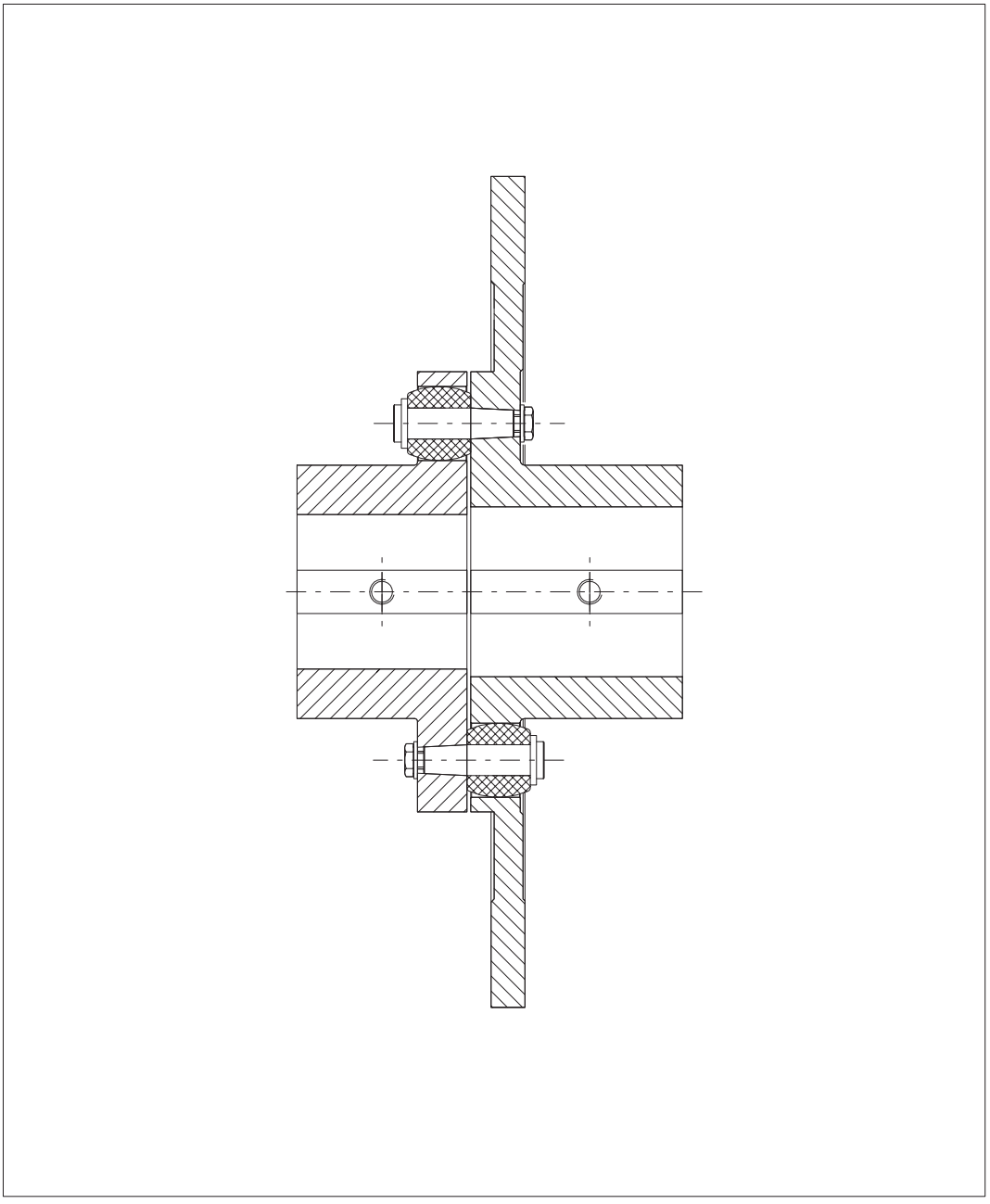
Operating Instructions

BA 3602 EN 01.02

Elastic **RUPEX** Couplings
Types **RWB, RBS**
with brake disk



FLENDER

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Contents

1. Technical data

1.1 Validity of rated torques

Validity of rated torques T_{KN} (**only** if original RUPEX buffers of Perbunan with a hardness of 80 Shore are used):

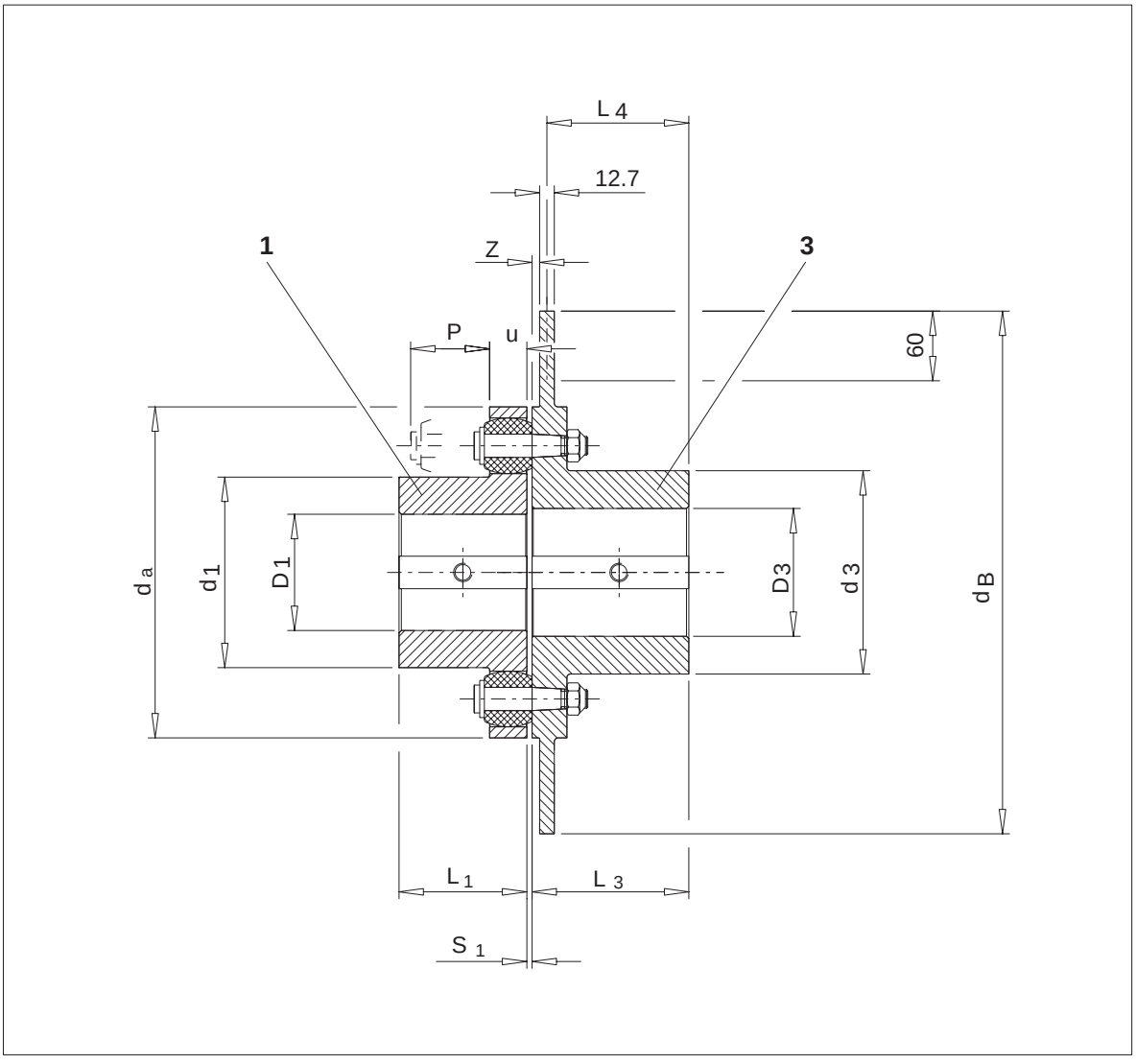
- daily operating cycle of up to 24 h
- during the starting operation or operation torque surges of up to 3 times the rated torque are permitted up to 25 times an hour.
- Operation within the specified alignment
- Operation over the temperature range of between -30 °C and +80 °C (ambient temperature, or temperature of shaft ends).

Caution!

For sustained faultfree operation the coupling must be designed with an application factor appropriate to the application. In the event of a change in operating conditions (output, speed, changes to the prime mover and driven machine) the design must always be checked.

1.2 Type RWB and RBS with 12.7 mm wide brake disk

1.2.1 Type RWB Size 144-360



Size	Rated torque T_{KN} 1)	Speed 2) n_{max}	Bore $D_{1/3}$ from	Bore D_1 to	Bore D_3 to	d_a	d_1	d_3	L_1	L_3	L_4	u	P	S_1	d_B min	d_B max	Z	Mass moment of inertia J 4) Part 1	Mass moment of inertia J 4) Part 3	Weight 4) Part 1	Weight 4) Part 3
	Nm	1/min	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm^2	kgm^2	kg	kg
144	500	2900	–	45	55	144	76	84	55	85	74	16	35	2....4	280	315	4.65	0.004	0.09	2.2	9.0
162	750	2900	–	50	60	162	85	92	60	102	91	20	40	2....5	315	400	4.65	0.007	0.23	3.2	15.0
178	950	2900	–	60	70	178	102	108	70	102	91	20	40	2....5	315	400	4.65	0.014	0.24	4.8	16.0
198	1300	2900	–	70	80	198	120	128	80	108	97	20	40	2....5	355	450	4.65	0.023	0.39	7.0	21.0
228	2200	2900	–	80	90	228	129	140	90	115	103	26	50	2....5	355	450	5.65	0.04	0.41	9.1	23.5
252	2750	2300	38	90	100	252	150	160	100	120	107	26	50	2....5	400	500	6.65	0.07	0.63	13.0	29.0
285	4300	2000	48	100	110	285	164	175	110	135	122	32	60	3....6	450	630	6.65	0.13	1.87	19.0	54.0
320	5500	1800	55	110	120	320	180	192	125	145	130	32	60	3....6	450	710	8.65	0.23	3.20	27.0	70.0
360	7800	1400	65	120	130	360	200	210	140	150	136	42	75	3....6	500	710	7.65	0.42	3.40	37.0	83.0

Table 1.2.1: Torques T_{KN}, speeds $n_{max.}$, dimensions and weights of Type RWB

Size	Rated torque T_{KN} 1)	Speed 3) n_{max}	Bore $D_{1/3}$ from	Bore D_1 to	Bore D_3 to	d_a	d_1	d_3	L_1	L_3	L_4	u	P	S_1	d_B min	d_B max	Z	Mass moment of inertia J 4) Part 1	Mass moment of inertia J 4) Part 3	Weight 4) Part 1	Weight 4) Part 3
	Nm	1/min	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm^2	kgm^2	kg	kg
144	500	3600	–	50	60	144	76	84	55	85	74	16	35	2....4	280	315	4.65	0.004	0.09	2.2	10.5
162	750	2850	–	55	65	162	85	92	60	102	91	20	40	2....5	315	400	4.65	0.007	0.25	3.2	17.0
178	950	2850	–	70	75	178	102	108	70	102	91	20	40	2....5	315	400	4.65	0.014	0.26	4.8	18.5
198	1300	2500	–	80	85	198	120	128	80	108	97	20	40	2....5	355	450	4.65	0.023	0.42	7.0	25.0
228	2200	2500	–	85	95	228	129	140	90	115	103	26	50	2....5	355	450	5.65	0.04	0.45	9.1	29.0
252	2750	2250	38	100	110	252	150	160	100	120	107	26	50	2....5	400	500	6.65	0.07	0.50	13.0	33.0
285	4300	1800	48	110	120	285	164	175	110	135	122	32	60	3....6	450	630	6.65	0.13	1.80	19.0	60.0
320	5500	1600	55	125	130	320	180	192	125	145	130	32	60	3....6	450	710	8.65	0.23	3.00	27.0	76.0
360	7800	1600	65	135	140	360	200	210	140	150	136	42	75	3....6	500	710	7.65	0.42	4.80	37.0	100.0

Table 1.2.2: Torques T_{KN}, speeds $n_{max.}$, dimensions and weights of Type RBS

1) Note validity of rated torques T_{KN} according to item 1.1!

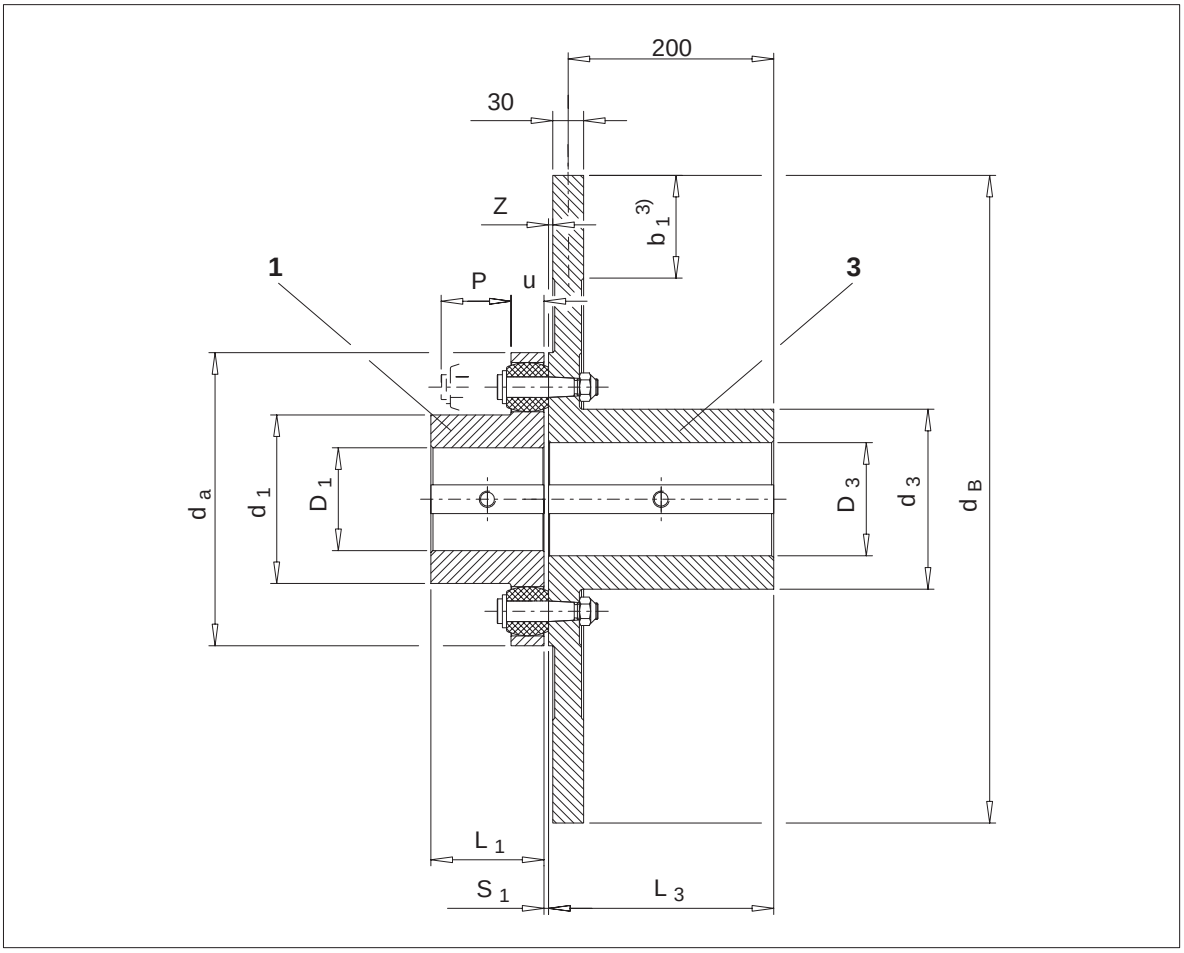
2) Maximum speed for brake disk diameters $d_{B\,max.}$
For smaller brake disk diameters d_B the following applies: $n_{max.} = 1146 / d_B$ (d_B in metres)

3) Maximum speed for brake disk diameters $d_{B\,max.}$
For smaller brake disk diameters d_B the following applies: $n_{max.} = 1528 / d_B$ (d_B in metres)

4) Weight and mass moments of inertia apply to maximum brake disk diameters d_B and average bores D_1 und D_3.

1.3 Type RWB and RBS with 30 mm wide brake disk

1.3.1 Type RWB Size 144-360



Size	Rated torque T_{KN} 1) Nm	Speed 2) n_{max} 1/min	Bore $D_{1/3}$ from mm	Bore D_1 to mm	Bore D_3 to mm	d_a mm	d_1 mm	d_3 mm	L_1 mm	L_3 mm	u mm	P mm	S_1 mm	3) d_B min mm	3) d_B max mm	Z mm	Mass moment of inertia J 4) Part 1 kgm^2	Mass moment of inertia J 4) Part 3 kgm^2	Weight 4) Part 1 kg	Weight 4) Part 3 kg
144	500	2300	–	45	45	144	76	84	55	219	16	35	2....4	315	500	4	0.004	1.33	2.2	45
162	750	2050	–	50	50	162	85	92	60	219	20	40	2....5	355	560	4	0.007	2.1	3.2	57
178	950	2050	–	60	60	178	102	108	70	219	20	40	2....5	355	560	4	0.014	2.1	4.8	59
198	1300	2050	–	70	70	198	120	128	80	219	20	40	2....5	400	560	4	0.023	2.1	7.0	62
228	2200	1450	–	80	80	228	129	140	90	219	26	50	2....5	450	800	4	0.04	8.7	9.1	118
252	2750	1450	38	90	100	252	150	160	100	219	26	50	2....5	500	800	4	0.07	8.8	13.0	120
285	4300	1450	48	100	110	285	164	175	110	219	32	60	3....6	560	800	4	0.13	8.8	19.0	126
320	5500	1150	55	110	120	320	180	192	125	219	32	60	3....6	560	1000	4	0.23	21.5	27.0	191
360	7800	1150	65	120	130	360	200	210	140	221	42	75	3....6	560	1000	6	0.42	21.5	37.0	200

Table 1.3.1: Torques T_{KN}, speeds $n_{max.}$, dimensions and weights of Type RWB

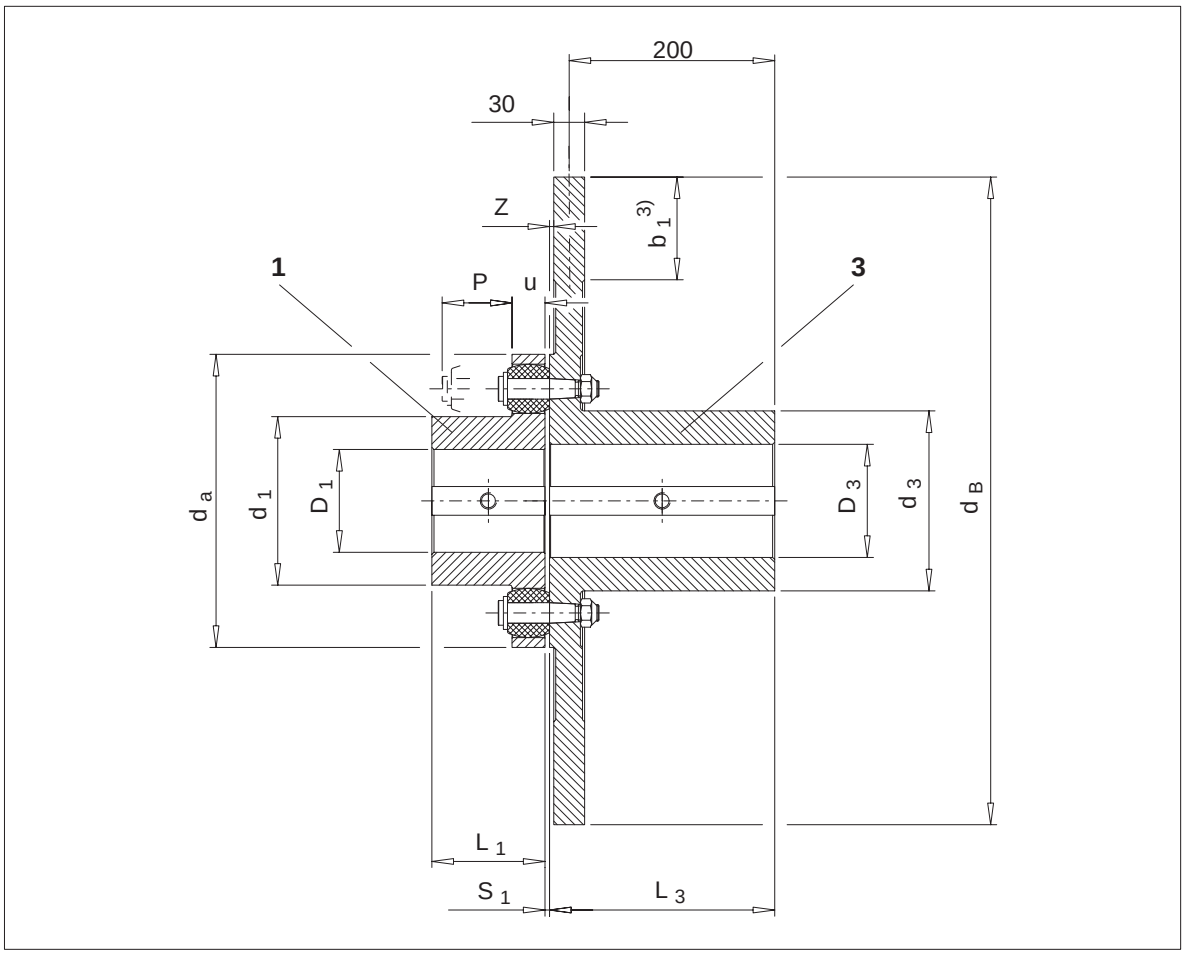
1) Note validity of rated torques T_{KN} according to item 1.1!

2) Maximum speed for brake disk diameters $d_{B\ max.}$
For smaller brake disk diameters d_B the following applies: $n_{max.} = 1146 / d_B$ (d_B in metres)

3) When determining the brake disk diameter the required brake surface $b_{1\ min}$ should be observed:
$d_B > d_a + 2 \times b_{1\ min}$

4) Weight and mass moments of inertia apply to maximum brake disk diameters d_B and average bores D_1 und D_3.

1.3.2 Type RBS Size 144-360



Size	Rated torque T_{KN} 1) Nm	Speed 2) n_{max} 1/min	Bore $D_{1/3}$ from mm	Bore D_1 to mm	Bore D_3 to mm	d_a mm	d_1 mm	d_3 mm	L_1 mm	L_3 mm	u mm	P mm	S_1 mm	3) d_B min mm	3) d_B max mm	Z mm	Mass moment of inertia J 4) Part 1 kgm^2	Mass moment of inertia J 4) Part 3 kgm^2	Weight 4) Part 1 kg	Weight 4) Part 3 kg
144	500	3050	–	50	45	144	76	84	55	219	16	35	2....4	315	500	4	0.004	1.4	2.2	46
162	750	2750	–	55	50	162	85	92	60	219	20	40	2....5	355	560	4	0.007	2.3	3.2	58
178	950	2750	–	70	60	178	102	108	70	219	20	40	2....5	355	560	4	0.014	2.3	4.8	60
198	1300	2750	–	80	70	198	120	128	80	219	20	40	2....5	400	560	4	0.023	2.3	7.0	62
228	2200	1900	–	85	80	228	129	140	90	219	26	50	2....5	450	800	4	0.04	9.5	9.1	123
252	2750	1900	38	100	100	252	150	160	100	219	26	50	2....5	500	800	4	0.07	9.6	13.0	127
285	4300	1900	48	110	120	285	164	175	110	219	32	60	3....6	560	800	4	0.13	9.6	19.0	135
320	5500	1550	55	125	130	320	180	192	125	219	32	60	3....6	560	1000	4	0.23	23.1	27.0	200
360	7800	1550	65	135	140	360	200	210	140	221	42	75	3....6	560	1000	6	0.42	23.1	37.0	210

Table 1.3.2: Torques T_{KN}, speeds $n_{max.}$, dimensions and weights of Type RBS

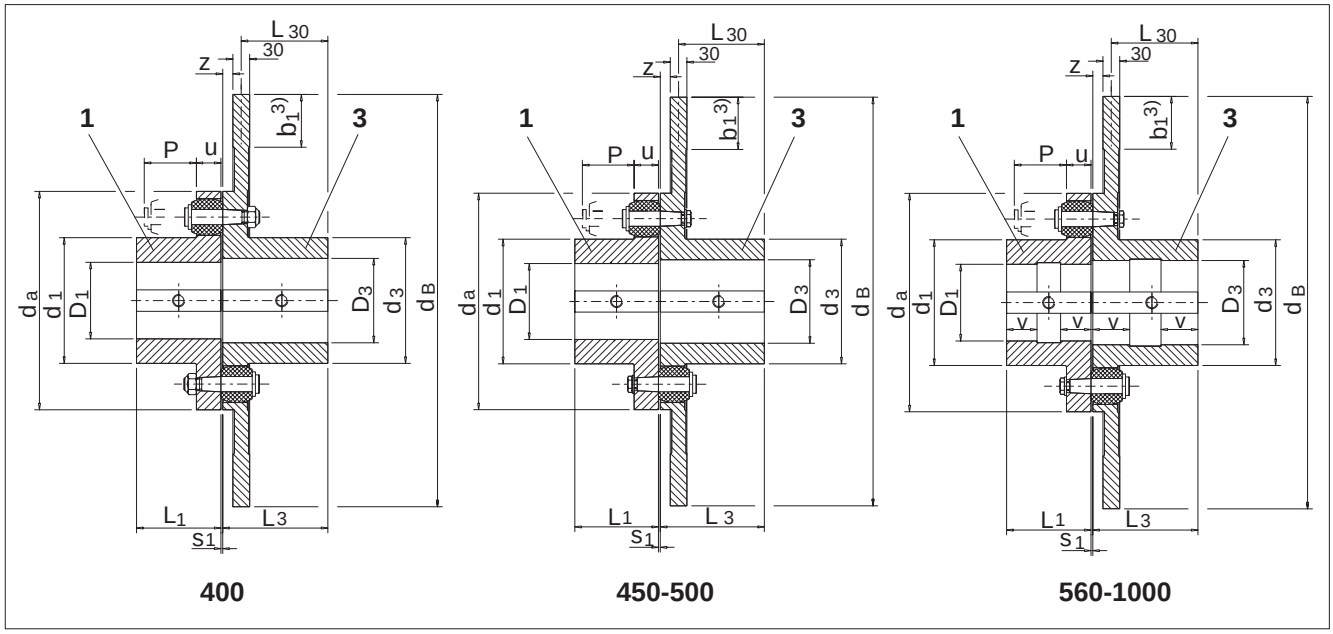
1) Note validity of rated torques T_{KN} according to item 1.1!

2) Maximum speed for brake disk diameters $d_{B\ max.}$
For smaller brake disk diameters d_B the following applies: $n_{max.} = 1528 / d_B$ (d_B in metres)

3) When determining the brake disk diameter the required brake surface $b_{1\ min}$ should be observed:
$d_B > d_a + 2 \times b_{1\ min}$

4) Weight and mass moments of inertia apply to maximum brake disk diameters d_B and average bores D_1 und D_3.

1.3.3 Type RWB Size 400-1000



Size	Rated torque T_{KN} 1) Nm	Speed n_{max} 2) 1/min	Bore D_1 from mm	Bore D_1 to mm	Bore D_3 from mm	Bore D_3 to mm	d_a mm	d_1 mm	d_3 mm	L_{30} mm	L_1 mm	L_3 mm	v 5) mm	u mm	P mm	S_1 mm	d_B min mm	d_B max mm	Z mm	Mass moment of inertia J 4) Part 1 kgm^2	Mass moment of inertia J 4) Part 3 kgm^2	Weight 4) Part 1 kg	Weight 4) Part 3 kg
400	12 500	1150	75	140	75	140	400	230	230	200	160	225	–	42	75	3...6	560	1000	10	0.89	22	60	215
450	18 500	1150	85	160	85	160	450	260	260	200	180	225	–	52	90	4...7	630	1000	10	1.7	22	89	235
500	25 000	1150	95	180	95	180	500	290	290	200	200	225	–	52	90	4...7	710	1000	10	2.8	22	115	245
			100	140				250												4.6		145	
560	39 000	1150	140	180	100	200	560	300	320	200	220	225	70	68	120	4...8	800	1000	10	5.0	24	155	275
			180	200				320												5.1		150	
			100	140				250												7.2		180	
630	52 000	900	140	180	100	220	630	300	355	200	240	240	80	68	120	4...8	900	1250	25	7.7	56	195	400
			180	220				355												8.4		210	
			110	160				290												13.0		265	
710	84 000	800	160	200	110	240	710	330	385	200	260	260	80	80	140	5...9	1000	1400	45	14.0	87	270	525
			200	240				385												15.0		285	
			125	180				320												22.0		350	
800	110 000	700	180	220	125	260	800	360	420	230	290	290	90	80	140	5...9	1250	1600	45	23.0	150	360	740
			220	260				420												24.5		380	
			140	220				360												39.0		500	
900	150 000	700	220	260	140	290	900	425	465	260	320	320	100	90	160	5...10	1250	1600	45	41.0	165	500	800
			260	290				465												43.0		530	
			150	240				395												60.0		640	
1000	195 000	700	240	280	150	320	1000	460	515	290	350	350	110	90	160	5...10	1250	1600	45	63.0	185	650	930
			280	320				515												68.0		680	

Table 1.3.3: Torques T_{KN}, speeds $n_{max.}$, dimensions and weights of Type RWB

1) Note validity of rated torques T_{KN} according to item 1.1!

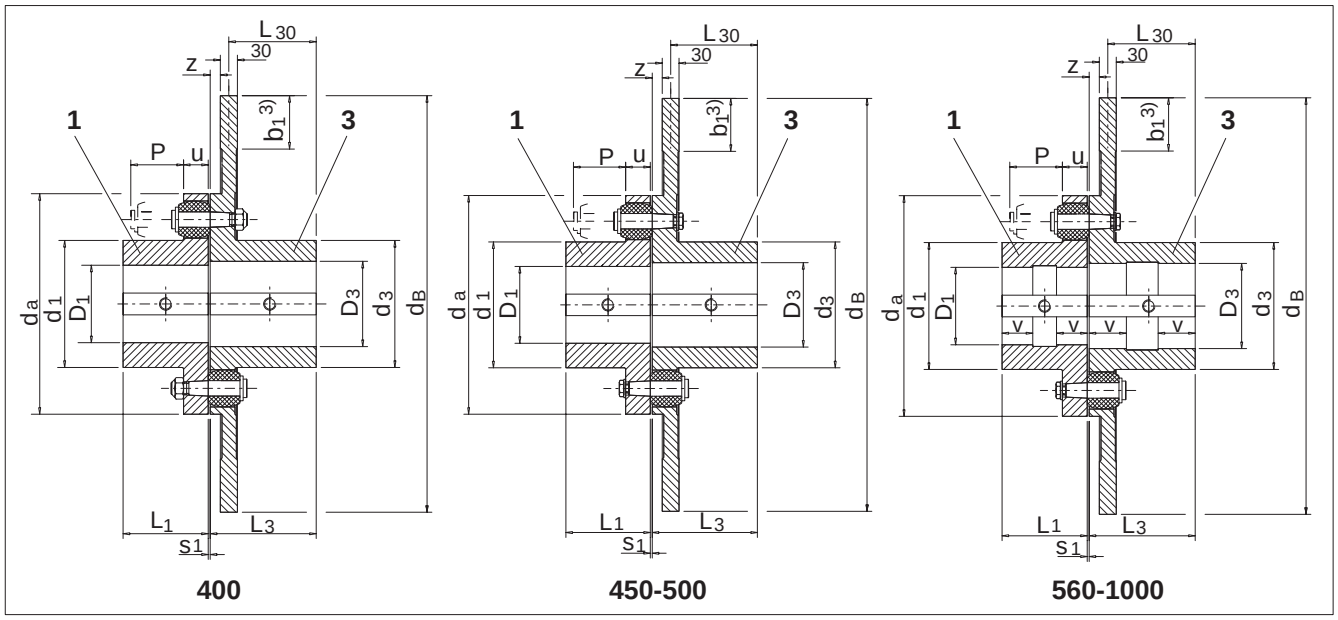
2) Maximum speed for brake disk diameters $d_{B\ max.}$
For smaller brake disk diameters d_B the following applies: $n_{max.} = 1146 / d_B$ (d_B in metres)

3) When determining the brake disk diameter the required brake surface $b_{1\ min}$ should be observed:
$d_B > d_a + 2 \times b_{1\ min}$

4) Weight and mass moments of inertia apply to maximum brake disk diameters d_B and average bores D_1 und D_3.

5) Hub-centre recess to $D_{1/3} + 1$ mm

1.3.4 Type RBS Size 400-1000



Size	Rated torque T_{KN} 1)	Speed n_{max} 2)	Bore D_1 from	Bore D_1 to	Bore D_3 from	Bore D_3 to	d_a	d_1	d_3	L_{30}	L_1	L_3	v 5)	u	P	S_1	d_B 3) min	d_B 3) max	Z	Mass moment of inertia J 4) Part 1	Mass moment of inertia J 4) Part 3	Weight 4) Part 1	Weight 4) Part 3
	Nm	1/min	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm^2	kgm^2	kg	kg
400	12 500	1150	75	150	75	150	400	230	230	202	160	225	–	42	75	3...6	560	1000	10	0.95	22	63	250
450	18 500	1150	85	170	85	170	450	260	260	200	180	225	–	52	90	4...7	630	1000	10	1.8	22	93	255
500	25 000	1150	95	190	95	190	500	290	290	200	200	225	–	52	90	4...7	710	1000	10	2.9	22	125	270
560	39 000	1150	100	165	100	210	560	250	320	200	220	225	70	68	120	4...8	800	1000	10	4.8	25	150	300
			165	200				300												5.2		155	
			200	210				320												5.4		155	
630	52 000	900	100	165	100	235	630	250	355	200	240	240	80	68	120	4...8	900	1250	25	7.6	60	190	425
			165	200				300												8.0		195	
			200	235				355												8.8		210	
710	84 000	800	110	190	110	250	710	290	385	200	260	260	80	80	140	5...9	1000	1400	45	14.3	97	275	590
			190	220				330												14.7		275	
			220	250				385												16.0		295	
800	110 000	700	125	210	125	280	800	320	420	230	290	290	90	80	140	5...9	1250	1600	45	23.3	160	370	800
			210	240				360												23.5		370	
			240	280				420												26.0		400	
900	150 000	700	140	210	140	310	900	320	465	260	320	320	100	90	160	5...10	1250	1600	45	40.0	185	480	860
			210	240				360												41.0		480	
			240	280				425												44.0		520	
			280	310				465												45.0		530	
1000	195 000	700	150	230	150	340	1000	355	515	290	350	350	110	90	160	5...10	1250	1600	45	63.0	200	620	1000
			230	260				395												64.0		620	
			260	300				460												68.0		670	
			300	340				515												71.0		700	

Table 1.3.4: Torques T_{KN}, speeds $n_{max.}$, dimensions and weights of Type RBS

1) Note validity of rated torques T_{KN} according to item 1.1!

2) Maximum speed for brake disk diameters $d_{B\ max.}$
For smaller brake disk diameters d_B the following applies: n max.= 1528 /d_B (d_B in metres)

3) When determining the brake disk diameter the required brake surface $b_{1\ min}$ should be observed:
$d_B > d_a + 2 \times b_{1\ min}$

4) Weight and mass moments of inertia apply to maximum brake disk diameters d_B and average bores D_1 und D_3.

5) Hub-centre recess to $D_{1/3}$ + 1 mm

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

Telephone: 02871/92-2800
Telefax: 02871/92-2801

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 and comply with them at all times in order to:

  – avoid injury or damage to the user and third parties,

  – ensure the safety and reliability of the coupling,

  and

  – avoid disruptions and environmental damage through incorrect use.

- During transport, assembly, installation, disassembly, operation and maintenance of the unit the relevant safety and environmental regulations must be complied with.
- 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 coupling 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 Operating Instructions (BA)

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. Transport, handling and storage

Note: Observe the ”Safety instructions” in section 3.

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 Transport and handling

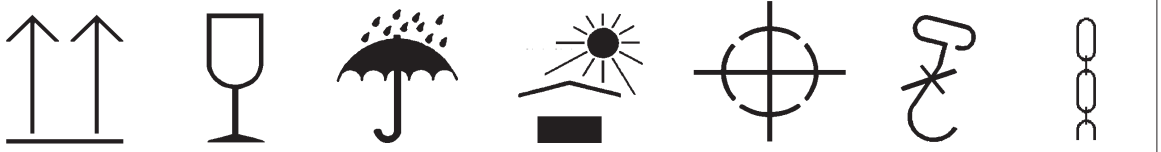
When handling FLENDER products, use only lifting and handling equipment of sufficient load-bearing capacity!

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



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 6 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 must be removed.**

4.3.2 Storing the buffers

4.3.2.1 General

Correctly stored buffers retain their properties unchanged for up to five years. Unfavourable storage conditions and improper treatment will negatively affect the physical properties of the buffers. 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 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

Note: Observe the ”Safety instructions” in section 3.

5.1 General description

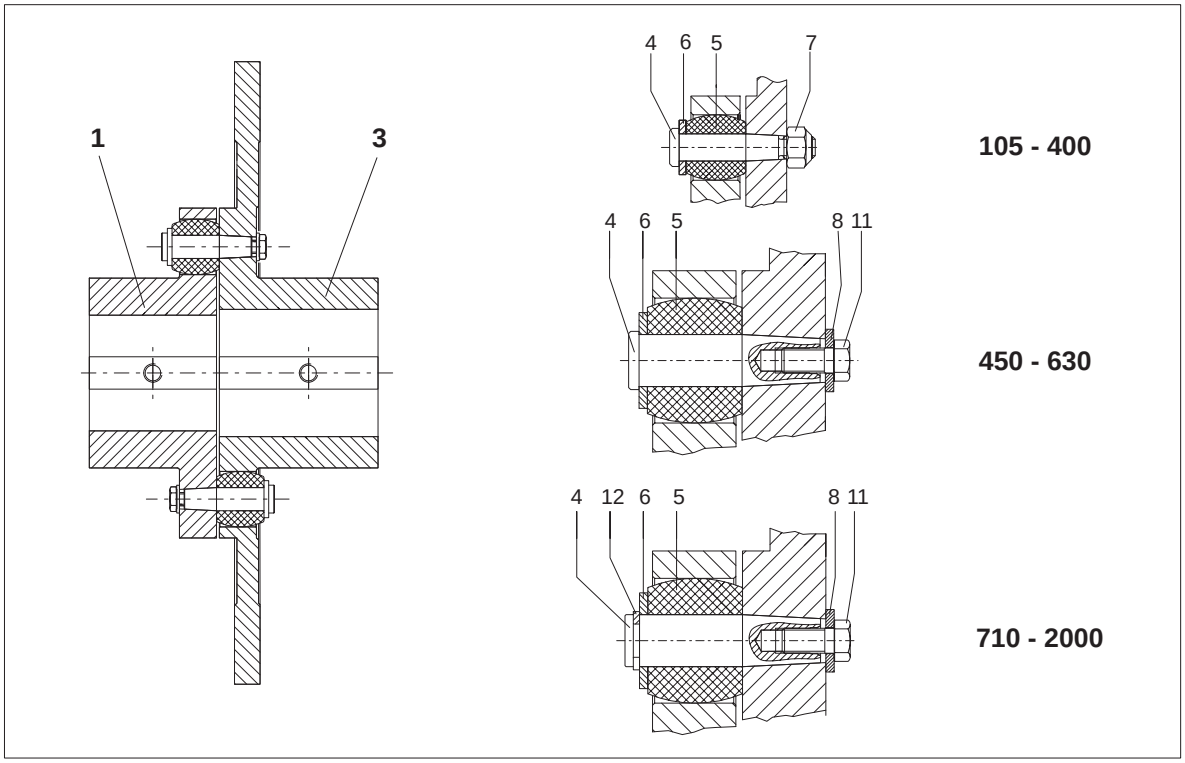


Fig. 5.1: Design of RUPEX coupling Type RWB/RBS

The RUPEX coupling Type RWB and RBS consists of a coupling section and a brake disk and the bolts required for torque transmission with the elastic plastic buffers. On the Type RWB the hub part (1) is manufactured of grey cast iron and the brake disk (3) of GGG-40 nodular cast iron; on the type RBS part 1 and part 3 are manufactured from steel.

Up to size 360 the ground steel bolts with the buffers are fastened only in the brake disk (3), from size 400 up reciprocally in the coupling parts (1 + 3). When mounted, the buffers engage in the corresponding buffer holes of the mating part.

The elastic plastic buffers of Perbunan are designed with a hardness of 80 Shore. Buffers of other material quality and/or hardness are available conditionally. With regard to availability and the coupling properties changed through use of these special buffers FLENDER must be consulted.

6. Assembly

Note: Observe the ”Safety instructions” in section 3.

6.1 Instructions for applying the finished bore and fitting the axial retaining means, set screws and balancing

6.1.1 Finish bore

- Remove buffer.
- Remove preservative from 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 run-outs, refer to DIN ISO 286 Basic Degree of Tolerance IT - Quality. The parts must be mounted on the marked faces (⌐).

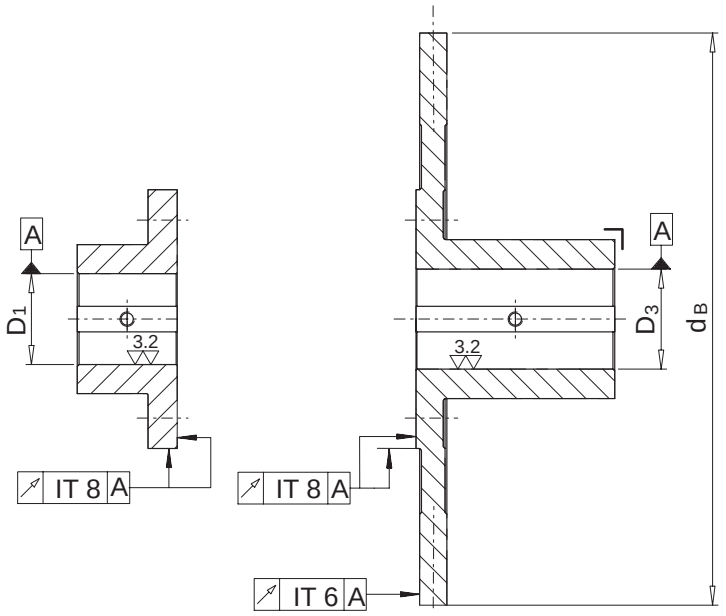
Caution!

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.

If other shaft-hub connections (e.g. splined hub profile, 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.

⚠

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



Part 1 **Part 3**

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: 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.

⚠

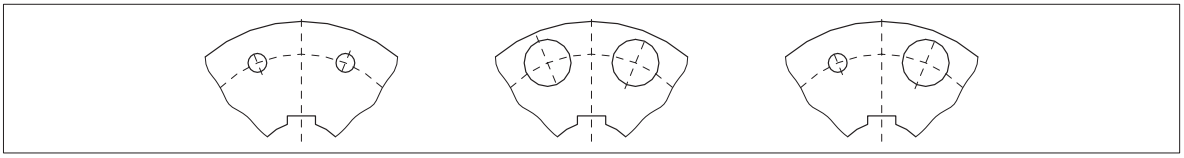
Failure to observe these instructions may result in breakage of the coupling. Danger from flying fragments!

6.1.1.1 Parallel keyway

The parallel keyways must be designed to suit the available parallel keys. For parallel keyways the tolerance zone of the hub keyway width **ISO JS 9** 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.**



6.1.2 Axial securing device

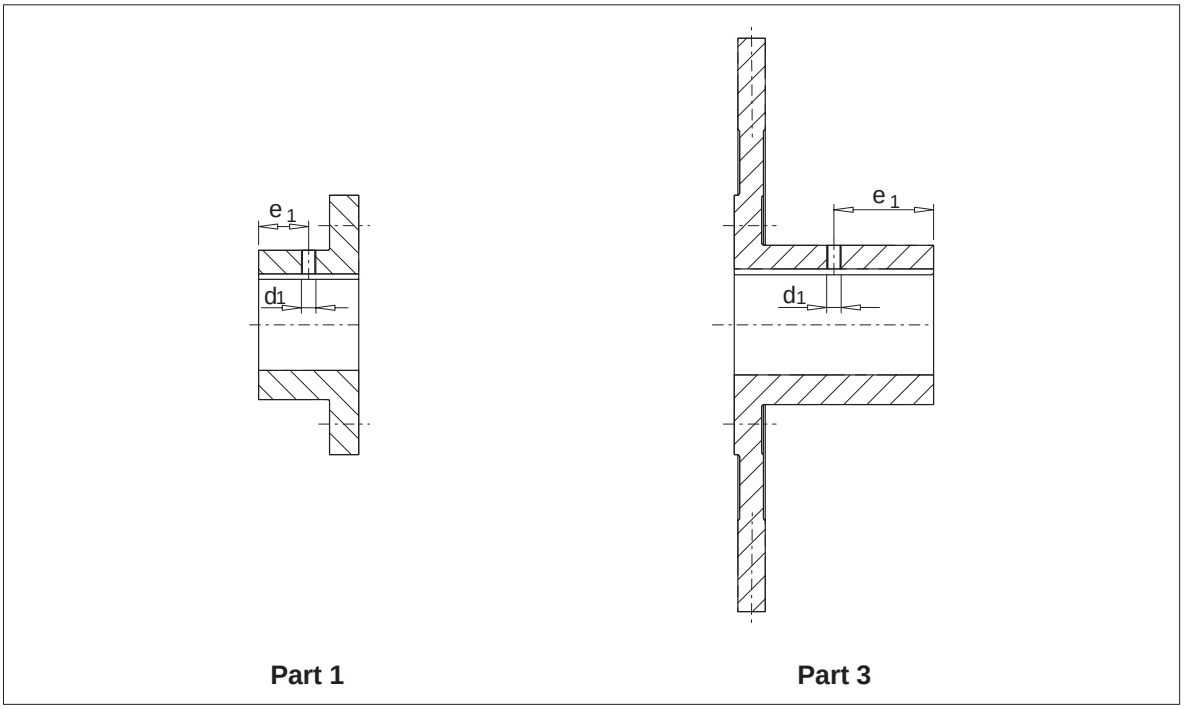
A set screw or end plate must be provided to secure the coupling parts axially. If end plates are used, FLENDER must be consulted with regard to machining the recesses in the coupling parts.

6.1.3 Set screws

Hexagon socket set screws with cup points to DIN 916 must be used for set screws.

The following guidelines must be observed!

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



Part 1 **Part 3**

Type RWB				Type RBS			
Bore range		Set screw size	Tightening torque	Bore range		Set screw size	Tightening torque
over	to	d_1	T_A	over	to	d_1	T_A
mm	mm	mm	Nm	mm	mm	mm	mm
8	30	M 6	4	8	30	M 6	4
30	38	M 8	8	30	75	M 8	8
38	65	M 10	15	75	95	M 12	25
65	95	M 12	25	95	110	M 16	70
95	110	M 16	70	110	150	M 20	130
110	150	M 20	130	150	230	M 24	230
150	230	M 24	230	230	600	M 30	470
230	600	M 30	470				

Table 6.2: Set screw assignment and tightening torques of the set screws

Size	**105**	**125**	**144**	**162**	**178**	**198**	**228**	**252**	**285**	**320**	**360**	**400**	**450**
Distance dimension $\mathbf{e_1}$	15	20	25	25	35	40	40	50	55	60	70	80	80
Size	**500**	**560**	**630**	**710**	**800**	**900**	**1000**	**1120**	**1250**	**1400**	**1600**	**1800**	**2000**
Distance dimension $\mathbf{e_1}$	90	100	110	130	115	160	175	160	200	240	250	300	330

Table 6.3: Distance dimensions of set screws

Caution! **The set screws must always be positioned on the keyway. In deviation from this the set screw on coupling parts (1, 3) of size 105 and 125 must be offset 180° to the parallel keyway.**

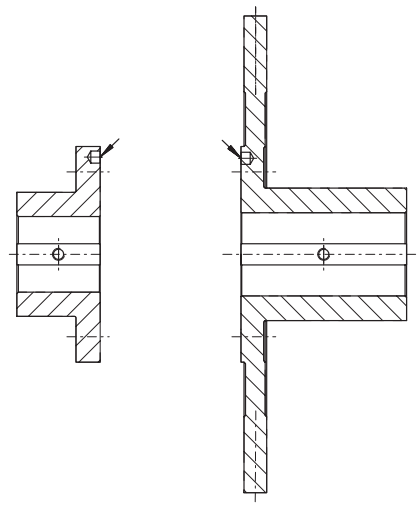
6.1.4 Balancing

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 740, VDI Guideline 2060).

Balancing is normally done by drilling material away. To keep the amount of material to be removed to a minimum, a largest possible balance radius must be selected.

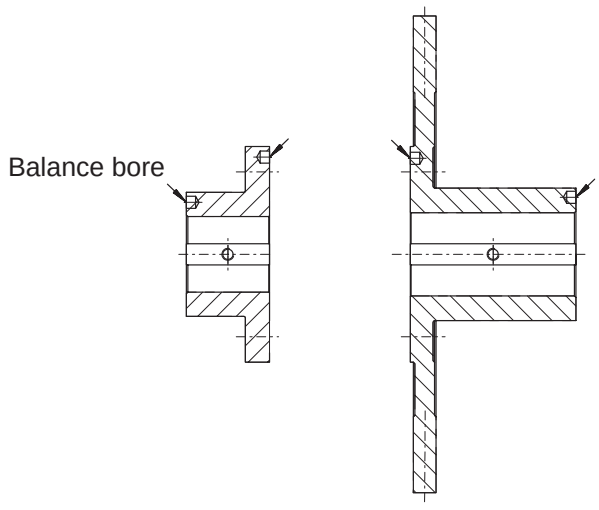
Caution! **On parts 1 and 3 the material must be removed between the bores without drilling completely through the bottom. On part 3 the brake surface must not under any circumstances be damaged.**

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



Part 1 **Part 3**

Arrangement of the balancing bore with one-level balancing



Part 1 **Part 3**

Arrangement of the balancing bore with two-level balancing

6.2 General information on assembly and installation

During assembly, Section 3. ”Safety Instructions” must be observed.

Assembly and installation 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 installation and assembly work.

6.3 Mounting the coupling parts

Before beginning installation, the shaft ends, the brake disk and the coupling parts must be carefully cleaned. Before cleaning the coupling parts with solvent the buffers must be removed.

Note manufacturer’s instructions for handling solvent.

If it has to be possible for the buffers to be replaced without moving the coupled machines, dimension P for installation according to item 6.6 must be allowed for.

Caution! **The set screws should be tightened only with a hexagon socket spanner to DIN 911, without extension tube.**

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

If necessary, heating the coupling parts (1) and the brake disk (3) (to max. +150 °C) will facilitate fitting. With temperatures over +80 °C the buffers/bolts must be removed from the coupling parts before heating.

Take precautions to avoid burns from hot components!

After fitting the coupling parts (1) or the brake disk (3) the buffers (5) must, if previously removed, be fitted. Tighten nuts (7) or bolts (11) by means of a torque wrench (for tightening torques, see item 6.6). Secure bolts (11) with a few drops of adhesive (e. g. Loctite, Type 242). Previously heated coupling parts (1) and brake disks (3) must have cooled down again to a temperature below 80 °C. After the coupling parts (1) and the brake disk (3) have cooled down, the set screws must be tightened to the torque specified in table 6.5.

Move together the machines to be coupled.

Danger of squeezing!

Dimension S_1 must be adhered to (see section 1.).

6.4 Alignment

The couplings pick up positional errors in the shaft ends to be connected up to the data shown in item 6.5.

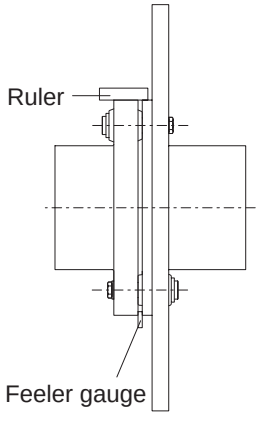
When aligning, the radial and angular misalignment of the shaft ends must be kept as small as possible, because, other conditions being equal, this increases the service life of the coupling.

Alignment is best done in the order:

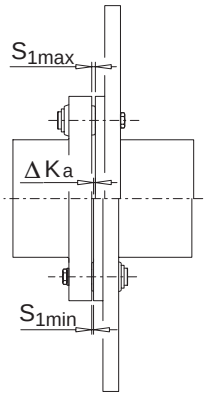
1. angular alignment
2. radial alignment

Alignment has to be effected in two axial planes arranged in vertical relation to each other. This can be done by means of a ruler (radial misalignment) and feeler gauge (angular misalignment), as shown in the illustration. The distance dimension S1 must be adhered to (see item 1.).

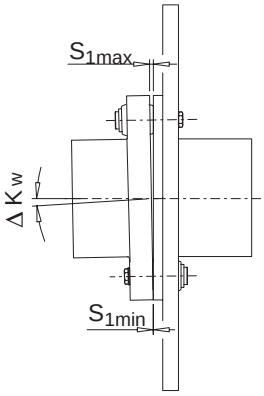
The aligning accuracy can be increased by using a dial gauge.



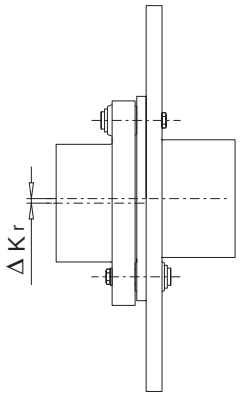
6.5 Possible misalignments



Axial misalignment
Fig. 6.5.1



Angular misalignment
Fig. 6.5.2



Radial misalignment
Fig. 6.5.3

Misalignments of the coupling parts in relation to each other can be caused by inaccurate alignment during assembly, but also by actual operation of the equipment (expansion due to heat, shaft deflection, insufficiently rigid machine frames, etc.).

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

6.5.1 Axial misalignment

Axial misalignment ΔKa (Fig. 6.5.1) of the coupling parts relative to one another is possible within the "permissible error" for dimension S_1 (see section 1.).

6.5.2 Angular misalignment

The angular misalignment ΔKw (Fig. 6.5.2) 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, refer to item 6.5.4.

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

$$\Delta K_{w\ zul.}\ \text{in Rad} = \frac{\Delta S_{1\ zul}}{d_a}$$

$$\Delta K_{w\ zul.}\ \text{in Grad} = \frac{180}{\pi} \times \frac{\Delta S_{1\ zul}}{d_a}$$

For ΔS_1 see item 6.5.4.

6.5.3 Radial misalignment

For the radial misalignment ΔKr perm. (Fig. 6.5.3) - depending upon the operating speed -, refer to item 6.5.4.

6.5.4 Permissible shaft misalignment values for radial misalignment $\Delta Kr_{perm.}$ and difference in gap dimension ΔS_1

Values given in mm, rounded off

Size	Coupling speed in 1/min								
	250	500	750	1000	1500	2000	3000	4000	5000
105	0.5	0.35	0.3	0.25	0.2	0.15	0.15	0.1	0.1
125	0.55	0.4	0.3	0.25	0.2	0.2	0.15	0.1	0.1
144	0.6	0.4	0.35	0.3	0.25	0.2	0.15	0.15	0.1
162	0.65	0.45	0.35	0.3	0.25	0.2	0.15	0.15	0.15
178	0.7	0.5	0.4	0.35	0.25	0.25	0.2	0.15	0.15
198	0.75	0.5	0.4	0.35	0.3	0.25	0.2	0.15	
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	0.2	
320	1.05	0.75	0.6	0.5	0.4	0.35	0.3		
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					

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

$$\Delta K_{r\ zul.} = \Delta S_1 = \left(0.1 + \frac{d_a}{1000}\right) \times \frac{40}{\sqrt{n}}$$

Coupling speed n in 1/min
Coupling size designation d_a in mm
Radial misalignment $K_{r\ perm.}$ in mm

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

6.6 Assignment of tightening torques

Size	P mm	Tightening torques T_A Nm	Spanner width S_w mm
105	30	12	10
125	35	30	13
144	35	30	13
162	40	60	17
178	40	60	17
198	40	60	17
228	50	65	19
252	50	65	19
285	60	150	24
320	60	150	24
360	75	220	27
400	75	220	27
450	90	180	24
500	90	180	24
560	120	340	30
630	120	340	30
710	140	580	36
800	140	580	36
900	160	600	36
1000	160	600	36
1120	180	1150	46
1250	180	1150	46
1400	210	1150	46
1600	210	1150	46
1800	240	2000	55
2000	240	2000	55

Table 6.4: Assignment of the tightening torques of nuts and bolts of the coupling bolt fastening

Note: The tightening torques of the set screws are specified in item 6.1.3.

7. Start-up

Note: Observe the ”Safety instructions” in section 3.

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.). Then fit the coupling guard to prevent unintentional contact.

8. Operation

Note: Observe the ”Safety instructions” in section 3.

8.1 General operating data

During operation of the coupling watch for:

– changes in running noise

– sudden shocks

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

Note: Observe the ”Safety instructions” in section 3.

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.

⚠

Before carrying out maintenance work, repairs or other work the operator must ensure that the entire drive train remains stationary. In particular the drive motors must be prevented from being started up unintentionally.
We also refer to the relevant accident prevention regulations at the place of installation.

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)
	Buffer worn, no damping	take the system out of service Demount coupling and remove remains of buffer Check and replace damaged coupling parts Buffers must be replaced in sets Check and, if necessary, adjust alignment (see section 6). Assembly of coupling according to section 6. ”Assembly” and section 7. ”Start-up”

10. Maintenance and repair

Note: Observe the ”Safety instructions” in section 3.

10.1 General

The circumferential backlash between the two coupling parts must be checked at system maintenance intervals or at least once a year. If an increased coupling backlash does not impair the operation of the coupling, the elastic buffers 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 a coupling part (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 must be replaced.

Caution! **The buffers must be replaced in sets.**

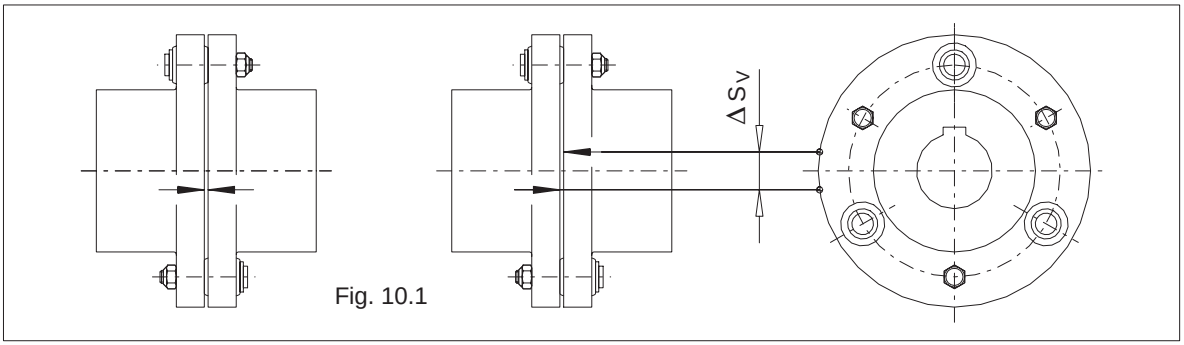


Fig. 10.1

Size	105	125	162	228	285	360	450	560	710	900	1120	1400	1800
		144	198	252	320	400	500	630	800	1000	1250	1600	2000
ΔS_V	3.0	3.5	4.0	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 can be replaced without moving the coupled machines.

On couplings up to size 400 the bolts with the plastic buffers can be demounted by undoing and removing the nuts and from size 450 to size 630 by undoing and removing the hexagon head screws and endplates through the buffer bores. The plastic buffer can then be pulled off the bolt.

On couplings of size 710 and upward the buffer can be demounted by removing the locking ring and pulling the buffer through the buffer bores. The bolt need not be demounted. The bolts can be demounted by undoing and removing the hexagon head screws and end plates through the buffer bores.

After the buffers have been replaced, assembly is done in the reverse order. The screws (11) must again be secured with adhesive (e. g. Loctite 242), and the self-locking nuts (7) replaced with new ones 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:

– Part no. (see section 5.)

– 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-part and customer-service addresses

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

FLENDER Germany

A. FRIEDR. FLENDER AG
46393 Bocholt - Tel.: (0 28 71) 92-0 - Fax: (0 28 71) 92 25 96
E-mail: contact@flender.com • www.flender.com
Shipping address: Alfred - Flender - Strasse 77 - 46395 Bocholt

A. FRIEDR. FLENDER AG - Kupplungswerk Mussum
Industriepark Bocholt - Schlavenhorst 100 - 46395 Bocholt - Tel.: (0 28 71) 92 28 68 - Fax: (0 28 71) 92 25 79
E-mail: couplings@flender.com • www.flender.com

A. FRIEDR. FLENDER AG - Werk Friedrichsfeld
Am Industriepark 2 - 46562 Voerde - Tel.: (0 28 71) 92-0 - Fax: (0 28 71) 92 25 96
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(2003-12-01)

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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
Types **RWB, RBS**
with brake disk

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, 2002-01-08

Signature (person responible for products)