Datasheet

Self-supporting flexible shaft, with ball bearings on both sides

Flanged shaft coupling

Cylindrical shaft coupling

Features at a glance

Flexible shafts type **FAP-M** are innovative and easy to install. The ball bearings integrated on both sides lead to an extended service life. The mounting flange above the protective cover enables easy and precise transmission of rotational movements between two elements that are not perfectly aligned. Excellent compensation of misalignments and damping of vibrations and shocks.

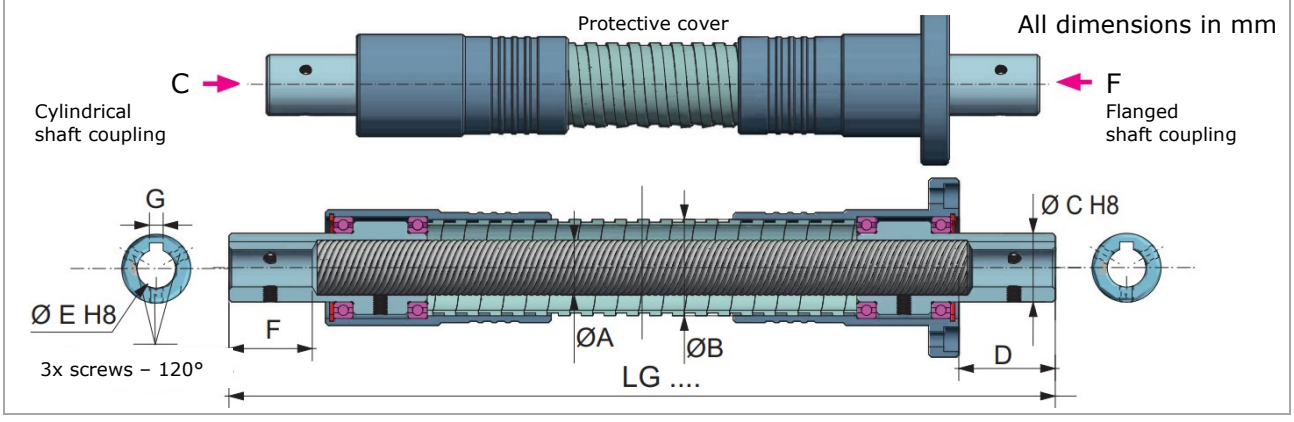
- High performance and rotation speed.
- Smooth rotation through ball bearings on both sides.
- High wear resistance.
- Suitable for manual and motorised drives.
- Terminal couplings made of solid stainless steel (AISI 303).
- Reinforced protective cover made of steel.

Universally applicable, ideal for new designs and upgrades, for power transmission with motors and gear motors.

Available terminal couplings: **C** = cylindrical shaft coupling; **F** = flanged shaft coupling.

Dimensions and efficiency table

FAP-M with reinforced protective cover made of steel



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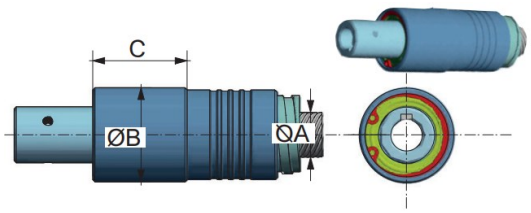
Version	Flexible shaft	Protective cover	Terminal	Effective length	Inner coupling	Bore depth
	Ø A	**Ø B**	**Ø C**	**D**	**Ø E**	**F**
FAP6M	6	14	12	16	6	12
FAP 8M	8	17	15	22	8	20
FAP 12M	12	25	17	26	10	26
FAP 15M	15	30	20	26	10	26
FAP 20M	20	35	25	35	14	32

Version	Key	Torsion	Bending radius*	Torque	Weight
	G	**(°)**	**mm**	**Nm**	**g**
FAP6M	-	80	70	3	800
FAP 8M	-	70	90	4.5	1100
FAP 12M	3	50	160	9	1600
FAP 15M	3	28	300	12	2100
FAP 20M	5	18	400	18.5	3300

The data refer to flexible shafts with a total length of 1000 mm.
* Minimal bending radius.

Terminal couplings for FAP-M made of solid stainless steel (AISI 303), available versions

C = cylindrical shaft coupling



Flexible shaft	Protective cover	Coupling cover
Ø A	**Ø B**	**C**
6	22	18,5
8	28	24
12	35	35
15	36	37
20	42	41

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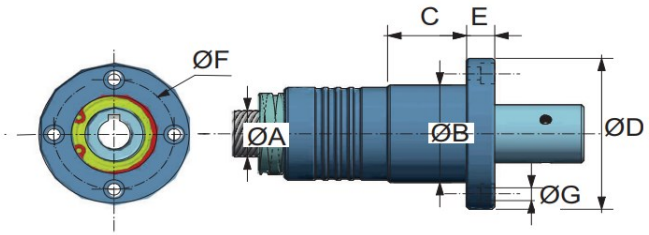
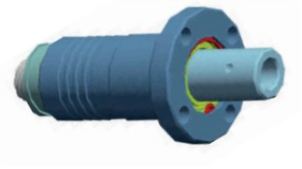
F = flanged shaft coupling





Flexible shaft	Protective cover	Terminal cover	Flange	Flange width	Bores radius	Bores
Ø A	**Ø B**	**C**	**Ø D**	**E**	**Ø F**	**Ø G**
6	22	30	38	6	30	3,2
8	28	28	45	8	36	4,2
12	35	26	55	9	45	4,2
15	36	16	60	9	48	5,2
20	42	12,5	65	11	52	5,2

Ordering example

Type	**FAP12M**	-	**500**	-	**DX**	-	**C-F**

FAP06M = flexible shaft ∅6 mm
FAP08M = flexible shaft ∅8 mm
FAP12M = flexible shaft ∅12 mm
FAP15M = flexible shaft ∅15 mm
FAP20M = flexible shaft ∅20 mm

Total length (mm)
In **xxx** mm (on request)

Rotation
DX = for operation in clockwise (right-hand) direction
SX = for operation in counter-clockwise (left-hand) direction

Terminal couplings (indication per shaft end)
C = cylindrical shaft coupling
F = flanged shaft coupling

Other versions that cannot be generated from the order code are available on request as special versions.

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Mechanical characteristics

Flexible shafts are mechanical elements subjected to torque and elastic deformation.
When considering a single flexible shaft, the equal and opposite torques acting on both sides cause a relative rotation of the different sections that is proportional to the length.

The relationship between applied torque **T [Nm]** and twist angle of the extremities **φ [°]** is obtained as a function of the following three parameters:

- Torsional rigidity **k [103Nm / °]**,
- which depends on the section diameter and the construction characteristics
- - length of the shaft **L [mm]**
- - Rotation direction **r**,
- dimensionless parameter characterising the asymmetrical behaviour of the shaft

$$\varphi = \frac{T}{rK} \cdot L \qquad T = \frac{rk}{L} \cdot \varphi$$

The parameter **r** is equal to **1** when the shaft is loaded according to the winding direction of the spiral.
When loaded in the opposite direction, **r < 1**, as indicated in the following table:

Flexible shaft parameters				
∅	k[10^3 Nm/°]	r	T_{max} [Nm]	Φ [°]*
4	17	0.55	1.1	46.71
5	26	0.55	1.8	69.23
6	38	0.55	3.0	78.95
8	67	0.55	4.5	67.16
10	101	0.55	7.5	74.26
12	180	0.65	9.0	50.00
15	405	0.80	12.5	30.86
20	1050	0.85	18.5	17.62

* The data refer to a length of T_{max} = 1000 mm.

Direction of rotation and winding
Flexible shafts differ both in their construction and in their direction of winding
A left-wound shaft (related to its outermost layer) can transmit a higher torque in clockwise direction than in counter-clockwise direction. A right-wound shaft can transmit a higher torque in counter-clockwise direction than in clockwise direction.

Outermost layer **left-wound**, for **operation in clockwise** (right-hand) **direction**.
Outermost layer **right-wound**, for **operation in counter-clockwise** (left-hand) **direction**.

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Efficiency diagrams and tables

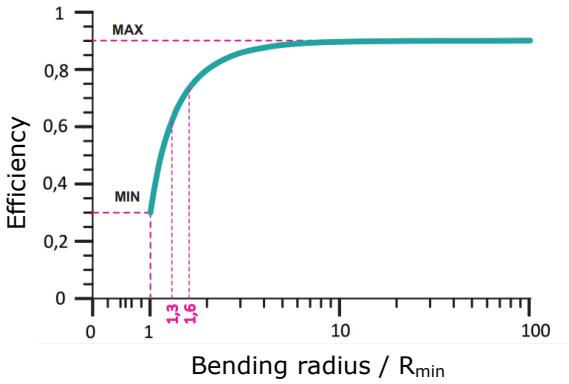
To identify the flexible shaft most suitable for your requirements, refer to the values in the tables.

If the actual loads and efficiency cannot be clearly determined, please contact our technical department.

All tables show linear dimensions in [mm] unless otherwise specified.
All forces, efficiency and loads are given in [N] or [Nm] (10 N = 1 kg or 10 N·m = 1 kg·m) unless otherwise specified.

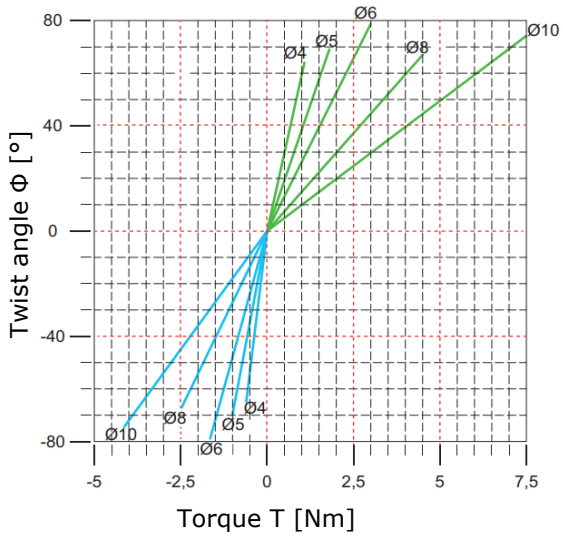
Bending radius

The diagram shows a qualitative-quantitative curve of the efficiency of the flexible shafts as a function of the bending radius. For configurations with a pseudo-straight line, the efficiency is equal to the maximum value of 0.9. The efficiency is nearly constant for high values of the bending radius and decreases rapidly towards the minimum bending radius of 0.2.

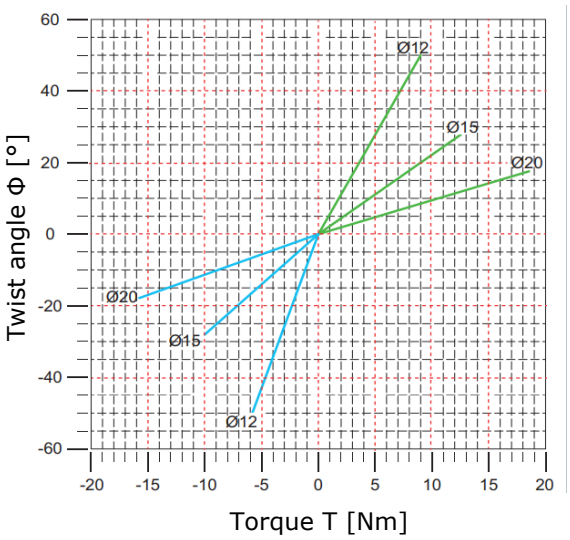


Twist angle / Torque*

For diameters from ∅4 to ∅10 mm



For diameters from ∅12 to ∅20 mm



* The data refer to flexible shafts with a total length of 1000 mm.

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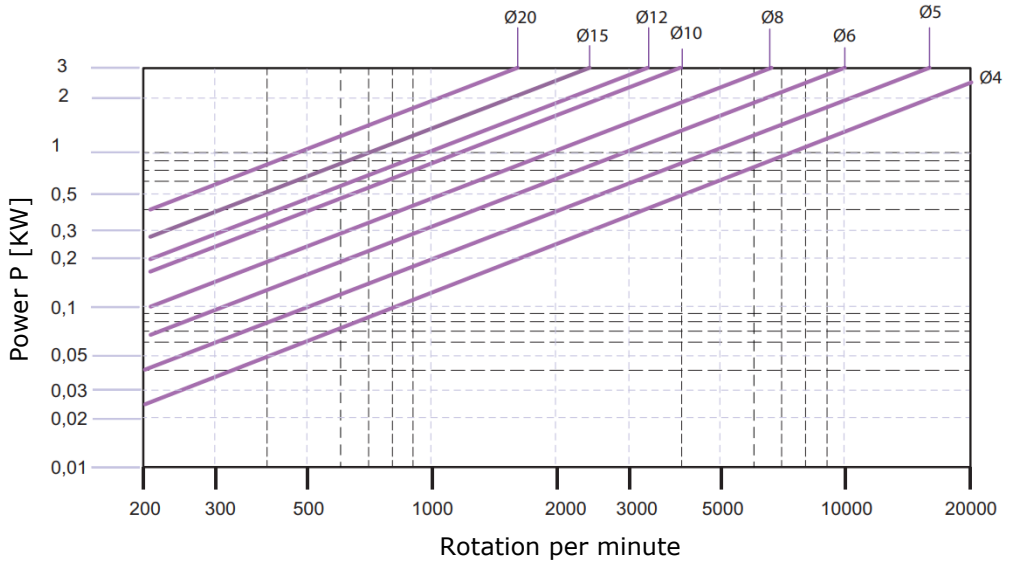
Power / Rotation per minute



Manufacturer:

The manufacturer reserves the right to make changes to the products that it deems necessary for their improvement without prior notice.