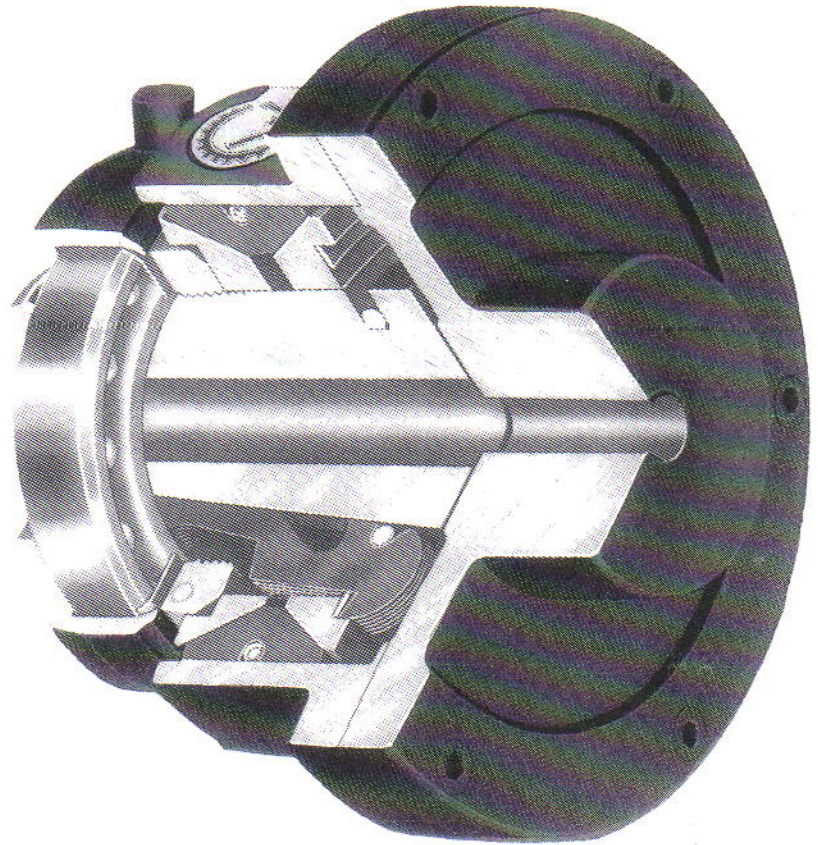




Van der Graaf B.V.

„G.V.“ FRICTION CLUTCHES



5 sizes

Output torque up to 640 Nm

6 different types

Also with flexible coupling

With ball bearing clutch collar

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Holland

NEW NUMBER

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VAN DER GRAAF POWER TRANSMISSION EQUIPMENT

The Friction Clutches as described in this leaflet are only one item of our range based on more than 40 year's experience and „know-how“.

„G.V.“ Start-up Couplings – Granulock –

- soft and load free start
- 100% efficient, saving energy
- simple to install

„G.V.“ Drum-Motors

- oilbath cooling
- 0,1 – 11kW
- Ø 127, 160, 215, 315, 400 and 500 mm

„G.V.“ Gear Boxes

- for mounting on the driven shaft
- helical gears
- up to 2100 Nm

„G.V.“ Variable Pulleys

- for V-belts A/SPA and B/SPB
- ratio 1 : 1,9
- up to 3 kW x 1500 r.p.m. nominal

ASK FOR DETAILED INFORMATION!!

„G.V.“ FRICTION CLUTCH

Construction

The „G.V.“ Friction Clutch comprises (see sketch on page 4) a steel hub (1) with grooves corresponding with those in the two identical conical compression rings (2), a shell (3), friction segments (9), an adjusting nut (11), a set of levers (14), and the clutch collar with ball bearing (16). The parts exposed to wear are of hardened steel i.e.; the clutch collar, levers, compression plate, lever pivot (7), and the spring rings (15).

The compression plate (6) prevents indentation by the short arms of the levers into the conical compression ring.

The friction segments are of a very resilient and coefficient material, guaranteeing a long service life.

The split adjusting nut is secured by means of a clamping screw (17).

The set of levers are composed of stainless steel laminates which are formed into groups of 3, gripping with slots around the 2-part lever pivot. The levers are placed in grooves around the hub and the conical compression rings, so that a multiple key connection is made, transmitting the torque and absorbing the shock loads. This construction has the advantage that the hub can have relatively large bores.

The bearing of the clutch collar is provided with a lifetime lubricator, is dust tight, and consequently free of maintenance.

Replacement of the friction segments can be made in two different ways:

- a. by loosening and shifting the shell or
- b. by taking away the clutch collar, the adjusting nut, and the outer conical compression ring.

The levers as well as the annular 2-part lever pivot can easily be replaced after taking away the conical inner compression ring, and the compression plate.

Types	: page 6 – 7
Dimensions	: page 8 – 11
Actuating	: page 12 – 13
Power table	: page 15 – 17

Operation

The clutch is engaged by shifting the clutch collar (16) on the long arms of the levers (14); the short arms shift a conical compression ring (2), which pushes the friction segments (9) against the inner surface of the shell (3). If the clutch collar has reached the „stop”, a spring ring (15) expands itself behind the ball bearing of the clutch collar so that an unintentional disengaging is prevented.

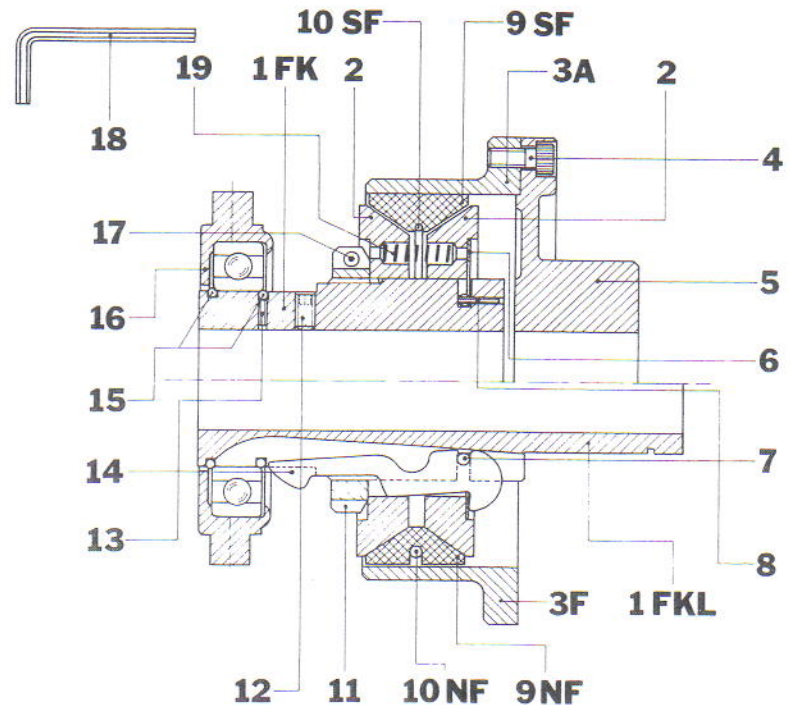
If the clutch is disengaged, the said spring ring ensures that the inner track of the ball bearing turns along with the rotating hub (1). During the disengagement the compression springs (19), push the conical compression ring back into its starting position. The segments run entirely free from the shell surface, and consequently do not wear.

The required torque is attained by adjusting nut (11) being secured by clamping screw (17). This clamping screw should only be tightened when the clutch is disengaged.

After the running-in time further adjustment will seldom be necessary provided the correct size of clutch is applied.

- | | |
|------|-----------------------------|
| 1FK | Hub |
| 1FKL | Hub |
| 2 | Compression ring |
| 3A | Coupling shell |
| 3F | Coupling shell |
| 4 | Flange screw |
| 5 | Flange nave |
| 6 | Compression plate |
| 7 | Lever pivot (2-part) |
| 8 | Spring pin |
| 9NF | Friction ring |
| 9SF | Friction ring |
| 10NF | Tension spring |
| 10SF | Spring ring |
| 11 | Adjusting nut |
| 12 | Set screw |
| 13 | Spring pin |
| 14 | Levers (set) |
| 15 | Spring ring |
| 16 | Clutch collar |
| 17 | Clamping screw |
| 18 | Hexagonal key for 12 and 17 |
| 19 | Compression spring |

Fig. 1



TECHNICAL DATA

SIZE		FK 90	FK 115	FK 148	FK 186	FK 234
Max. torque at service factor 1	Nm	80	160	240	400	640
Max. rev. driving mechanism type NF	n min. ⁻¹	2000	1700	1200	900	800
Max. rev. driving mechanism type SF	n min. ⁻¹	4500	3500	2735*	2175*	1730*
Max. rev. driving clutch shell type NF	n min. ⁻¹	4500	3500	2735*	2175*	1730*
Max. rev. during engaging	n min. ⁻¹	3180	2490	1935	1540	1225
Engaging force dynamic	Newton	500	960	840	1900	2200
Engaging force static	Newton	575	1100	950	2200	2500
Moment of inertia J(MR ²) mechanism M	kgm ² . 10 ⁻³	1,25	3,45	11,75	36,75	97,50
Moment of inertia J(MR ²) type F	kgm ² . 10 ⁻³	3,35	8,35	26,50	68,50	185,25
Moment of inertia J(MR ²) type LF	kgm ² . 10 ⁻³	3,45	8,62	26,94	70,76	189,75
Moment of inertia J(MR ²) type A	kgm ² . 10 ⁻³	5,25	12,95	40,75	103,75	293,25
Mass of mechanism M	kg	2,4	4,2	7,6	15,8	25,3
Mass of type F	kg	3,3	5,4	9,8	19,2	31,0
Mass of type LF	kg	3,9	6,4	11,2	22,3	35,5
Mass of type A	kg	4,4	7,5	13,9	26,5	45,5

*These types are in certain cases obtainable on demand for higher speed, if the clutch is not engaged at the higher speed.

Fig. 2

NF, friction ring with outer spring

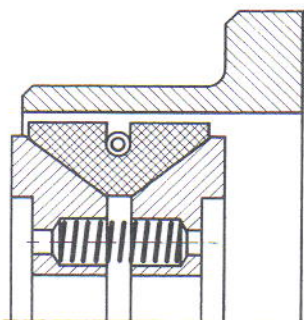
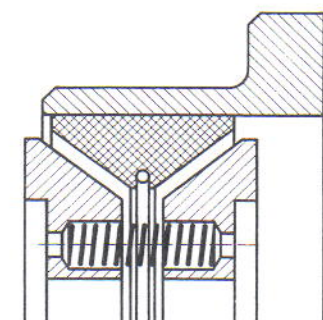


Fig. 3

SF, friction ring with inner spring



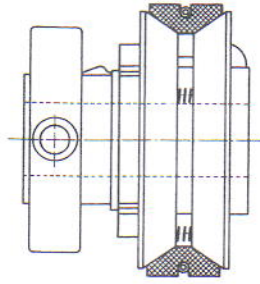
Consult the above table for maximum speeds.

N.B. If the order does not specify which type of friction ring is required, the normal friction ring (type NF) is supplied.

TYPES

Fig. 4

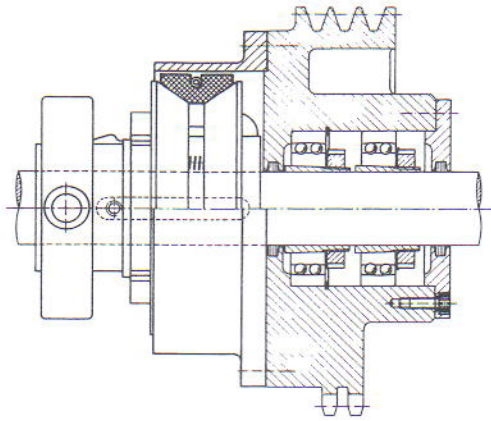
FK.....M



Inner mechanism only - universal application (without shell).

Fig. 5

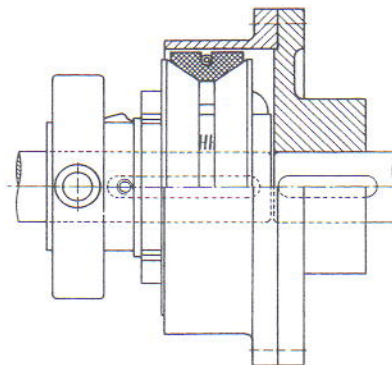
FK.....F



Flange clutch - for shaft, V-belt, or chain transmission on linear shaft.

Fig. 6

FK.....A

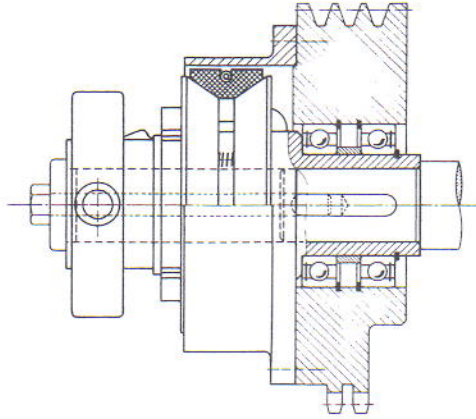


Shaft clutch - for shaft-shaft transmission, with good alignment and stability.

Actuating levers - see pages 12 and 13

Fig. 7

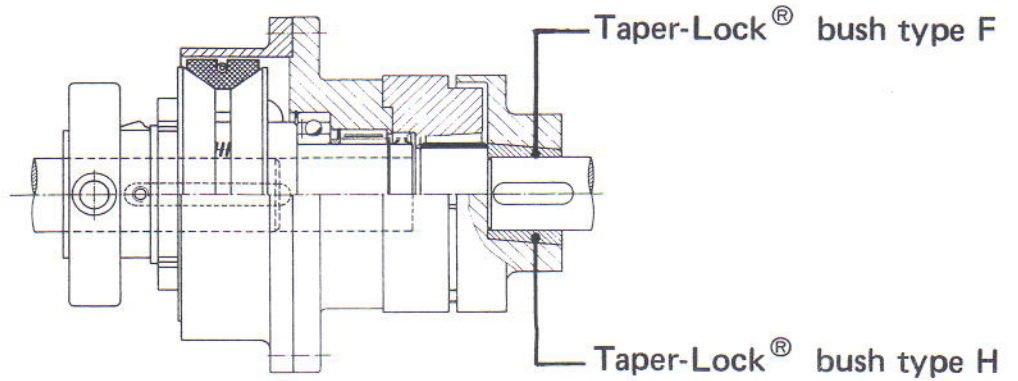
FKL.....F



Flange clutch - for shaft, V-belt, or chain transmission on short shaft ends with securing bolt.

Fig. 8

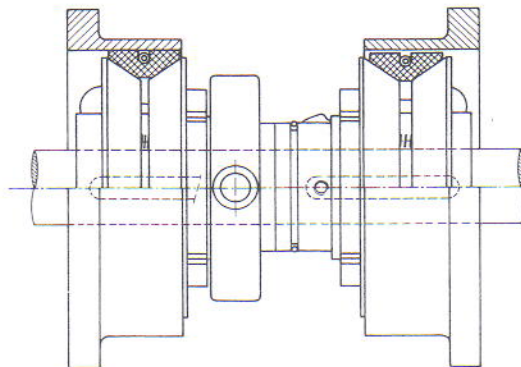
FKL.....E



Shaft clutch - flexible coupling for shaft-shaft transmission with instability and/or misalignment.

Fig. 9

FKD.....F



Duplex clutch - for two shaft hub transmission on continuous shaft, e.g.: different speeds - opposed rotating directions - or clutch and brake.

Actuating levers - see pages 12 and 13

TYPE	FK 90	FK 115	FK 148	FK 186	FK 234
A	85	112	130	150	180
a	88	98	118	140	165
a1	148	158	188	216	248
B	62	79	87	100	125
B1	153	168	204	238	283
B2	159	174	212	248	293
b	30	38	48	60	75
b1	50	75	82	95	120
b2	23,5	39	39,5	46,5	64,5
c	3	3	4	5	5
c1 (min.)	1	1	2	3	3
c2	28	33	38	48	52
D	125	152	195	235	290
D1	112	138	178	217	268
D2	90	115	148	186	234
D3	100	125	160	200	250
D4	60	75	95	120	150
D5 (k5)	40	50	55	80	95
d (∩)	11	43 45,5	13	25	30
d1 (max.)	25*	35*	42*	62*	70*
d2 (max.)	35	45	60	80	100
d3 (∩)	10	12	14	19	35
d4 (max.)	35	48	50	63	76
T-L d5 (max.)	28	32***	42	50	60
HRC coupling nr. ** Taper-Lock nr.	90 1108-Ø...	110 1210-Ø...	130 1610-Ø...	150 2012-Ø...	180 2517-Ø...
e	10	12	14	16	20
f	18	24	32	42	53
g	2	2	2	2	2
H	12	17	18	22	25
h	11	13	15	15	21
J	84	104	124	166	188
k Ø	11	12	16	18	18
l	43	43	50	55	58
l1	52	55	62	68	73
m	35	40	47	56	70
n	10	12	13	14	15
o	8	10	12	14	15
s	6 x M6	6 x M6	6 x M8	8 x M8	8 x M10
t	2,5	2	3	5	5
z	M6	M6	M8	M10	M10

*Shallow bores may be bigger in diameter; see drawing and table on page 14

**Taper-Lock® J.H. Fenner & Co. Ltd. - see page 18 and 19 - when ordering please state type of flange required.

***For the time being not available

Fig. 4a

FK.....M

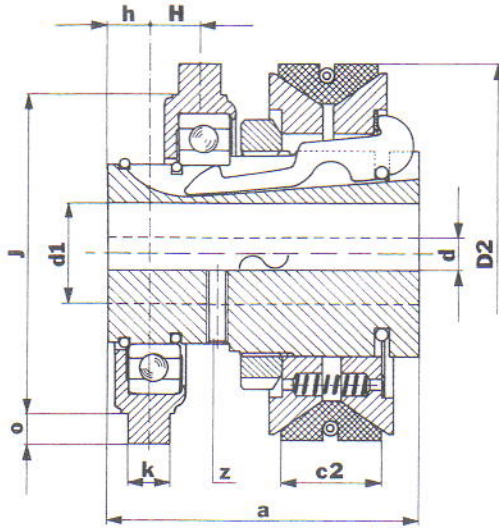


Fig. 5a

FK.....F

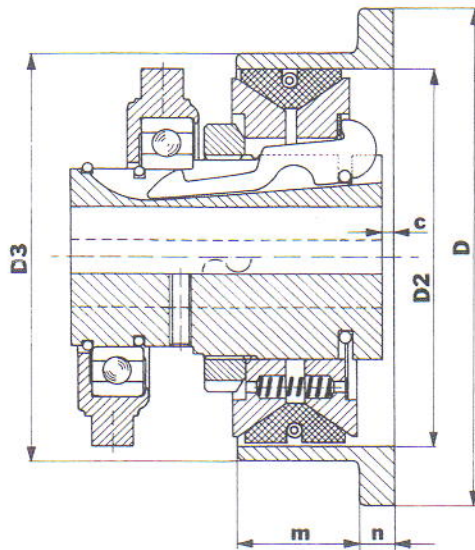
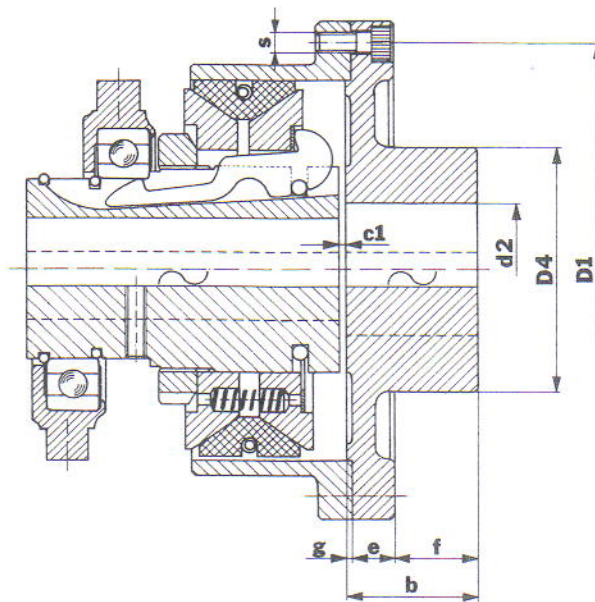


Fig. 6a

FK.....A



Actuating levers - see pages 12 and 13

TYPE	FK 90	FK 115	FK 148	FK 186	FK 234
A	85	112	130	150	180
a	88	98	118	140	165
a1	148	158	188	216	248
B	62	79	87	100	125
B1	153	168	204	238	283
B2	159	174	212	248	293
b	30	38	48	60	75
b1	50	75	82	95	120
b2	23,5	39	39,5	46,5	64,5
c	3	3	4	5	5
c1 (min.)	1	1	2	3	3
c2	28	33	38	48	52
D	125	152	195	235	290
D1	112	138	178	217	268
D2	90	115	148	186	234
D3	100	125	160	200	250
D4	60	75	95	120	150
D5 (k5)	40	50	55	80	95
d (∩)	11	13	13	25	30
d1 (max.)	25*	35*	42*	62*	70*
d2 (max.)	35	45	60	80	100
d3 (∩)	10	12	14	19	35
d4 (max.)	35	48	50	63	76
T-L d5 (max.)	28	32***	42	50	60
HRC coupling nr. ** Taper-Lock nr.	90 1108-Ø...	110 1210-Ø...	130 1610-Ø...	150 2012-Ø...	180 2517-Ø...
e	10	12	14	16	20
f	18	24	32	42	53
g	2	2	2	2	2
H	12	17	18	22	25
h	11	13	15	15	21
J	84	104	124	166	188
k Ø	11	12	16	18	18
l	43	43	50	55	58
l1	52	55	62	68	73
m	35	40	47	56	70
n	10	12	13	14	15
o	8	10	12	14	15
s	6 x M6	6 x M6	6 x M8	8 x M8	8 x M10
t	2,5	2	3	5	5
z	M6	M6	M8	M10	M10

*Shallow bores may be bigger in diameter; see drawing and table on page 14

**Taper-Lock® J.H. Fenner & Co. Ltd. - see page 18 and 19 - when ordering please state type of flange required.

*** For the time being not available

Fig. 7a

FKL.....F

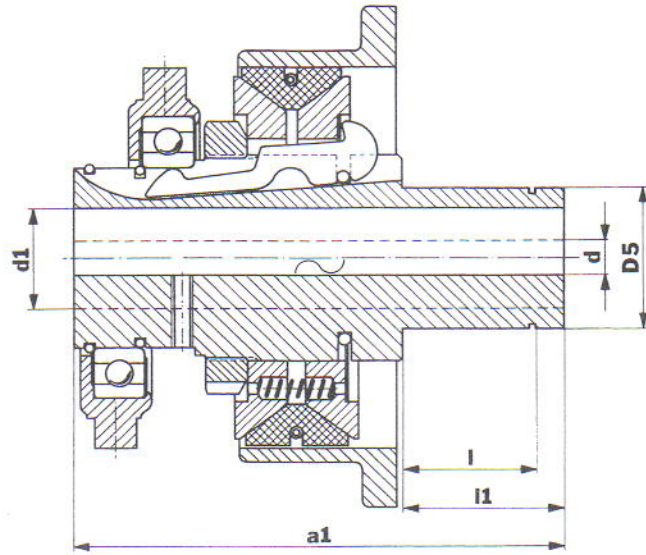
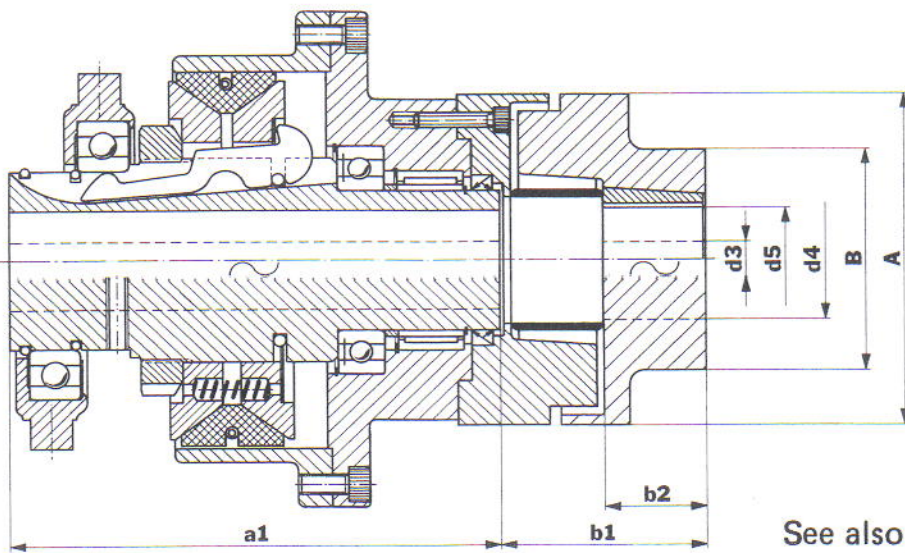


Fig. 8a

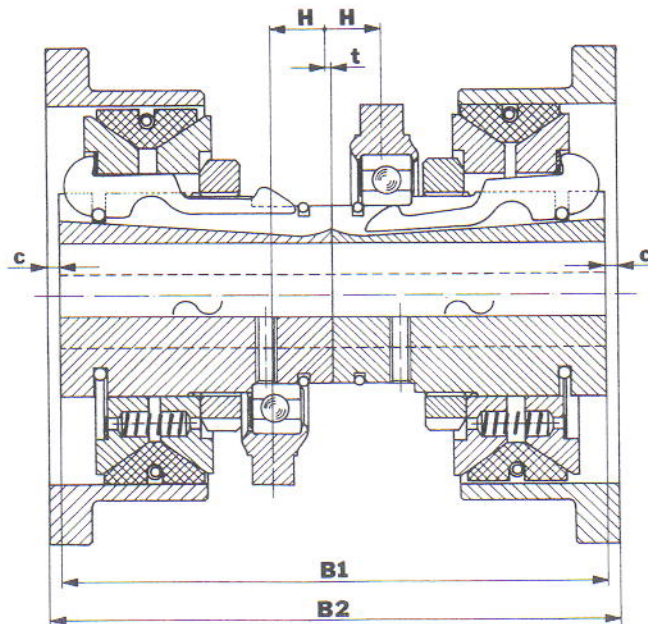
FKL.....E



See also page 18 and 19

Fig. 9a

FKD.....F

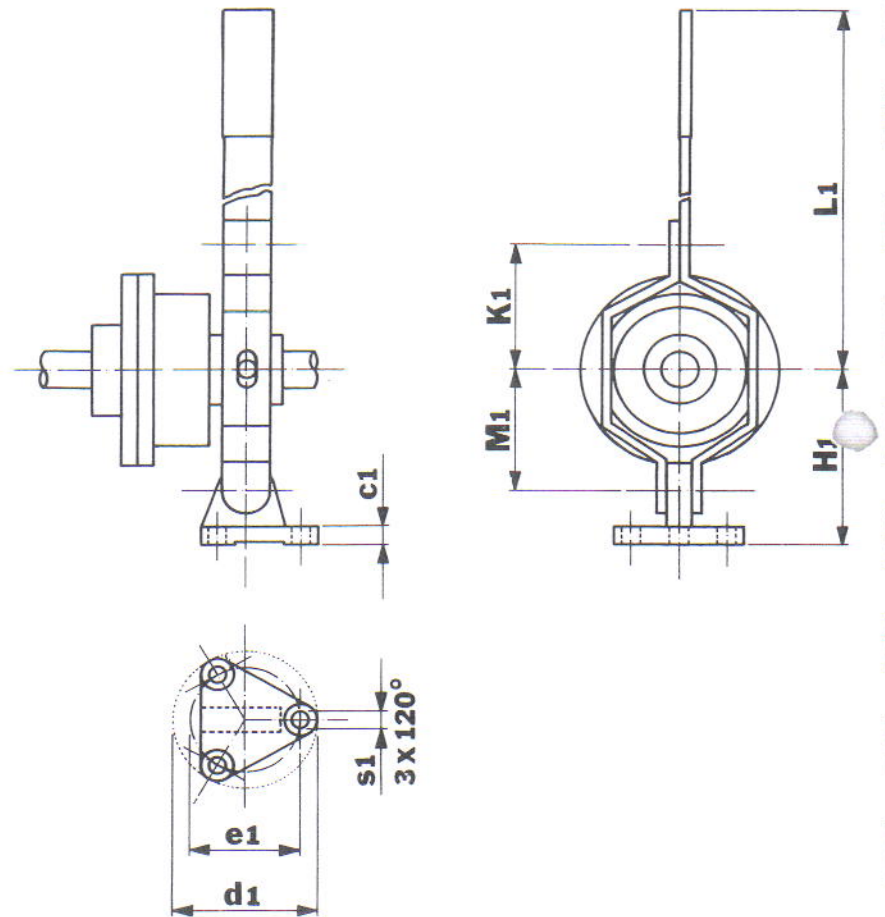


Actuating levers - see pages 12 and 13

ACTUATING LEVERS

Fig. 10

FK.....HS 1 (with one support)

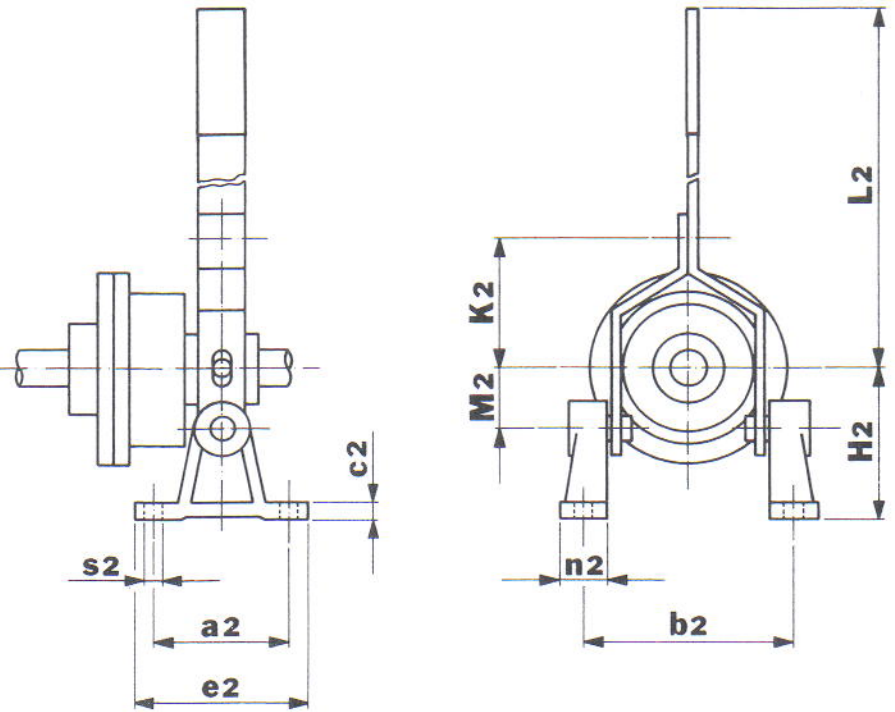


Type	FK-H 1			FK-S 1				
	K1	L1	M1	c1	d1 ϕ	e1 ϕ	H1	s1
FK 90 HS 1	85	405	81	12	93	69,3	115	11
FK 115 HS 1	105	535	100				135	
FK 148 HS 1	135	600	125				155	
FK 186 HS 1	155	790	130	15	120	92,3	175	13
FK 234 HS 1	195	980	155				200	

FK-H 1 : lever only
 FK-S 1 : support only
 FK-HS 1 : complete

Fig. 11

FK.....HS 2 (with two supports)



Type	FK-H 2			FK-S 2						
	K2	L2	M2	a2	b2	c2	e2	H2	n2	s2
FK 90 HS 2	85	240	40	85	130	12	110	100	30	11
FK 115 HS 2	105	320	45		155			105		
FK 148 HS 2	135	375	55		180			115		
FK 186 HS 2	155	540	65	115	240	14	145	155	40	13
FK 234 HS 2	195	770	83		260			170		

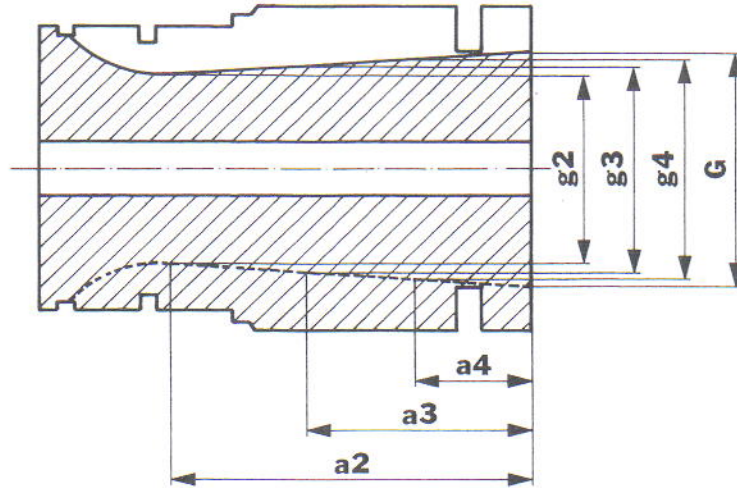
FK-H 2 : lever only

FK-S 2 : supports only

FK-HS 2 : complete

Fig. 12

Bores and depths where „cutting“ of the lever grooves occur.



Type	$g2\emptyset$	$a2$	$g3\emptyset$	$a3$	$g4\emptyset$	$a4$	$G\emptyset$
FK 90	28	65	32	40	36	20	40
FK 115	38	72	41	50	45	25	49
FK 148	44,5	85	48	60	53	30	58
FK 186	67	102	73	70	79	35	85
FK 234	74,5	125	83	80	91,5	40	100

For keyway dimensions see pages 26 and 27

To determine the required clutch size (see page 16 and 17), multiply the power to be transmitted by service factors as tabled below i.e.; types of drive and driven machine, plus frequency of starts.

SERVICE FACTORS FOR FRICTION CLUTCHES

TABLE 1

SERVICE FACTORS						
SOURCE OF ENERGY		Nature of load of driven machine				
		uniform and regular starting	uniform and moderate starting	light shock and moderate starting	moderate shock and heavy starting	heavy shock and heavy starting
Electric motor Turbine		1,0	1,15	1,3	1,6	1,85
Internal combustion engines	over 6 cylinders	1,15	1,3	1,5	1,8	2,1
	4 – 6 cylinders	1,3	1,5	1,7	2,0	2,4
	2 and 3 cylinders	1,5	1,7	1,85	2,2	2,7
	1 cylinder	1,7	1,85	2,1	2,5	3,1

TABLE 2

ADDITIONAL STARTING FACTORS					
starts per hour	11 – 20	21 – 35	36 – 50	51 – 75	over 75
starting factor	0,1	0,2	0,3	0,4	0,5

Installed power x (service factor + starting factor) = min. design power.

DESIGN POWER

(first see page 15)

TYPE	FK 90		FK 115		FK 148		FK 186		FK 234	
	HP	kW	HP	kW	HP	kW	HP	kW	HP	kW
hub	25*		35*		42*		62*		70*	
shaft flange	35		45		60		80		100	
r.p.m.**										
25	0,27 - 0,20	0,54 - 0,40	0,87 - 0,64	1,30 - 0,96	0,82 - 0,60	1,36 - 1,00	2,18 - 1,60	2,18 - 1,60	2,60 - 1,92	3,05 - 2,24
30	0,33 - 0,24	0,65 - 0,48	0,98 - 0,72	1,47 - 1,08	0,98 - 0,72	1,63 - 1,20	2,45 - 1,80	2,45 - 1,80	3,05 - 2,24	3,48 - 2,56
35	0,38 - 0,28	0,76 - 0,56	1,09 - 0,80	1,63 - 1,20	1,14 - 0,84	2,72 - 2,00	3,92 - 2,88	3,92 - 2,88	4,35 - 3,20	4,35 - 3,20
40	0,44 - 0,32									
45	0,49 - 0,36									
50	0,54 - 0,40									
60	0,65 - 0,48	1,31 - 0,96	1,52 - 1,12	2,28 - 1,68	1,96 - 1,44	3,26 - 2,40	5,22 - 3,84	5,22 - 3,84	6,10 - 4,48	6,95 - 5,12
70	0,76 - 0,56	1,52 - 1,12	1,74 - 1,28	2,61 - 1,92	2,28 - 1,68	4,35 - 3,20	6,10 - 4,48	6,10 - 4,48	7,83 - 5,76	8,70 - 6,40
80	0,87 - 0,64	1,74 - 1,28	1,96 - 1,44	2,94 - 2,16	2,61 - 1,92	5,44 - 4,00	8,70 - 6,40	8,70 - 6,40	10,45 - 7,68	10,45 - 7,68
90	0,98 - 0,72	1,96 - 1,44	2,18 - 1,60	3,26 - 2,40	2,94 - 2,16	6,53 - 4,80	10,45 - 7,68	10,45 - 7,68	12,18 - 8,96	12,18 - 8,96
100	1,09 - 0,80	2,18 - 1,60	2,61 - 1,92	3,92 - 2,88	3,26 - 2,40	7,61 - 5,60	12,18 - 8,96	12,18 - 8,96	13,92 - 10,24	13,92 - 10,24
120	1,31 - 0,96	2,61 - 1,92	3,05 - 2,24	4,57 - 3,36	3,92 - 2,88	9,79 - 7,20	15,65 - 11,52	15,65 - 11,52	17,40 - 12,80	17,40 - 12,80
140	1,52 - 1,12	3,05 - 2,24	3,48 - 2,56	5,22 - 3,84	4,57 - 3,36	10,88 - 8,00	17,40 - 12,80	17,40 - 12,80	19,58 - 14,40	19,58 - 14,40
160	1,74 - 1,28	3,48 - 2,56	3,92 - 2,88	5,87 - 4,32	5,22 - 3,84	12,24 - 9,00	21,75 - 16,00	21,75 - 16,00	24,00 - 17,60	24,00 - 17,60
180	1,96 - 1,44	3,92 - 2,88	4,35 - 3,20	6,53 - 4,80	5,87 - 4,32	13,60 - 10,00	26,10 - 19,20	26,10 - 19,20	30,45 - 22,40	30,45 - 22,40
200	2,18 - 1,60	4,35 - 3,20	4,90 - 3,60	7,34 - 5,40	6,53 - 4,80	15,00 - 11,00	17,60 - 12,80	17,60 - 12,80	19,58 - 14,40	19,58 - 14,40
225	2,45 - 1,80	4,90 - 3,60	5,44 - 4,00	8,16 - 6,00	7,34 - 5,40	16,30 - 12,00	19,20 - 14,40	19,20 - 14,40	21,75 - 16,00	21,75 - 16,00
250	2,72 - 2,00	5,44 - 4,00	6,00 - 4,40	9,00 - 6,60	8,16 - 6,00	17,60 - 12,80	19,58 - 14,40	19,58 - 14,40	21,75 - 16,00	21,75 - 16,00
275	3,00 - 2,20	6,00 - 4,40	6,53 - 4,80	9,80 - 7,20	9,00 - 6,60	19,03 - 14,00	24,00 - 17,60	24,00 - 17,60	26,10 - 19,20	26,10 - 19,20
300	3,26 - 2,40	6,53 - 4,80	7,61 - 5,60	11,42 - 8,40	9,80 - 7,20	21,75 - 16,00	26,10 - 19,20	26,10 - 19,20	30,45 - 22,40	30,45 - 22,40
350	3,81 - 2,80	7,61 - 5,60			11,42 - 8,40					

400	4,35 - 3,20	8,70 - 6,40	13,05 - 9,60	21,75 - 16,00	34,80 - 25,60
450	4,89 - 3,60	9,79 - 7,20	14,68 - 10,80	24,47 - 18,00	39,15 - 28,80
500	5,44 - 4,00	10,88 - 8,00	16,32 - 12,00	27,19 - 20,00	43,50 - 32,00
550	5,98 - 4,40	11,96 - 8,80	17,95 - 13,20	29,90 - 22,00	47,85 - 35,20
600	6,53 - 4,80	13,05 - 9,60	19,58 - 14,40	32,63 - 24,00	52,20 - 38,40
650	7,07 - 5,20	14,14 - 10,40	21,21 - 15,60	35,35 - 26,00	56,55 - 41,60
700	7,61 - 5,60	15,23 - 11,20	22,84 - 16,80	38,07 - 28,00	60,90 - 44,80
750	8,16 - 6,00	16,32 - 12,00	24,47 - 18,00	40,80 - 30,00	65,26 - 48,00
800	8,70 - 6,40	17,40 - 12,80	26,10 - 19,20	43,51 - 32,00	69,60 - 51,20
850	9,25 - 6,80	18,50 - 13,60	27,74 - 20,40	46,23 - 34,00	73,96 - 54,40
900	9,80 - 7,20	19,60 - 14,40	29,37 - 21,60	48,95 - 36,00	78,30 - 57,60
950	10,33 - 7,60	20,67 - 15,20	31,00 - 22,80	51,67 - 38,00	82,65 - 60,80
1000	10,88 - 8,00	21,75 - 16,00	32,63 - 24,00	54,38 - 40,00	87,00 - 64,00
1100	11,96 - 8,80	23,93 - 17,60	35,90 - 26,40	59,82 - 44,00	95,72 - 70,40
1200	13,05 - 9,60	26,10 - 19,20	39,16 - 28,80	65,26 - 48,00	104,42 - 76,80
1300	14,14 - 10,40	28,28 - 20,80	42,42 - 31,20	70,70 - 52,00	113,12 - 83,20
1400	15,23 - 11,20	30,46 - 22,40	45,68 - 33,60	76,14 - 56,00	121,82 - 89,60
1500	16,32 - 12,00	32,63 - 24,00	48,95 - 36,00	81,58 - 60,00	130,52 - 96,00
1600	17,40 - 12,80	34,80 - 25,60	52,20 - 38,40	87,00 - 64,00	139,22 - 102,40
1800	19,58 - 14,40	39,16 - 28,80	58,74 - 43,20	97,90 - 72,00	156,63 - 115,20
2000	21,75 - 16,00	43,50 - 32,00	65,26 - 48,00	108,77 - 80,00	
2250	24,47 - 18,00	48,95 - 36,00	73,42 - 54,00	122,37 - 90,00	
2500	27,20 - 20,00	54,40 - 40,00	81,58 - 60,00		
2750	29,90 - 22,00	59,80 - 44,00	89,74 - 66,00		
3000	32,63 - 24,00	65,26 - 48,00			
3250	35,35 - 26,00	70,70 - 52,00			
3500	38,07 - 28,00	76,14 - 56,00			
3750	40,80 - 30,00				
4000	43,50 - 32,00				
4500	48,95 - 36,00				

First see page 15

* See page 14 for shallow, larger bores

** See page 5 for maximum revolutions

TAPER-LOCK® BUSH DIMENSIONS

FKL 90— HRC 90		FKL 115— HRC 110		FKL 148— HRC 130		FKL 186— HRC 150		FKL 234— HRC 180	
T-L nr. 1108 Length 22,3 mm		T-L nr. 1210** Length 38,1 mm		T-L nr. 1610 Length 38,1 mm		T-L nr. 2012 Length 44,5 mm		T-L nr. 2517 Length 63,5 mm	
Bore	Keyway	Bore	Keyway	Bore	Keyway	Bore	Keyway	Bore	Keyway
10	3 x 1,4	12	4 x 1,8	19	6 x 2,8	24	8 x 3,3	28	8 x 3,3
11	4 x 1,8	14	5 x 2,3	20	6 x 2,8	25	8 x 3,3	30	8 x 3,3
12	4 x 1,8	16	5 x 2,3	22	6 x 2,8	28	8 x 3,3	32	10 x 3,3
14	5 x 2,3	18	6 x 2,8	24	8 x 3,3	30	8 x 3,3	35	10 x 3,3
16	5 x 2,3	19	6 x 2,8	25	8 x 3,3	32	10 x 3,3	38	10 x 3,3
18	6 x 2,8	20	6 x 2,8	28	8 x 3,3	35	10 x 3,3	40	12 x 3,3
19	6 x 2,8	22	6 x 2,8	30	8 x 3,3	38	10 x 3,3	42	12 x 3,3
20	6 x 2,8	24	8 x 3,3	32	10 x 3,3	40	12 x 3,3	45	14 x 3,8
22	6 x 2,8	25	8 x 3,3	35	10 x 3,3	42	12 x 3,3	48	14 x 3,8
24	8 x 3,3	28	8 x 3,3	38	10 x 3,3	45	14 x 3,8	50	14 x 3,8
25	8 x 3,3	30	8 x 3,3	40*	12 x 1,3	48	14 x 3,8	55	16 x 4,3
28*	8 x 1,3	32*	10 x 1,3	42*	12 x 1,3	50*	14 x 2,8	60	18 x 4,4

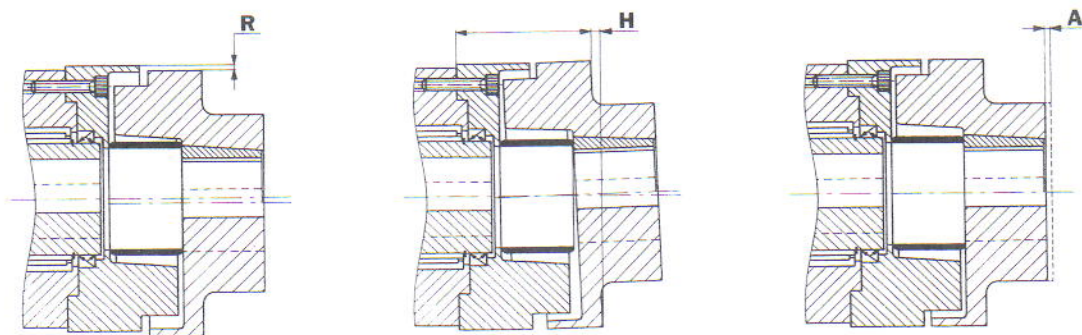
Taper-Lock® bush (J.H. Fenner & Co. Ltd.) can also be supplied in inch-dimension at additional price.

*These bores have a shallow keyway.

**For the time being, only B-flange (no T-L bush) available. Pilot bore or finished bore, with keyway and set screw on request.

MAXIMUM ALLOWABLE MISALIGNMENTS

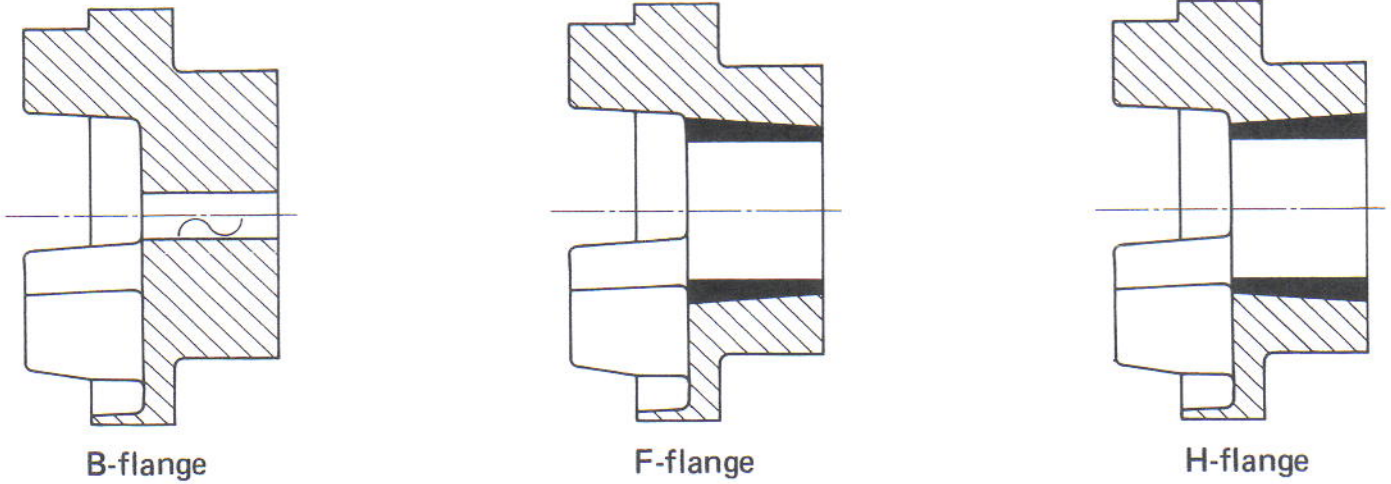
Fig. 13



Size		HRC 90	HRC 110	HRC 130	HRC 150	HRC 180
Radial	R	0,3	0,3	0,4	0,4	0,4
Linear	H	0,5	0,6	0,8	0,9	1,1
Axial	A	1	1,2	1,6	1,8	2,2
Torsional stiffness	Nm/°	25	48	84	176	240
	kNm/Rad.	1,43	2,75	4,81	10,08	13,75

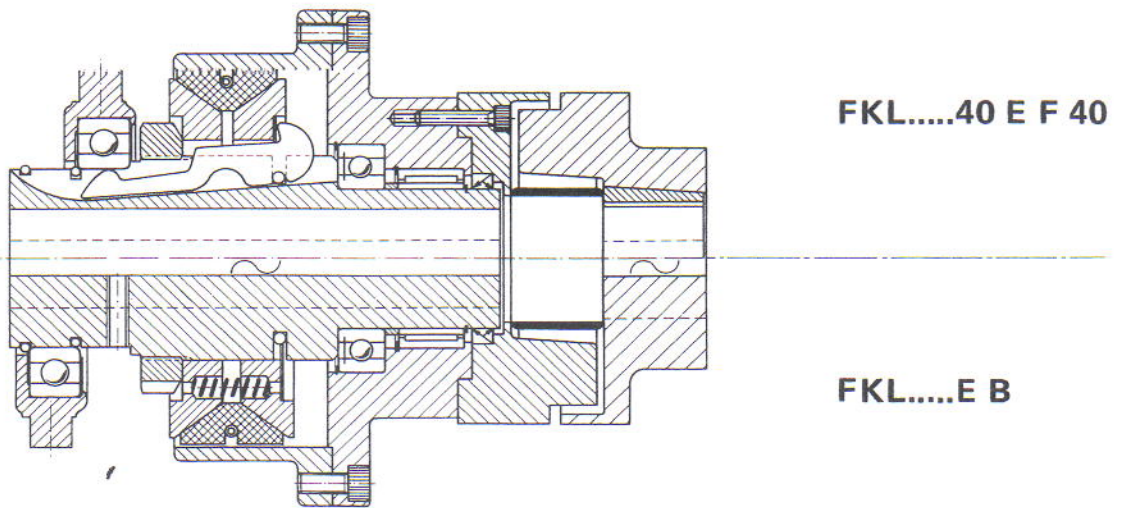
Fig. 14

Flange types of HRC couplings

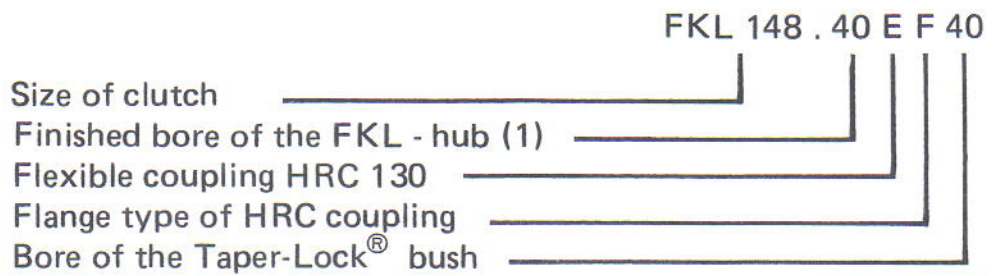


EXAMPLES FOR ORDERING

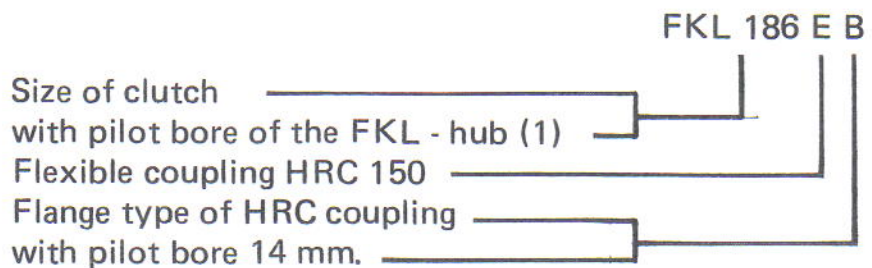
Fig. 15



Example 1:
(with finished bore)



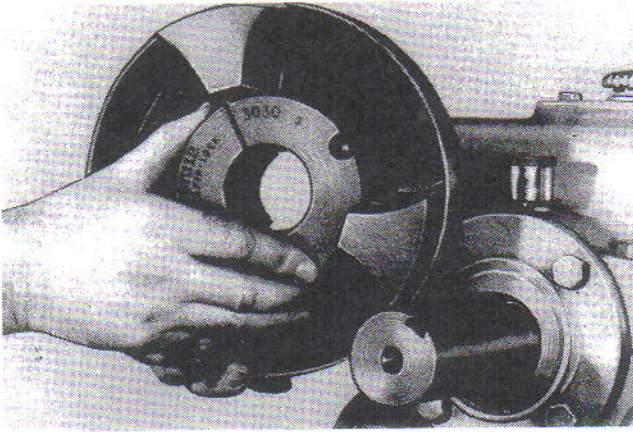
Example 2:
(with pilot bore)



INSTALLATION INSTRUCTIONS FOR TAPER-LOCK[®] BUSHES

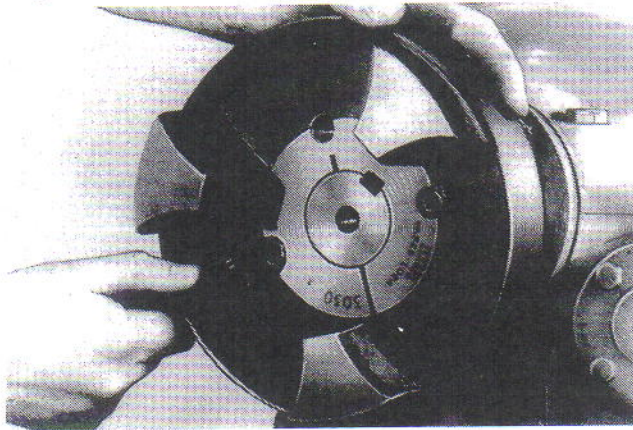
TO INSTALL

Fig. 16



1. Remove any oil, dirt, lacquer, etc. from all mating surfaces.
2. Place bush in hub and match half holes. Oil thread and setscrews sparingly. Place screws loosely in holes threaded in hub (see fig. 19).
3. Mount assembly on clean shaft and locate in desired position with bush slightly free in hub.

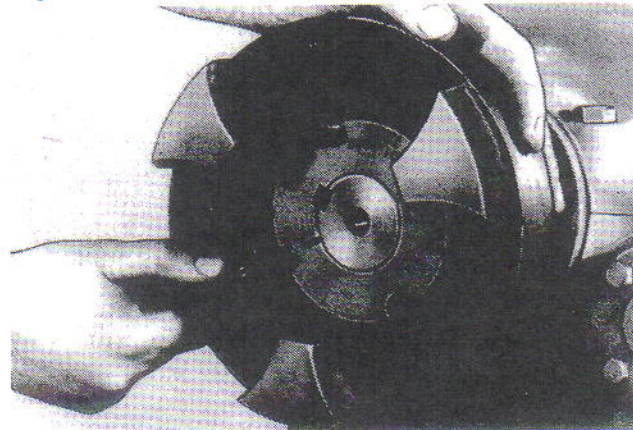
Fig. 17



4. Tighten the press-screws uniformly using a hexagonal key and tighten them further by lengthening the key if necessary.
5. When a key is not used hammer the conical bush further into the flange by way of a tube or a ring, while the shaft has to be stayed at the other side to prevent damage to bearings. After that the press-screws must be tightened firmly again. Repeat this alternate hammering and tightening of the screws once or twice.
6. Grease empty holes to exclude dirt.

TO REMOVE

Fig. 18



1. Remove dirt and grease from the empty bore, remove press-screws and screw one of them in the other thread hole (see fig. 20).
2. Tighten this press-screw by which means the connection will be loosened, after that the flange with Taper-Lock bush can be removed from the shaft.

Fig. 19

to install

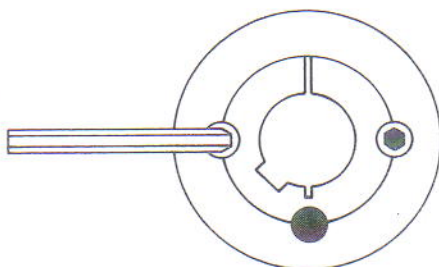
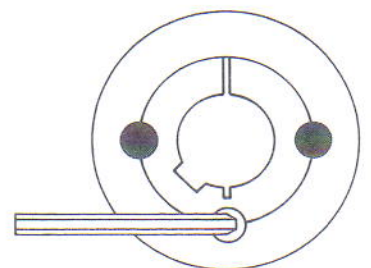


Fig. 20

to remove



SPECIAL CONSTRUCTIONS

Fig. 21

Shaft clutch for shaft-shaft transmission (which has good alignment and stability) with internal bearing if there is no room for bearing support on either shaft.

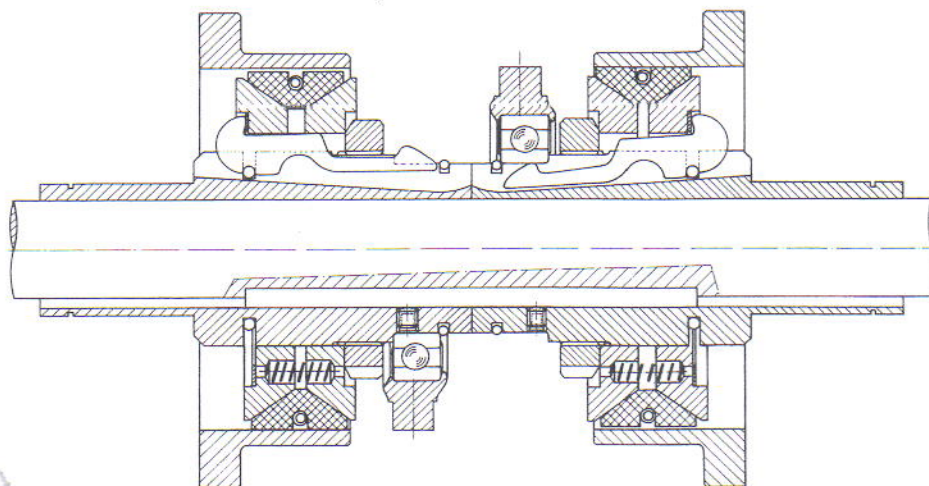
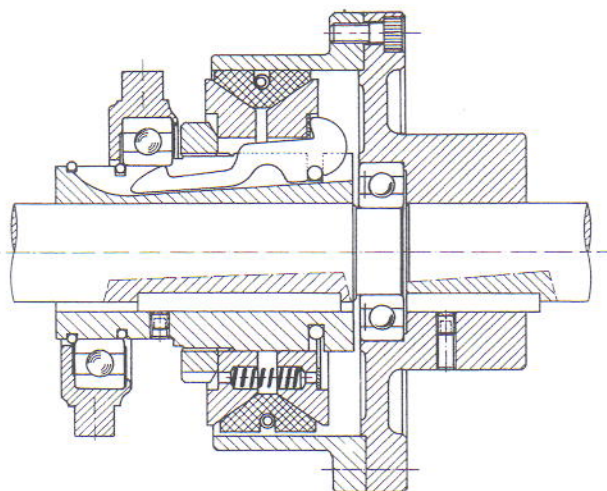


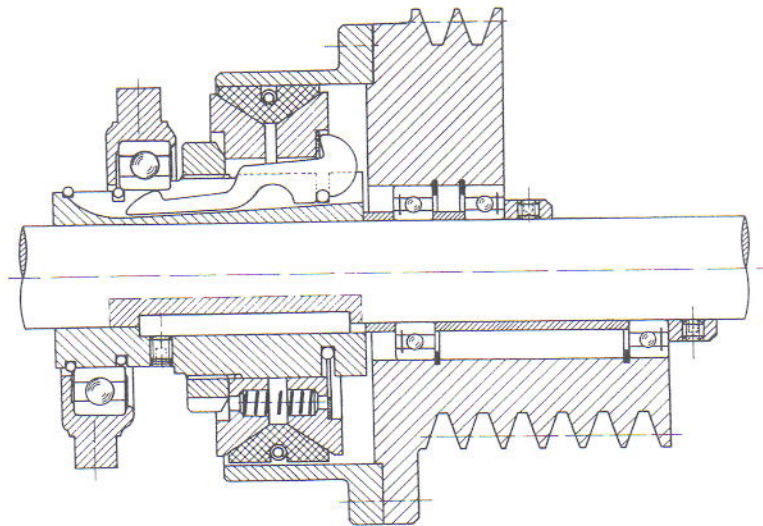
Fig. 22

FKD 2L.....F

PATENTS:	Belgium	589.390
	Denmark	100.280
	France	1.253.677 S.G.D.G.
	Great Britain	881.606
	Holland	106.118 and 121.055
	Italy	628.868
	Sweden	197.570
	Switzerland	382.503
	W.-Germany	1.180.581 and 1.775.899

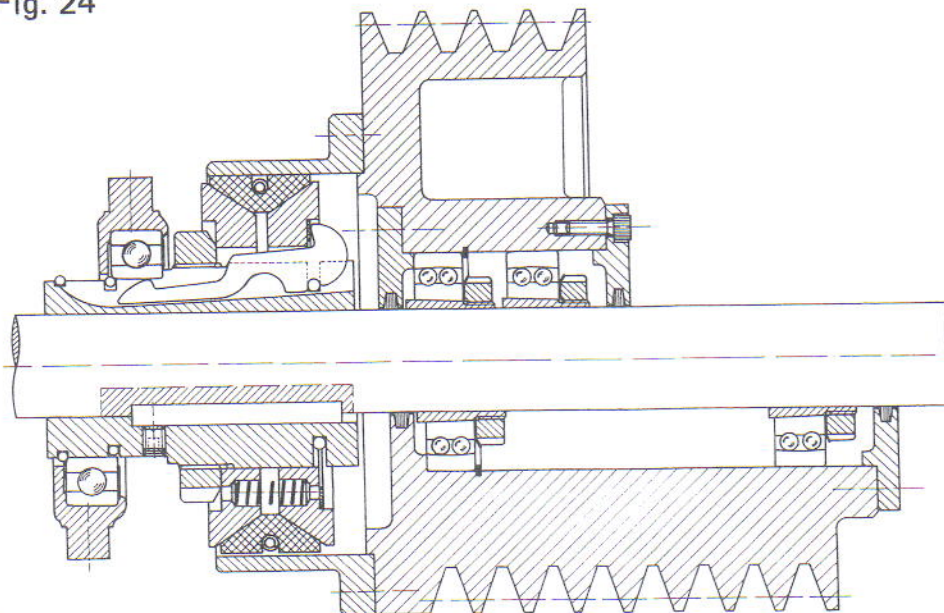
FLANGE CLUTCHES WHEN BUILDING ON V-PULLEYS

Fig. 23



Flange clutches when building on V-pulleys; construction with deep groove ball bearings.

Fig. 24



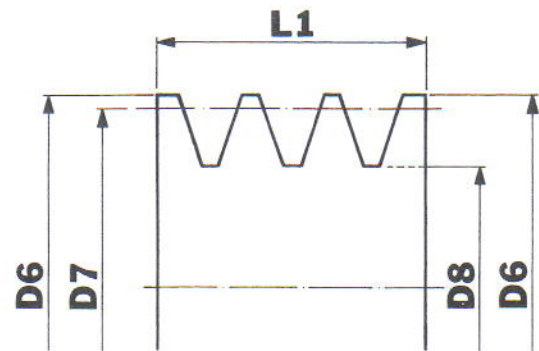
Construction with
2 bearing covers
(additional price)

Construction with
1 bearing cover

Flange clutches when building on V-pulleys;
construction with self-positioning - draw sleeve bearings.

V-PULLEY DIMENSIONS

Fig. 25



Manufactured to DIN 2211

Belt section	SPZ	SPA	SPB	SPC
D6 – D7	4,0	5,6	7,0	9,6
D6 – D8	22	28	36	48
Number of grooves	Pulley width L1			
1	16	20	25	34
2	28	35	44	59,5
3	40	50	63	85
4	52	65	82	110,5
5	64	80	101	136
6	76	95	120	161,5
7	88	110	139	187
8	100	125	158	212,5
9	112	140	177	238
10	124	155	196	263,5
11	136	170	215	289
12	148	185	234	314,5

Built-on V-pulley with bearings Serial No 6200
(maximum pulley widths at minimum building lengths)

Fig. 26

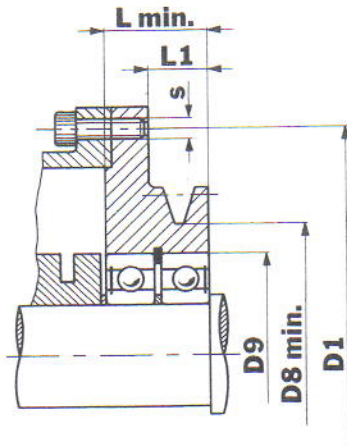
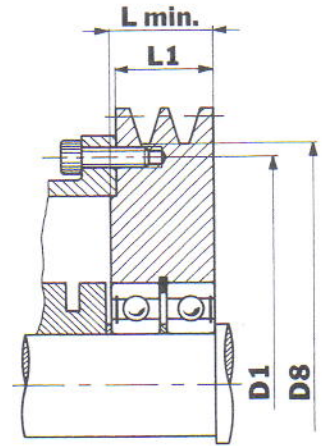


Fig. 27



Clutch size	Shaft diam.	Construct. length L min.	Bore diam. D9	According to fig. 26			According to fig. 27	
				Internal diam. D8 min.	to D1 + s	Pulley width L1	Intern. diam. over D1 + s	Pulley width L1
FK 90F	20	30	47	62	118	18	118	28
	25	32	52	72		20		30
FK 115F	25	32	52	77	144	18	144	30
	30	34	62	87		20		32
	35	37	72	95		23		35
FK 148F	30	34	62	92	186	18	186	32
	35	37	72	100		21		35
	40	39	80	105		23		37
FK 186F	40	39	80	110	225	21	225	37
	45	41	85	115		23		39
	50	43	90	125		25		41
	55	45	100	135		27		43
	60	48	110	145		30		46
FK 234F	45	41	85	120	278	19	278	39
	50	43	90	130		21		41
	55	45	100	140		23		43
	60	48	110	150		26		46
	65	50	120	160		28		48
	70	52	125	170		30		50

**Built-on V-pulley with bearings Serial No 1200 with drawal sleeve
(maximum pulley widths at minimum building lengths)**

Fig. 28

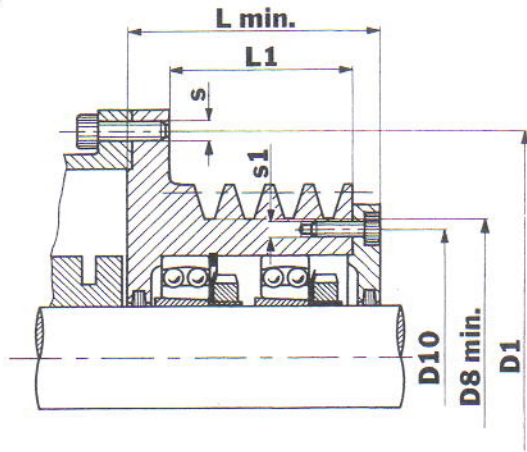
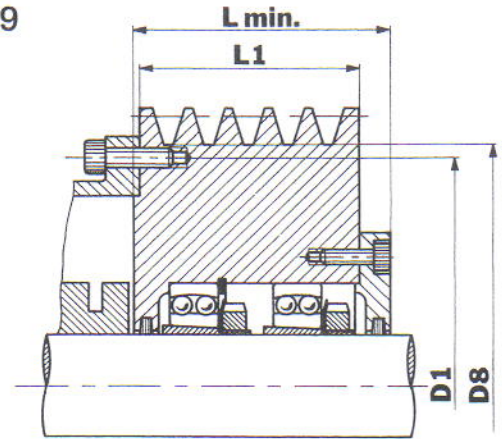


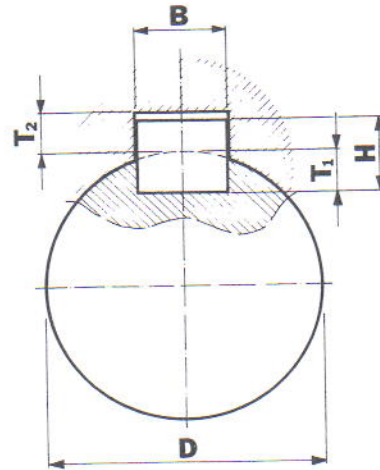
Fig. 29



Clutch size	Shaft diam.	Construct. length L min.	D10 + s1	According to fig. 28		According to fig. 29				
				Internal diam. D8 min.	Pulley width L1	Intern. diam. over D1 + s	Pulley width L1			
FK 90F	20	78	67 + 6	75	118	58	118	68		
	25	81	77 + 6	85					71	71
FK 115F	25	81	77 + 6	85	144	59	144	71		
	30	86	87 + 6	95					64	76
	35	91	95 + 6	103					69	81
FK 148F	30	86	87 + 6	95	186	62	186	76		
	35	91	95 + 6	103					67	81
	40	96	100 + 6	108					72	86
FK 186F	40	96	100 + 6	108	225	70	225	86		
	45	100	105 + 6	113					74	90
	50	106	115 + 6	123					78	94
	55	108	130 + 8	140					80	96
	60	114	140 + 8	150					86	102
FK 234F	45	100	105 + 6	113	278	70	278	90		
	50	106	115 + 6	123					74	94
	55	108	130 + 8	140					76	96
	60	114	140 + 8	150					82	102
	65	120	150 + 8	160					85	105
	70	128	160 + 8	170					93	113

**Key and keyway dimensions
(metric)**

Fig. 30



Manufactured to DIN 6885¹

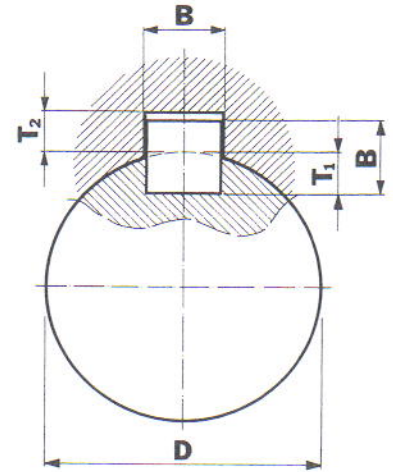
Shaft diameter D		Key dimension width x depth B x H	Keyway dimension in shaft T1		Keyway dimension in bore T2	
over	up to		Depth - tol.	Tol.	Depth - tol.	Tol.
6	8	2 x 2	1,2	} +0,1 0	1,0	} +0,1 0
8	10	3 x 3	1,8		1,4	
10	12	4 x 4	2,5		1,8	
12	17	5 x 5	3,0		2,3	
17	22	6 x 6	3,5	} +0,2 0	2,8	} +0,2 0
22	30	8 x 7	4,0		3,3	
30	38	10 x 8	5,0		3,3	
38	44	12 x 8	5,0		3,3	
44	50	14 x 9	5,5		3,8	
50	58	16 x 10	6,0		4,3	
58	65	18 x 11	7,0		4,4	
65	75	20 x 12	7,5		4,9	
75	85	22 x 14	9,0		5,4	
85	95	25 x 14	9,0		5,4	
95	110	28 x 16	10,0	} +0,3 0	6,4	} +0,3 0
110	130	32 x 18	11,0		7,4	
130	150	36 x 20	12,0		8,4	
150	170	40 x 22	13,0		9,4	
170	200	45 x 25	15,0		10,4	
200	230	50 x 28	17,0		11,4	
230	260	56 x 32	20,0		12,4	
260	290	63 x 32	20,0		12,4	
290	330	70 x 36	22,0		14,4	
330	380	80 x 40	25,0		15,4	
380	440	90 x 45	28,0	17,4		
440	500	100 x 50	31,0	19,5		

High tolerance P9 Low tolerance N9

High tolerance P9 Low tolerance J9

Key and keyway dimensions
(imperial)

Fig. 31



Manufactured to B.S.46 - 1/58

Shaft diameter D				Key dimension ϕB		Keyway dim. in shaft T1 (mm)		Keyway dim. in bore T2 (mm)					
inch		mm		inch	mm	Depth	tol.	Tol.	Depth	tol.	Tol.		
from	to	from	to										
1/4	1/2	6,35	12,7	1/8	3,18	1,83		Low tolerance N9	1,52		Low tolerance J9		
1/2	3/4	12,7	19,05	3/16	4,76	2,72			2,24				
3/4	1	19,05	25,4	1/4	6,35	3,6			2,92				
1	1 1/4	25,4	31,75	5/16	7,94	4,5	+ 0,15		3,61	+ 0,15			
1 1/4	1 1/2	31,75	38,1	3/8	9,53	5,41						4,29	
1 1/2	1 3/4	38,1	44,45	7/16	11,11	6,3						5	
1 3/4	2	44,45	50,8	1/2	12,7	7,19	+ 0,15		5,69	+ 0,15			
2	2 1/2	50,8	63,5	5/8	15,88	8,99						7,06	
2 1/2	3	63,5	76,2	3/4	19,05	10,77						8,46	
3	3 1/2	76,2	88,9	7/8	22,23	12,57	High tolerance P9		9,83	High tolerance P9			
3 1/2	4	88,9	101,6	1	25,4	14,38			11,23				
4	5	101,6	127	1 1/4	31,75	17,96			14				
5	6	127	152	1 1/2	38,1	21,54		16,79					

Van der Graaf

POWER TRANSMISSION EQUIPMENT



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