SMDP Series

Flexible Disc Coupling

Technical Catalogue

2015

Our Vision

ASK's vision is to be a recognized leader in innovative, sustainable, engineered, and customer-focused solutions for performance critical applications in the oil and gas, hydrocarbon processing, power generation, pulp and paper, and other selected industries.

Our mission

ASK aims to be a multi-industry company with a strong brand, which provides solutions that combine products, services, engineering, and customer-application expertise. The corporation is close to the customer by being direct-sales driven.
Engineering, innovation, and technology are cornerstones. ASK strives to be an attractive employer and to create an environment where employees can excel. The company focuses on creating value for its customers.

ASK Innotec

The research and development unit of ASK supports the other divisions of the company and industrial companies in their development projects by providing a contract including research and special technical services like diagnostics and certified testing as well as one-off production and engineering. ASK innotec has expertise in materials and surface engineering, fluid technology, as well as in mechanics. Its core competencies in research contract also lie in these classical disciplines.

Product Description

SMDP All Stainless Steel Couplings are outstanding for their application-optimized construction. The two types SMDP-I and SMDP-A have been specially designed for drives with uniform to medium loads and at the same time meet the requirements of API 610 & API 671. Their use in potentially explosive environments in accordance with Directive 94/9/EC is possible.

SMDP-I TYPE

The ASK type SMDP-I is a general purpose high speed high torque disc coupling used where minimum coupling weight is desirable. It is available as a standard flexible membrane coupling or in special designs.

Applications:
- Pumps
- Compressors
- Fans

Design Features include:
- Unitized disc packs allowing easy installation
- High torque to outer diameter ratio resulting in smaller coupling selection and higher speed potential

Industry Compliant:
- API 610
- ISO 14691
- ATEX II 2GD c T5

Technical data:

Power ratings

Size	Rated torque	Maximum torque	Overload torque	Fatigue torque	Maximum speed	Maximum permitted shaft misalignment							Torsional stiffness				
						$\pm\Delta K_a$	$\pm\Delta K_w$	$\pm\Delta K_r$					C_T				
	T_{KN}	T_{Kmax}	T_{KOL}	T_{KW}	n_{Kmax}			S = 100 mm	S = 140 mm	S = 180 mm	S = 200 mm	S = 250 mm	S = 100 mm	S = 140 mm	S = 180 mm	S = 200 mm	S = 250 mm
	Nm	Nm	Nm	Nm	rpm	mm		mm	mm	mm	mm	mm	MNm/rad	MNm/rad	MNm/rad	MNm/rad	MNm/rad
88	190	270	450	70	21700	1.10	0.7°	1.15	1.64	–	–	–	0.04	0.04	–	–	–
115	270	410	680	110	16600	1.81		1.15	1.64	2.13	–	–	0.09	0.09	0.08	–	–
135	580	870	1450	230	12700	2.02		1.14	1.62	2.11	–	–	0.21	0.19	0.17	–	–
150	660	100	1650	270	11400	2.41		1.14	1.62	2.11	2.36	2.97	0.27	0.25	0.24	0.23	0.21
176	1220	1900	3100	490	9750	2.75		1.11	1.6	2.09	2.33	2.94	0.44	0.40	0.38	0.36	0.34
185	1875	2900	4700	750	9300	2.85		1.09	1.58	2.06	2.31	2.92	0.56	0.52	0.49	0.47	0.44
212	2850	4230	7200	1200	8100	3.06		1.10	1.59	2.08	2.32	2.93	0.81	0.75	0.70	0.67	0.62
225	4200	6300	10500	1700	7650	3.14		–	1.59	2.08	2.32	2.93	–	0.85	0.81	0.79	0.74
256	5750	8700	15000	2300	6700	3.69		–	1.56	2.05	2.3	2.91	–	1.37	1.31	1.29	1.22
272	8050	12000	20000	3200	6300	3.85		–	1.51	2	2.25	2.86	–	1.44	1.39	1.36	1.3
298	10000	15000	25000	4000	5150	4.19		–	1.47	1.95	2.2	2.81	–	1.47	1.43	1.41	1.37
325	12000	18000	30000	4800	4700	4.45		–	–	1.93	2.17	2.79	–	–	2.48	2.44	2.34

Permitted shaft misalignments

Size	Permitted angular misalignment $\pm\Delta K_w$ 0.0°	0.1°	0.2°	0.3°	0.4°	0.5°	0.6°	0.7°
	Permitted axial misalignment $\pm\Delta K_a$ in mm							
88	1.10	0.94	0.79	0.63	0.47	0.31	0.16	0.00
115	1.81	1.55	1.29	1.03	0.77	0.52	0.26	0.00
135	2.02	1.73	1.44	1.15	0.86	0.58	0.29	0.00
150	2.41	2.06	1.72	1.38	1.03	0.69	0.34	0.00
176	2.75	2.36	1.96	1.57	1.18	0.79	0.39	0.00
185	2.85	2.45	2.04	1.63	1.22	0.82	0.41	0.00
212	3.06	2.63	2.19	1.75	1.31	0.88	0.44	0.00
225	3.14	2.69	2.24	1.80	1.35	0.90	0.45	0.00
256	3.69	3.16	2.64	2.11	1.58	1.05	0.53	0.00
272	3.85	3.30	2.75	2.20	1.65	1.10	0.55	0.00
298	4.19	3.59	2.99	2.39	1.80	1.20	0.60	0.00
325	4.45	3.82	3.18	2.54	1.91	1.27	0.64	0.00

SMDP-A TYPE

This type retains the piloted center member to provide fast installation and repeatable balance significantly reducing your installation and service time. In addition the SMDP-A is engineered with optimum torque density ratios to minimize overhung loads while transmitting maximum torque and ensuring reliable and safe performance. The SMDP-A meets API610 / ISO 13709 as manufactured and API671 / ISO 10441 when specified.

Applications:

- Pumps
- Compressors
- Fans
- Synchronized rollers
- Wire Feeders
- Blowers

Design Features include:

- Optimum torque density providing low overhung loads/lower cost of ownership
- Standard hardware balancing requires no special tooling
- Longer life due to standard overload bushings

Industry Compliant:

- API 671/ISO 10441
- API 610/ISO 13709
- ISO 14691
- ATEX II 2GD c T5

Technical data:

Power ratings

Size	Rated torque	Maximum torque	Overload torque	Fatigue torque	Maximum speed	Maximum permitted shaft misalignment							Torsional stiffness				
						$\pm\Delta K_a$	$\pm\Delta K_w$	$\pm\Delta K_r$					C_T				
	T_{KN}	T_{Kmax}	T_{KOL}	T_{KW}	n_{Kmax}			S = 100 mm	S = 140 mm	S = 180 mm	S = 200 mm	S = 250 mm	S = 100 mm	S = 140 mm	S = 180 mm	S = 200 mm	S = 250 mm
	Nm	Nm	Nm	Nm	rpm	mm		mm	mm	mm	mm	mm	MNm/rad	MNm/rad	MNm/rad	MNm/rad	MNm/rad
64	100	150	250	40	22500	0.80	0.7°	0.78	1.27	–	–	–	0.009	0.008	–	–	–
96	210	310	530	85	19900	1.15		0.78	1.27	–	–	–	0.06	0.05	–	–	–
120	490	740	1250	200	15900	1.47		0.65	1.14	1.62	–	–	0.17	0.15	0.13	–	–
142	925	1400	2300	370	13400	1.73		–	1.04	1.53	–	–	–	0.28	0.25	–	–
162	1600	2400	4000	640	11800	2.07		–	0.92	1.40	1.65	2.26	–	0.43	0.39	0.38	0.34
190	2500	3800	6300	1000	10000	2.36		–	0.93	1.42	1.66	2.27	–	0.71	0.65	0.63	0.57
214	3900	5900	9800	1600	8900	2.67		–	0.78	1.27	1.51	2.13	–	1.01	0.94	0.92	0.85
230	5200	7800	13000	2100	8300	2.88		–	–	1.25	1.49	2.10	–	–	1.36	1.32	1.22
245	7000	10500	18000	2800	7800	2.99		–	–	1.00	1.25	1.86	–	–	1.49	1.45	1.37
275	9800	15000	25000	4000	6250	3.38		–	–	–	1.22	1.83	–	–	–	1.65	1.58
310	12900	20000	33000	5200	5550	3.85		–	–	–	–	1.64	–	–	–	–	2.96
345	17000	26000	43000	6800	5000	4.24		–	–	–	–	1.61	–	–	–	–	4.12

Permitted shaft misalignments

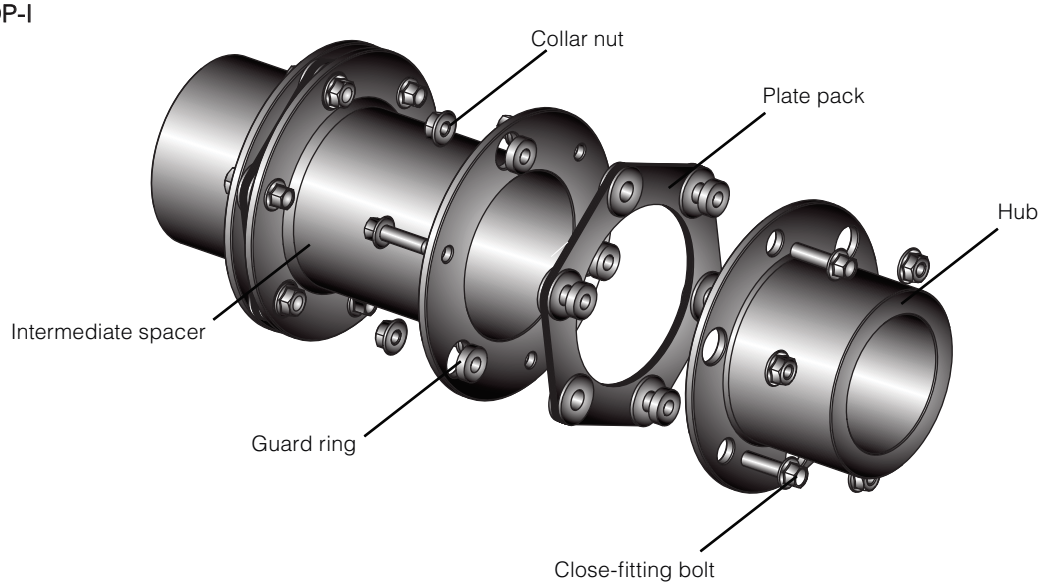
Size	Permitted angular misalignment $\pm\Delta K_w$							
	0.0°	0.1°	0.2°	0.3°	0.4°	0.5°	0.6°	0.7°
	Permitted axial misalignment $\pm\Delta K_a$ in mm							
64	0.80	0.68	0.57	0.46	0.34	0.23	0.11	0.00
96	1.15	0.99	0.82	0.66	0.49	0.33	0.16	0.00
120	1.47	1.26	1.05	0.84	0.63	0.42	0.21	0.00
142	1.73	1.48	1.23	0.99	0.74	0.49	0.25	0.00
162	2.07	1.77	1.48	1.18	0.89	0.59	0.30	0.00
190	2.36	2.02	1.68	1.35	1.01	0.67	0.34	0.00
214	2.67	2.29	1.91	1.53	1.14	0.76	0.38	0.00
230	2.88	2.47	2.06	1.65	1.23	0.82	0.41	0.00
245	2.99	2.56	2.13	1.71	1.28	0.85	0.43	0.00
275	3.38	2.90	2.41	1.93	1.45	0.97	0.48	0.00
310	3.85	3.30	2.75	2.20	1.65	1.10	0.55	0.00
345	4.24	3.64	3.03	2.42	1.82	1.21	0.61	0.00

Overal benefits

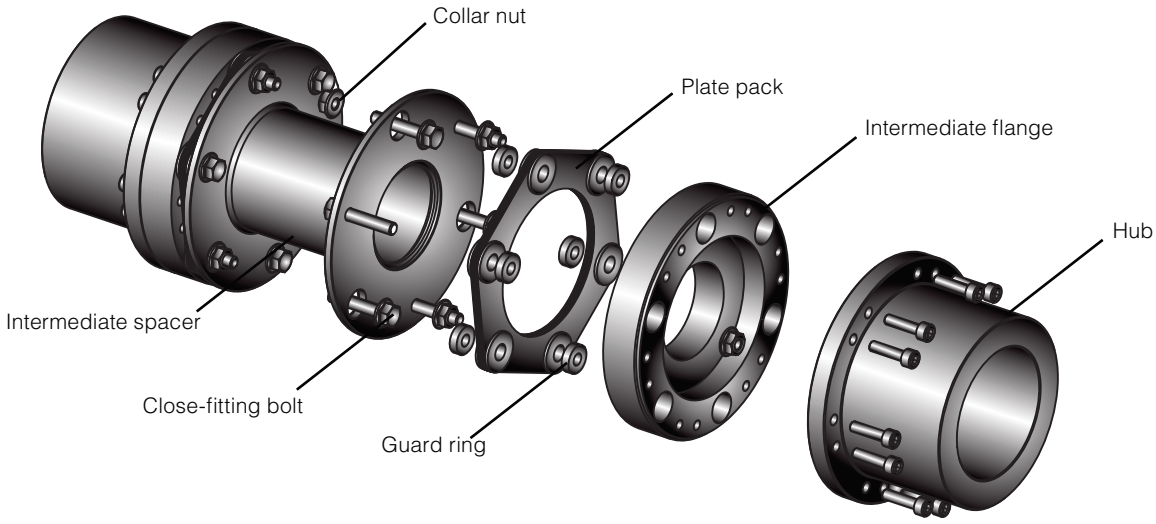
- Reduced moment configurations
- Maintenance Free
- Never requires lubrication
- All parts made in Stainless Steel
- Compliance with API 610 & API 671
- Inherent fail-safe design
- Unitised Membrane Pack assembly
- Metal Membrane construction provides optimum power and mis-alignment capability
- No additional balance tools required
- Improved balance and reliability
- Reduce windage configurations
- Minimised weights and interias
- Large Bore Hubs available
- Speeds up to 22,500rpm, from the standard range

Exploded View

Type SMDP-I

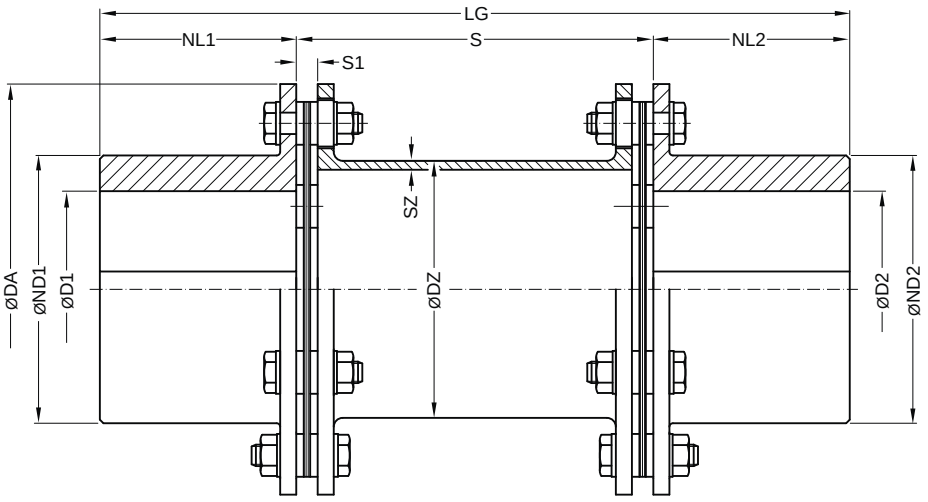


Type SMDP-A



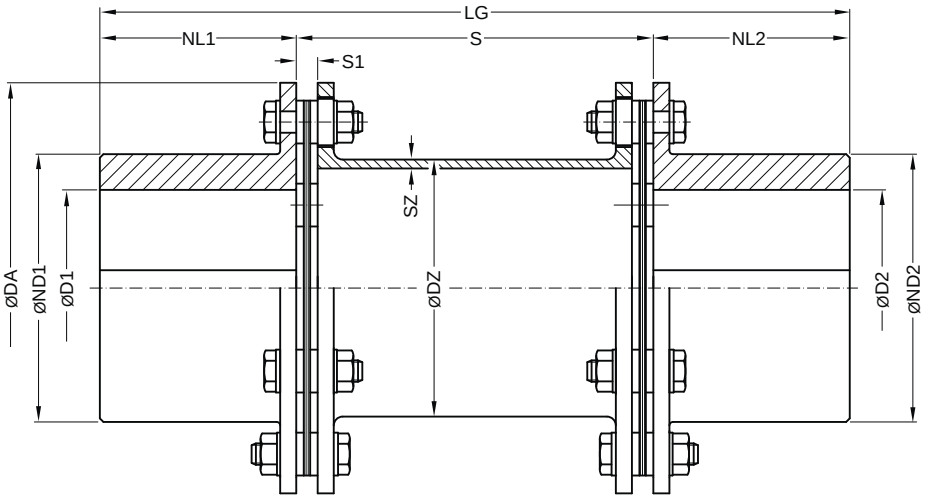
SMDP-I - Selection and ordering data

Torsionally rigid type SMDP-I coupling with radially freely dismountable intermediate spacer and catcher device for securing the inter-mediate spacer in the event of plate breakage. Standard coupling type in accordance with API 610.



Size	Rated torque	Maximum speed	Dimensions in mm								Mass moment of inertia	Product code	Weight
DA	T_{KN}	n_{Kmax}	D1/D2 Keyway DIN 6885	ND1/ND2	DZ	SZ	NL1/ NL2	S1	Shaft distance S	LG	J		m
mm	Nm	rpm	max.								kgm^2		kg
88	190	21 700	35	48	45	2.5	40	6	100	180	0.001	**SMDP-I-88-100**	1.6
									140	220	0.001	**SMDP-I-88-140**	1.7
115	270	16 600	55	75	72	2.5	55	6	100	210	0.005	**SMDP-I-115-100**	3.2
									140	250	0.005	**SMDP-I-115-140**	3.4
									180	290	0.005	**SMDP-I-115-180**	3.6
135	580	12 700	65	86	84	2.5	65	7	100	230	0.011	**SMDP-I-135-100**	5.2
									140	270	0.012	**SMDP-I-135-140**	5.4
									180	310	0.012	**SMDP-I-135-180**	5.6
150	660	11 400	75	101	99	2.5	75	7	100	250	0.019	**SMDP-I-150-100**	7.2
									140	290	0.020	**SMDP-I-150-140**	7.5
									180	330	0.021	**SMDP-I-150-180**	7.7
									200	350	0.021	**SMDP-I-150-200**	7.8
									250	400	0.022	**SMDP-I-150-250**	8.1
176	1 220	9 750	85	117	114	2.5	85	9	100	270	0.041	**SMDP-I-176-100**	11.4
									140	310	0.042	**SMDP-I-176-140**	11.7
									180	350	0.043	**SMDP-I-176-180**	12.0
									200	370	0.044	**SMDP-I-176-200**	12.1
									250	420	0.045	**SMDP-I-176-250**	12.4
185	1 875	9 300	90	122	120	3.0	90	11	100	280	0.056	**SMDP-I-185-100**	13.5
									140	320	0.057	**SMDP-I-185-140**	13.9
									180	360	0.058	**SMDP-I-185-180**	14.2
									200	380	0.058	**SMDP-I-185-200**	14.4
									250	430	0.060	**SMDP-I-185-250**	14.8

SMDP-I - Selection and ordering data (Continued)



Size	Rated torque	Maximum speed	Dimensions in mm								Mass moment of inertia	Product code	Weight
									Shaft distance				
DA	T_{KN}	n_{Kmax}	D1/D2 Keyway DIN 6885	ND1/ND2	DZ	SZ	NL1/ NL2	S1	S	LG	J		m
mm	Nm	rpm	max.								kgm^2		kg
212	2 850	8 100	100	134	131	3.0	100	10	100	300	0.095	**SMDP-I-212-100**	18.3
									140	340	0.097	**SMDP-I-212-140**	18.6
									180	380	0.098	**SMDP-I-212-180**	19.0
									200	400	0.099	**SMDP-I-212-200**	19.2
									250	450	0.101	**SMDP-I-212-250**	19.7
225	4 200	7 650	105	141	139	4.0	105	10	140	350	0.134	**SMDP-I-225-140**	22.8
									180	390	0.136	**SMDP-I-225-180**	23.3
									200	410	0.137	**SMDP-I-225-200**	23.6
									250	460	0.140	**SMDP-I-225-250**	24.2
256	5 750	6 700	120	163	162	5.0	120	12	140	380	0.262	**SMDP-I-256-140**	34.3
									180	420	0.267	**SMDP-I-256-180**	35.1
									200	440	0.270	**SMDP-I-256-200**	35.5
									250	490	0.276	**SMDP-I-256-250**	36.5
272	8 050	6 300	125	171	170	5.0	130	16	140	400	0.373	**SMDP-I-272-140**	42.9
									180	440	0.378	**SMDP-I-272-180**	43.7
									200	460	0.381	**SMDP-I-272-200**	44.1
									250	510	0.388	**SMDP-I-272-250**	45.1
298	10 000	5 150	140	189	186	6.0	140	20	140	420	0.559	**SMDP-I-298-140**	53.6
									180	460	0.567	**SMDP-I-298-180**	54.7
									200	480	0.572	**SMDP-I-298-200**	55.2
									250	530	0.582	**SMDP-I-298-250**	56.5
325	12 000	4 700	150	203	200	6.5	150	22	180	480	0.851	**SMDP-I-325-180**	69.4
									200	500	0.857	**SMDP-I-325-200**	70.0
									250	550	0.872	**SMDP-I-325-250**	71.6

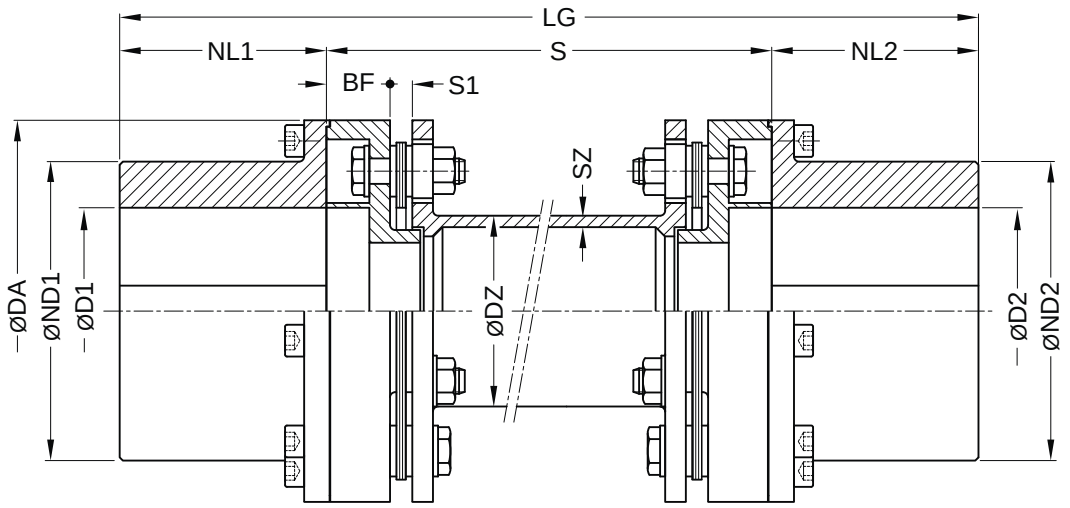
Hubs are designed with threaded pull-off holes.
Type SMDP-I with spacer machined on all sides, available in various standard lengths.
Other spacer lengths are available on request.
Weights and mass moments of inertia apply to the entire coupling with maximum bores D1/D2.

Ordering example:
SMDP-I coupling, size 135,
with shaft distance S = 140 mm

Product code:
SMDP-I-135-140

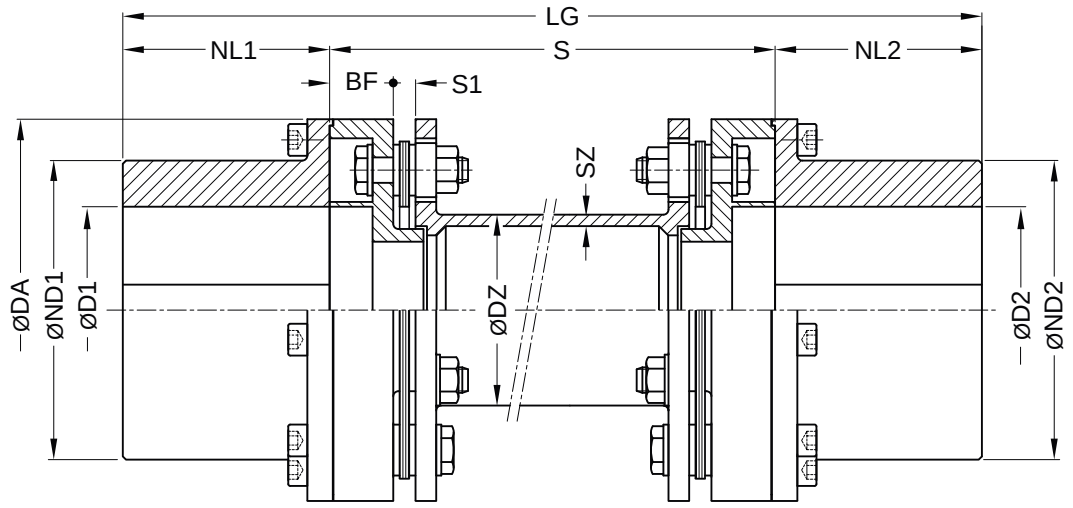
SMDP-A - Selection and ordering data

Torsionally rigid type SMDP-A coupling with radially freely dismountable intermediate unit and catcher device for securing the inter-mediate spacer in the event of plate breakage. Standard coupling type in accordance with API 610. Coupling type in accordance with API 671 possible.



Size	Rated torque	Maximum speed	Dimensions in mm									Mass moment of inertia	Product code	Weight
DA	T_{KN}	n_{Kmax}	D1/D2 Keyway DIN 6885	ND1/ND2	DZ	SZ	NL1/ NL2	S1	BF	Shaft distance S	LG	J		m
mm	Nm	rpm	max.									kgm^2		kg
96	210	19900	50	70	45	2.5	50	6	15	100	200	0.004	**SMDP-A-96-100**	3.8
										140	240	0.005	**SMDP-A-96-140**	3.9
120	490	15900	65	94	60	3.6	65	7	20	100	230	0.016	**SMDP-A-120-100**	8.1
										140	270	0.016	**SMDP-A-120-140**	8.3
										180	310	0.016	**SMDP-A-120-180**	8.5
142	925	13400	75	109	72	4.8	75	9	23	140	290	0.035	**SMDP-A-142-100**	13.2
										180	330	0.035	**SMDP-A-142-140**	13.6
162	1600	11800	85	122	84.5	5.5	85	11	27	140	310	0.066	**SMDP-A-162-140**	19.2
										180	350	0.067	**SMDP-A-162-180**	19.7
										200	370	0.067	**SMDP-A-162-200**	19.9
										250	420	0.068	**SMDP-A-162-250**	20.4
190	2500	10000	105	145	97.6	7.0	105	10	27	140	350	0.136	**SMDP-A-190-140**	28.4
										180	390	0.138	**SMDP-A-190-180**	29.0
										200	410	0.138	**SMDP-A-190-200**	29.4
										250	460	0.140	**SMDP-A-190-250**	30.1
214	3900	8900	115	164	110	9.1	115	10	33	140	370	0.251	**SMDP-A-214-140**	41.7
										180	410	0.253	**SMDP-A-214-180**	42.6
										200	430	0.254	**SMDP-A-214-200**	43.1
										250	480	0.257	**SMDP-A-214-250**	44.2
230	5200	8300	125	174	123	8.8	125	12	33	180	430	0.359	**SMDP-A-230-180**	51.5
										200	450	0.361	**SMDP-A-230-200**	52.0
										250	500	0.365	**SMDP-A-230-250**	53.2
245	7000	7800	130	185	128	12.2	130	16	41	180	440	0.532	**SMDP-A-245-180**	67.0
										200	460	0.534	**SMDP-A-245-200**	67.7
										250	510	0.540	**SMDP-A-245-250**	69.5

SMDP-A - Selection and ordering data (Continued)



Size	Rated torque	Maximum speed	Dimensions in mm									Mass moment of inertia	Product code	Weight
DA	T_{KN}	n_{Kmax}	D1/D2 Keyway DIN 6885	ND1/ND2	DZ	SZ	NL1/ NL2	S1	BF	Shaft distance S	LG	J		m
mm	Nm	rpm	max.									kgm^2		kg
275	9800	6250	150	213	148	12.6	150	20	40	200	500	0.917	**SMDP-A-96-100**	91.1
										250	550	0.927	**SMDP-A-96-140**	93.3
310	12900	5550	170	240	160	13.5	170	22	47	250	590	1.670	**SMDP-A-120-100**	131.7
345	17000	5000	190	267	172	18.5	190	24	47	250	630	2.742	**SMDP-A-120-140**	176.1

Hubs are designed with threaded pull-off holes.
Type SMDP-A with spacer machined on all sides, available in various standard lengths.
Other spacer lengths are available on request.
Weights and mass moments of inertia apply to the entire coupling with maximum bores D1/D2.

Ordering example:
SMDP-A coupling, size 275,
with shaft distance S = 200 mm

Product code:
SMDP-A-275-200

Service Factors

Service Factors are a means of classifying different equipment and applications into various load classifications. Due to variations in application of equipment, service factors are used to adjust equipment ratings to accommodate for variable loading conditions.

Load Characteristics	Electric Motor, Steam Turbine Gas Turbine	Steam Engine, Water Turbine, 8 Cyl. Recip. Engine	6 Cyl. Recip. Engine	4 Cyl. Recip. Engine
Constant Torque eg. Centrifugal pumps, compressors & blowers, light duty agitors and fans.	1.0	1.5	2.0	2.5
Slight Fluctuations eg. Slurry pumps, Screw compressors, Lobe and Vane Blowers.	1.5	2.0	2.5	3.0
Moderate Fluctuations and/or Slight Shock Loads Double acting pumps, Recip. Comp.	2.0	2.5	3.0	3.5
Large Fluctuations and/or Moderate Shock Loads 1 or 2 Cylinder Recip. pumps.	2.5	3.0	3.5	4.0
Shock Loads or Light Torque Reversals Slitters, Rod Mill, Hot Mill	3.0	3.5	4.0	Consult Factory
Heavy Shock Loads or Large Torque Reversals Feed Rolls, Reversing Mills	Consult Factory	Consult Factory	Consult Factory	Consult Factory

(1) Use a minimum Service Factor of 1.25 when driving through a gearbox or using a direct on-line electric motor.
(2) Consult ASK when using a Reciprocating Engine of less than 4 cylinders.
(3) Service Factors provided are for reference only. Customer experience may dictate the selection of different Service Factors.

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