

Rotary Measuring Technology

Incremental hollow shaft encoders

Large diameter Type A020



- Only 43 mm clearance needed
- Hollow shaft diameter up to 42 mm
- Very easy mounting. The encoder is mounted directly on the drive shaft without couplings.
- Electronic temperature and ageing compensation
- RS 422, push-pull or sine wave output
- High scanning rate

Mechanical characteristics:

Speed: ¹⁾	max. 3000 min ⁻¹	Shaft:	stainless steel H7
Rotor moment of inertia: ³⁾	<150 x 10 ⁻⁶ kgm ²	Shock resistance acc. to DIN-IEC 68-2-27:	1000 m/s ² , 6 ms
Starting torque with sealing:	< 0.2 Nm	Vibration resistance acc. to DIN-IEC 68-2-6:	100 m/s ² , 10...2000 Hz
Weight:	app. 0.7 kg		
Protection acc. to EN 60 529:	IP 65		
Working temperature:	-20° C ... +70 °C ²⁾		
	(optional up to -40 °C)		

¹⁾ Short term (app. 15 min. range) up to 3500 min⁻¹ ²⁾ Non-condensing ³⁾ Depending on shaft diameter

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 61000-6-2, EN 61000-6-4 and EN 61000-6-3		
RoHS compliant acc. to EU guideline 2002/95/EG		

¹⁾ If supply voltage correctly applied

Electrical characteristics RS 422 or push-pull output:

Output circuit:	RS 422 (TTL-compatible)	Push-pull	Push-pull (7272) ³⁾
Supply voltage:	5 V (±5 %) or 10 ... 30 V DC	10 ... 30 V DC	5 ... 30 V 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. ±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 t _r	max. 200 ns	max. 1 μs	max. 1 μs
Fall time t _f	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
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			

¹⁾ If supply voltage correctly applied

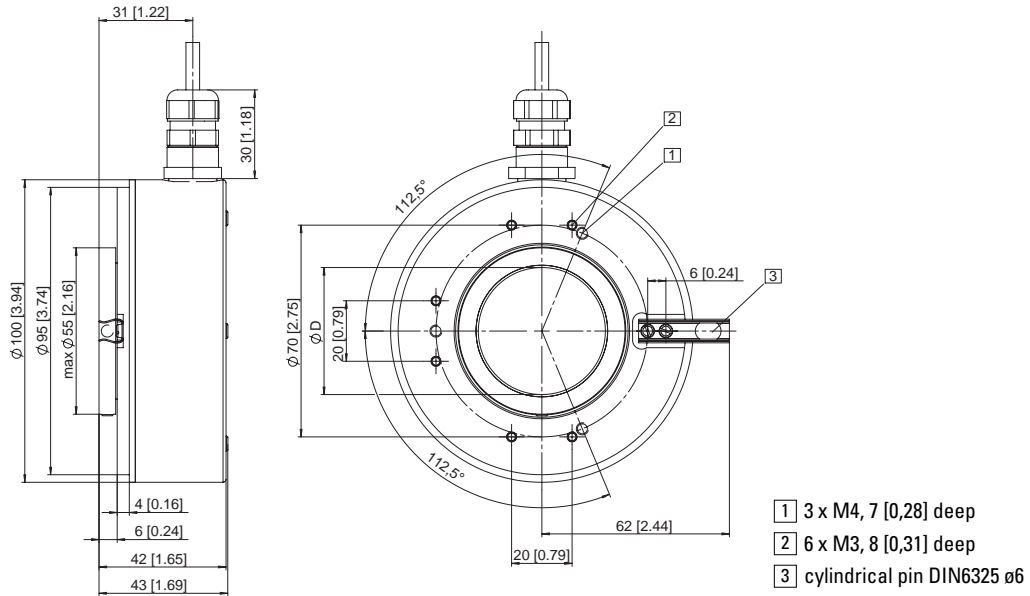
³⁾ Max. recommended cable length 30 m

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)

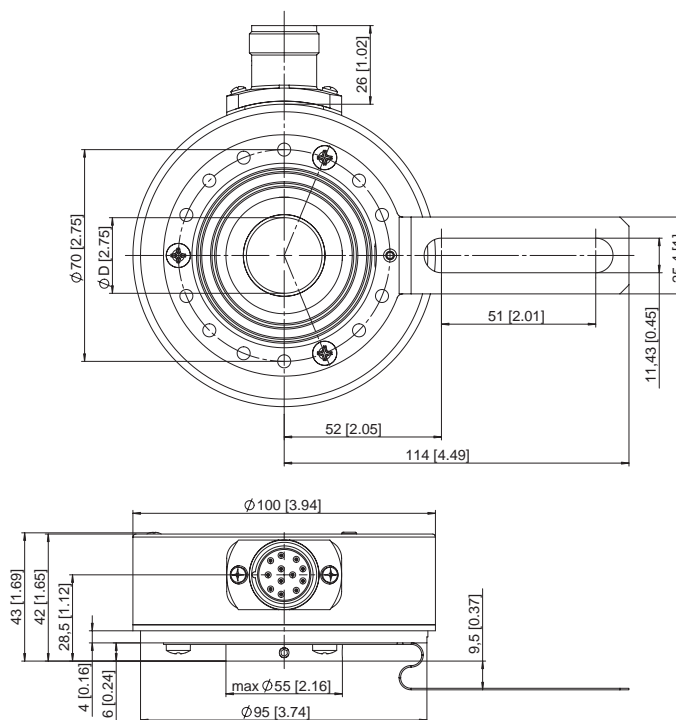
Large diameter Type A020

Dimensions

With spring element long (Flange type 3)



With tether arm long (Flange type 5)



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

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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	-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

Order code:

8.A020.XXXX.XXXX



<p>Type</p>	<p>Flange</p> <p>1 = without mounting aid 2 = with short spring element 3 = with long spring element 5 = with tether arm long</p>	<p>Hollow shaft</p> <p>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</p>	<p>Pulse rate</p> <p>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</p>	<p>Type of connection</p> <p>1 = Cable radial (1 m PVC-cable) 2 = radial 12 pin plug without mating connector E = Connector M12 8pin, radial</p>	<p>Output circuit and voltage display</p> <p>1 = RS 422 (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 = 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 V_{pp} (with inverted signal) 5 V supply voltage 9 = SIN/COS 1 V_{pp} (with inverted signal) 10 .. 30 V supply voltage A = Line driver 7272 5 ... 30 V supply voltage</p>
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Preferred types are indicated in bold

Accessories:

Cables and connectors, also pre-assembled, can be found in the chapter Connection Technology

Mounting attachments and couplings can be found in the chapter Accessories

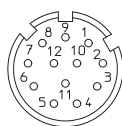
Accessories

Corresponding mating connector to
Type of connection 3 or 5,
12 pin: Order No. 8.0000.5012.0000
pin assignment cw

Corresponding mating connector with cable
pre-assembled: Order No. 8.0000.6101.XXXX
(XXXX = length [m])

Set includes connector type 8.0000.5012.0000
and cable type 8.0000.6101.XXXX
(Cable PUR 10 x 0.14 mm² + 2 x 0.5 mm²)

PIN allocation:



Dimensions:

