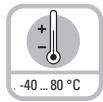


# Rotary Measuring Technology

## Incremental hollow shaft encoders

### Large diameter heavy duty Type A02H



Temperature



Shock/vibration resistant



Short-circuit proof



Reverse polarity protection



High rotational speed

#### 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
- RS 422, push-pull or SIN/COS outputs
- Extended speed range up to 6000 min<sup>-1</sup>
- High-quality hub/shaft fixing, balanced, stainless-steel - ensures quiet vibration-free running

#### Mechanical characteristics:

Speed:	max. 6000 min <sup>-1</sup> at 70°C <sup>1)</sup> max. 3500 min <sup>-1</sup> at 80°C <sup>1)</sup>	Working temperature:	-20° C ... +80 °C <sup>3)</sup> (optional up to -40 °C)
Rotor moment of inertia:	<220 x 10 <sup>-6</sup> kgm <sup>2</sup> 2)	Shaft:	stainless-steel H7
Starting torque with sealing:	< 0.2 Nm	Shock resistance acc. to DIN-IEC 68-2-27:	2000 m/s <sup>2</sup> , 6 ms
Weight:	approx. 0.8 kg	Vibration resistance acc. to DIN-IEC 68-2-6:	100 m/s <sup>2</sup> , 10...2000 Hz
Protection acc. to EN 60 529:	IP 65		
EX approval for hazardous areas:	optional zone 2 and 22		

<sup>1)</sup> During the run-in-phase of approx. 2 hours, reduce the limits for working temperature<sub>max</sub> or speed<sub>max</sub> by 1/3

<sup>2)</sup> Dependent on the shaft diameter

<sup>3)</sup> Non-condensing

#### Electrical characteristics sine wave output:

Output circuit:	Sine	Sine
	U = 1 V <sub>SS</sub>	U = 1 V <sub>SS</sub>
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 <sub>SS</sub> (±20%)	1 V <sub>SS</sub> (±20 %)
Signal level channel 0:	0.1 ... 1.2 V	0.1 ... 1.2 V
Short circuit proof outputs <sup>1)</sup> :	yes	yes
Reverse connection protection at U <sub>B</sub> :	no	yes
UL certified	File 224618	
Conforms to CE requirements acc. to EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3		
RoHS compliant acc. to EU guideline 2002/95/EG		

<sup>1)</sup> If supply voltage correctly applied

### Large diameter heavy duty Type A02H

#### Electrical characteristics RS 422 or push-pull output:

Output circuit:	RS 422 (TTL-compatible)	Push-pull	Push-pull (7272) <sup>3)</sup>
Supply voltage:	5 V ( $\pm 5\%$ ) or 10 ... 30 V DC	10 ... 30 V DC	5 ... 30V DC
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. $\pm 20$ mA	max. $\pm 30$ mA	max. $\pm 20$ 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 $\mu$ s	max. 1 $\mu$ s
Fall time tf	max. 200 ns	max. 1 $\mu$ s	max. 1 $\mu$ s
Short circuit proof outputs <sup>1)</sup> :	yes <sup>2)</sup>	yes	yes
Reverse connection protection at $U_B$ :	5 V: no, 10 ... 30 V: yes	yes	no
Conforms to CE requirements acc. to EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3			

<sup>1)</sup> If supply voltage correctly applied

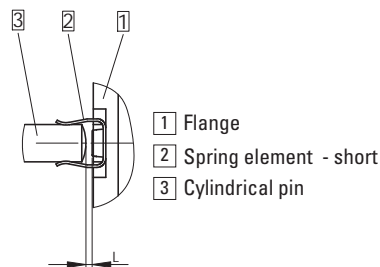
<sup>2)</sup> Only one channel allowed to be shorted-out:  
(If  $U_B=5$  V, short-circuit to channel, 0 V, or + $U_B$  is permitted)  
(If  $U_B=5-30$  V, short-circuit to channel or 0 V is permitted)

<sup>3)</sup> Max. recommended cable length 30 m

#### Mounting:

##### Mounting using the spring element - short

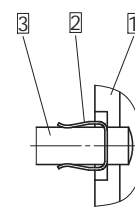
When mounting the encoder, ensure that dim. L is larger than the maximum axial play of the drive in the direction of the arrow.



- 1 Flange
- 2 Spring element - short
- 3 Cylindrical pin

##### Mounting using the spring element – long

Cylindrical pin fed through the bore of the spring



- 1 Flange
- 2 Spring element - long
- 3 Cylindrical pin

#### Terminal assignment:

Signal:	0 V GND	+ $U_B$	0 V 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	– <sup>1)</sup>
M12, 8 pin connector, Pin:	1	2			3	4	5	6	7	8	– <sup>1)</sup>
Cable colour:	WH	BN	GY PK	RD BU	GN	YE	GY	PK	BU	RD	Shield

<sup>1)</sup> Shield is attached to connector housing

Isolate unused outputs before initial startup

#### Top view of mating side, male contact base:

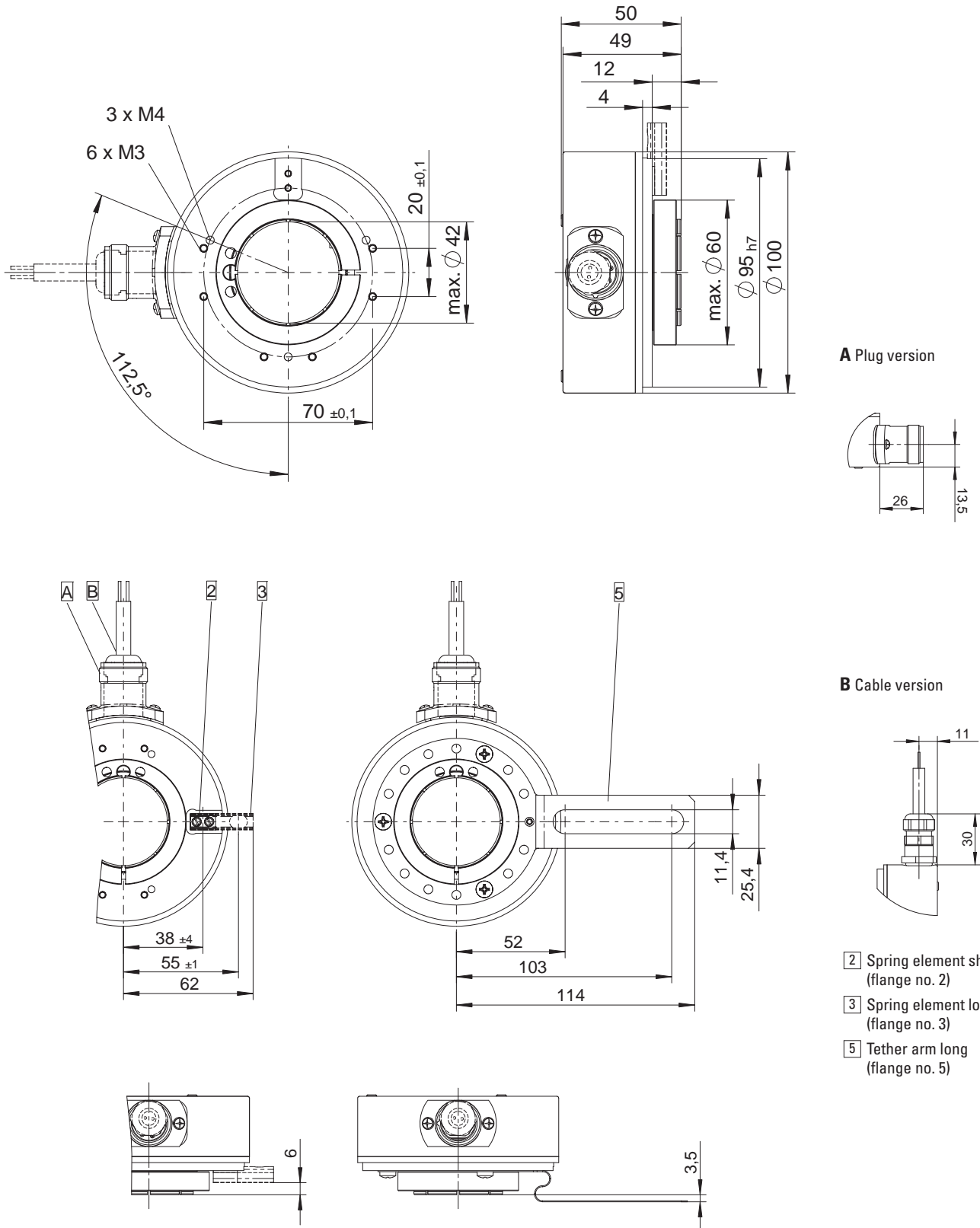
Type	8 pin M12 connector	12 pin M23 connector
View		
Corresponding mating connector:	05.CMB-8181-0	8.0000.5012.0000

Corresponding mating connector to  
Type of connection 2  
Art.-Nr. 8.0000.5012.0000  
Ask our technical hotline  
0049 7720 -3903-92

# Rotary Measuring Technology Incremental hollow shaft encoders

## Large diameter heavy duty Type A02H

Dimensions:



**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)

Recommended insertion depth min 38 mm

### Large diameter heavy duty Type A02H

Order code:

8.A02H.XXXX.XXXX

Type	
Flange	1 = without mounting aid 2 = with short spring device <b>3 = with long spring device</b> 5 = with tether arm long
Hollow shaft	1 = $\varnothing$ 42 mm 2 = $\varnothing$ 38 mm 3 = $\varnothing$ 28 mm 4 = $\varnothing$ 25.4 mm (1") <b>5 = <math>\varnothing</math> 25 mm</b> 6 = $\varnothing$ 24 mm <b>A = <math>\varnothing</math> 30 mm</b> B = $\varnothing$ 40 mm C = $\varnothing$ 20 mm H = $\varnothing$ 35 mm M = $\varnothing$ 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) <b>2 = radial 12 pin plug without mating connector</b> E = Connector M12 8pin, radial
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Output circuit and voltage display	<b>1 = RS 422 (with inverted signal) 5 V supply voltage</b> 2 = Push-pull (without inverted signal) 10 ... 30 V supply voltage <b>3 = Push-pull (with inverted signal) 10 ... 30 V supply voltage</b> 4 = RS 422 (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

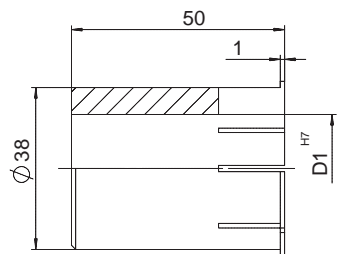
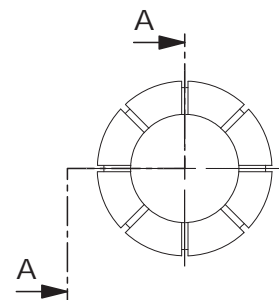
Corresponding mating connector with cable pre-assembled: Order No. 8.0000.6101.XXXX (XXXX = length [m])  
 Set includes Connector typ 8.0000.5012.0000 and cable type 8.0000.6100.XXXX (Cable PUR 10 x 0.14 mm<sup>2</sup> + 2 x 0.5 mm<sup>2</sup>)

### Accessories

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

### Accessories

Isolation insert for hollow shaft  $\varnothing$  38 mm:



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.

For more details please call our Technical Hotline (+49 7720 3903 92) or send us an e-mail (info@kuebler.com)

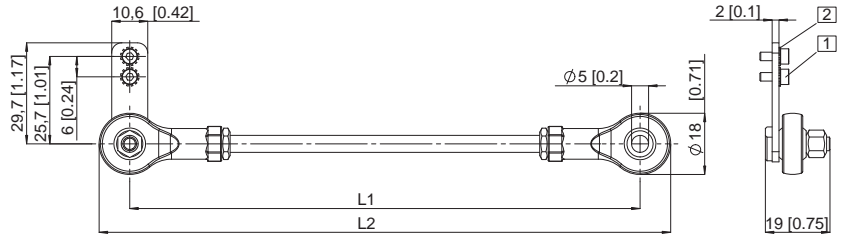
Isolation insert for hollow shaft  $\varnothing$  42 mm:

External diameter 42 mm  
 Internal diameter 38 H7  
 Order Number: 8.0010.4017.0000

# Rotary Measuring Technology Incremental hollow shaft encoders

## Large diameter heavy duty Type A02H, Accessories

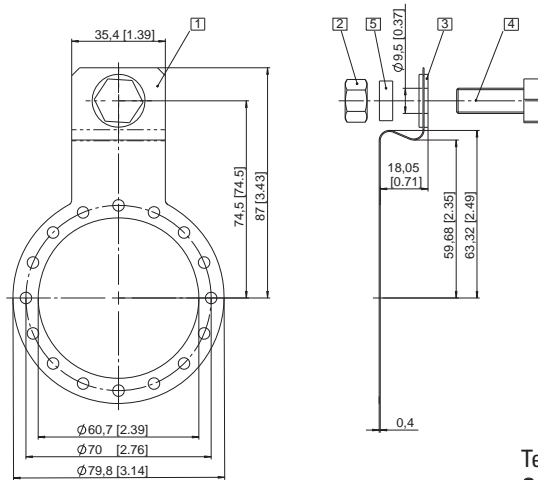
### Tether arm large, flexible



Tether arm			
Length L	L1	L2	Order code
70 mm	70 [2.76]	88 [3.46]	<b>8.0010.40S0.0000</b>
100 mm	100 [3.94]	118 [4.65]	<b>8.0010.40T0.0000</b>
150 mm	150 [5.91]	168 [6.61]	<b>8.0010.40U0.0000</b>

- 1 Socket cap screw M2.6x6
- 2 Lock washer

### Tether arm short



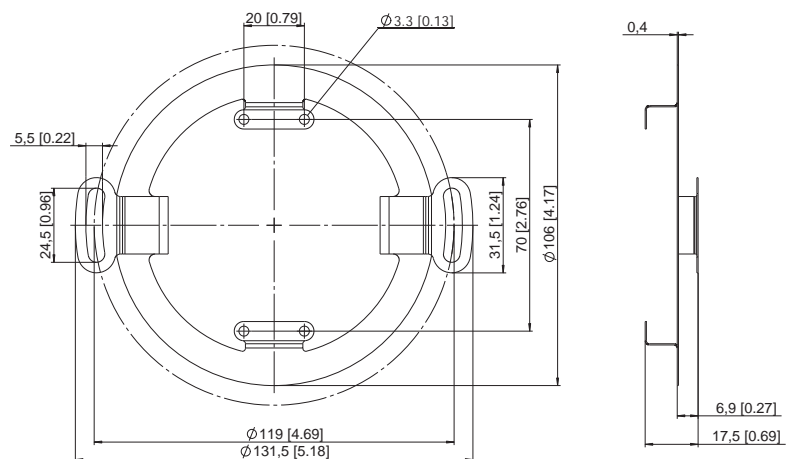
- 1 Curved spring element
- 2 Hexagonal nut 3/8 - 16 UNC
- 3 Washer (isolating)
- 4 Hexagonal screw 3/8 16 UNC x 1"
- 5 Washer D10,4 x 15 x 15

Tether arm short  
Order code: **8.0010.4T00.0000**

### Stator coupling



Stator coupling  
Order code: **8.0010.40V0.0000**



### Large diameter heavy duty Type A02H, Accessories

#### Protective cover

Protective cover with tether arm, short

- Protects the shaft and hub ring against soiling

- Delivery includes:
  - Protective cover
  - Tether arm, short
  - Fixing screws

Order code

for the set: 8.0010.40Y0.0001

