFLG**

1) Is the clearance required to allow tightening of the clamping screws and the tapered bushing. Use of a shortened wrench will reduce this dimension.
2) The distance that the clamping screws need to be withdrawn to release the tyre.
For coupling sizes 70, 80, 100 and 120 “F” flanges require a larger bushing than “H” flanges.
Mass and inertia figures are for a single flange with midrange bore and include clamping rings, screws, washers and a half tyre.

SKF Flex Spacer Coupling

The SKF Flex coupling spacer is used to join two shaft ends that cannot be positioned close enough to just use a coupling alone.

The spacer also allows removal of a shaft without the need to move either the driving or the driven machine. For example, this allows easy and fast replacement of impellers in pump applications.

Table 6

Distance between shaft ends (DBSE)

Coupling size	Distance between shaft ends (DBSE)		Spacer bush size	Bore		Coupling bush size	Bore		Designation
	Nominal min.	Nominal max.		Min	Max		Min	Max	
mm	mm		mm	mm		mm	mm		–
40	80	90	1 210	11	32	1 008	9	25	**PHE SM12–80DBSE**
40	100	110	1 210	11	32	1 008	9	25	**PHE SM12–100DBSE**
40	100	113	1 615	14	42	1 008	9	25	**PHE SM16–100DBSE**
40	140	150	1 615	14	42	1 008	9	25	**PHE SM16–140DBSE**
50	100	116	1 615	14	42	1 210	11	32	**PHE SM16–100DBSE**
50	140	156	1 615	14	42	1 210	11	32	**PHE SM16–140DBSE**
60	100	124	1 615	14	42	1 610	14	42	**PHE SM16–100DBSE**
60	140	164	1 615	14	42	1 610	14	42	**PHE SM16–140DBSE**
70	100	114	2 517	16	60	2 012	14	50	**PHE SM25–100DBSE**
70	140	154	2 517	16	60	2 012	14	50	**PHE SM25–140DBSE**
70	180	194	2 517	16	60	2 012	14	50	**PHE SM25–180DBSE**
80	100	117	2 517	16	60	2 517	16	60	**PHE SM25–100DBSE**
80	140	157	2 517	16	60	2 517	16	60	**PHE SM25–140DBSE**
80	180	197	2 517	16	60	2 517	16	60	**PHE SM25–180DBSE**
90	140	158	2 517	16	60	2 517	16	60	**PHE SM25–140DBSE**
90	180	198	2 517	16	60	2 517	16	60	**PHE SM25–180DBSE**
100	140	158	3 020	25	75	3 020	25	75	**PHE SM30–140DBSE**
100	180	198	3 020	25	75	3 020	25	75	**PHE SM30–180DBSE**
110	140	156	3 020	25	75	3 020	25	75	**PHE SM30–140DBSE**
110	180	196	3 020	25	75	3 020	25	75	**PHE SM30–180DBSE**
120	140	160	3 525	35	100	3 525	35	100	**PHE SM35–140DBSE**
120	180	200	3 525	35	100	3 525	35	100	**PHE SM35–180DBSE**
140	140	163	3 525	35	100	3 525	35	100	**PHE SM35–140DBSE**
140	180	203	3 525	35	100	3 525	35	100	**PHE SM35–180DBSE**

Installation

1 Place each tapered bushing in the correct flange and tighten the screws lightly.

2 If keys are being used, side fitting keys with top clearance should be used.

3 Use a straight edge to align the face of the clamping ring for coupling sizes F40–F60 (→ **fig. 1a**) or the flange for coupling sizes F70–F250 (→ **fig. 1b**) with the shaft end. A dial indicator can be used to check that the runout of the spacer flange is within limits indicated in **fig. 1a** and **b**.

Position the SKF Flex flange on the spacer flange shaft to dimension "Y" shown in **table 7** and secure it with a tapered bushing. This will allow for "M" and DBSE dimensions (→ **fig. 1c**) to be maintained when assembling. If necessary, the distance between shaft ends (DBSE) may be extended. The maximum DBSE possible is achieved when the spacer shaft end and driven shaft end are flush with the face of their respective tapered bushings.

4 Position the spacer sub-assembly in line with the spacer flange (→ **fig. 1d**), engage spigot align holes and insert screws. The torque values are given in **table 8**. Spread the tyre side walls apart and fit over the coupling flanges making sure that the tyre beads seat properly on the flanges and clamping rings.

To make sure that the tyre sits properly in position, it may be necessary to strike the outside diameter of the tyre with a small mallet. When the tyre is correctly positioned, there should be a gap between the ends of the tyre as shown in **table 5**.

5 Tighten the clamping ring screws alternately and evenly (half turn at a time), working around each flange until the required screw torque is achieved, as indicated in **table 8**.

To dismantle

1 Place a support underneath the spacer sub-assembly to prevent it from falling.

2 Remove clamping ring screws evenly (half turn per screw at a time) to prevent the clamping rings from distorting.

3 When the clamping rings are loose, remove the tyre. Then remove the remaining screws and spacer.

Table 7

Additional assembly data

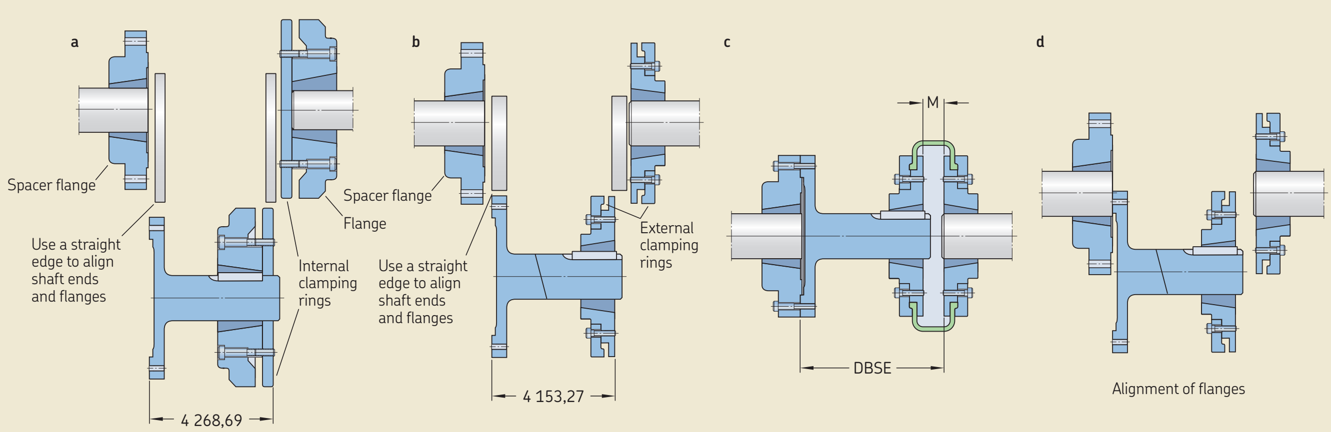
Size	"Y" for nominal DBSE		
	100	140	180
–	mm		
40	83	123	–
50	82	122	–
60	75	115	155
70	76	116	156
80	74	114	154
90	111	151	–
100	111	151	–
110	115	155	–
120	111	151	–
140	104	144	–

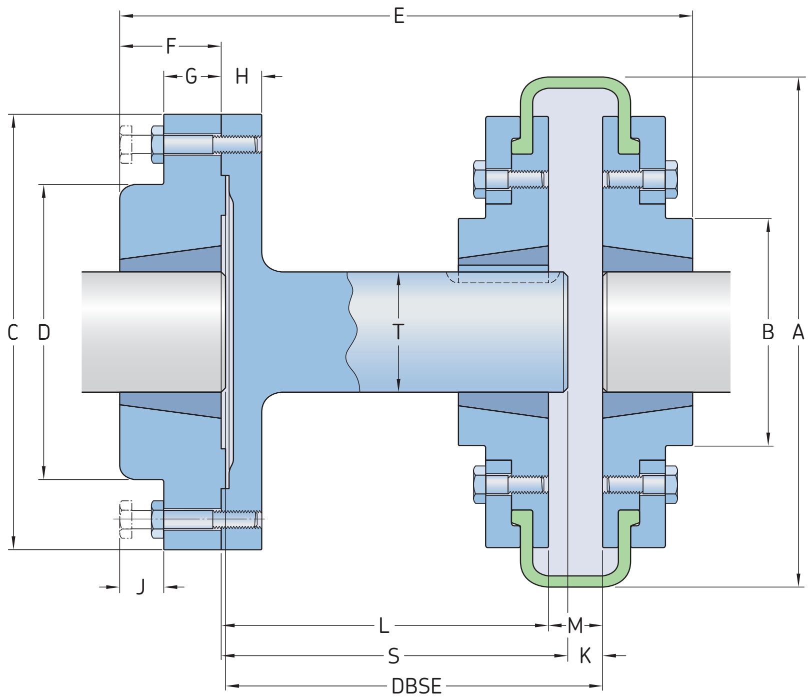
Table 8

Clamping screw torque

Size	Screw size	Torque
–	–	Nm
40	83	123
50	82	122
60	75	115
70	76	116
80	74	114
90	111	151
100	111	151
110	115	155
120	111	151
140	104	144

Fig. 1





Coupling size	Dimensions														Designation
	A	B	C	D	E	F	G	H	J	K	L	M	S	T	
mm	mm														–
40	104	82	118	83	134	25	14	15	14	6	65	22	77	25	**PHE SM12–80DBSE**
40	104	82	118	83	140	25	14	15	14	22	77	22	77	25	**PHE SM12–100DBSE**
40[1]	104	82	127	80	157	38	18	15	14	9	88	22	94	32	**PHE SM16–100DBSE**
40[1]	104	82	127	80	187	38	18	15	14	9	128	22	134	32	**PHE SM16–140DBSE**
50	133	79	127	80	160	38	18	15	14	9	85	25	94	32	**PHE SM16–100DBSE**
50	133	79	127	80	200	38	18	15	14	9	125	25	134	32	**PHE SM16–140DBSE**
60	165	103	127	80	161	38	18	15	14	9	78	33	94	32	**PHE SM16–100DBSE**
60	165	103	127	80	201	38	18	15	14	9	118	33	134	32	**PHE SM16–140DBSE**
70[2]	187	80	178	123	180	45	22	16	14	9	80	23	94	48	**PHE SM25–100DBSE**
70[2]	187	80	178	123	220	45	22	16	14	9	120	23	174	48	**PHE SM25–140DBSE**
70[2]	187	80	178	123	260	45	22	16	14	9	160	23	174	48	**PHE SM25–180DBSE**
80	211	95	178	123	193	45	22	16	14	9	78	25	94	48	**PHE SM25–100DBSE**
80	211	95	178	123	233	45	22	16	14	9	118	25	134	48	**PHE SM25–140DBSE**
80	211	95	178	123	273	45	22	16	14	9	158	25	174	48	**PHE SM25–180DBSE**
90	235	108	178	123	233	45	22	16	14	9	116	27	134	48	**PHE SM25–140DBSE**
90	235	108	178	123	273	45	22	16	14	9	156	27	174	48	**PHE SM25–180DBSE**
100	254	120	216	146	245	51	29	20	17	9	116	27	134	60	**PHE SM30–140DBSE**
100	254	120	216	146	285	51	29	20	17	9	156	27	174	60	**PHE SM30–180DBSE**
110	279	134	216	146	245	51	29	20	17	9	118	25	134	60	**PHE SM30–140DBSE**
110	279	134	216	146	285	51	29	20	17	9	158	25	174	60	**PHE SM30–180DBSE**
120	314	140	248	178	272	63	34	20	17	9	114	29	134	80	**PHE SM35–140DBSE**
120	314	140	248	178	312	63	34	20	17	9	154	29	174	80	**PHE SM35–180DBSE**
140	359	178	248	178	271	63	34	20	17	9	111	27	134	80	**PHE SM35–140DBSE**
140	359	178	248	178	312	63	34	20	17	9	151	27	174	80	**PHE SM35–180DBSE**

1) “B” Flange must be used to fit spacer shaft
2) “F” Flange must be used to fit spacer shaft

SKF Chain Couplings

Chain couplings are able to transmit higher torque than their shafts, making them ideal for high torque applications. Available with a pilot bore, finished bore or tapered bushing (face or hub), flanges are linked together with duplex roller chains enabling them to accommodate up to 2° of misalignment.

To help provide maximum service life and reliability, particularly for high speed applications, SKF recommends fitting all chain couplings with a cover and lubricating them properly. If a chain coupling is to be subjected to reversing operations, shock or pulsating loads, or other severe operating conditions, select a coupling one size larger than normal.

Selection

Standard selection method

This selection procedure can be used for most motor, turbine, or engine driven applications. The following information is required to select an SKF chain coupling:

- Torque – power [kW]
- Input speed [r/min]
- Type of equipment and application
- Shaft diameters
- Physical space limitations
- Special bore or finish requirements

1 Service factor
Determine the service factor from **table 7** and **8** on **page 60** and **61**.

2 Design power
Determine the required minimum design power as shown below:

Design power = Service factor × normal running power [kW]

Using **table 2** on **page 45**, search for the appropriate speed until a power rating greater than the design power is found. The required chain coupling size is listed at the head of the table.

3 Size
Select the appropriate coupling from the product table on **page 47** and check that chosen flanges can accommodate both driven and driving shafts.

4 Other considerations
Possible other restrictions might be speed [r/min], bore and dimensions.

Example

Select a coupling to connect a 30 kW, 1 500 r/min electric motor driving a boiler feed pump. The motor shaft diameter is 55 mm and the pump shaft diameter 45 mm. Shaft extensions are 140 mm and 110 mm respectively. The selection is replacing a gear type coupling.

1 Service factor
From **table 8** on **page 61** = 1,50

2 Required design power:
1,5 × 30 kW = 45 kW

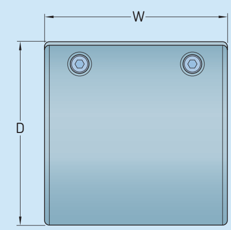
3 Coupling size
Look under 1 500 r/min in **table 2** on **page 45** and choose the first power figure which exceeds the required 45 kW. This is 95,2 kW of coupling size 1218.

By referring to the product table on **page 47**, it can be seen that both shaft diameters fall within the bore range available.

4 Other considerations
The speed capacity of 3 000 r/min (coupling size 1218) exceeds the required speed of 1 500 r/min. The maximum bore capacity of 62 mm exceeds the required shaft diameters of 55 mm and 45 mm. The resulting service factor is 2,11. This will provide a very good service life for the coupling and a high level of reliability.

Table 1

Coupling covers



Cover size	Aluminum D	Aluminum W	Weight	Plastic D	Plastic W	Weight
–	mm		kg	mm		kg
IS0816[1)]	102	51	0,42	102	59	0,9
IS1016[1)]	130	60	0,59	130	67	1,32
IS1018[1)]	130	60	0,59	130	67	1,32
IS1218[1)]	162	75	1,20	175	78	1,98
IS1220[1)]	162	75	1,20	175	78	1,98
IS1222[1)]	208	102	1,45	175	78	2,22
IS1618	208	102	1,45	210	106	2,22
IS1620	208	102	1,45	210	106	2,22
IS2018	257	133	4,80	238	151	3,97
IS2020	257	133	4,80	257	133	5,74
IS2418	289	187	8,10	289	187	7,47
IS2422	337	202	9,20	337	202	8,85

SKF

Engineering data

Power ratings

Maximum torque figures should be treated as short duration overload ratings occurring in circumstances such as direct-on-line starting.

For speeds not shown, calculate the nominal torque for the application using the following formula and select a coupling according to nominal torque ratings.

$$\text{Nominal torque (Nm)} = \frac{\text{Design power (kW)} \times 9\,549}{\text{r/min}}$$

For additional information about chain couplings, such as chain cover data, please refer to **table 1** and **2**.

Table 2

Power ratings

Size	Max torque	Max r/min	Bore Min.	Bore Max.	kW ratings at given r/min: 1	5	10	25	50	100	200	300	400	500	600	800	1 000	1 200	2 500	3 000	3 600	4 000	4 800
–	Nm	r/min	mm		kW																		
0816	386	5 000	16	24	0,04	0,21	0,41	1,03	2,06	3,09	4,69	6,17	7,41	8,85	10,1	12,5	15,3	17,3	31,9	37,0	43,0	46,9	54,9
1016	735	4 000	16	43	0,08	0,39	0,78	1,95	3,91	5,86	8,92	11,7	14,1	16,8	19,2	23,8	28,9	32,9	60,6	70,4	81,6	–	–
1018	931	3 600	19	51	0,10	0,50	0,99	2,48	4,95	7,43	11,3	14,9	17,8	21,3	24,4	30,1	36,6	41,6	76,8	89,2	–	–	–
1218	1 750	3 000	25,5	62	0,18	0,93	1,87	4,67	9,33	14,0	21,3	28,0	33,6	40,1	45,9	56,8	69,1	78,4	145	–	–	–	–
1220	2 060	2 500	28,5	70	0,21	1,08	2,17	5,42	10,82	16,2	24,7	32,5	38,0	46,5	53,2	65,9	80,2	90,9	168,2	–	–	–	–
1222	2 370	2 500	28,5	76	0,25	1,25	2,51	6,31	12,5	18,8	28,6	37,7	45,3	54,1	61,9	76,5	93,1	105	195	–	–	–	–
1618	3 880	2 000	28,5	80	0,41	2,07	4,14	10,3	20,7	31,0	47,2	62,1	74,5	89,0	101	126	153	174	–	–	–	–	–
1620	5 580	2 000	38	91	0,48	2,44	4,89	12,2	24,4	36,6	55,7	73,3	87,9	105,0	119,2	148,7	180,5	205,3	–	–	–	–	–
2018	7 180	1 800	38	98,5	0,62	3,13	6,25	15,6	31,3	46,8	71,3	93,8	112,5	134,4	152,6	190,3	231,1	262,8	–	–	–	–	–
2020	8 780	1 800	38	117,5	0,93	4,66	9,33	23,3	46,6	70,0	106	140	168	200	229	283	345	392	–	–	–	–	–
2418	13 200	1 500	51	119	1,40	7,02	14,0	35,1	70,2	105	160	210	252	302	345	426	519	590	–	–	–	–	–
2422	17 100	1 200	51	156	1,81	9,07	18,1	45,3	90,7	136	206	272	326	390	446	551	671	762	–	–	–	–	–

Table 3

Order data

Size	Hub: Plain bore	Qty	FTB[1]	Qty	HTB[1]	Qty	Bored to size[2]	Qty	Chain	Qty	Covers	Qty
0816	PHE IS0816RSB	2 and/or	PHE IS0816FTB	2 and/or	PHE IS0816HTB	2 and/or	PHE IS0816X...	2	PHE IS0816CHN	1	PHE IS0816COVER	2
1016	PHE IS1016RSB	2 and/or	–	2 and/or	–	2 and/or	PHE IS1016X...	2	PHE IS1016CHN	1	PHE IS1016COVER	2
1018	PHE IS1018RSB	2 and/or	PHE IS1018FTB	2 and/or	PHE IS1018HTB	2 and/or	PHE IS1018X...	2	PHE IS1018CHN	1	PHE IS1018COVER	2
1218	PHE IS1218RSB	2 and/or	–	2 and/or	–	2 and/or	PHE IS1218X...	2	PHE IS1218CHN	1	PHE IS1218COVER	2
1220	PHE IS1220RSB	2 and/or	PHE IS1220FTB	2 and/or	PHE IS1220HTB	2 and/or	PHE IS1220X...	2	PHE IS1220CHN	1	PHE IS1220COVER	2
1222	PHE IS1222RSB	2 and/or	–	2 and/or	–	2 and/or	PHE IS1222X...	2	PHE IS1222CHN	1	PHE IS1222COVER	2
1618	PHE IS1618RSB	2 and/or	–	2 and/or	–	2 and/or	PHE IS1618X...	2	PHE IS1618CHN	1	PHE IS1618COVER	2
1620	PHE IS1620RSB	2 and/or	PHE IS1620FTB	2 and/or	PHE IS1620HTB	2 and/or	PHE IS1620X...	2	PHE IS1620CHN	1	PHE IS1620COVER	2
2018	PHE IS2018RSB	2 and/or	–	2 and/or	–	2 and/or	PHE IS2018X...	2	PHE IS2018CHN	1	PHE IS2018COVER	2
2020	PHE IS2020RSB	2 and/or	PHE IS2020FTB	2 and/or	PHE IS2020HTB	2 and/or	PHE IS2020X...	2	PHE IS2020CHN	1	PHE IS2020COVER	2
2418	PHE IS2418RSB	2 and/or	–	2 and/or	–	2 and/or	PHE IS2418X...	2	PHE IS2418CHN	1	PHE IS2418COVER	2
2422	PHE IS2422RSB	2 and/or	–	2 and/or	–	2 and/or	PHE IS2422X...	2	PHE IS2422CHN	1	PHE IS2422COVER	2

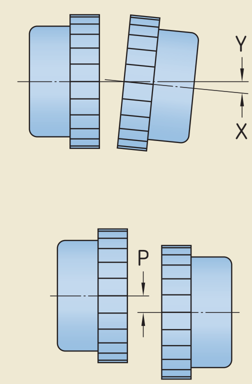
[1] Following chain coupling taper bush assembly configurations are possible: 2 hubs HTB or 2 hubs FTB or 1 hub HTB and 1 hub FTB.
[2] To complete bored to size designation, add bore size. For example: PHE IS1016X22MM designates hub size IS1016 with a 22 mm bore.

Order data

A complete chain coupling consists of:
2 hubs, 1 chain and 1 cover.

For additional information about ordering specific couplings, refer to **table 3**.

Installation



1 Cleaning
Clean all metal parts using non-flammable solvent and check hubs, shafts and keyways for burrs and remove if necessary. Mount the oil seal rings on the sprocket hubs. Install the sprocket hubs flush with the end of the shafts (**1**).

2 Gap and angular alignment
Measure the gap at various intervals and adjust to the "C" dimension specified in the product table on **page 47**. The measurement must not exceed a difference between points of more than 1° which is the allowable angular misalignment.

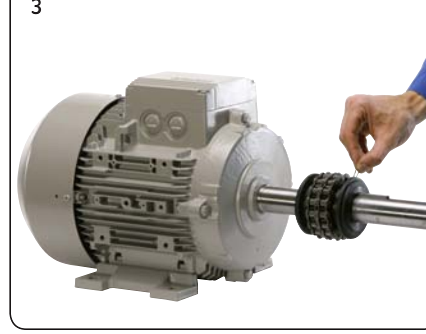
3 Offset alignment
Align the two hubs so that a straight edge rests squarely on both hubs (**2**). Repeat this at 90° intervals. Clearance must not exceed parallel misalignment of 2° which is the maximum allowable offset installation limit. Tighten all foundation bolts and repeat steps 2 and 3. Realign the coupling if necessary.

4 Lubrication
Lubricate the chain with grease. Wrap the chain around the two sprocket hubs and fix with the pin (**3**). Fill the cover halves with grease and insert the gaskets, install the cover and the installation is complete (**4**).

1

2

3



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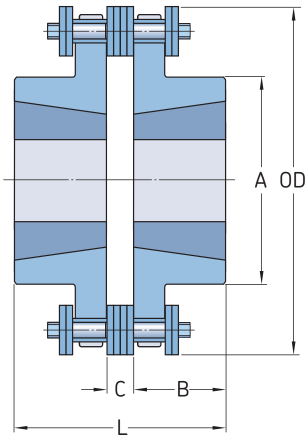
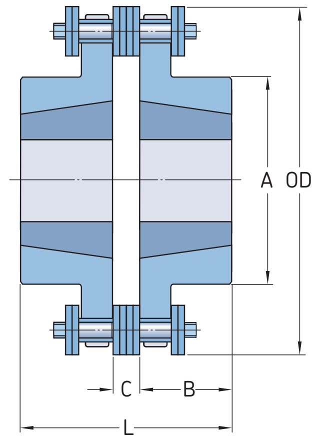
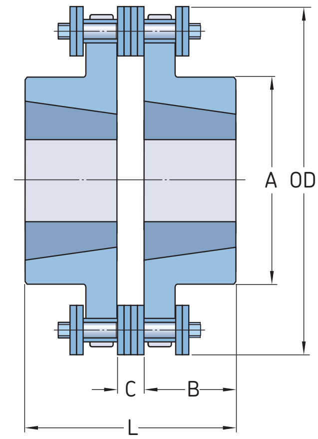


Assembly configuration HH



Assembly configuration FF



Assembly configuration FH

Coupling size	Bushing No.	Bore Min.	Max.	Dimensions A	B	C	L	OD	Weight	Max. speed	Nominal torque	Chain weight	Hub designation Plain bore	FTB	HTB	Bored to size
–	–	mm		mm					kg	r/min	Nm	kg	–			
0816	–	15,9	23,8	50,0	28,96	7,1	65,0	77,0	0,45	5 000	294	0,23	**PHE IS0816RSB**	–	–	PHE IS0816X...
	1108	12,7	28,6	50,0	22,2	7,1	51,6	77,0	0,41	5 000	294	0,23	**–**	PHE IS0816FTB	PHE IS0816HTB	–
1016	–	15,9	42,9	63,5	36,88	9,5	83,3	96,0	1,00	4 000	559	0,54	**PHE IS1016RSB**	–	–	PHE IS1016X...
1018	–	19,1	50,8	75,4	43,26	9,5	87,1	106,4	1,59	3 600	706	0,59	**PHE IS1018RSB**	–	–	PHE IS1018X...
	1610	12,7	41,3	75,4	25,4	9,5	60,3	106,4	0,50	3 600	706	0,59	**–**	PHE IS1018FTB	PHE IS1018HTB	–
1218	–	25,4	61,9	88,9	47,60	11,1	106,3	127,0	2,27	3 000	1 333	1,00	**PHE IS1218RSB**	–	–	PHE IS1218X...
1220	–	28,6	69,9	98,4	50,80	11,1	112,7	139,7	2,95	2 500	1 559	1,18	**PHE IS1220**	–	–	PHE IS1220X...
	2012	12,7	50,8	98,4	31,8	11,1	74,6	139,7	1,23	2 500	1 559	1,18	**–**	PHE IS1220FTB	PHE IS1220HTB	–
1222	–	28,6	76,2	114,3	54,00	11,1	119,1	151,2	4,31	2 500	1 794	1,23	**PHE IS1222RSB**	–	–	PHE IS1222X...
1618	–	28,6	79,4	115,9	60,70	14,7	136,1	169,1	4,99	2 000	2 961	2,40	**PHE IS1618RSB**	–	–	PHE IS1618X...
1620	–	38,1	90,5	136,5	66,10	14,7	146,9	185,3	7,40	2 000	3 579	2,68	**PHE IS1620RSB**	–	–	PHE IS1620X...
1620	3020	23,8	76,2	136,5	50,0	14,7	116,3	185,3	2,77	2 000	3 579	2,68		PHE IS1620FTB	PHE IS1620HTB	–
2018	–	38,1	98,4	144,5	70,90	18,3	160,1	211,5	9,21	1 800	4 981	4,45	**PHE IS2018RSB**	–	–	PHE IS2018X...
2020	–	38,1	117,5	170,7	79,80	18,3	177,9	231,8	14,43	1 800	6 688	4,95	**PHE IS2020RSB**	–	–	PHE IS2020X...
2020	3535	30,2	88,9	170,7	88,9	18,3	196,1	231,8	8,62	1800	6 688	4,95	**–**	PHE IS2020FTB	PHE IS2020HTB	–
2418	–	50,8	119,1	171,5	88,30	21,8	198,4	254,0	16,70	1 500	10 032	7,85	**PHE IS2418RSB**	–	–	PHE IS2418X...
2422	–	50,8	155,6	222,3	102,10	21,8	226,0	302,0	31,76	1 200	12 993	9,62	**PHE IS2422RSB**	–	–	PHE IS2422X...

SKF FRC Couplings

With a higher load capacity than jaw couplings and maintenance-free operation, FRC couplings are designed as a general purpose coupling. They are able to cushion moderate shock loads, dampen low levels of vibration and accommodate incidental misalignment. FRC couplings offer a range of hubs and elements to select, to meet the demand for low cost, general purpose spacer-type flexible coupling.

FRC couplings are phosphate coated for improved corrosion resistance and available with fire-resistant and anti-static elements (F.R.A.S.) FRC couplings are available with a pilot bore, finished bore or tapered bushing (face or hub) to make installation quick and simple.

Fully machined outside surfaces allow alignment with a simple straight edge. Shaft connections are “fail safe” due to their interlocking jaw design.

Selection

1 Service factor
Determine the required service factor from **tables 7** and **8** on **pages 60** and **61**.

2 Design power
Multiply normal running power by the service factor. This gives the design power for coupling selection.

3 Coupling size
Using FRC **table 1** on **page 49** to find the speed rating for a coupling that has a power that is greater than the design power. The required FRC coupling is listed at the head of the column.

4 Bore size
Using the FRC product table on **page 51**, check that the selected flanges can accommodate both the drive and driven shafts.

Example

An FRC coupling is required to transmit 15 kW from an electric motor running at 500 r/min to a rotary pump for 15 hours per day. The shaft diameter of the motor is 25 mm and the shaft diameter of the pump is 20 mm.

1 Service factor
From **table 7** on **page 60** = 1,75.

2 Design power
15 × 1,75 = 26,25 kW

3 Coupling size
Search for 500 r/min in **table 1** on **page 49** and choose the first power figure which exceeds the required 26,25 kW. This is 31,41 kW of coupling size 150.

4 Bore size
By referring to product table on **page 51**, it can be seen that both shaft diameters fall within the bore range available.

Engineering data

Power ratings

Maximum torque figures should be treated as short duration overload ratings occurring in circumstances such as direct-on-line starting.

For speeds not shown, calculate the nominal torque for the design application using the formula below and select a coupling based on the nominal torque rating.

$$\text{Nominal torque (Nm)} = \frac{\text{Design power (kW)} \times 9\,549}{\text{r/min}}$$

For additional information on FRC couplings, refer to **tables 1** and **2**.

Order data

A complete FRC coupling consists of: 2 hubs and 1 element.

For more detailed information on ordering specific couplings, refer to **table 3**.

Table 1

Power ratings

Speed	Coupling size							
	70	90	110	130	150	180	230	280
r/min	kW							
50	0,16	0,42	0,84	1,65	3,14	4,97	10,47	16,49
100	0,33	0,84	1,68	3,3	6,28	9,95	20,94	32,98
200	0,66	1,68	3,35	6,6	12,57	19,9	41,88	65,97
300	0,99	2,51	5,03	9,9	18,85	29,84	62,83	98,95
400	1,32	3,35	6,7	13,19	25,13	39,79	83,77	131,94
500	1,65	4,19	8,38	16,49	31,41	49,74	104,71	164,92
600	1,98	5,03	10,05	19,79	37,7	59,69	125,65	197,91
700	2,31	5,86	11,73	23,09	43,98	69,63	146,6	230,89
720	2,37	6,03	12,06	23,75	45,24	71,62	150,79	237,49
800	2,64	6,7	13,4	26,39	50,26	79,58	167,54	263,87
900	2,97	7,54	15,08	29,69	56,54	89,53	188,48	296,86
960	3,17	8,04	16,08	31,66	60,31	95,5	201,05	316,65
1 000	3,3	8,38	16,75	32,98	62,83	99,48	209,42	329,84
1 200	3,96	10,05	20,1	39,58	75,39	119,37	251,31	395,81
1 400	4,62	11,73	23,46	46,18	87,96	139,27	293,19	461,78
1 440	4,75	12,06	24,13	47,5	90,47	143,25	301,57	474,97
1 600	5,28	13,4	26,81	52,77	100,52	159,16	335,08	527,75
1 800	5,94	15,08	30,16	59,37	113,09	179,06	376,96	593,72
2 000	6,6	16,75	33,51	65,97	125,65	198,95	418,85	659,69
2 200	7,26	18,43	36,86	72,57	138,22	218,85	460,73	725,65
2 400	7,92	20,1	40,21	79,16	150,79	238,74	502,62	–
2 600	8,58	21,78	43,56	85,76	163,35	258,64	544,5	–
2 800	9,24	23,46	46,91	92,36	175,92	278,53	–	–
2 880	9,5	24,13	48,25	94,99	180,94	286,49	–	–
3 000	9,9	25,13	50,26	98,95	188,48	298,43	–	–
3 600	11,87	30,16	60,31	118,74	226,18	–	–	–
Nominal torque	31	80	160	315	600	950	2 000	3 150
Max. torque	72	180	360	720	1 500	2 350	5 000	7 200

Table 2

Assembled dimensions and charachteristics

Size	Assembled length comprising flange types FF, FH, HH	FB, HB	BB	Mass[1]	Inertia	Torsional stiffness	Misalignment Angular	Parallel	Axial	Nominal torque	Max torque
–	mm	mm	mm	kg	kg/m^2	Nm/°	°	mm	mm	Nm	Nm
70	65,0	65,0	65,0	1,00	0,00085	–	1	0,3	0,2	31,5	72
90	69,5	76,0	82,5	1,17	0,00115	–	1	0,3	0,5	80	180
110	82,0	100,5	119,0	5,00	0,0040	65	1	0,3	0,6	160	360
130	89,0	110,0	131,0	5,46	0,0078	130	1	0,4	0,8	315	720
150	107,0	129,5	152,0	7,11	0,0181	175	1	0,4	0,9	600	1500
180	142,0	165,5	189,0	16,60	0,0434	229	1	0,4	1,1	950	2350
230	164,5	202,0	239,5	26,00	0,1207	587	1	0,5	1,3	2000	5000
280	207,5	246,5	285,5	50,00	0,4465	1025	1	0,5	1,7	3150	7200

[1] Mass is for an FF, FH or HH coupling with mid range tapered bushings.

Table 3

Order data

Coupling type	Flanges	Qty	Element	Qty	Taper bush	Qty
RSB both sides	PHE FRC70RSB PHE FRC70FR	2 –	PHE FRC70NR –	1 –	– –	– –
RSB/F Combination	PHE FRC70RSB PHE FRC70FTB	1 1	PHE FRC70NR or PHE FRC70FR	1 –	PHF TB1008X...MM –	1
RSB/H Combination	PHE FRC70RSB PHE FRC70HTB	1 1	PHE FRC70NR or PHE FRC70FR	1 –	PHF TB1008X...MM –	1
F/F Combination	PHE FRC70FTB PHE FRC70FTB	2 2	PHE FRC70NR or PHE FRC70FR	1 –	PHF TB1008X...MM PHF TB1008X...MM	1 1
H/H Combination	PHE FRC70HTB PHE FRC70HTB	1 1	PHE FRC70NR or PHE FRC70FR	1 –	PHF TB1008X...MM PHF TB1008X...MM	1 1
F/H Combination	PHE FRC70FTB PHE FRC70HTB	1 1	PHE FRC70NR or PHE FRC70FR	1	PHF TB1008X...MM PHF TB1008X...MM	1 1

NR = Natural rubber
FR = Fire-resistant and anti-static (FRAS)

Installation

1 Place the couplings on their shafts so that shaft ends do not protrude into the internal section of the coupling. Then tighten the screws on the tapered bushing to the torque values listed in the mounting instructions (**1**).

2 Insert the coupling element into one side of the coupling (**2**).

3 Move the other coupling into position and connect the two halves (**4**). Check that the assembled length is correct (**5**).

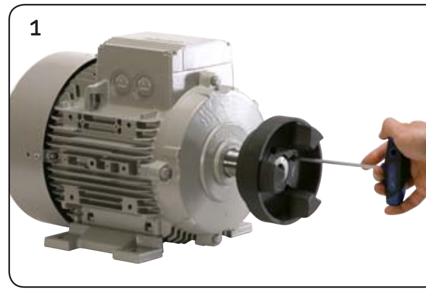
4 Check angular misalignment by measuring the assembled length in four positions at 90° around the coupling. Then check for parallel misalignment using a straight edge across the length of the coupling flange (**6**). Allowable angular misalignment for all FRC couplings is 1°. Allowable parallel misalignment for FRC couplings is based on size (→ **table 4**).

Note: For the most consistent results, check across at least 3 of the 6 points where the rubber elements are visible between the flanges.

Table 4

Allowable parallel misalignment	
Coupling size	
–	mm
FRC70 to 110	0,3
FRC130 to 180	0,4
FRC230 to 280	0,5

1



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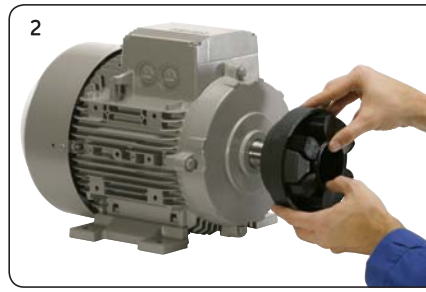

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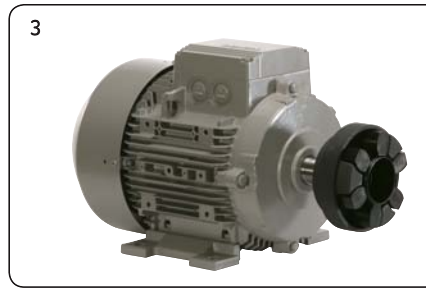

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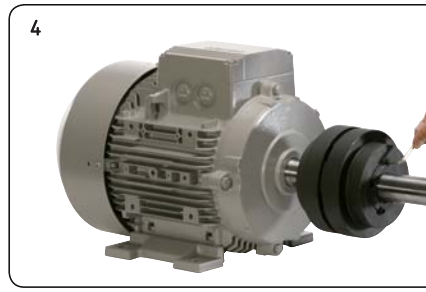

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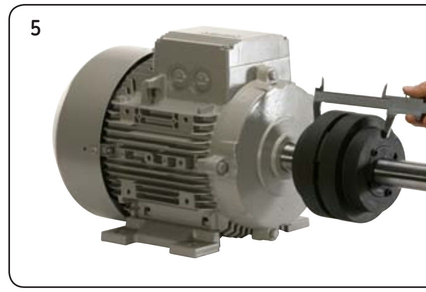

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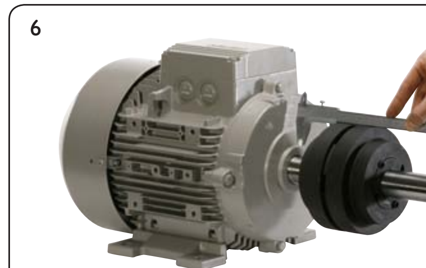
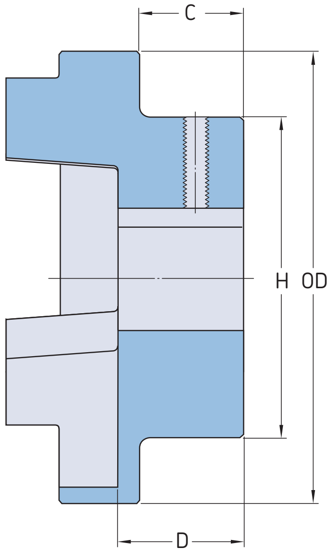
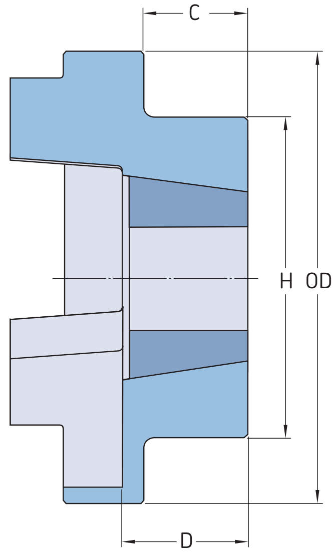
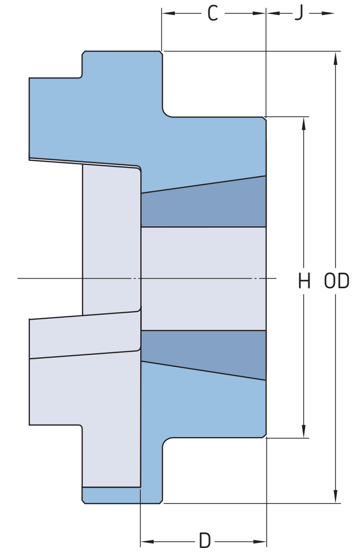




Type B



Type F



Type H

Coupling size	Dimensions OD	H	Type F, H Bushing size	Bore Min.	Max.	C	D	J[1)]	Type B Bore Min	Max	Key screw	C	D	Hub designation Type F	Type H	Type B Pilot bore
–	mm													–		
70	69	60	1 008	9	25	20	23,5	29	32	10	M6	20	25,8	**PHE FRC70FTB**	**PHE FRC70HTB**	**PHE FRC70RSB**
90	85	70	1 108	9	28	19,5	23,5	29	38	10	M6	26	30,0	**PHE FRC90FTB**	**PHE FRC90HTB**	**PHE FRC90RSB**
110	112	100	1 610	14	42	18,5	26,5	38	55	10	M10	37	45,3	**PHE FRC110FTB**	**PHE FRC110HTB**	**PHE FRC110RSB**
130	130	105	1 610	14	42	18	26,5	38	60	20	M10	39	47,5	**PHE FRC130FTB**	**PHE FRC130HTB**	**PHE FRC130RSB**
150	150	115	2 012	14	50	23,5	33,5	42	70	28	M10	46	60,0	**PHE FRC150FTB**	**PHE FRC150HTB**	**PHE FRC150RSB**
180	180	125	2 517	16	60	34,5	46,5	48	80	28	M10	58	70,0	**PHE FRC180FTB**	**PHE FRC180HTB**	**PHE FRC180RSB**
230	225	155	3 020	25	75	39,5	52,5	55	100	45	M12	77	90,0	**PHE FRC230FTB**	**PHE FRC230HTB**	**PHE FRC230RSB**
280	275	206	3 525	35	100	51	66,5	67	115	55	M16	90	105,5	**PHE FRC280FTB**	**PHE FRC280HTB**	**PHE FRC280RSB**

[1)] Clearance required for tightening/losening the bush on the shaft

SKF Jaw Couplings

Jaw couplings provide a cost-effective solution for standard power applications, cushioning moderate shock loads and dampening low vibration levels.

Maintenance-free and easy to install, jaw couplings are available with a “snap wrap” element allowing element replacement in situ.

Urethane and hytrel elements have a greater power rating than nitrile elements and are recommended for applications where a compact, high torque solution is required.

Selection

1 Service factor
Determine the required service factor in tables **7** and **8** on **pages 60** and **61**.

2 Design power
Multiply normal running power by the service factor. This gives the design power for selecting a coupling with a nitrile element.

3 Alternative elements
To allow coupling selection based on one power rating table (nitrile), an element correction is required to give a new reference design power. This is done by dividing the design power calculated for a nitrile element by the alternative element power factor listed in **table 1**.

4 Coupling size
Using **table 2** on **page 53**, search for the appropriate speed until a power greater than the design power is found. The required jaw coupling is given at the head of the column.

5 Bore size
Using prodcut table on **page 55**, check that the selected flanges can accommodate both the drive and driven shaft.

Example

A jaw coupling is required to transmit 4 kW from an electric motor running at 300 r/min to a centrifugal fan for 12 hours per day. The motor shaft is 20 mm diameter and the pump shaft diameter 18 mm.

1 Service factor
From **table 7** on **page 60** = 1,0.

2 Design power
Design power = 4 × 1,0 = 4 kW

3 Coupling size
When looking for for 300 r/min in **table 2** on **page 53**, the first power figure to exceed the required 4 kW of step 2 is 4,7 kW. In this case, a nitrile element can be used with a jaw coupling size 150.

4 Bore size
By referring to the product table on **page 55**, it can be seen that both shaft diameters fall within the bore range available.

Engineering data

Power ratings

Maximum torque figures should be treated as short duration overload ratings occurring in circumstances such as direct-on-line starting.

For speeds not shown, calculate the nominal torque for the design application using the formula below and select coupling according to nominal torque ratings.

$$\text{Nominal torque (Nm)} = \frac{\text{Design power (kW)} \times 9\,549}{\text{r/min}}$$

For additional useful information on jaw couplings, such as standard bore and keyway data, please refer to **tables 1** to **3**.

Table 1

Elements

Type	Temperature range	Misalignment		Power factor
		Angular	Parallel	
–	°C	°	mm	–
Nitrile	–40 to 100	1	0,38	1
Urethane	–35 to 70	1	0,38	1,5
Hytrel®	–50 to 120	0,5	0,38	3

Order data

A complete jaw coupling consists of: 2 hubs and 1 element. A complete coupling with spacer consists of 2 hubs and 1 element.

For more detailed information on ordering specific couplings, refer to **table 4**.

Table 2

Power ratings – Nitrile elements

Speed	Coupling sizes									
	50	70	75	90	95	100	110	150	190	225
r/min	kW									
50	0,018	0,030	0,06	0,10	0,14	0,3	0,5	0,8	1,1	1,5
100	0,037	0,060	0,12	0,20	0,27	0,6	1,1	1,6	2,1	2,9
200	0,074	0,121	0,25	0,40	0,54	1,2	2,2	3,1	4,2	5,9
300	0,110	0,181	0,37	0,60	0,81	1,7	3,3	4,7	6,3	8,8
400	0,147	0,242	0,50	0,80	1,08	2,3	4,4	6,3	8,4	11,7
500	0,184	0,302	0,62	1,01	1,35	2,9	5,5	7,9	10,5	14,7
600	0,221	0,363	0,75	1,21	1,62	3,5	6,6	9,4	12,6	17,6
700	0,257	0,423	0,87	1,41	1,89	4,1	7,7	11,0	14,7	20,5
720	0,265	0,435	0,90	1,45	1,95	4,2	7,9	11,3	15,1	21,1
800	0,294	0,483	1,00	1,61	2,16	4,6	8,8	12,6	16,8	23,5
900	0,331	0,544	1,12	1,81	2,43	5,2	9,9	14,1	18,8	26,4
960	0,353	0,580	1,20	1,93	2,59	5,6	10,6	15,1	20,1	28,1
1 000	0,368	0,604	1,25	2,01	2,70	5,8	11,0	15,7	20,9	29,3
1 200	0,441	0,725	1,50	2,41	3,24	7,0	13,2	18,8	25,1	35,2
1 400	0,515	0,846	1,74	2,81	3,78	8,1	15,4	22,0	29,3	41,1
1 440	0,529	0,870	1,79	2,90	3,89	8,4	15,8	22,6	30,2	42,2
1 600	0,588	0,967	1,99	3,22	4,32	9,3	17,6	25,1	33,5	46,9
1 800	0,662	1,088	2,24	3,62	4,86	10,4	19,8	28,3	37,7	52,8
2 000	0,735	1,208	2,49	4,02	5,40	11,6	22,0	31,4	41,9	58,6
2 200	0,809	1,329	2,74	4,42	5,94	12,8	24,2	34,6	46,1	64,5
2 400	0,882	1,450	2,99	4,83	6,48	13,9	26,4	37,7	50,3	70,4
2 600	0,956	1,571	3,24	5,23	7,02	15,1	28,6	40,8	54,5	76,2
2 800	1,029	1,692	3,49	5,63	7,56	16,2	30,8	44,0	58,6	82,1
2 880	1,059	1,740	3,59	5,79	7,78	16,7	31,7	45,2	60,3	84,4
3 000	1,103	1,813	3,74	6,03	8,10	17,4	33,0	47,1	62,8	88,0
3 600	1,323	2,175	4,49	7,24	9,73	20,9	39,6	56,5	75,4	105,5
Nominal torque Nm	3,51	5,77	11,9	19,2	25,8	55,4	105	150	200	280

Table 3

Standard bore and keyway chart

Bore	Keyway	Coupling size									
		050	070	075	090	095	100	110	150	190	225
mm	mm	–									
9	3×1,4	X	X	X	X	–	–	–	–	–	–
10	3×1,4	X	X	X	X	–	–	–	–	–	–
11	4×1,8	X	X	X	X	–	–	–	–	–	–
12	4×1,8	X	X	X	X	X	–	–	–	–	–
14	5×2,3	X	X	X	X	X	X	–	–	–	–
15	5×2,3	–	X	X	X	X	X	–	–	–	–
16	5×2,3	–	X	X	X	X	X	X	X	–	–
17	5×2,3	–	X	X	X	X	X	X	X	–	–
18	6×2,8	–	X	X	X	X	X	X	X	–	–
19	6×2,8	–	X	X	X	X	X	X	X	X	–
20	6×2,8	–	–	X	X	X	X	X	X	X	–
22	6×2,8	–	–	X	X	X	X	X	X	X	–
24	8×3,3	–	–	–	X	X	X	X	X	X	X
25	8×3,3	–	–	–	–	X	X	X	X	X	X
28	8×3,3	–	–	–	–	X	X	X	X	X	X
30	8×3,3	–	–	–	–	–	X	X	X	X	X
32	10×3,3	–	–	–	–	–	X	X	X	X	X
35	10×3,3	–	–	–	–	–	X	X	X	X	X
38	10×3,3	–	–	–	–	–	X	X	X	X	X
40	12×3,3	–	–	–	–	–	–	X	X	X	X
42	12×3,3	–	–	–	–	–	–	X	X	X	X
45	14×3,8	–	–	–	–	–	–	–	X	X	X
48	14×3,8	–	–	–	–	–	–	–	X	X	X
50	14×3,8	–	–	–	–	–	–	–	–	X	X
55	16×4,3	–	–	–	–	–	–	–	–	X	X
60	18×4,4	–	–	–	–	–	–	–	–	–	X

Table 4

Order data

Coupling type	Flanges	Qty	Element	Qty	Spacer shaft	Qty	Nitrile wrap element	Qty	Ring kit	Qty
RSB both sides	PHE L090HUB	2	PHE L090/095NR or PHE L090/095UR PHE L090/095HL	1	PHE L090X ... SPACER	1	PHE L090NRWRAP	2	PHE L090RINGKIT	2
Bore with keyway/ RSB combination	PHE L090HUB PHE L090 – ... MM	1 1	PHE L090/095NR or PHE L090/095UR PHE L090/095HL	1	PHE L090X ... SPACER	1	PHE L090NRWRAP	2	PHE L090RINGKIT	2
Bore with keyway on both sides	PHE L090 – ... MM	2	PHE L090/095NR or PHE L090/095UR PHE L090/095HL	1	PHE L090X ... SPACER	1	PHE L090NRWRAP	2	PHE L090RINGKIT	2
Bore only/ RSB combination	PHE L090 – ... MMP PHE L090HUB	1 1	PHE L090/095NR or PHE L090/095UR PHE L090/095HL	1	PHE L090X ... SPACER	1	PHE L090NRWRAP	2	PHE L090RINGKIT	2
Bore only	PHE L090 – ... MMP	2	PHE L090/095NR or PHE L090/095UR PHE L090/095HL	1	PHE L090X ... SPACER	1	PHE L090NRWRAP	2	PHE L090RINGKIT	2
Bore only/bore with keyway combination	PHE L090 – ... MMP PHE L090 – ... MM	1 1	PHE L090/095NR or PHE L090/095UR PHE L090/095HL	1	PHE L090X ... SPACER	1	PHE L090NRWRAP	2	PHE L090RINGKIT	2

NR = Nitrile
UR = Urethane
HL = Hytrel

Available spacer shaft lengths are 100 mm and 140 mm. To complete the designation, add spacer length. For example: PHE L090X100SPACER for spacer of 100 mm, coupling size 090.
When ordering bored to size and keywayed hubs, it is required that the bore diameter is added to the designation found in the table above.
Where a keyway is NOT required, the designation should be suffixed with a P.
PHE L150-18MM = Hub Size 150 with 18 mm bore and keyway.
PHE L070-16MMP = Hub Size 070 with 16 mm bore (no keyway).

Installation

1 Place each coupling on its shaft so that shaft ends do not protrude into the internal section of the coupling (**1**). Then tighten the set screws.

2 Insert the coupling element into one side of the coupling (**2**).

3 Move the other coupling side into position and connect the two halves (**3**). Check that the assembled length is correct (**4**).

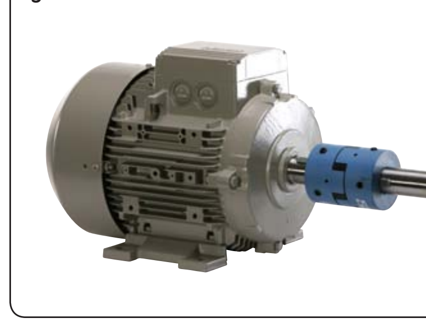
4 Check the angular misalignment by checking the assembled length in four positions at 90° around the coupling. Check parallel misalignment using a straight edge across the length of the coupling flange (**5**). Allowable angular misalignment for all jaw couplings is 1°. Allowable parallel misalignment for all jaw couplings is 0,38 mm.

Note: For most consistent results, check across at least 3 of the 6 points where the rubber elements are visible between the flanges.

1

2

3



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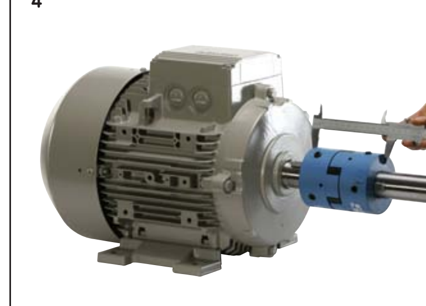

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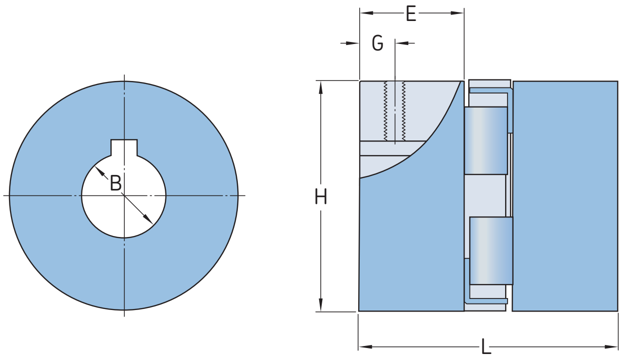
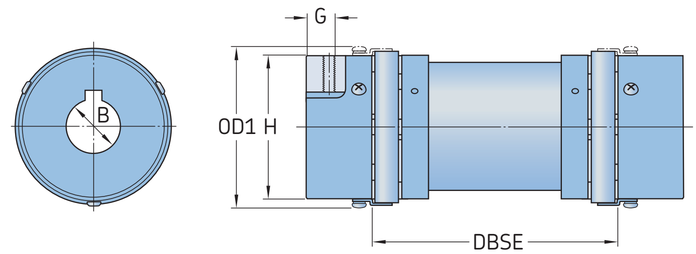


Hub



Spacer

Size	Dimensions								Set screw	Approx. mass[2]	Max speed	Designation
	B Pilot	Max	OD	OD1[1]	L	E	H	G				
	mm								–	kg	r/min	–
035	3,20	9,5	15,9	–	20,6	6,7	15,9	–	–	0,03	31 000	**PHE L035HUB**
050	6,35	14,0	27,5	–	44,0	16,0	27,5	6,5	M6	0,05	18 000	**PHE L050HUB**
070	6,35	19,0	35,0	–	51,0	19,0	35,0	9,5	M6	0,12	14 000	**PHE L070HUB**
075	6,35	24,0	44,5	–	54,0	21,0	44,5	9,0	M6	0,22	11 000	**PHE L075HUB**
090	6,35	24,0	54,0	–	54,0	21,0	54,0	8,7	M6	0,28	9 000	**PHE L090HUB**
095	11,11	28,0	54,0	64	64,0	25,0	54,0	11,0	M8	0,31	9 000	**PHE L095HUB**
100	12,70	35,0	65,0	77	89,0	35,0	65,0	11,0	M8	0,75	7 000	**PHE L100HUB**
110	15,87	42,0	84,0	97	108,0	43,0	84,0	19,0	M10	1,50	5 000	**PHE L110HUB**
150	15,87	48,0	96,0	112	115,0	45,0	96,0	22,0	M10	2,40	4 000	**PHE L150HUB**
190	19,05	55,0	115,0	130	133,0	54,0	102,0	22,0	M12	3,50	3 600	**PHE L190HUB**
225	19,05	60,0	127,0	143	153,0	64,0	108,0	29,0	M12	4,50	3 600	**PHE L225HUB**

[1] Outer diameter of ring kit
[2] Mass of hub with pilot bores
DBSE = Distance between shaft ends
Hub material is high grade cast iron. Spacer material is aluminium.

SKF Universal Joints

Universal joints, also known as pin and block couplings, are commonly used for low to medium torque industrial, off-road and agricultural applications.

These couplings offer an economical solution for applications up to 1 800 r/min and will provide working angles of up to 25° or 35° for manual drives. SKF offers these couplings with a solid bore from stock, bored to size, square, hexagonal and round bores on request. The couplings are available in either a single (UJMA) or double (UJMB) configuration.

Selection

Universal joints are selected based on torque. The following application information is required:

- Torque – power [kW]
- Speed [r/min]
- Joint angle [°]

The product tables on **page 57** provide maximum allowable torque (expressed in Nm) based on a 10° angle of inclination and continuous use.

However, if the inclination angle is not 10°, the values shown will be reduced or increased in accordance with the torque factors listed in **table 1**.

Torque is calculated using the following formula:

Nominal torque (Nm) =

$$\frac{\text{Design power (kW)} \times 9\,549}{\text{r/min}}$$

Example

An electric motor is driving a small gearbox. The application has the following basic data.

- Power = 3 kW
- Speed = 1500 r/min
- Joint angle = 20°

1 Determine the basic required torque

$$\frac{3\text{ kW} \times 9\,549}{1\,500\text{ r/min}} = 19{,}1\text{ Nm}$$

2 Adjust the torque value to accommodate a 20° angle of inclination. **Table 1** lists a correction value of 0,75. The previously calculated basic torque rating must be divided by the correction factor in order to get the adjusted torque value. In other words, a joint with larger dimensions must be selected as the angle is greater than 10°.

$$\frac{19{,}1\text{ kW}}{0{,}75\text{ kgm}} = 24{,}46\text{ Nm}$$

3 From product table on **page 57**, the joint size UJMA13 is the proper selection.

Engineering data

For additional information about universal joints, refer to **table 1**.

Order data

Standard universal joints are without bore.

For addtional information about ordering specific universal joints, refer to **table 2**.

Table 1

Maximum allowable torque

Angle up to	**Factor F**
–	kgm
5°	1,25
10°	1
20°	0,75
30°	0,45
40°	0,30

Table 2

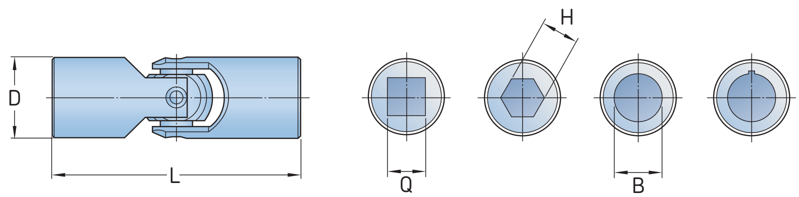
Order data

Universal joint type	**Size**	**Qty**
Single	PHE UJMA10	1
Double	PHE UJMB20	1

Available on request with finish bore, finish bore with keyway, hexagonal bore or square bore, e.g. the designations as shown below.

Universal joints with finish bore H7, with keyway (BSX30MM)
– PHE UJMB45BSX30MM
Universal joints with finish bore H7, without keyway (X30MM)
– PHE UJMB45X30MM
Universal joints with hexagonal bore (HBX30MM)
– PHE UJMB45HBX30MM
Universal joints with square bore (SBX30MM)
– PHE UJMB45SBX30MM

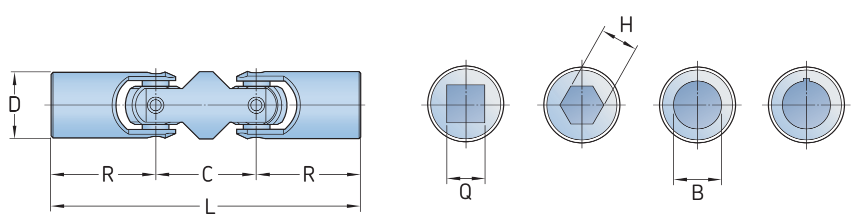
Single universal joints



Size	L	D	Bore			B Max		Static breaking torque	Designation
			B	Q	H	Bore	With keyway		
–	mm					mm		Nm	–
10	38	10	6	6	6	6	–	13,5	**PHE UJMA10**
13	45	13	8	8	8	8	–	26	**PHE UJMA13**
16	52	16	8	8	8	10	8	45	**PHE UJMA16**
20	62	20	10	10	10	13	11	88	**PHE UJMA16**
25	74	25	12	12	12	16	14	180	**PHE UJMA25**
32	86	32	16	16	16	22	18	405	**PHE UJMA32**
40	108	40	20	20	20	25	22	860	**PHE UJMA40**
45	120	45	20	20	20	30	25	1 250	**PHE UJMA45**
50	132	50	25	25	25	35	30	1 730	**PHE UJMA50**
63	166	63	32	32	-	45	35	3 400	**PHE UJMA63**
75	190	75	40	40	-	55	45	5 300	**PHE UJMA75**

Standard is without bore.
Available on request with finish bore H7 – on request with keyway (B), hexagonal bore (H) or square bore (Q)

Double universal joints



Size	Dimensions									Static breaking torque	Designation
	L	R	E Min	D	C	B_{Max} Bore	With keyway	Q	H		
–	mm									Nm	–
13	68	22,5	13	23	8	8	8	8	–	26	**PHE UJMB13**
16	77	26	16	25	8	8	8	10	8	45	**PHE UJMB16**
20	92	31	20	30	10	10	10	13	11	88	**PHE UJMB20**
25	110	37	25	36	12	12	12	16	14	180	**PHE UJMB25**
32	133	43	32	47	16	16	16	22	18	405	**PHE UJMB32**
40	164	54	40	56	20	20	20	25	22	860	**PHE UJMB40**
45	183	60	45	63	20	20	20	30	25	1 250	**PHE UJMB45**
50	202	66	50	70	25	25	25	35	30	1 730	**PHE UJMB50**
63	250	83	63	84	32	32	-	45	35	3 400	**PHE UJMB63**
75	290	95	75	100	40	40	-	55	45	5 300	**PHE UJMB75**

Standard is without bore.
Available on request with finish bore H7 – on request with keyway (B), hexagonal bore (H) or square bore (Q)

General engineering data on SKF Couplings

Table 1

Recommended shaft diameter/key combinations for bore with one key, DIN 6885 part 1

Nominal shaft diamiter				Key		A*	B*
Over	Up to	Over	Up to	Width	Height	For shaft	For hub
mm		in.		mm		mm	
6	8	0,24	0,31	2	2	1,1/1,3	1,0/1,1
8	10	0,31	0,39	3	3	1,8/1,9	1,4/1,5
10	12	0,39	0,47	4	4	2,5/2,6	1,8/1,9
12	17	0,47	0,67	5	5	3,0/3,1	2,3/2,4
17	22	0,67	0,87	6	6	3,5/3,6	2,8/2,9
22	30	0,87	1,18	8	7	4,0/4,2	3,3/3,5
30	38	1,18	1,50	10	8	5,0/5,2	3,3/3,5
38	44	1,50	1,73	12	8	5,0/5,2	3,3/3,5
44	50	1,73	1,97	14	9	5,5/5,7	3,8/4,0
50	58	1,97	2,28	16	10	6,0/6,2	4,3/4,5
58	65	2,28	2,56	18	11	7,0/7,2	4,4/4,6
65	75	2,56	2,95	20	12	7,5/7,7	4,9/5,1
75	85	2,95	3,35	22	14	9,0/9,2	5,4/5,6
85	95	3,35	3,74	25	14	9,0/9,2	5,4/5,6
95	110	3,74	4,33	28	16	10,0/10,2	6,4/6,6
110	130	4,33	5,12	32	18	11,0/11,2	7,4/7,6
130	150	5,12	5,91	36	20	12,0/12,3	8,4/8,7
150	170	5,91	6,69	40	22	13,0/13,3	9,4/9,7
170	200	6,69	7,87	45	25	15,0/15,3	10,4/10,7
200	230	7,87	9,06	50	28	17,0/17,3	11,4/11,7
230	260	9,06	10,24	56	32	20,0/20,3	12,4/12,7
260	290	10,24	11,42	63	32	20,0/20,3	12,4/12,7
290	330	11,42	12,99	70	36	22,0/22,3	14,4/14,7
330	380	12,99	14,96	80	40	25,0/25,3	15,4/15,7

* Using A and B dimensions given will allow proper headroom clearance.
Recommended tolerance on keyway width is +0,05/–0 mm (+0.002/–0 in.)

Table 2

Recommended shaft diameter/key combinations for bores with one key, ANSI B17.1

Nominal shaft diameter		Rectangular key		Square key	
Over	Up to	Width	Height	Width	Height
in.		in.		in.	
5/16	7/16	–	–	3/32	3/32
7/16	9/16	1/8	3/32	1/8	1/8
9/16	7/8	3/16	1/8	3/16	3/16
7/8	1 1/4	1/4	3/16	1/4	1/4
1 1/4	1 3/8	5/16	1/4	5/16	5/16
1 3/8	1 3/4	3/8	1/4	3/8	3/8
1 3/4	2 1/4	1/2	3/8	1/2	1/2
2 1/4	2 3/4	5/8	7/16	5/8	5/8
2 3/4	3 1/4	3/4	1/2	3/4	3/4
3 1/4	3 3/4	7/8	5/8	7/8	7/8
3 3/4	4 1/2	1	3/4	1	1
4 1/2	5 1/2	1 1/4	7/8	1 1/4	1 1/4
5 1/2	6 1/2	1 1/2	1	1 1/2	1 1/2
6 1/2	7 1/2	1 3/4	1 1/2	1 3/4	1 3/4
7 1/2	9	2	1 1/2	2	2
9	11	2 1/2	1 3/4	2 1/2	2 1/2
11	13	3	2	3	3
13	15	3 1/2	2 1/2	3 1/2	3 1/2
15	18	4	3	4	4

A minimum headroom clearance of 0.005 in. is recommended.
Recommended tolerance on keyway width is +0/–0.002 in.

Table 3

Recommended bore tolerances for SKF steel coupling hubs

Shaft diameters		Bore diameter tolerances		
Nominal	Tolerance	Clearence	Standard	Interferance
mm	–	–	–	–
6 – 30	k6	F7	H7	M6
31 – 50	k6	F7	H7	K6
51 – 80	m6	F7	H7	K7
81 – 100	m6	F7	H7	M7
101 – 200	m6	F7	H7	P7
201 – 355	m6	F7	H7	R7
356 – 500	m6	F7	H7	R8

Table 4

Recommended bore tolerances for SKF steel coupling hubs

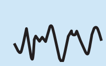
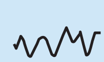
Torque demands driven equipment	Typical applications for electric motors	Service factor
	Constant torque centrifugal pumps, blowers and compressors.	1,0
	Continuous duty, some torque variations such as plastic extruders and forced draft fans.	1,5
	Light shock loads, such as metal extruders, cooling towers and log hauling.	2,0
	Moderate shock loads, such as rock crushers, rail car dumpers and vibrating screens.	2,5
	Heavy shock loads, such as roughing mills, reciprocating pumps and reversing runout tables.	3,0

Table 5

Shaft diameters and ratings for NEMA 60 hertz

T frames

Frame size	Shaft diameter	3 600 r/min Drip proof	Enclosed	1 800 r/min Drip proof	Enclosed	1 200 r/min Drip proof	Enclosed	900 r/min Drip proof	Enclosed
–	in.	hp		hp		hp		hp	
143	0,88	1 1/2	1 1/2	1	1	3/4	3/4	1/2	1/2
145	0,88	2-3	2	1 1/2–2	1 1/2–2	1	1	3/4	3/4
182	1,13	5	3	3	3	1 1/2	1 1/2	1	1
184	1,13	7 1/2	5	5	5	2	2	1 1/2	1 1/2
213	1,38	10	7 1/2	7 1/2	7 1/2	3	3	2	2
215	1,38	15	10	10	10	5	5	3	3
254	1,63	20	15	15	15	7 1/2	7 1/2	5	5
256	1,63	25	20	20	20	10	10	7 1/2	7 1/2
284	1,88	30	25	25	25	15	15	10	10
286	1,88	40	30	30	30	20	20	15	15
324	2,13	50	40	40	40	25	25	20	20
326	2,13	60	50	50	50	30	30	25	25
364	2,38	75	60	60	60	40	40	30	30
365	2,38	100	75	75	75	50	50	40	40
404	2,88	125	–	100	–	60	60	50	50
405	2,88	150	100	125	100	75	75	60	60
444	3,38	200	125	150	125	100	100	75	75
445	3,38	250	150	200	150	125	125	100	100

T frames

Frame size	Shaft diameter	3 600 r/min Drip proof	Enclosed	1 800 r/min Drip proof	Enclosed	1 200 r/min Drip proof	Enclosed	900 r/min Drip proof	Enclosed
–	in.	hp		hp		hp		hp	
284	1,63	30	25	25	25	15	15	10	10
286	1,63	40	30	30	30	20	20	15	15
324	1,88	50	40	40	40	25	25	20	20
326	1,88	60	50	50	50	30	30	25	25
364	1,88	75	60	60	60	40	40	30	30
365	1,88	100	75	75	75	50	50	40	40
404	2,13	125	–	100	–	60	60	50	50
405	2,13	150	100	125	100	75	75	60	60
444	2,38	200	125	150	125	100	100	75	75
445	2,38	250	150	200	150	125	125	100	100

Table 6

Shaft diameters and ratings for metric foot mounted motor (IEC)

Frame size	Shaft diameter	3 000 r/min	1 500 r/min	1 000 r/min	750 r/min
–	mm	kW	kW	kW	kW
80	19	0,75 – 1,10	0,55 – 0,75	0,37 – 0,55	0,18 – 0,25
90S	24	1,5	1,1	0,75	0,37
90L	24	2,2	1,5	1,1	0,55
100L	28	3,0	2,2, 3,0	1,5	0,75, 1,1
112M	28	4,0	4,0	2,2	1,5
132S	38	5,5 – 7,5	5,5	3,0	2,2
132M	38	–	7,5	4,0 – 5,5	3,0
160M	42	11 – 15	11,0	7,5	4,0 – 5,5
160L	42	18,5	15,0	11,0	7,5
180M	48	22	18,5	–	–
180L	48	–	22,0	15,0	11,0
200M/L	55	30 – 37	30	18,5 – 22	15,0
225S	55, 60	45	37 – 45	30	18,5
225M	55, 60	45	45	30	22
250S	60, 65, 70	55	55	37	30
250M	60, 65, 70	55 – 75	55 – 75	37 – 45	30 – 37
280S	65, 75, 80	75 – 90	75 – 90	45 – 50	37 – 45
280M	65, 75, 80	90 – 110	90 – 110	55 – 75	45 – 55

Table 7

Service factors by application

Application	Electric motor with standard torque	Reciprocating engine with 6 or more cylinders	Reciprocating engine with 4/5 cylinders
Aerator	2,0	2,5	3,0
Agitators			
Vertical and horizontal	1,0	1,5	2,0
Screw, propeller, paddle	1,5	2,0	2,5
Barge haul puller			
Blowers			
Centrifugal	1,0	1,5	2,0
Lobe or vane	1,25	1,75	2,25
Car dumpers	2,5	*	*
Car pullers	1,5	2,0	2,5
Clarifier or classifer	1,0	1,5	2,0
Clay working machines			
Brick press	1,75	2,25	2,75
Pug mill	1,75	2,25	2,75
Briquette machine	1,75	2,25	2,75
Compressors			
Centrifugal	1,0	1,5	2,0
Rotary, lobe or vane	1,25	1,75	2,25
Rotary, screw	1,0	1,5	2,0
Reciprocating			
Direct connected	Contact SKF		
Without flywheel	Contact SKF		
With flywheel and gear between compressor and prime mover			
1 cylinder, single acting	3,0	*	*
1 cylinder, double acting	3,0	*	*
2 cylinders, single acting	3,0	*	*
2 cylinders, double acting	3,0	*	*
3 cylinders, single acting	3,0	*	*
3 cylinders, double acting	2,0	2,5	3,0
4 or more cylinder, single acting	1,75	2,25	2,75
4 or more cylinder, doubble acting	1,75	2,25	2,75
Conveyors			
Apron, assembly, belt, chain	1,0	1,5	2,0
Bucket flight, screw	1,25	1,75	2,25
Live roll, shaker	1,0	1,5	2,0
Inclined belt and screw	3,0	*	*
Reciprocating	1,75	2,25	2,75
Main hoist	1,75	2,25	2,75
Skip hoist	1,5	2,0	2,5
Slope	1,75	2,25	2,75
Bridge, travel or trolley	2,5	*	*
Cranes and hoist	1,75	2,25	2,75
Crushers			
Cable reel	1,25	1,75	2,25
Dredges			
Conveyors	2,0	2,5	3,0
Cutter head, jig drive	1,5	2,0	2,5
Maneuvering winch	1,5	2,0	2,5
Pumps (uniform load)	1,75	2,25	2,75
Dynamometer			
Screen drive, stacker	1,5	2,0	2,5
Utility winch	1,0	1,5	2,0

Application	Electric motor with standard torque	Reciprocating engine with 6 or more cylinders	Reciprocating engine with 4/5 cylinders
Elevators			
Bucket, centrifugal discharge	1,25	1,75	2,25
Freight or passenger	Not approved		
Gravity discharge	1,25	1,75	2,25
Escalators	Not approved		
Exciter, generator	1,0	1,5	2,0
Extruder, plastic	1,5	2,0	2,5
Fans			
Centrifugal	1,0	1,5	2,0
Cooling tower	2,0	2,5	3,0
Forced draft – across the lines start	1,5	2,0	2,5
Forced draft motor			
Driven through fluid or electric slip clutch	1,0	1,5	2,0
Gas recirculating	1,5	2,0	2,5
Induced draft with damper control or blade cleaner	1,25	1,75	2,25
Induced draft without controls	2,0	2,5	3,0
Feeder			
Apron, belt, disc, screw	1,0	1,5	2,0
Reciprocating	2,5	3,0	3,5
Generators			
Even load	1,0	1,5	2,0
Hoist or railway service	1,5	2,0	2,5
Welder load	2,0	2,5	3,0
Hammermill	1,75	2,25	2,75
Kiln	2,0	2,5	3,0
Laundry washer or tumbler	2,0	2,5	3,0
Line shafts			
Any processing machinery	1,5	2,0	2,5
Machine tools			
Auxiliary and traverse drive	1,0	1,5	2,0
Bending rolls, notching press			
Punch press, planer, plate			
Reversing	1,75	2,25	2,75
Main drive	1,5	2,0	2,5
Man lifts	Not approved		
Mills (rotary type)			
Ball or pebble	2,0	2,5	3,0
Rod or tube	2,0	2,5	3,0
Metal forming machines			
Dryer and cooler	1,75	2,25	2,75
Continuous caster	1,75	2,25	2,75
Draw bench carriage and main drive	2,0	2,5	3,0
Extruder	2,0	2,5	3,0
Forming machine and forming mills	2,0	2,5	3,0
Slitters	1,0	1,5	2,0
Wire drawing or flattening	1,75	2,25	2,75
Wire winder	1,5	2,0	2,5
Coilers and uncoilers	1,5	2,0	2,5

Application	Electric motor with standard torque	Reciprocating engine with 6 or more cylinders	Reciprocating engine with 4/5 cylinders
Mixers (see agitators)			
Concrete	1,75	2,25	2,75
Muller	1,5	2,0	2,5
Press, printing	1,5	2,0	2,5
Pug mill	1,75	2,25	2,75
Pulverizers			
Hammermill and hog	1,75	2,25	2,75
Roller	1,5	2,0	2,5
Pumps			
Boiler feed	1,5	2,0	2,5
Centrifugal			
Constant speed	1,0	1,5	2,0
Frequent speed changes under load	1,25	1,75	2,25
Descaling, with accumulators	1,25	1,75	2,25
Gear, rotary, or vane	1,25	1,75	2,25
Reciprocating, plunger, piston			
1 cylinder, single or double acting	3,0	*	*
2 cylinders, single acting	2,0	2,5	3,0
2 cylinders, double acting	1,75	2,25	2,75
3 or more cylinders	1,5	2,0	2,5
Screw pump, progressing cavity	1,25	1,75	2,25
Vacuum pump	1,25	1,75	2,25
Screens			
Air washing	1,0	1,5	2,0
Grizzly	2,0	2,5	3,0
Rotary coal or sand	1,5	2,0	2,5
Vibrating	2,5		
Water	1,0	1,5	2,0
Ski tows and lifts	Not approved		
Steering gear	1,0	1,5	2,0
Stoker	1,0	1,5	2,0
Tire shredder	1,5	2,0	2,5
Tumbling barrel	1,75	2,25	2,75
Winch, maneuvering			
Dredge, marine	1,5	2,0	2,5
Wind turbines	1,25	1,75	2,25
Windlass	1,5	2,0	2,5
Woodworking machinery	1,0	1,5	2,0
Work lift platforms	Not approved		

* For balanced opposed design, contact SKF
If people are occasionally transported, contact SKF for the selection of the proper size of the coupling
For high peak load applications (such as metal rolling mills), contact SKF

Table 8

Service factors by industry

Application	Electric motor with standard torque	Reciprocating engine with 6 or more cylinders	Reciprocating engine with 4/5 cylinders
Aggregate processing,			
Cement, mining kilns;			
Tube, rod and ball mills			
Direct or on low speed shaft of reducer, with final drive machined spur gears	2,0	2,5	3,0
Single helical or herringbone gears	1,75	2,25	2,75
Conveyors, feeders, screens, elevators	See general listing		
Crushers, ore or stone	2,5	*	*
Dryer, rotary	1,75	2,25	2,75
Grizzly	2,0	2,5	3,0
Hammermill or hog	1,75	2,25	2,75
Tumbling mill or barrel	1,75	2,25	2,75
Brewing and distilling			
Bottle and can filling machines	1,0	1,75	2,0
Brew kettle	1,0	1,5	2,0
Cookers, continuous duty	1,25	2,0	2,0
Lauter tub	1,5	2,0	2,5
Mash tub	1,25	1,75	2,0
Scale hopper, frequent peaks	1,75	2,25	2,75
Clay working industry			
Brick press, briquette machine, clay working machine,	1,75	2,25	2,75
Pug mill	1,75	2,25	2,75
Food industry			
Beet slicer	1,75	2,25	2,75
Bottling, can filling machine	1,0	1,5	2,0
Cereal cooker	1,25	1,75	2,0
Dough mixer, meat grinder	1,75	2,25	2,75
Lumber			
Band resaw	1,5	2,0	2,5
Circular resaw, cut-off	1,75	2,25	2,75
Edger, head rig, hog	2,0	2,5	3,0
Gang saw (reciprocating)	Contact SKF		
Log haul	2,0	2,5	3,0
Planer	1,75	2,25	2,75
Rolls, non-reversing	1,25	1,75	2,0
Rolls, reversing	2,0	2,5	3,0
Sawdust conveyor	1,25	1,75	2,0
Slab conveyor	1,75	2,25	2,75
Sorting table	1,5	2,0	2,5
Trimmer	1,75	2,25	2,75
Metal rolling mills			
Coilers (up or down) cold mills only	1,5	2,0	2,5
Coilers (up or down) hot mills only	2,0	2,5	3,0
Coke plants			
Pusher ram drive	2,5	*	*
Door opener	2,0	2,5	3,0
Pusher or larry car traction drive	3,0	*	*
Continuous caster	1,75	2,25	2,75
Cold mills			
Strip mills	Contact SKF		
Temper mills	Contact SKF		
Cooling beds	1,5	2,0	2,5
Drawbench	2,0	2,5	3,0
Feed rolls – blooming mills	3,0	*	*
Furnace pushers	2,0	2,5	3,0
Hot and cold saws	2,0	2,5	3,0
Hot mills			
Strip or sheet mills	Contact SKF		
Reversing blooming	Contact SKF		
Slabbing mills	Contact SKF		
Edger drives	Contact SKF		
Hot mills			
Strip or sheet mills	Contact SKF		
Reversing blooming	Contact SKF		
Slabbing mills	Contact SKF		
Edger drives	Contact SKF		
Ingot cars	2,0	2,5	3,0
Manipulators	3,0	*	*
Merchant mills	Contact SKF		
Mill tables			
Roughing breakdown mills	3,0	*	*
Hot bed or transfer, non-reversing	1,5	2,0	2,5
Runout, reversing	3,0	*	*
Runout, non-reversing, non-plugging	2,0	2,5	3,0
Reel drive	1,75	2,25	2,75
Rod mills	Contact SKF		
Screwdown	2,0	2,5	3,0
Seamless tube mills			
Piercer	3,0	*	*
Thrust block	2,0	2,5	3,0
Tube converyor rolls	2,0	2,5	3,0
Reeler	2,0	2,5	3,0
Kick out	2,0	2,5	3,0
Shear, croppers	Contact SKF		
Sideguards	3,0	*	*
Skelp mills	Contact SKF		
Slitters, steel mill only	1,75	2,25	2,75
Soaking pit cover drives			
Lift	1,0	1,5	2,0
Travel	2,0	2,5	3,0
Straighteners	2,0	2,5	3,0
Unscramblers (billet bundle busters)	2,0	2,5	3,0
Wire drawing machinery	1,75	2,25	2,75
Oil industry			
Chiller	1,25	1,75	2,25
Oilwell pumping (not over 150% peak torque)	2,0	2,5	3,0
Paraffin filter press	1,5	2,0	2,5
Rotary kiln	2,0	2,5	3,0
Paper mills			
Barker auxiliary, hydraulic	2,0	2,5	3,0
Barker, mechanical	2,0	2,5	3,0
Barking drum			
L, S, shaft of reducer with final drive			
Helical or herringbone gear	2,0	2,5	3,0
Machined spur gear	2,5	*	*
Cast tooth spur gear	3,0	*	*
Beater and pulper	1,75	2,25	2,75
Bleachers, coaters	1,0	1,5	2,0
Calender and super calender	1,75	2,25	2,75
Chipper	2,5	*	*
Converting machine	1,25	1,75	2,25
Couch	1,75	2,25	2,75
Cutter, flet whipper	2,0	2,5	3,0
Cylinder	1,75	2,25	2,75
Dryer	1,75	2,25	2,75
Felt stretcher	1,25	1,75	2,25
Fourdrinier	1,75	2,25	2,75
Jordan	2,0	2,5	3,0
Log haul	2,0	2,5	3,0
Line shaft	1,5	2,0	2,5
Press	1,75	2,25	2,75
Pulp grinder	1,75	2,25	2,75
Reel, rewinder, winder	1,5	2,0	2,5
Stock chest, washer, thickener	1,5	2,0	2,5
Stock pumps, centrifugal			
Constant speed	1,0	1,5	2,0
Frequent speed changes under load	1,25	1,75	2,25
Suction roll	1,75	2,25	2,75
Vacuum pumps	1,25	1,75	2,25
Rubber industry			
Calender	2,0	2,5	3,0
Cracker, plasticator	2,5	*	*
Extruder	1,75	2,25	2,75
Intensive or banbury mixer	2,5	*	*
Mixing mill, refiner or sheeter			
One or two in line	2,5	*	*
Three or four in line	2,0	2,5	3,0
Five or more in line	1,75	2,25	2,75
Tire building machine	2,5	*	*
Tire & tube press opener (peak torque)	1,0	1,5	2,0
Tuber, strainer, pelletizer	1,75	2,25	2,75
Warming mill			
One or two mills in line	2,0	2,5	3,0
Three or more mills in line	1,75	2,25	2,75
Washer	2,5	*	*
Sewage disposal equipment			
Bar screen, chemical feeders,			
Collectors dewatering			
Screen, grit collector	1,0	1,5	2,0
Sugar industry			
Cane carrier & leveler	1,75	2,25	2,75
Cane knife & crusher	2,0	2,5	3,0
Mill stands, turbine driver with all helical or herringbone gears	1,5	2,0	2,5
Electric drive or steam engine			
Drive with helical,			
herringbone, or spur gears			
with any prime mover	1,75	2,25	2,75
Textile industry			
Batcher	1,25	1,75	2,25
Calender, card machine	1,5	2,0	2,5
Cloth finishing machine	1,5	2,0	2,5
Dry can, loom	1,5	2,0	2,5
Dyeing machinery	1,25	1,75	2,25
Knitting machine	Contact SKF		
Mangle, napper, soaper	1,25	1,75	2,25
Spinner, tenter frame, winder	1,5	2,0	2,5

* For balanced opposed design, contact SKF
If people are occasionally transported, contact SKF for the selection of theproper size coupling
For high peak load applications (such as metal rolling mills), contact SKF

Lubrication

A sufficient supply of lubricant is vital to satisfactory operation. A list of typical lubricants and specifications for general purpose and long term grease is available below. Using general purpose grease requires annual re-lubrication of the coupling.

General purpose grease

The specifications and lubricants in **table 1** and **2** are for general purpose grease, whereas the specifications and lubricants in **table 3** apply to SKF Gear Couplings. These specifications apply to couplings that are lubricated annually and that operate at temperatures between 0 to 150 °F (–18 to 66 °C). For temperatures beyond this range, consult SKF.

If couplings leak grease, are exposed to extreme temperatures or excessive moisture or experience frequent reversals, more frequent lubrication may be required.

Specifications:

- Dropping point – 300 °F (149 °C) or higher
- Consistency – NLGI 2 with worked penetration value in the range of 250–300 (10^{-1} mm).
- Separation and resistance – low oil separation rate and high resistance to separation from centrifuging.
- Liquid constituent – should possess good lubricating properties, equivalent to high quality, well refined, petroleum oil.
- Inactive – must not corrode steel or cause swelling or deterioration of synthetic seals.

Table 1

General purpose grease

Ambient temperature range	0 to 150 °F (–18 to +66 °C)	–30 to 100 °F* (–34 to +38 °C)
NLGI grade manufacturer	**#2 lubricant**	**#2 lubricant**
SKF	LGEP 2	LGEP 2
Gulf Oil Corp.	Gulfcrown Grease #2	Gulfcrown Grease #2
Mobil Oil Corp.	Mobilux #2	Mobilux #1
Phillips Petroleum Co.	IB and RB Grease	Philube IB and RB Grease
Shell Oil Co.	Alvania Grease #2	Alvania Grease #2

* For northern climate applications. For continuous operation at constant ambient temperatures less than 0 °F or –18 °C (for example refrigeration systems) consult SKF.

Table 2

NLGI 1 grease

Coupling speed range:	See table 3
Temperature range:	–30 to +200°F* (–34 to +93°C)

Manufacturer	Lubricant
SKF	LGWM 1
Mobil Oil Corp.	Mobilux EP1
Phillips Petroleum Co.	Philube EP 1
Shell Oil Co.	Alvania EP Grease #1

* For northern climate applications. For continuous operation at constant ambient temperatures less than 0 °F or –18 °C (for example refrigeration systems), consult SKF.

Table 3

Coupling speed range

Coupling size	Speed range with NLGI 1 grease*	
	Minimum	Allowed
–	r/min	
1010	1 030	7 000
1015	700	6 000
1020	550	5 000
1025	460	4 750
1030	380	4 400
1035	330	3 900
1040	290	3 600
1045	250	3 200
1050	230	2 900
1055	210	2 650
1060	190	2 450
1070	160	2 150
1080	140	1 750
1090	120	1 550
1100	110	1 450
1100	100	1 330
1120	94	1 200
1130	88	1 075
1140	82	920
1150	76	770
1160	72	650
1180	64	480
1200	58	370
1220	52	290
1240	48	270
1260	44	250
1280	40	230
1300	38	220
2130	88	1 075
2140	82	920
2150	76	770
2160	72	650
2180	64	480
2200	58	370
2220	52	290
2240	48	270
2260	44	250
2280	40	230
2300	38	220

* Coupling speed range with NLGI 0 greases is from zero to the maximum shown.

Information shown for sizes 1010 through 1070 also applies to size 10 through 70 respectively, e.g. 1010 = 10, etc

Shaft alignment tools

TMEA series

Pinpoint accurate alignment simply achieved

The SKF shaft alignment tools, TMEA series, offer you simplicity with a high degree of accuracy.

Measuring, aligning and documenting

These highly innovative tools feature a three-step process for correcting alignment. First, measure the machinery's current alignment status. Then, align the machine vertically and horizontally. Finally, document and keep track of the alignment activities.

These three simple steps allow you to easily and effectively align shafts using advanced laser technology.

Features

- Easy-to-use, three-step process: measure-align-document
- Compact, lightweight design
- Spirit levels allow easy and fast positioning of the measuring units
- Measurements in millimeters or inches facilitate worldwide use
- Supplied in sturdy, lightweight carrying cases for portability
- Supplied with high precision SKF pre-cut shims for accurate alignment

TMEA 2

Easy, quick and affordable shaft alignment

The TMEA 2 is an easy-to-use shaft alignment tool, which requires no special training to operate.

The two measuring units can be easily attached to the shafts using magnetic brackets or chains.

Each measuring unit emits a laser line, which is projected on the detector of the other unit.

Features

- Display unit simultaneously provides clear "real-time" coupling and values in feet during alignment process making rechecking of the alignment unnecessary
- The laser and scale lines facilitate easy pre-alignment
- "Soft foot" feature easily guides the operator through this function
- Display unit can be held using one hand, freeing the operator to perform the alignment
- Magnetic brackets allow easy fixture of the measuring units onto the shaft
- A set of blank alignment reports to help you keep record of your alignment jobs
- Maximum distance of 0,85 m (2,8 ft) between the measuring unit's brackets

TMEA 1P/2,5

Shaft alignment tool with printer capability. Record alignment activities using an optional printer

The TMEA 1P/2,5 offers you the advantage of keeping record of the alignment activities. It is equipped with a printer port to which the optional thermal printer TMEA P1 can be connected.

The printer provides a clear and complete alignment report, which can be used to document alignment activities. This user-friendly printer is operated with the touch of a single button on the display unit of the TMEA 1P/2,5.

Features

- Optional printer facilitates recording of alignment activities
- Maximum distance of 2,5 m (8,2 ft) between the measuring units makes it suitable for aligning a variety of applications
- Display unit provides clear "real-time" values during the alignment process making rechecking alignment unnecessary
- User-friendly display unit with only four buttons for operation
- Supplied with blank alignment reports for recording alignment activities in case the printer is not purchased

TMEA 1PEx

Accurate alignment in potentially explosive hazardous areas. Intrinsically safe shaft alignment tool

The TMEA 1PEx is an intrinsically safe (Ex) shaft alignment tool, especially designed for use in potentially explosive hazardous areas. It has been tested and certified according to the latest ATEX standards in intrinsic safety zones generally found in industries such as petrochemical, gas and pharmaceutical, among others. The TMEA 1PEx is supplied standard with a thermal printer for recording alignment activities.

Features

- Intrinsically safe classification ATEX code: II 2 G, EEx ib IIC T4, at ambient temperature range of 0 to 40°C (32 to 104°F)
  EC Type Examination Certificate Nemko 03ATEX101X
- Standard printer facilitates recording of alignment activities
- Maximum distance of 1 m (3 ft) between the measuring units makes it suitable for aligning a variety of applications
- Display unit provides clear "real-time" values during the alignment process making rechecking alignment unnecessary
- User-friendly display unit with only five buttons for operation

Thermal printer TMEA P1

Keep track of alignment jobs

This compact thermal printer helps you to document your alignment jobs. A clear and complete printout of the measurement data shows that the machine has been properly aligned within the allowed tolerances.

Features

- Compact easy-to-use printer
- Clear easy-to-read printout
- Pre-alignment and post-alignment reports possible
- Battery is rechargeable
- Continental European adaptor included
- Printer uses standard thermal paper roll, 120 mm × 20 m (4.4 in × 65 ft)
- Can be used in combination with TMEA 1P/2,5 and TMEA 1PEx only

Machinery shims TMAS series

For accurate vertical machinery alignment

Accurate machine adjustment is an essential element of any alignment process. SKF single slot pre-cut shims are available in five different dimensions and in ten different thicknesses.

Features

- Made of high quality stainless steel, allowing re-use
- Easy to fit and to remove
- Close tolerances for accurate alignment
- Thickness clearly marked on each shim
- Fully de-burred
- Pre-cut shims are supplied in packs of 10 and complete kits are also available

Table 1

Contents in TMAS shim kits

Designation	Size, mm	Thickness, mm								
		0,05	0,10	0,20	0,25	0,40	0,50	0,70	1,00	2,00
–	–	Quantities								
TMAS 340	100 × 100	20	20	20	20	20	20	20	20	10
	125 × 125	20	20	20	20	20	20	20	20	10
TMAS 360	50 × 50	20	20	20	–	–	20	–	20	20
	75 × 75	20	20	20	–	–	20	–	20	20
	100 × 100	20	20	20	–	–	20	–	20	20
TMAS 510	50 × 50	20	20	20	20	20	20	20	20	10
	75 × 75	20	20	20	20	20	20	20	20	10
	100 × 100	20	20	20	20	20	20	20	20	10
TMAS 720	50 × 50	20	20	20	20	20	20	20	20	20
	75 × 75	20	20	20	20	20	20	20	20	20
	100 × 100	20	20	20	20	20	20	20	20	20
	125 × 125	20	20	20	20	20	20	20	20	20

Inspection tool

Stroboscope TMRS 1

Easy, cost effective inspection in a flash

The SKF TMRS 1 is a portable, easy-to-use stroboscope that allows the motion of rotating or reciprocating machinery to appear frozen, facilitating inspection without stopping the machine. Equipped with a phase shift feature that allows the user to advance or retard the flash timing without changing the flash rate, the motion can be "frozen" at the position required for inspection.

Features

- The bright flash allows better illumination of the application at a distance, giving a wider viewing area.
- Flash rates of up to 12 500 flashes per minute (FPM) cover a wide range of applications
- Flash rate is quick and easy to adjust using the variable dial rate. Allows the required speed to be reached within a matter of seconds
- Phase shift mode for optimum inspection of gears, rolls, fans, pulleys. The feature of interest can be rotated to the correct position for inspection
- × 2, ÷2 buttons for quick adjustment of FPM
- Easy to read LCD display
- Compact design, one-hand operated instrument
- Battery powered with long running time per charge (up to 2,5 h)
- Includes universal AC adaptor that can be used worldwide
- Extra flashtube supplied to minimise downtime of unit
- Supplied in carrying case for protection and portability
- Mounting thread on the underside allows mounting on a tripod for stability and ease of use

Table 1

Technical data	
Designation	TMRS 1
Flash rate range	12 500 flashes per minute (FPM)
Flash rate accuracy	± 0,5 FPM or +/– 0,01% of reading, whichever is greater
Flash setting resolution	to 9 999 FPM –0,1 FPM, 10 000 to 12 500 FPM –1 FPM
Tachometer range	40–59 000 r/min
Tachometer accuracy	+/– 0,5 r/min or +/– 0,01% of reading, whichever is greater
Flash tube	Xenon, 10 W, TMRS 1-BULB
Flash tube life	100 million flashes
Flash duration	9–15 msec
Light power	154 mJ per flash
Battery type	NiMH, rechargeable, removable
Battery capacity	2,6 AmpHr
Battery charge time	2–4 hours, using supplied AC adapter
Run time per charge	2,5 hours at 1 600 FPM, 1,25 hours at 3 200 FPM
Battery charger	AC input 100-240 VAC, 50/60 Hz
Display	8 character by 2 line LCD, alphanumeric
Display update	Continuous
Display resolution	100 to 9 999 FPM; 0,1 FPM, 10 000 to 12 500 FPM -1FPM
Time base	Crystal oscillator, 100 ppm accuracy
Controls	Power, x2, x1/2, phase shift, external trigger
External trigger input	0-5V TTL type via stereo phono jack
EXTL. trigger to flash delay	5 ms maximum
Clock output	0-5V TTL Type signal via stereo phono jack
Colour	Grey
Housing	Impact and oil resistant polycarbonate
Weight	650 g (1 lb, 4 oz)
Operating temperature	10 to 40 °C (50 to 104 °F)
Storage temperature	–20 to 45 °C (–4 to 113 °F)

SKF – the knowledge engineering company

From one simple but inspired solution to a misalignment problem in a textile mill in Sweden, and fifteen employees in 1907, SKF has grown to become a global industrial knowledge leader.

Over the years we have built on our expertise in bearings, extending it to seals, mechatronics, services and lubrication systems. Our knowledge network includes 46 000 employees, 15 000 distributor partners, offices in more than 130 countries, and a growing number of SKF Solution Factory sites around the world.

Research and development

We have hands-on experience in over forty industries, based on our employees' knowledge of real life conditions. In addition our world-leading experts and university partners who pioneer advanced theoretical research and development in areas including tribology, condition monitoring, asset management and bearing life theory. Our ongoing commitment to research and development helps us keep our customers at the forefront of their industries.

Meeting the toughest challenges

Our network of knowledge and experience along with our understanding of how our core technologies can be combined helps us create innovative solutions that meet the toughest of challenges. We work closely with our customers throughout the asset life cycle, helping them to profitably and responsibly grow their businesses.

Working for a sustainable future

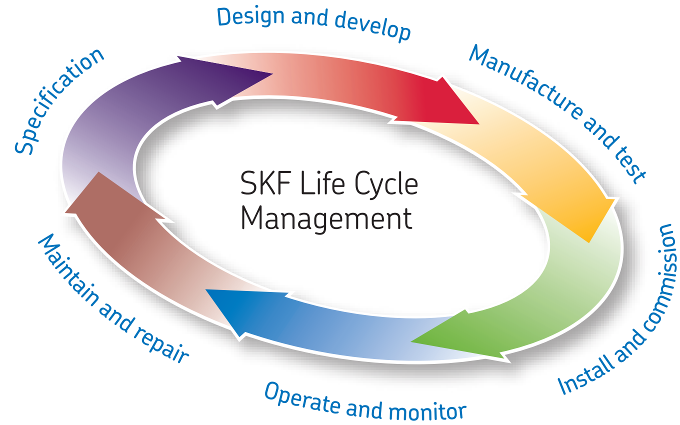
Since 2005, SKF has worked to reduce the negative environmental impact from our own operations and those of our suppliers. Our continuing technology development introduced the SKF BeyondZero portfolio of products and services which improve efficiency and reduce energy losses, as well as enable new technologies harnessing wind, solar and ocean power. This combined approach helps reduce the environmental impact both in our own operations and in our customers'.

SKF Solution Factory makes SKF knowledge and manufacturing expertise available locally, to provide unique solutions and services to our customers.

Working with SKF IT and logistics systems and application experts, SKF Authorized Distributors deliver a valuable mix of product and application knowledge to customers worldwide.

Our knowledge – your success

SKF Life Cycle Management is how we combine our technology platforms and advanced services, and apply them at each stage of the asset life cycle, to help our customers to be more successful, sustainable and profitable.



Working closely with you

Our objective is to help our customers improve productivity, minimize maintenance, achieve higher energy and resource efficiency, and optimize designs for long service life and reliability.

Innovative solutions

Whether the application is linear or rotary or a combination of the two, SKF engineers can work with you at each stage of the asset life cycle to improve machine performance by looking at the entire application. This approach doesn't just focus on individual components like bearings or seals. It looks at the whole application to see how each component interacts with the next.

Design optimization and verification

SKF can work with you to optimize current or new designs with proprietary 3-D modeling software that can also be used as a virtual test rig to confirm the integrity of the design.

Bearings
SKF is the world leader in the design, development and manufacture of high performance rolling bearings, plain bearings, bearing units and housings.

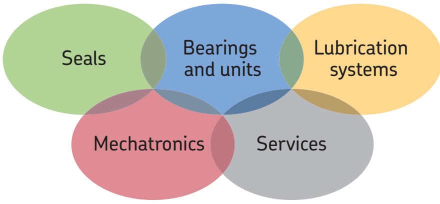
Machinery maintenance
Condition monitoring technologies and maintenance services from SKF can help minimize unplanned downtime, improve operational efficiency and reduce maintenance costs.

Sealing solutions
SKF offers standard seals and custom engineered sealing solutions to increase uptime, improve machine reliability, reduce friction and power losses, and extend lubricant life.

Mechatronics
SKF fly-by-wire systems for aircraft and drive-by-wire systems for off-road, agricultural and forklift applications replace heavy, grease or oil consuming mechanical and hydraulic systems.

Lubrication solutions
From specialized lubricants to state-of-the-art lubrication systems and lubrication management services, lubrication solutions from SKF can help to reduce lubrication related downtime and lubricant consumption.

Actuation and motion control
With a wide assortment of products – from actuators and ball screws to profile rail guides – SKF can work with you to solve your most pressing linear system challenges.



The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry world-wide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.

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