Connection of motor and encoder | **Couplings** | **Bellows and spring washer couplings**



Bellows couplings provide cost-effective connection of the motor and encoder. They are also able to correct any angular errors between the drive and encoder.

Spring washer couplings are used with high speeds.

Order code Couplings

8.0000	.	1	XXX	.	XX	XX
Type			ⓐ		ⓑ	ⓒ

ⓐ *Type of coupling*
102 = Bellows-type ø 19 mm [0.75“]
202 = Bellows-type ø 15 mm [0.59“]
301 = Spring washer type, ø 30 mm [1.18“], one-part
401 = Spring washer type, ø 30 mm [1.18“], three part, plug-in
502 = Bellows-type ø 25 mm [0.98“]

ⓑ *Bore diameter d1* (see technical data)

Note:
for the bore diameter d1 = 1/4” please enter Code A2

ⓒ *Bore diameter d2* (see technical data)

Example: d1 = 10 mm [0.39“] and d2 = 12 mm [0.47“]
Order no. = 8.0000.1X0X.**1012**

Technical data

Type			8.0000.1**1**02.XXXX	8.0000.1**2**02.XXXX	8.0000.1**3**01.XXXX	8.0000.1**4**01.XXXX	8.0000. 1**5**02.XXXX
Maximum speed		min^{-1}	10000	10000	12000	12000	10000
Maximum torque		Ncm	120	40	80	60	200
Maximum displacement	radial	mm	± 0.3	± 0.25	± 0.4	± 0.3	± 0.35
	axial	mm	± 0.5	± 0.45	± 0.4	± 0.4	± 0.54
	angular	-	± 4°	± 4°	± 3°	± 2.5°	± 4°
Torsion spring stiffness		Nm/rad	150	85	150	30	183
Radial spring stiffness		N/mm	10	20	6	40	17.8
Moment of inertia		gcm^2	9.5	2.1	19	35	20
Max. tightening torque		Ncm	150	70	80	80	120
Working temperature			-30°C ... +120°C [-22°F ... +248°F]	-30°C ... +120°C [-22°F ... +248°F]	-30°C ... +120°C [-22°F ... +248°F]	-10°C ... +80°C [+14°F ... +176°F]	-30°C ... +120°C [-22°F ... +248°F]
Weight approx.			16 g [0.56 oz]	6.5 g [0.23 oz]	16 g [0.56 oz]	30 g [1.06 oz]	24 g [0.85 oz]
Material	flange		Al, anodized	Al, anodized	Al, anodized	Al, anodized	Al, anodized
	bellow or spring washer/casing		stainless steel	stainless steel	stainless steel	PA 6.6 gf.	stainless steel
Diameter d/d1 from ... to		mm [inch]	3 ... 12 [0.12 ... 0.47]	3 ... 9 [0.12 ... 0.35]	3 ... 8 [0.12 ... 0.32]	4 ... 16 [0.16 ... 0.47]	3 ... 16 [0.12 ... 0.63]
Standard bore diameter	(d1 / d2)	mm [inch]	12 / 12 [0.47 ... 0.47] 12 / 10 [0.47 ... 0.39] 10 / 10 [0.39 ... 0.39] 10 / 08 [0.39 ... 0.32] 10 / 06 [0.39 ... 0.24] 08 / 08 [0.32 ... 0.32] 06 / 06 [0.24 ... 0.24]	08 / 06 [0.32 ... 0.24] 06 / 06 [0.24 ... 0.24] 06 / 04 [0.24 ... 0.16] 04 / 04 [0.16 ... 0.16]	06 / 06 [0.24 ... 0.24]	12 / 12 [0.47 ... 0.47] 12 / 10 [0.47 ... 0.39] 10 / 10 [0.39 ... 0.39] 10 / 06 [0.39 ... 0.24] 06 / 06 [0.24 ... 0.24] 1/4” / 10 1/4” / 06	15 / 12 [0.59 ... 0.47] 14 / 12 [0.55 ... 0.47] 14 / 10 [0.55 ... 0.39] 10 / 10 [0.39 ... 0.39] 06 / 06 [0.24 ... 0.24]

Description and applications

Manufacturing and installation tolerances as well as the effects of temperature cause alignment errors between shafts in drive engineering which can sometimes lead to extreme overload on the bearings.

This may result in increased wear of the bearings and may lead to premature failure of the encoder. By using couplings, these alignment errors can be compensated, thereby reducing the load on the bearings to a minimum. A distinction should be made between three different kinds of alignment error: radial, angular and axial displacement.

Whilst with torsion-free but flexible shaft couplings, axial shaft displacements produce only static forces in the coupling, radial and angular displacements produce alternating stresses, restoring forces and moments which may have an impact on adjoining components (shaft bearings).

Depending on the type of coupling, particular attention should be paid to radial shaft displacement which should be kept to a minimum.

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Metal bellows-type couplings (.1102, .1202 und .1502)

Metal bellows-type couplings are recommended as an inexpensive type of coupling. They are also suitable for compensating larger angle displacements.

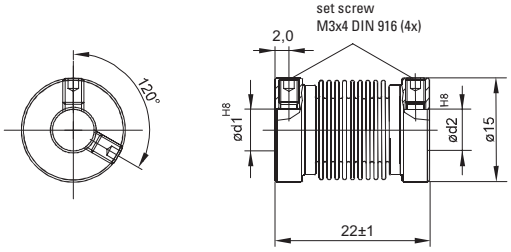
Spring washer-type couplings (.1301 und .1401)

Spring washer couplings are used primarily where high speeds and minimal axial errors occur. For applications requiring potential separation between the encoder and the drive, use the electrically isolating spring washer coupling.

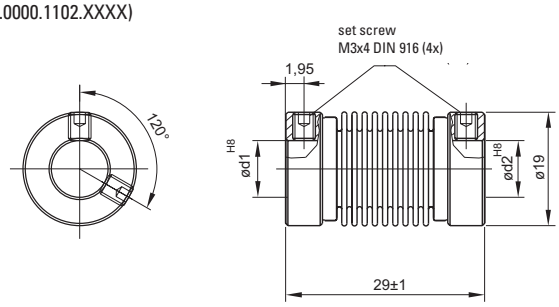
Dimensions

Dimensions in mm

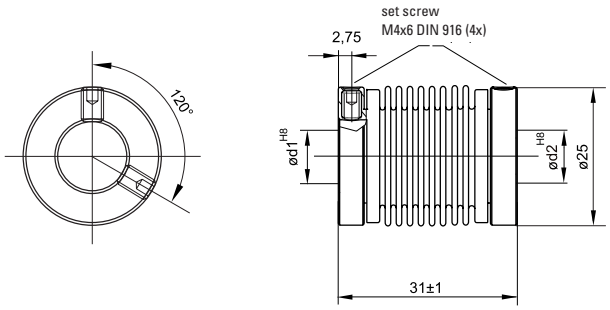
Bellows-type coupling ø 15 [0.59]
(8.0000.1202.XXXX)



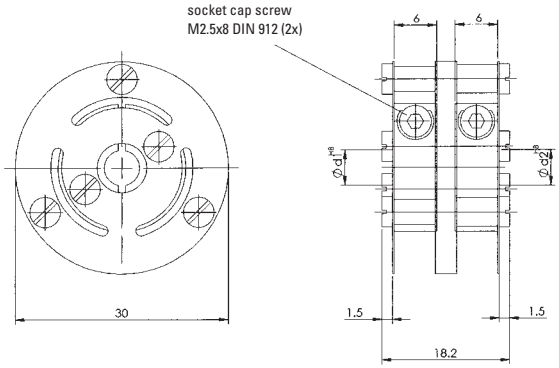
Bellows-type coupling ø 19 [0.75]
(8.0000.1102.XXXX)



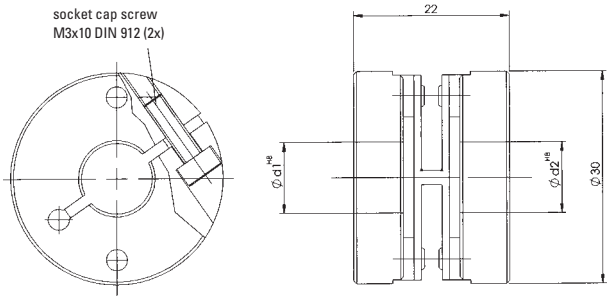
Bellows-type coupling ø 25 [0.98]
(8.0000.1502.XXXX)



Spring washer-type coupling, one-part
(8.0000.1301.XXXX)

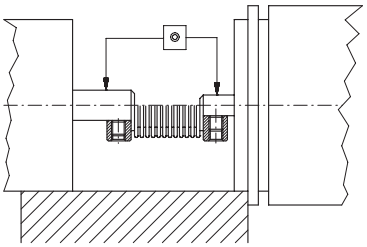


Spring washer-type coupling, three part, plug-in
(8.0000.1401.XXXX)



Installation instructions

1. Check shaft for displacement; see technical data for details.
2. Align and adjust coupling on shafts.
3. Tighten locking screws carefully. Avoid overtightening.
4. During installation protect the coupling from damage and from overbending.



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Connection of motor and encoder | **Couplings** | **Bellows couplings (FS)**



Bellows couplings provide cost-effective connection of the motor and encoder. They are also able to correct any angular errors between the drive and encoder.

These bellows couplings (FS) are used for safe connection of applications and Sendix SIL encoders.

The safety-oriented bellows coupling has, in addition to the metallic bellows, internal claws that ensure the driving of the encoder in case of breakage of the bellows connection.

Order code Couplings

8.0000	.	1	X	FS	.	XX	XX
Type			ⓐ			ⓑ	ⓒ

ⓐ *Type of coupling*
5 = bellows coupling ø 25 mm [0.98"]

ⓑ *Bore diameter d1*
(see technical data)

ⓒ *Bore diameter d2*
(see technical data)

Example: d1 = 10 mm and d2 = 12 mm
order no. = 8.0000.15FS.**1012**

Accessory		Order no.
Screw retention	Loctite 243, 5 ml	**8.0000.4G05.0000**

Technical data

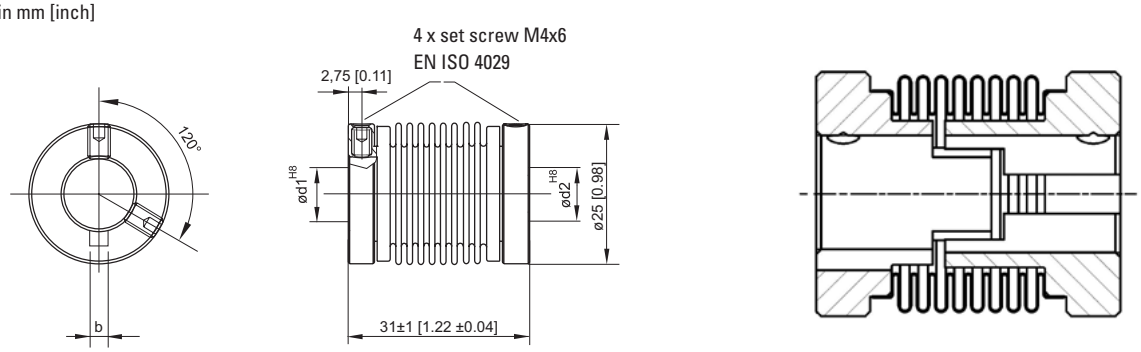
Mechanical characteristics

Max. speed		10000 min^{-1}
Max. torque		200 Ncm
Max. shaft offset	radial	± 0.3 mm
	axial	± 0.45 mm
	angular	± 3°
Torsion spring stiffness		183 Nm/rad
Radial spring stiffness		17.8 N/mm
Moment of inertia		9.1 gcm^2
Headless set screw tightening torque		
	min.	80 Ncm
	max.	100 Ncm

Working temperature range		-30°C ... +120°C [-22 ... +248°F]
Weight approx.		54 g
Material	flange	stainless steel 1.4104
	bellows	stainless steel 1.4571
Standard bore diameter	(d1 / d2)	10 / 10 mm [0.39 / 0.39"]
		10 / 12 mm [0.39 / 0.47"]
		12 / 12 mm [0.47 / 0.47"]
Insertion depth	min.	6 mm [0.24"]
	max.	11 mm [0.43"]

Dimensions

Dimensions in mm [inch]



Nut DIN 6885

nut width b	d1 / d2
3 [0.12]	10 [0.39]
4 [0.16]	12 [0.47]

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Connection of motor and encoder | Flexible shaft coupling | Double loop coupling



The safe, uncomplicated and economical solution, if drive shafts with angular, radial and/or axial displacement are to be friction-locked together.

Order no. size 1

Bore diameter both sides 6 mm [0.24“]	**8.0000.1J01.0606**

Order no. size 2

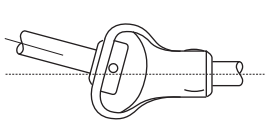
Bore diameter both sides 10 mm [0.39“]	**8.0000.1K01.1010**
Bore diameter 11 mm [0.43“] and 12 mm [0.47“] with keyway	**8.0000.1L01.1112**

Technical data

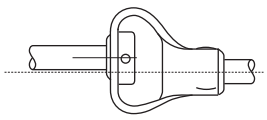
		Size 1	Size 2
Max. speed		3000 min^{-1}	3000 min^{-1}
Max. torque		0.5 Nm	2.0 Nm
Max. offset of shafts	radial	± 2 mm	± 3 mm
	axial	± 2 mm	± 4 mm
	angular	± 10°	± 12°
Torsion spring stiffness		13 Nm/rad	28 Nm/rad
Radial spring stiffness		13 N/mm	7 N/mm
Moment of inertia		41 gcm²	106 gcm²
Max. clamping torque		100 Ncm	100 Ncm
Weight, approx.		33 g [1.16 oz]	85 g [3.35 oz]
Temperature range		-30°C ... + 80°C [-22°F ... +176°F]	
Material	flange	steel galvanized	
	connecting element	Polyurethane	

Functional principle

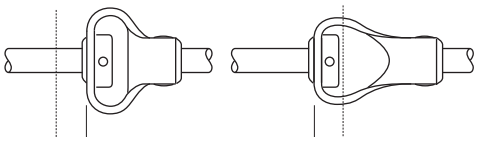
Compensation of an angular misalignment



Compensation of a radial misalignment



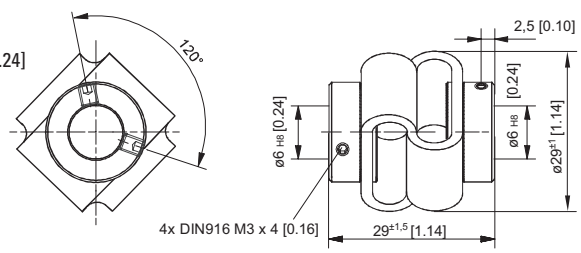
Compensation of a axial misalignment



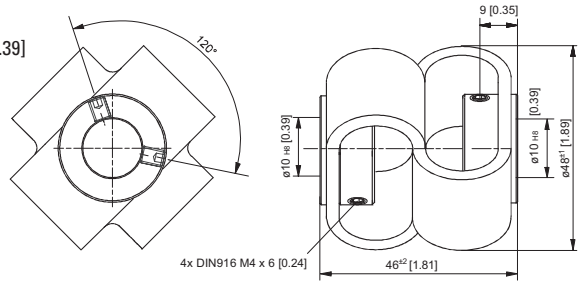
Dimensions

Dimensions in mm

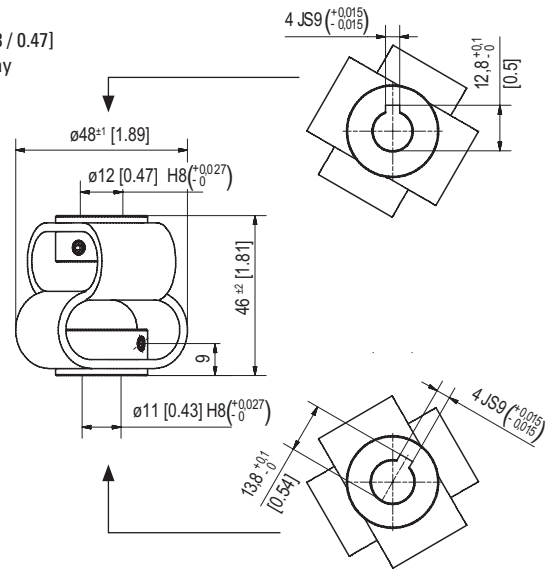
Size 1
6 / 6
[0.24 / 0.24]



Size 2
10 / 10
[0.39 / 0.39]



Size 2
11 / 12 [0.43 / 0.47]
with keyway



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