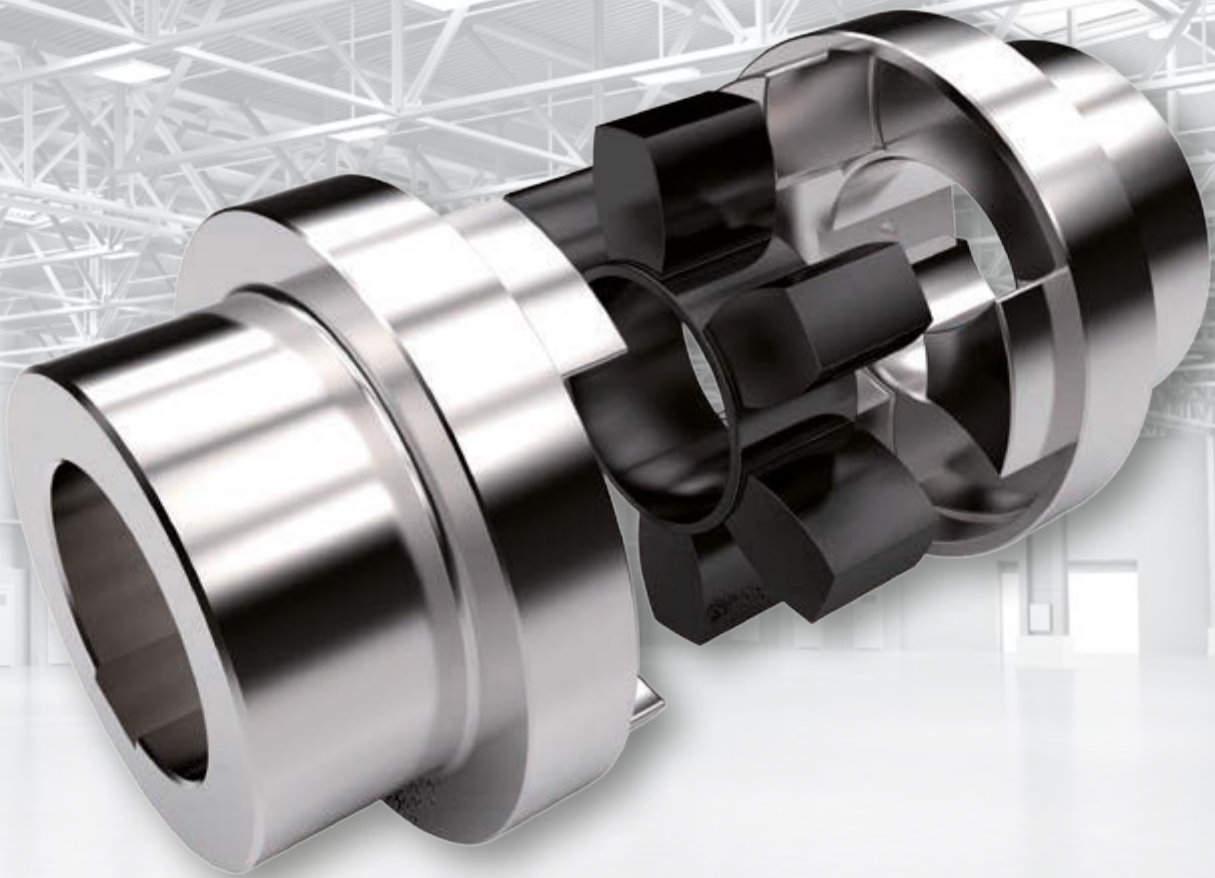


TECNAMIC

Dynamic Drive Technology

FLEXIBLE COUPLINGS

HRC



HRC

The flexible HRC coupling is a break-through safe claw coupling with a flexible element to provide a torsionally flexible connection of shafts. The flexible element, the coupling star, excels in its wear resistance, its oil, ozone and ageing resistance and its temperature resistance from -20°C to $+80^{\circ}\text{C}$. Thanks to the coupling's flexibility, impacts, rotary vibrations and noises are effectively absorbed. The coupling star is dimensioned such that radial and axial movements between the two halves of the coupling are cancelled out. With the fixed position of the coupling star its deformability in axial direction is free, and so no damaging axial forces can act on the machine bearing even with alternating torque. HRC couplings are fail-safe up to the fracture moment of the cast iron transmission cam and this provides maximum operational safety. The coupling is of the plug-in type for installation and does not involve any particularly rigorous requirements with respect to alignment accuracy. The HRC coupling can be used in the whole of machine construction wherever a reliable shaft connection is needed between motor and working machine.



TYPE

- Standard coupling
- Taper bush type
- Combined type standard / taper
- Components can be combined as needed

WITH TAPER BUSH

The HRC coupling combines the outstanding features of the flexible couplings with the advantages of the taper bush system: fast and easy installation for a torsionally flexible connection between shafts and elimination of shaft alignment errors. HRC couplings with taper bush have the advantage that even

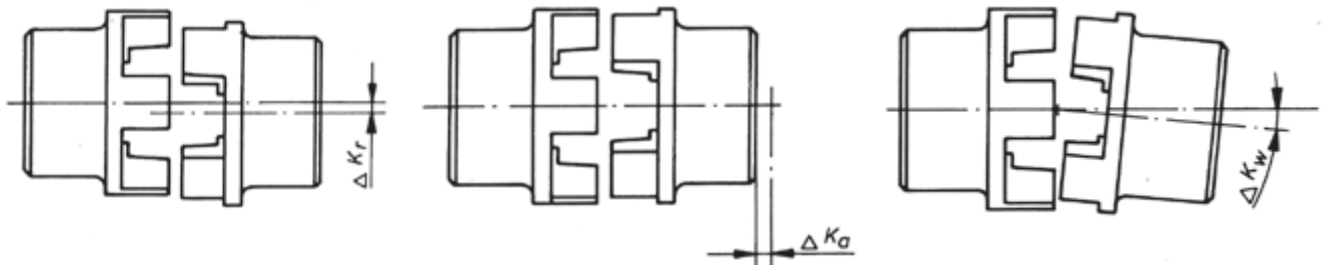
with greater shaft tolerances there is a backlash-free and at the same time axial fixing of the shaft. In addition the close sliding fit makes axial alignment of the coupling easier. The coupling star can be replaced by a simple axial displacement of the coupling halves without having to disassemble the machines connected.

TECHNICAL DATA

Size	Max. rotation rpm	Torque ¹⁾ Nm		Torsion spring rigidity Nm/°	Moments of inertia ²⁾ kgm ²	Weight ²⁾	Max. shaft misalignment ³⁾		
		nominal T_{KN}	max. T_{Kmax}				radial ΔK_r mm	axial ΔK_a mm	angular ΔK_w degree
70	8100	31	72	-	0.00085	1.00	0.3	+0.2	1
90	6500	80	180	-	0.00115	1.17	0.3	+0.5	1
110	5200	160	360	65	0.00400	5.00	0.3	+0.6	1
130	4100	315	720	130	0.00780	5.46	0.4	+0.8	1
150	3600	600	1500	175	0.01810	7.11	0.4	+0.9	1
180	3000	950	2350	229	0.04340	16.6	0.4	+1.1	1
230	2600	2000	5000	587	0.12068	26.0	0.5	+1.3	1
280	2200	3150	7200	1025	0.44653	50.0	0.5	+1.7	1

- 1) Torques for shaft fit with keyway
- 2) The information concerning weights and moments of inertia apply for medium holes per coupling;
coupling half materials: EN-GJL-250 (GG-25) in accordance with DIN EN 1561.
- 3) The values mentioned are valid for $n = 600$ rpm and may occur only separately.
At multiple misalignments or higher speeds the values must be reduced.

ALLOWABLE MISALIGNMENTS



Radial misalignment

Axial misalignment

Angular misalignment

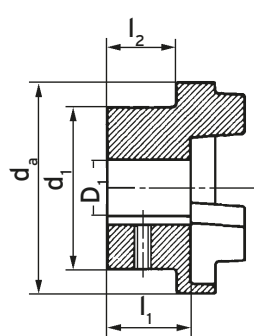
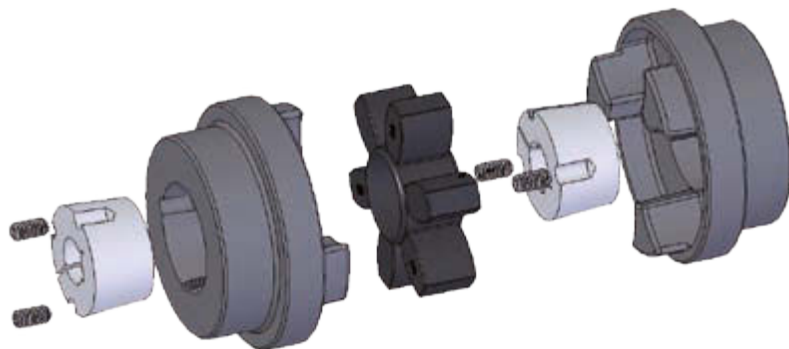
- Reduction of the allowable values of misalignment when the combination of misalignments occur or at other rotational speeds:
- $$\frac{\Delta W_r}{\Delta K_r} + \frac{\Delta W_a}{\Delta K_a} + \frac{\Delta W_w}{\Delta K_w} \leq 1$$

- <1 = applies to speeds of 600 rpm
 ≤ 0.8 601 - 1000 rpm
 ≤ 0.65 1001 - 1500 rpm
 ≤ 0.50 1501 - 3000 rpm

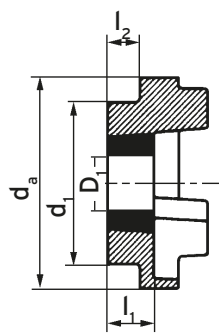
$\Delta K_{r/a/w}$ = allowable radial, axial or angular misalignment of the shafts resp. of the coupling halves

$\Delta W_{r/a/w}$ = measured radial, axial or angular misalignment of the shafts resp. of the coupling halves

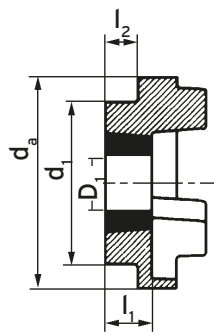
HRC FLANGE B, F, H



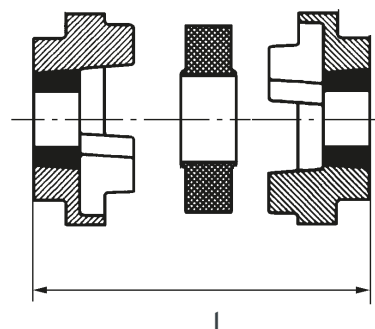
B flange



F flange



H flange



Size	B flange				F and H flange					d _a	d _i	Installation length		
	pre. mm	D _i (H7) ¹⁾	l ₁ mm	l ₂ mm	bush	D _i		l ₁ mm	l ₂ mm			FF FH HH mm	l FB HB mm	BB mm
		max. mm				min. mm	max. mm							
70	8	32	23.5	20	1008	10	25	23.5	20	69	60	65	65	65
90	10	42	30.0	26	1108	10	25	23.5	19.5	85	70	69.5	76	82.5
110	10	55	45.0	37	1610	14	40	26.5	18.5	112	100	82	100.5	119
130	15	60	47.5	39	1610	14	40	26.5	18.0	130	105	89	118	147
150	20	70	56.0	46	2012	14	50	33.5	23.5	150	115	107	133.5	160
180	25	80	70.0	58	2517	16	60	46.5	34.5	180	125	142	165.5	189
230	25	100	90.0	77	3020	25	75	52.5	39.5	225	155	164.5	202	239.5
280	30	115	105.5	90	3525	35	100	66.5	51.0	275	206	207.5	246.5	285.5

1) Drill holes H7 with keyway in accordance with DIN 6885/1; tolerance zone JS9 and set screws on the keyway

TAPER BUSHES WITH KEYWAY ACC. TO DIN 6885/1

TOLERANCE JS9

Taper bush no.	Bore ø of available Taper bushes											
	mm											
1008	10	11	12	14	16	18	19	20	22	24	25	
1108	10	11	12	14	16	18	19	20	22	24	25	28*
1610 / 1615	14	16	18	19	20	22	24	25	28	30	32	35
	38	40	42*									
2012	14	16	18	19	20	22	24	25	28	30	32	35
	38	40	42	45	48	50						
2517	16	18	19	20	22	24	25	28	30	32	35	38
	40	42	45	48	50	55	60					
3020	25	28	30	32	35	38	40	42	45	48	50	55
	60	65	70	75								
3525	35	38	40	42	45	48	50	55	60	65	70	75
	80	85	90	95	100							

* These bore holes are with flat keyway in accordance with DIN 6885/3.

SELECTION

The torque of the machine T_{AN} is determined by: $T_{AN} [Nm] = 9550 \times \frac{P_{Motor} [kW]}{n [rpm]}$

This torque T_{AN} multiplied by a safety factor S depending on the application and the temperature factor S_T (see table page 7) gives the required nominal coupling torque T_{KN} .

Result: $T_{KN} \geq S \times S_T \times T_{AN}$

➤ In case that bigger shock or changing loads occur we recommend a revision according to DIN 740. An adequate calculation program is available. For such a revision the following information is required:

1. Kind of the driving machine
2. Kind of the driven machine
3. Power of driving and driven machines
4. Rotational speed of operation
5. Shock loads
6. Exciting loads
7. Moments of inertia of load- and driving sides
8. Starts per hour
9. Ambient temperature

DESIGN EXAMPLE FOR IEC STANDARD MOTORS

Dates of the plant

Driving machine:

Three-phase motor: 225 M

Power of the motor: $P = 45 \text{ kW}$ Rotation at speed: $n = 1500 \text{ rpm}$

Driven machine: mixer

Ambient temperature: $+50^\circ\text{C}$

$$T_{AN} [Nm] = 9550 \times \frac{45 \text{ kW}}{1500 \text{ rpm}} = 287 \text{ Nm}$$

$$T_{KN} = 1.75 \times 1.5 \times 287 \text{ Nm} = 753 \text{ Nm}$$

Selection: HRC size 180

$$T_{KN} = 950 \text{ Nm}$$

ALLOCATION TO IEC MOTORS

Power P of the IEC motors and allocated HRC couplings									Shaft ends	
Size of the three-phase motor	3000 rpm		1500 rpm		1000 rpm		750 rpm		Form E DIN 748 part 3 d x l at speed approx.	
	P kw	HRC size	P kw	HRC size	P kw	HRC size	P kw	HRC size	3000 rpm	1500 rpm and less
56	0.09	70	0.06	70	0.037	70	-		9 x 20	
	0.12	70	0.09	70	0.045	70				
63	0.18	70	0.12	70	0.06	70	-		11 x 23	
	0.25	70	0.18	70	0.09	70				
71	0.37	70	0.25	70	0.18	70	0.09	70	14 x 30	
	0.55	70	0.37	70	0.25	70	0.12	70		
80	0.75	70	0.55	70	0.37	70	0.18	70	19 x 40	
	1.1	70	0.75	70	0.55	70	0.25	70		
90 S	1.5	70	1.1	70	0.75	70	0.37	70	24 x 50	
90 L	2.2	70	1.5	70	1.1	70	0.55	70	24 x 50	
100 L	3	90	2.2	90	1.5	90	0.75	90	28 x 60	
	-		3	90	-		1.1	90		
112 M	4	90	4	90	2.2	90	1.5	90	28 x 60	
132 S	5.5	110	5.5	110	3	110	2.2	110	38 x 80	
	7.5	110	-		-		-			
132 M	-		7.5	110	4	110	3	110	38 x 80	
			-		5.5	110	-			
160 M	11	130	11	130	7.5	130	4	130	42 x 110	
	15	130	-		-		5.5	130		
160 L	18.5	130	15	130	11	130	7.5	130	42 x 110	
180 M	22	130	18.5	130	-		-		48 x 110	
180 L	-		22	130	15	130	11	130	48 x 110	
200 L	30	150	30	150	18.5	150	15	150	55 x 110	
	37	150	-		22	150	-			
225 S	-		37	150	-		18.5	150	55 x 110	60 x 140
225 M	45	150	45	150	30	150	22	150	55 x 110	60 x 140
250 M	55	150	55	180	37	180	30	180	60 x 140	65 x 140
280 S	75	180	75	230	45	230	37	230	65 x 140	75 x 140
280 M	90	180	90	230	55	230	45	230	65 x 140	75 x 140
315 S	110	180	110	280	75	280	55	280	65 x 140	80 x 170
315 M	132	180	132	280	90	280	75	280	65 x 140	80 x 170
315 L	160	230	160	280	110	280	90	280	65 x 140	80 x 170
	200	230	200	280	132	280	110	280		
355 L	250	230	250	280	160	280	132	-	75 x 140	95 x 170
	315	230	315	-	200	-	160	-		
	-		-		250	-	200	-		
400 L	355	280	355	-	315	-	250	-	80 x 170	100 x 210
	400	280	400	-	--		--			

As proposed in the table for surface cooled three-phase motors with cage rotor acc. to DIN 42673, page1 (data for motor 56, 63, 71, 80, 315 L, 355 L, 400 L, see catalogue Siemens). This allocation is a preliminary selection for normal conditions of operation.

For conditions of operation under shock and changing loads the selection must be made according to the following.

SAFETY FACTOR S

Assignment of load characteristics according to type of working machine

Assignment of load characteristics according to type of working machine					
S	DREDGERS	S	RUBBER MACHINERY	S	PUMPS
S	Bucket conveyor	S	Extruders	S	Piston pumps
M	Landing gear (caterpillar)	M	Calenders	G	Centrifugal pumps (light liquids)
M	Landing gear (rail)	S	Kneading mills	M	Centrifugal pumps (viscous liquids)
M	Manoeuvring winches	M	Mixers	S	Plunger pumps
M	Pumps	S	Rolling mills	S	Press pumps
S	Impellers				
S	Cutter heads		WOOD WORKING MACHINES		STONE AND CLAY
M	Slewing gear	S	Barkers		WORKING MACHINES
		M	Planing machines	S	Crusher
M	GENERATORS, TRANSFORMERS	G	Wood working machines	S	Rotary ovens
M	Frequency transformers	S	Saw frames	S	Hammer mills
M	Generators			S	Ball mills
M	Welding generators		CRANES	S	Tube mills
		G	Luffing gear block	S	Beater mills
M	CHEMICAL INDUSTRY	S	Travelling gear	S	Brick presses
M	Cooling drums	G	Hoist gear		
G	Mixers	M	Slewing gear	M	TEXTILE MACHINES
M	Agitators (liquid material)	M	Derricking jib gear	M	Batchers
M	Agitators (semi-liquid material)			M	Printing and dyeing machines
M	Drying drums		PLASTIC INDUSTRY MACHINES	M	Tanning vats
G	Centrifuges (light)	M	Extruders	M	Willows
M	Centrifuges (heavy)	M	Calenders	M	Looms
		M	Mixers		
	OIL INDUSTRY	M	Crushers		COMPRESSORS
M	Pipeline pumps			S	Piston compressors
S	Rotary drilling equipment		METAL WORKING MACHINES	M	Turbo compressors
		M	Plate bending machines		
M	CONVEYORS	S	Plate straightening machines		METAL ROLLING MILLS
S	Pit-head winches	S	Hammers	S	Plate shears
M	Winding engines	S	Metal planning machines	M	Manipulator for turning sheets
M	Jointed-band conveyors	S	Presses	S	Ingot pushers
G	Belt conveyors (bulk material)	M	Shears	S	Ingot and slabbing-mill train
M	Belt conveyors (piece goods)	S	Forging presses	S	Ingot handling machinery
M	Band pocket conveyors	S	Punch presses	M	Wire drawing benches
M	Chain conveyors	G	Countershafts, line shafts	S	Descaling machines
M	Circular conveyors	M	Machine tools (main drives)	S	Thin plate mills
M	Load elevators	G	Machine tools (auxiliary drives)	S	Heavy and medium plate mills
G	Bucket conveyors for flour			M	Winding machines (strip and wire)
M	Passenger lifts		FOOD INDUSTRY MACHINERY	S	Cold rolling mills
M	Plate conveyors	G	Bottling and container filling machines	M	Chain tractor
M	Screw conveyors	M	Kneading machines	S	Billet shears
M	Ballast elevators	M	Mash tubs	M	Cooling beds
S	Inclined hoists	G	Packaging machines	M	Cross tractor
M	Steel belt conveyors	M	Cane crushers	M	Roller tables (light)
M	Drag chain conveyors	M	Cane cutters	S	Roller tables (heavy)
		S	Cane mills	M	Roller straighteners
	BLOWERS, VENTILATORS	M	Sugar beet cutters	S	Tube welding machines
M	Rotary piston blowers	M	Sugar beet washing machines	M	Trimming shears
G	Blowers (axial/radial)			S	Cropping shears
M	Cooling tower fans		PAPER MACHINES	S	Continuous casting plant
M	Induced draught fans	S	Couches	M	Rollers adjustment drive
G	Turbo blowers	S	Glazing cylinders	S	Manipulators
		M	Pulper		
	BUILDING MACHINERY	S	Pulp grinders		LAUNDRIES
S	Hoists	M	Calenders	M	Tumblers
G	Concrete mixers	S	Wet presses	M	Washing machines
S	Road construction machinery	S	Willows		
		S	Suction presses		WATER TREATMENT
		S	Suction rolls	M	Aerators
		S	Drying cylinders	M	Screw pumps

Operating factor S

Driving machines	Load characteristics of the working machine		
	G	M	S
Electric motors, turbines, hydraulic motors	1	1.75	2.5
Piston machines 4-6 cylinders, degree of nonuniformity 1:100 - 1:200	1.5	2.5	3.5
Piston machines 1-3 cylinders, degree of nonuniformity up to 1:100	2	3	4

Temperature factor S_T

θ [°C]	S _T
-20 < θ < +30	1.0
+30 < θ < +40	1.2
+40 < θ < +60	1.5
+60 < θ < +80	1.8

Tecnamic GmbH & Co. KG

Kleinbahnstraße 21
59759 Arnsberg
Germany

T +49 2932 300-440

F +49 2932 300-830

E info@tecnamic.com



TECNAMIC

www.tecnamic.com