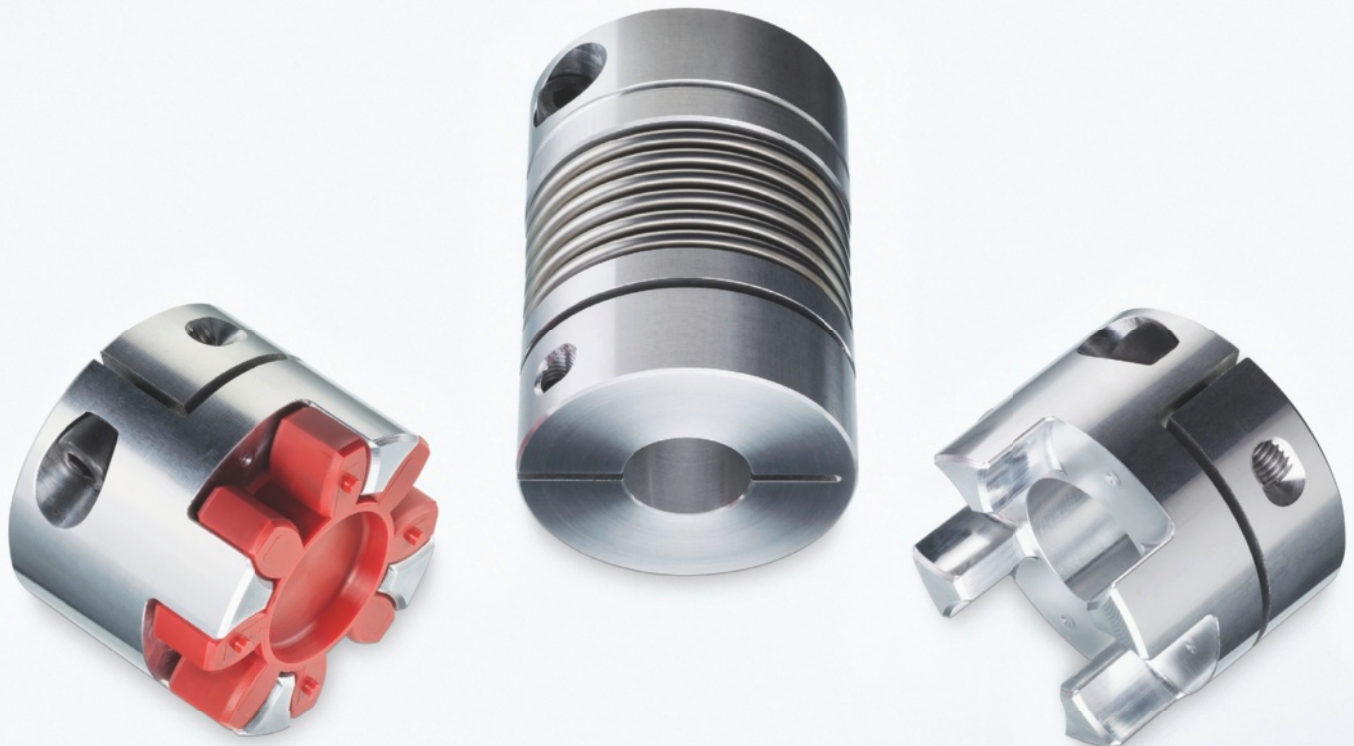


SIEMENS



SIPEX and BIPEX-S

Backlash-free Couplings
















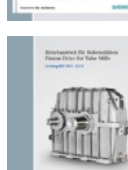


FLENDER couplings

Catalog
MD 10.3

Edition
2015

Answers for industry.

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<p>Gear Units Sizes 23–28</p> <p>MD 20.11</p> <p>E86060-K5720-A211-A3-6300</p>		<p>Industry Mall Information and Ordering Platform in the Internet:</p> <p>www.siemens.com/industrymall</p> 	

SIPEX and BIPEX-S

Backlash-free Couplings

FLENDER couplings



Catalog MD 10.3 · 2015

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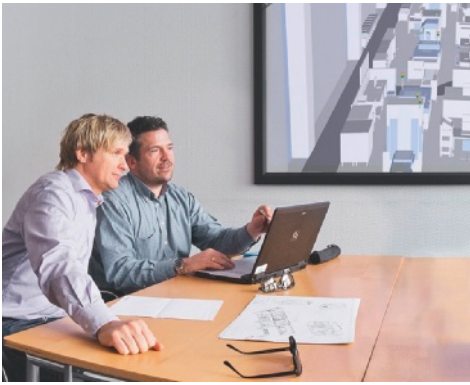
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Integrated technologies, vertical market expertise and services for greater productivity, energy efficiency, and flexibility.

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FLENDER Standard Couplings

Series SIPEX Torsionally Rigid Couplings, Series BIPEX-S Flexible Couplings

Article number code

Overview

The article number consists of a combination of digits and letters and is divided into three blocks linked by hyphens for better clarity. The coupling series, the type and the size are encoded in blocks 1 and 2. Block 3 contains information applying only to the coupling specified in blocks 1 and 2. The three blocks of the article number are supplemented by information on the bore of the coupling hub parts and information on "Special Types".

The bore details with the code letter L always refer to the bore diameter D1 of the hub part shown on the left on the dimension drawing. The order code beginning with M always refers to the bore diameter D2 of the hub part shown on the right on the dimension drawing.

The order code without the letter "-Z" refers to tolerance H7 without keyway. An exception to this rule is type BNN of series BIPEX-S to which tolerance H7 with keyway applies.

To order other types with keyway, the letter "-Z" must be appended to the article number.

*L40 / M40 = Keyway according to DIN 6885, keyway width JS9
L41 / M41 = Keyway according to DIN 6885, keyway width P9*

Structure of the Article No.	Place	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FLENDER standard couplings																	
1st to 3rd place Digit, letter, letter	Type		2	L	C												
4th place Digit	Coupling design				0 ... 9												
5th and 6th place Digits	Series SIPEX BIPEX-S					5 1	9 9										
7th and 8th place Digits	Size							0 1 2		0 ... 8							
9th and 10th place Letters	Type, subassembly or component part										A ... H	A					
11th place Digit	Shaft-hub connection, flange connection											9					
12th place Digit	Shaft-hub connection, flange connection, V-belt pulley												9				
13th to 16th place Digit, letter, letter, digit	Further technical design details													0	A	A	0
	Z requires order code Q0Y and additional information in plain text for dimension S.														B	C	Z
Bore specifications	Additional order codes for bores finished in delivery condition ØD1 and ØD2 Specification of "9" in the 11th Place of the article number (article number without "-Z") with order codes L.. for ØD1 and/or specification of "9" in the 12th Place of the article number (article number without "-Z") with order codes M.. for ØD2 Selection of order codes for diameter and tolerance in the following tables under "Bore specifications".																
Special types	Additional order codes (article number with "-Z") and, if required, plain text																- Z

FLENDER Standard Couplings

Series SIPEX Torsionally Rigid Couplings, Series BIPEX-S Flexible Couplings

Bore specifications

Options

Additional identification code with order codes for bore specifications (**no letter "-Z"** required)

Identification codes with order codes have been specified for the bore specifications.

A bore is ordered by specifying the digit **9** in the 11th and 12th places of the article number and by adding the appropriate order codes for $\varnothing D1$ and $\varnothing D2$ from the table below.

Unless a different bore tolerance is specified, H7 is selected for all metric bore diameters.

Bore diameter metric in mm								
Bore diameter	Order code for bore diameter		Bore diameter	Order code for bore diameter		Bore diameter	Order code for bore diameter	
	$\varnothing D1$	$\varnothing D2$		$\varnothing D1$	$\varnothing D2$		$\varnothing D1$	$\varnothing D2$
1	L3L	M3L	16	L0J	M0J	42	L0X	M0X
2	L3M	M3M	18	L0K	M0K	45	L1A	M1A
3	L3N	M3N	19	L0L	M0L	48	L1B	M1B
4	L3P	M3P	20	L0M	M0M	50	L1C	M1C
5	L3Q	M3Q	22	L0N	M0N	55	L1D	M1D
6	L0A	M0A	24	L0P	M0P	60	L1E	M1E
7	L0B	M0B	25	L0Q	M0Q	65	L1F	M1F
8	L0C	M0C	28	L0R	M0R	70	L1G	M1G
9	L0D	M0D	30	L0S	M0S	75	L1H	M1H
10	L0E	M0E	32	L0T	M0T	80	L1J	M1J
11	L0F	M0F	35	L0U	M0U	85	L1K	M1K
12	L0G	M0G	38	L0V	M0V	90	L1L	M1L
14	L0H	M0H	40	L0W	M0W			

To order a bore diameter other than the values stated in the table, the digit **9** must be specified in the 11th and/or 12th place of the article number; in addition, the letter **"-Z"** must be added to the article number as well as the order code **L9Y** with plain text for the left-hand hub and/or order code **M9Y** with plain text for the right-hand hub.

Unless a different bore tolerance is specified, H7 is selected for all imperial bore diameters.

Bore diameter imperial in inches								
Bore diameter	Order code for bore diameter		Bore diameter	Order code for bore diameter		Bore diameter	Order code for bore diameter	
	$\varnothing D1$	$\varnothing D2$		$\varnothing D1$	$\varnothing D2$		$\varnothing D1$	$\varnothing D2$
0.1875	L5A	M5A	1.3125	L5T	M5T	2.375	L6N	M6N
0.25	L5B	M5B	1.375	L5U	M5U	2.4375	L6P	M6P
0.3215	L5C	M5C	1.4375	L5V	M5V	2.5	L6Q	M6Q
0.375	L5D	M5D	1.5	L5W	M5W	2.5625	L6R	M6R
0.5	L5E	M5E	1.5625	L5X	M5X	2.625	L6S	M6S
0.5625	L5F	M5F	1.625	L6A	M6A	2.6875	L6T	M6T
0.625	L5G	M5G	1.6875	L6B	M6B	2.75	L6U	M6U
0.6875	L5H	M5H	1.75	L6C	M6C	2.8125	L6V	M6V
0.75	L5J	M5J	1.8125	L6D	M6D	2.875	L6W	M6W
0.8125	L5K	M5K	1.875	L6E	M6E	2.9375	L6X	M6X
0.875	L5L	M5L	1.9375	L6F	M6F	3	L7A	M7A
0.9375	L5M	M5M	2	L6G	M6G	3.0625	L7B	M7B
1	L5N	M5N	2.0625	L6H	M6H	3.125	L7C	M7C
1.0625	L5P	M5P	2.125	L6J	M6J	3.3125	L7D	M7D
1.125	L5Q	M5Q	2.1875	L6K	M6K	3.375	L7E	M7E
1.1875	L5R	M5R	2.25	L6L	M6L	3.4375	L7F	M7F
1.25	L5S	M5S	2.3125	L6M	M6M	3.5	L7G	M7G

Additional identification code with order code for shaft distance (**no letter "-Z"** required)

Order specification with order code **Q0Y** has been specified for the shaft distance.

Shaft distance is ordered by specifying the letter **Z** in the 15th place of the article number, adding order code **Q0Y** and providing additional information in plain text for dimension S (shaft distance).

Ordering example:

SIPEX SHH-W coupling, size 60
 Shaft distance S = 1000 mm
 Total length LG = 1044 mm
 Bore $\varnothing D1$ 24 H7
 Bore $\varnothing D2$ 28 H7

Article No.:

2LC0591-1AH99-0AZ0

L0P+M0R+Q0Y

Plain text for **Q0Y**: S = 1000 mm

Overview

Transmissible torques of the different clamping connections as a function of hub design and shaft diameter

SIPEX series

Size	Hub design	Transmissible torque of clamping connection in Nm																											
		Bore diameter ØD1/D2 in mm																											
		2	3	4	6	8	10	12	14	16	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55	60		
5	G	-	1.1	1.2	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	H	-	0.6	0.8	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
10	G	-	1.1	1.2	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	H	-	0.6	0.8	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
15	G	-	2.4	2.5	2.8	3.1	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	H	-	1.1	1.4	2.1	2.8	3.5	4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
20	G	-	4.4	4.6	5.1	5.5	5.9	6.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	H	-	1.6	2.2	3.2	4.3	5.4	6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
45	G	-	-	-	8.1	8.6	9.2	9.7	10.3	10.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	H	-	-	-	5.5	7.4	9.2	11	12.9	14.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
100	G	-	-	-	10.3	10.8	11.4	11.9	12.5	13.1	13.8	14.2	14.7	-	-	-	-	-	-	-	-	-	-	-	-	-			
	H	-	-	-	5.5	7.4	9.2	11	12.9	14.7	16.6	18.4	20.2	-	-	-	-	-	-	-	-	-	-	-	-	-			
18	G	-	-	-	-	25.7	26.9	28.1	29.3	30.5	32.3	33	34	35.3	36	-	-	-	-	-	-	-	-	-	-	-			
	H	-	-	-	-	12.2	15.2	18.3	21.3	24.4	29	30.5	33.5	36.6	38	-	-	-	-	-	-	-	-	-	-	-			
	K	-	-	-	-	22	35	50	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	I	-	-	-	-	17	27	39	53	69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
30	G	-	-	-	-	-	42.2	44	45.6	47.3	50	50.7	52.4	54	55	57.4	59	-	-	-	-	-	-	-	-	-			
	H	-	-	-	-	-	21.5	25.8	30.1	34.4	40.9	43	47.3	51.6	53.9	60.2	64.5	-	-	-	-	-	-	-	-	-			
	K	-	-	-	-	-	-	39	53	69	97	108	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
	I	-	-	-	-	-	-	33	44	58	82	90	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
60	G	-	-	-	-	-	-	93	96	99	104	105	108	112	113	118	121	124	129	-	-	-	-	-	-	-			
	H	-	-	-	-	-	-	47.4	55.3	63.2	75	79	87	95	99	111	119	126	138	-	-	-	-	-	-	-			
	K	-	-	-	-	-	-	-	65	92	102	123	147	159	200	229	261	-	-	-	-	-	-	-	-	-			
	I	-	-	-	-	-	-	63	86	112	158	175	211	251	273	-	-	-	-	-	-	-	-	-	-	-			
80	G	-	-	-	-	-	-	-	173	178	185	188	193	198	200	207	212	217	225	232	237	242	-	-	-	-			
	H	-	-	-	-	-	-	-	88	100	120	126	138	151	157	176	189	201	220	239	251	264	-	-	-	-			
	K	-	-	-	-	-	-	-	-	-	-	131	159	189	205	257	295	336	402	-	-	-	-	-	-	-			
	I	-	-	-	-	-	-	-	-	-	-	147	178	212	230	289	331	330	394	-	-	-	-	-	-	-			
150	G	-	-	-	-	-	-	-	-	172	178	185	188	193	198	200	207	212	217	225	232	237	242	-	-	-			
	H	-	-	-	-	-	-	-	-	88	100	120	126	138	151	157	176	189	201	220	239	251	264	-	-	-			
	K	-	-	-	-	-	-	-	-	-	-	131	159	189	205	257	295	336	402	-	-	-	-	-	-	-			
	I	-	-	-	-	-	-	-	-	-	-	147	178	212	230	289	331	330	394	-	-	-	-	-	-	-			
200	G	-	-	-	-	-	-	-	-	-	300	306	313	317	328	335	342	353	364	371	378	389	-	-	-	-			
	H	-	-	-	-	-	-	-	-	-	183	202	220	229	257	275	293	321	348	367	385	413	-	-	-	-			
	K	-	-	-	-	-	-	-	-	-	151	182	217	235	295	339	285	341	402	446	491	-	-	-	-	-			
	I	-	-	-	-	-	-	-	-	-	147	178	212	230	289	331	330	394	395	438	483	-	-	-	-	-			
300	G	-	-	-	-	-	-	-	-	-	-	-	-	338	342	353	360	367	378	389	396	403	414	425	432	-			
	H	-	-	-	-	-	-	-	-	-	-	-	-	220	229	257	275	293	321	348	367	385	413	440	458	-			
	K	-	-	-	-	-	-	-	-	-	-	-	-	-	328	412	472	538	643	758	687	757	869	1073	-	-			
	I	-	-	-	-	-	-	-	-	-	-	-	-	-	314	394	452	515	616	726	804	744	854	972	1055	-			
500	G	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	588	603	613	623	638	658	662	687	712		
	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	441	478	504	529	567	604	630	692	755	
	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	477	562	623	686	788	897	973	1177	-
	I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	373	425	508	599	664	732	840	884	959	1160
800	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1773	2146	2553	
1400	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1773	2146	2553	

G = clamping hub
H = half-shell
K = external taper
I = internal taper

FLENDER Standard Couplings

Series SIPEX Torsionally Rigid Couplings, Series BIPEX-S Flexible Couplings

Technical information

BIPEX-S series

Size	Hub design	Transmissible torque by clamping connection in Nm																								
		Bore diameter ØD1/D2 in mm																								
		2	3	4	6	8	10	12	14	16	19	20	22	24	25	28	30	32	35	38	40	42	45	48	50	55
5	G	0.5	0.6	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	G	-	1	1.2	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	G	-	-	3.1	3.4	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	G	-	-	-	5.9	6.3	6.7	7.1	7.8	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	5.9	6.3	6.7	7.1	7.8	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	H	-	-	-	4	5.3	6.6	8	9.2	10.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	K	-	-	-	13.2	25	25	37	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	G	-	-	-	-	26	27.5	28.9	30	31.6	33.7	34.5	35.9	-	-	-	-	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	23	24	25	26	27.5	29	30	31	-	-	-	-	-	-	-	-	-	-	-	-	-
	H	-	-	-	-	21	26.5	31.8	37	42	50	53	58	-	-	-	-	-	-	-	-	-	-	-	-	-
	K	-	-	-	-	-	29	56	89	74	129	146	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	G	-	-	-	-	-	42	44	45.5	47	50	50.5	53	54	55	57	59	-	-	-	-	-	-	-	-	-
	C	-	-	-	-	-	42	44	45.5	47	50	50.5	53	54	55	57	59	-	-	-	-	-	-	-	-	-
	H	-	-	-	-	-	26.5	31.8	37	42	50	53	58	64	66	74	79	-	-	-	-	-	-	-	-	-
	K	-	-	-	-	-	48	71	164	132	234	275	249	327	371	-	-	-	-	-	-	-	-	-	-	-
28	G	-	-	-	-	-	-	-	-	100	105	107	110	113	115	119	122	125	130	135	-	-	-	-	-	-
	C	-	-	-	-	-	-	-	-	100	105	107	110	113	115	119	122	125	130	135	-	-	-	-	-	-
	H	-	-	-	-	-	-	-	-	78	92	97	107	117	121	136	146	156	178	185	-	-	-	-	-	-
	K	-	-	-	-	-	-	-	-	171	276	204	268	341	381	423	509	466	593	738	-	-	-	-	-	-
38	G	-	-	-	-	-	-	-	-	118	122	124	127	130	131	136	139	142	147	152	155	158	163	167	-	-
	C	-	-	-	-	-	-	-	-	188	195	197	202	207	210	217	222	227	234	242	247	252	259	267	-	-
	H	-	-	-	-	-	-	-	-	78	92	97	107	117	121	136	146	156	178	185	195	204	219	233	-	-
	K	-	-	-	-	-	-	-	-	-	287	374	474	529	589	708	653	827	827	947	863	1036	1227	-	-	
42	G	-	-	-	-	-	-	-	-	207	210	215	220	222	230	234	239	247	254	259	264	271	279	284	-	-
	C	-	-	-	-	-	-	-	-	-	-	-	-	-	222	230	234	239	247	254	259	264	271	279	284	-
	H	-	-	-	-	-	-	-	-	-	147	155	170	186	193	217	232	248	271	294	309	325	349	372	387	-
	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	532	641	588	750	747	858	802	967	1049	1280	-
48	G	-	-	-	-	-	-	-	-	-	-	-	-	-	345	360	367	374	385	396	403	410	421	432	439	457
	C	-	-	-	-	-	-	-	-	-	-	-	-	-	345	360	367	374	385	396	403	410	421	432	439	457
	H	-	-	-	-	-	-	-	-	-	-	-	-	-	283	316	339	361	39	429	452	474	509	542	565	621
	K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	857	1004	1248	1262	1429	1362	1609	1880	1710	2150

G = clamping hub
 C = clamping hub compact
 H = half-shell
 K = external taper

Overview

SIPEX couplings are torsionally rigid and backlash-free. They are characterized by their compact design and high power density. SIPEX couplings connect machine shafts and compensate for shaft misalignment that can occur during assembly or operation.

SIPEX couplings are suitable for all drive applications which require a coupling that offers positioning accuracy as well as a reliable, wear- and maintenance-free torque transmission.



Benefits

SIPEX couplings are suitable for mounting horizontally, vertically or in any desired position. The coupling parts can be arranged as required on the shaft ends to be connected.

The metal bellows are very torsional-resistant and combined with different clamping connections they ensure an absolutely angle-preserving torque transmission between the connected shafts. The moment of inertia is low.

SIPEX couplings compensate axial, radial and angular shaft misalignment with only low restoring forces. SIPEX couplings are wear-free within their technical limits and therefore offer an unlimited service life.



Application

SIPEX couplings are available in 19 sizes within the standard catalog range, 7 of which are miniature versions and the other 12 standard designs. Rated torques range from 0.1 to 5000 Nm. The coupling is suitable for ambient temperatures of between -30 °C to +120 °C

Couplings manufactured by alternative methods are available for higher ambient temperatures up to +250 °C.

SIPEX couplings from the standard range are especially suitable for application in highly dynamic drives such as, for example, linear axes in machine tools, packaging machines or printing presses, or generally for automation technology.

SIPEX couplings from the miniature range are designed for use in combination with rotary encoders, stepper motors or tachometers.



FLENDER Standard Couplings

Torsionally Rigid Couplings – SIPEX Series

General

Design

SIPEX couplings consist of two hub parts that are connected by means of bellows made of high-strength stainless steel.

The hubs can be coupled to the shafts by many different methods including set screws, key joint, slotted clamping hubs, half-shell hubs, clamping hubs or expanding hubs.

Thanks to their metal bellows, SIPEX couplings are torsionally rigid, but flexible. Misalignment between the connected shafts deforms the metal bellows.

Coupling materials:

Depending on the coupling version, hubs are made of aluminum (N, G, H) or steel (K, I), but stainless-steel variants are also optionally available.

All the metal bellows are made of stainless steel and are available as single-wall or multiple-wall devices depending on size and application. Metal bellows come in various standard lengths.

Metal bellows can be combined with different hub versions to create a complete unit. Once the hubs have been joined to metal bellows, they cannot be dismantled again.

Hub versions

N: Hub with set screws

G: Slotted clamping hub

H: Half-shell clamping hub

K: Clamping hub with external taper

I: Clamping hub with internal taper

S: Expanding hub

Hubs are supplied as standard with bore tolerance H7 and without keyway.

Versions N, G and H are optionally available with keyway in accordance with DIN 6885-1.

The fitting tolerance of the coupled shaft ends should be g6 or h7.

Versions of SIPEX couplings

Type	Description
SNN	Hub with set screw on both sides
SGG	Slotted clamping hub on both sides
SGG-A	Slotted clamping hub - for axial plug-in
SHH	Half-shell clamping hub on both sides
SKK	Clamping hub with external taper on both sides
SGS	Hub 1: Slotted/Hub 2: Expanding hub
SHH-W	Drive shaft with half-shell clamping hubs
SII	Clamping hubs with internal taper on both sides

Hub variants



Overview

Coupling dimensioning

Dimensioning according to torque

It must be ensured that the coupling is capable of safely transferring peak torques that regularly occur at the drive or load end. The service factor is provided in order to describe the deviation between the real coupling load and ideal load conditions:

$$T_{KN} \geq T_{AS} \times FB \text{ or } T_{LS} \times FB$$

Torque characteristic of drive	Service factor FB
Uniform	1.5
Non Uniform	2
Rough	2.5 - 4
Servomotors (machine tools)	1.5 - 2

Dimensioning according to acceleration torques

The correct coupling size can be calculated more accurately on the basis of acceleration or deceleration torques because the peak torque at the coupling is reduced by the ratio between the moments of inertia on the drive and load ends:

$$T_{KN} \geq T_S \times FB$$

$$T_S = T_{AS} \times \frac{J_L}{J_A + J_L} \text{ or } T_S = T_{LS} \times \frac{J_L}{J_A + J_L}$$

Checking the maximum torsion angle

If the application requires a maximum torsion angle of the coupling, the selected coupling size must be checked to ensure that it is sufficiently torsionally rigid for the application in question:

$$\varphi = \frac{180}{\pi} \times \frac{T_S}{C_{Tdyn}}$$

Checking the maximum speed

For all load situations $n_{Kmax} > n_{max}$

Checking the permitted shaft misalignment

The actual shaft misalignment must be less than the permitted shaft misalignment for all load situations.

Checking the shaft-hub connection

In the case of clamping connections without feather key, it must be ensured that the transmissible torque of the hub connection is greater than the peak torque at the coupling.

Formula symbols

Key to formula symbols

Name	Formula symbol	Unit	Explanation
Rated coupling torque	T_{KN}	Nm	Torque which can be transmitted as static torque by the coupling over the period of use.
Coupling overload torque	T_{KOL}	Nm	Torque which can be transmitted very rarely as maximum torque by the coupling.
Peak torque at drive end	T_{AS}	Nm	Peak torque during non-periodic torque surges at drive end
Peak torque at load end	T_{LS}	Nm	Peak torque during non-periodic torque surges at load end
Peak torque	T_S	Nm	Peak torque at the coupling
Service factor	FB		Factor that expresses the real coupling load as a ratio of the nominal coupling load
Moment of inertia of drive end	J_A	kgm ²	Sum of the moments of inertia at the drive end referred to the coupling speed
Moment of inertia of load end	J_L	kgm ²	Sum of the moments of inertia at the load end referred to the coupling speed
Torsion angle	φ	°	Torsion angle of the coupling under torsional load
Torsional stiffness, dynamic	C_{Tdyn}	Nm/rad	Dynamic torsional stiffness of the coupling
Axial stiffness	C_a	N/mm	Axial stiffness of the coupling
Radial stiffness	C_r	N/mm	Radial stiffness of the coupling
Rated speed	n_N	rpm	Coupling speed
Maximum coupling speed	n_{Kmax}	rpm	Maximum permissible coupling speed
Axial misalignment	ΔK_a	mm	Axial misalignment of the coupling halves
Radial misalignment	ΔK_r	mm	Radial misalignment of the coupling halves
Angular misalignment	ΔK_w	°	Angular misalignment of the coupling halves

FLENDER Standard Couplings

Torsionally Rigid Couplings – SIPEX Series

Technical information

Technical specifications

Power ratings of miniature series

Size	Rated torque T_{KN} Nm	Maximum torque T_{KOL} Nm	Maximum speed n_{Kmax} rpm	Torsional stiffness C_{Tdyn} Nm/rad	Stiffness		Permitted shaft misalignment		
					Radial C_r N/mm	Axial C_a N/mm	ΔK_a mm	ΔK_r mm	ΔK_w degrees
1	0.1	0.15	15000	65	10	14	0.2	0.1	1.5
5	0.5	0.75	15000	258	128	18	0.2	0.1	1.5
				195	54	13	0.3	0.2	1.5
				160	26	11	0.4	0.2	2
10	1	1.5	15000	510	187	36	0.2	0.1	1.5
				380	82	27	0.3	0.2	1.5
				308	42	22	0.4	0.2	2
15	1.5	2.25	15000	750	139	23	0.3	0.1	1.5
				700	81	12	0.4	0.2	2
20	2	3	15000	1510	147	18	0.3	0.2	1.5
				1300	96	14	0.4	0.2	1.5
				1040	46	9	0.5	0.3	2
45	4.5	6.75	15000	6480	444	47	0.3	0.1	1.5
				4100	108	29	0.5	0.2	2
100	10	15	15000	8080	361	46	0.4	0.2	1.5
				6750	193	34	0.6	0.3	2

Power ratings of standard series

Size	Rated torque T_{KN} Nm	Maximum torque T_{KOL} Nm	Maximum speed n_{Kmax} rpm	Torsional stiffness C_{Tdyn} kNm/rad	Stiffness		Permitted shaft misalignment		
					Radial C_r N/mm	Axial C_a N/mm	ΔK_a mm	ΔK_r mm	ΔK_w degrees
18	18	27	12800	19	200	50	0.5	0.2	1.5
				17	85	40	0.5	0.2	2.0
30	30	45	10300	36	720	50	0.5	0.2	1.5
				26	220	30	0.8	0.2	2.0
60	60	90	8700	75	1100	90	0.5	0.2	1.5
				50	330	55	0.8	0.2	2.0
80	80	120	6900	128	1200	80	0.5	0.2	1.5
				75	400	55	0.7	0.2	2.0
150	150	225	6900	155	2000	150	0.5	0.2	1.5
				102	600	85	0.6	0.2	2.0
200	200	300	6400	175	2500	150	0.5	0.2	1.5
				120	450	85	0.7	0.2	2.0
300	300	450	6000	502	6300	280	0.5	0.2	1.5
				282	1500	85	0.7	0.2	2.0
500	500	750	5000	690	8800	100	0.5	0.2	1.5
				315	1000	85	0.8	0.2	2.0
800	800	1200	3700	760	510	190	0.8	0.2	1.8
1400	1400	2100	3700	1300	710	280	0.8	0.2	1.8
3000	3000	4500	2800	2800	8060	880	0.8	0.2	1.5
5000	5000	7500	2800	4800	9190	740	0.8	0.2	1.5

Permitted shaft misalignment

The permitted shaft misalignments ΔK_a , ΔK_r and ΔK_w are maximum values and must not occur simultaneously. The following formula can be used to roughly calculate whether combinations of misalignments are permissible:

$$\frac{\Delta K_r \text{ act}}{\Delta K_r} + \frac{\Delta K_a \text{ act}}{\Delta K_a} + \frac{\Delta K_w \text{ act}}{\Delta K_w} < 1$$

The different torsional stiffness values apply to the various lengths of metal bellows of the relevant SIPEX type.

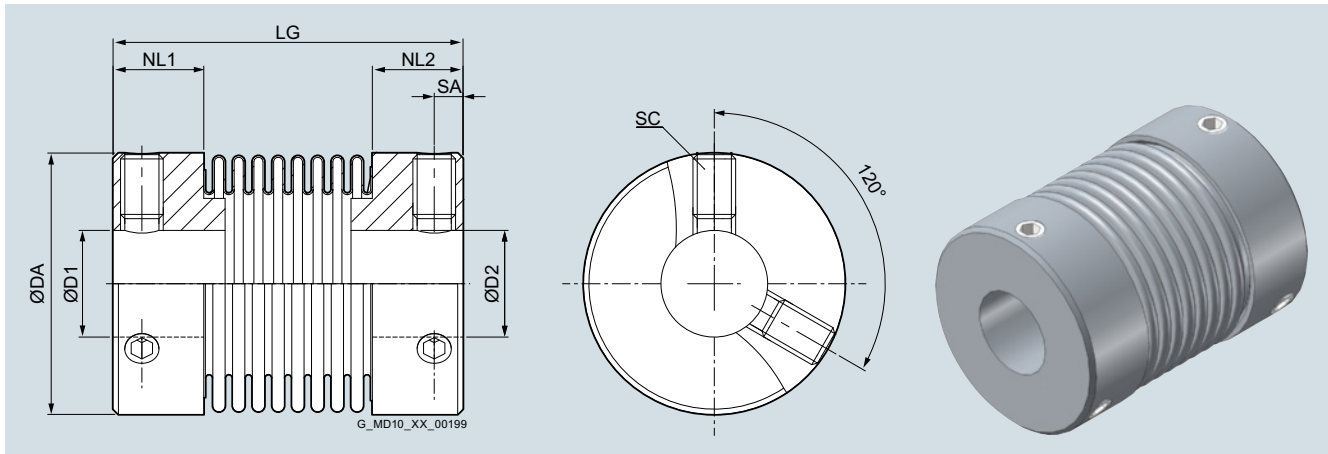
FLENDER Standard Couplings

Torsionally Rigid Couplings – SIPEX Series

Type SNN

Selection and ordering data

Miniature series with set screws



Size	Rated torque	Maximum speed	Dimensions in mm					Screw EN ISO 4027 SC	Moment of inertia J	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m	
	T_{KN} Nm	n_{Kmax} rpm	DA	D1, D2 H7 min. max.	NL1/ NL2	LG	SA					T_A Nm
1	0.1	15000	10	2 5	4.2	22	2	M3	0.5	0.5	2LC0590-1AA99-0AA0	3
5	0.5	15000	15	3 8	6	19	2.2	M3	0.5	2	2LC0590-2AA99-0AA0	5.6
						23				2.1	2LC0590-2AA99-0AB0	6
						27				2.3	2LC0590-2AA99-0AC0	6.5
10	1	15000	15	3 8	6	21	2.2	M3	0.5	2.5	2LC0590-3AA99-0AA0	7
						25				2.7	2LC0590-3AA99-0AB0	7.5
						29				2.9	2LC0590-3AA99-0AC0	8
						26				3	2LC0590-4AA99-0AA0	13
15	1.5	15000	20.5	3 12	8	30	3	M4	1.5	8.7	2LC0590-4AA99-0AA0	13.9
						33				9.2	2LC0590-4AA99-0AB0	20.3
						37				23	2LC0590-5AA99-0AB0	23.8
20	2	15000	24.5	3 14	8.5	40	2.7	M4	1.5	19.2	2LC0590-5AA99-0AA0	26.5
						48				26	2LC0590-5AA99-0AC0	26.5
						55				80	2LC0590-6AA99-0AA0	51
45	4.5	15000	32	6 18	12.3	40	4.5	M6	3	110	2LC0590-6AA99-0AB0	68
						48				188	2LC0590-7AA99-0AA0	74
100	10	15000	40	6 24	12.5	45	4.5	M6	3	292	2LC0590-7AA99-0AB0	109
						55						

Shaft connected to hub by means of set screws according to EN ISO 4027. A keyway according to DIN 6885-1 can be selected additionally as an option.

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example:

SIPEX SNN coupling, size 45
Total length LG = 40 mm
Bore $\varnothing D1$ 14 H7
Bore $\varnothing D2$ 18 H7

Article No.:
2LC0590-6AA99-0AA0
LOH+MOK

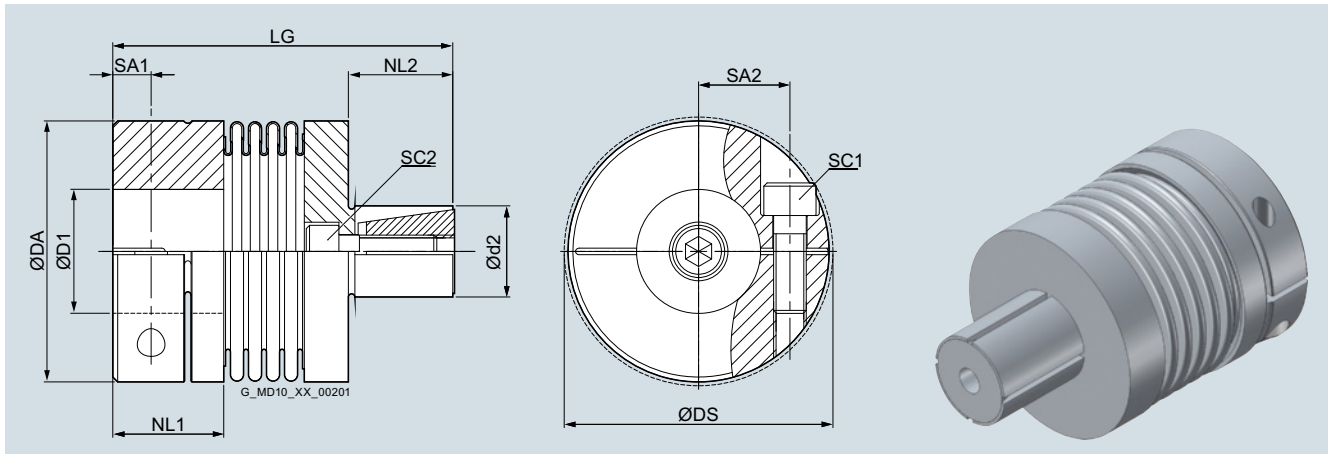
FLENDER Standard Couplings

Torsionally Rigid Couplings – SIPEX Series

Type SGS

Selection and ordering data

Miniature series with expanding hub



Size	Rated torque T_{KN} Nm	Maximum speed n_{kmax} rpm	Dimensions in mm							Screw EN ISO 4762		Screw EN ISO 4762		Mass moment of inertia J gcm ²	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m g						
			DA	DS	D1 H7 min.	d2 h7 max.	NL1	NL2	LG	SA1	SA2	SC1	T_A Nm				SC2	T_A Nm				
5	0.5	15000	15.5	17.5	3	7	8	6.8	8	28	2.4	5.2	M2	0.43	M3	1	2.5	2LC0590-2AD90-0AA0	9.3			
										32										2.6	2LC0590-2AD90-0AB0	9.7
										36												
10	1	15000	15.5	17.5	3	7	8	6.8	8	30	2.4	5.2	M2	0.43	M3	1	3	2LC0590-3AD90-0AA0	10.6			
										34										3.2	2LC0590-3AD90-0AB0	11
										38												
15	1.5	15000	20.5	21	3	10	10	8.5	12	37	3	7	M2.5	0.85	M4	3	7.8	2LC0590-4AD90-0AA0	18.5			
										41										8.4	2LC0590-4AD90-0AB0	19.3
										46												
20	2	15000	25.5	27	3	12.5	10	11	12	41	3.5	9	M3	2	M4	3	20.6	2LC0590-5AD90-0AA0	27.8			
										46										24.2	2LC0590-5AD90-0AB0	31.3
										50												
45	4.5	15000	32.5	34	6	16	14	13	16	52	4.5	11.5	M4	3.5	M5	5.9	68	2LC0590-6AD90-0AA0	57			
										60										99	2LC0590-6AD90-0AB0	74
										71												
100	10	15000	40.5	41.5	6	22	16	14	20	61	4.7	15.5	M4	3.5	M6	10	153	2LC0590-7AD90-0AA0	81			
										71										257	2LC0590-7AD90-0AB0	117
										71												

A hollow shaft can be connected to the expanding hub.

The bore for connecting the expanding hub must have tolerance H7.

Weights and mass moments of inertia apply to maximum bore diameters.

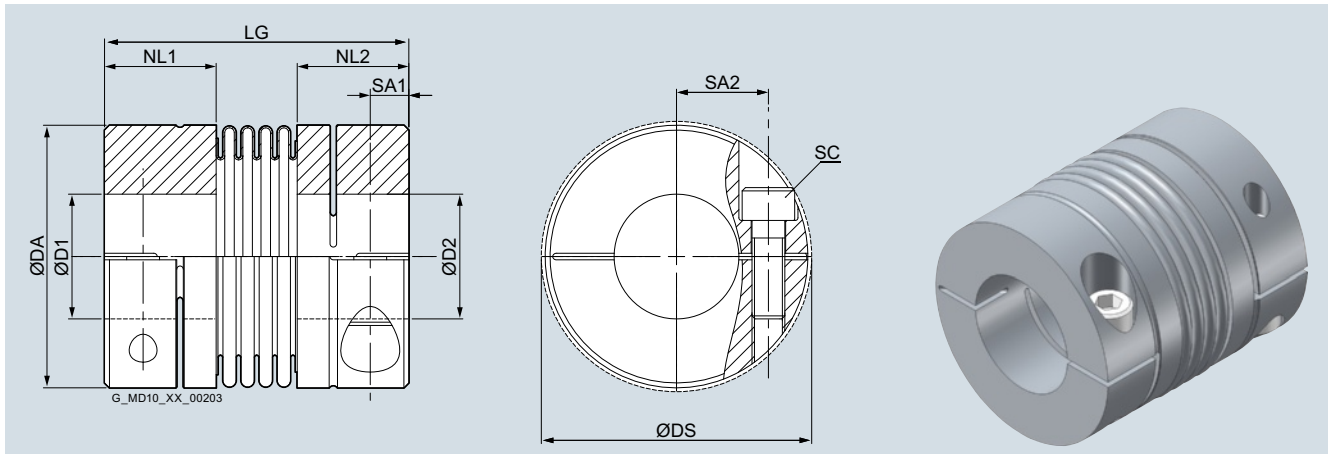
Ordering example:

SIPEX SGS coupling, size 45
Total length LG = 52 mm
Bore $\varnothing D1$ 14 H7
Shaft $\varnothing d2$ 14 h7

Article No.:
2LC0590-6AD90-0AA0
LOH

Selection and ordering data

Miniature series with clamping hub



Size	Rated torque T_{KN} Nm	Maximum speed n_{Kmax} rpm	Dimensions in mm						Screw EN ISO 4762 T_A Nm	Mass moment of inertia J gcm ²	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m g					
			DA	DS	D1, D2 H7		NL1/ NL2	LG					SA1	SA2	SC		
					min.	max.											
5	0.5	15000	15.5	17.5	3	7	6.8	21	2.5	5.3	M2	0.3	2.4	2LC0590-2AB99-0AA0	6.6		
								25					2.5			2LC0590-2AB99-0AB0	7
								28					2.7			2LC0590-2AB99-0AC0	7.5
10	1	15000	15.5	17.5	3	7	6.8	23	2.5	5.3	M2	0.3	2.9	2LC0590-3AB99-0AA0	7.9		
								27					3.1			2LC0590-3AB99-0AB0	8.5
								31					3.3			2LC0590-3AB99-0AC0	9
15	1.5	15000	20	21	3	10	8.5	27	3	7	M2.5	0.8	7.7	2LC0590-4AB99-0AA0	12.5		
								31					8.3			2LC0590-4AB99-0AB0	13.3
20	2	15000	25	27	3	12.5	11	32	3.5	9	M3	1.5	24	2LC0590-5AB99-0AA0	25		
								38					28			2LC0590-5AB99-0AB0	28
								42					31			2LC0590-5AB99-0AC0	31
45	4.5	15000	32.5	34	6	16	13	42	4.5	12	M4	3	80	2LC0590-6AB99-0AA0	49		
								50					110			2LC0590-6AB99-0AB0	66
100	10	15000	40	41.5	6	22	14	48	4.7	15.5	M4	3	193	2LC0590-7AB99-0AA0	74		
								57					298			2LC0590-7AB99-0AB0	110

The slotted clamping hub allows a frictionally engaged connection to the input and output shaft.

A single tightening screw per hub ensures easy assembly.

The maximum torques that can be transmitted by the clamping connection are listed in the table on page 5.

A keyway according to DIN 6885-1 can be selected additionally as an option.

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example:

SIPEX SGG coupling, size 45

Total length LG = 42 mm

Bore $\varnothing D1$ 12 H7

Bore $\varnothing D2$ 16 H7

Article No.:

2LC0590-6AB99-0AA0

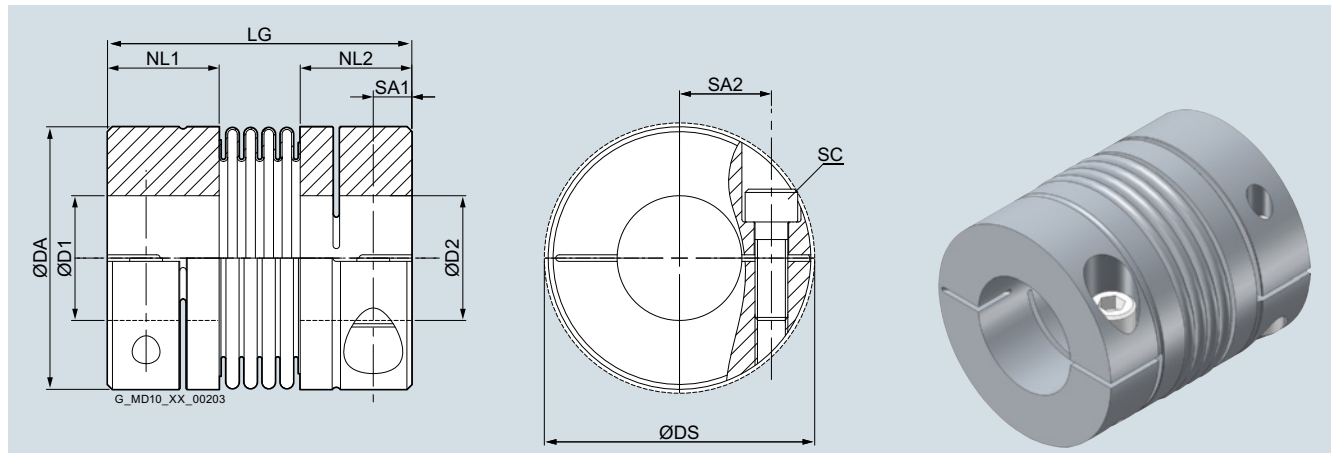
LOG+M0J

FLENDER Standard Couplings

Torsionally Rigid Couplings – SIPEX Series

Type SGG

Standard series with clamping hub



Size	Rated torque T_{KN} Nm	Maximum speed n_{Kmax} rpm	Dimensions in mm					Screw EN ISO 4762 T_A Nm	Mass moment of inertia J $10^{-3} \times$ kgm ²	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m kg				
			DA	DS	D1, D2 H7 min. max.	NL1/ NL2	LG					SA1	SA2	SC	
18	18	12800	45	47	8	25	20.5	63	5.7	17.5	M5	8	0.05	2LC0590-8AB99-0AA0	0.14
								72					0.06	2LC0590-8AB99-0AB0	0.15
30	30	10300	54	56	10	30	24.5	65	7.5	20	M6	15	0.11	2LC0591-0AB99-0AA0	0.23
								74					0.12	2LC0591-0AB99-0AB0	0.25
60	60	8700	65	67	12	35	29	79	10	24	M8	40	0.31	2LC0591-1AB99-0AA0	0.44
								89					0.32	2LC0591-1AB99-0AB0	0.45
80	80	6900	79	84	14	42	34	92	11.8	28	M10	72	0.76	2LC0591-2AB99-0AA0	0.74
								103					0.82	2LC0591-2AB99-0AB0	0.79
150	150	6900	79	84	14	42	34	92	11.8	28	M10	84	0.76	2LC0591-3AB99-0AA0	0.74
								103					0.82	2LC0591-3AB99-0AB0	0.79
200	200	6400	90	93	20	43	38	101	12.5	31.5	M12	125	1.41	2LC0591-4AB99-0AA0	1.1
								113					1.5	2LC0591-4AB99-0AB0	1.17
300	300	6000	109	110	24	50	38	103	13	35	M12	145	3	2LC0591-5AB99-0AA0	1.7
								116					3.2	2LC0591-5AB99-0AB0	1.75
500	500	5000	119	122	35	60	41.5	111	15	42	M14	190	4.5	2LC0591-6AB99-0AA0	1.99
								123					4.7	2LC0591-6AB99-0AB0	2.05

The slotted clamping hub allows a frictionally engaged connection to the input and output shaft.

A single tightening screw per hub ensures easy assembly.

The maximum torques that can be transmitted by the clamping connection are listed in the table on page 5.

A keyway according to DIN 6885-1 can be selected additionally as an option.

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example:

SIPEX SGG coupling, size 80

Total length LG = 103 mm

Bore $\varnothing D1$ 30 H7

Bore $\varnothing D2$ 38 H7

Article No.:

2LC0591-2AB99-0AB0

LOS+MOV

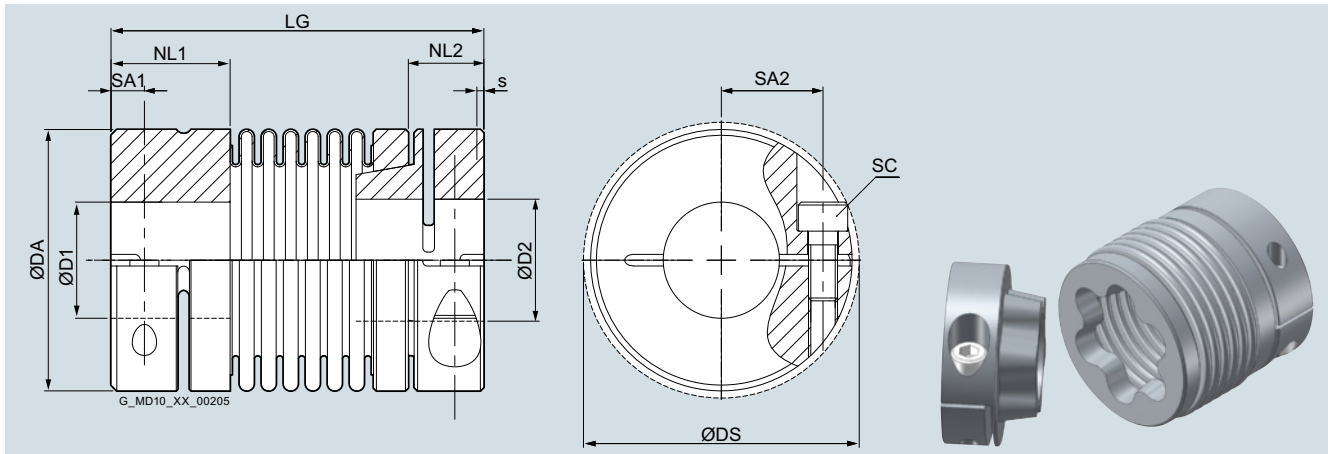
FLENDER Standard Couplings

Torsionally Rigid Couplings – SIPEX Series

Type SGG-A

Selection and ordering data

Miniature and standard series with axially plug-in clamping hub



Miniature series

Size	Rated torque T_{KN}	Maximum speed n_{Kmax}	Dimensions in mm											Screw EN ISO 4762 T_A	Mass moment of inertia J	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m	
			DA	DS	D1, D2 H7 min.	D1 max.	D2 max.	NL1	NL2	LG	s Preten.	SA1	SA2					SC
	Nm	rpm												Nm	gcm ²		g	
45	4.5	15000	32.5	34	5	16	14	13	13	48	0.7	4.5	12	M4	3.5	88	2LC0590-6AE99-0AA0	58
																	95	2LC0590-6AE99-0AB0
100	10	15000	40	41.5	6	22	18	14	13	54	1	4.7	15.5	M4	4.5	230	2LC0590-7AE99-0AA0	90
																	260	2LC0590-7AE99-0AB0

Standard series

Size	Rated torque T_{KN}	Maximum speed n_{Kmax}	Dimensions in mm											Screw EN ISO 4762 T_A	Mass moment of inertia J $10^{-3} \times$ kgm ²	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m	
			DA	DS	D1, D2 H7 min.	D1 max.	D2 max.	NL1	NL2	LG	s Preten.	SA1	SA2					SC
	Nm	rpm												Nm	kgm ²		kg	
18	18	12800	45	47	8	25	21	20.5	13	62	0.5-1.0	5.7	17.5	M5	8	0.04	2LC0590-8AE99-0AA0	0.12
										69						0.05	2LC0590-8AE99-0AB0	0.15
30	30	10300	54	56	10	30	23	24.5	19.5	70	0.5-1.0	7.5	20	M6	15	0.12	2LC0591-0AE99-0AA0	0.27
										78						0.13	2LC0591-0AE99-0AB0	0.28
60	60	8700	65	67	12	35	30	29	25.5	84	0.5-1.5	10	24	M8	40	0.33	2LC0591-1AE99-0AA0	0.50
										94						0.34	2LC0591-1AE99-0AB0	0.52
80	80	6900	79	84	14	42	38	34	26	95	0.5-1.5	11.8	28	M10	72	0.78	2LC0591-2AE99-0AA0	0.79
										105						0.84	2LC0591-2AE99-0AB0	0.83
150	150	6900	79	84	14	42	38	34	24	95	0.5-1.5	11.8	28	M10	84	0.78	2LC0591-3AE99-0AA0	0.79
										105						1.05	2LC0591-3AE99-0AB0	0.96
200	200	6400	90	93	20	45	40	38	31.5	105	0.5-1.5	12.5	31.5	M12	125	1.47	2LC0591-4AE99-0AA0	1.16
										117						1.58	2LC0591-4AE99-0AB0	1.25
300	300	6000	109	110	24	50	45	38	32	110	0.5-1.5	13	35	M12	145	3.2	2LC0591-5AE99-0AA0	1.8
										121						3.3	2LC0591-5AE99-0AB0	1.85
500	500	5000	119	122	35	60	60	41.5	39	126	0.5-2.0	15	42	M14	190	5.0	2LC0591-6AE99-0AA0	2.25
										137						5.2	2LC0591-6AE99-0AB0	2.3

The variant with axially plug-in clamping hub is designed for simple blind or bell housing assembly.

The maximum torques that can be transmitted by the clamping connection are listed in the table on page 5.

A keyway according to DIN 6885-1 can be selected additionally as an option.

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example:

SIPEX SGG-A coupling, size 80

Total length LG = 95 mm

Bore $\varnothing D1$ 30 H7

Bore $\varnothing D2$ 38 H7

Article No.:

2LC0591-2AE99-0AA0

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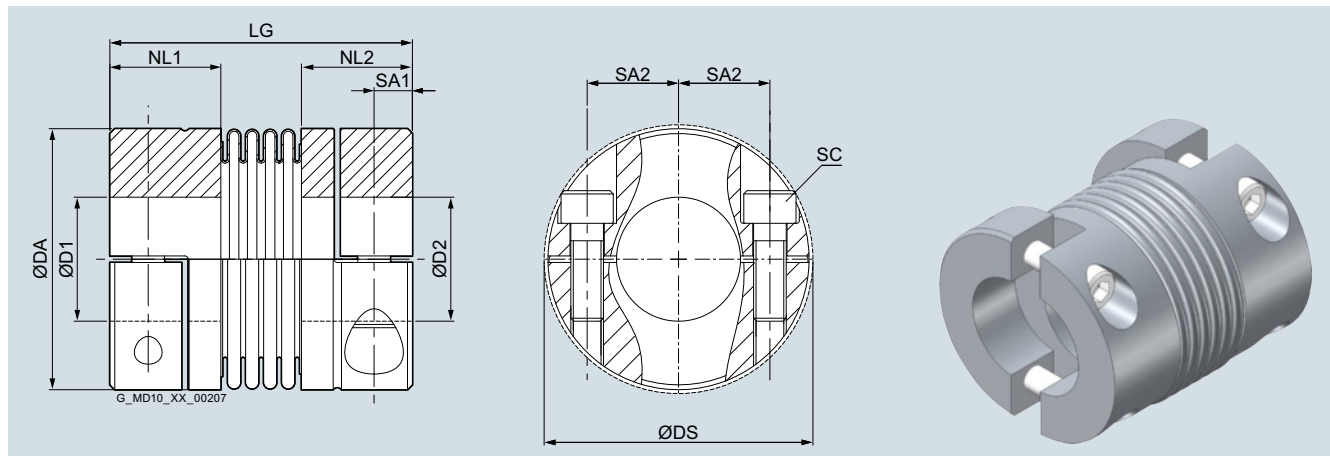
FLENDER Standard Couplings

Torsionally Rigid Couplings – SIPEX Series

Type SHH

Selection and ordering data

Miniature series with half-shell clamping hub



Size	Rated torque T_{KN} Nm	Maximum speed n_{Kmax} rpm	Dimensions in mm					Screw EN ISO 4762 T_A Nm	Mass moment of inertia J gcm ²	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m g					
			DA	DS	D1, D2 H7 min. max.		NL1/ NL2					LG	SA1	SA2	SC	
5	0.5	15000	15.5	17.5	3	7	6.8	21	2.4	5.2	M2	0.5	1.4	2LC0590-2AC99-0AA0	4	
								25					2.6		2LC0590-2AC99-0AB0	7.3
								28					2.8		2LC0590-2AC99-0AC0	7.7
10	1	15000	15.5	17.5	3	7	6.8	23	2.4	5.2	M2	0.5	3	2LC0590-3AC99-0AA0	8.2	
								27					3.2		2LC0590-3AC99-0AB0	8.8
								31					3.4		2LC0590-3AC99-0AC0	9.3
15	1.5	15000	20	21	3	10	8.5	27	3	7	M2.5	0.9	8.4	2LC0590-4AC99-0AA0	13.7	
								31					8.5		2LC0590-4AC99-0AB0	13.8
20	2	15000	25	27	3	12.5	11	32	3.5	9	M3	2	25	2LC0590-5AC99-0AA0	25	
								38					28		2LC0590-5AC99-0AB0	29
								42					32		2LC0590-5AC99-0AC0	32
45	4.5	15000	32.5	34	6	16	13	42	4.5	11.5	M4	3.5	82	2LC0590-6AC99-0AA0	50	
								50					113		2LC0590-6AC99-0AB0	68
100	10	15000	40	41.5	6	22	14	48	4.7	15.5	M4	4.5	196	2LC0590-7AC99-0AA0	75	
								57					300		2LC0590-7AC99-0AB0	111

It is possible to radially assemble and dismantle the hub version with half-shells without moving the connected units.

The maximum torques that can be transmitted by the clamping connection are listed in the table on page 5.

A keyway according to DIN 6885-1 can be selected additionally as an option.

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example:

SIPEX SHH coupling, size 45

Total length LG = 42 mm

Bore $\varnothing D1$ 12 H7

Bore $\varnothing D2$ 16 H7

Article No.:

2LC0590-6AC99-0AA0

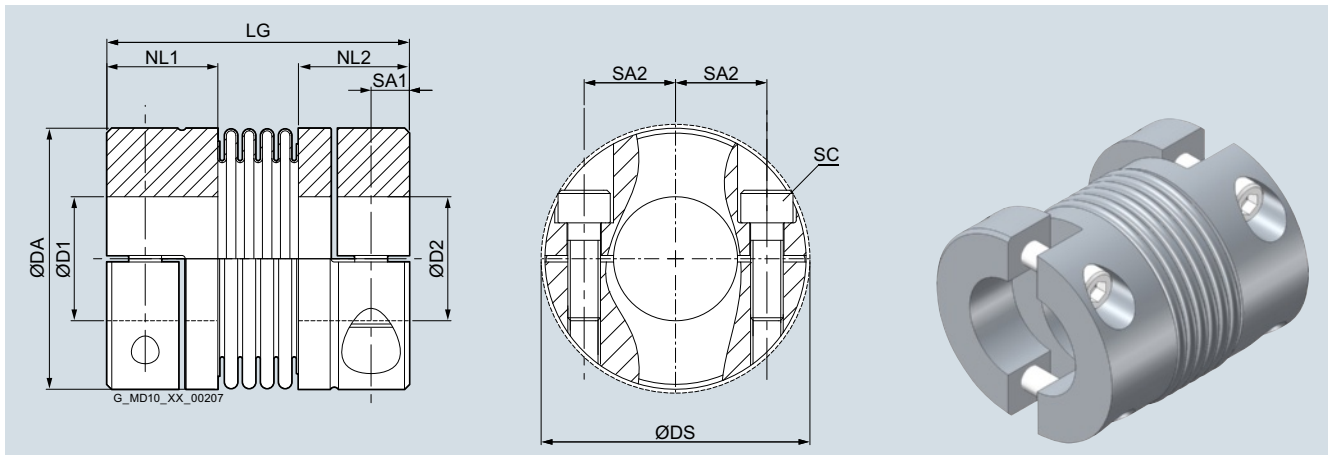
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FLENDER Standard Couplings

Torsionally Rigid Couplings – SIPEX Series

Type SHH

Standard series with half-shell clamping hub



Size	Rated torque T_{KN} Nm	Maximum speed n_{Kmax} rpm	Dimensions in mm						Screw EN ISO 4762 T_A Nm	Mass moment of inertia J $10^{-3} \times$ kgm ²	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m kg			
			DA	DS	D1, D2 H7		NL1/ NL2	LG					SA1	SA2	SC
					min.	max.									
18	18	12800	45	48	8	25	20.5	63	5.7	17.5	M5	8	0.05	2LC0590-8AC99-0AA0	0.15
								72					0.05	2LC0590-8AC99-0AB0	0.16
30	30	10300	54	56	10	30	24.5	65	7.5	20	M6	15	0.11	2LC0591-0AC99-0AA0	0.23
								74					0.12	2LC0591-0AC99-0AB0	0.25
60	60	8700	65	67	12	35	29	79	10	24	M8	40	0.32	2LC0591-1AC99-0AA0	0.46
								89					0.33	2LC0591-1AC99-0AB0	0.49
80	80	6900	79	84	14	42	34	91	11.8	28	M10	72	0.83	2LC0591-2AC99-0AA0	0.81
								102					0.89	2LC0591-2AC99-0AB0	0.85
150	150	6900	79	84	14	42	34	91	11.8	28	M10	84	0.83	2LC0591-3AC99-0AA0	0.81
								102					0.89	2LC0591-3AC99-0AB0	0.85
200	200	6400	90	93	20	45	38	101	12.5	31.5	M12	125	1.45	2LC0591-4AC99-0AA0	1.14
								113					1.55	2LC0591-4AC99-0AB0	1.21
300	300	6000	109	110	24	50	38	103	13	35	M12	145	3.04	2LC0591-5AC99-0AA0	1.69
								116					3.15	2LC0591-5AC99-0AB0	1.73
500	500	5000	119	122	35	60	41.5	111	14	42	M14	190	4.59	2LC0591-6AC99-0AA0	2.05
								123					4.77	2LC0591-6AC99-0AB0	2.11

It is possible to radially assemble and dismantle the hub version with half-shells without moving the connected units.

The maximum torques that can be transmitted by the clamping connection are listed in the table on page 5.

A keyway according to DIN 6885-1 can be selected additionally as an option.

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example:
SIPEX SHH coupling, size 80
Total length LG = 91 mm
Bore $\varnothing D1$ 30 H7
Bore $\varnothing D2$ 38 H7

Article No.:
2LC0591-2AC99-0AA0
LOS+MOV

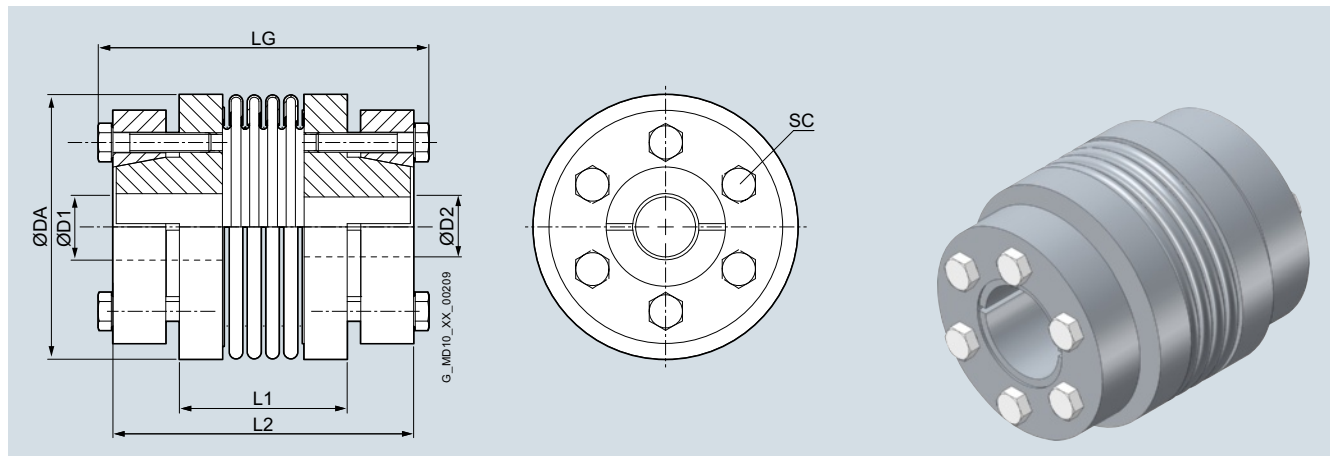
FLENDER Standard Couplings

Torsionally Rigid Couplings – SIPEX Series

Type SKK

Selection and ordering data

Miniature and standard series with external taper



Miniature series

Size	Rated torque T_{KN} Nm	Maximum speed n_{Kmax} rpm	Dimensions in mm			L1	L2	LG	Screw EN ISO 4017		Mass moment of inertia J gcm ²	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m g
			DA	D1, D2 H7 min.	max.				SC	T_A Nm			
45	4.5	15000	32	6	10	25	37	42	M3	1.3	64	2LC0590-6AF99-0AA0	49
						33	45	50			95		2LC0590-6AF99-0AB0
100	10	15000	40	8	14	33	45	48	M3	1.3	166	2LC0590-7AF99-0AA0	77
						42	54	57			270		2LC0590-7AF99-0AB0

Standard series

Size	Rated torque T_{KN} Nm	Maximum speed n_{Kmax} rpm	Dimensions in mm			L1	L2	LG	Screw EN ISO 4017		Mass moment of inertia J 10 ⁻³ × kgm ²	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m kg
			DA	D1, D2 H7 min.	max.				SC	T_A Nm			
18	18	12800	47	8	15	37	57	65	M5	5.9	0.07	2LC0590-8AF99-0AA0	0.30
						45	65	73			0.08		2LC0590-8AF99-0AB0
30	30	10300	56	12	20	30	52	60	M5	5.9	0.12	2LC0591-0AF99-0AA0	0.43
						38	60	68			0.17		2LC0591-0AF99-0AB0
60	60	8700	64	15	32	34	70	79	M6	8.7	0.57	2LC0591-1AF99-0AA0	0.89
						44	80	89			0.57		2LC0591-1AF99-0AB0
80	80	6900	82	20	35	48	88	97	M6	15	1.42	2LC0591-2AF99-0AA0	1.63
						60	100	109			1.44		2LC0591-2AF99-0AB0
150	150	6900	82	20	35	48	88	97	M6	15	1.42	2LC0591-3AF99-0AA0	1.63
						60	100	109			1.44		2LC0591-3AF99-0AB0
200	200	6400	90	20	42	50	89	98	M6	15	1.5	2LC0591-4AF99-0AA0	1.80
						62	101	110			1.6		2LC0591-4AF99-0AB0
300	300	6000	110	25	50	55	99	110	M8	25	4.9	2LC0591-5AF99-0AA0	3.05
						65	109	120			5.0		2LC0591-5AF99-0AB0
500	500	5000	122	35	55	60	113	125	M8	36	8.3	2LC0591-6AF99-0AA0	4.39
						70	123	135			8.5		2LC0591-6AF99-0AB0
800	800	3700	157	50	70	92	166	182	M12	85	36	2LC0591-7AF99-0AA0	10.9
1400	1400	3700	157	50	70	92	166	182	M12	115	36	2LC0591-8AF99-0AA0	10.9
3000	3000	2800	157	55	75	92	166	182	M12	125	36	2LC0592-0AF99-0AA0	10.9
5000	5000	2800	210	60	90	140	219	240	M16	210	165	2LC0592-1AF99-0AA0	30.4

The clamping hubs with external taper are the ideal solution for high-speed and highly dynamic applications.

The maximum torques that can be transmitted by the clamping connection are listed in the table on page 5.

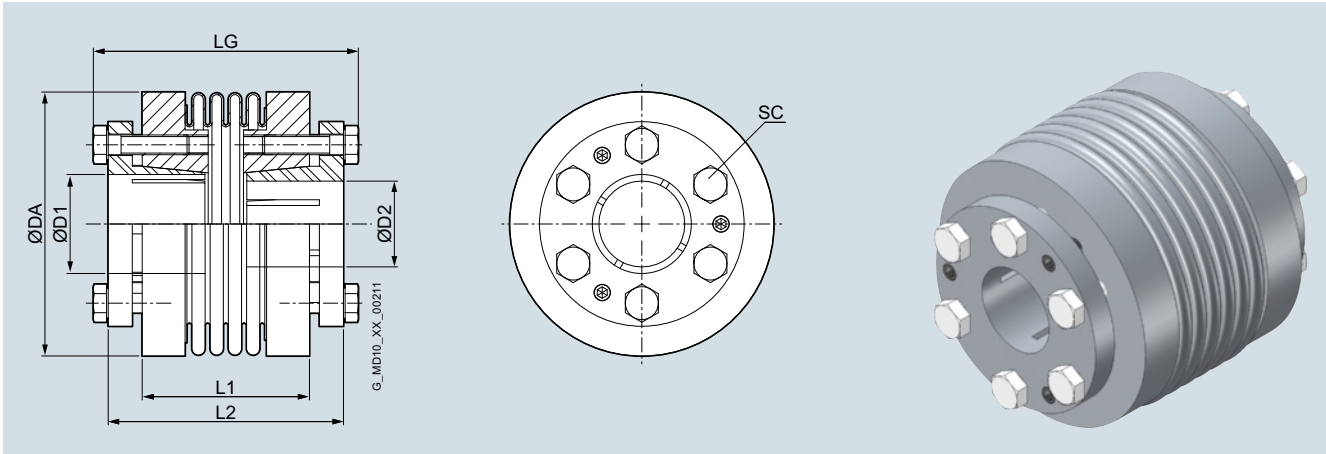
Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example:
SIPEX SKK coupling, size 80
Total length LG = 97 mm
Bore øD1 30 H7
Bore øD2 38 H7

Article No.:
2LC0591-2AF99-0AA0
LOS+MOV

Selection and ordering data

Standard series with internal taper



Standard series

Size	Rated torque T_{KN} Nm	Maximum speed n_{Kmax} rpm	Dimensions in mm			LG	L1	L2	Screw EN ISO 4017		Mass moment of inertia J $10^{-3} \times$ kgm^2	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m kg
			DA	D1, D2 H7 min.	D2 max.				SC	T_A Nm			
18	18	12800	47	10	17	62	42	57	M4	4	0.05	2LC0590-8AG99-0AA0	0.20
						70	50	64			0.05		
30	30	10300	56	12	20	53	34	47	M4	4.5	0.08	2LC0591-0AG99-0AA0	0.24
						61	42	55			0.09		
60	60	8700	64	15	25	62	34	53	M6	8.5	0.22	2LC0591-1AG99-0AA0	0.46
						73	45	64			0.25		
80	80	6900	82	20	35	79	50	70	M6	10	0.65	2LC0591-2AG99-0AA0	0.82
						90	60	81			0.71		
150	150	6900	82	20	35	79	50	70	M6	15	0.65	2LC0591-3AG99-0AA0	0.82
						90	60	81			0.71		
200	200	6400	90	20	40	79	50	70	M6	15	0.85	2LC0591-4AG99-0AA0	0.92
						92	63	84			0.95		
300	300	6000	110	25	50	90	53	78	M8	17	2.58	2LC0591-5AG99-0AA0	1.82
						103	65	91			2.85		
500	500	5000	122	35	55	103	65	91	M8	25	4.20	2LC0591-6AG99-0AA0	2.34
						113	71	101			4.42		
800	800	3700	157	50	70	170	108	148	M16	45	28.4	2LC0591-7AG99-0AA0	9.69
						170	108	148			28.4		
1400	1400	3700	157	50	70	170	108	148	M16	80	32.5	2LC0592-0AG99-0AA0	10.2
						170	108	148			32.5		
3000	3000	2800	157	55	75	170	108	148	M16	115	115	2LC0592-1AG99-0AA0	20.9
						170	108	148			115		

The clamping hubs with internal taper are the ideal solution for high-speed and highly dynamic applications. These couplings require less installation space than type SKK.

The maximum torques that can be transmitted by the clamping connection are listed in the table on page 5.

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example:
SIPEX SII coupling, size 80
Total length LG = 79 mm
Bore $\varnothing D1$ 30 H7
Bore $\varnothing D2$ 38 H7

Article No.:
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LOS+MOV

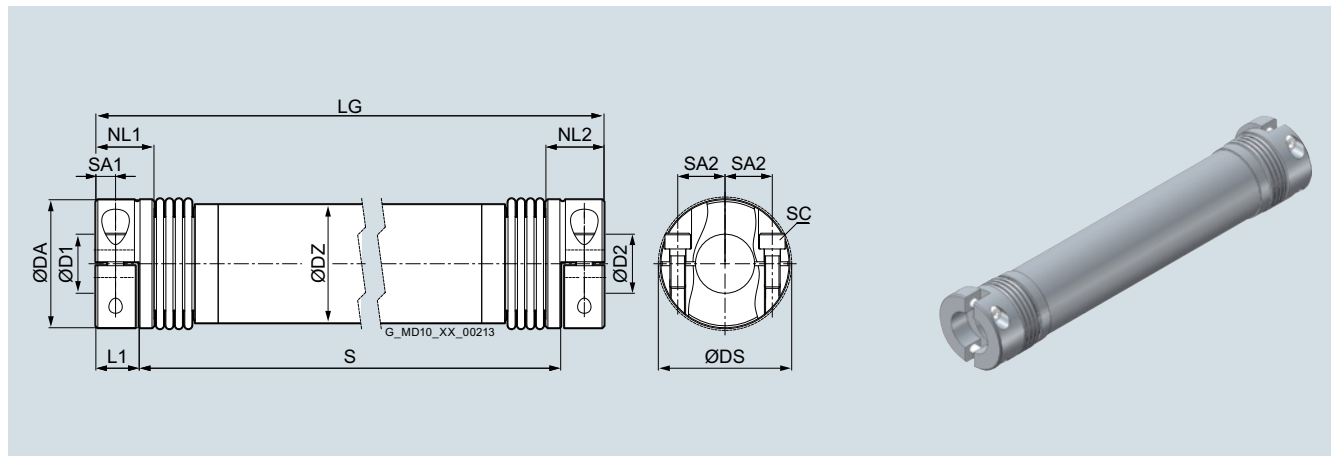
FLENDER Standard Couplings

Torsionally Rigid Couplings – SIPEX Series

Type SHH-W

Selection and ordering data

Standard series – drive shaft with half-shell clamping hubs



Standard series

Size	Rated torque T_{KN}	Maximum speed n_{Kmax}	Dimensions in mm									Screw EN ISO 4762		Mass moment of inertia J for DBSE = 1000 mm $10^{-3} \times$ kgm ²	Article No. Plain text required for dimension S. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m kg		
			DA	DS	D1, D2 H7	DZ	NL1/ NL2	L1	LG	SA1	SA2	SC	T_A					
	Nm	rpm	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.		Nm	kgm ²		kg	
18	18	1500	45	48	8	25	40	20.5	13.5	132	3000	5.7	17.5	M5	8	0.51	2LC0590-8AH99-0AZ0	1.63
30	30	1500	54	56	10	30	50	24.5	17	130	3000	7.5	20	M6	15	1.13	2LC0591-0AH99-0AZ0	2.29
60	60	1500	65	67	12	35	60	29	22	165	3000	10	24	M8	40	2.42	2LC0591-1AH99-0AZ0	3.34
150	150	1500	79	84	14	42	75	34	24	196	3000	11.8	28	M10	84	5.77	2LC0591-3AH99-0AZ0	5.1
200	200	1500	90	93	14	42	90	38	28	218	3000	12.5	31.5	M12	125	9.53	2LC0591-4AH99-0AZ0	5.9
300	300	1500	109	110	20	45	100	38	28	220	3000	13	35	M12	145	14.6	2LC0591-5AH99-0AZ0	7.1
500	500	1500	119	122	35	60	110	41.5	31.5	250	3000	14	42	M14	190	18.6	2LC0591-6AH99-0AZ0	7.3

It is possible to radially assemble and dismantle the hub version with half-shells without moving the connected units. It must be noted that the total length LG is obtained with shaft distance $S + 2 \times L1$.

The intermediate tubes in the standard version are made of aluminum. Tubes made of carbon-fiber-reinforced plastic (CFRP) are also available as an option.

Weights and mass moments of inertia apply to maximum bore diameters and a shaft distance $S = 1000$ mm.

Ordering example:

SIPEX SHH-W coupling, size 60
Shaft distance $S = 1000$ mm
Total length $LG = 1044$ mm
Bore $\varnothing D1$ 24 H7
Bore $\varnothing D2$ 28 H7

Article No.:

2LC0591-1AH99-0AZ0

LOP+MOR+QOY

Plain text for **QOY**: $S = 1000$ mm

Drive shafts with slotted clamping hubs are available as an alternative (type SGG-W).

Overview

BIPEX-S couplings are torsionally flexible and are free of backlash in the pretensioned state. They are characterized by their compact design and high power density. BIPEX-S couplings connect machine shafts and compensate for shaft misalignment that can occur during assembly or operation. The damping properties of the couplings can be varied by the use of cam rings made of elastomer of various degrees of hardness.

BIPEX-S couplings are suitable for all drive applications which require a coupling that offers positioning accuracy and vibration damping.



Benefits

BIPEX-S couplings are suitable for mounting horizontally, vertically or in any desired position. The coupling parts can be arranged as required on the shaft ends to be connected. The coupling can be axially plugged in.

The cam ring is pretensioned and is therefore assembled without backlash. The cams attached to the cam ring allow the coupling to compensate shaft misalignment, and also provide electrical isolation since they prevent contact between the two hub parts.

BIPEX-S couplings are fail-safe. When the cam ring is worn, the claws of the coupling hubs provide for fail-safe operation.

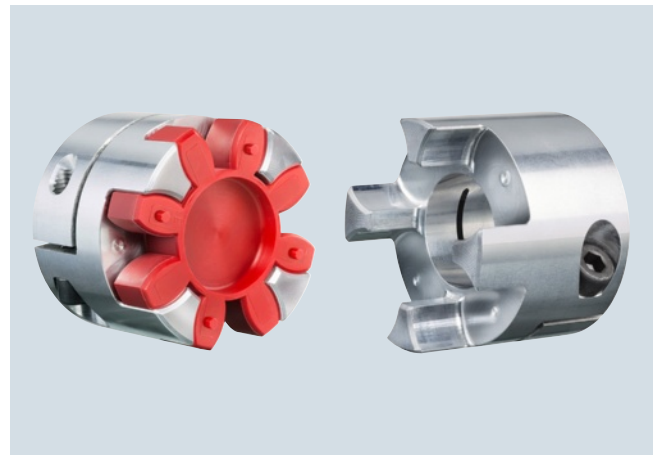
Available in 4 different Shore hardness grades, the cam rings allow to select the optimum degree of rigidity for any application.



Application

BIPEX-S couplings within the standard catalog range are available in 10 sizes with torque ratings ranging from 0.5 to 655 Nm. The coupling is suitable for ambient temperatures of between -30 °C and +90 °C. Cam rings with alternative hardness grades can be supplied for ambient temperatures down to -50 °C or up to +120 °C.

BIPEX-S couplings are ideal for use in servo drives, linear axes or rotary encoders of the type typically deployed in machine tools, packaging machines or printing presses.



FLENDER Standard Couplings

Flexible Couplings – BIPEX-S Series

General

Design

BIPEX-S couplings each comprise two hub parts connected by a cam ring made of polyurethane (PU).

The couplings can be axially plugged in during assembly. The hubs can be coupled to the shafts by many different methods including set screws, key joint, slotted clamping hubs, half-shell hubs, clamping hubs or expanding hubs.

BIPEX-S couplings are positive-locking and torsionally flexible thanks to the polyurethane cam ring. Misalignment between the connected shafts deforms the cam ring.

Coupling materials:

Hubs:	Up to size 38 aluminum Sizes 42 and 48 steel
Cam ring:	PU 80 ShoreA -50 °C to +80 °C PU 92 ShoreA -40 °C to +90 °C PU 98 ShoreA -30 °C to +90 °C (standard ring) PU 64 ShoreD -50 °C to +120 °C

The coupling types can be combined from the available range of hub versions and different elastomer grades.

Hub versions

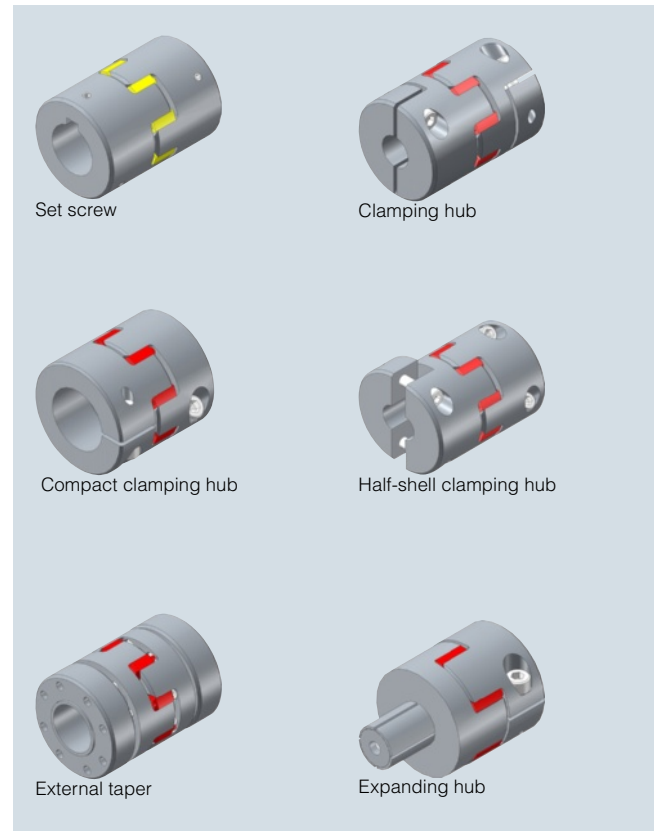
N:	Hub with set screw
G:	Slotted clamping hub
C:	Slotted clamping hub, compact
H:	Half-shell clamping hub
K:	Clamping hub with external taper
S:	Expanding hub

Versions N, G, C and H are optionally available with keyway.

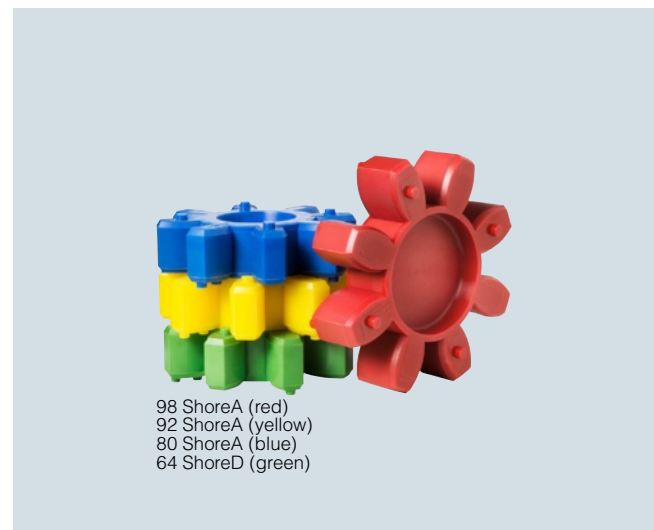
BIPEX-S coupling versions

Type	Description
BNN ¹⁾	Hub with set screw on both sides
BGG ¹⁾	Clamping hub on both sides
BCC ¹⁾	Compact clamping hub on both sides
BHH ¹⁾	Half-shell clamping hubs on both sides
BKK ¹⁾	Clamping hub with external taper on both sides
BCS ¹⁾	Hub 1: Clamping hub/Hub 2: Expanding hub
BHH-W ¹⁾	Drive shaft with half-shell clamping hub
BNG	Hub 1: Set screw/Hub 2: Clamping hub
BNC	Hub 1: Set screw/Hub 2: Compact cl. hub
BNH	Hub 1: Set screw/Hub 2: Half-shell
BNK	Hub 1: Set screw/Hub 2: External taper
BGC	Hub 1: Clamping hub/Hub 2: Compact cl. hub
BGH	Hub 1: Clamping hub/Hub 2: Half-shell
BGK	Hub 1: Clamping hub/Hub 2: External taper
BGS	Hub 1: Clamping hub/Hub 2: Expanding hub
BCH	Hub 1: Cl. hub compact/Hub 2: Half-shell
BCK	Hub 1: Cl. hub compact/Hub 2: External taper
BHK	Hub 1: Half-shell/Hub 2: External taper
BHS	Hub 1: Expanding hub/Hub 2: Half-shell
BKS	Hub 1: Expanding hub/Hub 2: External taper

Hub variants



Cam rings



¹⁾ Standard version

Overview

Preliminary dimensioning

Dimensioning according to torque

The coupling must be dimensioned such that the rated torque of the drive including service factors does not exceed the rated torque of the coupling.

$$T_{KN} \geq T_N \times FB \times FT$$

Torque characteristic	Service factor FB
Uniform	1.25
Non uniform	1.5
Rough	2.0

In order to increase the torsional rigidity and therefore minimize the torsional backlash, it is possible to apply significantly higher service factors for main spindle or positioning drives.

Temperature range	Temperature factor FT
-30 °C to +30 °C	1.0
to +60 °C	1.4
to +80 °C	1.8
to +100 °C	2.0
to +120 °C	2.8

Note:

Please note the permissible temperature ranges of different cam rings.

Starts per hour	Startup factor FA
< 125	1.0
125 to 250	1.3
250 to 500	1.6
500 to 1000	1.8
> 1000	2.0

Checking the peak torques

The coupling size selected during the preliminary dimensioning process must also be suitable with respect to peak torques at the drive and load ends.

$$T_{KN} \geq T_S \times FB \times FT$$

$$T_S = T_{AS} \times \frac{J_L}{J_A + J_L} \times FA \quad \text{or} \quad T_S = T_{LS} \times \frac{J_A}{J_A + J_L} \times FA$$

Checking the maximum speed

For all load situations $n_{Kmax} > n_{max}$

Checking the permitted shaft misalignment

The actual shaft misalignment must be less than the permitted shaft misalignment for all load situations.

Checking the shaft-hub connection

In the case of clamping connections without feather key, it must be ensured that the transmissible torque of the hub connection is greater than the peak torque at the coupling.

Formula symbols

Key to formula symbols

Name	Formula symbol	Unit	Explanation
Rated coupling torque	T_{KN}	Nm	Torque which can be transmitted as static torque by the coupling over the period of use.
Coupling overload torque	T_{KOL}	Nm	Torque which can be transmitted very rarely as maximum torque by the coupling.
Peak torque at drive end	T_{AS}	Nm	Peak torque during non-periodic torque surges at drive end
Peak torque at load end	T_{LS}	Nm	Peak torque during non-periodic torque surges at load end
Peak torque	T_S	Nm	Peak torque at the coupling
Service factor	FB		Factor that expresses the real coupling load as a ratio of the nominal coupling load
Temperature factor	FT		Factor that takes into account the reduction in strength of flexible rubber materials at higher temperatures
Startup factor	FA		Factor that takes into account additional loading as a function of starting frequency
Moment of inertia of drive end	J_A	kgm ²	Sum of the moments of inertia at the drive end referred to the coupling speed
Moment of inertia of load end	J_L	kgm ²	Sum of the moments of inertia at the load end referred to the coupling speed
Torsion angle	φ	°	Torsion angle of the coupling under torsional load
Torsional stiffness, dynamic	C_{Tdyn}	Nm/rad	Dynamic torsional stiffness of the coupling
Axial stiffness	C_a	N/mm	Axial stiffness of the coupling
Radial stiffness	C_r	N/mm	Radial stiffness of the coupling
Rated speed	n_N	rpm	Coupling speed
Maximum coupling speed	n_{Kmax}	rpm	Maximum permissible coupling speed
Axial misalignment	ΔK_a	mm	Axial misalignment of the coupling halves
Radial misalignment	ΔK_r	mm	Radial misalignment of the coupling halves
Angular misalignment	ΔK_w	°	Angular misalignment of the coupling halves

FLENDER Standard Couplings

Flexible Couplings – BIPEX-S Series

Technical information

Technical specifications

Power ratings

Size	Shore hardness	Rated torque	Maximum torque	Maximum speed	Maximum speed	Maximum speed	Torsional stiffness	Radial stiffness	Permitted shaft misalignment		
		T_{KN} Nm	T_{KOL} Nm	n_{Kmax} rpm	n_{Kmax} rpm	n_{Kmax} rpm	C_{Tdyn} Nm/rad	C_r N/mm	ΔK_a mm	ΔK_r mm	ΔK_w degrees
5	80 ShoreA	0.3	0.6	47500	38000	–	10	82	0.4	0.12	1.1
	92 ShoreA	0.5	1.0				16	154	0.4	0.06	1
	98 ShoreA	0.9	1.8				25	296	0.4	0.04	0.9
7	80 ShoreA	0.7	1.4	35000	26000	–	26	114	0.6	0.15	1.1
	92 ShoreA	1.2	2.4				43	219	0.6	0.1	1
	98 ShoreA	2.0	4.0				69	421	0.6	0.06	0.9
	64 ShoreD	2.4	4.8				103	630	0.6	0.04	0.8
9	80 ShoreA	1.8	3.6	24000	18000	–	52	125	0.8	0.19	1.1
	92 ShoreA	3.0	6				95	262	0.8	0.13	1
	98 ShoreA	5.0	10				155	518	0.8	0.08	0.9
	64 ShoreD	6.0	12				224	769	0.8	0.05	0.8
14	80 ShoreA	4.0	8	16000	12000	25000	180	153	1	0.21	1.1
	92 ShoreA	7.5	15				344	335	1	0.15	1
	98 ShoreA	12.5	25				513	655	1	0.09	0.9
	64 ShoreD	16	32				702	855	1	0.06	0.8
19	80 ShoreA	5	10	12000	9500	18500	1030	582	1.2	0.15	1.1
	92 ShoreA	10	20				1720	1125	1.2	0.1	1
	98 ShoreA	17	34				2580	2010	1.2	0.06	0.9
	64 ShoreD	21	42				3720	2950	1.2	0.04	0.8
24	92 ShoreA	35	70	8700	7000	13900	4300	1490	1.4	0.14	1
	98 ShoreA	60	120				6190	2550	1.4	0.1	0.9
	64 ShoreD	75	150				8930	3695	1.4	0.07	0.8
28	92 ShoreA	95	190	7400	6000	11800	6880	1785	1.5	0.15	1
	98 ShoreA	160	320				10310	3210	1.5	0.11	0.9
	64 ShoreD	200	400				13050	4350	1.5	0.08	0.8
38	92 ShoreA	190	380	6000	4700	9600	13750	2350	1.8	0.17	1
	98 ShoreA	325	650				21490	4410	1.8	0.12	0.9
	64 ShoreD	405	810				31620	6475	1.8	0.09	0.8
42	92 ShoreA	265	530	5000	4000	8000	24300	2440	2	0.19	1
	98 ShoreA	450	900				48000	5575	2	0.14	0.9
	64 ShoreD	560	1120				71700	7280	2	0.1	0.8
48	92 ShoreA	310	620	4600	3500	7100	18055	2590	2.1	0.23	1
	98 ShoreA	525	1050				55925	5950	2.1	0.16	0.9
	64 ShoreD	655	1310				90500	8280	2.1	0.11	0.8

Torsional stiffness and damping

The values stated in the above table apply to a capacity utilization of 50 %, an excitation amplitude of 10 % T_{KN} with a frequency of 10 Hz and an ambient temperature of 20 °C. The dynamic torsional stiffness is load-dependent and increases in proportion to capacity utilization.

The relative damping coefficient is

$\psi = 0.8$ for 98, 92 and 80 ShA

$\psi = 0.75$ for 64 ShD.

T_{KOL} is the torque which can be transmitted very rarely as maximum torque by the coupling.

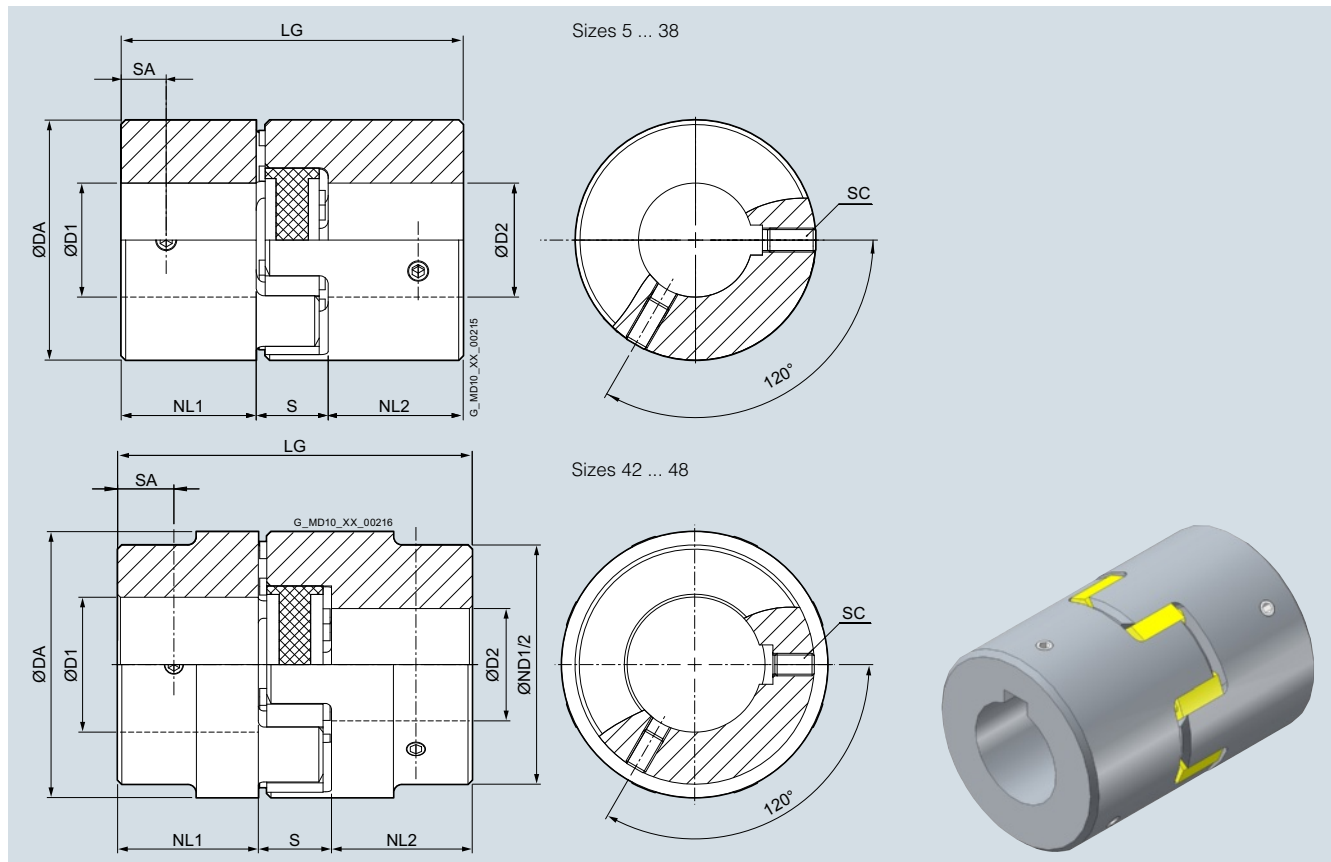
Permitted shaft misalignment

The permitted shaft misalignments ΔK_a , ΔK_r and ΔK_w are maximum values and must not occur simultaneously. The following formula can be used to roughly calculate whether combinations of misalignments are permissible:

$$\frac{\Delta K_r \text{ act}}{\Delta K_r} + \frac{\Delta K_a \text{ act}}{\Delta K_a} + \frac{\Delta K_w \text{ act}}{\Delta K_w} < 1$$

Selection and ordering data

Hubs with set screws



Size	Rated torque T_{KN} 98ShA Nm	Rated torque T_{KN} 92ShA Nm	Maximum speed n_{Kmax} rpm	Dimensions in mm							Screw DIN EN ISO 4027 SC	Mass moment of inertia J $10^{-6} \times$ kgm^2	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m kg	
				DA	D1, D2 H7 min. max.	ND1/ ND2	NL1/ NL2	S	LG	SA					T_A Nm
5	0.9	0.5	47500	10	2 5	–	5	5	15	2.5	M3	2.5	0.04	2LC0190-0AA99-0AA0	0.003
7	2	1.2	35000	14	3 7	–	7	8	22	3.5	M3	2.5	0.2	2LC0190-1AA99-0AA0	0.007
9	5	3	24000	20	4 10	–	10	10	30	5	M4	5	1.1	2LC0190-2AA99-0AA0	0.018
14	12.5	7.5	16000	30	5 16	–	11	13	35	5	M4	5	6.4	2LC0190-3AA99-0AA0	0.045
19	17	10	12000	40	6 24	–	25	16	66	10	M5	10	37	2LC0190-4AA99-0AA0	0.14
24	60	35	8700	55	8 28	–	30	18	78	10	M5	10	171	2LC0190-5AA99-0AA0	0.36
28	160	95	7400	65	10 38	–	35	20	90	15	M8	15	370	2LC0190-6AA99-0AA0	0.53
38	325	190	6000	80	12 45	–	45	24	114	15	M8	15	1100	2LC0190-7AA99-0AA0	1.1
42	450	265	5000	95	14 55	85	50	26	126	20	M8	20	4960	2LC0190-8AA99-0AA0	3.5
48	525	310	4600	105	15 62	95	56	28	140	20	M8	20	9900	2LC0191-0AA99-0AA0	5.3

Shaft is connected to hub by means of feather key according to DIN 6885-1.

The keyway can be optionally omitted and the shaft connected to the hub solely by means of set screws.

Cam ring made of polyurethane with Shore hardness 92 ShA as standard (yellow cam ring).

For other hardness grades, [see page 24](#).

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example

BIPEX-S BGG coupling, size 24

Part 1: Bore $\varnothing D1$ 20 H7

Part 2: Bore $\varnothing D2$ 24 H7

Article No.:

2LC0190-5AA99-0AA0

LOM + MOP

Options for other Shore hardness grades:

-Z K03 = 80 ShA (blue cam ring)

-Z K01 = 98 ShA (red cam ring)

-Z K04 = 64 ShD (green cam ring)

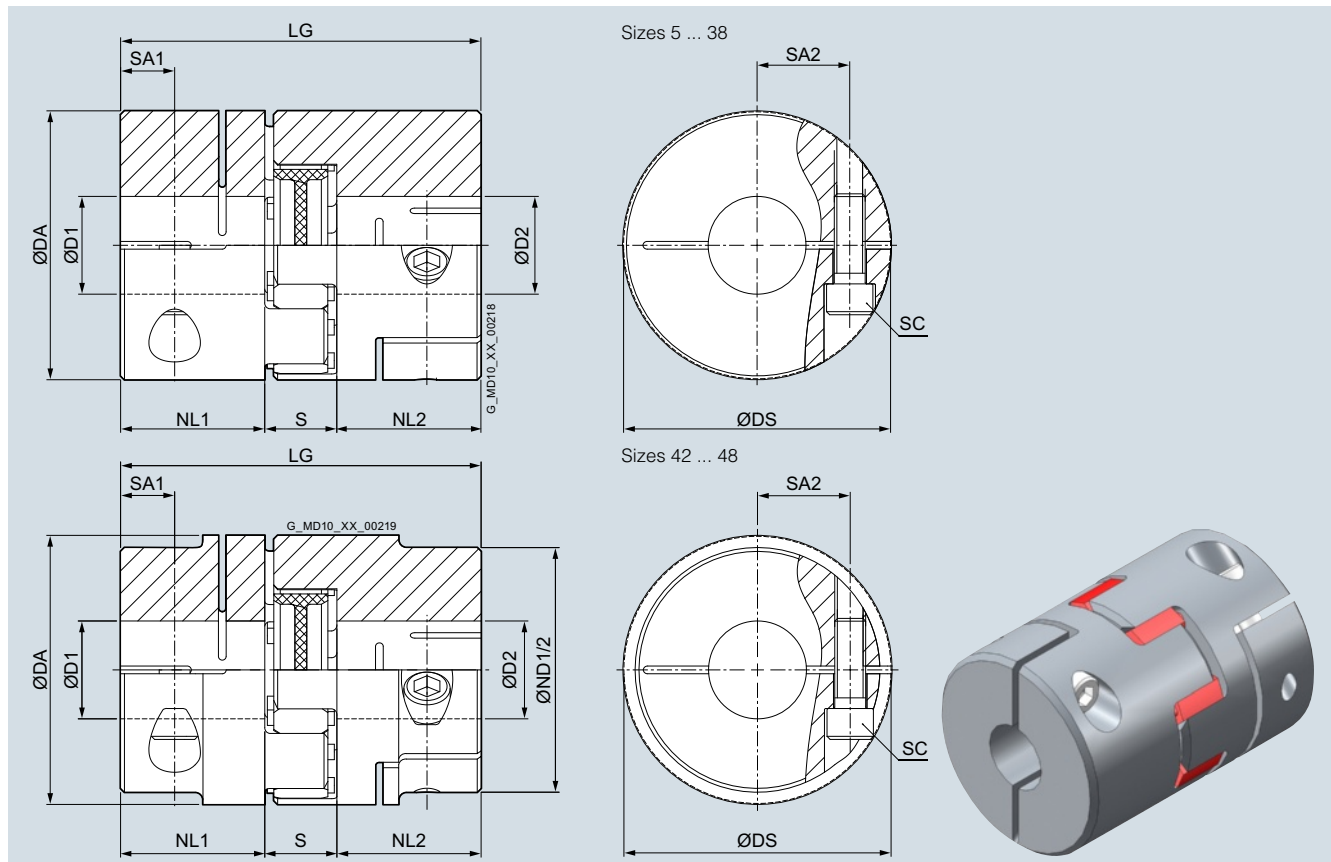
FLENDER Standard Couplings

Flexible Couplings – BIPEX-S Series

Types BGG and BCC

Selection and ordering data

Standard clamping hubs (type BGG)



Size	Rated torque T_{KN} 98ShA Nm	Rated torque T_{KN} 92ShA Nm	Maximum speed n_{Kmax} rpm	Dimensions in mm										Screw DIN EN ISO 4762 T_A Nm	Mass moment of inertia J $10^{-6} \times$ kgm ²	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m kg	
				DA	DS	D1, D2 H7 min. max.	ND1/ ND2	NL1/ NL2	S	LG	SA1	SA2	SC					
5	0.9	0.5	38000	10	11.5	2	4	-	5	5	15	2.5	3.5	M1.6	0.3	0.04	2LC0190-0AB99-0AA0	0.003
7	2	1.2	26000	14	16.5	3	7	-	7	8	22	3.5	5	M2	0.4	0.2	2LC0190-1AB99-0AA0	0.007
9	5	3	18000	20	23.4	5	9	-	10	10	30	5	7.3	M2.5	0.8	1.1	2LC0190-2AB99-0AA0	0.019
14	12.5	7.5	12000	30	32.2	6	16	-	11	13	35	5	11	M3	2	6.3	2LC0190-3AB99-0AA0	0.04
19	17	10	9500	40	45.7	8	24	-	25	16	66	11	14.5	M6	11	37	2LC0190-4AB99-0AA0	0.14
24	60	35	7000	55	57.4	10	28	-	30	18	78	10.5	20	M6	15	165	2LC0190-5AB99-0AA0	0.35
28	160	95	6000	65	72.6	15	38	-	35	20	90	11	24.5	M8	32	390	2LC0190-6AB99-0AA0	0.51
38	325	190	4700	80	83.3	15	45	-	45	24	114	15.5	30	M8	38	1060	2LC0190-7AB99-0AA0	1.0
42	450	265	4000	95	95	19	50	85	50	26	126	18	32.5	M10	84	4800	2LC0190-8AB99-0AA0	3.6
48	525	310	3500	105	105	25	55	95	56	28	140	21	36	M12	145	8180	2LC0191-0AB99-0AA0	5.0

The slotted clamping hub allows a frictionally engaged connection to the input and output shaft.

A single tightening screw per hub ensures easy assembly.

The maximum torques that can be transmitted by the clamping connection are listed in the table on page 6.

A keyway according to DIN 6885-1 can be selected additionally as an option.

Cam ring made of polyurethane with Shore hardness 98 ShA as standard (red cam ring).

For other hardness grades, [see page 24](#).

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example

BIPEX-S BGG coupling, size 24

Part 1: Bore $\varnothing D1$ 20 H7

Part 2: Bore $\varnothing D2$ 24 H7

Cam ring 98 ShA

Article No.:

2LC0190-5AB99-0AA0

LOM + MOP

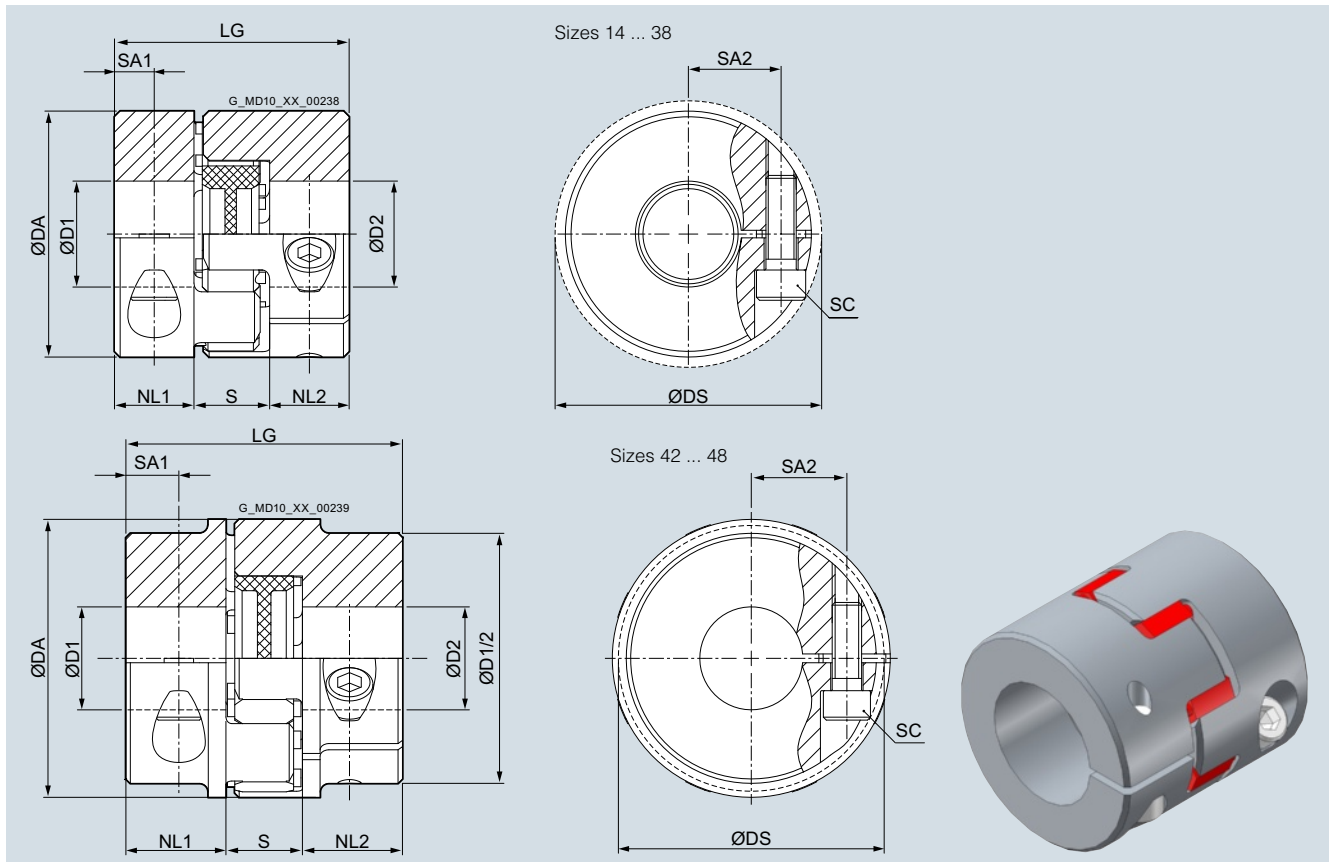
Options for other Shore hardness grades:

-Z K03 = 80 ShA (blue cam ring)

-Z K02 = 92 ShA (yellow cam ring)

-Z K04 = 64 ShD (green cam ring)

Clamping hubs in compact design (type BCC)



Size	Rated torque	Rated torque	Maximum speed	Dimensions in mm										Screw DIN EN ISO 4762	Mass moment of inertia	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight	
	T_{KN} 98ShA Nm	T_{KN} 92ShA Nm		n_{Kmax} rpm	DA	DS	D1, D2 H7 min. max.	ND1/ ND2	NL1/ NL2	S	LG	SA1	SA2					SC
14	12.5	7.5	12000	30	32.2	6	16	-	11	13	35	5	11	M3	2	6.3	2LC0190-3AF99-0AA0	0.04
19	17	10	9500	40	45.7	10	24	-	17	16	50	8.5	15	M5	10	29	2LC0190-4AF99-0AA0	0.11
24	60	35	7000	55	57.4	12	28	-	20	18	58	10	20	M6	18	123	2LC0190-5AF99-0AA0	0.26
28	160	95	6000	65	72.6	15	35	-	21	20	62	10.5	24.5	M8	43	253	2LC0190-6AF99-0AA0	0.38
38	325	190	4700	80	83.3	16	45	-	31	24	86	15.5	30	M10	84	816	2LC0190-7AF99-0AA0	0.79
42	450	265	4000	95	95	19	50	85	34	26	94	18	32.5	M10	84	3290	2LC0190-8AF99-0AA0	2.5
48	525	310	3500	105	105	25	55	95	40	28	108	21	36	M12	145	5459	2LC0191-0AF99-0AA0	3.3

The slotted clamping hub allows a frictionally engaged connection to the input and output shaft.

A single tightening screw per hub ensures easy assembly.

The maximum torques that can be transmitted by the clamping connection are listed in the table on page 6.

A keyway according to DIN 6885-1 can be selected additionally as an option.

Cam ring made of polyurethane with Shore hardness 98 ShA as standard (red cam ring).

For other hardness grades, [see page 24](#).

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example

BIPEX-S BCC coupling, size 24

Part 1: Bore $\varnothing D1$ 20 H7

Part 2: Bore $\varnothing D2$ 24 H7

Cam ring 98 ShA

Article No.:

2LC0190-5AF99-0AA0

LOM + MOP

Options for other Shore hardness grades:

-Z K03 = 80 ShA (blue cam ring)

-Z K02 = 92 ShA (yellow cam ring)

-Z K04 = 64 ShD (green cam ring)

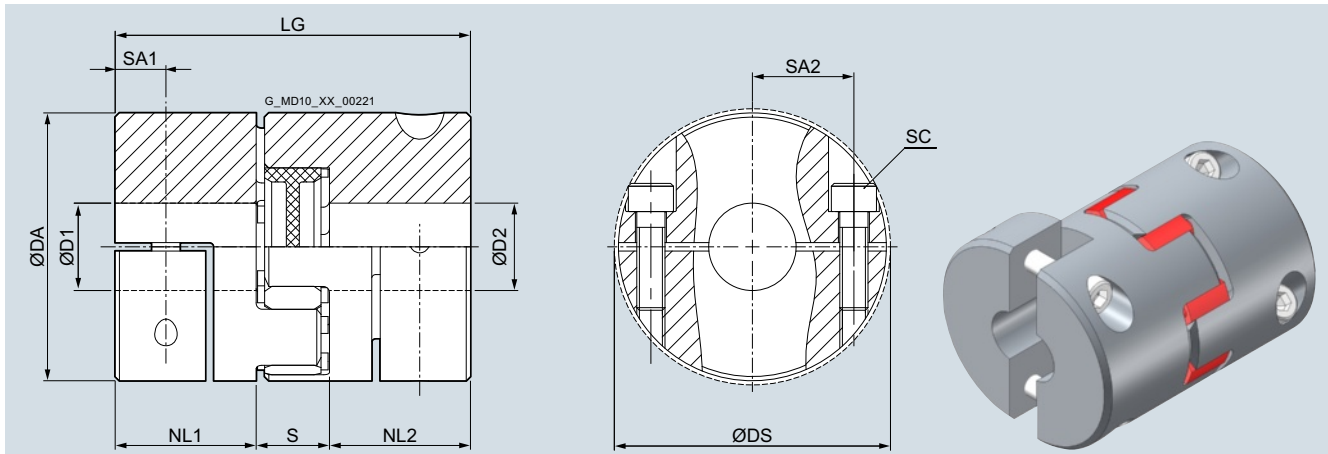
FLENDER Standard Couplings

Flexible Couplings – BIPEX-S Series

Type BHH

Selection and ordering data

Half-shell clamping hub



Size	Rated torque	Rated torque	Maximum speed	Dimensions in mm						Screw DIN EN ISO 4762	Mass moment of inertia	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight				
	T_{KN} 98ShA Nm	T_{KN} 92ShA Nm		n_{Kmax} rpm	DA	DS	D1, D2 H7 min. max.	NL1/ NL2	S					LG	SA1	SA2	SC
14	12.5	7.5	12000	30	33	6	16	11	13	35	5	11	M4	1.4	5.6	2LC0190-3AC99-0AA0	0.02
19	17	10	9500	40	45	8	23	25	16	66	6	14.5	M5	8	38	2LC0190-4AC99-0AA0	0.15
24	60	35	7000	55	57	10	30	30	18	78	10.5	20	M6	10.5	166	2LC0190-5AC99-0AA0	0.35
28	160	95	6000	65	70	15	38	35	20	90	11	24.5	M8	25	370	2LC0190-6AC99-0AA0	0.53
38	325	190	4700	80	83	15	48	45	24	114	15.5	30	M8	25	1040	2LC0190-7AC99-0AA0	0.98
42	450	265	4000	95	95	19	50	50	26	126	18	32.5	M10	69	5970	2LC0190-8AC99-0AA0	4.1
48	525	310	3500	105	105	25	55	56	28	140	15	40	M12	120	9830	2LC0191-0AC99-0AA0	5.6

It is possible to radially assemble and dismantle the hub version with half-shells without moving the connected units.

The maximum torques that can be transmitted by the clamping connection are listed in the table on page 6.

A keyway according to DIN 6885-1 can be selected additionally as an option.

Cam ring made of polyurethane with Shore hardness 98 ShA as standard (red cam ring).

For other hardness grades, [see page 24](#).

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example

BIPEX-S BHH coupling, size 24

Part 1: Bore $\varnothing D1$ 20 H7

Part 2: Bore $\varnothing D2$ 24 H7

Cam ring 98 ShA

Article No.:

2LC0190-5AC99-0AA0

LOM + MOP

Options for other Shore hardness grades:

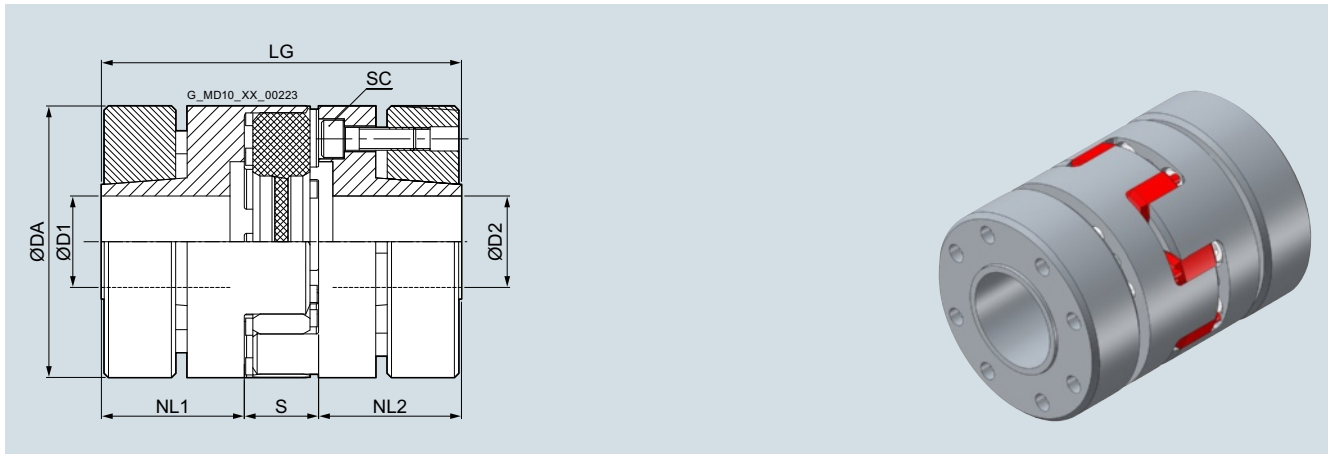
-Z K03 = 80 ShA (blue cam ring)

-Z K02 = 92 ShA (yellow cam ring)

-Z K04 = 64 ShD (green cam ring)

Selection and ordering data

Clamping hubs with external taper



Size	Rated torque	Rated torque	Maximum speed	Dimensions in mm						Screw	Mass moment of inertia	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight	
	T_{KN} 98ShA Nm	T_{KN} 92ShA Nm	n_{Kmax} rpm	DA	D1, D2 H7 min. max.		NL1/ NL2	S	LG	DIN EN ISO 4762				T_A Nm
14	12.5	7.5	25000	30	5	14	18.5	13	50	M3	1.3	18	2LC0190-3AD99-0AA0	0.11
19	17	10	18500	40	10	20	25	15	65	M4	2.9	57	2LC0190-4AD99-0AA0	0.23
24	60	35	13900	55	10	25	30	18	78	M5	6	268	2LC0190-5AD99-0AA0	0.57
28	160	95	11800	65	15	36	35	20	90	M5	6	610	2LC0190-6AD99-0AA0	0.86
38	325	190	9600	80	20	48	43.5	24	111	M6	10	1690	2LC0190-7AD99-0AA0	1.5
42	450	265	8000	95	28	50	50	26	126	M8	35	5880	2LC0190-8AD99-0AA0	4.0
48	525	310	7100	105	30	55	56	28	140	M10	69	9600	2LC0191-0AD99-0AA0	5.4

The clamping hubs with external taper are the ideal solution for high-speed and highly dynamic applications. The clamping ring is made of steel.

The maximum torques that can be transmitted by the clamping connection are listed in the table on page 6.

Cam ring made of polyurethane with Shore hardness 98 ShA as standard (red cam ring).

For other hardness grades, [see page 24](#).

Sizes 14 to 48 are also available on request as a light-weight version with hubs and clamping rings made of aluminum (type designation BKK-L).

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example

BIPEX-S BKK coupling, size 24

Part 1: Bore $\varnothing D1$ 20 H7

Part 2: Bore $\varnothing D2$ 24 H7

Cam ring 98 ShA

Article No.:

2LC0190-5AD99-0AA0

LOM + MOP

Options for other Shore hardness grades:

-Z K03 = 80 ShA (blue cam ring)

-Z K02 = 92 ShA (yellow cam ring)

-Z K04 = 64 ShD (green cam ring)

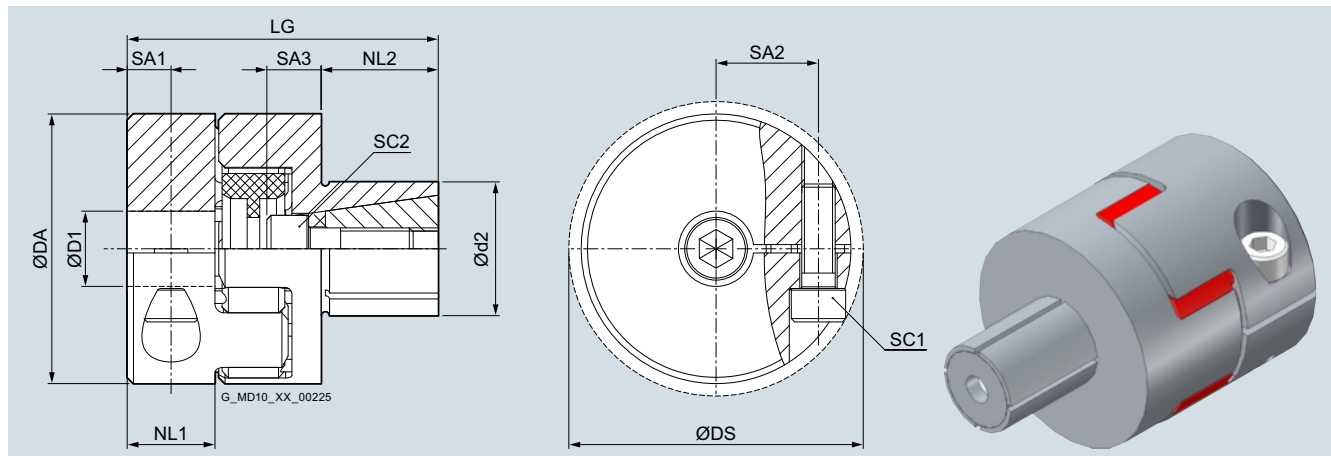
FLENDER Standard Couplings

Flexible Couplings – BIPEX-S Series

Type BCS

Selection and ordering data

Compact clamping hubs and expanding hub



Size	Rated torque T_{KN} 98 ShA Nm	Rated torque T_{KN} 92 ShA Nm	Maximum speed n_{Kmax} rpm	Dimensions in mm								Screw DIN EN ISO 4762		Screw DIN EN ISO 4027		Mass moment of inertia J $10^{-6} \times$ kgm ²	Article No. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m kg				
				DA	DS	D1 H7	d2 h7	NL1	NL2	LG	SA1	SA2	SA3	SC1	T_A				SC2	T_A		
9	5	3	18000	20	23.4	5	9	10	16	10	11	40	5	7.3	9	M2.5	0.75	M4	8	1.0	2LC0190-2AE99-0AA0	0.03
14	12.5	7.5	12000	30	32.2	6	16	13	25	11	12.5	42.5	5	11	7	M3	2	M5	9	7.0	2LC0190-3AE99-0AA0	0.06
19	17	10	9500	40	45.7	10	24	14	30	17	20	61	8.5	14.5	8	M5	15	M6	15	28	2LC0190-4AE99-0AA0	0.13
24	60	35	7000	55	57.4	12	28	23	38	20	30	76	10	20	12	M6	15	M8	35	113	2LC0190-5AE99-0AA0	0.33
28	160	95	6000	65	72.6	15	35	26	42	21	36	85	10.5	24.5	13	M8	35	M10	70	222	2LC0190-6AE99-0AA0	0.50
38	325	190	4700	80	83.3	16	45	38	60	31	45	113	15.5	30	17	M8	35	M12	120	800	2LC0190-7AE99-0AA0	1.1

A hollow shaft can be connected to the expanding hub.

The bore for connecting the expanding hub must have tolerance H7.

Cam ring made of polyurethane with Shore hardness 98 ShA as standard.

For other hardness grades, [see page 24](#).

Weights and mass moments of inertia apply to maximum bore diameters.

Ordering example

BIPEX-S BKK coupling, size 24

Part 1: Bore $\varnothing D1$ 20 H7

Part 2: Shaft $\varnothing d2$ 24 h7

Cam ring 98 ShA

Article No.:

2LC0190-5AE99-0AA0

LOM + MOP

Options for other Shore hardness grades:

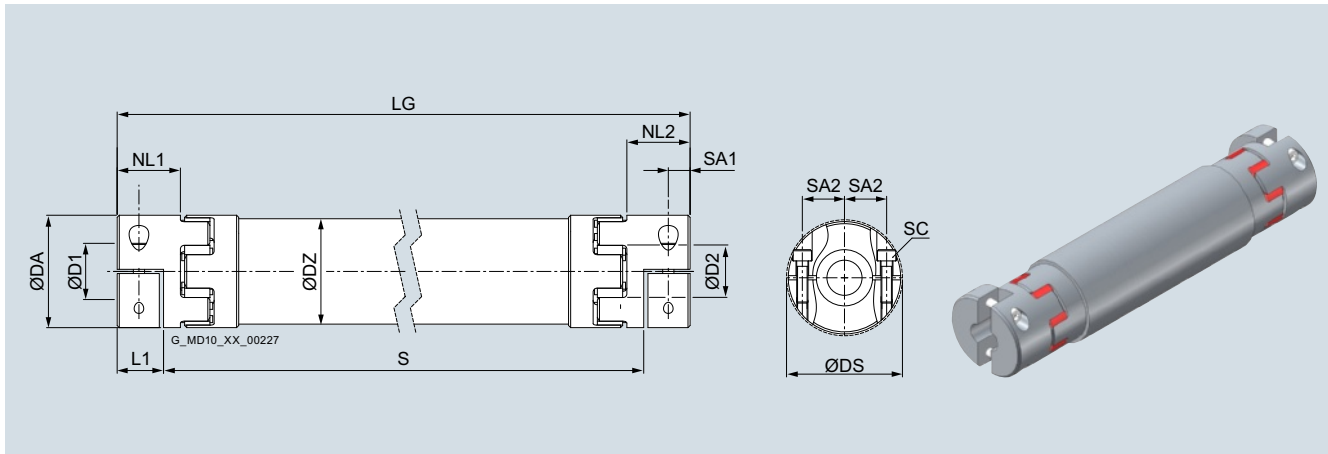
-Z K03 = 80 ShA (blue cam ring)

-Z K02 = 92 ShA (yellow cam ring)

-Z K04 = 64 ShD (green cam ring)

Selection and ordering data

Drive shaft with half-shell clamping hubs



Size	Rated torque T_{KN} 98ShA	Maximum speed n_{Kmax}	Dimensions in mm										Screw DIN EN ISO 4762		Mass moment of inertia J for DBSE = 1000 mm $10^{-6} \times$ kgm ²	Article No. Plain text required for dimension S. With finished bore; required order code for bore diameters and tolerances see page 4	Weight m kg	
			DA	DS	D1, D2 H7	DZ	NL1/ NL2	L1	LG	SA1	SA2	SC	T_A					
	Nm	rpm	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	Nm			
14	12.5	1500	30	33	6	16	30	11	9	85	3000	5	11	M4	3	79	2LC0190-3AH99-0AZ0	0.54
19	17	1500	40	45	8	23	40	25	13.4	135	3000	6	15	M5	5.9	151	2LC0190-4AH99-0AZ0	0.58
24	60	1500	55	57	10	30	50	30	21	165	3000	10.5	20	M6	15	2250	2LC0190-5AH99-0AZ0	3.4
28	160	1500	65	70	15	38	60	35	23.5	205	3000	11	24.5	M8	32	2510	2LC0190-6AH99-0AZ0	3.5
38	325	1500	80	83	15	48	75	45	33	250	3000	15.5	30	M8	38	8360	2LC0190-7AH99-0AZ0	7.8
42	450	1500	95	95	19	50	90	50	35	265	3000	18	32.5	M10	84	1780	2LC0190-8AH99-0AZ0	11.8
48	525	1500	105	105	25	55	110	56	32.5	285	3000	15	40	M12	145	21150	2LC0191-0AH99-0AZ0	15.3

It is possible to radially assemble and dismantle the hub version with half-shells without moving the connected units. It must be noted that the total length LG is obtained with shaft distance $S + 2 \times L1$.

The intermediate tubes in the standard version are made of aluminum. Tubes made of carbon-fiber-reinforced plastic (CFRP) are also available as an option.

Weights and mass moments of inertia apply to maximum bore diameters and a shaft distance $S = 1000$ mm.

Ordering example

BIPEX-S BHH-W coupling, size 24
 Shaft distance $S = 1000$ mm
 Total length $LG = 1042$ mm
 Part 1: Bore $\varnothing D1$ 20 H7
 Part 2: Bore $\varnothing D2$ 24 H7

Article No.:

2LC0190-5AH99-0AZ0

LOM + MOP + Q0Y

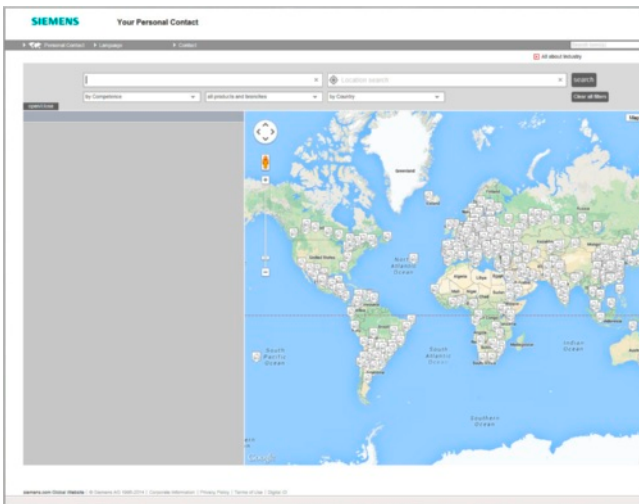
Plain text for **Q0Y**: $S = 1000$ mm

Options for other Shore hardness grades:

-Z K04 = 64 ShD (green cam ring)

Appendix

Partner at Siemens



At Siemens Industry we are resolutely pursuing the same goal: long-term improvement of your competitive ability. We are committed to this goal. Thanks to our commitment, we continue to set new standards in automation and drive technology. In all industries – worldwide.

At your service locally, around the globe for consulting, sales, training, service, support, spare parts ... on the entire Industry Automation and Drive Technologies range.

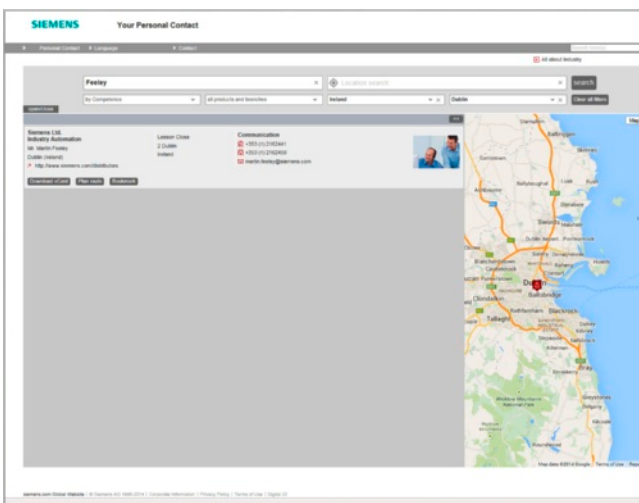
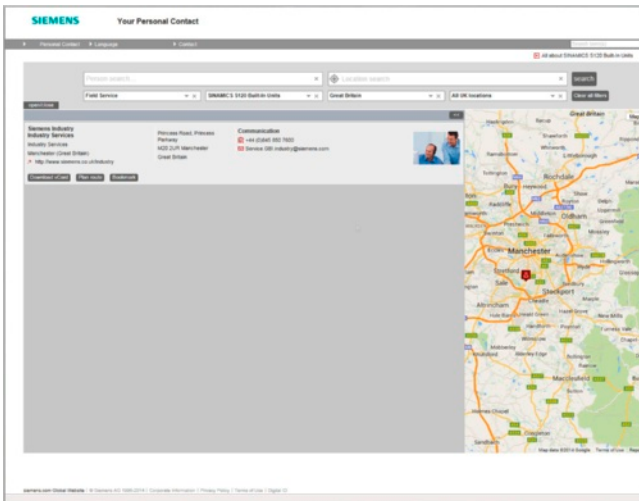
Your personal contact can be found in our Contacts Database at: www.siemens.com/automation/partner

You start by selecting

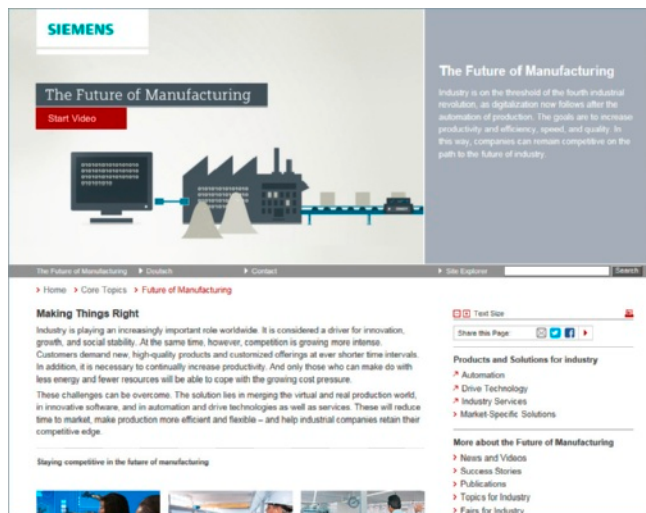
- the required competence,
- products and branches,
- a country,
- a city

or by a

- location search or
- person search.



Siemens Industry Automation and Drive Technologies in the WWW



A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

Siemens Industry Automation and Drive Technologies has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

www.siemens.com/industry

you will find everything you need to know about products, systems and services.

Product Selection Using the Interactive Catalog CA 01



Detailed information together with convenient interactive functions:

The interactive catalog CA 01 covers more than 80 000 products and thus provides a full summary of the Siemens Industry Automation and Drive Technologies product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives. All information is linked into a user interface which is easy to work with and intuitive.

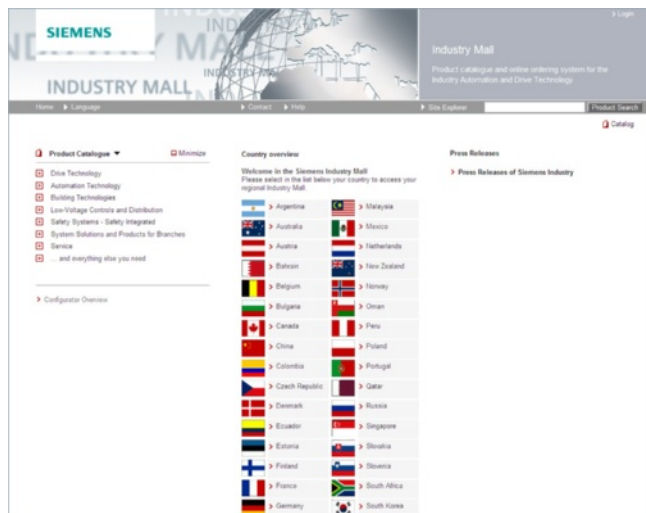
After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the interactive catalog CA 01 can be found in the Internet under

www.siemens.com/automation/ca01

or on DVD.

Easy Shopping with the Industry Mall



The Industry Mall is the electronic ordering platform of Siemens AG on the Internet. Here you have online access to a huge range of products presented in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking and tracing of the order to be carried out. Availability checks, customer-specific discounts and preparation of quotes are also possible.

Numerous additional functions are available to support you.

For example, powerful search functions make it easy to select the required products. Configurators enable you to configure complex product and system components quickly and easily. CAx data types are also provided here.

Please visit the Industry Mall on the Internet under:

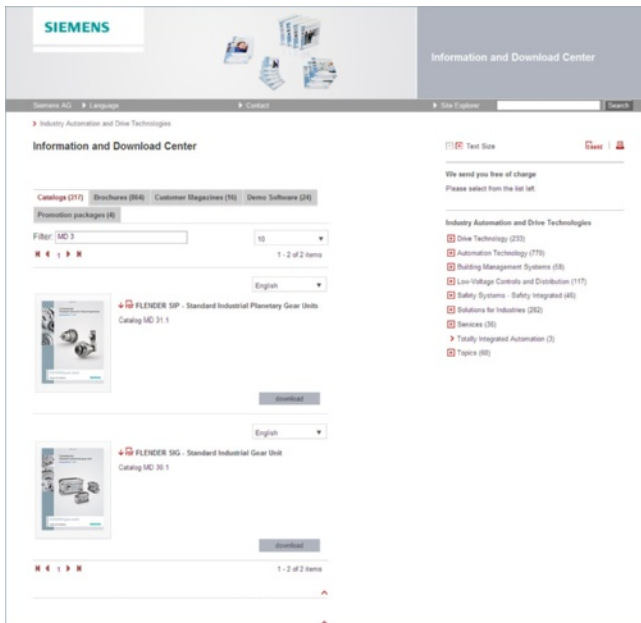
www.siemens.com/industrymall

Appendix

Online Services

Information and Download Center

Downloading Catalogs



In addition to numerous other useful documents, you can also find the catalogs listed on the back inside cover of this catalog in the Information and Download Center. Without having to register, you can download these catalogs in PDF format or increasingly as digital page-turning e-books.

The filter dialog box above the first catalog displayed makes it possible to carry out targeted searches. If you enter "MD 3" for example, you will find both the MD 30.1 and MD 31.1 catalogs. If you enter "ST 70" both the ST 70 catalog and the associated news or add-ons are displayed.

Visit us on the web at:

www.siemens.com/industry/infocenter

Your machines and plant can do more – with Industry Services.

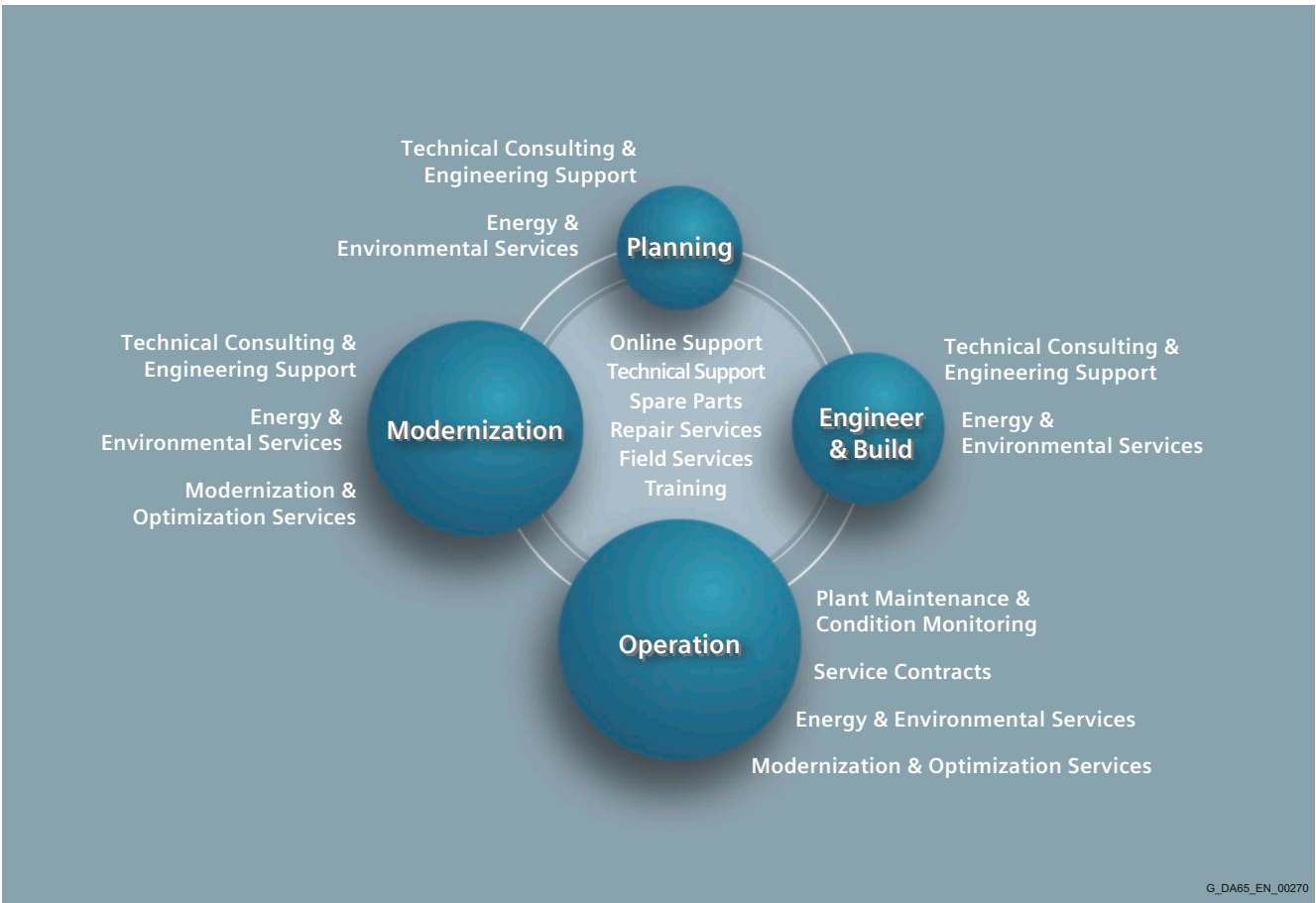


Whether it is production or process industry - in view of rising cost pressure, growing energy costs, and increasingly stringent environmental regulations, services for industry are a crucial competitive factor in manufacturing as well as in process industries.

All over the world Siemens supports its customers with product, system, and application-related services throughout the entire life cycle of a plant. Right from the earliest stages of planning, engineering, and building, all the way to operation and modernization. These services enable customers to benefit from the Siemens experts' unique technological and product knowledge and industry expertise.

Thus downtimes are reduced and the utilization of resources is optimized. The bottom line: increased plant productivity, flexibility, and efficiency, plus reduced overall costs.

Discover all advantages of our service portfolio:
www.siemens.com/industry-services



Siemens supports its clients with technology based Services across a plants entire life cycle.

Appendix

Industry Services

Industry Services for the entire life cycle

Online Support

Online support is a comprehensive information system for all questions relating to products, systems, and solutions that Siemens has developed for industry over time. With more than 300,000 documents, examples and tools, it offers users of automation and drive technology a way to quickly find up-to-date information. The 24-hour service enables direct, central access to detailed product information as well as numerous solution examples for programming, configuration and application.

The content, in six languages, is increasingly multimediated – and now also available as a mobile app. Online support's "Technical Forum" offers users the opportunity to share information with each other. The "Support Request" option can be used to contact Siemens' technical support experts. The latest content, software updates, and news via newsletters and Twitter ensure that industry users are always up to date.



www.siemens.com/industry/onlinesupport

Online Support App



Using the Online Support app, you can access over 300,000 documents covering all Siemens industrial products - anywhere, any time. Regardless of whether you need help implementing your project, fault-finding, expanding your system or are planning a new machine.

You have access to FAQs, manuals, certificates, characteristics curves, application examples, product notices (e.g. announcements of new products) and information on successor products in the event that a product is discontinued.

Just scan the product code printed on the product directly using the camera of your mobile device to immediately see all technical information available on this product at a glance. The graphical CAx information (3D model, circuit diagrams or EPLAN macros) is also displayed. You can forward this information to your workplace using the e-mail function.

The search function retrieves product information and articles and supports you with a personalized suggestion list. You can find your favorite pages – articles you need frequently – under "mySupport". You also receive selected news on new functions, important articles or events in the News section.

Scan the QR code for information on our Online Support app.

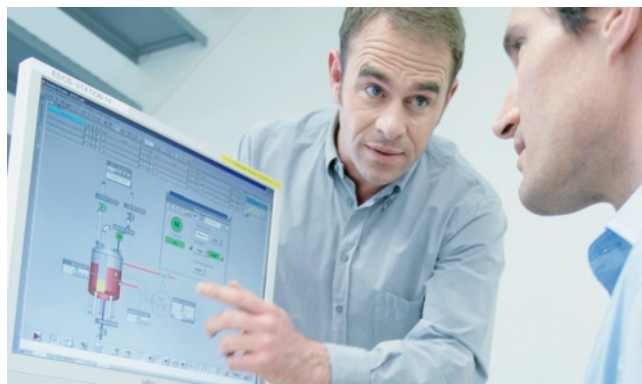


The app is available free of charge from the Apple App Store (iOS) or from Google Play (Android).

www.siemens.com/industry/onlinesupportapp

Technical Support

The ability to quickly analyze system and error messages and take appropriate action are key factors in ensuring that plants run safely and efficiently. Questions can arise at any time and in any industry, whether it's an individual product or a complete automation solution. Siemens technical support offers individual technical assistance in matters related to functionality, how to operate, applications, and fault clearance in industrial products and systems – at any time and globally, over the phone, by e-mail, or via remote access. Experienced experts from Siemens answer incoming questions promptly. Depending on the requirements, they first consult specialists in the areas of development, on-site services, and sales. Technical support is also available for discontinued products that are no longer available. Using the support request number, any inquiry can be clearly identified and systematically tracked.



Spare Parts

Drive and automation systems must be available at all times. Even a single missing spare part can bring the entire plant to a standstill – and result in substantial financial losses for the operator. The spare parts services from Siemens protect against such losses – with the aid of quickly available, original spare parts that ensure smooth interaction with all other system components. Spare parts are kept on hand for up to ten years; defective parts can be returned. For many products and solutions, individual spare parts packages ensure a preventive stock of spare parts on-site. The spare parts service is available around the world and around the clock. Optimum supply chain logistics ensure that replacement components reach their destination as quickly as possible. Siemens' logistics experts take care of planning and management as well as procurement, transportation, customs handling, warehousing, and complete order management for spare parts.



Repair Services

Reliable electrical and electronic equipment is crucial for operating continuous processes. That is why it is essential that motors and converters always undergo highly specialized repair and maintenance. Siemens offers complete customer and repair services – on site and in repair centers – as well as technical emergency services worldwide. The repair services include all measures necessary to quickly restore the functionality of defective units. In addition, services such as spare parts logistics, spare parts storage and rapid manufacturing are available to plant operators in all verticals. With a global network of certified repair shops operated by Siemens as well as third parties, Siemens handles the maintenance and overhaul of motors, converters, and other devices as an authorized service partner.



Field Services

It's a top priority in all industries: the availability of plants and equipment. Siemens offers specialized maintenance services such as inspection and upkeep as well as rapid fault clearance in industrial plants – worldwide, continuously, and even with emergency services as needed. The services include startup as well as maintenance and fault clearance during operation. The startup service includes checking the installation, function tests, parameterization, integration tests for machines and plants, trial operation, final acceptance, and employee training. All services, including remote maintenance of drives, are also available as elements of customized service contracts.



Appendix

Industry Services

Industry Services for the entire life cycle

Training

Increasingly, up-to-date knowledge is becoming a determining factor in success. One of the key resources of any company is well-trained staff that can make the right decision at the right moment and take full advantage of the potential. With SITRAIN – Training for Industry, Siemens offers comprehensive advanced training programs. The technical training courses convey expertise and practical knowledge directly from the manufacturer. SITRAIN covers Siemens' entire product and system portfolio in the field of automation and drives. Together with the customer, Siemens determines the company's individual training needs and then develops an advanced training program tailored to the desired requirements. Additional services guarantee that the knowledge of all Siemens partners and their employees is always up-to-date.



Technical Consulting & Engineering Support

The efficiency of plants and processes leads to sustainable economic success. Individual services from Siemens help save substantial time and money while also guaranteeing maximum safety. Technical consulting covers the selection of products and systems for efficient industrial plants. The services include planning, consulting, and conceptual design as well as product training, application support, and configuration verification – in all phases of a plant's lifecycle and in all questions related to product safety. Engineering support offers competent assistance throughout the entire project, from developing a precise structure for startup to product-specific preparation for implementation as well as support services in areas such as prototype development, testing and acceptance.



Energy & Environmental Services

Efficient energy use and resource conservation – these top sustainability concerns pay off – both for the environment and for companies. Siemens offers integrated solutions that unlock all technical and organizational potential for successful environmental management. Customized consulting services are aimed at sustainably lowering the cost of energy and environmental protection and thus increasing plant efficiency and availability. The experts provide support in the conceptual design and implementation of systematic solutions in energy and environmental management, enabling maximum energy efficiency and optimized water consumption throughout the entire company. Improved data transparency makes it possible to identify savings potential, reduce emissions, optimize production processes, and thereby noticeably cut costs.



Modernization & Optimization Services

High machine availability, expanded functionality and selective energy savings – in all industries, these are decisive factors for increasing productivity and lowering costs. Whether a company wants to modernize individual machines, optimize drive systems, or upgrade entire plants, Siemens' experts support the projects from planning to commissioning.

Expert consulting and project management with solution responsibility lead to security and make it possible to specifically identify savings potential in production. This secures investments over the long term and increases economic efficiency in operation.



Plant Maintenance & Condition Monitoring

Modern industrial plants are complex and highly automated. They must operate efficiently in order to ensure the company's competitive strength. In addition, the steadily increasing networking of machines and plants require consistent security concepts. Maintenance and status monitoring as well as the implementation of integrated security concepts by Siemens' experts support optimum plant use and avoid downtime. The services include maintenance management as well as consulting on maintenance concepts, including the complete handling and execution of the necessary measures. Complete solutions also cover remote services, including analysis, remote diagnosis, and remote monitoring. These are based on the Siemens Remote Services platform with certified IT security.



Service Contracts

Making maintenance costs calculable, reducing interfaces, speeding up response times, and unburdening the company's resources – the reduced downtimes that these measures achieve increase the productivity of a plant. Service contracts from Siemens make maintenance and repairs more cost-effective and efficient. The service packages include local and remote maintenance for a system or product group in automation and drive technology. Whether you need extended service periods, defined response times, or special maintenance intervals, the services are compiled individually and according to need. They can be adjusted flexibly at any time and used independently of each other. The expertise of Siemens' specialists and the capabilities of remote maintenance thus ensure reliable and fast maintenance processes throughout a plant's entire lifecycle.



Appendix

Conditions of sale and delivery

1. General Provisions

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following Terms and Conditions of Sale and Delivery (hereinafter referred to as "T&C"). Please note that the scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following T&C apply exclusively for orders placed with Siemens Aktiengesellschaft, Germany.

1.1 For customers with a seat or registered office in Germany

For customers with a seat or registered office in Germany, the following applies subordinate to the T&C:

- the "General Terms of Payment"¹⁾ and,
- for software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or Registered Office in Germany"¹⁾ and,
- for other supplies and services, the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"¹⁾.

1.2 For customers with a seat or registered office outside Germany

For customers with a seat or registered office outside Germany, the following applies subordinate to the T&C:

- the "General Terms of Payment"¹⁾ and,
- for software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or Registered Office outside of Germany"¹⁾ and
- for other supplies and/or services, the "General Conditions for Supplies of Siemens Industry for Customers with a Seat or Registered Office outside of Germany"¹⁾.

2. Prices

The prices are in € (Euro) ex point of delivery, exclusive of packaging.

The sales tax (value added tax) is not included in the prices. It shall be charged separately at the respective rate according to the applicable statutory legal regulations.

Prices are subject to change without prior notice. We will charge the prices valid at the time of delivery.

To compensate for variations in the price of raw materials (e.g. silver, copper, aluminum, lead, gold, dysprosium and neodym), surcharges are calculated on a daily basis using the so-called metal factor for products containing these raw materials. A surcharge for the respective raw material is calculated as a supplement to the price of a product if the basic official price of the raw material in question is exceeded.

The metal factor of a product indicates the basic official price (for those raw materials concerned) as of which the surcharges on the price of the product are applied, and with what method of calculation.

An exact explanation of the metal factor can be downloaded at: www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

To calculate the surcharge (except in the cases of dysprosium and neodym), the official price from the day prior to that on which the order was received or the release order was effected is used.

To calculate the surcharge applicable to dysprosium and neodym ("rare earths"), the corresponding three-month basic average price in the quarter prior to that in which the order was received or the release order was effected is used with a one-month buffer (details on the calculation can be found in the explanation of the metal factor).

3. Additional Terms and Conditions

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches apply only to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the individual pages of this catalog - especially with regard to data, dimensions and weights given - these are subject to change without prior notice.

4. Export regulations

We shall not be obligated to fulfill any agreement if such fulfillment is prevented by any impediments arising out of national or international foreign trade or customs requirements or any embargoes and/or other sanctions.

Export of goods listed in this catalog may be subject to licensing requirements. We will indicate in the delivery details whether licenses are required under German, European and US export lists. Goods labeled with "AL" not equal to "N" are subject to European or German export authorization when being exported out of the EU. Goods labeled with "ECCN" not equal to "N" are subject to US re-export authorization.

The export indications can be viewed in advance in the description of the respective goods on the Industry Mall, our online catalog system. Only the export labels "AL" and "ECCN" indicated on order confirmations, delivery notes and invoices are authoritative.

Even without a label, or with label "AL:N" or "ECCN:N", authorization may be required i .a. due to the final disposition and intended use of goods.

If you transfer goods (hardware and/or software and/or technology as well as corresponding documentation, regardless of the mode of provision) delivered by us or works and services (including all kinds of technical support) performed by us to a third party worldwide, you must comply with all applicable national and international (re-)export control regulations.

If required for the purpose of conducting export control checks, you (upon request by us) shall promptly provide us with all information pertaining to the particular end customer, final disposition and intended use of goods delivered by us respectively works and services provided by us, as well as to any export control restrictions existing in this relation.

The products listed in this catalog may be subject to European/German and/or US export regulations. Any export requiring approval is therefore subject to authorization by the relevant authorities.

Errors excepted and subject to change without prior notice.

1) The text of the Terms and Conditions of Siemens AG can be downloaded at www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

Further information can be obtained from our branch offices listed at www.siemens.com/automation/partner

Interactive Catalog on DVD Products for Automation and Drives	<i>Catalog</i> CA 01	Low-Voltage Power Distribution and Electrical Installation Technology	<i>Catalog</i>
Building Control GAMMA Building Control	ET G1	SETRON · SIVACON · ALPHA Protection, Switching, Measuring and Monitoring Devices, Switchboards and Distribution Systems	LV 10
Drive Systems SINAMICS G130 Drive Converter Chassis Units	D 11	Standards-Compliant Components for Photovoltaic Plants	LV 11
SINAMICS G150 Drive Converter Cabinet Units		Electrical Components for the Railway Industry	LV 12
SINAMICS GM150, SINAMICS SM150 Medium-Voltage Converters	D 12	<i>Digital: TÜV-certified Power Monitoring System</i>	LV 14
SINAMICS PERFECT HARMONY GH180 Medium-Voltage Air-Cooled Drives Germany Edition	D 15.1	Components for Industrial Control Panels according to UL Standards	LV 16
SINAMICS G180 Converters – Compact Units, Cabinet Systems, Cabinet Units Air-Cooled and Liquid-Cooled	D 18.1	3WT Air Circuit Breakers up to 4000 A	LV 35
SINAMICS S120 Chassis Format Units and Cabinet Modules	D 21.3	3VT Molded Case Circuit Breakers up to 1600 A	LV 36
SINAMICS S150 Converter Cabinet Units		<i>Digital: SIVACON System Cubicles, System Lighting and System Air-Conditioning</i>	LV 50
SINAMICS DCM DC Converter, Control Module	D 23.1	<i>Digital: ALPHA Distribution Systems</i>	LV 51
SINAMICS DCM Cabinet	D 23.2	ALPHA FIX Terminal Blocks	LV 52
SINAMICS Inverters for Single-Axis Drives and SIMOTICS Motors	D 31	SIVACON S4 Power Distribution Boards	LV 56
SINAMICS G120P and SINAMICS G120P Cabinet pump, fan, compressor converters	D 35	SIVACON 8PS Busbar Trunking Systems	LV 70
Three-Phase Induction Motors SIMOTICS HV, SIMOTICS TN	D 84.1	<i>Digital: DELTA Switches and Socket Outlets</i>	ET D1
• Series H-compact		Motion Control	
• Series H-compact PLUS		SINUMERIK 840D sl Type 1B Equipment for Machine Tools	NC 62
Three-Phase Induction Motors SIMOTICS HV, Series H-compact	D 86.1	SINUMERIK 808 Equipment for Machine Tools	NC 81.1
Synchronous Motors with Permanent-Magnet Technology, HT-direct	D 86.2	SINUMERIK 828 Equipment for Machine Tools	NC 82
DC Motors	DA 12	SIMOTION, SINAMICS S120 & SIMOTICS Equipment for Production Machines	PM 21
SIMOREG DC MASTER 6RA70 Digital Chassis Converters	DA 21.1	Drive and Control Components for Cranes	CR 1
SIMOREG K 6RA22 Analog Chassis Converters	DA 21.2	Power Supply	
<i>Digital: SIMOREG DC MASTER 6RM70 Digital Converter Cabinet Units</i>	DA 22	SITOP Power supply	KT 10.1
SIMOVERT PM Modular Converter Systems	DA 45	Safety Integrated	
SIEMOSYN Motors	DA 48	Safety Technology for Factory Automation	SI 10
MICROMASTER 420/430/440 Inverters	DA 51.2	SIMATIC HMI / PC-based Automation	
MICROMASTER 411/COMBIMASTER 411	DA 51.3	Human Machine Interface Systems/ PC-based Automation	ST 80/ ST PC
SIMODRIVE 611 universal and POSMO	DA 65.4	SIMATIC Ident	
<i>Note: Additional catalogs on the SINAMICS drive system and SIMOTICS motors with SINUMERIK and SIMOTION can be found under Motion Control</i>		Industrial Identification Systems	ID 10
Low-Voltage Three-Phase-Motors		SIMATIC Industrial Automation Systems	
SIMOTICS Low-Voltage Motors	D 81.1	Products for Totally Integrated Automation	ST 70
SIMOTICS FD Flexible Duty Motors	D 81.8	SIMATIC PCS 7 Process Control System	ST PCS 7
LOHER Low-Voltage Motors	D 83.1	System components	
MOTOX Geared Motors	D 87.1	SIMATIC PCS 7 Process Control System Technology components	ST PCS 7 T
SIMOGEAR Geared Motors	MD 50.1	Add-ons for the SIMATIC PCS 7 Process Control System	ST PCS 7 AO
SIMOGEAR Gearboxes with adapter	MD 50.11	SIMATIC NET	
Mechanical Driving Machines		Industrial Communication	IK PI
FLENDER Standard Couplings	MD 10.1	SIRIUS Industrial Controls	
FLENDER High Performance Couplings	MD 10.2	SIRIUS Industrial Controls	IC 10
FLENDER Backlash-free Couplings	MD 10.3		
FLENDER SIG Standard industrial gear units	MD 30.1		
FLENDER SIP Standard industrial planetary gear units	MD 31.1		
Process Instrumentation and Analytics			
<i>Digital: Field Instruments for Process Automation</i>	FI 01		
<i>Digital: SIPART Controllers and Software</i>	MP 31		
Products for Weighing Technology	WT 10		
<i>Digital: Process Analytical Instruments</i>	AP 01		
<i>Digital: Process Analytics, Components for the System Integration</i>	PA 11		
<i>Digital: These catalogs are only available as a PDF.</i>			
		Information and Download Center	
		Digital versions of the catalogs are available on the Internet at: www.siemens.com/industry/infocenter	
		There you'll find additional catalogs in other languages.	
		Please note the section "Downloading catalogs" on page "Online services" in the appendix of this catalog.	

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