

TECHNICAL DATASHEET

Absolute Multiturn Motor Feedback Encoder – BD38



- Mechanical MT absolute encoder for general performance motion control
- No external battery required to store MT data, saving battery replacement and labor costs, saving time and effort
- axial runout of $\pm 0.5\text{mm}$ and radial runout of 0.05mm on the motor shaft.
- $\Phi 6/\Phi 8$ blind holes and 1:10 9mm cone hollow shaft design, compatible with mainstream market solutions
- High resolution up to 23 bits ST + 12 bits MT
- Wide operating temperature from -40°C to $+110^{\circ}\text{C}$
- Maximum continuous speed up to 10,000 rpm
- Provides OEM data area for storing motor parameters and encoder electronic nameplate (EDS) preset parameter readout.
- Built-in alarm recording function for easy troubleshooting

ACURO®
drive

BiSS
INTERFACE

SSI

CE



TECHNICAL DATA Mechanical

Housing diameter	37.5 mm
Shaft diameter	$\Phi 6/\Phi 8$ (hub shaft) $\Phi 9$ (1:10 cone hollow shaft)
Mounting depth	I.OJ/F.O.R: 35.6 mm L.OJ: 36.6 mm U.O.R/J.O.R: 38 mm
Flange types (Housing mounting)	Tether
Protection class (Shaft/housing)	IP40/IP40
Permissible axial endplay of mounting shaft	$\pm 0.5\text{ mm}$
Permissible radial runout of mount- ing shaft	TIR 0.05 mm
Max. speed	10,000 rpm
Vibration resistance (DIN EN 60068-2-6)	300 m/s^2 (10 ... 2000 Hz)
Shock resistance (DIN EN 60068-2-27)	$2,000\text{ m/s}^2$ (6ms)
Shaft/housing material	Stainless steel/engineering plastics
Moment of inertia	$1.05 \times 10^{-6}\text{ kgm}^2$
Operating temperature	-40°C ... $+110^{\circ}\text{C}$
Storage temperature	-30°C ... $+80^{\circ}\text{C}$ (due to packaging)
Weight	Approx. 70 g (MT without cable)
Operating humidity RH%	85% without condensation
Connection	8-pin PCB connector with 5.8 mm outer diameter twisted pair shielded cable (Interface AS/AE: 4 cores; Interface BE: 6 cores)

Specifications subject to change without notice.

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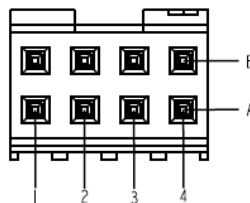
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TECHNICAL DATA electrical

Supply voltage	5VDC $\pm$ 10%
Power consumption	Max. 120mA
ST resolution	Max. 23 bits
MT resolution	12 bits mechanical gearbox (lifetime maintenance free)
EMC	As per IEC 61326-1 industrial application environment
electrostatic (ESD)	Refer to IEC61000-4-2 for test levels and methods
Fast Transient Pulse (Burst)	Refer to IEC61000-4-4 for test levels and methods
Surge (Surge)	Refer to IEC61000-4-5 for test levels and methods
Output interface	RS485 (interface AS/AE) / RS422 (interface BE/SG)
Communication protocol	BiSS-C/NRZ/SSI Gray
OEM Storage area	Standard 2K bytes, NRZ can be extended to 8K bytes
Absolute accuracy typ.	$\pm 50''$
Cycle time (Frame Repetition)	BiSS-C: 31.25 μ s NRZ: 62.5 μ s standard, 31.25 μ s on request

ELECTRICAL CONNECTIONS 8 PIN PCB connector



Matching plug model:
TE 964976-4 or FCI 90311-008LF

Matching pin model:
TE 969047-3 or FCI 77138-101LF

NRZ (Interface option AS/AE)

PIN	Color	Signal	PIN	Color	Signal
1A	/	/	1B	/	/
2A	/	/	2B	/	/
3A	Blue	SD+	3B	Blue/ Black	SD-
4A	Red	+5V	4B	Black	GND

BiSS-C/SSI (Interface option BE/SG)

PIN	Color	Signal	PIN	Color	Signal
1A	/	/	1B	/	/
2A	Green	DATA+	2B	Green/ Black	DATA-
3A	Blue	CLOCK+	3B	Blue/ Black	CLOCK-
4A	Red	+5V	4B	Black	GND

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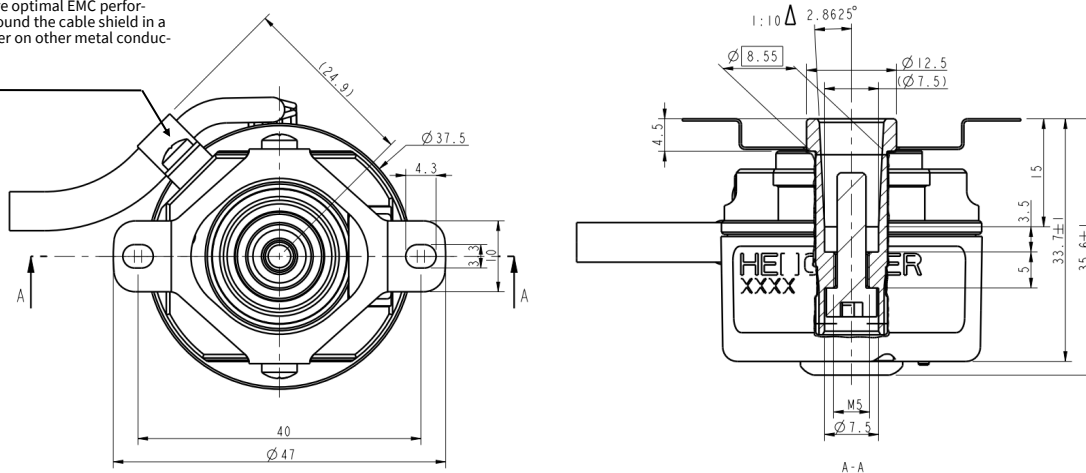
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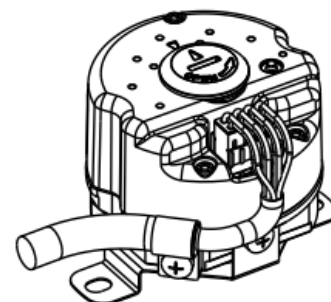
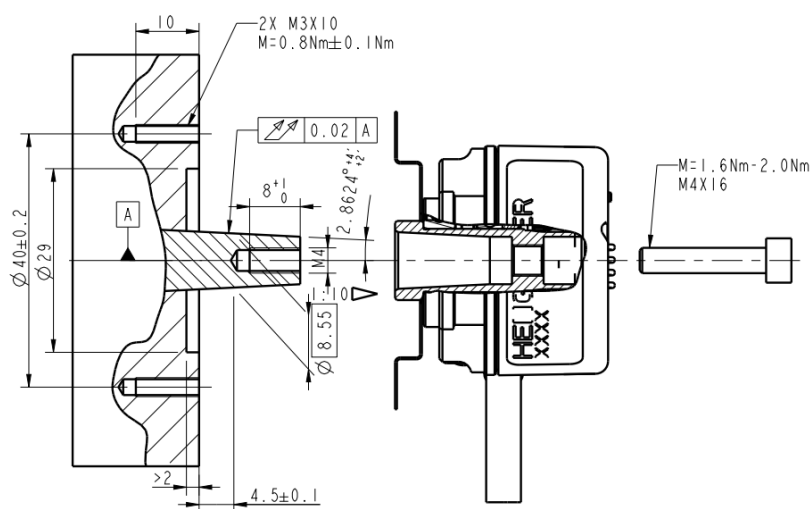
DIMENSIONED DRAWINGS

Conical hollow shaft (I.OJ)

The EMC clamp can be removed in case of space constraints. To ensure optimal EMC performance, be sure to ground the cable shield in a "face contact" manner on other metal conductive surfaces.



Matching dimensions required



Dimensions in mm

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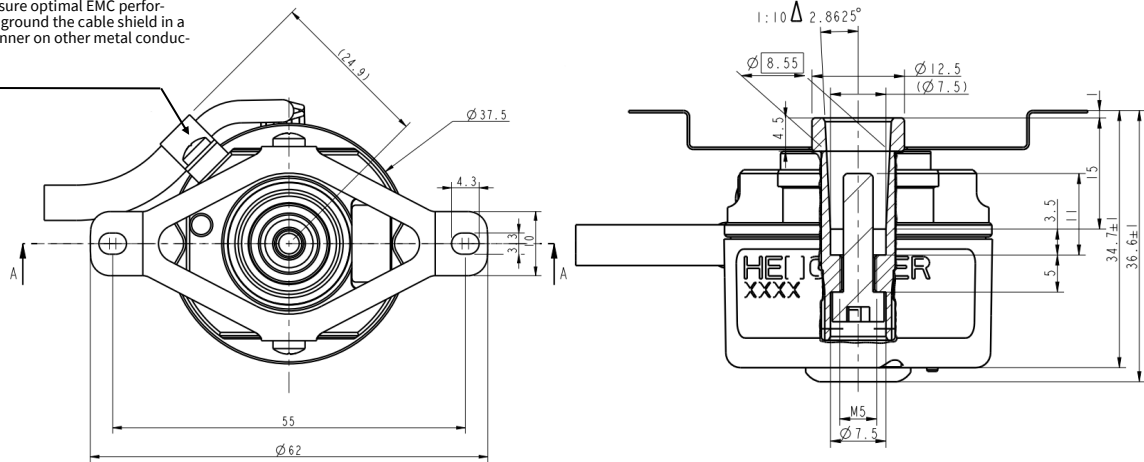
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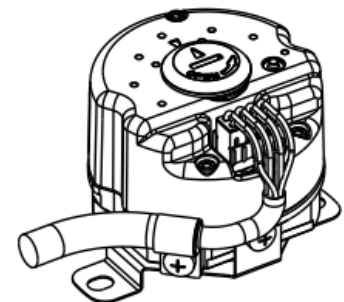
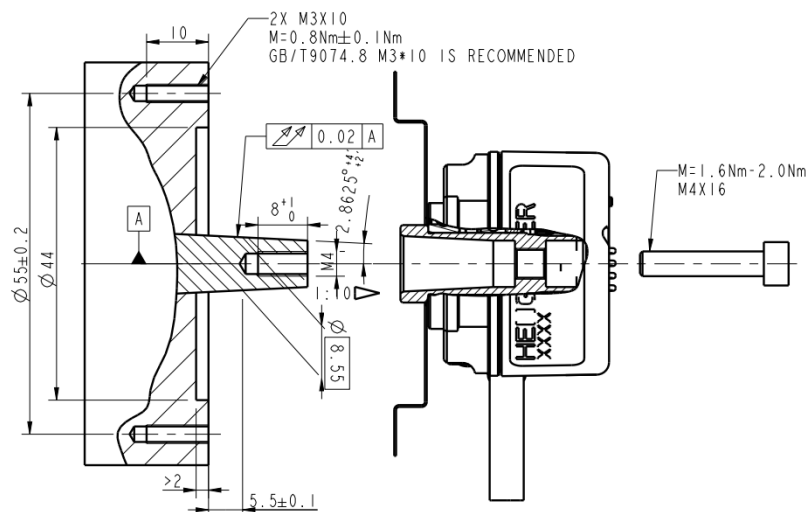
DIMENSIONED DRAWINGS

Conical hollow shaft (L.0J)

The EMC clamp can be removed in case of space constraints. To ensure optimal EMC performance, be sure to ground the cable shield in a "face contact" manner on other metal conductive surfaces.



Matching dimensions required



Dimensions in mm

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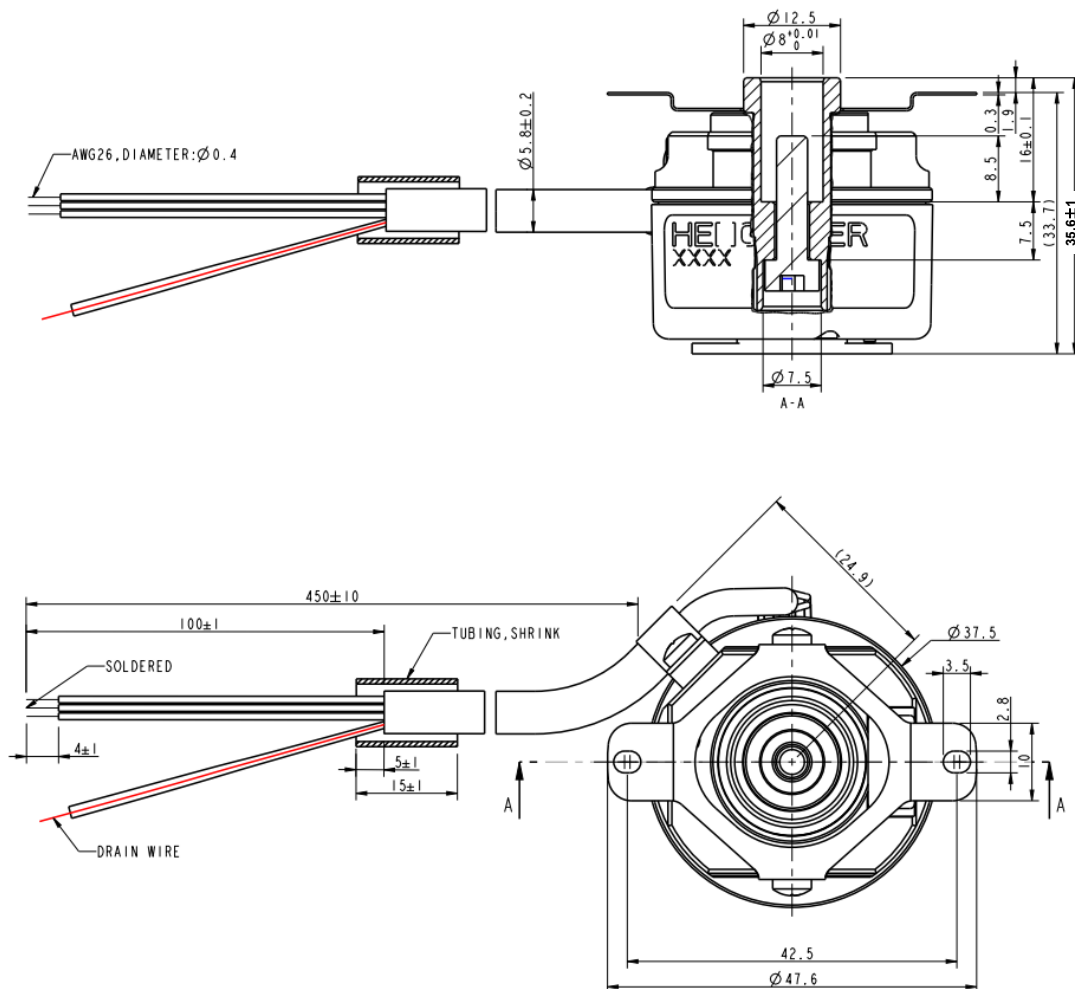
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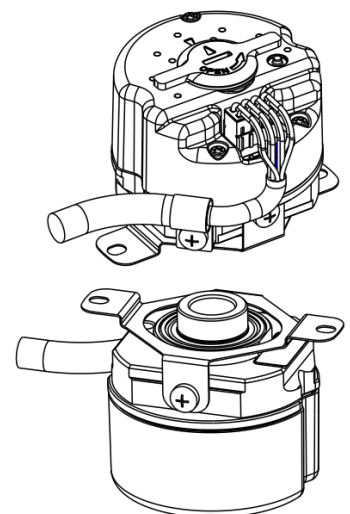
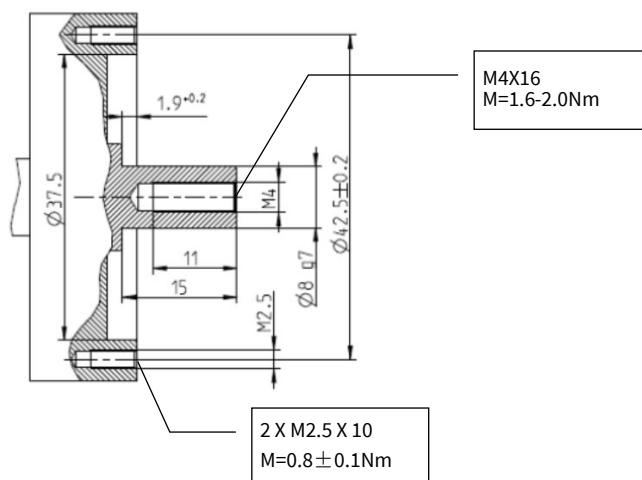
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DIMENSIONED DRAWINGS

Hub shaft (F.0R)



Matching dimensions required



Dimensions in mm

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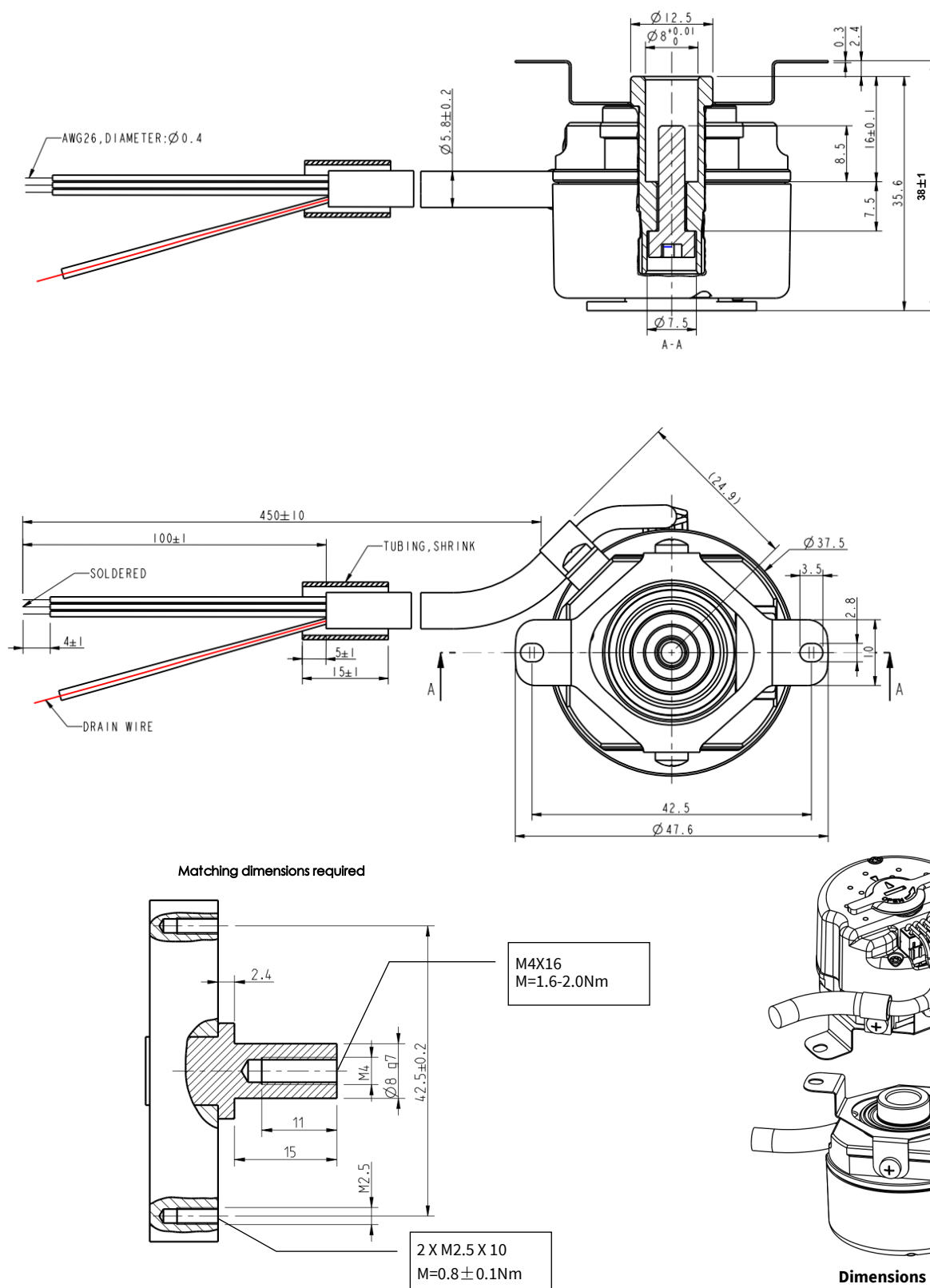


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DIMENSIONED DRAWINGS

Hub shaft(U.0R)



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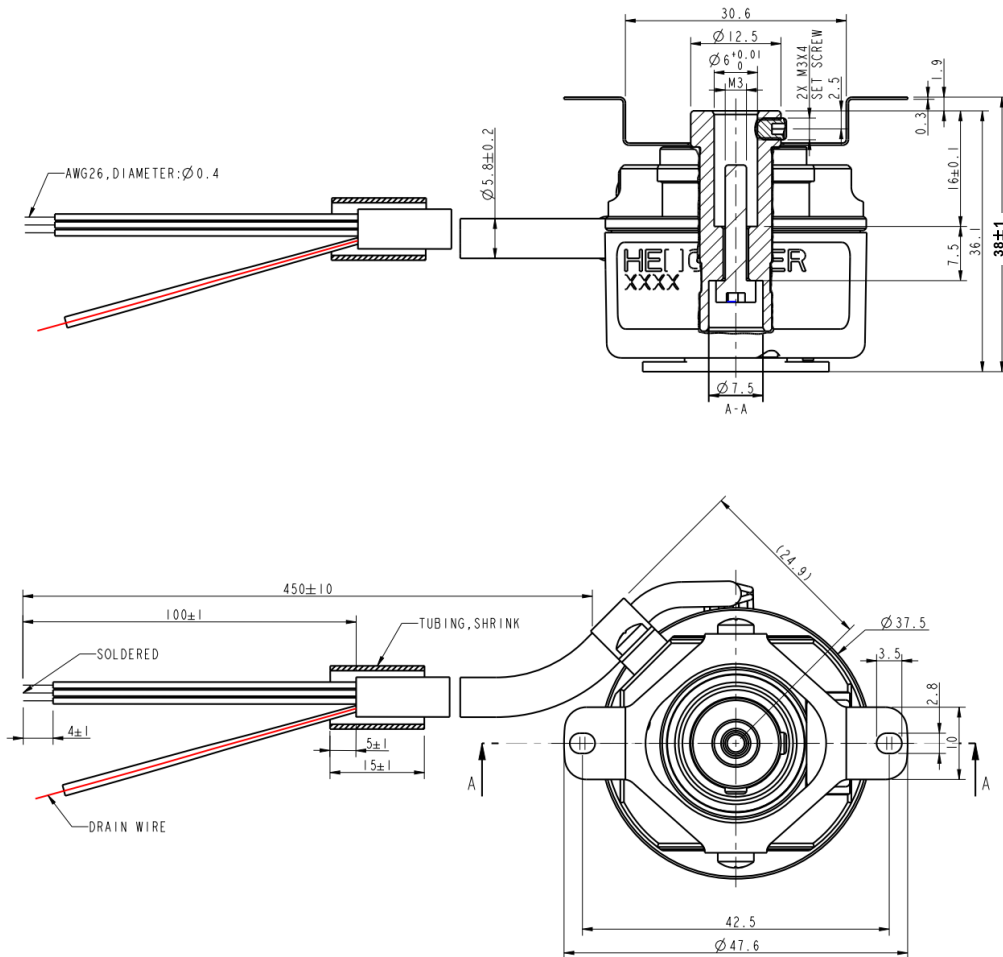
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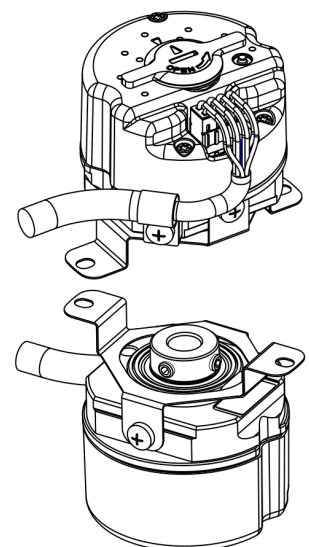
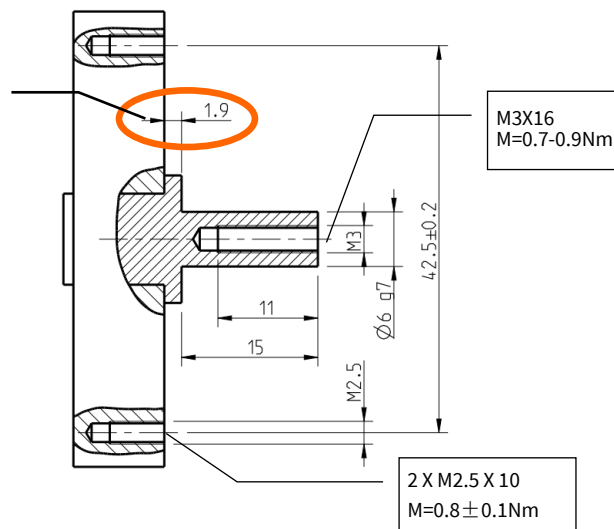
Hub shaft (J.0G)



Matching dimensions required

There are two ways to fix the encoder shaft:

1. Front side set screw installation:
No step is required on the motor shaft.
2. Rear side M3 screw installation:
The spring plate mounting surface and motor shaft step must be 1.9 mm in size to ensure reliable contact between the encoder shaft and the motor shaft step.



Dimensions in mm

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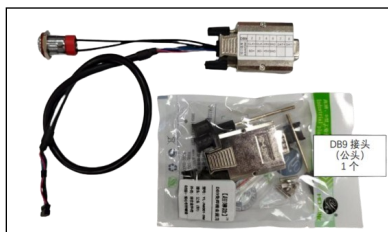
ORDERING INFORMATION

Type	Resolution	Power Voltage	Flange, Protection, Shaft	Connection	Cable length
	/				
BD38	1217 12 Bit MT+17 Bit ST 1223 12 Bit MT+23 Bit ST	A 5VDC	I.OJ Spring tether 40 mm, IP40, 9 mm 1:10 cone hollow shaft L.OJ Spring tether 55 mm, IP40, 9 mm 1:10 cone hollow shaft F.OR Spring tether 42.5 mm, IP40, 8 mm hub shaft U.OR Spring tether 42.5 mm, IP40, 8 mm hub shaft J.OG Spring tether 42.5 mm, IP40, 6 mm hub shaft	BE BiSS-C AS NRZ (2.5Mbps) AE NRZ (5Mbps) SG SSI Gray	00 No cable A5 0.5m cable

ACCESSORIES Debug cable Part Nr. : 118138-0500



Debug cable with button + DB9 connector Part Nr. : 118399-0001



PIN	Color	Signal	PIN	Color	Signal
1A	Transparent	SHIELD	1B	Purple	$\overline{\text{SET}}^1$
2A	Green	DATA+ ²	2B	Green/Black	DATA- ²
3A	Blue	CLOCK+/SD+ ³	3B	Blue/Black	CLOCK-/SD- ³
4A	Red	+5V	4B	Black	GND

¹ $\overline{\text{SET}}$ setting (low level active): - Single click (short connect GND more than 0.1 seconds) : do accuracy autocalibration - Double click (interval less than 1 second): preset position to zero

² Debugging interface AS/AE: 2A/2B no wiring; Interface BE/SG: 2A connects to DATA+, 2B connects to DATA-.

³ Debugging interface AS/AE: 3A connects to SD+, 3B connects to SD-. Interface BE/SG: 3A connects to CLCOK+, 3B connects to CLOCK-.

PIN	Color	Signal	PIN	Color	Signal
1			6	Black	GND
2	Blue	CLOCK+/SD+ ³	7	Green	DATA+ ²
3	Blue/Black	CLOCK-/SD- ³	8	Green/Black	DATA- ²
4	Red	+5V	9		
5			Button	Purple	$\overline{\text{SET}}^1$

¹ $\overline{\text{SET}}$ setting (low level active, connected to button):

- Single click (short connect GND more than 0.1 seconds) : do accuracy autocalibration

- Double click (interval less than 1 second): preset position to zero

Cable shield have been connected to metal housing of DB9 connector

² Debugging interface AS/AE: PIN 7 and 8 no wiring; Interface BE/SG: PIN 7 connects to DATA+, PIN 8 connects to DATA-.

³ Debugging interface AS/AE: PIN 2 connects to SD+, PIN 3 connects to SD-. Interface BE/SG: PIN 2 connects to CLCOK+, PIN 3 connects to CLOCK-

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