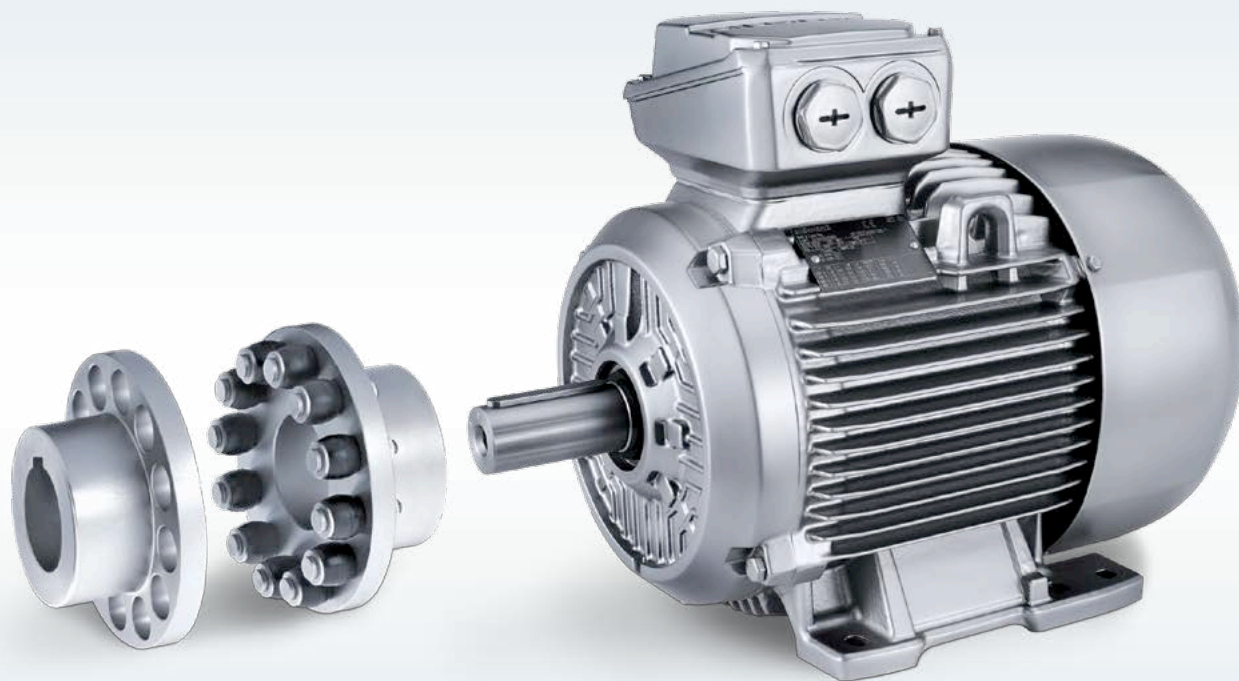


SIEMENS



Integrated Drive Systems

Couplings for SIMOTICS GP, SIMOTICS SD and SIMOTICS FD motors

www.siemens.de/x-cat-ng

Catalog
Add-On
D 35 AO

July
2014

Answers for industry.

Integrated Drive Systems

Assignment of coupling sizes to SIMOTICS FD, SIMOTICS GP and SIMOTICS SD motors



The market for industrial drive technology is characterized by the merging of components into integrated drive systems. Here, Siemens is setting new standards with its Integrated Drive Systems concept. Drive technology based on Integrated Drive Systems maximizes productivity, energy efficiency and reliability in any automation environment and over the complete lifecycle – tailored to individual requirements, or as a standard system for all torque ranges, performance classes and voltage specifications.

In addition to its converter and motor ranges, Siemens offers a broad range of couplings for pump, fan and compressor applications. This supplement is based on Catalog D 35 **SINAMICS G120P and SINAMICS G120P Cabinet pump, fan, compressor converters**

You will find additional information about the motors and converters in the following catalogs:
D 81.8 **SIMOTICS Flexible Duty** and
D 81.1 **SIMOTICS Low-Voltage Motors**

General information

You will find general information below that will enable you to select the right coupling for your application:

Operating factor FB

The operating factor FB* describes the deviation of the actual loading on the coupling from the ideal load conditions. To determine the operating factor FB, the torque characteristic (Tab. 1) of the driven machine in the converter-controlled drive train must be determined. You can find recommendations for the operating factors to be applied (Tab. 2) for pump, fan and compressor applications as well as possible coupling types.

Torque characteristic of the driving machine	"regular"	"moderate shocks"	"irregular"	"extremely rough"
Electrical motors with converters	1.0	1.25	1.5	1.75

Tab. 1: Operating factor FB according to torque characteristic

Example applications	FB	N-EUPEX	RUPEX	ARPEX
Centrifugal pumps	1.0 ... 1.5	✓	–	✓
Fans / Blowers	1.75 ... 2.0	✓	✓	✓
Screw-type compressors	1.5 ... 1.75	–	✓	✓
Other	See Catalog MD 10.1, pages 3/3 to 3/5			

Tab. 2: Operating factor FB and possible coupling types according to application

*Important information:

The operating principles of the driving and driven machines are divided into categories. The operating factor FB derived from these categories in accordance with DIN 3990-1. This is, however, only a recommendation; regulations, rules and your own experience should take priority in any decision.

Integrated Drive Systems

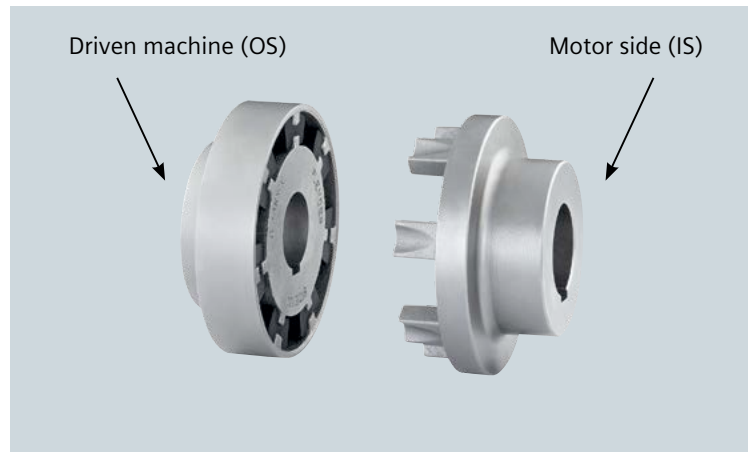
Assignment of coupling sizes to SIMOTICS GP and SIMOTICS SD motors

SIMOTICS GP and SIMOTICS SD motors recommended for converter-fed operation with SINAMICS G120P		
P _{N50} kW	Frame size	1500 rpm, 4-pole
		Article No.
SIMOTICS GP aluminum series		
2.2	100 L	1 L E 1 0 9 2 - 1 A B 4 ■ - ■ ■ ■ ■ ■ ■
3	100 L	1 L E 1 0 9 2 - 1 A B 5 ■ - ■ ■ ■ ■ ■ ■
4	112 M	1 L E 1 0 9 2 - 1 B B 2 ■ - ■ ■ ■ ■ ■ ■
5.5	132 S	1 L E 1 0 9 2 - 1 C B 0 ■ - ■ ■ ■ ■ ■ ■
7.5	132 M	1 L E 1 0 9 2 - 1 C B 2 ■ - ■ ■ ■ ■ ■ ■
11	160 M	1 L E 1 0 9 2 - 1 D B 2 ■ - ■ ■ ■ ■ ■ ■
15	160 L	1 L E 1 0 9 2 - 1 D B 4 ■ - ■ ■ ■ ■ ■ ■
SIMOTICS SD gray cast iron series		
2.2	100 L	1 L E 1 5 9 2 - 1 A B 4 ■ - ■ ■ ■ ■ ■ ■
3	100 L	1 L E 1 5 9 2 - 1 A B 5 ■ - ■ ■ ■ ■ ■ ■
4	112 M	1 L E 1 5 9 2 - 1 B B 2 ■ - ■ ■ ■ ■ ■ ■
5.5	132 S	1 L E 1 5 9 2 - 1 C B 0 ■ - ■ ■ ■ ■ ■ ■
7.5	132 M	1 L E 1 5 9 2 - 1 C B 2 ■ - ■ ■ ■ ■ ■ ■
11	160 M	1 L E 1 5 9 2 - 1 D B 2 ■ - ■ ■ ■ ■ ■ ■
15	160 L	1 L E 1 5 9 2 - 1 D B 4 ■ - ■ ■ ■ ■ ■ ■
18.5	180 M	1 L E 1 5 9 2 - 1 E B 2 ■ - ■ ■ ■ ■ ■ ■
22	180 L	1 L E 1 5 9 2 - 1 E B 4 ■ - ■ ■ ■ ■ ■ ■
30	200 L	1 L E 1 5 9 2 - 2 A B 5 ■ - ■ ■ ■ ■ ■ ■
37	225 S	1 L E 1 5 9 2 - 2 B B 0 ■ - ■ ■ ■ ■ ■ ■
45	225 M	1 L E 1 5 9 2 - 2 B B 2 ■ - ■ ■ ■ ■ ■ ■
55	250 M	1 L E 1 5 9 2 - 2 C B 2 ■ - ■ ■ ■ ■ ■ ■
75	280 S	1 L E 1 5 9 2 - 2 D B 0 ■ - ■ ■ ■ ■ ■ ■
90	280 M	1 L E 1 5 9 2 - 2 D B 2 ■ - ■ ■ ■ ■ ■ ■
110	315 S	1 L E 1 5 9 2 - 3 A B 0 ■ - ■ ■ ■ ■ ■ ■
132	315 M	1 L E 1 5 9 2 - 3 A B 2 ■ - ■ ■ ■ ■ ■ ■
160	315 L	1 L E 1 5 9 2 - 3 A B 4 ■ - ■ ■ ■ ■ ■ ■
200	315 L	1 L E 1 5 9 2 - 3 A B 5 ■ - ■ ■ ■ ■ ■ ■



FLENDER cam coupling Series N-EUPEX – Type B								
FB 1.25	OS Ø D1	FB 1.5	OS Ø D1	FB 1.75	OS Ø D1	FB 2.0	OS Ø D1	IS Ø D2
Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	(mm)
80	30	80	30	80	30	80	30	28
80	30	80	30	80	30	80	30	28
80	30	80	30	80	30	80	30	28
80	30	80	30	95	42	95	42	38
95	42	95	42	95	42	95	42	38
95	42	110	48	110	48	110	48	42
110	48	110	48	125	55	125	55	42
80	30	80	30	80	30	80	30	28
80	30	80	30	80	30	80	30	28
80	30	80	30	80	30	80	30	28
80	30	80	30	95	42	95	42	38
95	42	95	42	95	42	95	42	38
95	42	110	48	110	48	110	48	42
110	48	110	48	125	55	125	55	42
110	48	125	55	125	55	125	55	48
125	55	125	55	140	60	140	60	48
125	55	140	60	140	60	160	65	55
140	60	140	60	160	65	160	65	60
140	60	160	65	160	65	180	75	60
160	65	160	65	180	75	180	75	65
180	75	180	75	180	75	200	85	75
180	75	180	75	200	85	200	85	75
200	85	200	85	200	85	225	90	80
200	85	200	85	225	90	225	90	80
200	85	225	90	225	90	250	110	80
225	90	225	90	250	110	250	110	80

Voltages	50 Hz 220 VΔ /380 VY, 60 Hz 440 VΔ	2 - 1
Designs	Without flange IM B3	A
	With flange IM B5	F
	With standard flange IM B14	K
	Other designs are available on request	■
Motor protection	With embedded temperature sensor KTY 84-130	F
Terminal box position	Terminal box position, top	4
	Other terminal box positions are possible on request	■



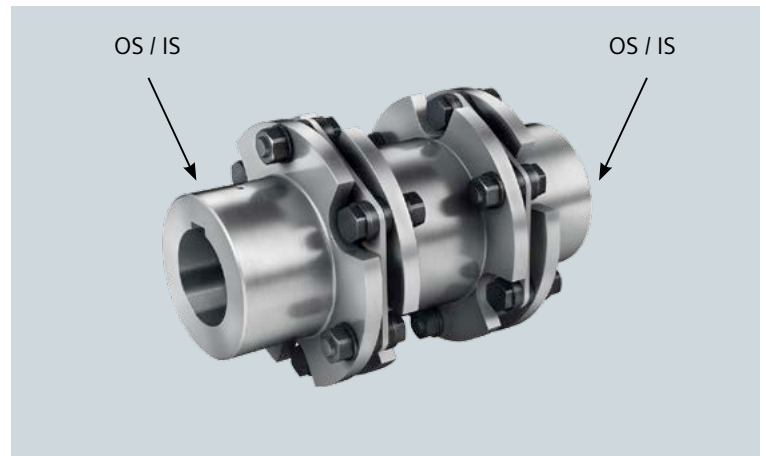
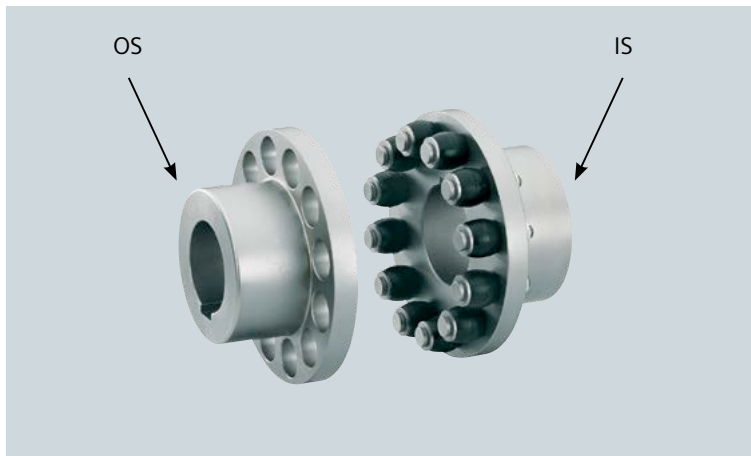
IS (Input Side) = Drive side / motor side
 OS (Output Side) = Load side / driven machine

FLENDER pin and bush coupling
Series RUPEX – Type RWN (gray cast iron)

FB 1.25	OS Ø D1	FB 1.5	OS Ø D1	FB 1.75	OS Ø D1	FB 2.0	OS Ø D1	IS Ø D2
Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	(mm)
105	32	105	32	105	32	105	32	28
105	32	105	32	105	32	105	32	28
105	32	105	32	105	32	105	32	28
105	32	105	32	105	32	105	32	38
105	32	105	32	105	32	105	32	38
125	40	125	40	125	40	125	40	42
125	40	125	40	125	40	125	40	42
105	32	105	32	105	32	105	32	28
105	32	105	32	105	32	105	32	28
105	32	105	32	105	32	105	32	28
105	32	105	32	105	32	105	32	38
105	32	105	32	105	32	105	32	38
125	40	125	40	125	40	125	40	42
125	40	125	40	125	40	125	40	42
125	40	125	40	125	40	125	40	48
125	40	125	40	125	40	125	40	48
144	45	144	45	144	45	144	45	55
162	50	162	50	162	50	162	50	60
162	50	162	50	162	50	162	50	60
178	60	178	60	178	60	178	60	65
198	70	198	70	198	70	198	70	75
198	70	198	70	198	70	198	70	75
198	70	198	70	198	70	228	80	80
198	70	198	70	228	80	228	80	80
198	70	228	80	228	80	228	80	80
228	80	228	80	252	90	252	90	80

FLENDER all-steel coupling
Series ARPEX ARS-6 – Type NEN

FB 1.25	OS Ø D1	FB 1.5	OS Ø D1	FB 1.75	OS Ø D1	FB 2.0	OS Ø D1	IS Ø D2
Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	(mm)
78	28	78	28	78	28	78	28	28
78	28	78	28	78	28	78	28	28
78	28	78	28	78	28	78	28	28
105	45	105	45	105	45	105	45	38
105	45	105	45	105	45	105	45	38
105	45	105	45	105	45	105	45	42
105	45	105	45	105	45	105	45	42
78	28	78	28	78	28	78	28	28
78	28	78	28	78	28	78	28	28
78	28	78	28	78	28	78	28	28
105	45	105	45	105	45	105	45	38
105	45	105	45	105	45	105	45	38
105	45	105	45	105	45	105	45	42
105	45	105	45	105	45	105	45	42
125	55	125	55	125	55	125	55	48
125	55	125	55	125	55	125	55	48
125	55	125	55	125	55	125	55	55
140	65	140	65	140	65	140	65	60
140	65	140	65	140	65	140	65	60
140	65	140	65	140	65	140	65	65
140	65	140	65	140	65	140	65	65
165	75	165	75	165	75	165	75	75
165	75	165	75	165	75	165	75	75
175	80	175	80	175	80	175	80	80
175	80	175	80	175	80	175	80	80
175	80	175	80	175	80	195	90	80
175	80	175	80	195	90	195	90	80



Integrated Drive Systems

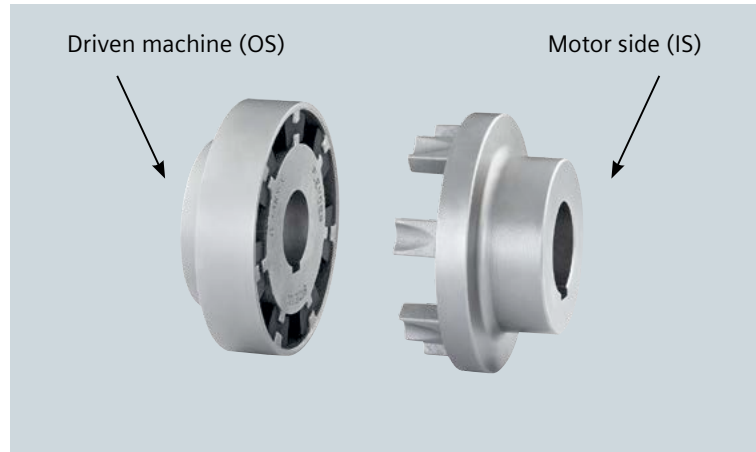
Assignment of coupling sizes to SIMOTICS FD motors

SIMOTICS FD Flexible Duty motors recommended for converter-fed operation with SINAMICS G120P		
P_{N50} kW	Frame size	Article No.
Air-cooled motors for converter-fed operation (self-ventilated), IC411 cooling method, 50 Hz 400 V		
190	315	1 L M 1 2 2 2 - 3 A C 1 1 - 3 ■ ■ 0
235	315	1 L M 1 2 2 2 - 3 A B 1 1 - 1 ■ ■ 0
235	315	1 L M 1 2 2 2 - 3 A C 3 1 - 3 ■ ■ 0
270	315	1 L M 1 2 2 2 - 3 A C 5 1 - 3 ■ ■ 0
300	315	1 L M 1 2 2 2 - 3 A B 3 1 - 1 ■ ■ 0
300	315	1 L M 1 2 2 2 - 3 A C 7 1 - 3 ■ ■ 0
315	315	1 L M 1 2 2 2 - 3 A B 3 1 - 2 ■ ■ 0
325	315	1 L M 1 2 2 2 - 3 A B 5 1 - 1 ■ ■ 0
345	315	1 L M 1 2 2 2 - 3 A B 5 1 - 2 ■ ■ 0
350	315	1 L M 1 2 2 2 - 3 A B 7 1 - 1 ■ ■ 0
400	315	1 L M 1 2 2 2 - 3 A B 7 1 - 2 ■ ■ 0
Air-cooled motors with mounted separately driven fan for converter-fed operation, IC416 cooling method, 50 Hz 400 V		
180	315	1 L Q 1 2 2 2 - 3 A C 1 1 - 4 ■ ■ ■
215	315	1 L Q 1 2 2 2 - 3 A C 1 1 - 3 ■ ■ ■
215	315	1 L Q 1 2 2 2 - 3 A C 3 1 - 4 ■ ■ ■
245	315	1 L Q 1 2 2 2 - 3 A B 1 1 - 1 ■ ■ ■
270	315	1 L Q 1 2 2 2 - 3 A C 7 1 - 4 ■ ■ ■
305	315	1 L Q 1 2 2 2 - 3 A C 5 1 - 3 ■ ■ ■
310	315	1 L Q 1 2 2 2 - 3 A B 3 1 - 1 ■ ■ ■
315	315	1 L Q 1 2 2 2 - 3 A B 3 1 - 2 ■ ■ ■
345	315	1 L Q 1 2 2 2 - 3 A C 7 1 - 3 ■ ■ ■
355	315	1 L Q 1 2 2 2 - 3 A B 5 1 - 1 ■ ■ ■
355	315	1 L Q 1 2 2 2 - 3 A B 5 1 - 2 ■ ■ ■
375	315	1 L Q 1 2 2 2 - 3 A B 7 1 - 1 ■ ■ ■
405	315	1 L Q 1 2 2 2 - 3 A B 7 1 - 2 ■ ■ ■



FLENDER cam coupling Series N-EUPEX – Type B								
FB 1.25	OS Ø D1	FB 1.5	OS Ø D1	FB 1.75	OS Ø D1	FB 2.0	OS Ø D1	IS Ø D2
Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	(mm)
250	100	250	100	280	110	280	110	85
–	–	–	–	–	–	–	–	–
280	110	280	110	–	–	–	–	85
280	110	280	110	–	–	–	–	85
–	–	–	–	–	–	–	–	–
280	110	–	–	–	–	–	–	85
250	100	280	110	280	110	–	–	85
–	–	–	–	–	–	–	–	–
250	100	280	110	280	110	–	–	85
–	–	–	–	–	–	–	–	–
280	110	280	110	–	–	–	–	85
280	110	280	110	–	–	–	–	85
–	–	–	–	–	–	–	–	–
280	110	–	–	–	–	–	–	85
–	–	–	–	–	–	–	–	–
250	100	280	110	280	110	–	–	85
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
280	110	–	–	–	–	–	–	85
–	–	–	–	–	–	–	–	–
250	100	280	110	280	110	–	–	85
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
280	110	280	110	–	–	–	–	85
–	–	–	–	–	–	–	–	–
280	110	280	110	–	–	–	–	85

Speed	
$n = 3000$ rpm	1
$n = 1500$ rpm	2
$n = 1000$ rpm	3
$n = 750$ rpm	4
Designs	
IM 1001 (IM B3)	A
IM 3001 (IM B5) with support mounting foot	F
IM 3011 (IM V1) without protective cover	J
IM 2001 (IM B35)	K
IM 3011 (IM V1) with protective cover	G
Terminal box position	
Terminal box on DE top (standard)	A
Other terminal box positions are possible on request	■
Separately driven fan position	
Separately driven fan unit NDE, top	2
Separately driven fan unit NDE, right-hand	3
Separately driven fan unit NDE, left-hand	4



IS (Input Side) = Drive side / motor side
 OS (Output Side) = Load side / driven machine

**FLENDER pin and bush coupling
Series RUPEX – Type RWS (steel)**

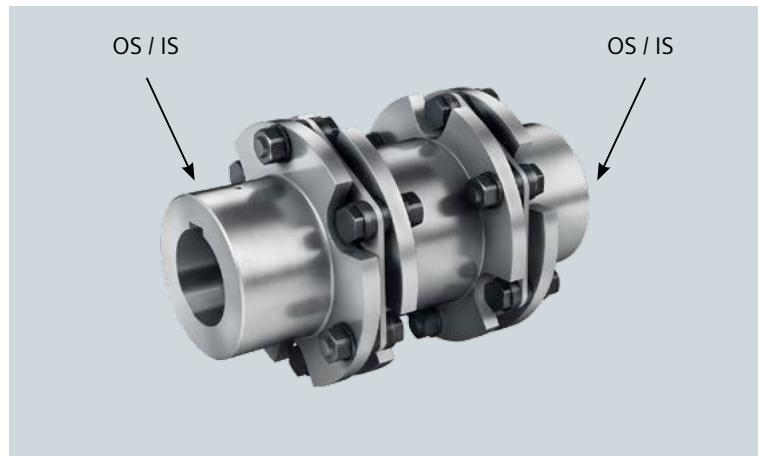
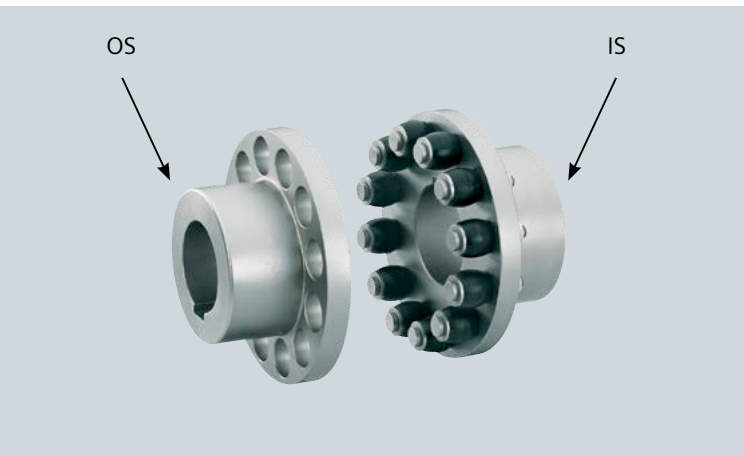
FB 1.25	OS Ø D1	FB 1.5	OS Ø D1	FB 1.75	OS Ø D1	FB 2.0	OS Ø D1	IS Ø D2
Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	(mm)
252	100	252	100	285	110	282	110	85
198	80	198	80	228	85	228	85	85
285	110	285	110	285	110	320	125	85
285	110	285	110	320	125	320	125	85
198	80	228	85	228	85	228	85	85
285	110	285	110	320	125	360	135	85
252	100	285	110	285	110	285	110	85
198	80	228	85	228	85	228	85	85
252	100	285	110	285	110	320	125	85
228	85	228	85	228	85	252	100	85
285	110	285	110	320	125	320	125	85

252	110	285	120	285	120	320	130	85
252	110	285	120	285	120	320	130	85
285	110	285	120	320	130	320	130	85
228	95	228	95	228	95	228	95	85
285	120	320	130	360	140	360	140	85
285	120	320	130	320	130	360	140	85
228	95	228	95	228	95	228	95	85
252	110	285	120	285	120	285	120	85
285	120	320	130	360	140	360	140	85
228	95	228	95	228	95	285	120	85
285	120	285	120	285	120	320	130	85
228	95	228	95	228	95	285	120	85
285	120	285	120	320	130	320	130	85

**FLENDER all-steel coupling
Series ARPEX ARS-6 – Type NEN**

FB 1.25	OS Ø D1	FB 1.5	OS Ø D1	FB 1.75	OS Ø D1	FB 2.0	OS Ø D1	IS Ø D2
Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	(mm)
195	90	195	90	210	95	210	95	85
195	90	195	90	195	90	195	90	85
195	90	210	95	210	95	240	110	85
210	95	210	95	240	110	240	110	85
195	90	195	90	195	90	195	90	85
210	95	210	95	240	110	255	115	85
195	90	210	95	210	95	210	95	85
195	90	195	90	195	90	195	90	85
195	90	210	95	210	95	210	95	85
195	90	195	90	195	90	195	90	85
195	90	210	95	210	95	210	95	85
195	90	195	90	195	90	195	90	85
210	95	210	95	240	110	240	110	85

195	90	210	95	210	95	240	110	85
195	90	210	95	210	95	210	95	85
210	95	210	95	240	110	240	110	85
195	90	195	90	195	90	195	90	85
210	95	240	110	255	115	255	115	85
210	95	210	95	240	110	255	115	85
195	90	195	90	195	90	195	90	85
195	90	210	95	210	95	210	210	85
210	95	240	110	255	115	255	115	85
195	90	195	90	195	90	195	90	85
195	90	210	95	210	95	240	110	85
195	90	195	90	195	90	195	90	85
195	90	195	90	195	90	195	90	85
210	95	210	95	240	110	240	110	85



Integrated Drive Systems

Ordering example

The following examples demonstrate how to select the right coupling for a drive train. Apart from the operating factor, the coupling type, frame size and bore diameter of the shaft extensions must also be determined. In this example, a coupling is to be selected to drive a **centrifugal pump** (for light liquids) between an electric motor and a pump.

The converter and electric motor have already been selected from Catalog D 35 SINAMICS G120P and SINAMICS G120P Cabinet pump, fan, compressor converters:

Series: SIMOTICS SD

Electric motor $P_{N50} = 55$ kW

Speed $n = 1500$ rpm

Procedure:

An operating factor of $FB = 1.25$ is determined using Tab. 1 and Tab. 2. Two coupling types are available for selection – N-EUPEX and ARPEX. The decision is made in favor of the shorter N-EUPEX coupling. The correct motor is selected on the basis of the motor speed and output. This determines the bore of the coupling on the motor side (IS). The frame size of the coupling can be read from the matrix based on the operating factor selected. The maximum admissible bore diameter for the driven machine (OS) is based on the frame size.

The following values can be obtained from the selection and ordering overview:

SIMOTICS GP and SIMOTICS SD motors optimized for converter-fed operation with SINAMICS G120P				FLENDER cam coupling Series N-EUPEX – Type B								
P_{N50} kW	Frame size	1500 rpm, 4-pole		FB 1.25	OS \varnothing D1	FB 1.5	OS \varnothing D1	FB 1.75	OS \varnothing D1	FB 2.0	OS \varnothing D1	IS \varnothing D2
		Article No.		Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	Frame size	max. (mm)	(mm)
55	250 M	1 L E 1 5 92-2CB2 ■ - ■ ■ ■ ■		160	65	160	65	180	75	180	75	65

Coupling selected from Catalog MD 10.1 or using the tool X.CAT NG:

Flender standard coupling	N-EUPEX	
Type	B	
Size	160	
D1 (OS)	max. 65	This value must be matched on the driven machine side!
Bore diameter IS	65	

More information:

Features of the standard type	N-EUPEX and RUPEX	ARPEX
Bore tolerance	H7	H7
Keyway according to DIN 6885-1	Slot width tolerance (NBT): JS9	NBT: P9
Balancing standard according to DIN ISO 8821	Half feather key arrangement	unbalanced ¹⁾
Balancing quality level acc. to DIN ISO 1940	Balancing quality G16	–
Elastomer material	NBR (Perbunan)	–
Hardness	80 ShoreA	–
Permissible ambient temperature	-30 °C ... +80 °C	-40 °C ... +280 °C

¹⁾ Standard balancing quality ARPEX couplings are unbalanced. Standard balancing quality is nearly always adhered to by steel components which are machined all round and precisely guided adapters.

Using X.Cat NG or **Catalog MD 10.1 Flender Standard Couplings**, further options, such as balancing, ATEX versions with CE marking according to Directive 94/9/EC or an electrically insulating version can be selected.

Did you know?

From 75 kW upwards, we urgently recommend implementing the relevant coupling in an electrically insulating version!

Tools and downloads

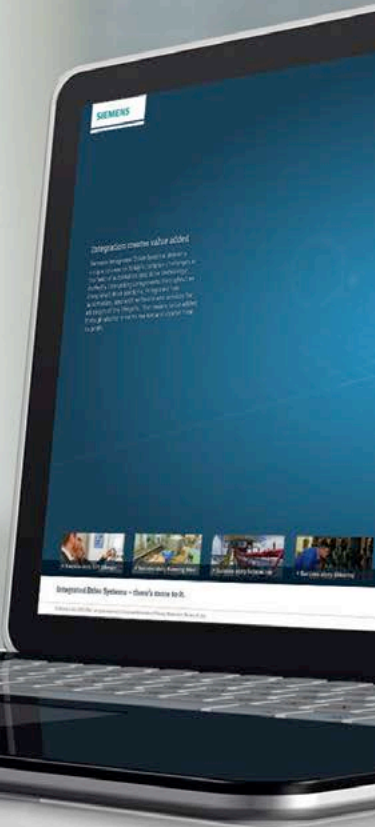
The tool X.CAT NG is available for configuring couplings. X.CAT NG can be downloaded free of charge from the Internet at www.siemens.com/couplings. You will find the online version at www.siemens.de/x-cat-ng. You can also access our catalog and online ordering system (Industry Mall) on the Internet at: www.siemens.com/industrymall

Find out more:

siemens.com/ids

See for yourself how
Integrated Drive
Systems enhance the
competitiveness of
production plants and
entire companies in
every sector.

The advantages
of Integrated
Drive Systems
at a glance



Subject to change without prior notice
E86060-K5535-E101-A1-7600
E.9114.45.VK7/E.9115.24.LDT
Dispo 18402
AO 0714 14. SB/WÜ 8 En
Printed in Germany
© Siemens AG 2014

The information provided in this brochure contains merely general descriptions or performance characteristics which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract. Availability and technical specifications are subject to change without notice.

All product designations may be trademarks or product names of Siemens AG or other supplier companies whose use by third parties for their own purposes could violate the rights of the owners.

Follow us on:
twitter.com/siemensindustry
youtube.com/siemens

Siemens AG
Industry Sector
Drive Technologies Division
Large Drives
Mechanical Drives
Motion Control Systems