

Rotary Measuring Technology

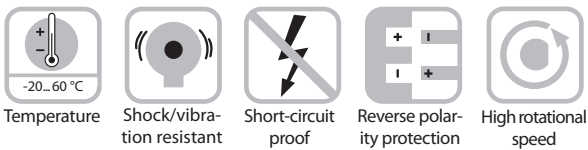
Incremental hollow shaft encoders

TURCK

Industrial
Automation

Incremental Encoders

Large diameter heavy duty Type A02H



Rugged

- Balanced, stainless-steel clamping rings, special bearing-shaft connection increases stability and vibration resistance
- Optional plastic isolating inserts protect against damage from shaft currents
- Now with approval for dust
- New type of mechanical construction, ideal for handling tough mechanical stresses and strains



Economical

- Alternative to traditional heavy duty encoders that are often over-engineered and expensive

Versatile

- Very compact. Optional isolating inserts protect against damage from shaft currents, e.g. with AC vector motors
- Only 49 mm clearance needed
- Hollow shaft diameter up to $\varnothing 42$ mm
- RS422, push-pull or SIN/COS outputs
- Extended speed range up to 6000 min⁻¹
- High-quality hub/shaft fixing, balanced, stainless-steel - ensures quiet vibration-free running

Mechanical characteristics:

Speed:	max. 6000 min ⁻¹ at 70°C ¹⁾ max. 3500 min ⁻¹ at 80°C ¹⁾	(optional up to -40 °C)
Rotor moment of inertia:	<220 x 10 ⁻⁶ kgm ² ²⁾	Shaft: stainless-steel H7
Starting torque with sealing:	< 0.2 Nm	Shock resistance acc. to DIN-IEC 68-2-27: 2000 m/s ² , 6 ms
Weight:	approx. 0.8 kg	Vibration resistance acc. to DIN-IEC 68-2-6: 100 m/s ² , 10...2000 Hz
Protection acc. to EN 60 529:	IP65	
EX approval for hazardous areas:	optional zone 2 and 22	
Working temperature:	-20° C ... +80 °C ³⁾	

¹⁾ During the run-in-phase of approx. 2 hours, reduce the limits for working temperature_{max} or speed_{max} by 1/3

²⁾ Dependent on the shaft diameter

³⁾ Non-condensing

Electrical characteristics sine wave output:

Output circuit:	Sine	Sine
	U = 1 V _{SS}	U = 1 V _{SS}
Supply voltage:	5 V (±5 %)	10 ... 30 V DC
Current consumption (no load) with inverted signals:	typ. 65 mA / max. 110 mA	typ. 65 mA / max. 110 mA
-3 dB frequency:	180 kHz	180 kHz
Signal level channels A/B:	1 V _{SS} (±20%)	1 V _{SS} (±20 %)
Signal level channel 0:	0.1 ... 1.2 V	0.1 ... 1.2 V
Short circuit proof outputs ¹⁾ :	yes	yes
Reverse connection protection at U _B :	no	yes
UL certified	File 224618	
Conforms to CE requirements acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3		
RoHS compliant acc. to EU guideline 2002/95/EG		

¹⁾ If supply voltage correctly applied

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Electrical characteristics RS422 or push-pull output:

Output circuit:	RS422 (TTL-compatible)	Push-pull	Push-pull (7272) ³⁾
Supply voltage:	5 V (±5 %) or 10 ... 30 V DC		10 ... 30 V DC 5 ... 30VDC
Power consumption (no load) without inverted signal:	not available	typ. 55 mA / max. 125 mA	–
Power consumption (no load) with inverted signal:	typ. 40 mA / max. 90 mA	typ. 80 mA/ max. 150 mA	typ. 50 mA/ max. 100 mA
Permissible load/channel:	max. ±20 mA	max. ±30 mA	max. ±20 mA
Pulse frequency:	max. 300 kHz	max. 300 kHz	max. 300 kHz
Signal level high:	min. 2.5 V	min. $U_B - 3 V$	min. $U_B - 2.0 V$
Signal level low:	max. 0.5 V	max. 2.5 V	max. 0.5 V
Rise time tr	max. 200 ns	max. 1 µs	max. 1 µs
Fall time tf	max. 200 ns	max. 1 µs	max. 1 µs
Short circuit proof outputs ¹⁾ :	yes ²⁾	yes	yes
Reverse connection protection at U_B :	5 V: no, 10 ... 30 V: yes	yes	no
Conforms to CE requirements acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3			

¹⁾ If supply voltage correctly applied

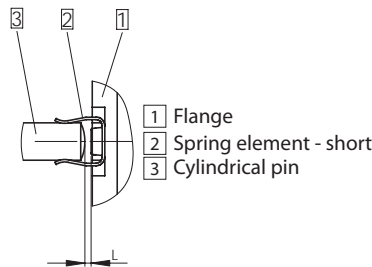
²⁾ Only one channel allowed to be shorted-out:
(If $U_B=5 V$, short-circuit to channel, 0 V, or + U_B is permitted)
(If $U_B=5-30 V$, short-circuit to channel or 0 V is permitted)

³⁾ Max. recommended cable length 30 m

Mounting:

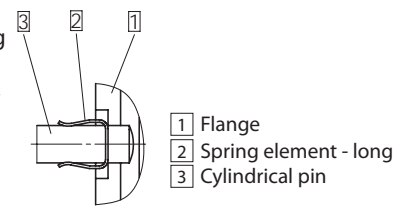
Mounting using the spring element - short

When mounting the encoder, ensure that dim. L is larger than the maximum axial play of the drive in the direction of the arrow.



Mounting using the spring element - long

Cylindrical pin fed through the bore of the spring



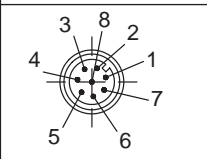
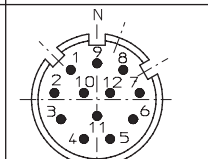
Terminal assignment:

Signal:	0V GND	+ U_B	0V Sens	+ U_B Sens	A	\bar{A}	B	\bar{B}	0	$\bar{0}$	Shield
M23, 12 pin connector, Pin:	10	12	11	2	5	6	8	1	3	4	– ¹⁾
M12, 8 pin connector, Pin:	1	2			3	4	5	6	7	8	– ¹⁾
Cable colour:	WH	BN	GY PK	RD BU	GN	YE	GY	PK	BU	RD	Shield

¹⁾ Shield is attached to connector housing

Isolate unused outputs before initial startup

Top view of mating side, male contact base:

Type	8 pin M12 connector	12 pin M23 connector
View		
Corresponding mating connector:	05.CMB-8181-0	8.0000.5012.0000

Corresponding mating connector to
Type of connection 2
Art.-Nr. 8.0000.5012.0000

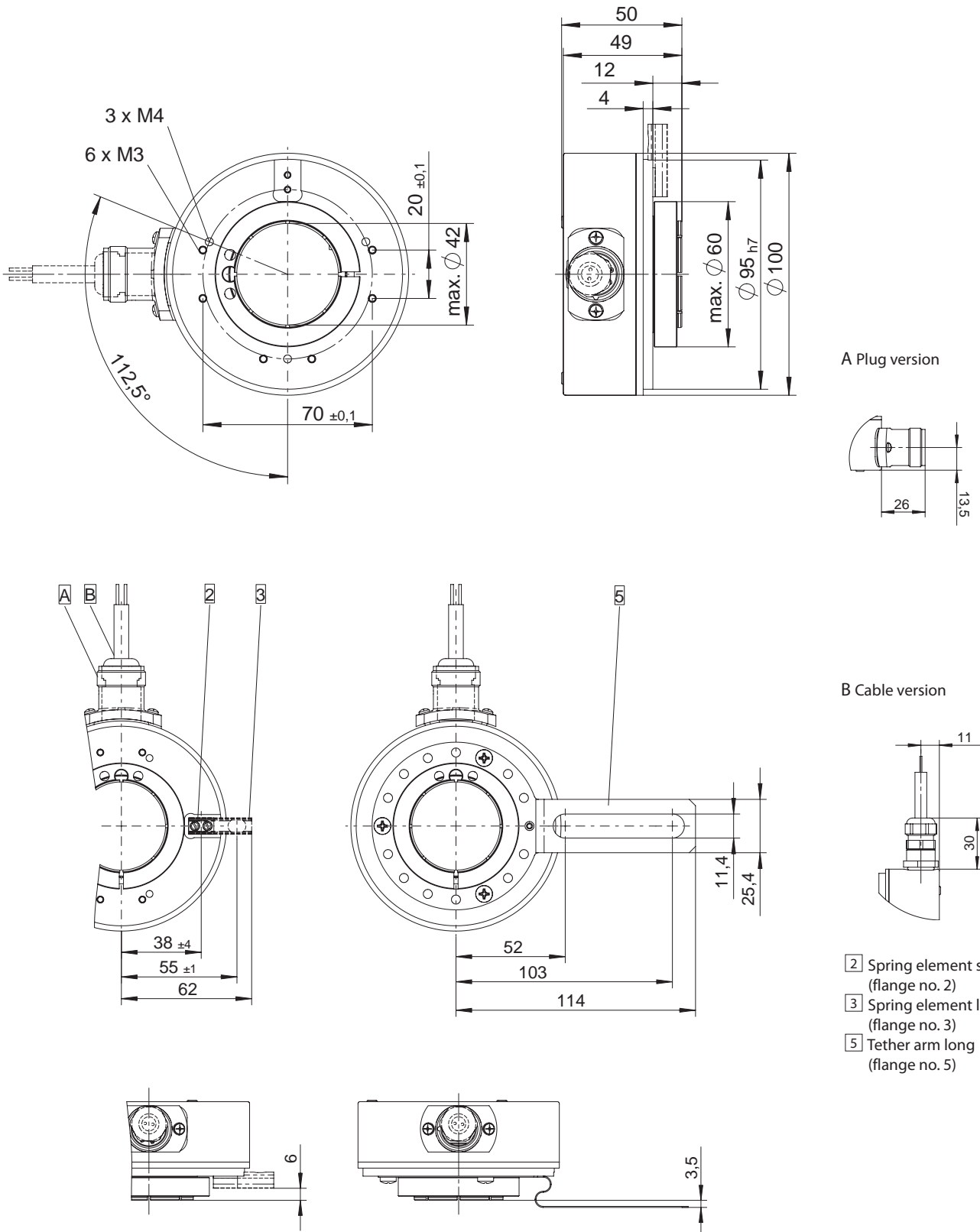
Rotary Measuring Technology

Incremental hollow shaft encoders



Large diameter heavy duty Type A02H

Dimensions:



Note: minimum insertion depth $1.5 \times D_{\text{hollow shaft}}$

Incremental Encoders

A Plug version

B Cable version

- 2 Spring element short (flange no. 2)
- 3 Spring element long (flange no. 3)
- 5 Tether arm long (flange no. 5)

Large diameter heavy duty Type A02H

Order code:

T8.A02H.XXXX.XXXX

Type	
Flange	1 = without mounting aid 2 = with short spring device 3 = with long spring device 5 = with tether arm long
Hollow shaft	1 = ø 42 mm 2 = ø 38 mm 3 = ø 28 mm 4 = ø 25.4 mm (1") 5 = ø 25 mm 6 = ø 24 mm A = ø 30 mm B = ø 40 mm C = ø 20 mm H = ø 35 mm M = ø 19 mm

Pulse rate	50*, 360*, 512*, 600*, 1000*, 1024, 1500, 2000, 2048, 2500, 4096, 5000 *not for SIN/COS version (SIN/COS version not available with pulses <1024) (e.g. 360 pulses => 0360) Other pulse rates on request
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Type of connection	1 = Cable radial (1 m PVC-cable) 2 = radial 12 pin plug without mating connector E = Connector M12 8pin, radial
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Output circuit and voltage display	1 = RS422 (with inverted signal) 5 V supply voltage 2 = Push-pull (without inverted signal) 10 ... 30 V supply voltage 3 = Push-pull (with inverted signal) 10 ... 30 V supply voltage 4 = RS422 (with inverted signal) 10 ... 30 V supply voltage 5 = Push pull (with inverted signal) 5 ... 30 V supply voltage 8 = SIN/COS 1 Vpp (with inverted signal) 5 V supply voltage 9 = SIN/COS 1 Vpp (with inverted signal) 10 .. 30 V supply voltage A = Line driver 7272 5 ... 30 V supply voltage
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Preferred types are indicated in bold

Optional (on request):
 - special connector pin out
 - special output signals formats

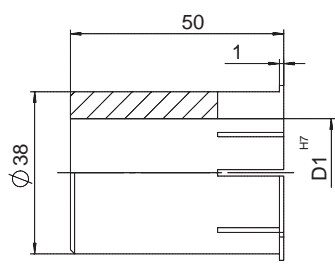
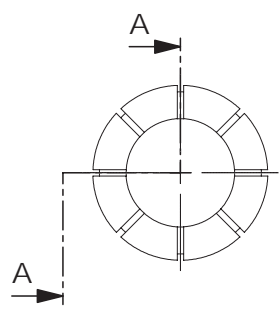
Corresponding mating connector with cable pre-assembled: Order No. 8.0000.6101.XXXX (XXXX = length [m])
 Set includes Connector typ 8.0000.5012.0000 and cable type 8.0000.6100.XXXX (Cable PUR 10 x 0.14 mm² + 2 x 0.5 mm²)

Accessories

Corresponding mating connector to Type of connection 2, 12 pin: Order No. 8.0000.5012.0000 pin assignment cw

Accessories

Isolation insert



Diameter: D1	Order-no.:
12.7 mm (1/2")	8.0010.4013.0000
15.875 mm	8.0010.4070.0000
16	8.0010.4019.0000
18 mm	8.0010.4080.0000
19.05 mm (3/4")	8.0010.4090.0000
20 mm	8.0010.4011.0000
25 mm	8.0010.4012.0000
25.4 mm	8.0010.4050.0000
31.75 mm (1 1/4")	8.0010.4060.0000

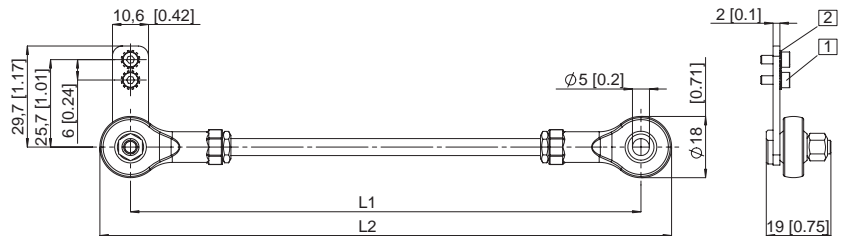
Isolation inserts prevent currents from passing through the encoder bearings. These currents can occur when using inverter controlled three-phase or AC vector motors and considerably shorten the service life of the encoder bearings.

Isolation insert for hollow shaft ø 42 mm:

External diameter 42 mm
 Internal diameter 38 H7
 Order Number: T8.0010.4017.0000

Large diameter heavy duty Type A02H, Accessories

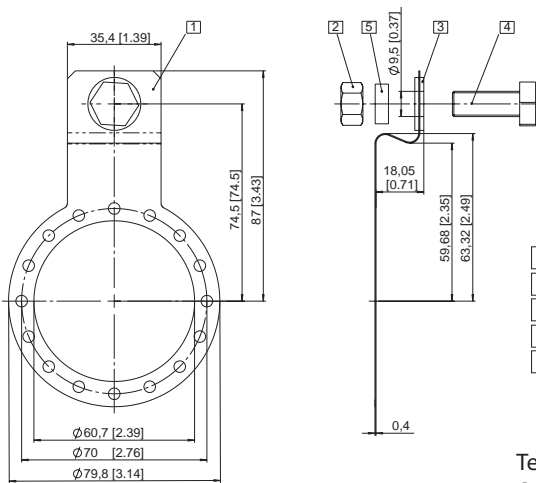
Tether arm large, flexible



Tether arm			
Length L	L1	L2	Order code
70 mm	70 [2.76]	88 [3.46]	T8.0010.40S0.0000
100 mm	100 [3.94]	118 [4.65]	T8.0010.40T0.0000
150 mm	150 [5.91]	168 [6.61]	T8.0010.40U0.0000

- 1 Socket cap screw M2.6 x 6
- 2 Lock washer

Tether arm short



- 1 Curved spring element
- 2 Hexagonal nut 3/8 - 16 UNC
- 3 Washer (isolating)
- 4 Hexagonal screw 3/8 16 UNC x 1"
- 5 Washer D10,4 x 15 x 15

Tether arm short
Order code: T8.0010.4T00.0000

Stator coupling



Stator coupling
Order code: T8.0010.40V0.0000

