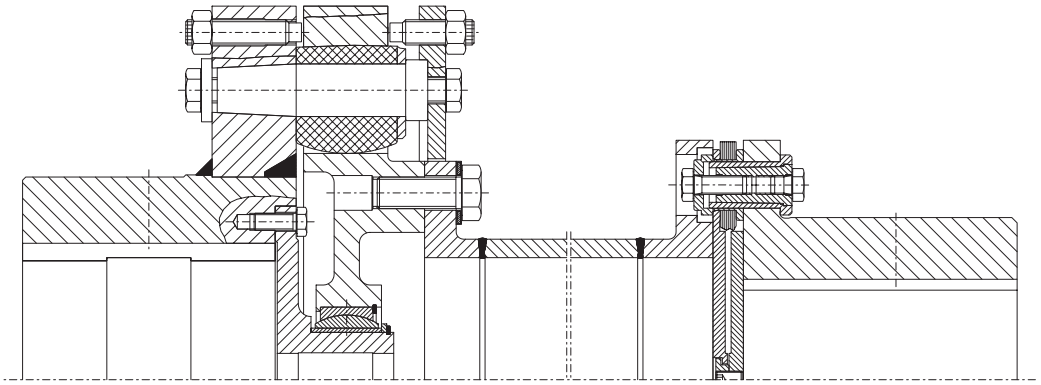
Operating Instructions

BA 3603 EN 07.04

Elastic **RUPEX** Couplings
Type **RAK**



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1. Technical data

Caution! **If a dimensioned drawing has been made out for the coupling, the data in this drawing must be given priority. The user of the system must make the dimensioned drawing available.**

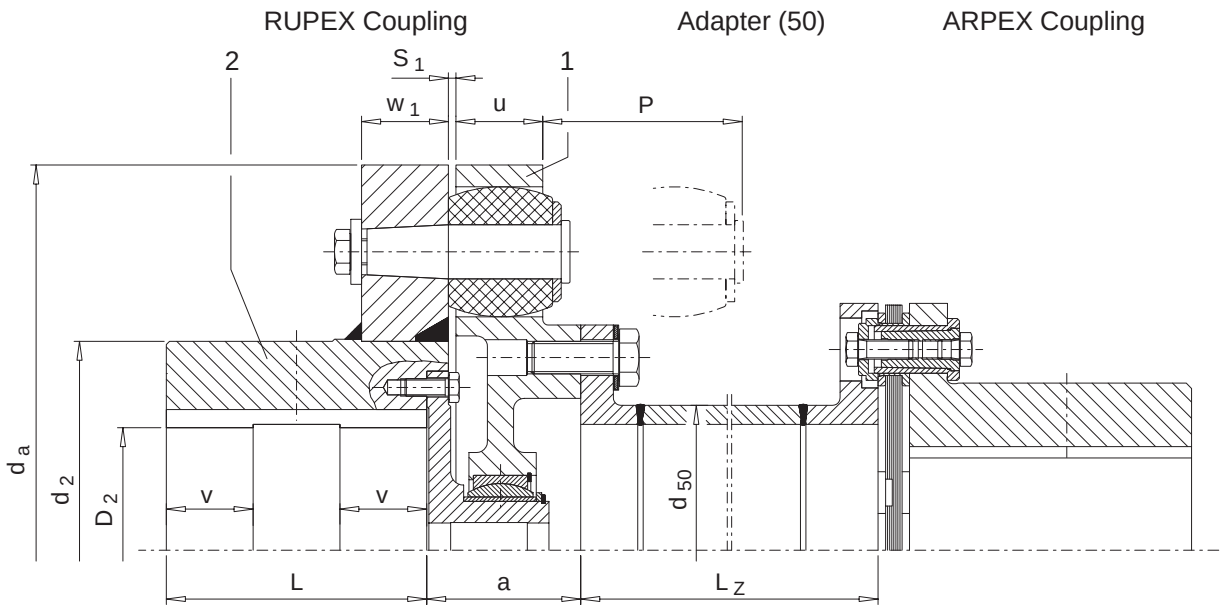
1.1 Operating Instructions

The Type RAK is a combination of flexible RUPEX and ARPEX couplings. These Operating Instructions refer to the flexible RUPEX coupling only. For the ARPEX coupling the information and instructions in the relevant documentation must be observed!

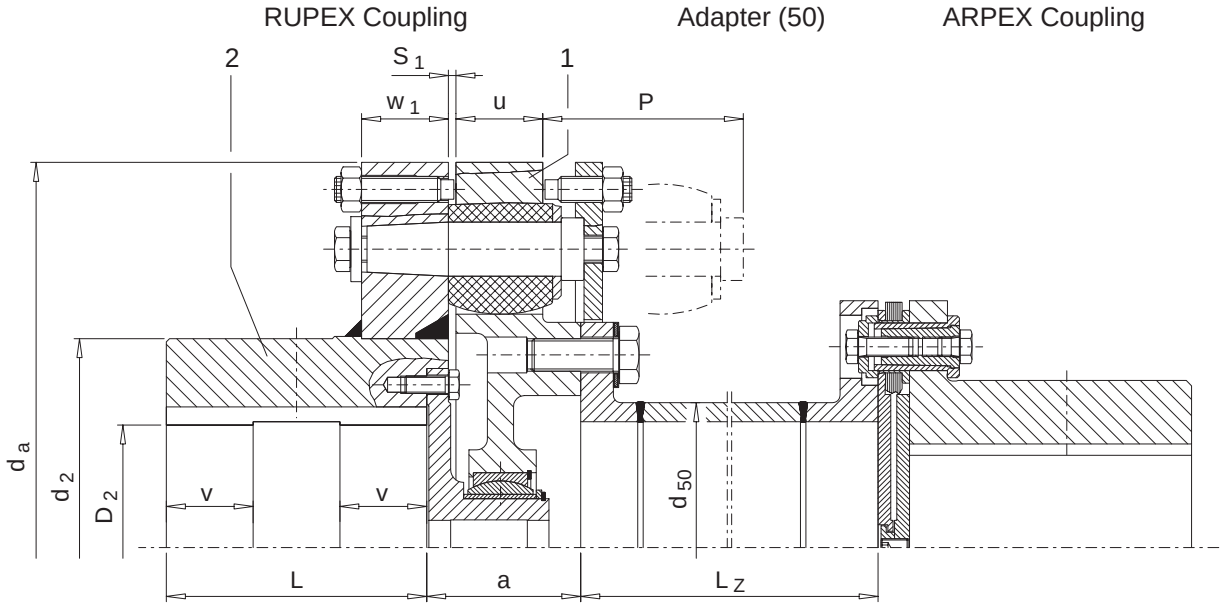
Caution! **For the ARPEX coupling please observe the relating Operating Instructions BA 8704 EN!**

1.2 Geometric data, weights and mass moments of inertia

Coupling combination **without** axial backlash limitation



Coupling combination **with** axial backlash limitation



1.2.1 RUPEX Coupling

Coupling combination			Bore D_2				d_a	d_2	L	v	P	S_1		w_1	u	a	
RUPEX	ARPEX		RWN		RWS												
Size	Type	Size	from mm	to mm	from mm	to mm	mm	mm	mm	mm	mm	mm		mm	mm	mm	
228		**195**		90		95	228	140	82		50	3.5	± 1.5	24	26	51.5	± 1.5
252		**210**	38	100	38	110	252	160	90		50	3.5	± 1.5	24	26	53.5	± 1.5
285		**240**	48	110	48	120	285	175	100		60	4.5	± 1.5	30	32	59.5	± 1.5
360		**255**	65	130	65	140	360	210	125		75	4.5	± 1.5	42	42	79.5	± 1.5
400	**ARS-6**	**305**	75	140	75	150	400	230	145		75	4.5	± 1.5		42	98.5	± 1.5
450		**335**	85	160	85	170	450	260	162		90	5.5	± 1.5		52	102.5	± 1.5
500		**407**	95	180	95	190	500	290	182		90	5.5	± 1.5		52	100.5	± 1.5
560		**442**	100 > 140 > 180	140 180 200	100 > 165 > 200	165 200 210	560	250 300 320	200	65	120	6	± 2		68	124	± 2
630		**385**	100 > 140 > 180	140 180 220	100 > 165 > 200	165 200 235	630	250 300 355	220	75	120	6	± 2		68	124	± 2
710		**455**	110 > 160 > 200	160 200 240	110 > 190 > 220	190 220 250	710	290 330 385	240	80	140	7	± 2		80	142	± 2
800		**505**	125 > 180 > 220	180 220 260	125 > 210 > 240	210 240 280	800	320 360 420	270	90	140	7	± 2		80	142	± 2
900	**ARC-8**	**545**	140 > 220 > 260	220 260 290	140 > 210 > 240 > 280	210 240 280 310	900	320 360 425 465	300	100	160	7.5	± 2.5		90	152.5	± 2.5
1000		**595**	150 > 240 > 280	240 280 320	150 > 230 > 260 > 300	230 260 300 340	1000	355 395 460 515	330	110	160	7.5	± 2.5		90	152.5	± 2.5
1120		**630**	160 > 200 > 250 > 300	200 250 300 350	160 > 240 > 270 > 330	240 270 330 370	1120	360 410 495 560	350	110	180	8.5	± 2.5		100	183.5	± 2.5
1250		**630**	180 > 230 > 280 > 330	230 280 330 380	180 > 270 > 300 > 360	270 300 360 400	1250	410 460 540 610	390	130	180	8.5	± 2.5		100	183.5	± 2.5
1400		**760**	200 > 260 > 320 > 380	260 320 380 440	200 > 310 > 350 > 410	310 350 410 460	1400	465 525 620 700	450	145	210	9	± 3		120	204	± 3
1600	**ARC-10**	**860**	260 > 320 > 380 > 440	320 380 440 480	260 > 370 > 410 > 480	370 410 480 510	1600	565 625 720 770	510	165	210	9	± 3		120	204	± 3
1800		**950**	320 > 380 > 440 > 500	380 440 500 540	320 > 440 > 480 > 540	440 480 540 580	1800	660 720 820 870	560	185	240	12	± 4		140	247	± 4
2000		**1035**	380 > 440 > 500 > 560	440 500 560 600	380 > 500 > 540 > 610	500 540 610 640	2000	760 820 920 960	620	200	240	12	± 4		140	247	± 4

Table 1.2.1 a : Dimensions of the RUPEX coupling

The types RWN / RWS with axial backlash limitation are produced only in sizes 285-1250.

Coupling combination			d_2	RWN				RWS			
RUPEX	ARPEX			Weight		Mass moment of inertia		Weight		Mass moment of inertia	
Size	Type	Size		Part 1	Part 2	Part 1	Part 2	Part 1	Part 2	Part 1	Part 2
			mm	kg	kg	kgm^2	kgm^2	kg	kg	kgm^2	kgm^2
228	**ARS-6**	**195**	140	5.3	13	0.031	0.071	5.7	13.5	0.034	0.077
252		**210**	160	7.3	16.5	0.05	0.11	7.9	17.8	0.056	0.12
285		**240**	175	10.5	24	0.098	0.21	11.5	26	0.11	0.23
360		**255**	210	21	59	0.33	0.76	23	63	0.36	0.81
400		**305**	230	35	55	0.71	0.88	38	59	0.76	0.95
450		**335**	260	55	81	1.5	1.73	55	86	1.5	1.73
500		**407**	290	68	105	2.28	2.6	68	115	2.28	2.8
560		**442**	250 300 320	105	160 155 160	4.15	4.9 4.7 5.1	114	173 168 173	4.5	5.3 5.1 5.5
630	**ARC-8**	**385**	250 300 355	140	190 200 220	7.2	7.1 7.5 8.3	140	205 215 240	7.8	7.7 8.1 9
710		**455**	290 330 385	175	260 275 285	12.2	13.3 15.3 15	190	280 300 310	13.2	14.4 16.6 16.2
800		**505**	320 360 420	245	365 380 405	21	22 23 24.5	265	395 410 440	22.7	24 25 26.5
900		**545**	320 360 425 465	340	– 500 540 550	36.5	– 38 42 43	370	500 540 585 600	39.5	40 41 45 47
1000		**595**	355 395 460 515	400	– 600 640 700	56	– 61 64 66	435	640 650 695 760	61	63 66 69 71
1120		**630**	360 410 495 560	560	780 800 880 890	94	98 100 105 110	610	845 865 950 970	102	106 108 115 120
1250	**ARC-10**	**630**	410 460 540 610	640	960 990 1120 1200	145	150 155 170 175	695	1040 1070 1210 1300	157	162 168 185 190
1400		**760**	465 525 620 700	860	1440 1500 1620 1750	255	285 290 305 325	930	1560 1630 1750 1900	275	310 315 330 350
1600		**860**	565 625 720 770	1250	1900 1950 2100 2200	450	480 490 510 540	1350	2050 2100 2250 2400	485	520 530 550 585
1800		**950**	660 720 820 870	1900	3000 3100 3300 3400	860	920 970 1050 1050	2060	3250 3350 3550 3700	930	995 1050 1140 1140
2000		**1035**	760 820 920 960	2300	3650 3800 4100 4200	1300	1400 1500 1550 1600	2500	3950 4100 4450 4550	1410	1520 1620 1680 1730

Table 1.2.1 b : Weights and mass moments of inertia

Weights and mass moments of inertia apply to max. bores.

Weights and mass moments of inertia for part 2 including flanged shaft.

1.2.2 Adapter

Coupling combination			Adapter					
RUPEX	ARPEX		$L_{Z\,min}$	d_{50}	Weight		Mass moment of inertia	
Size	Type	Size			L_{Zmin}	100 mm each	L_{Zmin}	100 mm each
			mm	mm	kg	kg	kgm^2	kgm^2
228	**ARS-6**	**195**	113.5	60.3	5	1.7	0.014	0.029
252		**210**	131.5	76.1	5.8	1.6	0.021	0.043
285		**240**	142.5	82.5	8.5	2.2	0.04	0.082
360		**255**	152.5	114.3	10	2.1	0.065	0.114
400		**305**	199.5	152.4	15.5	2.5	0.16	0.325
450		**335**	207.5	165.1	20.5	3.4	0.25	0.5
500		**407**	239.5	193.7	38	5.6	0.67	1.3
560		**442**	258	177.8	57	8.5	0.98	1.95
630	**ARC-8**	**385**	171	229	46	9.1	0.95	1.16
710		**455**	234	267	62	10.5	1.7	2.6
800		**505**	262	323.9	79	12	3.1	4.3
900		**545**	289.5	355.6	104	14.5	4.9	6.4
1000		**595**	321.5	394	137	16.5	8.3	9.8
1120		**630**	348.5	419	195	19.5	13	14.2
1250	**ARC-10**	**630**	348.5	406.4	270	28	20	15
1400		**760**	392	495	415	35	42	39
1600		**860**	464	559	600	47	78	72
1800		**950**	471	610	770	51	118	120
2000		**1035**	471	660.4	1050	75	180	190

Table 1.2.2: Dimensions, weights and mass moments of inertia of the adapter

1.3 Performance data of the RUPEX coupling

Note: For identification marking of the individual buffers, see section 5.

Buffers: 80 Shore A (standard)									
Size	Speed n_{max}		Rated torque	Maximum torque	Fatigue torque	dynamic torsional stiffness $C_{T\,dyn}$			
	RWN	RWS	T_{KN}	T_{Kmax}	T_{KW}	$0.75xT_{KN}$	$0.5xT_{KN}$	$0.25xT_{KN}$	$0xT_{KN}$
	1/min	1/min	Nm	Nm	Nm	Nm/rad	Nm/rad	Nm/rad	Nm/rad
228	3000	4400	2 200	6 600	676	293 000	156 000	83 000	44 000
252	2700	4200	2 750	8 250	840	430 000	225 000	118 000	62 000
285	2400	3900	4 300	12 900	1 320	650 000	340 000	176 000	92 000
360	1900	3100	7 800	23 400	2 400	1 370 000	720 000	375 000	197 000
400	1700	2800	12 500	37 500	3 880	1 880 000	995 000	530 000	280 000
450	1500	2500	18 500	55 500	5 800	2 510 000	1 340 000	715 000	380 000
500	1350	2200	25 000	75 000	7 600	3 650 000	1 920 000	1 010 000	530 000
560	1200	2000	39 000	117 000	12 000	5 150 000	2 700 000	1 410 000	740 000
630	1050	1800	52 000	156 000	16 000	7 200 000	3 800 000	1 990 000	1 050 000
710	950	1600	84 000	252 000	26 000	10 400 000	5 450 000	2 860 000	1 500 000
800	850	1400	110 000	330 000	34 400	14 700 000	7 700 000	4 000 000	2 100 000
900	750	1250	150 000	450 000	47 600	21 000 000	11 000 000	5 750 000	3 000 000
1000	680	1100	195 000	585 000	60 800	32 500 000	16 500 000	8 350 000	4 250 000
1120	600	1000	270 000	810 000	84 000	49 000 000	25 100 000	12 800 000	6 500 000
1250	550	900	345 000	1 035 000	106 400	76 500 000	38 000 000	19 100 000	9 500 000
1400	490	800	530 000	1 590 000	164 400	126 000 000	60 500 000	29 300 000	14 100 000
1600	430	700	750 000	2 250 000	231 200	241 000 000	114 000 000	54 000 000	25 500 000
1800	380	600	975 000	2 925 000	300 000	495 000 000	218 000 000	95 500 000	42 000 000
2000	340	550	1 300 000	3 900 000	400 000	870 000 000	395 000 000	180 000 000	82 000 000

Buffers: 60 Shore A									
Size	Speed n_{max}		Rated torque	Maximum torque	Fatigue torque	dynamic torsional stiffness $C_{T\,dyn}$			
	RWN	RWS	T_{KN}	T_{Kmax}	T_{KW}	$0.75xT_{KN}$	$0.5xT_{KN}$	$0.25xT_{KN}$	$0xT_{KN}$
	1/min	1/min	Nm	Nm	Nm	Nm/rad	Nm/rad	Nm/rad	Nm/rad
228	3000	4400	1 300	3 900	520	64 000	45 000	31 000	22 000
252	2700	4200	1 650	5 000	660	96 000	66 000	45 000	31 000
285	2400	3900	2 600	7 800	1 050	140 000	97 000	67 000	46 000
360	1900	3100	4 700	14 000	1 900	295 000	205 000	145 000	99 000
400	1700	2800	7 500	22 500	3 000	425 000	295 000	205 000	140 000
450	1500	2500	11 000	33 000	4 400	550 000	380 000	270 000	190 000
500	1350	2200	15 000	45 000	6 000	780 000	540 000	380 000	265 000
560	1200	2000	23 500	71 000	9 400	1 100 000	770 000	540 000	370 000
630	1050	1800	31 000	93 000	12 500	1 550 000	1 100 000	760 000	530 000
710	950	1600	50 000	150 000	20 000	2 250 000	1 550 000	1 100 000	750 000
800	850	1400	66 000	200 000	26 500	3 200 000	2 200 000	1 500 000	1 050 000
900	750	1250	90 000	270 000	36 000	4 600 000	3 200 000	2 200 000	1 500 000
1000	680	1100	115 000	350 000	46 000	6 700 000	4 600 000	3 100 000	2 100 000
1120	600	1000	160 000	480 000	64 000	10 000 000	6 900 000	4 800 000	3 300 000
1250	550	900	205 000	620 000	82 000	15 100 000	10 300 000	7 000 000	4 800 000
1400	490	800	320 000	960 000	130 000	25 600 000	16 600 000	10 800 000	7 000 000
1600	430	700	450 000	1 350 000	180 000	46 600 000	30 100 000	19 400 000	12 500 000
1800	380	600	585 000	1 750 000	235 000	85 500 000	53 600 000	33 500 000	21 000 000
2000	340	550	780 000	2 350 000	310 000	171 000 000	106 600 000	66 500 000	41 500 000

damping coefficient $\Psi = 1.1$

Caution!

The speed n_{max} specified in the table refers to the RUPEX coupling only. The maximum speed of the combined RUPEX/ARPEX coupling is limited by the weight and the critical speed of the adapter. Speed n_{max} upon request, or see dimensioned drawing.

The performance data are valid for:

- max. 25 starts per hour
- daily operating cycle of up to 24 h
- operation within the specified alignment
- Operation in temperature range from

  - 30 °C up to + 80 °C with Perbunan buffers (5)
  - 50 °C up to + 50 °C with natural rubber buffers (5)

  Temperature measured in the immediate vicinity of the coupling

Caution!

For sustained faultfree operation the coupling must be designed with a service factor f_1 in accordance with item 1.5 and appropriate to the application. In the event of a change in operating conditions (e.g. output, speed, starting frequency, changes to the prime mover and driven machine) the design must always be checked (see item 1.4).

1.4 Checking the selected RAK coupling size

The following must apply to the RAK coupling:

$T_{KN} \geq T_N \times f_1$

T_{KN} = rated coupling torque
T_N = torque - rated drive torque acting on the coupling
f_1 = service factor in accordance with item 1.5

During starting or operation torque impulses up to 25 times per hour are permissible. The following applies:

$T_{Kmax} \geq T_{max}$

T_{Kmax} = maximum coupling torque
T_{max} = maximum system torque - peak drive torque acting on the coupling

The following must apply to the alternating torques occurring during operation:

$T_{KW} \geq T_W \times S_f \times f_1$

T_{KW} = fatigue torque load on the coupling
T_W = alternating torque load on the coupling
f_1 = service factor in accordance with item 1.5

$S_f = \sqrt{\frac{f_{Err}}{10Hz}}$ for $f_{Err} > 10$ Hz

$S_f = 1.0$ for $f_{Err} \leq 10$ Hz

f_{Err} = excitation frequency of the alternating torque load in Hz

Caution! **When selecting the coupling, the permissible maximum speed and the permissible maximum bore must also be taken into consideration. Selection of bore fit in accordance with section 6, item 6.1.1.**

Caution! **The shaft displacement values specified in section 6, item 6.7, must not be exceeded.**

1.5 Determining the service factor for the RAK coupling

The service factors taken as basis are based on empirical values which generally estimate the output of in- and output combinations in service.

Service factor f_1 (daily operating cycle of up to 24 h)

Prime mover	Load characteristic of driven machine		
	G	M	S
Electric motors, Turbines, Hydraulic motors	1	1.25	1.75
Piston engines 4 - 6 cylinders Coefficient of cyclic variation up to 1 : 100 to 1 : 200	1.25	1.5	2
Piston engines 1 - 3 cylinders Coefficient of cyclic variation up to 1 : 100	1.5	2	2.5

Load characteristics of driven machines listed by area of application

Dredgers
S Bucket-chain conveyors
S Travelling gear (caterpillar)
M Travelling gear (rails)
M Manoeuvring winches
M Lift pumps
S Bucket wheels
S Cutter heads
M Slewing gear

Building machinery
M Hoists
M Concrete mixers
M Road construction machinery

Chemical industry
M Cooling drums
M Mixers
G Agitators (light liquids)
M Agitators (semi-liquid material)
M Drying drums
G Centrifuges (light)
M Centrifuges (heavy)

Mineral oil extraction
M Pipeline pumps
S Rotary drilling equipment

Conveyor systems
M Hauling winches
S Hoists
M Link conveyors
M Belt conveyors (bulk material)
S Belt conveyors (piece goods)
M Band pocket conveyors
M Endless chain transporters
M Rotary conveyors
M Goods lifts
G Bucket-type flour conveyors
M Passenger lifts
M Apron conveyors
M Screw conveyors
M Ballast elevators
S Inclined hoists
M Steel belt conveyors
M Trough chain conveyors

Blowers, Ventilators
G Rotary piston blowers $T_N \leq 75$ Nm
M Rotary piston blowers $T_N \leq 750$ Nm
S Rotary piston blowers $T_N > 750$ Nm
G Blowers (axial/radial) $T_N \leq 75$ Nm
M Blowers (axial/radial) $T_N \leq 750$ Nm
S Blowers (axial/radial) $T_N > 750$ Nm
G Cooling tower fans $T_N \leq 75$ Nm
M Cooling tower fans $T_N \leq 750$ Nm
S Cooling tower fans $T_N > 750$ Nm
G Induced draught fans $T_N \leq 75$ Nm
M Induced draught fans $T_N \leq 750$ Nm
S Induced draught fans $T_N > 750$ Nm
G Turbo blowers $T_N \leq 75$ Nm
M Turbo blowers $T_N \leq 750$ Nm
S Turbo blowers $T_N > 750$ Nm

Generators, transformers
S Frequency transformers
S Generators
S Welding generators

Rubber processing machines
S Extruders
M Calenders
S Pug mills
M Mixers
S Rolling mills

Wood working machines
S Barkers
M Planing machines
G Wood working machines
S Saw frames

Cranes
G Luffing gear
S Travelling gear
S Hoisting gear
M Slewing gear
M Derricking jib gear

Plastics processing machines
M Extruders
M Calenders
M Mixers
M Crushers

Metal working machines
M Sheet bending machines
S Sheet straightening machines
S Hammers
S Planing machines
S Presses
M Shears
S Forging presses
S Punch presses
G Countershafts, shaft trains
M Machine tools, main drives
G Machine tools, auxiliary drives

Food processing machines
G Bottling and container filling machines
M Kneading machines
M Mash tubs, crystallizers
G Packaging machines
M Cane crushers
M Cane knives
S Cane mills
M Sugar beet cutters
M Sugar beet washing machines

Paper processing machines
S Couches
S Glazing cylinders
S Pulpers
S Pulp grinders
S Calenders
S Wet presses
S Willows
S Suction presses
S Suction rolls
S Drying cylinders

Pumps
S Piston pumps
G Centrifugal pumps (light liquids)
M Centrifugal pumps (heavy liquids)
S Plunger pumps
S Pressure pumps

Stone and clay working machines
S Crushers
S Rotary kilns
S Hammer mills
S Ball mills
S Tube mills
S Beater mills
S Brick presses

Textile machines
M Batchers
M Printing and dyeing machines
M Tanning vats
M Willows
M Looms

Compressors
S Piston compressors
M Turbo compressors

Rolling mills
S Sheet shears
M Sheet tilters
S Ingot pushers
S Blooming and slabbing mills
S Ingot conveying systems
M Wire drawing benches
S Descaling machines
S Thin sheet mills
S Heavy sheet mills
M Winding machines (strip and wire)
S Cold rolling mills
M Chain transfers
S Billet shears
M Cooling beds
M Cross transfers
M Roller tables (light)
S Roller tables (heavy)
M Roller straighteners
S Tube welding machines
M Trimming shears
S Cropping shears
S Continuous casting plant
M Roller adjustment drives
S Shifting devices

Laundry machines
M Tumble driers
M Washing machines

Water treatment
M Rotary aerators
G Screw pumps

G = uniform load M = medium load S = heavy load

2. General notes

2.1 Introduction

These Operating Instructions (BA) are an integral part of the coupling delivery and must be kept in its vicinity for reference at all times.

Caution! **All persons involved in the installation, operation, maintenance and repair of the coupling must have read and understood these Operating Instructions and must comply with them at all times. We accept no responsibility for damage or disruption caused by disregard of these Instructions.**

The **"Coupling"** described in these operating instructions has been developed for stationary use in general engineering applications. The coupling serves to transmit power and torque between two shafts or flanges connected by this coupling.

The coupling is designed only for the application described in section 1, "Technical data". Other operating conditions must be contractually agreed.

The coupling described in these Instructions reflects the state of technical development at the time these Instructions went to print.

In the interest of technical progress we reserve the right to make changes to the individual assemblies and accessories which we regard as necessary to preserve their essential characteristics and improve their efficiency and safety.

2.2 Copyright

Technical enquiries should be addressed to the following works

FLENDER AG
D 46393 Bocholt

Telefon: 02871/92-2868
Telefax: 02871/92-2579

or to one of our customer-service addresses. A list of our customer-service addresses is given in section 11, "Spare parts, customer-service addresses".

3. Safety notes

3.1 Proper use

- The coupling has been manufactured in accordance with the state of the art and is delivered in a condition for safe and reliable use. Any changes on the part of the user which may affect safety and reliability are prohibited. This applies equally to safety features designed to prevent accidental contact.
- The coupling must be used and operated strictly in accordance with the conditions laid down in the contract governing performance and supply.

3.2 Obligations of the user

- The operator must ensure that all persons involved in installation, operation, maintenance and repair have read and understood these Operating Instructions (BA) and comply with them at all times in order to:

  – avoid injury or damage,

  – ensure the safety and reliability of the coupling,

  and

  – avoid disruptions and environmental damage through incorrect use.

- During transport, assembly, installation, dismantling, operation and maintenance of the unit, the relevant safety and environmental regulations must be complied with at all times.
- The coupling must be operated, maintained or repaired only by authorised, duly trained and qualified personnel.
- All work must be carried out with great care and with due regard to safety.
- All work on the gear unit must be carried out only when it is at a standstill.
  The drive unit must be secured against being switched on accidentally (e.g. by locking the key switch or removing the fuses from the power supply). A notice should be attached to the ON switch stating clearly that work is in progress.
- The coupling must be fitted with suitable safeguards to prevent accidental contact. The operation of the coupling must not be impaired by the safeguard.
- The drive unit must be shut down as soon as changes to the coupling are detected during operation.
- If the coupling is intended for installation in plant or equipment, the manufacturer of such plant or equipment must ensure that the contents of the present Operating Instructions are incorporated in his own instructions.
- All spare parts must be obtained from FLENDER.

3.3 Warnings and symbols used in these Instructions

This symbol indicates safety measures which must be observed to avoid **personal injury.**

Caution! This symbol indicates safety measures which must be observed to avoid **damaging the coupling.**

Note: This symbol indicates general **operating instructions** which are of particular importance.

4. Handling and storage

4.1 Scope of supply

The products supplied are listed in the despatch papers. Check immediately on receipt to ensure that all the products listed have actually been delivered. Parts damaged during transport or missing parts must be reported in writing immediately.

4.2 Handling

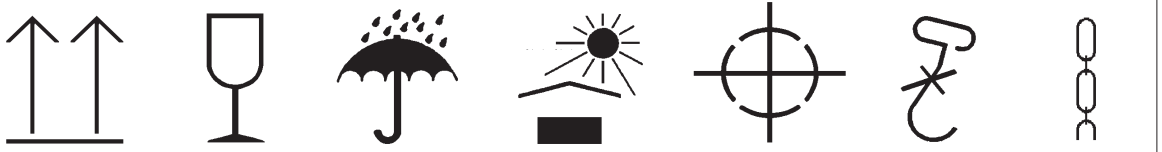
When handling FLENDER products, use only lifting and handling equipment of sufficient load-bearing capacity!

Note: The coupling must be transported using suitable transport equipment only.

Different forms of packaging may be used depending on the size of the coupling and method of transport. Unless otherwise agreed, the packaging complies with the **HPE Packaging Guidelines.**

The symbols marked on the packaging must be observed at all times. These have the following meanings:

bild-transport



This way up | Fragile | Keep dry | Keep cool | Centre of gravity | Use no hand hook | Attach here

4.3 Storage of the coupling

4.3.1 Storage of the coupling parts

Unless otherwise expressly agreed, the coupling is delivered in a preserved condition and can be stored in a covered, dry place for up to 3 months. If the coupling is to be stored for a protracted period, it should be treated with a long-term preservative agent (FLENDER must be consulted).

Caution! **Before cleaning the coupling parts and applying the long-term preservative agent, the buffers (5) must be removed.**

4.3.2 Storing the buffers

4.3.2.1 General

Correctly stored buffers (5) retain their properties unchanged for up to five years. Unfavourable storage conditions and improper treatment will negatively affect the physical properties of the buffers (5). Such negative effects may be caused by e.g. the action of ozone, extreme temperatures, light, moisture, or solvents.

4.3.2.2 Storage area

The storage area must be dry and free from dust. The buffers (5) must not be stored with chemicals, solvents, motor fuels, acids, etc. Furthermore, they should be protected against light, in particular direct sunlight and bright artificial light with a high ultraviolet content.

Caution! **The storage areas must not contain any ozone-generating equipment, e.g. fluorescent light sources, mercury vapour lamps, high-voltage electrical equipment. Damp storage areas are unsuitable. Ensure that no condensation occurs. The most favourable atmospheric humidity is below 65 %.**

5. Technical description

5.1 General description

Type RAK is a coupling combination of a RUPEX coupling and an ARPEX coupling.

RUPEX couplings are torsionally flexible bolt couplings. They are suitable for linking machines and can compensate for small shaft misalignment caused by manufacturing inaccuracies, heat expansion, and the like.

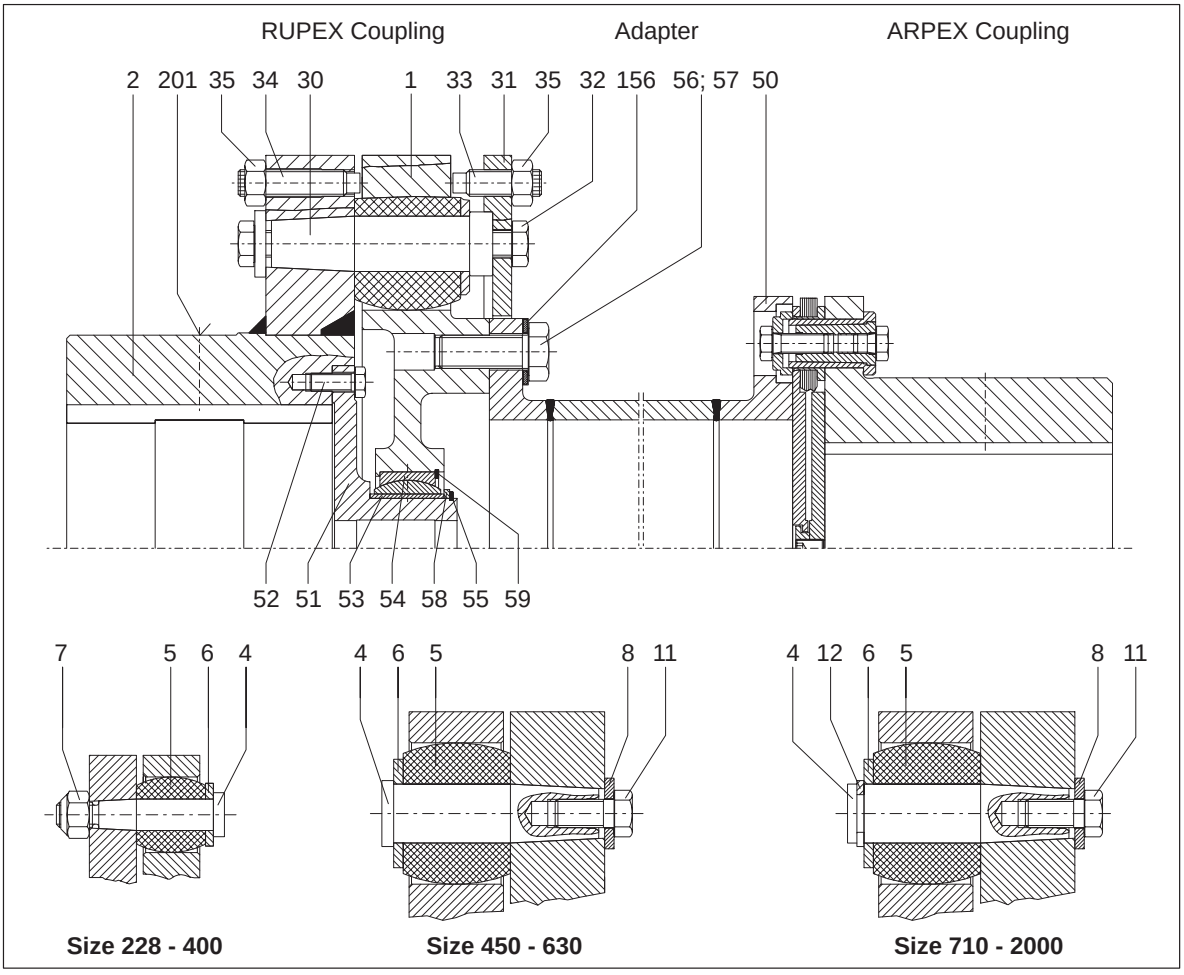
The RUPEX coupling in the RWN or RWS design comprises two coupling parts (1; 2) and the bolts (4) with the flexible plastic buffers (5) required for torque transmission. On the RWN type the coupling parts (1; 2) are of grey cast iron; on the RWS type they are of steel.

On sizes up to 360 the ground steel bolts (4) with the buffers (5) are fastened in coupling part (2) only, and on size 400 and up alternately in coupling parts (1; 2). When mounted, the buffers (5) engage in the corresponding buffer holes of the mating part.

RUPEX couplings can also be designed with axial backlash limitation. On these the bolts (4) are replaced with special bolts (30) to which the retaining ring (31) is fixed. The retaining ring (31) limits axial backlash by means of the headless set screws (33; 34) and nuts (35). The special bolts (30) are arranged only in the coupling part (2).
RUPEX couplings with limited axial backlash are used particularly where the motor has no own axial bearing.

ARPEX couplings are all-steel couplings. The plate pack is arranged between the flange of the coupling part and that of the adapter and bolted to them alternately. This enables shaft misalignments to be compensated for.
The ARPEX coupling is torsion-resistant and transmits the torque without circumferential backlash.

The combination of the two couplings enables flexible torque transmission.



5.2 Buffer

The RUPEX buffers (5) of Perbunan can be supplied in 60 Shore A and 80 Shore A hardness versions. The Perbunan buffers (5) in Shore A 80 hardness are also available in an electrically insulating version. Observe the modified temperature range with the buffers (5) of natural rubber.

The different buffers (5) are distinguished as follows:

Material	Hardness	Configuration	Identification marking	Temperature range
Perbunan	80 Shore A	normal	black	- 30 °C to + 80 °C
Perbunan	60 Shore A	normal	black with a green dot on the end face	- 30 °C to + 80 °C
Perbunan	80 Shore A	electrically insulating	green	- 30 °C to + 80 °C
Natural rubber	80 Shore A	normal	black with a white dot on the end face	- 50 °C to + 50 °C

Caution! **Only identical buffers (5) may be used in one coupling.**

6. Mounting

Caution! **If a dimensioned drawing has been made out for the coupling, the data in this drawing must be given priority. The user of the system must make the dimensioned drawing available.**

At the customer's request FLENDER also delivers unbored or prebored coupling parts.

The necessary refinishing must be carried out in strict compliance with the following specifications and with particular care!

Caution! **Responsibility for carrying out the refinishing is borne by the orderer. FLENDER can accept no guarantee claims arising from unsatisfactory refinishing!**

6.1 Instructions for inserting the finished bore, parallel keyway, axial retaining means, set screws and balancing of the RUPEX coupling

6.1.1 Finished bore

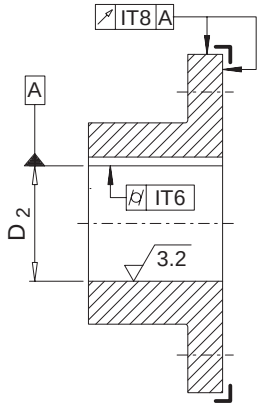
- Remove buffer and depreserve and, if necessary, clean coupling parts.

Note manufacturer's instructions for handling solvent.

When machining the finished bore the parts must be carefully aligned. For the permissible radial and axial runout errors and the permissible cylindricity tolerances, see DIN ISO 286. The parts must be mounted on the marked faces (⌐).

Caution! **The maximum permissible bore diameters (see section 1.) are designed for drive-type fastenings without taper action to DIN 6885/1 and must not under any circumstances be exceeded. The finish-machined bores must be 100 % checked with suitable measuring equipment.**

If other shaft-hub connections (e.g. taper or stepped bore, drive-type fastenings with taper action, etc.) are to be used instead of the drive-type fastenings provided for, FLENDER must be consulted.



Part 2 of the RUPEX coupling

For drive by means of parallel keys the following fit pairs are prescribed for the bores:

Selection of fit	Bore over mm	Bore to mm	Shaft tolerances	Bore tolerances
Shaft tolerances to FLENDER standard		25	k6	H7
	25	100	m6	
	100		n6	
Shaft tolerances to DIN 748/1		50	k6	H7
	50		m6	
System standard shaft		50	h6	K7
	50			M7
	all		h8	N7

Table 6.1.1: Fit pairs

Caution!

The assigned fits must be adhered to in order, on the one hand, to keep the play in the shaft-hub connection as low as possible, depending on utilisation of the tolerance zones, or, on the other, to keep the hub tension arising from the oversize within the permissible load limit. Failure to adhere to the fits may impair the shaft-hub connection.
If the tolerance values of the shafts deviate from those in table 6.1.1 above, FLENDER must be consulted.
If there is a total interference fit, FLENDER must be consulted.

⚠ **Failure to observe these instructions may result in breakage of the coupling. Danger from flying fragments!**

6.1.2 Parallel keyway

The parallel keyways must be designed in accordance with DIN 6885/1. If the keyway geometry deviates, FLENDER must be consulted.

The parallel keyways must be designed to suit the available parallel keys. For parallel keyways the tolerance zone of the hub keyway width **ISO JS9** must be adhered to.

For **more difficult operating conditions** of the kind arising e.g. with reversing operation or operation with impulses the hub keyway tolerance zone **ISO P9** is specified.

Caution!

The parallel keyways must be applied centrally between the buffer bores.

6.1.3 Axial fastening

For the coupling parts one of the following axial fixtures must be provided:

– Set screw fixture consisting of a headless set screw with a toothed cup point to DIN 916 (see item 6.1.4)

– Set screw fixture consisting of a headless set screw with a full dog point to DIN 915 (see item 6.1.4)

– End plate fixture: Contact FLENDER.

– Total interference fit: Contact FLENDER.

Caution! **In the case of the version with axial backlash limitation the coupling parts must also absorb axial forces. The set screw fixture consisting of a headless set screw with a toothed cup point to DIN 916 must not be used here.**

6.1.4 Set screws

In the case of the version without axial backlash limitation headless set screws with toothed cup point to DIN 916 must be used.

In the case of the version with axial backlash limitation headless set screws with full dog point to DIN 915 must be used. For this the parallel key fixed in the shaft must be spot-drilled as shown in Figure 6.1.4 b.

For couplings with bores larger than 230 mm end plates or a total interference fit must be provided.

The following guidelines must be observed!

⚠ **The length of the set screw must be selected so that it fills the threaded hole, but does not project from the hub ($L_{min} = d_1 \times 1.2$).**

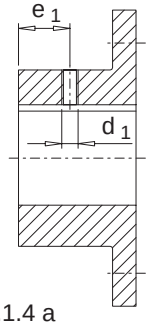
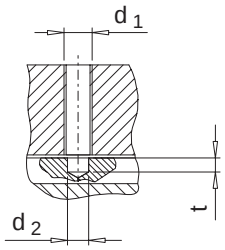


Fig. 6.1.4 a



Spot-drilling the parallel key for headless set screws with full dog point to DIN 915

Fig. 6.1.4 b

Type RWN						Type RWS					
Bore range					Tightening torque	Bore range					Tightening torque
over mm	to mm	d_1 mm	d_2 mm	t mm	T_A Nm	over mm	to mm	d_1 mm	d_2 mm	t mm	T_A Nm
8	30	M 6	–	–	4	8	30	M 6	–	–	4
30	38	M 8	–	–	8	30	75	M 8	5.5	2	8
38	65	M10	7	2.5	15	75	95	M12	8.5	3	25
65	95	M12	8.5	3	25	95	110	M16	12	4	70
95	110	M16	12	4	70	110	150	M20	15	5	130
110	150	M20	15	5	130	150	230	M24	18	6	230
150	230	M24	18	6	230						

Table 6.1.4 a : Set screw assignment

Size	228	252	285	360	400	450	500	560	630	710	800	900	1000	1120	1250	1400	1600	1800	2000
Distance dimension e_1	40	50	55	70	80	80	90	100	110	130	115	160	175	160	200	240	250	300	330

Table 6.1.4 b : Distance dimensions of set screws

Caution! **The set screws must always be positioned on the keyway.**

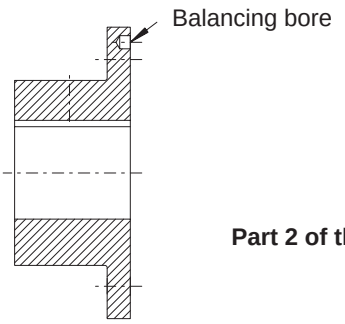
6.1.5 Balancing

Prebored couplings or prebored coupling parts are delivered unbalanced. It is recommended that these parts are balanced to suit the application after finish-boring (see DIN ISO 1940 and DIN 740/2), but to min. balancing quality G16.

Balancing is normally done by drilling material away.

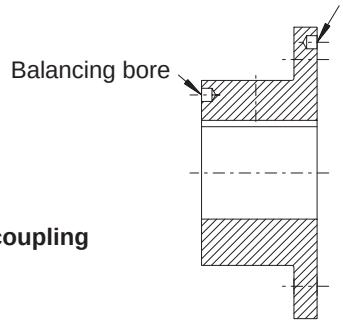
Caution! **On coupling part (2) the material must be removed between the bores without drilling completely through the bottom.**

Finish-bored couplings or coupling parts are balanced according to the customer's specifications.



Arrangement of the balancing bore with one-level balancing

Part 2 of the RUPEX coupling



Arrangement of the balancing bore with two-level balancing

6.2 General information on fitting

During fitting, the "Safety Instructions" in Section 3 must be observed.

Fitting work must be done with great care by trained and qualified personnel.

As early as during the planning phase it must be ensured that sufficient space is available for installation and subsequent care and maintenance work.

Adequate lifting equipment must be available before beginning the fitting work.

Caution! **If a dimensioned drawing has been made out for the coupling, the data in this drawing must be given priority. The user of the system must make the dimensioned drawing available.**

6.3 Mounting the coupling part (2)

Before beginning installation, the shaft end and the coupling part (2) must be carefully cleaned. The buffers (5) must not come in contact with solvents.

Caution! **The self-aligning plain bearing (54) must not under any circumstances come into contact with solvent, as otherwise the coating will be destroyed.**

Note manufacturer's instructions for handling solvent.

Caution! **Coupling part (2) with tapered bore and parallel key connection must be mounted in cold condition.**

If necessary, heating coupling part (2) (to max. + 150 °C) will facilitate fitting. At temperatures of over + 50 °C / + 80 °C the buffers (5) must be removed from the coupling part (2) before heating (observe temperature range of the buffers acc. to section 5.).

Take precautions to avoid burns from hot components!

Caution! **The coupling part (2) should be fitted with the aid of suitable equipment to avoid damage to the shaft bearings through axial joining forces.**
Always use suitable lifting equipment.

The coupling part (2) must be mounted on the shaft complete. The shaft end must not project in the area of the flange shaft (51).

Allow coupling part (2) to cool down to approx. + 30 °C.

Axial securing of the coupling part (2) is effected by means of the set screw. In the case of the version with axial backlash limitation the parallel key must be spot-drilled through the set screw bore as described in item 6.1.4. Carefully clean coupling part (2).

Caution! **Tightening the set screws to a tightening torque in accordance with item 6.1.4.**

Failure to observe these instructions may result in breakage of the coupling. Danger from flying fragments!

6.4 Mounting

Screw the flange shaft (51) to part 2 (2), using the screws (52) (for tightening torques, see item 6.9). Slide the ring (53) on the flange shaft (51).

If the bolts (4; 30) have been previously removed, reinsert them in the coupling part (2) together with locking rings (12, sizes 710-2000 only), washers (6) and buffers (5).

Caution! **Balancing sets, if available, must be fitted in accordance with their markings.**

Using a torque spanner, tighten nuts (7, self-locking, intact) or screws (11), with fitted washers (8) (for tightening torques, see item 6.9). Secure screws (11) with a few drops of adhesive (e. g. Loctite, Type 243).

Slightly heating part 1 (1) (max. + 80 °C) makes insertion of the self-aligning plain bearing (54) easier (note temperature range of buffers (5) according to section 5).

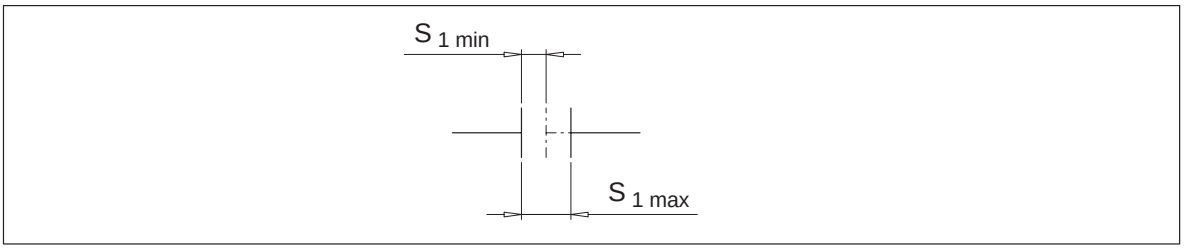
Insert the self-aligning plain bearing (54) into the mounting hole of part 1 (1) and allow to cool to approx. + 30 °C.

Caution! **When inserting the self-aligning plain bearing (54), apply pressure only to the bearing outer ring to avoid damaging the bearing.**

Fit part 1 (1) over the bolts (4) and buffers (5), at the same time fitting the self-aligning plain bearing (54) onto the ring (53).

Danger of squeezing!

During assembly the size of the gap between coupling part (2) and part 1 (1) must be set within the permissible tolerance for dimension S_1 (see section 1).



In the case of the version with axial backlash limitation fit the retaining ring (31) onto the special bolt (30), using the screws (32). Secure screws (32) with a few drops of adhesive (e. g. Loctite, Type 242) (for tightening torques, see item 6.9).

Note identification marking.

The axial backlash must be set as specified in item 6.8.

Position the adapter (50) between part 1 (1) and the ARPEX coupling and, if necessary, support. Connect part 1 (1) to adapter (50) by means of shims (156), screws (56) and cheese-head screws (57) (for tightening torque, see item 6.9), noting the identification marking.

Caution! **The ARPEX coupling must be fitted and aligned in accordance with the relevant BA 8704 EN operating instructions.**

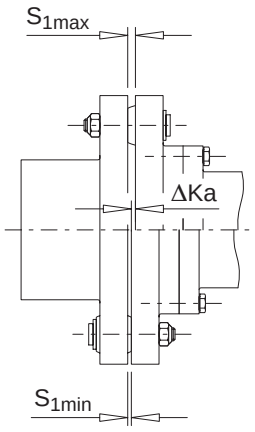
6.5 Alignment

The couplings pick up positional errors in the shaft ends to be connected up to the data shown in item 6.6.
When aligning, the radial and angular misalignment of the shaft ends must be kept as small as possible, because, other conditions being equal, this increases the service life of the buffers and keeps down the restoring forces set up by alignment errors.

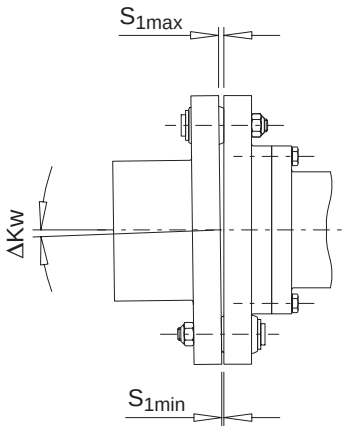
Caution! **Shaft misalignments will set up restorative forces, which will impose a load on the coupled machines.**

Caution! **Displacements which may occur during operation (heat expansion, shaft flexing, settlement of foundations, etc.) must be taken into consideration when aligning.**

6.6 Possible misalignments



Axial misalignment
Fig. 6.6.1



Angular misalignment
Fig. 6.6.2

Caution! **The following maximum permissible misalignments must by no means be exceeded during operation.**

6.6.1 Axial misalignment

When aligning, the size of the gap between the coupling parts must be set within the permissible tolerance for dimension S_1 (see section 1).

During operation an axial misalignment of $\Delta Ka_{perm.}$ dynamic at a max. frequency of 10 Hz is permissible. For the permissible values for the axial misalignment $\Delta Ka_{perm.}$, see to item 6.7.

6.6.2 Angular misalignment

The angular misalignment ΔKw (Fig. 6.6.2) can usefully be measured as the difference in the gap dimension ($\Delta S_1 = S_{1max} - S_{1min}$). For the permissible values for the difference in the gap dimension, see item 6.7.

If required, the permissible angular misalignment ΔKw can be calculated as follows:

$$\Delta Kw_{zul} \text{ in Rad} = \frac{\Delta S_{1\,perm.}}{d_a}$$

$$\Delta Kw_{zul} \text{ in Degrees} = \frac{180}{\pi} \times \frac{\Delta S_{1\,perm.}}{d_a}$$

$\Delta S_{1\,perm.}$ see item 6.7
d_a see section 1

6.6.3 Radial misalignment

The RAK coupling combination is a double-joint coupling in which radial misalignment of the coupled shafts causes angular misalignment of the RUPEX and ARPEX coupling.

6.7 Shaft displacement values

For the permissible values in operation for radial shaft displacement $\Delta Kr_{perm.}$ and angular shaft displacement $\Delta Kw_{perm.}$ as the difference in the gap size $\Delta S_{1perm.}$ and axial shaft displacement $\Delta Ka_{perm.}$, see the following table:

Values given in mm, rounded off

Size	Coupling speed in 1/min							
	250	500	750	1000	1500	2000	3000	4000
228	0.8	0.55	0.45	0.4	0.3	0.25	0.2	0.2
252	0.85	0.6	0.5	0.45	0.35	0.3	0.25	0.2
285	0.95	0.65	0.55	0.45	0.4	0.3	0.25	
360	1.15	0.8	0.65	0.55	0.45	0.4	0.3	
400	1.25	0.85	0.7	0.6	0.5	0.45		
450	1.35	0.95	0.8	0.7	0.55	0.45		
500	1.5	1.05	0.85	0.75	0.6	0.5		
560	1.65	1.15	0.95	0.8	0.65	0.55		
630	1.85	1.3	1.05	0.9	0.75			
710	2.05	1.45	1.15	1	0.8			
800	2.25	1.6	1.3	1.1				
900	2.5	1.75	1.45	1.25				
1000	2.75	1.95	1.6	1.35				
1120	3.05	2.15	1.75	1.5				
1250	3.4	2.4	1.95					
1400	3.75	2.65	2.15					
1600	4.3	3						
1800	4.8	3.4						
2000	5.3	3.75						

The numerical values of the table can be calculated as follows:

$$\Delta Kw_{perm.} = \Delta S_{1\,perm.} = \left(0.1 + \frac{d_a}{1000}\right) \times \frac{40}{\sqrt{n}}$$

Coupling speed n in 1/min

Coupling size designation d_a in mm (see section 1)

Angular misalignment $\Delta Kw_{perm.}$ in mm

Caution! **Angular and axial misalignment may occur simultaneously.**

6.8 Setting the axial backlash

The axial backlash limitation on the RUPEX coupling must in every case be less than the determined axial backlash of the electric motor.

Using the headless set screws (33, 34), set the axial backlash of the RUPEX coupling to about half the determined motor axial backlash. The coupling backlash must be within the permissible values for S_1 (see section 1).

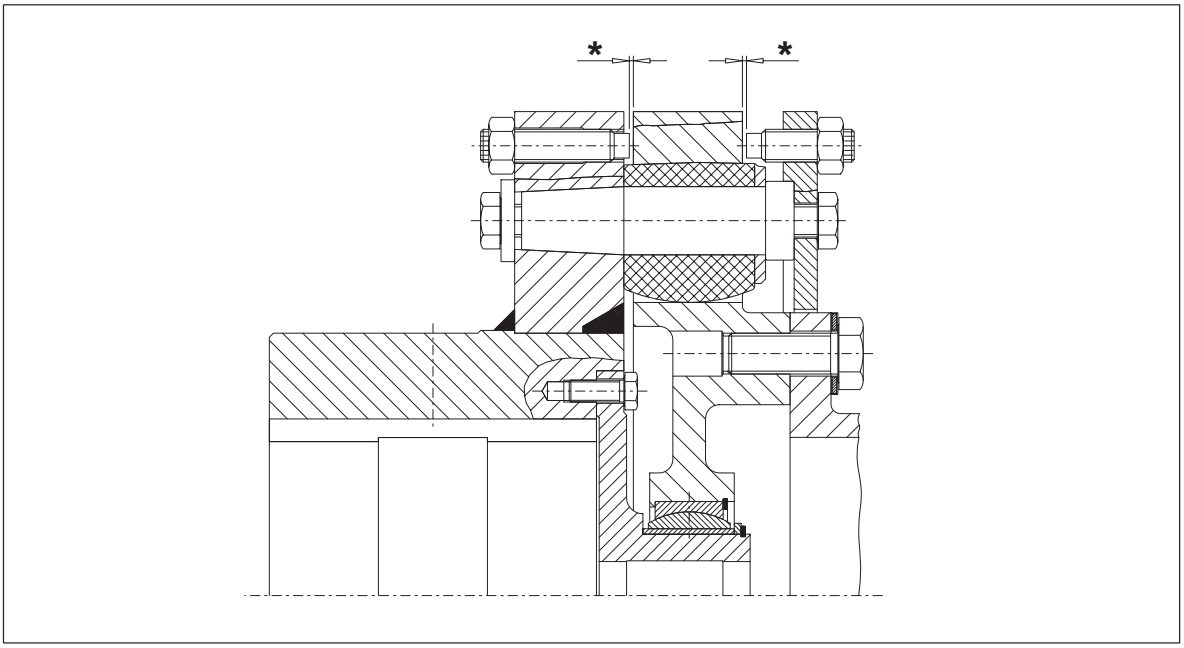
Example:

Axial backlash of motor	=	8 mm
Axial backlash of coupling	=	4 mm
axial backlash to be set for each coupling part (dimension *)	=	2 mm

As the mid-point of the rotor's axial backlash need not coincide with the magnetic centre of the motor, many electric motors have a mark on the shaft. When this identification mark is aligned with the outer surface of the bearing cover, the magnetic centre of the rotor is obtained.
In the case of motors without this identification marking the magnetic centre must be determined by means of a trial run.

In this operating position the set axial backlash on the RUPEX coupling (dimension *) must be identical on both sides to prevent axial forces affecting the machine bearings. After setting the nuts (35) must be tightened.

Caution! **The set axial backlash must be sufficient to enable the RUPEX coupling to compensate for the resulting angular deviation.**



6.9 Tightening torques and wrench width

Size	Part no. 7 / 11		Part no. 32		Part no. 52		Part no. 56	
	Tightening torques T_A Nm	Wrench width S_w mm	Tightening torques T_A Nm	Wrench width S_w mm	Tightening torques T_A Nm	Wrench width S_w mm	Tightening torques T_A Nm	Wrench width S_w mm
228	55	19	–	–	12	10	120	19
252	55	19	–	–	30	13	120	19
285	100	24	60	17	30	13	295	24
360	170	27	105	19	60	17	295	24
400	170	27	105	19	60	17	295	24
450	180	24	255	24	105	19	580	30
500	180	24	255	24	105	19	1000	36
560	340	30	500	30	255	24	1000	36
630	340	30	500	30	255	24	2000	46
710	580	36	870	36	255	24	2000	46
800	580	36	870	36	500	30	2000	46
900	600	36	870	36	500	30	2000	46
1000	600	36	870	36	500	30	3560	55
1120	1150	46	1750	46	870	36	3560	55
1250	1150	46	1750	46	870	36	5270	65
1400	1150	46	–	–	1750	46	5270	65
1600	1150	46	–	–	1750	46	8640	75
1800	2000	55	–	–	1750	46	8640	75
2000	2000	55	–	–	1750	46	13850	85

Table 6.9: Tightening torques and wrench width

Note: Tightening torques apply to screws with untreated surfaces which are not or only lightly oiled (coefficient of friction $\mu = 0.14$). The use of lubricant paint or the like, which affects the coefficient of friction μ, is not permitted.

Caution! **The specified tightening torques T_A have been fixed with reference to DIN 25202 Screw Connection Class B with an output torque scatter of $\pm$ 5 %.**

Note: The tightening torques of the set screws are specified in item 6.1.4.

7. Start-up

7.1 Procedure before start-up

Before starting up, check the tightness of the set screws, check and, if necessary, adjust the alignment and the distance dimension S_1, and check the specified tightening torques of all the screw connections (see section 1 and section 6).

Caution! **Then fit the coupling guard to prevent unintentional contact.**

8. Operation

8.1 General operating data

During operation of the coupling watch for:

– changes in running noise

– sudden vibrations

Caution!

If any irregularities are noticed during operation, switch the drive assembly off at once. Determine the cause of the fault, using the table in section 9.
This table contains a list of possible faults, their causes and suggested remedies.
If the cause cannot be identified or the unit repaired with the facilities available, you are advised to contact one of our customer-service offices for specialist assistance (see section 11.).

9. Faults, causes and remedy

9.1 General

The following irregularities can serve as a guide for fault tracing.

Where the system is a complex one, all the other component units must be included when tracing faults.

The coupling must run with little noise and without vibration in all operating phases. Irregular behaviour must be treated as a fault requiring immediate remedy.

Caution!

FLENDER will not be bound by the terms of the guarantee or otherwise be responsible in cases of improper use of the coupling, modifications carried out without FLENDER's agreement, or use of spare parts not supplied by FLENDER.

When remedying faults and malfunctions, the gear unit must always be taken out of service.
Secure the drive unit to prevent it from being started up unintentionally.
Attach a warning notice to the start switch!

9.2 Possible faults

Malfunctions	Causes	Remedy
Sudden changes in the noise level and/or sudden vibrations.	Change of alignment.	Take the system out of service. If necessary, rectify causes of alignment change (e.g. tighten loose foundation bolts). Check and, if necessary, adjust alignment (see section 6). Wear check, procedure as described in section 10.
	Buffers (5) worn.	Take the system out of service. Demount bolt (4; 30) and remove remains of buffer (5). Check components and replace any damaged parts. Buffers (5) must be changed in sets; use only identical RUPEX buffers (5). Assembly of coupling according to section 6 and section 7.

Table 9.1: Faults, causes and remedy

9.3 Incorrect use

Experience has shown that the following faults can result in incorrect use of the RUPEX coupling. In addition to observing the other instructions in these Operating Instructions (BA), care must therefore be taken to avoid these faults.

⚠ **Failure to observe these instructions may result in breakage of the coupling. Danger from flying fragments!**

Caution! **Incorrect use of the RUPEX coupling can result in damage to the coupling.**

Caution! **Coupling damage may result in stoppage of the drive and the entire system.**

9.3.1 Possible faults when selecting the coupling or coupling size

- Important information for describing the drive and the environment will not be communicated to others.
- System torque too high.
- System speed too high.
- Application factor not correctly selected.
- Chemically aggressive environment not taken into consideration.
- The ambient temperature is not permissible. See also section 1.
- Finished bore with impermissible diameter (see section 1) and/or impermissible fit classification (see section 6).
- The transmission capacity of the shaft-hub connection is not appropriate to the operating conditions.

9.3.2 Possible faults when installing the coupling

- Components with transport or other damage are being fitted.
- When fitting coupling parts in a heated condition, already fitted RUPEX buffers (5) are being excessively heated.
- The shaft diameter is outside the specified tolerance range.
- Coupling parts are being interchanged, i.e. their assignment to the specified shaft is incorrect.
- Prescribed tightening torques are not being adhered to.
- Alignment or shaft misalignment values do not match the operating instructions.
- The coupled machines are not correctly fastened to the foundation, so a shifting of the machines e.g. through loosening of the foundation screw connection is causing excessive displacement of the coupling parts.
- RUPEX buffers (5) are not being fitted or not being correctly positioned.
- Operating instructions are being changed without authorisation.

9.3.3 Possible faults in maintenance

- Maintenance intervals are not being adhered to.
- The fitted buffers (5) are not original FLENDER RUPEX buffers.
- Old or damaged RUPEX buffers (5) are being used.
- Different RUPEX buffers (5) are being used (see section 5).
- Leakage in the vicinity of the coupling is not being identified and as a result chemically aggressive media are damaging the coupling.

10. Maintenance and repair

All work on the gear unit must be carried out only when it is at a standstill. The drive unit must be secured against being switched on accidentally (e.g. by locking the key switch or removing the fuses from the power supply). A notice should be attached to the ON switch stating clearly that work is in progress.

10.1 Maintenance interval

Caution! **The torsional backlash between the two coupling parts must be checked after three months, then at least once a year.**

If an increased coupling backlash does not impair the operation of the coupling, the buffers (5) can continue to be used up to a specified wear limit before being replaced. To assess wear, the permitted circumferential backlash, converted to the chord dimension ΔS_V on the outer coupling diameter, is shown in table 10.1. To obtain the dimension ΔS_V, one coupling part is rotated without torque as far as the stop and a mark applied to both side (see Fig. 10.1). If the coupling part is rotated in the opposite direction of rotation as far as the stop, the marks move apart. The distance between the marks is the chord dimension ΔS_V. If the dimension ΔS_V exceeds the value in table 10.1, the buffers (5) must be replaced.

Caution! **The buffers (5) must be replaced in sets.**
Only identical buffers (5) may be used in one coupling.

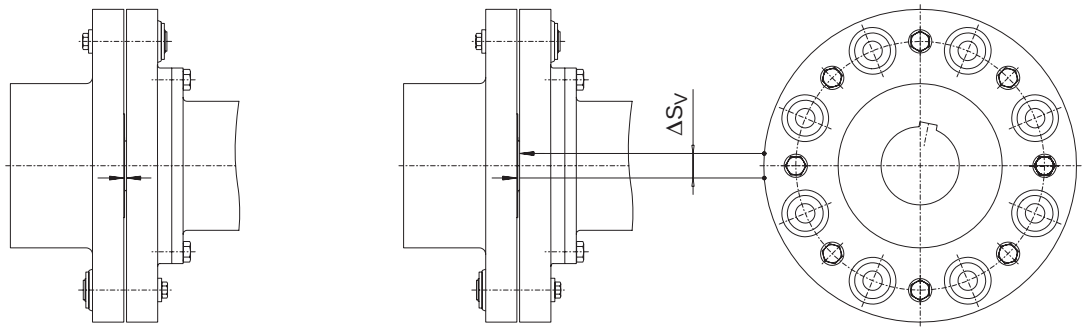


Fig. 10.1

Size	228	285	360	450	560	710	900	1120	1400	1800
	252		400	500	630	800	1000	1250	1600	2000
Wear mark ΔS_V (mm)	4.5	6.0	7.0	8.5	10.0	12.0	13.5	15.0	18.0	20.0

Table 10.1: Wear mark

10.2 Replacement of wearing parts

Only **original RUPEX buffers** must be used for replacement in order to guarantee troublefree torque transmission and faultfree operation.

Note: The buffers (5) can be replaced without moving the coupled machines.

Caution! **Balancing sets, if available, must be fitted in accordance with their markings.**

Note: For demounting the bolts (4) FLENDER offers a hydraulic extracting device, which can be provided on request.
The extracting device can be used only on bolts (4) which are provided with an oil hole. These bolts (4) are marked with the letter ”O” or a groove on the end face on the buffer side.
For important information and handling and operation of the hydraulic extracting device, see the BA 3600.1 EN operating instructions ”Demounting box for extracting RUPEX bolts”.

In the case of the version with axial backlash limitation undo the screws (32) and locate the retaining ring (31) on the shaft.

On coupling up to size 400 the bolts (4; 30) with the buffers (5) can be removed through the buffer holes after undoing and removing the nuts (7) and on coupling sizes 450 and up after undoing and removing the hexagon screws (11) and washers (8).
Only in the case of bolts (4) and from coupling size 710 and up the buffers (5) can be changed without removing the bolts (4). After removing the locking ring (12) and the washer (6) the buffers (5) can be removed through the buffer holes.

Pull off the buffers (5) and carefully clean the bolts (4; 30) and fitting holes.

After replacing the buffers (5) assembly is carried out in the reverse order, the screws (11) being resecured with adhesive (e.g. Loctite 243). The self-locking nuts (7) must be replaced with new nuts (7) to DIN 982.

For re-assembly, the instructions in section 6, ”Assembly”, and section 7, ”Start-up”, must be carefully observed.

11. Spare parts, customer-service addresses

By stocking the most important spare and wearing parts on site you can ensure that the coupling is ready for use at any time.

When ordering spare parts, always state the following:

– Original order no.

– Part no. (see section 11.1.)

– Specification / size (the size designation corresponds to the outside diameter ”d_a” in mm)

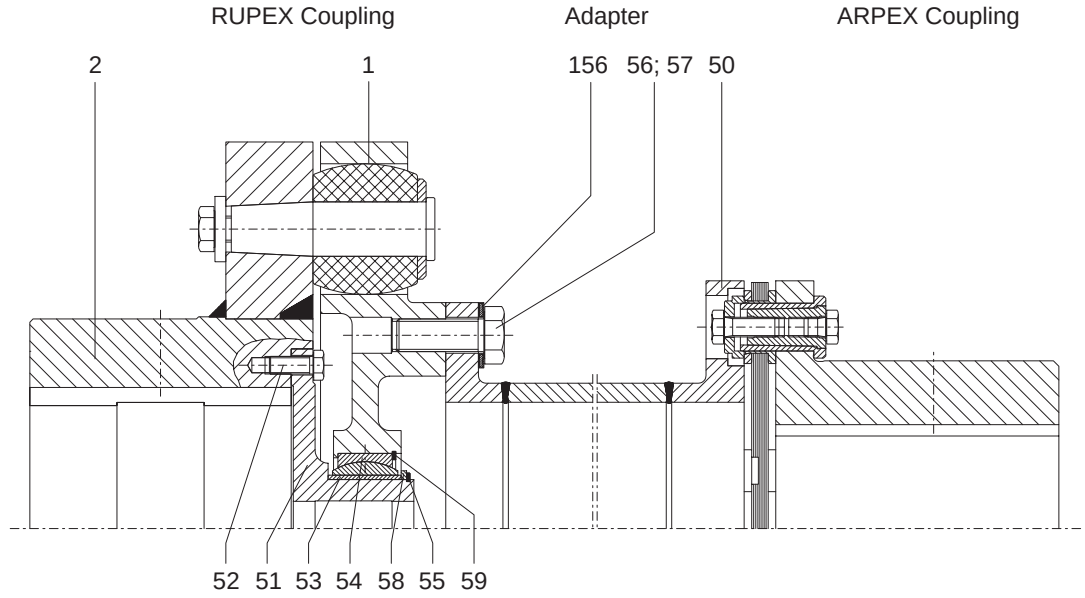
– Quantity

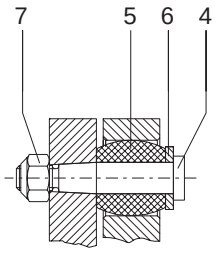
We guarantee only the original spare parts supplied by us.

Caution! **Please note that spare parts and accessories not supplied by us have not been tested or approved by us. The installation or use of such products may therefore impair essential characteristics of the coupling under certain circumstances and so pose an active or passive hazard. FLENDER will assume no liability or guarantee for damage caused by spare parts and accessories not supplied by FLENDER.**

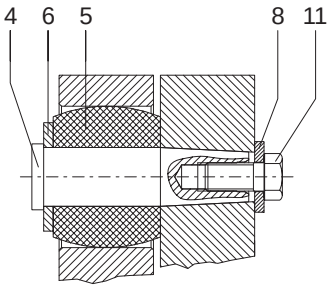
Please note that certain components often have special production and supply specifications and that we supply you with spare parts which comply fully with the current state of technical development as well as current legislation.

11.1 Spare parts list RUPEX coupling, types RWN, RWS

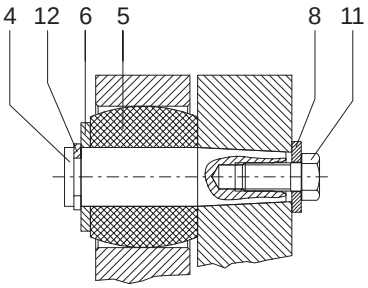




Size 228 - 400



Size 450 - 630

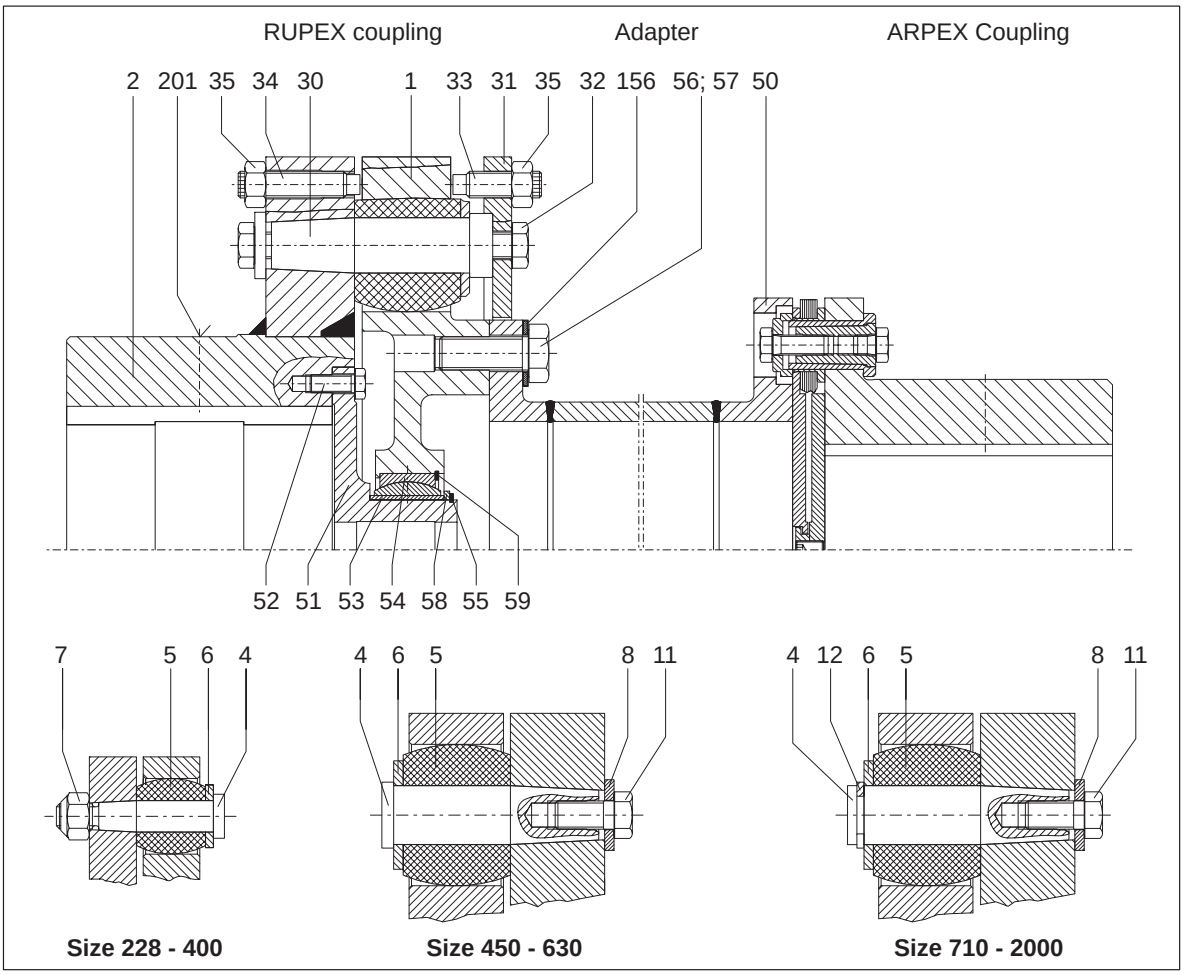


Size 710 - 2000

Spare parts types RWN, RWS			
Part no.	Description	Part no.	Description
1	Part 1	51	Flanged shaft
2	Part 2	52	Hexagon head screw
4	Bolt	53	Ring
5	Buffer	54	Ball and socket joint
6	Washer	55	Locking ring
7	Hexagon nut, self-locking	56	Hexagon head screw
8	Washer	57	Parallel pin
11	Hexagon head screw	58	Ring
12	Locking ring	59	Locking ring
50	Adapter	156	Washer

Table 11.1: Spare parts list RUPEX coupling, types RWB, RWS

11.2 Spare parts list RUPEX coupling, types RWN, RWS with axial backlash



Spare parts type RWN, RWS with axial backlash			
Part no.	Description	Part no.	Description
1	Part 1	35	Hexagon nut
2	Part 2	50	Adapter
4	Bolt	51	Flanged shaft
5	Buffer	52	Hexagon head screw
6	Washer	53	Ring
7	Hexagon nut, self-locking	54	Ball and socket joint
8	Washer	55	Locking ring
11	Hexagon head screw	56	Hexagon head screw
12	Locking ring	57	Parallel pin
30	Bolt spec.	58	Ring
31	Retaining ring	59	Locking ring
32	Hexagon head screw	156	Washer
33	Headless set screw	201	Headless set screw
34	Headless set screw		

Table 11.2: Spare parts list RUPEX coupling, types RWN, RWS with axial backlash

11.3 Spare-part and customer service addresses

When ordering spare parts or requesting the services of our specialist engineers, please apply first to FLENDER AG.

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12. Declaration by the manufacturer

Declaration by the manufacturer

in accordance with EC Engineering Guideline 98/37/EC, Appendix II B

We hereby declare that the

Elastic **RUPEX** Couplings
Type **RAK**

described in these Operating Instructions are intended for incorporation in a machine, and that it is prohibited to put them into service before verifying that the machine into which they are incorporated complies with the EC Guidelines (original edition 98/37/EC including any subsequent amendments thereto).

This Manufacturer's Declaration takes into account all the unified standards (inasmuch as they apply to our products) published by the European Commission in the Official Journal of the European Community.

Bocholt, 2004-07-26

Signature (person responible for products)