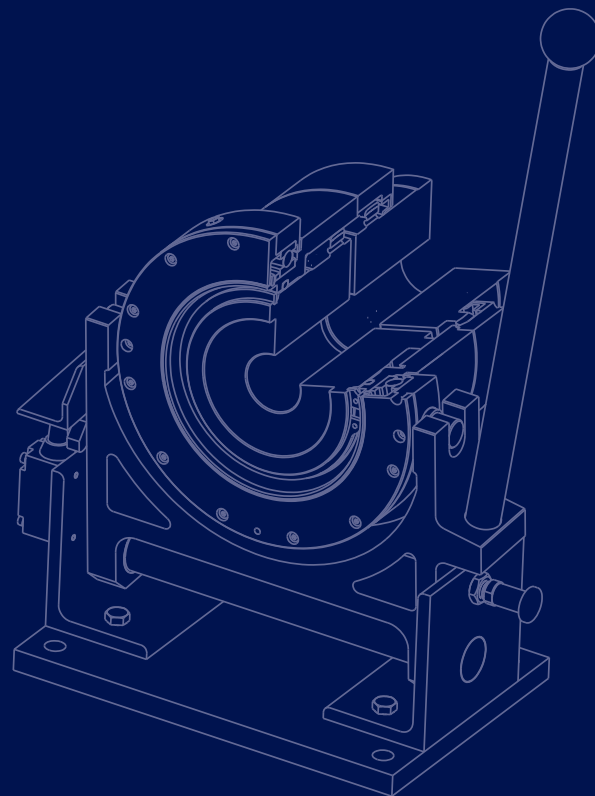


Innovative Power Transmission



**Curved Tooth Couplings
Disengageable at Standstill**

owner's choice

Coupling Selection and Size Determination

Table 1 - Service Factors

Machine	Service Factor $K_1^{1)}$	Machine	Service Factor $K_1^{1)}$	Machine	Service Factor $K_1^{1)}$
Excavator		Wood processing machines		Presses	
Chain bucket excavators	2.0	Debarking drums	1.8	Folding presses	1.8
Travelling gear (caterpillar)	1.8	Planers	1.4	Briquetting presses	2.5
Travelling gear (rails)	1.6	Frame saws	1.4	Eccentric presses	2.0
Suction pumps	1.6	Steel plants		Forging presses	2.25
Bucket wheels	1.8	Blast furnace blowers	1.4	Brick moulding presses	2.5
Cutter heads	2.0	Converters	2.0	Pumps	
Slewing gear	1.4	Inclined blast furnace elevators	1.8	Centrifugal pumps (thin liquid)	1.25
Winches	1.6	Slag crushers	1.8	Centrifugal pumps (viscous liquid)	1.4
Mining, stones		Cranes		Reciprocating pumps ($U \leq 1:100$)	1.8
Crushers	2.24	Luffing gear	1.25	Reciprocating pumps ($U = 1:100-200$)	1.6
Rotary kilns	1.8	Traversing gear	1.6	Plunger pumps	2.0
Mine ventilators	2.0	Hoists	1.4	Sludgers	1.4
Vibrators	1.6	Slewing gear	1.4	ELMO-Vacuum pumps	1.5
Chemical plant		Winches	1.25	Textile machines	
Agitators (thin liquid)	1.25	Metalworking		Winders	1.6
Agitators (viscous liquid)	1.6	Press brakes	1.6	Printing and drying machines	1.6
Centrifuges (light)	1.4	Sheet straighteners	1.8	Tanning vats	1.6
Centrifuges (heavy)	1.8	Hammers	1.8	Calenders	1.6
Conveyor plants		Shears	1.6	Opening machines	1.6
Conveyors	1.8	Forging presses	1.8	Weaving looms	1.6
Slatted conveyors	1.6	Stamping machines	1.8	Compressors	
Belt conveyors (bulk materials)	1.4	Mills		Reciprocating piston compressors ($U \leq 1:100$)	2.0
Slatted conveyors (piece goods)	1.6	Hammer mills	2.0	Reciprocating piston compressors ($U = 1:100-200$)	1.6
Pocket belt conveyors	1.25	Ball mills	2.0	Turbo compressors	1.6
Bucket chain conveyors	1.4	Suspended roller mills	2.0	Rolling mills	
Rotary conveyors	1.4	Impact mills	2.0	Sheet metal shears	1.8
Elevators	1.4	Rod mills	2.0	Sheet turning machines	1.6
Bucket type flour conveyors	1.25	Roller mills	2.0	Ingot slab mills	2.0
Lifts	1.8	Food machinery		Block conveyors	1.8
Apron conveyors	1.4	Fillers	1.25	Block pushers	2.0
Screw conveyors	1.4	Kneading machines	1.4	Tape and wire reels	1.4
Steel belt conveyors	1.4	Packaging machines	1.25	Descalers	1.6
Redler conveyors	1.4	Sugar cane crushers	1.6	Sheet mills	1.8
Blowers, ventilators		Sugar cane cutters	1.6	Plate mills	2.0
Rotary piston blowers	1.4	Sugar cane mills	1.8	Cold rolling mills	2.0
Blowers (axial and radial)	1.25	Sugar beet cutters	1.6	Track-type tractors	1.6
Cooling tower ventilators	1.4	Sugar beet washing plant	1.6	Billet shears	1.8
Induced draught fans	1.4	Paper machines		Colling beds	1.4
Turbo-blowers	1.25	Couch presses	1.8	Transfer skids	1.4
Generators, converters		M.G. cylinders	2.0	Roller tables (light)	1.4
Frequency converters	2.24	Reels	1.8	Roller tables (heavy)	1.8
Generators	1.4	Beating engines	1.6	Roller levellers	1.6
Welding generators	2.24	Pulp grinders	1.8	Trimming shears	1.4
Rubber and plastics machinery		Calenders	1.6	End shears	1.8
Extruders	1.6	Wet presses	1.8	Looplifters	1.4
Calenders	1.6	Opening machines	1.8	Roller control gear	1.4
Kneader machines	1.8	Agitators	1.8		
Mixers	1.8	Suction presses	1.6		
Rolling plant	1.8	Suction couch rolls	1.8		
		Drying cylinders	2.0		

Size Determination

Equation for continuous power:

$$\frac{P_N}{n} \cdot K_1 \leq \frac{P_{KN}}{n} \quad (\text{kW} \cdot \text{min})$$

P_N = max. continuous power (kW)

n = operating speed (rpm)

K_1 = service factor from Table 1

$\frac{P_{KN}}{n}$ = power rating acc. to dimension table (kW · min)

Equation for continuous torque T_N

$$T_N \cdot K_1 \leq T_{KN}$$

$$T_N = \frac{P_N}{n} \cdot 9550 \quad (\text{Nm})$$

$$T_{KN} = \frac{P_{KN}}{n} \cdot 9550 \quad (\text{Nm})$$

Permissible additional loads:

max. starting load of coupling
= $1.5 \cdot P_{KN}/n$ for 10° LC

max. short-circuit load of coupling
= $3 \cdot P_{KN}/n$ for 10° LC

LC = load cycle

The maximum permissible bore diameter is a further criterion in coupling selection. For this reason, the bore capacity has to be checked after having determined the coupling size on basis of the power data. If the bore dimension does not allow to install the shaft, a larger coupling size has to be selected.

Important note

The values listed in the dimension tables for the maximum permissible bore only apply to keyed connections, if the keyway does not exceed the dimensions according to DIN 6885. Please consult RENK AG in case of larger keyways.

The power transmission capability of the shaft-hub connection has to be verified by the purchaser.

For shaft-hub connections with interference fit, please advise the shrinkage allowance or the exact shaft dimensions.

1) The service factor K_1 is applicable to drives by electric motor or turbine. For drives involving hydraulic motors or internal combustion engines, the factor K_1 has to be multiplied by 1.1.

Curved Tooth Couplings Disengageable at Standstill

Since the introduction of the curved tooth coupling, it has also been available as disconnect type, i.e. the toothed members can be engaged and disengaged while the connected machines are at rest or running synchronously. It is thus possible, e.g. to temporarily separate certain machines within a power transmission line, or to connect auxiliary or alternative drives when they are required.

The shifting process is usually performed by means of a shifting mechanism which is actuated by hand lever, or by hydraulic or pneumatic cylinder.

For better meshing, the teeth of the respective tooth row are pointed.

For the lubrication of the coupling it is recommended to use one of the grease types as stated on our lubricant list.

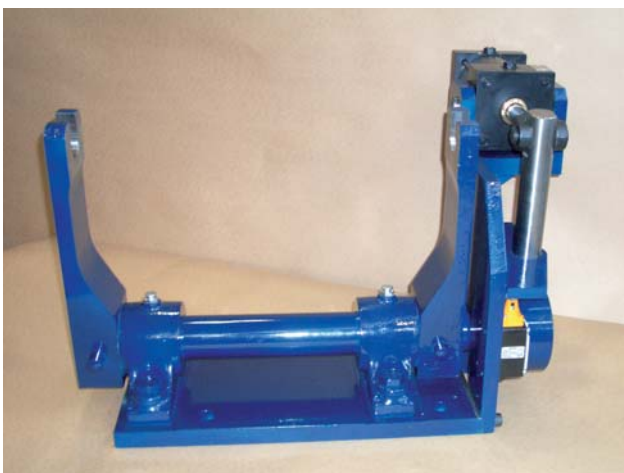
The bearings in the shifting collar require roller bearing grease.

Most of the disconnect type curved tooth couplings are special designs tailor-made to the application requirements.

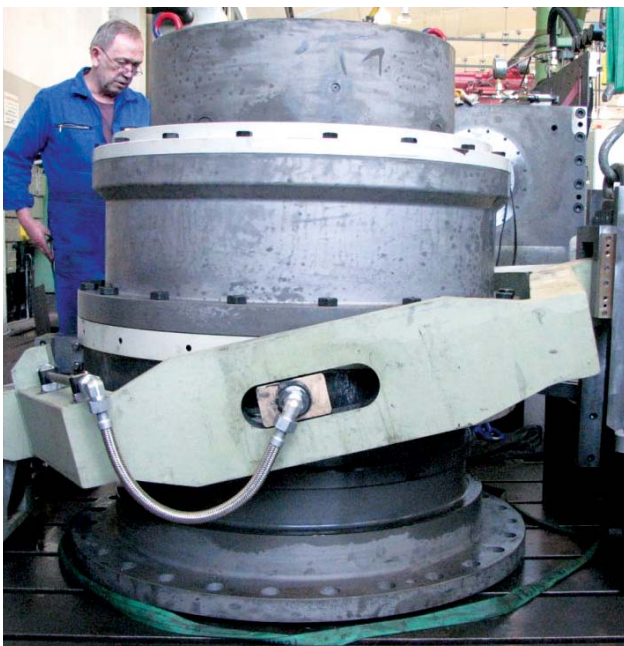
We supply couplings which can be separated completely, thus allowing to move the driving machine sideways.

We also offer disconnect-type couplings with preselection teeth to provide safe engagement of couplings being installed between pumps and generators in pump-fed power stations.

In addition to the standard dimension tables and examples shown on the following pages, disconnect-type curved tooth couplings are available in many types and sizes as required in each particular case.



1



2



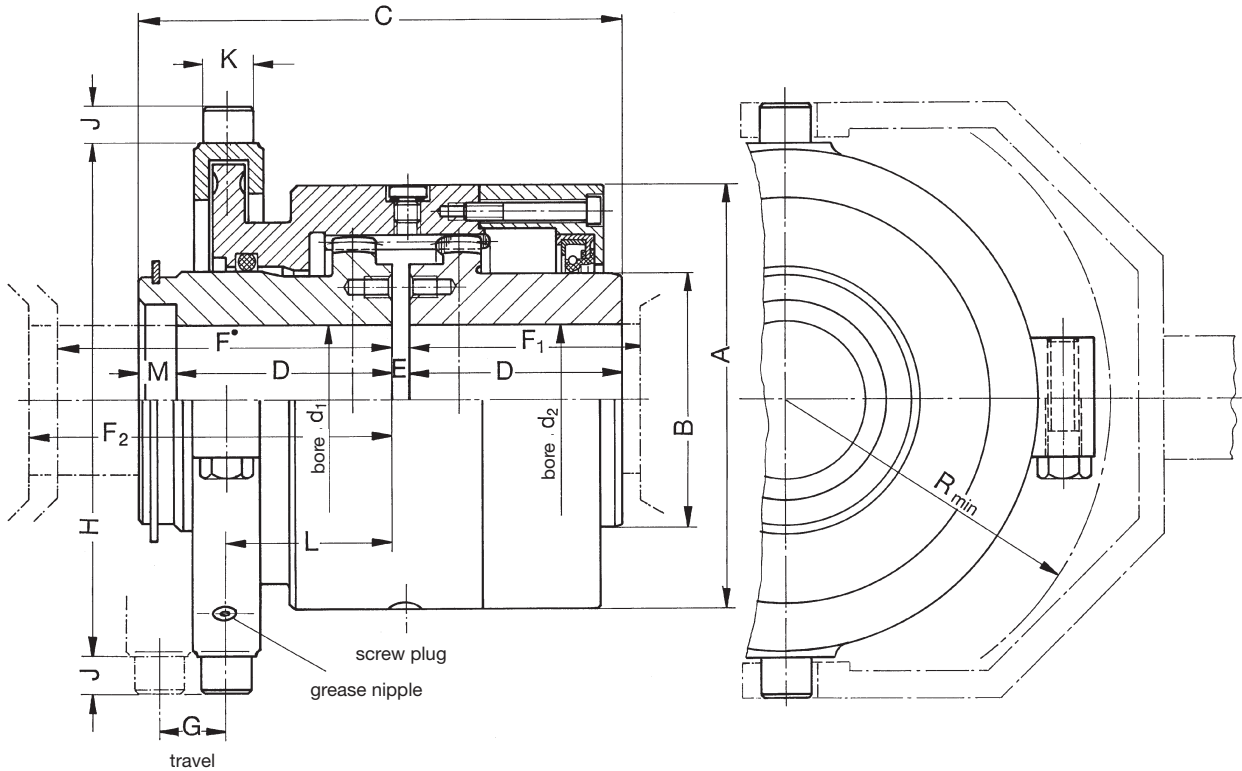
3

- 1 Shifting mechanism with pneumatic cylinder for curved tooth coupling Type HAW 180 spec.
- 2 Curved tooth coupling Type VHBA 525 spec. with tooth-by-tooth injection lubrication, vertical installation
- 3 Shifting mechanism with hand lever for curved tooth coupling

Curved Tooth Couplings Construction Series HA



Disengageable coupling with sliding ring
Dimension table No. 242 940 / 2



For size selection, please see 'Coupling Selection and Size Determination'.

Larger sizes available on request.

1) Values for the complete coupling, with bore d_1 ; d_{2max} .

• The dismounting dimension F is required to allow vertical installation and removal of the machines.

The distance dimensions F_1 and F_2 are required for shrink-fitting.

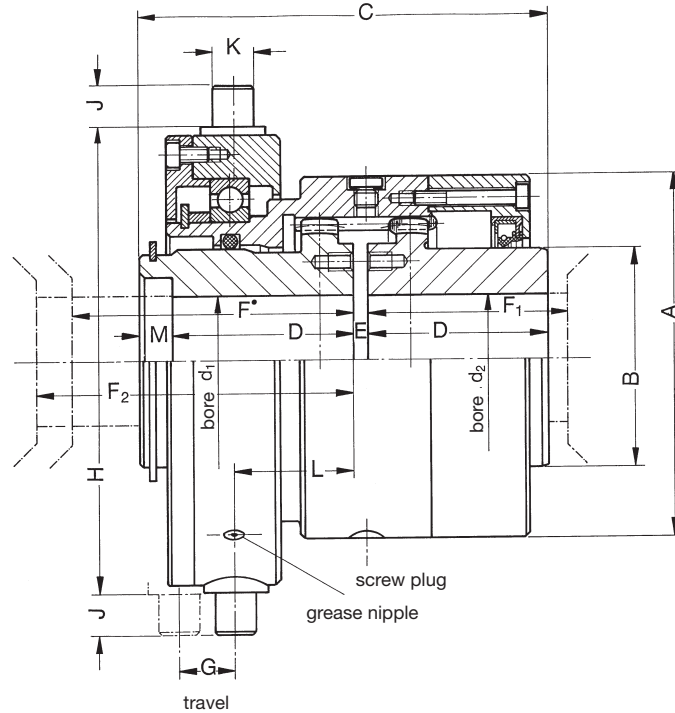
Coupling Type HA	Normal Continuous Duty $\frac{P_{KN}}{n}$ kW-min	Speed n_{max} rpm ⁻¹	Dimensions																	Total Grease Quantity kg	Mass ¹⁾ Moment of Inertia kgm ²	Weight ¹⁾ kg	
			Bore $d_1; d_2$ pre min. max.			A	B	C	D	E	F*	F_1	F_2	G	H	J	K	L	M				R
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm				mm
40	0,146	1600	20	22	45	120	70	138	60	5	110	80	110	20	170	12	17	52	13	105	0,10	0,018	9,3
50	0,288	1400	23	25	55	140	85	158	70	5	115	90	125	22	170	12	17	55	13	105	0,16	0,032	12,5
60	0,50	1250	26	28	65	165	105	183	80	6	125	105	140	25	230	30	20	58	17	135	0,17	0,082	22,5
70	0,82	1120	28	30	80	185	120	203	90	6	135	115	145	28	230	30	20	63	17	135	0,34	0,12	27
80	1,14	1000	30	32	90	200	140	221	100	6	145	125	155	30	250	30	20	70	15	145	0,45	0,21	34
90	1,64	900	30	32	100	230	150	238	110	8	150	135	170	32	250	30	20	72	10	145	0,58	0,30	44
100	2,30	800	53	55	110	245	170	258	120	8	160	145	185	35	315	35	25	79	10	175	0,7	0,46	60
110	2,88	710	63	65	120	265	190	268	130	8	165	155	195	35	355	35	25	78	-	190	0,9	0,69	75
125	4,60	630	73	75	140	295	210	310	150	10	195	180	220	40	355	35	25	91	-	190	1,2	1,14	98
140	6,48	530	83	85	150	330	240	340	165	10	205	195	240	45	355	35	25	100	-	190	1,4	1,7	125

Subject to change due to technical improvement.

Curved Tooth Couplings Construction Series HAW



Disengageable coupling with roller bearing
Dimension table No. 242 939 / 4



- 1) Values for the complete coupling, with bore d_1 ; d_{2max} .
- The dismounting dimension F is required to allow vertical installation and removal of the machines.
- The distance dimensions F_1 and F_2 are required for shrink-fitting.

For size selection, please see 'Coupling Selection and Size Determination'.

Larger sizes available on request.

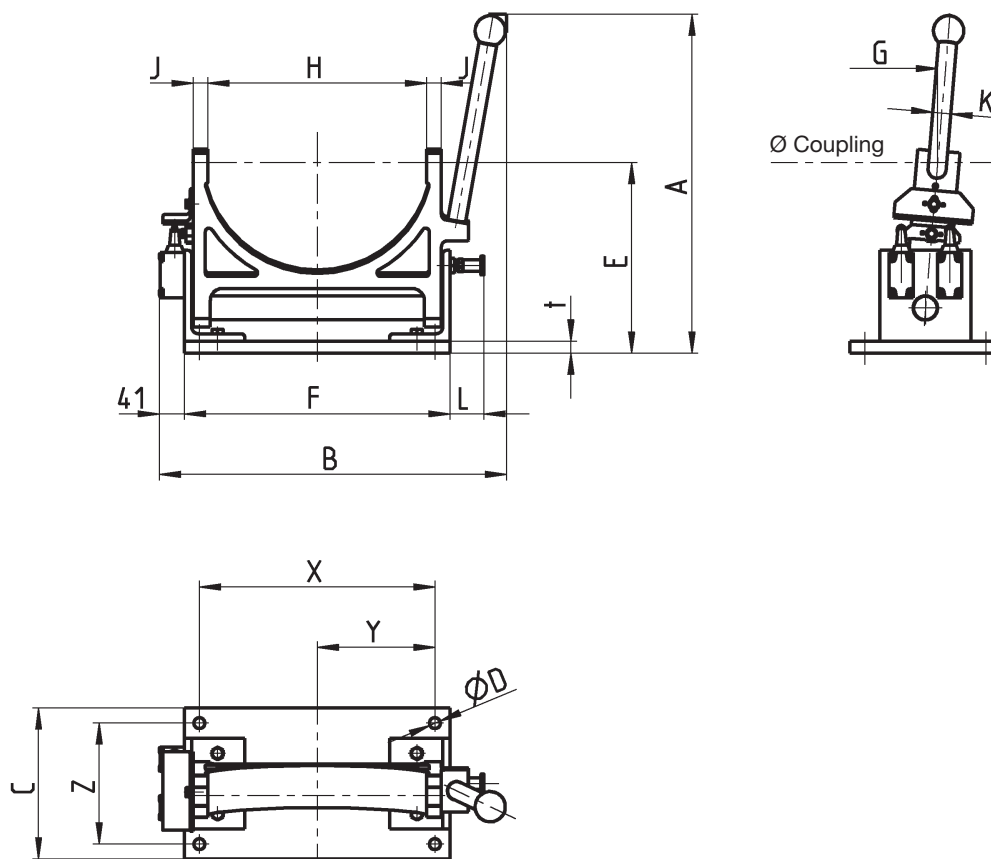
Coupling Type HAW	Normal Duty $\frac{P_{KN}}{n}$	Speed n_{max} rpm ⁻¹	Dimensions																	Total Grease Quantity kg	Grease Quantity for shifting collar kg	Mass ¹⁾ Moment of Inertia kgm ²	Weight ¹⁾ kg
			Bore d_1 ; d_2			A	B	C	D	E	F•	F_1	F_2	G	H	J	K	L	M				
			pre	min.	max.	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm				
40	0,146	5300	20	22	45	120	70	138	60	5	110	80	125	20	150	14	15	51,5	13	0,10	0,02	0,015	10
50	0,288	4300	23	25	55	140	85	158	70	5	115	90	130	22	180	16	16	47	13	0,16	0,03	0,028	15
60	0,50	3400	26	28	65	165	105	183	80	6	125	105	150	25	210	18	20	55	17	0,17	0,05	0,065	24
70	0,82	3000	28	30	80	185	120	203	90	6	135	115	160	28	230	18	20	59	17	0,34	0,06	0,11	30
80	1,14	2700	30	32	90	200	140	221	100	6	145	125	170	30	230	18	20	63	15	0,45	0,07	0,16	38
90	1,64	2400	30	32	100	230	150	238	110	8	150	135	180	32	260	20	22	66	10	0,58	0,08	0,29	48
100	2,30	2200	53	55	110	245	170	258	120	8	160	145	190	35	300	22	25	70	10	0,7	0,11	0,42	62
110	2,88	1900	63	65	120	265	190	268	130	8	165	155	200	35	300	22	25	71	-	0,9	0,12	0,57	73
125	4,60	1800	73	75	140	295	210	310	150	10	195	180	240	40	360	24	30	87	-	1,2	0,19	1,07	105
140	6,48	1600	83	85	150	330	240	340	165	10	205	195	250	45	360	24	30	94	-	1,4	0,22	1,7	134
160	9,24	1400	118	120	170	375	270	392	190	12	235	225	285	50	430	26	34	108	-	2,0	0,35	3,3	206
180	12,92	1200	138	140	200	415	310	452	220	12	265	260	315	60	465	26	34	122	-	3,0	0,5	5,7	279
200	18,4	1000	158	160	225	470	350	504	245	14	295	285	355	67	540	30	38	133	-	4,5	0,6	10,4	405

Subject to change due to technical improvement.

For Curved Tooth Couplings Construction Series HA / HAW Shifting Devices

Design with hand lever

Dimension table No. 243 362

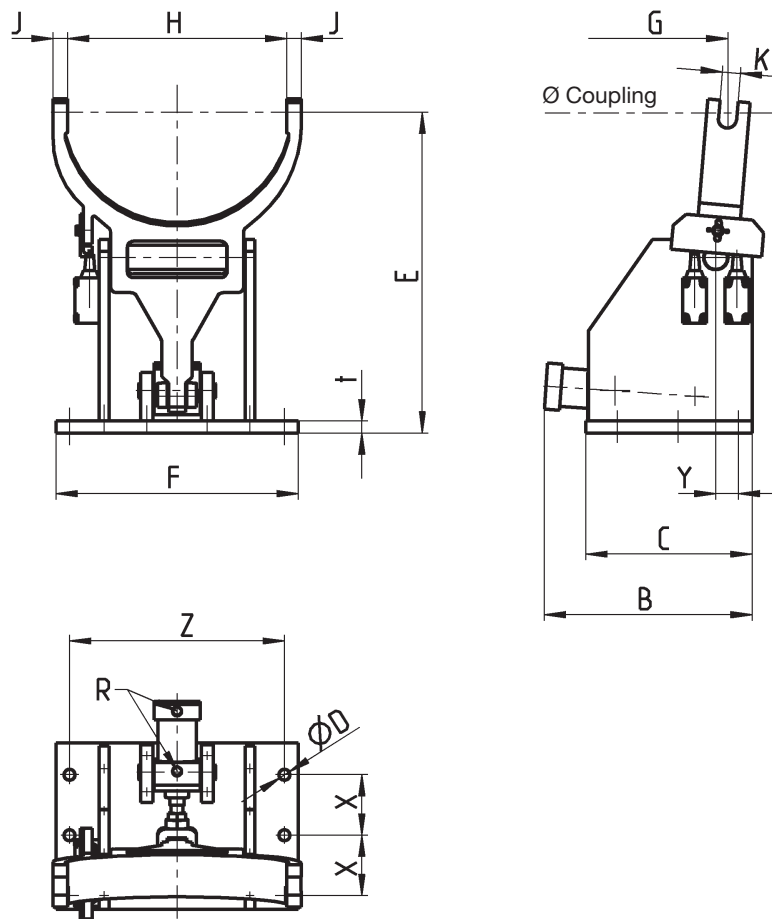


Type HA/HAW Size	Dimensions														
	A mm	B mm	C mm	t mm	D mm	E mm	F mm	G mm	H mm	J mm	K mm	L mm	X mm	Y mm	Z mm
40	1200	300	220	16	14	175	207	20	152	14	15	39	162	75,5	175
50	1200	300	220	16	14	200	241	22	182	16	16	39	196	92,5	175
60	1200	300	220	16	14	215	275	25	212	18	20	39	230	109,5	175
70	1200	350	220	16	14	225	295	28	232	18	20	39	250	119,5	175
80	1200	350	220	16	14	225	295	30	232	18	20	39	250	119,5	175
90	1400	450	250	20	18	275	331	32	262	20	22	56	281	140,5	200
100	1400	490	250	20	18	295	375	35	302	22	25	56	325	162,5	200
110	1400	490	250	20	18	295	375	35	302	22	25	56	325	162,5	200
125	1400	580	250	20	18	315	439	40	362	24	30	56	389	194,5	200
140	1400	580	250	20	18	335	439	45	362	24	30	56	389	194,5	200
160	1600	800	320	25	22	420	520	50	432	26	34	65	460	230,0	260
180	1600	800	320	25	22	445	555	60	467	26	34	65	495	247,5	260
200	1600	800	320	25	22	490	638	67	542	30	38	65	578	289,0	260

Subject to change due to technical improvement.

For Curved Tooth Couplings Construction Series HA / HAW Shifting Devices

Design with pneumatic / hydraulic cylinder
Dimension table No. 243 363



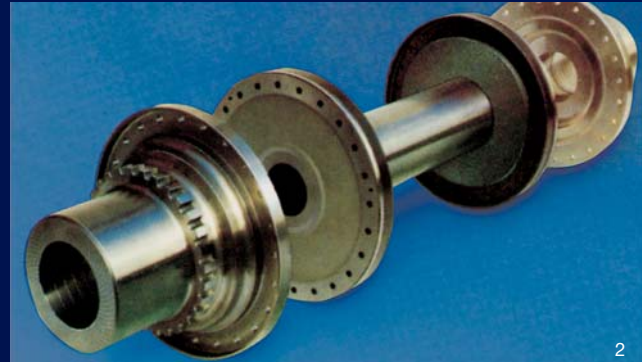
Type HA/HAW Size	Dimensions													
	B mm	C mm	t mm	D mm	E mm	F mm	G mm	H mm	J mm	K mm	R Inch	X mm	Y mm	Z mm
40	275	220	16	14	285	260	20	152	14	15	1/2	80	37,5	215
50	275	220	16	14	310	260	22	182	16	16	1/2	80	37,5	215
60	275	220	16	14	325	260	25	212	18	20	1/2	80	37,5	215
70	275	220	16	14	335	260	28	232	18	20	1/2	80	37,5	215
80	275	220	16	14	335	260	30	232	18	20	1/2	80	37,5	215
90	350	275	20	18	490	400	32	262	20	22	1/2	100	37,5	335
100	350	275	20	18	510	400	35	302	22	25	1/2	100	37,5	335
110	350	275	20	18	510	400	35	302	22	25	1/2	100	37,5	335
125	350	275	20	18	530	400	40	362	24	30	1/2	100	37,5	335
140	350	275	20	18	550	400	45	362	24	30	1/2	100	37,5	335
160	400	400	25	22	750	600	50	432	26	34	1/2	175	37,5	550
180	400	400	25	22	775	600	60	467	26	34	1/2	175	37,5	550
200	400	400	25	22	820	600	67	542	30	38	1/2	175	37,5	550

Subject to change due to technical improvement.

Further products of our range of couplings



1 Curved Tooth Coupling with hardened and ground inner and outer teeth, tooth-by-tooth injection lubrication



2 High-Speed Diaphragm Coupling
Type MCN



3 Raflex® Steel Disk Coupling
Type MTP acc. to API 610



4 HYGUARD® Safety Coupling
Type BWL



RENK Aktiengesellschaft
Rheine works
Rodder Damm 170
D-48432 Rheine / Germany

Telephone: ++49 5971 790-0
Telefax: ++49 5971 790 208 and 790 256
E-mail: info.rheine@renk.biz
Internet: <http://www.renk.eu>