

Baumer electric
CH-8501 Frauenfeld
Swiss made

AMCC
PDI MATCHMAKER
CE

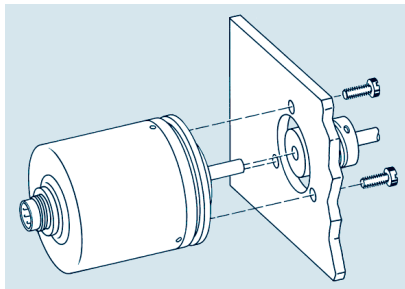
RECOM
REC5-12V200W/B
IP: DC 8-18V
OPP: DC 1-12V 2200mA
+V IN
-V IN
+V OUT
-V OUT
COM

Accessories

Mounting instructions

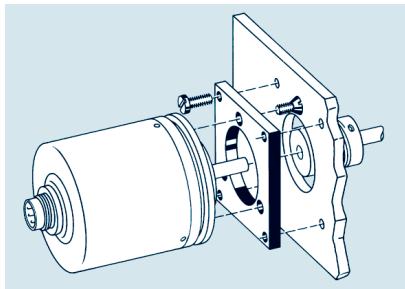
Shaft encoders

Mounting



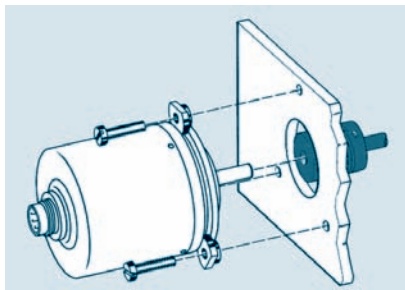
...by screw fastening directly onto the encoder flange

All shaft encoders may be mounted in this way.



...by screw fastening onto a mounting adapter

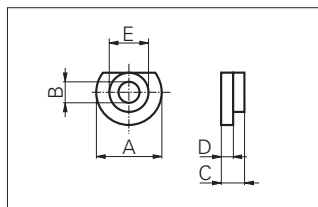
All collar type encoders may be mounted in this way.



...with servo clamps

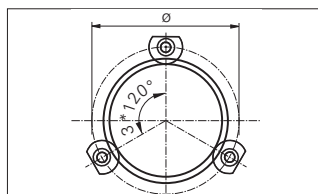
With this type of mounting the installed encoder can be turned so as to set the encoders reference pulse (marker pulse) to the drive shaft mechanical zero position. Clamp options are shown in the accessories section.

Clamp set



part nr.	106004	252773	117668	
dimensions	ø A	10	15	14
	ø B	3,2	4,2	4,3
	C	3,8	5,4	6,5
	D	2	2,6	2,75
	ø E	6	9,5	9

Mounting clamps

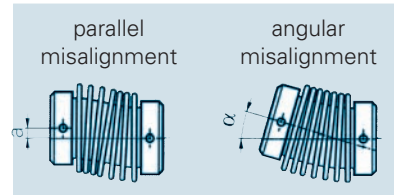


encoder	part nr.	ø
BDK	106004	37
BDT, BMSV, BMMV, BRIV	252773	68
BHW	252773	90
BMA, BMB, BMC, BMD, BME, BMF, BPMV58S, BPSV58S	117668	68

Shaft connections

Each shaft encoder can be easily fastened to the drive shaft by means of a flexible coupling. The purpose of this coupling is to transmit rotary movement to the encoder without torsional error. Small inaccuracies in alignment are equalized by parallel or angular compensation (see drawing). Different styles for various applications are available. A selection guide with specifications is shown under the accessories section.

In the choice of the correct coupling for measurement tasks, the torsional stiffness of the coupling is decisive. Other



selection criteria are various environmental effects, such as temperature, aggressive media, mechanical misalignment and operating modes. Also, care should be taken that no damaging natural resonances can occur in the relevant application.

Axial misalignment ΔA

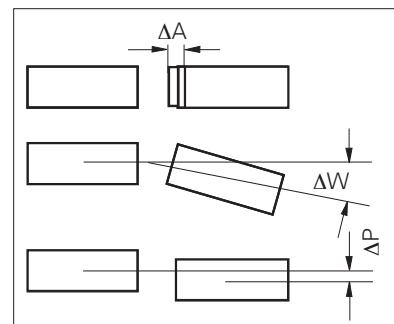
Produces tension or pressure with single piece couplings. Split couplings can compensate for this error.

Angular misalignment ΔW

Produces bending of the flexible coupling section and leads to alternating tensile and compressive loads.

Parallel misalignment ΔP

With rigid couplings, high restoring forces occur, which have a harmful effect on the ball bearings.



Installation notes

The power transmission between coupling and shaft is effected by means of frictional locking between contact surfaces. Precautions must be taken to ensure equal tightening of the mounting screws.

Before installation, check that the shaft misalignment is within permissible limits. Excessive misalignment will impair the service life of the coupling.

Selection by coupling torque

The torque applied is obtained from:

$$M_k = M_{max} * K * JK$$

- M_k = coupling torque in Nm
- M_{max} = accelerating torque of the drive
- K = load factor, for servomotors in reversing operation $\rightarrow K = 2 \dots 3$
- JK = mass moment of inertia of the hollow shaft and coupling $kg\ m^2$

Selection by torsional stiffness

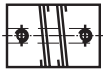
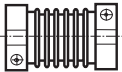


The transmission error due to elastic deformation of the flexible part is obtained from:

$$f_i = (180 / \pi) * (M_k / Ct)$$

- f_i = angle of rotation in degrees
- Ct = torsional stiffness in Nm / rad
- M_k = coupling torque in Nm

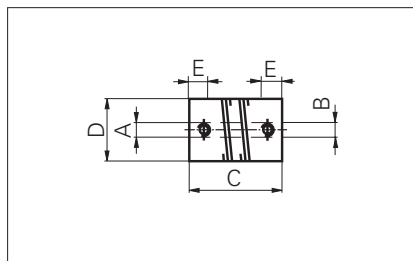
Couplings

Shaft encoders

Overview couplings				
	spiral coupling aluminum	bellows coupling alu/stainless steel	slit coupling aluminum	slit coupling polyamid
high torsional stiffness		○	○	
high torque	○	○	○	
low moment of inertia		○		○
vibration absorption				○
electrically insulating				○
clamp fastening		○	○	
stud bolt fastening	○			○

Spiral coupling

aluminum

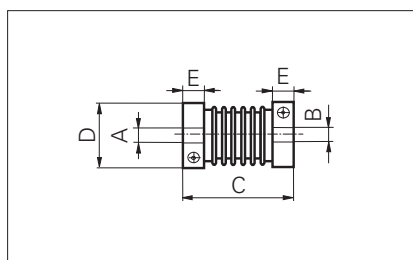


part nr. mm	106009	251401	251402
∅	5...9,5	6...9,5	6...12
A	5	6	5,88
B	6	6	7,5
C	25,4	25,4	38
D	19	19	25,4
E	6,3	6,3	11,6

max. rated torque	(Nm)	1	1	5
axial axis misalignment	(mm)	≤ 0,2	≤ 0,2	≤ 0,3
parallel axis misalignment	(mm)	≤ 0,2	≤ 0,2	≤ 0,3
angular axis misalignment	(°)	≤ 2,5	≤ 2,5	≤ 2,5
torsional stiffness	(Nm/rad)	60	60	250
moment of inertia	(kgm ² *10E-7)	5	5	20

Bellows coupling

aluminum / stainless steel

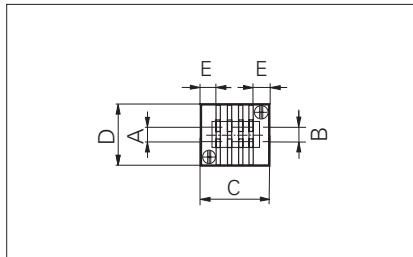


part nr. mm	106008		
∅	6...12		
A	∅ 6		
B	∅ 8		
C	42		
D	∅ 25		
E	12		

max. rated torque	(Nm)	2		
axial axis misalignment	(mm)	≤ 0,2		
parallel axis misalignment	(mm)	≤ 0,2		
angular axis misalignment	(°)	≤ 2		
torsional stiffness	(Nm/rad)	1290		
moment of inertia	(kgm ² *10E-7)	12		

Slit coupling

aluminum

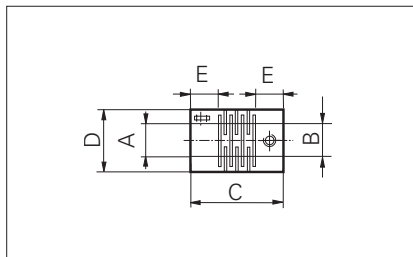


part nr. mm	107671	107670	
∅	5...6	6...12	
A	6	6	
B	5	6	
C	16,6	28	
D	18	25	
E	6	8	

max. rated torque	(Nm)	1	5	
axial axis misalignment	(mm)	≤ 0,1	≤ 0,2	
parallel axis misalignment	(mm)	≤ 0,1	≤ 0,2	
angular axis misalignment	(°)	≤ 1,5	≤ 2	
torsional stiffness	(Nm/rad)	200	3400	
moment of inertia	(kgm ² *10E-7)	3	15	

Slit coupling

polyamid

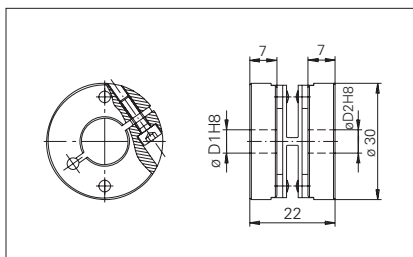


part nr. mm	115110	124461	
∅	6	5	
A	∅ 6	∅ 5	
B	∅ 6	∅ 5	
C	20,2	20,2	
D	∅ 15	∅ 15	
E	6	6	

max. rated torque	(Nm)	0,2	0,2	
axial axis misalignment	(mm)	±0,2	±0,2	
parallel axis misalignment	(mm)	±0,3	±0,3	
angular axis misalignment	(°)	±2,5	±2,5	
torsional stiffness	(Nm/rad)	15	15	
moment of inertia	(kgm ² *10E-7)	0,5	0,5	

Spring washer coupling

clamping ring: aluminum
spring washer: plastic



part nr. mm	141131	141132	141133
D1	6	6	10
D2	10	6	10

max. rated torque	(Nm)	0,6
axial axis misalignment	(mm)	±0,4
parallel axis misalignment	(mm)	±0,3
angular axis misalignment	(°)	±2,5
torsional stiffness	(Nm/rad)	50
moment of inertia	(kgm ² *10E-7)	29,5

Mounting accessories

Shaft encoders

Measuring wheel



dimensions			
meas. wheel circumference		0,2m	0,5m
bore		10 mm	10mm
measuring width		12 mm	25 mm
material	profile	part nr.	part nr.
aluminum	knurled	117671	117677
plastic	smooth	117673	117679
plastic	corrugated	117675	117681

Adapter



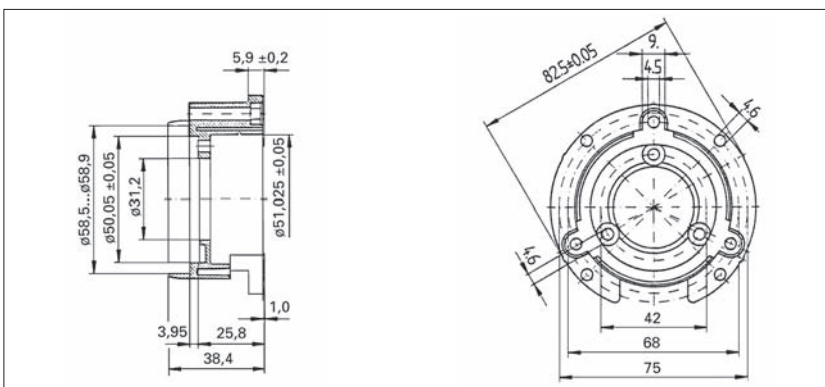
for encoder:
BAV, BDT, BPxV 58S, BMA/BMB,
BMC/BMD, BME/BMF

mounting adapter part nr. 117667

fixing screws
and servo clamps part nr. 117668

Note for BPxV

For mounting please use the according coupling springs.

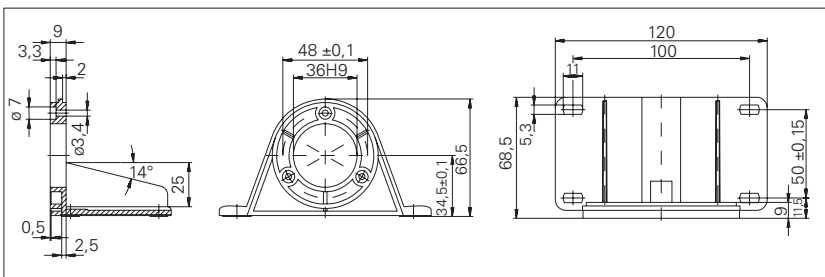


Mounting bracket

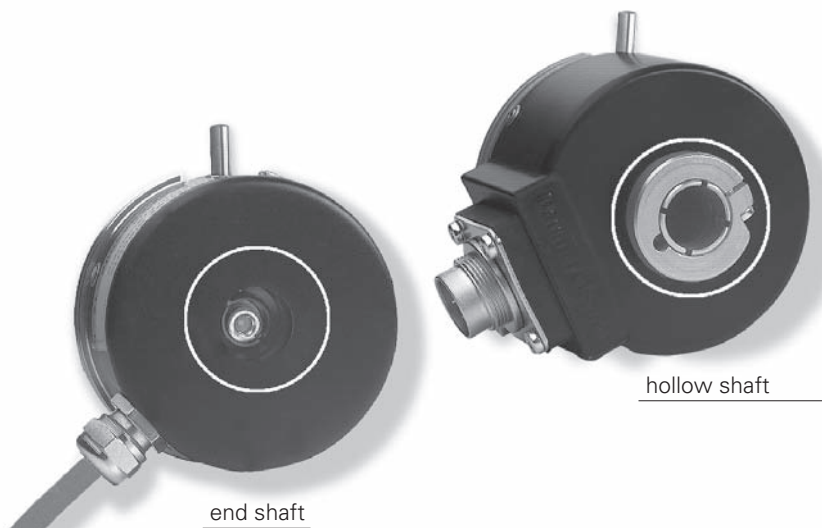


for clamping flange encoder:
BPxV 58K, BDH

mounting bracket part nr. 125051
of PPS

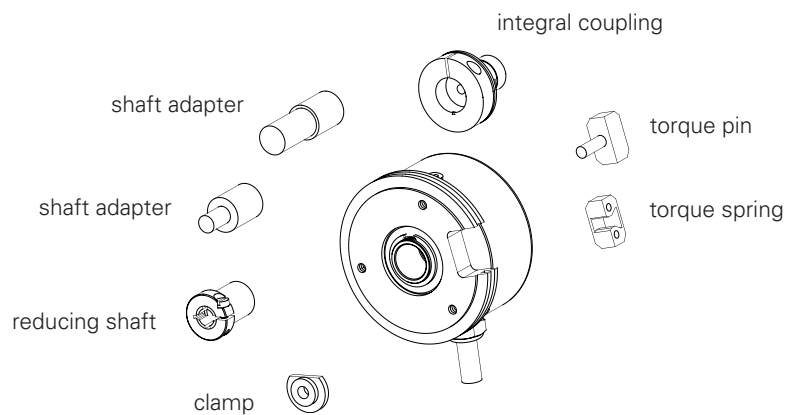


Mounting shaft versions



Advantages of hollow shaft encoders are less depth, simple mounting and a flexible mechanical interface. Neither shaft load nor misalignments occur. Fixing is done by hollow shaft or end shaft.

Mounting accessories



The principle of the flexible mechanical interface makes it possible to adapt the drive/encoder connection to the appropriate situation using various accessories.

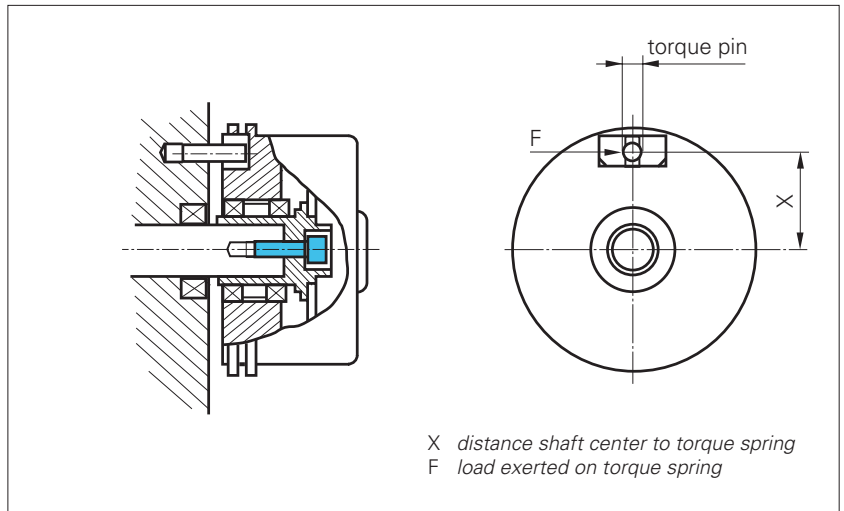
Mounting with torque spring

Hollow shaft encoder

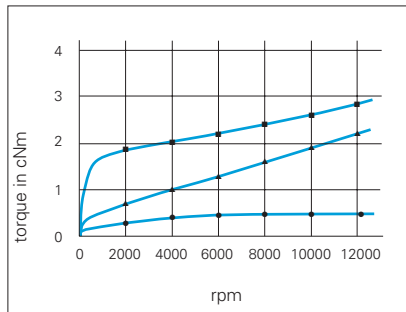
Drag angle error

The characteristic curve of the spring steel bracket has been designed for the minimum possible hysteresis and maximum stiffness. Because of this, small

drag angles are achieved. The permissible drag angle error must be included in the required positioning accuracy.



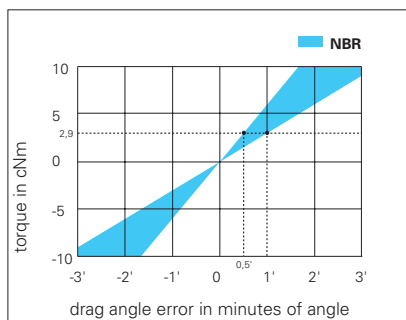
Torque curve



From the torque curve, it is possible to determine that with different encoders, at a rotational speed of 6'000 rpm, the following loads are to be expected:

	type	shaft	6'000 rpm
■	BHG	-B2	2,2 cNm
▲	BHF	-12	1,3 cNm
●	BHK	-B6	0,5 cNm

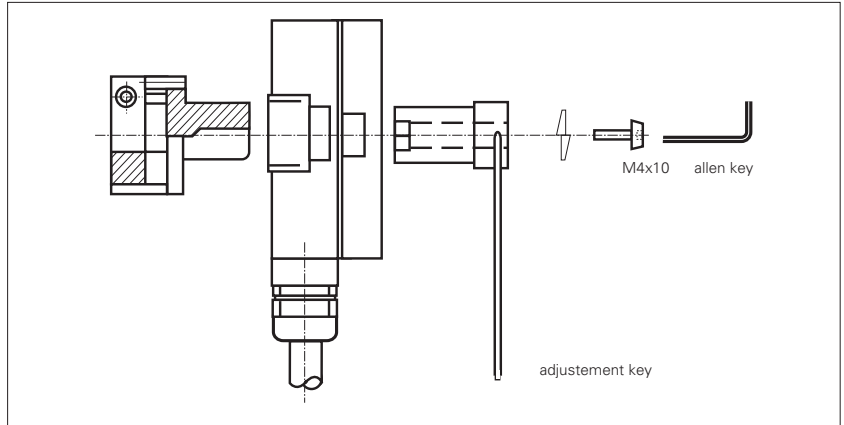
Spring characteristic curve



As can be seen from the characteristic curve, it is necessary with a torque of 2,2 cNm, to expect a drag angle error of $\pm 0,5$ to 1 minute of angle.

Mounting couplings Hollow shaft encoders

Mounting example

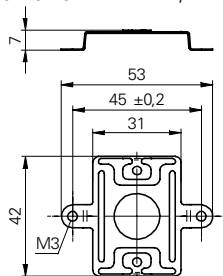


1. Insert coupling in hollow shaft
2. Place adjustment key through hood in slot of hollow shaft
3. Insert spring washer and screw in hollow shaft
4. Screw the screw into coupling with allen key
Tightening torque 250 Ncm.

allen key 3 mm	part nr. 112430
adjustment key	part nr. 114450
allen key for BHT for clamping element 2,5 mm	part nr. 112431

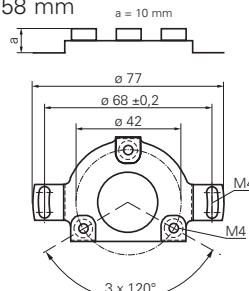
Spring plate set

For hollow shaft encoder ($\varnothing \geq 8\text{mm}$)
dimension $\varnothing 40\text{ mm}$: BHK, BRIH



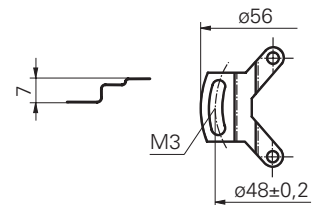
spring plate incl. screws
part nr. 158424

For hollow shaft encoder:
dimension $\varnothing 58\text{ mm}$



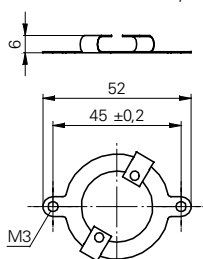
spring plate incl. screws
part nr. 136635

For hollow shaft encoder:
dimension $\varnothing 42\text{ mm}$
BMSH, BMMH



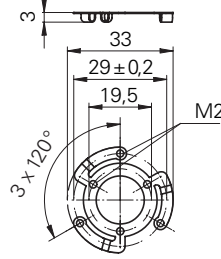
spring plate incl. screws
part nr. 138610

For hollow shaft encoder ($\varnothing < 8\text{mm}$)
dimension $\varnothing 40\text{ mm}$: BHK, BRIH



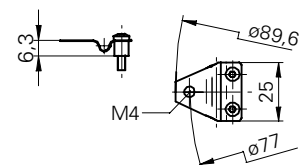
spring plate incl. screws
part nr. 158423

For hollow shaft encoder:
BTIH 24



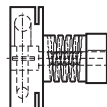
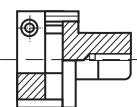
spring plate incl. screws
part nr. 159530

For hollow shaft encoder:
dimension $\varnothing 58\text{ mm}$
BRIH, BRID



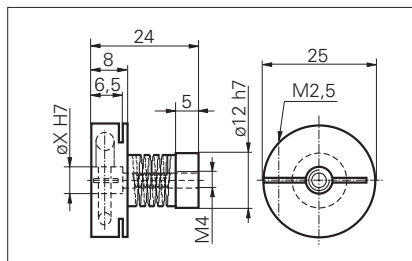
spring plate incl. screws
part nr. 154742

Overview couplings

	 spiral coupling stainless steel	 controlflex Alu/POM
high torque		○
low moment of inertia		○
vibration absorption		○
electrically insulating		○
multi-section		○
rust and chemical resistant	○	
clamp fastening	○	○

Integral coupling

stainless steel

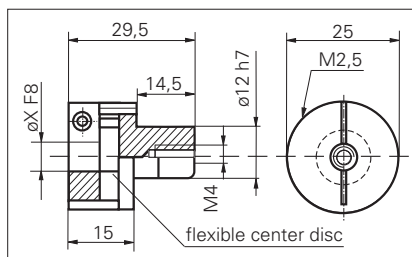


ø X	part nr.
ø 6 mm	110595
ø 6,35 mm	111342
ø 8 mm	111097
ø 10 mm	111100
ø 12 mm	111102

max. rated torque	(Nm)	0,42	
axial axis misalignment	(mm)	±0,2	
parallel axis misalignment	(mm)	±0,2	
angular axis misalignment	(°)	1	
torsional stiffness	(Nm/rad)	32	
moment of inertia	(kgm ² *10E-7)	12,5	

Controlflex coupling

Alu/POM (Poly Oxide Methyl)



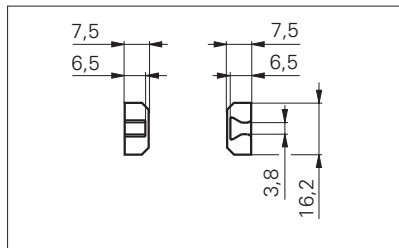
ø X	part nr.
ø 6 mm	114826
ø 8 mm	114823
ø 10 mm	114824
ø 12 mm	114825

max. rated torque	(Nm)	1	
axial axis misalignment	(mm)	±0,4	
parallel axis misalignment	(mm)	±0,25	
angular axis misalignment	(°)	1	
torsional stiffness	(Nm/rad)	29	
moment of inertia	(kgm ² *10E-7)	8	



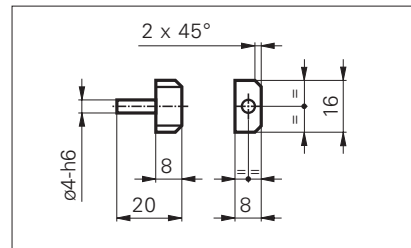
Torque pin for locking the shaft encoder

Torque spring



part nr. 109520

Torque pin

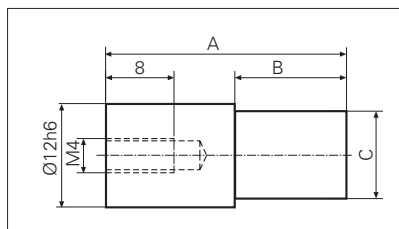


part nr. 107540



Turns the hollow shaft encoder into a shaft encoder

shaft adapter

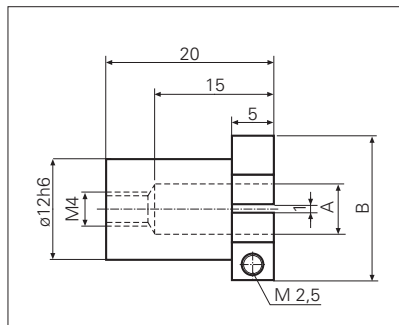


part nr.	110844	110843
dimensions	shaft 12/6	shaft 12/10
A	25 mm	34 mm
B	10 mm	19 mm
C	6 h7	10 h7



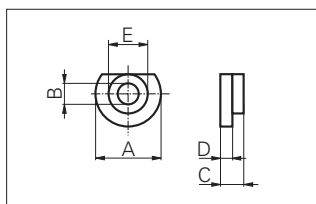
Reduces the diameter of the hollow shaft

Reducing shaft



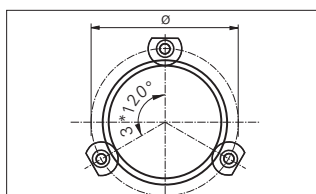
part nr.	112322	110574
dimensions	shaft 12/8	shaft 12/6
A	8 h7	6 h7
B	19,5 h13	16 h11

Clamp set



part nr.	110616	252773
dimensions	ø A	15
	ø B	4,2
	C	3,6
	D	1,8
	ø E	9,5

Mounting servo clamps



encoder	part nr.	ø
BDT, BFF, BFG, BHF, BHG, BMSH, BMMH, BMSK, BMMK, BOSD, BOSH, BOMH	110616	68
BHT, BHW	252773	90

Note

Adapters for shafts up to 16 mm on request.