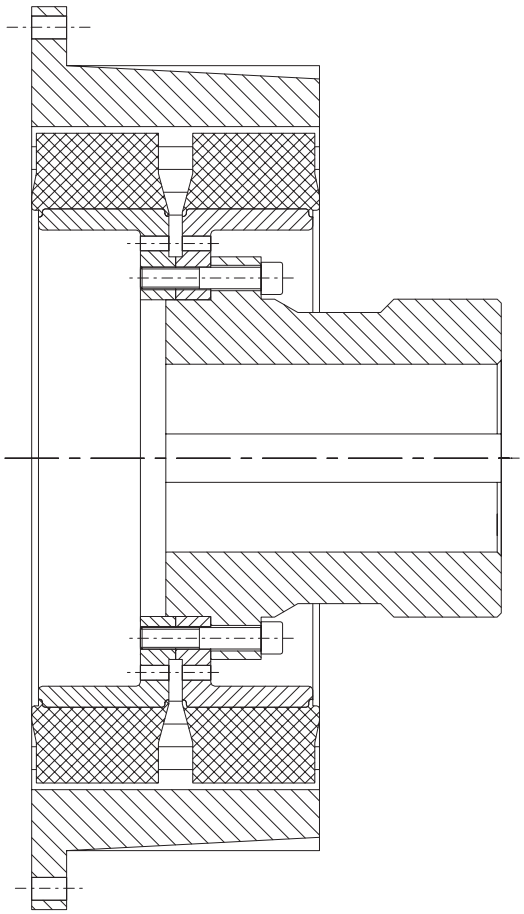
Operating Instructions

BA 3302 EN 11.04

Highly flexible **ELPEX-S** couplings
ESN, ESNR, ESD, ESDR, EST, ESNW and **ESDW** types
including design in accordance with Directive 94/9/EC



ESDR

FLENDER

A. Friedr. Flender AG · 46393 Bocholt · Tel. 02871/92-0 · Telefax 02871/92-2596 · www.flender.com

Contents

1. Technical data

1.1 Geometric data of type ESN

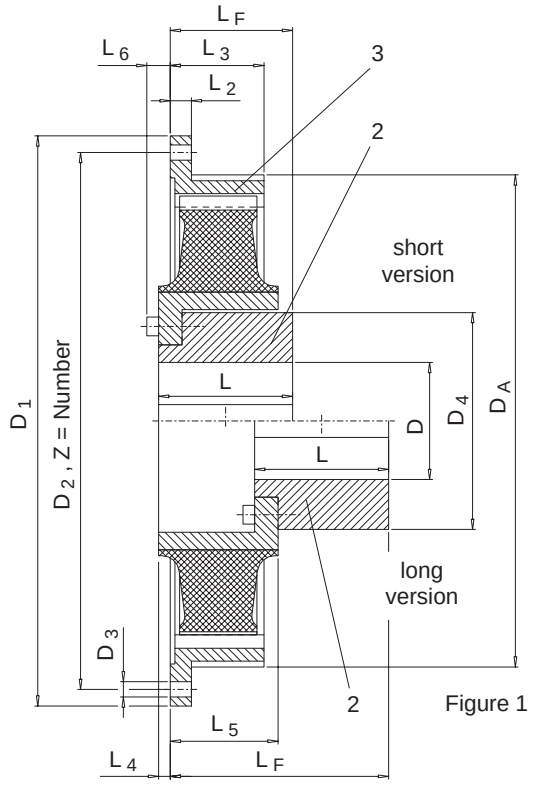


Figure 1

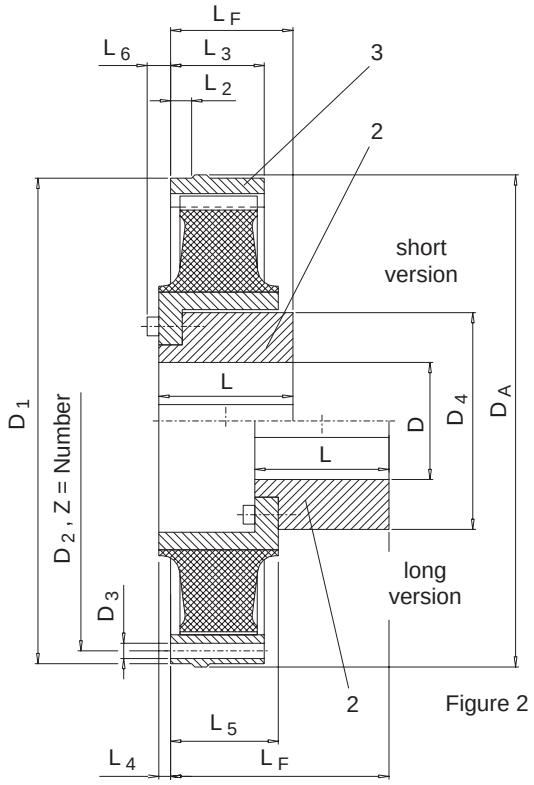


Figure 2

Size	Fig.	Flanged connection SAE J620d						D											Mass moment of inertia		Weight
		Size	D_1 g7	D_2	D_3	Z	D_A	min.	max.	D_4	L	L_2	L_3	L_4	L_5	L_6	L_F short	L_F long	J_1 outer	J_2 inner	2)
			mm	mm	mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm² 2)		kg
220	2	6.5	215.9	200.0	8.5	6	222		60	98	54	8	41	–	52		–	103	0.008	0.01	5.8
	2	7.5	241.3	222.3	8.5	8	222		60	98	54	33	33	–	43	–	–	94	0.011	0.01	6.1
	1	8	263.5	244.5	10.5	6	222		60	98	54	8	33	–	43	–	–	94	0.011	0.01	6.4
	1	10	314.3	295.3	10.5	8	222		60	98	54	8	33	–	43	–	–	94	0.017	0.01	6.9
265	2	8	263.5	244.5	10.5	6	263		65	118	65	38	38	3	42	15	74	104	0.011	0.022	6.6
	1	10	314.3	295.3	10.5	8	263		65	118	65	10	38	3	42	15	74	104	0.017	0.022	6.9
	1	11.5	352.4	333.4	10.5	8	263		65	118	65	10	38	3	42	15	74	104	0.024	0.022	7.2
290	1	10	314.3	295.3	10.5	8	290		65	118	68	16	52	6	59	13	74	121	0.026	0.026	9.2
	1	11.5	352.4	333.4	10.5	8	290		65	118	70	16	52	6	59	13	59	107	0.036	0.027	10.5
320	1	11.5	352.4	333.4	10.5	8	318		80	140	101	16	60	8	68	20	105	166	0.062	0.065	19
	1	14	466.7	438.2	13	8	318	1)	80	140	87	16	60	8	68	20	91	152	0.18	0.061	20.5
360	2	11.5	352.4	333.4	10.5	8	358		90	160	110	65	65	13	76	29	106	175	0.065	0.13	24.5
	1	14	466.7	438.2	13	8	358		90	160	105	15	65	13	76	29	92	161	0.18	0.13	27.5
420	1	14	466.7	438.2	13	8	420		100	185	102	18	80	10	92	26	92	174	0.22	0.32	36
	1	16	517.5	489.0	13	8	420		100	185	102	18	80	10	92	26	92	174	0.32	0.32	38
	1	18	571.5	542.9	17	6	420		100	185	102	18	80	10	92	26	92	174	0.47	0.32	40
465	2	14	466.7	438.2	13	8	465		120	222	125	85	85	33	88	–	92	164	0.31	0.58	56
	1	16	517.5	489.0	13	8	465		120	222	125	27	85	33	88	–	92	164	0.41	0.58	57
	1	18	571.5	542.9	17	6	465		120	222	125	18	85	33	88	–	92	164	0.52	0.58	61
520	1	18	571.5	542.9	17	12	514		165	250	142	18	84	–	86	16	159	225	0.48	0.93	55
	1	21	673.5	641.4	17	12	514		165	250	142	18	84	–	86	16	159	225	0.95	0.93	60
560	2	18	571.5	542.9	17	12	560	75	200	320	140	35	92	9	103	25	136	223	0.85	1.2	69
	1	21	673.5	641.4	17	12	560	75	200	320	140	35	92	9	103	25	136	223	1.8	1.2	78
580	2	18	571.5	542.9	17	12	580	90	200	316	200	104	104	3	107	23	215	300	0.77	1.8	100
	1	21	673.1	641.4	17	12	580	90	200	316	200	26	104	3	107	23	215	300	1.2	1.8	105
680	2	21	673.1	641.4	17	12	682	90	220	380	210	85	111	–	107	24	232	312	4.1	5.3	205
	1	24	733.5	692.2	21	12	682	90	220	380	210	20	111	–	107	24	232	312	5.3	5.3	215

1) unbored and precentered

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

1.2 Geometric data of type ESNR

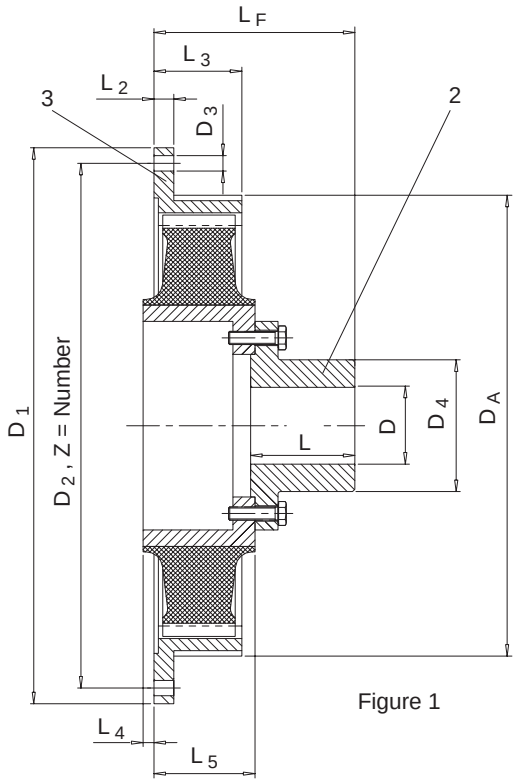


Figure 1

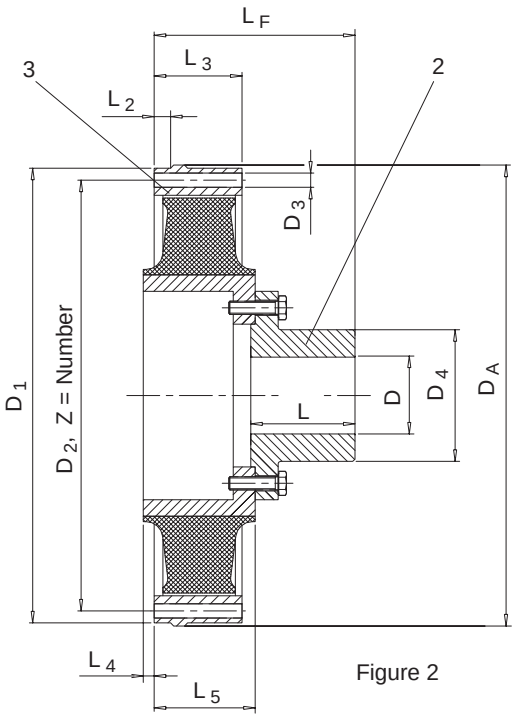


Figure 2

Size	Fig.	Flanged connection SAE J620d					D_A	D		D_4	L_1	L_2	L_3	L_4	L_5	L_F	Mass moment of inertia		Weight
		Size	D_1	D_2	D_3	Z		min.	max.								J_1 outer	J_2 inner	2)
			mm	mm	mm		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm^2 2)		kg
265	2	8	263.5	244.5	10.5	6	263		50	78	65	38	38	3	42	104	0.011	0.017	5
	1	10	314.3	295.3	10.5	8	263		50	78	65	10	38	3	42	104	0.017	0.017	5.3
	1	11.5	352.4	333.4	10.5	8	263		50	78	65	10	38	3	42	104	0.024	0.017	5.6
290	1	10	314.3	295.3	10.5	8	290		50	78	65	16	52	6	58	120	0.026	0.027	8.1
	1	11.5	352.4	333.4	10.5	8	290		50	78	65	16	52	6	58	120	0.036	0.027	8.4
320	1	11.5	352.4	333.4	10.5	8	318		65	98	87	16	60	8	68	152	0.062	0.042	13.5
	1	14	466.7	438.2	13	8	318		65	98	87	16	60	8	68	152	0.18	0.042	16
360	2	11.5	352.4	333.4	10.5	8	358		85	123	88	15	65	13	76	161	0.065	0.11	20
	1	14	466.7	438.2	13	8	358	1)	85	123	88	15	65	13	76	161	0.18	0.11	23
420	1	14	466.7	438.2	13	8	420		100	155	85	18	80	10	92	174	0.22	0.3	31
	1	16	517.5	489.0	13	8	420		100	155	85	18	80	10	92	174	0.32	0.3	32
	1	18	571.5	542.9	17	6	420		100	155	85	18	80	10	92	174	0.47	0.3	35
465	2	14	466.7	438.2	13	8	465		130	190	119	27	85	2	88	204	0.31	0.54	41
	1	16	517.5	489.0	13	8	465		130	190	119	27	85	2	88	204	0.41	0.54	42
	1	18	571.5	542.9	17	6	465		130	190	119	18	85	2	88	204	0.52	0.54	45
520	1	18	571.5	542.9	17	12	514		150	227	162	18	84	0	86	245	0.48	0.94	59
	1	21	673.1	641.4	17	12	514		150	227	162	18	84	0	86	245	0.95	0.94	64
560	2	18	571.5	542.9	17	12	560	75	150	240	180	35	92	0	103	277	0.85	1.2	75
	1	21	673.1	641.4	17	12	560	75	150	240	180	35	92	0	103	277	1.8	1.2	85
580	2	18	571.5	542.9	17	12	580	90	160	240	200	15	104	0	107	302	0.77	1.6	80
	1	21	673.1	641.4	17	12	580	90	160	240	200	26	104	0	107	302	1.2	1.6	84
680	2	21	673.1	641.4	17	12	682	90	200	300	210	15	111	0	107	312	4.1	3.6	155
	1	24	733.4	692.2	21	12	682	90	200	300	210	20	111	0	107	312	5.3	3.6	165
770	1	–	860	820	21	32	780	90	260	390	255	26	135	0	137	389	10.7	12	330
	1	–	920	880	21	32	780	90	260	390	255	27	135	0	137	389	15.4	12	350
	1	–	995	950	21	32	780	90	260	390	255	27	135	0	137	389	20.5	12	375

1) unbored and precentered

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

1.3 Geometric data of type ESD

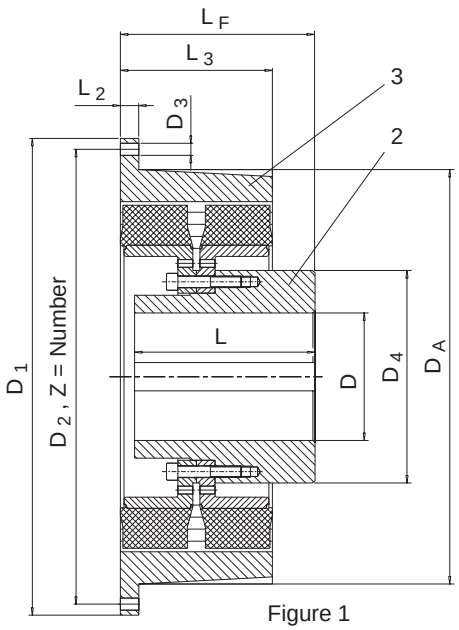


Figure 1

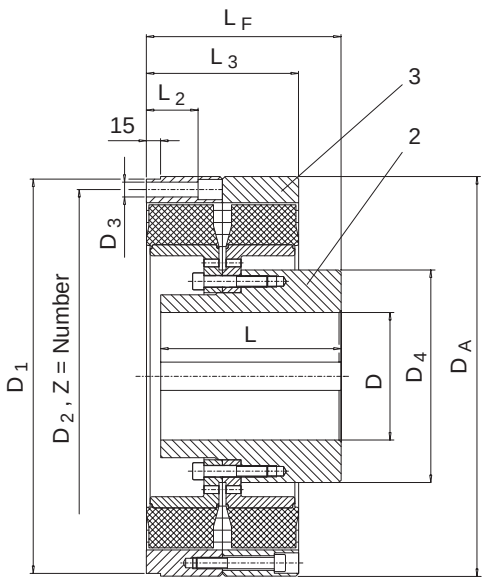


Figure 2

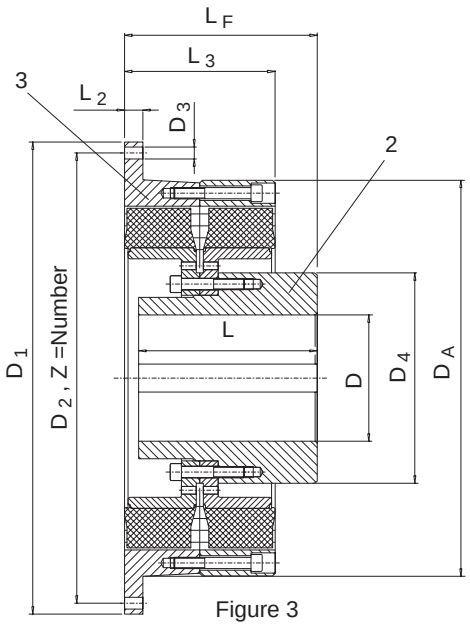


Figure 3

Size	Fig.	Flanged connection SAE J620d						D							Mass moment of inertia		Weight
		Size	D_1	D_2	D_3	Z	D_A	min.	max.	D_4	L_1	L_2	L_3	L_F	J_1 outer	J_2 inner	2)
			mm	mm	mm		mm	mm	mm	mm	mm	mm	mm	mm	kgm² 2)		kg
520	1	18	571.5	542.9	17	12	525	1)	165	250	174	25	172	255	1	1.6	85
	1	21	673.1	641.4	17	12	525		165	250	174	18	172	255	1.5	1.6	90
560	1	18	571.5	542.9	17	12	560	75	170	316	210	35	205	270	1.7	2.8	140
	1	21	673.1	641.4	17	12	560	75	170	316	210	35	205	270	2.6	2.8	150
580	1	21	673.1	641.4	17	12	585	90	200	310	250	26	210	350	2	3.8	170
	1	24	733.4	692.2	21	12	585	90	200	310	250	26	210	350	2.6	3.8	175
680	2	21	673.1	641.4	17	12	682	90	220	380	255	85	218	265	8.2	7	265
	3	24	733.4	692.2	21	12	682	90	220	380	255	20	218	265	9.4	7	275

1) unbored and precentered

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

1.4 Geometric data of type ESDR

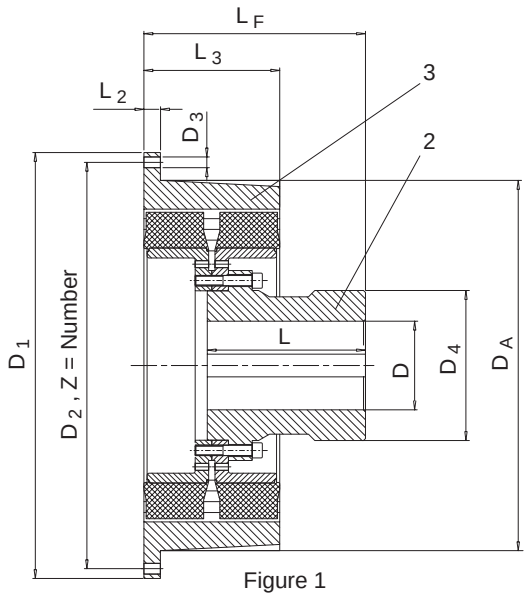


Figure 1

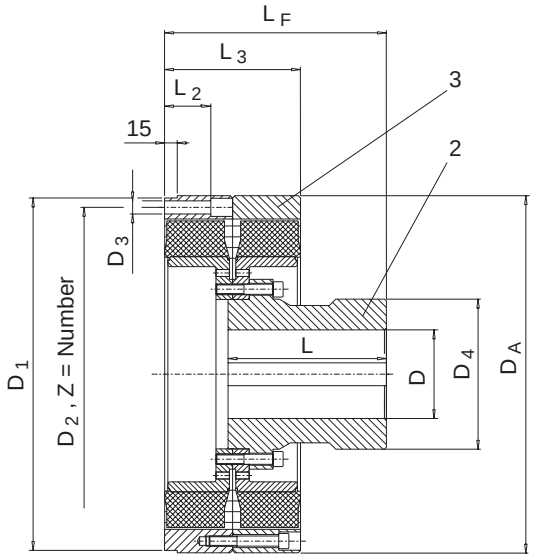


Figure 2

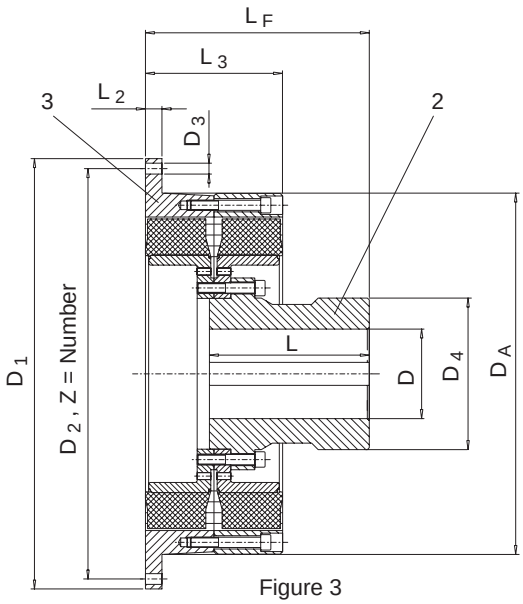


Figure 3

Size	Fig.	Flanged connection SAE J620d					D_A	D		D_4	L_1	L_2	L_3	L_F	Mass moment of inertia		Weight
		Size	D_1	D_2	D_3	Z		min.	max.						J_1 outer	J_2 inner	2)
			mm	mm	mm		mm	mm	mm	mm	mm	mm	mm	mm	kgm^2 2)		kg
520	1	18	571.5	542.9	17	12	525	1)	150	227	226	25	172	307	1	1.8	105
	1	21	673.1	641.4	17	12	525		150	227	226	18	172	307	1.5	1.8	110
560	1	18	571.5	542.9	17	12	560	75	160	248	240	35	205	338	1.7	2.5	135
	1	21	673.1	641.4	17	12	560	75	160	248	240	35	205	338	2.6	2.5	140
580	1	21	673.1	641.4	17	12	585	90	160	240	250	26	210	350	2	3.2	145
	1	24	733.4	692.2	21	12	585	90	160	240	250	26	210	350	2.6	3.2	150
680	2	21	673.1	641.4	17	12	682	90	200	300	250	85	218	352	8.2	6.5	260
	3	24	733.4	692.2	21	12	682	90	200	300	250	20	218	352	9.4	6.5	270
770	3	–	860	820	21	32	780	90	260	390	300	19	258	496	22.3	20	540
	3	–	920	880	21	32	780	90	260	390	300	27	266	500	26	20	555
	3	–	995	950	21	32	780	90	260	390	300	27	266	500	31	20	600

1) unbored and precentered

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

1.5 Geometric data of type EST

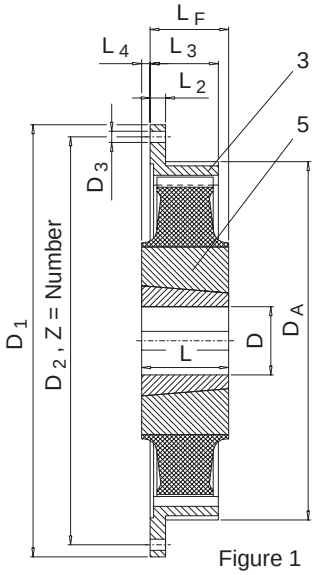


Figure 1

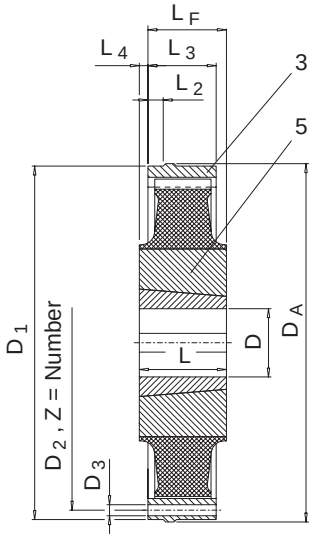


Figure 2

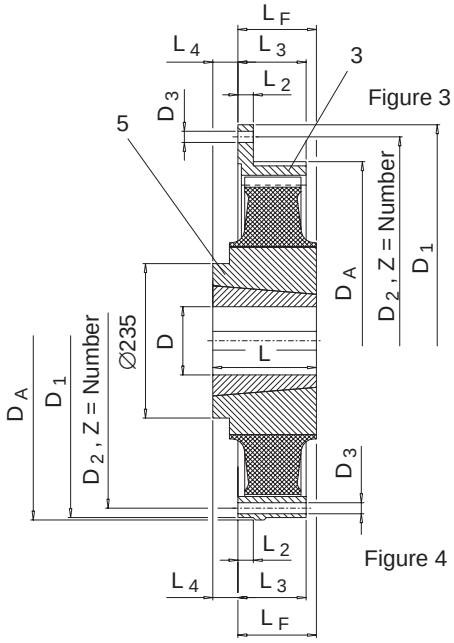
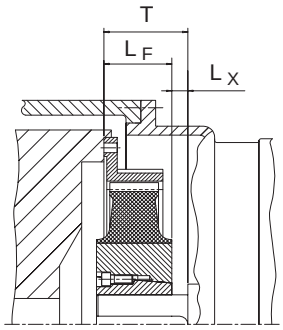


Figure 3

Figure 4



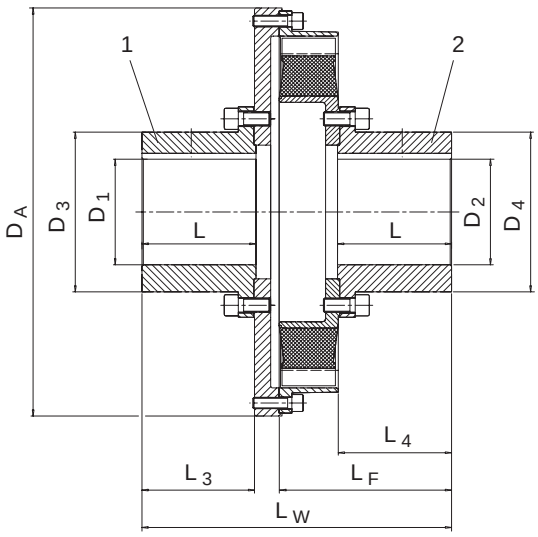
Information on installation:
In the case of motor and generator connection dimensions to DIN 6281 the distance L_X must be taken into consideration during installation.
The coupling dimension L_F must be within tolerance values.

1) Weights and mass moments of inertia apply to max. bores.
2) Length L of the TAPER clamping bush TB 2517 = 45 mm

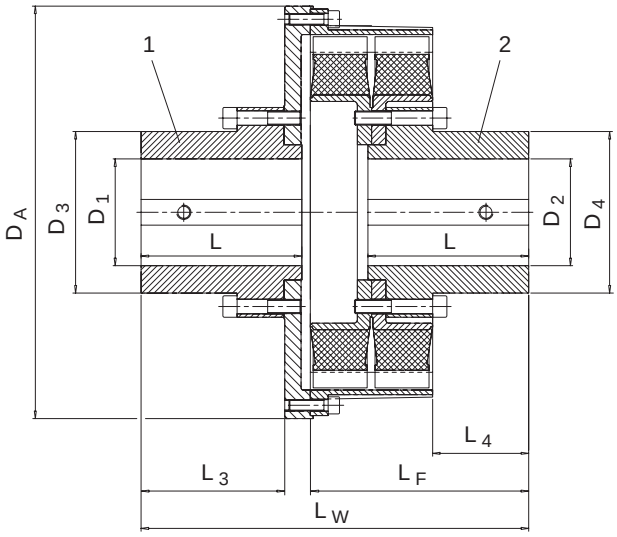
Size	Fig.	Flanged connection SAE J620d Size	D_1 mm	D_2 mm	D_3 mm	Z	TAPER clamping bush	D_A mm	L mm	L_2 mm	L_3 mm	L_4 mm	L_F mm	T mm	L_X mm	Mass moment of inertia J_1 outer kgm² 1)	Mass moment of inertia J_2 inner 1)	Weight 1) kg
220	2	6.5	215.9	200	8.5	6	2012	222	32	8	41	0	52	–	–	0.008	0.008	3.6
	2	7.5	241.3	222.3	8.5	8	2012	222	32	33	33	0	43	–	–	0.008	0.008	3.5
	1	8	263.5	244.5	10.5	6	2012	222	32	8	33	0	43	81	38	0.011	0.008	3.7
	1	10	314.3	295.3	10.5	8	2012	222	32	8	33	0	43	73	30	0.02	0.008	4.2
265	2	8	263.5	244.5	10.5	6	2517	263	45	38	38	3	42	81	41	0.011	0.019	5.9
	1	10	314.3	295.3	10.5	8	2517	263	45	10	38	3	42	73	31	0.017	0.019	6.2
	1	11.5	352.4	333.4	10.5	8	2517	263	45	10	38	3	42	58.6	16	0.024	0.019	6.5
290	1	10	314.3	295.3	10.5	8	2517	290	2) 64	16	52	6	58	73	14	0.026	0.026	8.5
	1	11.5	352.4	333.4	10.5	8	2517	290	64	16	52	6	58	58.6	0	0.036	0.026	8.8
320	1	11.5	352.4	333.4	10.5	8	3030	318	76	16	60	8	68	106.6	39	0.062	0.06	14
	1	14	466.7	438.2	13	8	3030	318	76	16	60	8	68	92.4	25	0.18	0.06	17
360	2	11.5	352.4	333.4	10.5	8	3535	358	89	65	65	13	76	106.6	30	0.065	0.13	21
	1	14	466.7	438.2	13	8	3535	358	89	15	65	13	76	92.4	17	0.18	0.13	24
420	1	14	466.7	438.2	13	8	4040	420	102	18	80	10	92	92.4	0	0.22	0.33	37
	1	16	517.5	489	13	8	4040	420	102	18	80	10	92	82.7	0	0.32	0.33	38
	1	18	571.5	542.9	17	6	4040	420	102	18	80	10	92	82.7	0	0.47	0.33	41
465	4	14	466.7	438.2	13	8	4545	465	115	85	85	28	87	92.4	5	0.31	0.76	63
	3	16	517.5	489	13	8	4545	465	115	27	85	28	87	82.7	0	0.41	0.76	64
	3	18	571.5	542.9	17	6	4545	465	115	18	85	28	87	82.7	0	0.52	0.76	68

TAPER clamping bushes with keyway to DIN 6885 sheet 1 (hub width tolerance JS9)																			
Bush no.	Bores D of the clamping bushes in mm																		
2012	14	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	
2517	16	18	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60
3030	35	38	40	42	45	48	50	55	60	65	70	75							
3535	35	38	40	42	45	48	50	55	60	65	70	75	80	85	90				
4040	40	42	45	48	50	55	60	65	70	75	80	85	90	95	100				
4545	55	60	65	70	75	80	85	90	95	100	105	110							

1.6 Geometric data of types ESNW and ESDW



Type ESNW



Type ESDW

Type	Size	D_1 / D_2 min.	D_1 / D_2 max.	D_A	D_3 / D_4	L	L_3	L_4	L_F	L_W	Mass moment of inertia J_1 2)	Mass moment of inertia J_2 2)	Weight 2)
		mm	mm	mm	mm	mm	mm	mm	mm	mm	kgm²		kg
ESNW	**265**		50	275	78	65	62	66	104	195	0.11	0.017	15
ESNW	**290**		50	325	78	65	62	68	120	215	0.21	0.027	22
ESNW	**320**		65	365	98	87	84	92	152	270	0.37	0.042	32
ESNW	**360**	1)	70	365	110	88	85	96	161	295	0.45	0.11	43
ESNW	**420**		100	480	155	85	82	94	174	300	1.5	0.3	75
ESNW	**465**		130	480	190	119	116	119	204	360	1.6	0.54	89
ESNW	**520**		150	585	227	162	159	161	245	445	4	0.94	155
ESNW	**560**	75	150	585	240	180	174	174	277	490	4.1	1.2	160
ESNW	**580**	90	150	585	240	200	195	198	302	545	5.5	1.6	185
ESNW	**680**	90	160	685	300	210	205	201	312	570	12	3.6	315
ESNW	**770**	90	260	870	390	255	250	253	389	690	27.2	12	500
ESDW	**520**	1)	150	585	227	226	201	135	307	550	4.7	1.8	215
ESDW	**560**	75	160	585	248	240	215	133	318	595	5.4	2.5	250
ESDW	**580**	90	160	585	240	250	220	140	350	620	10.1	3.2	300
ESDW	**680**	90	200	685	300	255	218	134	352	625	14.5	6.5	440
ESDW	**770**	90	260	870	390	300	265	238	496	820	40	20	720

1) unbored and precentered

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

1.7 Performance data

Rubber disk elements made of a natural/synthetic rubber mix								
Type	**Size**	Rubber element	Rated torque T_{KN} Nm	Maximum torque T_{Kmax} Nm	Fatigue torque T_{KW} Nm	dynamic torsional stiffness $C_{T\,dyn}$ Nm/rad	Motor flange SAE J620d	Speed n_{max} 1/min
ESN. EST	**220**	WN NN SN	330 360 400	750 900 1000	165 180 200	1100 1700 2500	6.5 7.5 8	4200 4200 4200
ESN. EST	**265**	WN NN SN	500 600 700	1250 1800 2100	250 300 350	2100 3100 4500	8 10 11.5	4200 3600 3500
ESN. EST	**290**	WN NN SN	800 900 1000	2000 2700 3000	400 450 500	3600 5000 7500	10 11.5	3600 3500
ESN. EST	**320**	WN NN SN	1200 1350 1550	3000 3600 4200	600 650 750	8000 10000 13500	11.5 14	3500 3000
ESN. EST	**360**	WN NN SN	1800 2000 2500	4500 5400 7500	900 1000 1250	8500 13000 22000	11.5 14	3200 3000
ESN. EST	**420**	WN NN SN	3100 3450 4200	7700 10000 12600	1500 1700 2100	16000 30000 45000	14 18	3000 2300
ESN. EST	**465**	WN NN SN	4600 5200 6300	10000 15600 18900	2300 2600 3100	35000 56000 100000	14 18	2600 2300
ESN.	**520**	WN NN SN	6200 7000 7800	14000 21000 23400	3100 3500 3900	38000 75000 110000	18 21	2300 2000
ESD.	**520**	WN NN SN	12400 14000 15600	28000 42000 46800	6200 7000 7800	76000 150000 220000	18 21	2300 2000
ESN.	**560**	WN NN SN	8000 9000 10000	18000 27000 30000	4200 4800 5500	55000 100000 190000	18 21	2300 2000
ESD.	**560**	WN NN SN	16000 18000 20000	36000 54000 60000	8400 9600 11000	110000 200000 380000	18 21	2300 2000
ESN.	**580**	WN NN SN	11000 12500 14000	28000 37000 42000	5500 6250 7000	75000 120000 210000	18 21	2300 2000
ESD.	**580**	WN NN SN	22000 25000 28000	56000 74000 84000	11000 12500 14000	150000 240000 420000	21 24	2000 1800
ESN.	**680**	WN NN SN	16000 18000 20000	40000 54000 60000	8000 9000 10000	150000 250000 450000	21 24	2000 1800
ESD.	**680**	WN NN SN	32000 36000 40000	80000 108000 120000	16000 18000 20000	300000 500000 900000	21 24	2000 1800
ESN.	**770**	WN NN SN	25000 28000 31500	75000 84000 94000	12500 14000 15000	250000 400000 700000	similar to DIN 6288	1500
ESD.	**770**	WN NN SN	50000 56000 63000	150000 168000 189000	25000 28000 30000	500000 800000 1400000	similar to DIN 6288	1300

relative damping coefficient WN: $\Psi = 0.8$
NN: $\Psi = 1.15$
SN: $\Psi = 1.25$

Rubber disk elements made of silicon-rubber mix											
Type	Size	Rubber element	Rated torque T_{KN}	Maximum torque $T_{Kmax\ 1}$	Maximum torque $T_{Kmax\ 2}$	Fatigue torque T_{KW} (10 Hz)	dynamic torsional stiffness $C_{T\ dyn}$ 0.1x T_{KN}	0.25x T_{KN}	0.5x T_{KN}	0.75x T_{KN}	1x T_{KN}
			Nm	Nm	Nm	Nm	Nm/rad	Nm/rad	Nm/rad	Nm/rad	Nm/rad
ESN.	**220**	NX	300	450	600	130	600	800	900	1300	1700
ESN.	**265**	NX	450	675	900	200	1000	1400	1700	2400	3100
ESN.	**290**	NX	750	1125	1500	320	1900	2400	3000	4200	5400
ESN.	**320**	NX	1150	1725	2300	480	4200	5300	6600	9300	12000
ESN.	**360**	NX	1800	2700	3600	720	4500	5600	7000	9800	12700
ESN.	**420**	NX	3000	4500	6000	1200	10600	13000	16000	23000	30000
ESN.	**465**	NX	4500	6750	9000	1800	18600	23000	29000	41000	53000
ESN.	**520**	NX	6100	9150	12200	2400	26000	33000	41000	58000	75000
ESD.	**520**	NX	12200	18300	24400	4800	52000	66000	82000	116000	150000
ESN.	**560**	NX	7500	11250	15000	3300	29000	36500	45700	64000	83000
ESD.	**560**	NX	15000	22500	30000	6600	58000	73000	91400	128000	166000
ESN.	**580**	NX	10000	15000	20000	4000	40000	49000	61000	87000	113000
ESD.	**580**	NX	20000	30000	40000	8800	80000	98000	122000	174000	226000
ESN.	**680**	NX	15000	22500	30000	6000	79000	100000	123000	172000	225000
ESD.	**680**	NX	30000	45000	60000	12000	158000	200000	246000	344000	450000
ESN.	**770**	NX	22500	33750	45000	9000	225000	263000	316000	376000	480000
ESD.	**770**	NX	45000	67500	90000	18000	450000	526000	632000	752000	960000

relative damping coefficient Ψ = 1.15

Caution!

For sustained faultfree operation the coupling must be designed with an safety factor S_S and temperature factor S_ϑ 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 1.7.1).

$T_{K\ max.\ 1}$ is the highest permitted maximum torque of the unit, caused by starting or stopping with traversing resonance.

$T_{K\ max.\ 2}$ is the highest permitted peak torque which due to the system can occur with limited frequency, e.g. short circuit, faulty synchronisation, emergency stop.

1.7.1 Checking the selected coupling size

The following must apply to the coupling:

$T_{KN} \geq T_N \times S_\vartheta \times S_S$

T_{KN} = rated coupling torque
T_N = Rated system torque - rated drive torque acting on the coupling
S_ϑ = Temperature factor
S_S = 1.1 for small coefficients of cyclic variation (eg. diesel-motor generator drive)
S_S = 1.5 for large coefficients of cyclic variation (eg. diesel-motor compressor drive)

The highest temperature in the immediate vicinity of the coupling must be applied

	T_U	-40 °C to +50 °C	to +60 °C	to +70 °C	to +80 °C	to +90 °C	to +100 °C	to +110 °C	to +120 °C
Rubber version SN, NN, WN	S_ϑ	1	1.25	1.4	1.6	–	–	–	–
Rubber version NX		1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.7

Table 1.7.1: Temperature factor S_ϑ

Caution!

Ambient temperatures exceeding 80 °C are not permitted for rubber versions SN, NN and WN.
Ambient temperatures exceeding 120 °C are not permitted for rubber version NX.

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

$T_{Kmax} \geq T_{max} \times S_\vartheta$

T_{Kmax} = Maximum coupling torque
T_{max} = Maximum system torque - peak drive torque acting on the coupling
S_ϑ = Temperature factor

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

$T_{KW} \geq T_W \times S_f \times S_\vartheta$

T_{KW} = Fatigue torque load on the coupling
T_W = Alternating torque load on the coupling
S_ϑ = Temperature factor
S_f = Frequency factor

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

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

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

For use in potentially explosive environments reduced fatigue coupling torques are permitted. The temperature factor and frequency factor remain unchanged.

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.

Caution!

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

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 (BA) 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 Operating Instructions (BA) 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

The copyright to these Operating Instructions (BA) is held by **FLENDER AG**.

These Operating Instructions (BA) must not be wholly or partly reproduced for competitive purposes, used in any unauthorised way or made available to third parties without our agreement.

Technical enquiries should be addressed to the following works

FLENDER AG	Telefon: 02871/92-2868
D 46393 Bocholt	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 Operating Instructions

This symbol indicates safety measures which must be observed with regard to **explosion protection.**

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

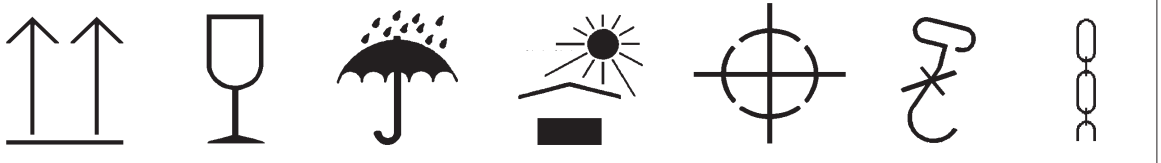
When handling FLENDER products, use only lifting and handling equipment of sufficient load-bearing capacity!

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 rubber part of the rubber disk element (5; 6) must be covered. The rubber part of the rubber disk element must not come into contact with oil or solvents.**

4.3.2 Storage of the rubber disk elements

4.3.2.1 General

Correctly stored rubber disk elements (5; 6) retain their properties unchanged for up to five years. Unfavourable storage conditions and improper treatment will negatively affect the physical properties of the rubber disk elements (5; 6). 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 rubber disk elements (5; 6) 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

The ELPEX-S coupling is a highly flexible rubber disk element.

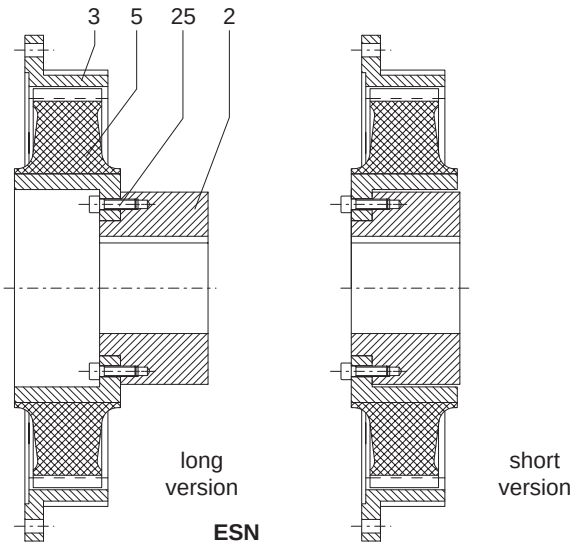
The rubber disk element (5; 6) is vulcanised by its inside radius onto a flange to receive a TAPER bush or a hub bored to customer requirements.

On its outside diameter the rubber disk element (5; 6) has a set of cams which engage in an outer flange (3).

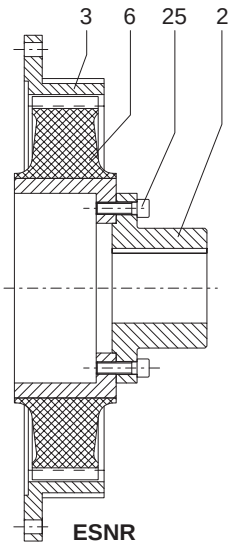
During assembly the rubber disk element (5; 6) is inserted into the outer flange (3). The connection is positive and virtually free of play.

The rubber disk element (5; 6) consists of a natural/synthetic rubber mixture or silicon rubber and is available from stock in a number of rubber disk element hardnesses.

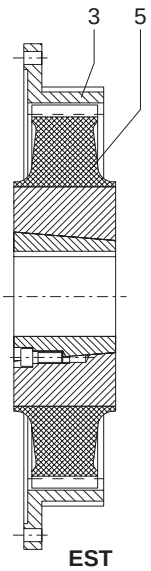
In the case of types ESNR, ESDR, ESNW and ESDW the rubber disk element (5; 6) can be fitted or demounted without having to move the coupled machines.



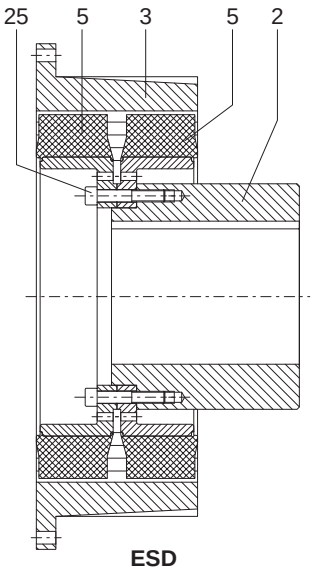
ESN



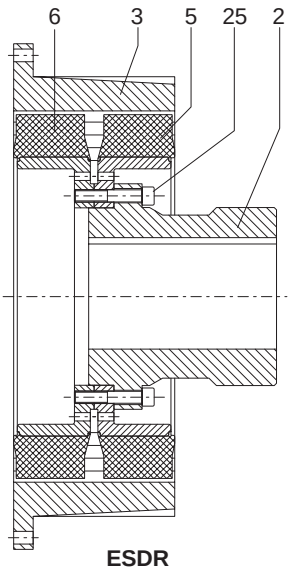
ESNR



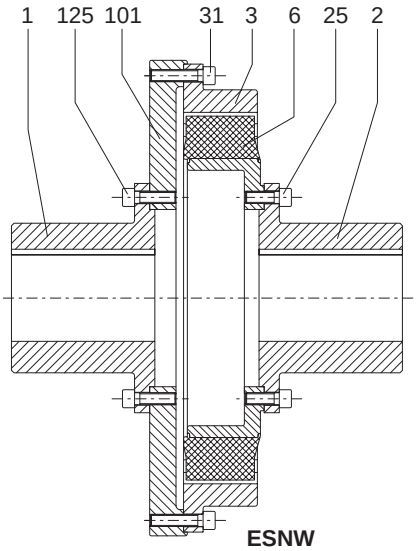
EST



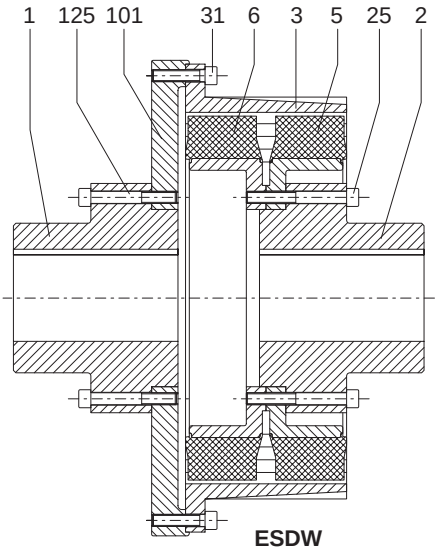
ESD



ESDR



ESNW



ESDW

5.2 Marking the coupling parts for explosion protection

Note: Couplings which are intended for use in potentially explosive areas must bear the following markings on part 3:

FLENDER AG	CE Ex II 2 G T3 D160 °C X
D 46393 Bocholt	CE Ex II 2 G T4 D120 °C X
ELPEX-S coupling - year of construction	– 40 °C ≤ T_a ≤ 80 °C

5.3 Service conditions

With reduced fatigue torque load the coupling is suited for service conditions in accordance with Guideline 94/9/EC.

Equipment group II (use above ground) of category 2 and 3 for areas where there are explosible gas, vapour, mist, air mixtures as well as for areas where dust can form explosible atmospheres.

Ex **For use in potentially explosive environments reduced fatigue torques must be adhered to.**
To determine the fatigue torque load, a torsional vibration calculation, for which the subassembly manufacturer is responsible, may be necessary.

Ex **ELPEX-S types with TAPER clamping bush are not suitable for use in explosible environments.**

5.3.1 Operation with low fatigue load

Ex **The fatigue torque T_{KW} in item 1.7 must be reduced by 70 %. In the case of these special operating conditions the coupling satisfies the requirements of temperature class T4 D120 °C.**

5.3.2 Operation with medium fatigue load

Ex **The fatigue torque T_{KW} in item 1.7 must be reduced by 50 %. In the case of these special operating conditions the coupling satisfies the requirements of temperature class T3 D160 °C.**

6. Mounting

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!**

Ex **Couplings with CE marking for use in potentially explosive areas are delivered exclusively as finish-bored units.**

6.1 Instructions for machining the finished bore, parallel keyway, axial retaining means, set screws and balancing

6.1.1 Finished bore

- Depreserve and if necessary clean Part 1 (1) and part 2 (2).

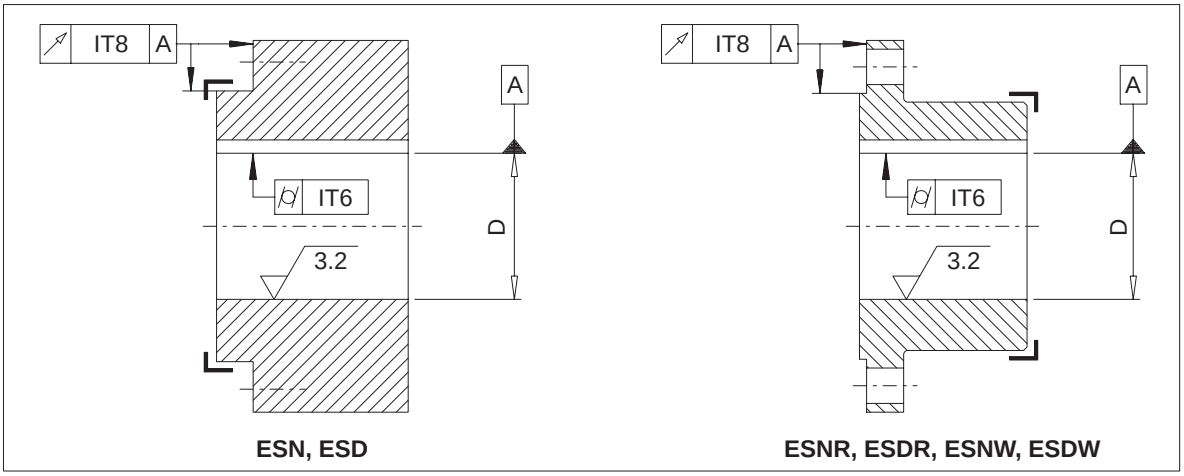
Note manufacturer's instructions for handling solvent.

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. 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.



ESN, ESD **ESNR, ESDR, ESNW, ESDW**

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

Selection of fit	Hole D over mm	Hole D up 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.

Failure to observe these instructions may result in breakage of the coupling. Danger from flying fragments!
The coupling then becomes an explosion hazard.

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.

6.1.3 Axial fastening

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.

If the coupling part mounted on the shaft does not lie up against the shaft shoulder, we recommend using grooved spacer rings.

6.1.4 Set screws

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

The following guidelines must be observed!

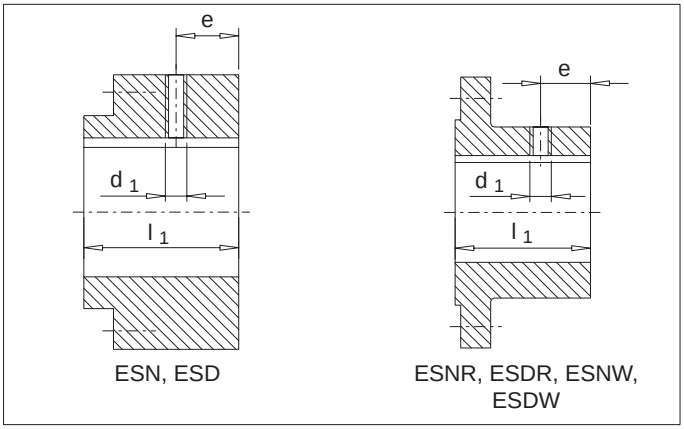
Caution! **The length of the set screw must be selected so that it fills the threaded hole, but does not project from the hub ($L_{min.} = d_1 \times 1.2$).**

The set screws must always be positioned on the keyway.

The distance dimension e is to be met with $e \approx 0.3 \times l_1$.

D over mm	D up to mm	Set screw d_1	Tightening torque T_A Nm
10	22	M 5	3
22	30	M 6	4
30	50	M 8	8
50	75	M 12	25
75	95	M 14	50
95	130	M 16	70
130	160	M 20	130

Table 6.1.4: Set screw assignment



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. To keep the amount of material to be removed to a minimum, a largest possible balance radius must be selected.

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

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.

If lacquered couplings are used in potentially explosive areas, the requirements made of the conductivity of the lacquer and the limitation on the thickness of the lacquer applied must be observed in accordance with EN 13463-1. Where lacquer coatings have a thickness less than 200 µm, no electrostatic charge is to be expected. Where lacquer coatings are thicker than 200 µm, an electrostatic charge, e.g. by cleaning the coupling, must be avoided.

The coupled machines must be adequately earthed.

6.3 Mounting the coupling parts

Before beginning installation, the shaft ends and the coupling parts must be carefully cleaned. The rubber portion of the rubber disk element (5; 6) must not come in contact with solvent.

Note manufacturer’s instructions for handling solvent.

Caution!

The hub (2) or the coupling part (1) should be fitted with the aid of suitable equipment to avoid possible damage to the shaft bearings through axial joining forces.
Always use suitable lifting equipment.

The shaft ends, particularly in the case of types ESNR, ESDR, ESNW and ESDW, must not project on the inner sides of the hub. Axial securing is effected by means of the set screw or end plate.

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!

Screw the rubber disk element (5; 6) or the rubber disk elements (5; 6) to the hub (2) as shown in the diagrams in section 5. Observe tightening torque in accordance with item 6.8.3.
Screw the flanged ring (101) on types ESNW and ESDW to the hub (1) as shown in the diagrams in section 5. Observe tightening torque in accordance with item 6.8.3.

Screw the outer flange (3) to the machine to be coupled or to the flanged ring (101). Note tightening torques as specified in item 6.8.1 and item 6.8.2. Fit the outer flange (3) and the rubber disk element (5; 6) together.

6.4 Mounting the TAPER clamping bush on type EST

Before mounting begins, the shaft ends and the outer and inner taper of the TAPER clamping bush must be carefully cleaned and degreased. When cleaning the rubber disk element (5) the rubber must not come into contact with solvent.

Note manufacturer's instructions for handling solvent.

Up to size 3030 = 2 and from size 3535 = 3 up the TAPER clamping bushes have axially parallel, cylindrical and smooth blind holes in the large end face, only half of which are in the material of the bush. The other half, which is in the hub, have threads.

Insert rubber disk element (5) and the TAPER clamping bush one inside the other, align holes and slightly tighten bolts.

Mount the coupling part with the TAPER clamping bush on the cleaned shaft and bring into the fitting position L_X (see section 1). Tighten the screws (for tightening torques see item 6.8.4).
During the screwing-on operation the hub is drawn onto the tapered bush and the bush thus pressed onto the shaft.

If the TAPER clamping bushes are to be used without parallel keys, the sliding torques and tightening torques (see item 6.8.4) must be observed. All TAPER clamping bushes are designed with a keyway for parallel keys with parallel sides (no wedges).

The screws can be retightened by lightly tapping the TAPER clamping bush with a hammer through a pad. If necessary, this step is to be repeated. Fill the unused holes in the TAPER clamping bushes with grease to prevent the ingress of dirt.

Screw the outer flange (3) to the machine to be coupled. Note tightening torques as specified in item 6.8.1 and item 6.8.2. Fit the outer flange (3) and the rubber disk element (5) together.

6.5 Demounting the TAPER clamping bushes

The TAPER clamping bushes are released by removing the bolts. One of the bolts is then screwed into the bush thread as a forcing-off screw and tightened.

From TAPER clamping bush no. 3535 up two forcing-off screws are provided.

The coupling part thus released can be pulled off by hand with the TAPER clamping bush without tools.

6.6 Alignment

The couplings pick up positional errors in the shaft ends to be connected up to the data shown in item 6.7.

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 rubber disk elements.

Alignment in the case of flanged couplings must be done from the coupling half on the shaft side to one of the machined surfaces of the motor flywheel or motor housing.

In the case of shaft couplings the angular and radial misalignment between the two coupling halves is determined in the usual way by passing a dial gauge over them.

6.7 Possible misalignments

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.**

Caution! **Angular and radial misalignments may occur at the same time.**

Coupling size	220	265	290	320	360	420	465	520	560	580	680	770
Axial misalignment ΔKa (mm) 	3	4	5	5	5	5	5	4	4	3	3	3
Radial misalignment ΔKr (mm) 	1.2	1.2	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.5
Angular misalignment ΔKw 	0.5°	0.5°	0.5°	0.5°	0.5°	0.4°	0.4°	0.4°	0.4°	0.3°	0.3°	0.3°

6.8 Bolt tightening torques

To ensure reliable torque transmission, all bolts must be tightened to the prescribed tightening torques.

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

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 %.**

6.8.1 Bolt tightening torques for bolting the outer flange (3) to the motor flywheel

Size of flywheel to SAE J620d	6 1/2	7 1/2	8	10	11 1/2	14	16	18	21	24	–
Flange connection D_1 in mm	215.9	241.3	263.5	314.3	352.4	466.7	517.5	571.5	673.5	733.5	860, 920, 995
Bolt size	M 8		M 10			M 12		M 16		M 20	
Tightening torque in Nm	25		49			86		210		420	
Inch bolts	5/16 - 18		3/8 - 16			1/2 - 13		5/8 - 11		3/4 - 10	
Tightening torque in Nm	24		42			102		203		340	

Bolts of strength class 8.8 must be used, if possible, with a shim to DIN 125.

6.8.2 Bolt tightening torques for bolting the outer flange (3) to the flanged ring (101) of types ESNW, ESDW

Coupling size	265, 290, 320, 360	420, 465	520, 560, 580, 680	770
Bolt size	M10	M12	M16	M20
Tightening torque in Nm	49	86	210	420

Bolts of strength class 8.8 must be used, if possible, with a shim to DIN 125.

6.8.3 Bolt tightening torques for bolting the hub (2) to the rubber disk element (5; 6) and the hub (1) to the flanged ring (101)

Coupling size	220	265	290 320	360 420	465		520		560		580, 680, 770		ESDR 770
Bolt size	M 8	M 12	M 12	M 16	M 16	M 20	M 16	M 20	M 16	M 20	M 20	M 24	M 24
Tightening torque in Nm	35	86	86	210	210	420	210	420	210	420	420	710	1000
Strength class	10.9	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	10.9

6.8.4 TAPER clamping bushes

TAPER clamping bush **No.**	Bushes Hole D mm	Sliding torque 1) T_R Nm	Tightening torque T_A Nm	Spanner width S_W DIN 911 S mm
2012	24 42 50	165 340 420	31	6
2517	24 48 60	220 510 670	48	6
3030	38 55 75	520 890 1300	90	8
3535	42 75 90	1000 2150 2600	113	10
4040	48 75 100	1700 3150 4400	170	12
4545	55 75 110	2500 3900 6300	192	14

1) The specified sliding torques T_R apply to the use of TAPER clamping bushes without a parallel key, taking into consideration the specified tightening torques T_A. These sliding torques apply to the service factor $f_1 = 1$. Sliding torques for holes which are not specified in the table can be obtained by interpolation.
The precondition for achieving the specified sliding torques is always a clean, greasefree surface of the parts to be fitted one inside the other and thorough greasing of the tightening bolts.
A parallel key is necessary, if the operating torque of the coupling is greater than the sliding torque of the bush.

7. Start-up

7.1 Procedure before start-up

Before starting up, check the tightness of the set screws and check and, if necessary, adjust the alignment, and check the specified tightening torques of all the screw connections (see 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	Possible 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.
	Rubber disk elements (5; 6) worn	Take the system out of service. Remove and replace the rubber disk element (5; 6). Check and, if necessary, adjust alignment (see section 6). 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. Directive 94/9/EC requires the manufacturer and user to exercise especial care.

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

Through incorrect use the coupling may become an explosion hazard.

Caution! **Incorrect use of the ELPEX-S 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 are not communicated.
- 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.
- Torsional vibration hazard was not identified.
- Fatigue torque load too high, or the restriction stated in item 5.3 not taken into consideration.

9.3.2 Possible faults when installing the coupling

- Components with transport or other damage are being fitted.
- 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, and as a result shifting of the machines e.g. through loosening of the foundation screw connection is causing excessive displacement of the coupling parts.
- The coupled machines are not sufficiently earthed.
- ELPEX-S rubber disk element (5; 6) is not correctly positioned.
- The coupling housing used is not suitable or does not conform to the applicable guidelines.
- Operating instructions are being changed without authorisation.

9.3.3 Possible faults in maintenance

- Maintenance intervals are not being adhered to.
- An original FLENDER ELPEX-S rubber disk element (5; 6) is not being used.
- An old or damaged ELPEX-S rubber disk element (5; 6) is being used.
- 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 General

Inspections are limited to a visual assessment of the condition of the coupling. Where identifiable, damage or cracks in the rubber disk element, binding screws and any damage caused by force must be watched out for. The inspection of the coupling should always be carried out at the same time as the inspection of the entire system, or at least once a year.

10.2 Replacement of wearing parts

Rubber disk elements must be replaced as soon as cracks of a length exceeding 20 mm or a depth exceeding 5 mm appear on the surface.

Only **original ELPEX-S rubber disk elements** must be used for replacement in order to guarantee troublefree torque transmission and faultfree operation.

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 11.2.)

– Description / size

– Quantity

We guarantee only the original spare parts supplied by FLENDER.

Caution!

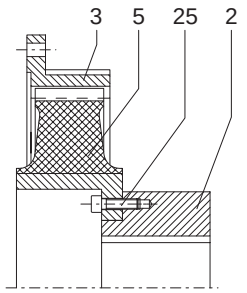
Please note that spare parts and accessories not supplied by us have not been tested or approved by us. The installation or use of such products may therefore impair essential characteristics of the coupling under certain circumstances and so pose an active or passive hazard. FLENDER will assume no liability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

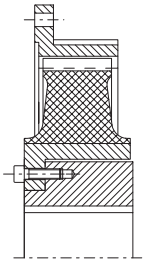
11.1 Spare parts and customer service addresses

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

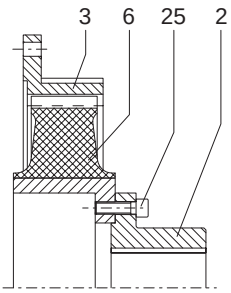
11.2 Spare parts list



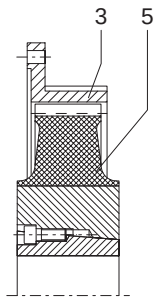
long version



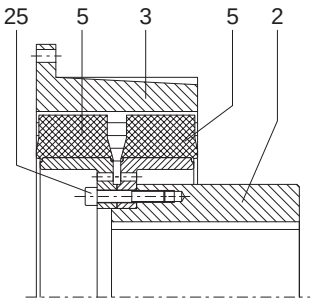
ESN short version



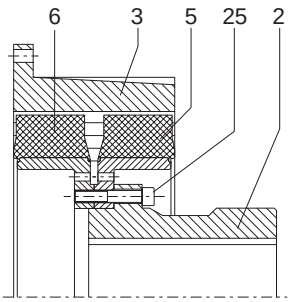
ESNR



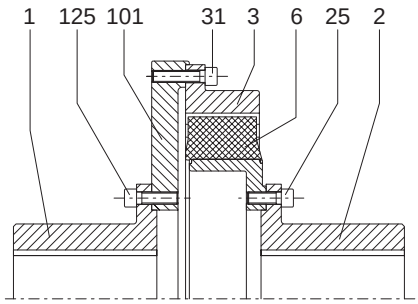
EST



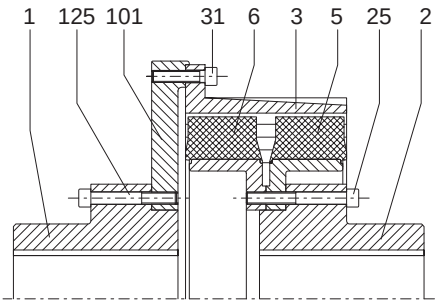
ESD



ESDR



ESNW



ESDW

Part no.	Description	ESN	ESNR	EST	ESD	ESDR	ESNW	ESDW
1	Part 1 1)						x	x
2	Part 2	x	x		x	x	x	x
3	Part 3	x	x	x	x	x	x	x
5	Rubber disk element	x		x	x	x		x
6	Rubber disk element		x			x	x	x
25	Bolt	x	x		x	x	x	x
31	Bolt						x	x
101	Flange 1)						x	x
125	Bolt 1)						x	x
201	Retaining ring 2)		x				x	

Table 11.2: Spare parts list

1) Depending on the size, part 1 is also constructed in two parts (1; 101) with a screw connection (125).

2) The type ESNR can be constructed with a retaining ring (201) or threads in part 5.

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12. Declaration by the manufacturer / Declaration of Conformity

Declaration by the manufacturer

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

We hereby declare that the

Highly flexible **ELPEX-S** couplings
ESN, ESNR, ESD, ESDR, EST, ESNW and **ESDW** types
including design in accordance with Directive 94/9/EC

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).

Bocholt, 2004-11-11

Signature (Director Engineering)

Declaration of Conformity

within the meaning of EC Guideline 94/9/EC of 23.03.94
and with the legal requirements laid down for its implementation

The manufacturer A. Friedr. Flender AG, D 46393 Bocholt, declares that the

Highly flexible **ELPEX-S** couplings
ESN, ESNR, ESD, ESDR, EST, ESNW and **ESDW** types
including design in accordance with Directive 94/9/EC

equipment described in these operating instructions is in conformity with Article 1 and Article 8, Par graph 1) b) ii) of Guideline 94/9/EC and complies with the requirements of Guideline 94/9/EC and the standards EN 1127-1 : 1997, DIN EN 13463-1 / -5 / -6 / -8 and BGR 132 : 2003.

The technical documentation has been delivered to the named body

EXAM, BBG Prüf- und Zertifizier GmbH, D 44727 Bochum, Code Number: 0158.

Bocholt, 2004-11-11

Signature (Director Engineering)

Signature (Couplings Division)