

# Series AI25 BiSS Interface

- Up to 17 Bit single-turn resolution
- 4096 revolutions of multi-turn resolution
- Short installation depth
- Safety through self-diagnostics
- Solid shaft and hollow shaft versions
- -40° C to +100° C Operating temperature



## APPLICATION/INDUSTRY

The Dynapar brand ACURO Absolute Encoder offers a modern full-feature design equipped with BiSS interface.

## DESCRIPTION

The **Acuro AI25** is available in a single-turn or multi-turn versions. Its multi-turn design is based on a reliable high-speed gear with optical scanning and the latest generation of OptoASIC technology.

Mechanical concept is based on a double ball bearing design, and is available as a solid-shaft or hollow-shaft version in common shaft diameters.

**BiSS** is a new, fully-digital and bi-directional sensor interface. It defines communication between one master and several slaves (sensors) in industrial control systems. BiSS manifests a new standard in technology and is available license-free. Due to its high performance, it constitutes an efficient alternative to the standard combination of data interface and analog sine/cosine incremental output.

**BiSS** needs only 6 wires and does not require any hardware for analog signals - and therefore, helps to reduce system costs.

Self-configuration allows "plug+play" and keeps the system in an operable condition even after a power failure. For detailed information on BiSS and support, please visit [www.biss-ic.de](http://www.biss-ic.de)

## FEATURES AND BENEFITS

- Compact design to save valuable space
- Low power consumption
- Fast delivery of any model variant
- Additional field-bus and point-to-point interfaces available

## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS

**Single-turn Resolution:** 10, 12, 13, 14, 17 Bit  
**Multi-turn Resolution:** 12 bit (only available with 12, 13, 14 or 17 bit ST resolution)  
**Linearity:** +/- 1/2 LSB  
**Absolute Accuracy:** ± 0.01° mechanical (36 arc-sec.)  
**Repeatability:** ± 0.002° mechanical (7.2 arc-sec.)  
**Code format:** Binary, Gray, Gray Excess, parameterization through *AcuroSoft*  
**Parameterization:** Resolution code type, sense of rotation, warning, alarm

### ELECTRICAL

**Connection:** Cable, M23 - 12 pole Conin connector, M12 - 8-pole connector  
**Supply voltage:** 5 VDC -5%/+10% or 10-30 VDC  
**Intrinsic current consumption:** 50 mA (ST), 100 mA (MT) not including output current  
**Output current:** 60 mA per bit, short circuit protected  
**Frequency response:** 500 kHz  
**Maximum cable length:** 400 m  
**Control Inputs:** Direction  
**Alarm output:** Warning and Alarm bits  
**Status LED:** Green = OK, Red = Alarm (IP64 only)  
**Preset Switch:** Sets encoder to zero output at present mechanical position (IP64 only)

### BiSS Benefits

- All digital interface eliminates the costs of interpolation electronics
- Offers transmission reliability through a 4-bit cyclic redundancy check (CRC)
- Represents the only fully digital, open motor feedback interface for real-time applications

### MECHANICAL

**Shaft diameter:**  
 Shaft: 6 mm (Servo Mount), 10 mm (Clamping Mount), 3/8" (Square Flange Mount)  
**Hubshaft:** 10mm, 12 mm, 3/8", 1/2"  
**Maximum shaft load:**  
 6 mm shaft: 13 lb axial, 24 lb radial  
 10 mm shaft: 24 lb axial, 35 lb radial  
**Maximum shaft speed:** 10,000 RPM (continuous), 12,000 RPM (peak)  
**Starting torque:** < 1.4 in-oz  
**Weight (approx.):** 350 g ST, 400 g MT  
**Shaft tolerance (hubshaft only):** +/- 1.5 mm axial, +/- 0.2 mm radial  
**Flange configurations:** Square, Clamp, Servo, Hubshaft with flexible tether  
**Bearing life:**  
 1 x 10<sup>10</sup> revolutions at 35% full rated shaft load  
 1 x 10<sup>9</sup> revolutions at 75% full rated shaft load  
 1 x 10<sup>8</sup> revolutions at 100% full rated shaft load

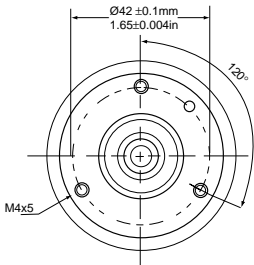
### ENVIRONMENTAL

**Operating Temperature:** -40 to 100° C  
**Storage Temperature:** -40 to 100° C  
**Enclosure Rating:** IP64 or IP67  
**Shock:** 1,000 m/s<sup>2</sup> (6 ms)  
**Vibration:** 100 m/s<sup>2</sup> (10 to 2,000 Hz)

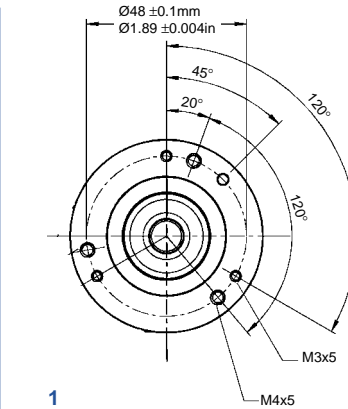
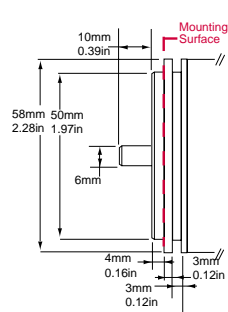
Code 1: Model	Code 2: Bits	Code 3 :Mounting	Code 4: Shaft Size	Code 5: Protocol	Code 6: Electrical	Code 7: Connector
<b>AI25</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>AI25</b> Size25 Acuro Absolute Encoder	<b>Single-Turn</b> <b>0010</b> 10 Bit <b>0012</b> 12 Bit <b>0013</b> 13 Bit <b>0014</b> 14 Bit <b>0017</b> 17 Bit  <b>Multi-Turn</b> <b>1212</b> 12 Bit Multi-Turn, 12 Bit Single-Turn <b>1213</b> 12 Bit Multi-Turn, 13 Bit Single-Turn <b>1214</b> 12 Bit Multi-Turn, 14 Bit Single-Turn <b>1217</b> 12 Bit Multi-Turn, 17 Bit Single-Turn	Available when Code 4 is 0 or A <b>0</b> Servo*  Available when Code 4 is 2 or C <b>1</b> Clamping*  Available when Code 4 is 1 or B <b>2</b> Square flange**  Available when Code 4 is 3, 4, 5 or 6 <b>3</b> Hubshaft w/tether† * 58mm Dia. ** 2.5" Square † 63mm BC	<b>w/o shaft seal (IP64)</b> <b>0</b> 6 mm <b>1</b> 3/8" <b>2</b> 10 mm <b>3</b> 3/8" Hub Shaft <b>4</b> 12 mm Hubshaft <b>5</b> 1/2" Hubshaft <b>6</b> 10 mm Hub Shaft  <b>w/ shaft seal (IP67)</b> <b>A</b> 6 mm <b>B</b> 3/8" <b>C</b> 10 mm	<b>A</b> BiSS	<b>0</b> 5 VDC <b>2</b> 10-30 VDC	<b>0</b> 1.5m axial cable <b>1</b> 1.5m radial cable <b>2</b> M23 Conin 12 pin axial CW <b>3</b> M23 Conin 12 pin radial CW <b>C</b> M12 , 8-pole connector axial <b>D</b> M12 , 8-pole connector radial

# Series AI25 BiSS Interface

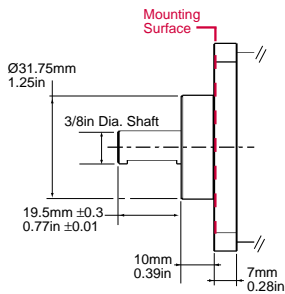
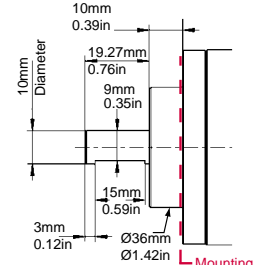
## Code 3: Mounting



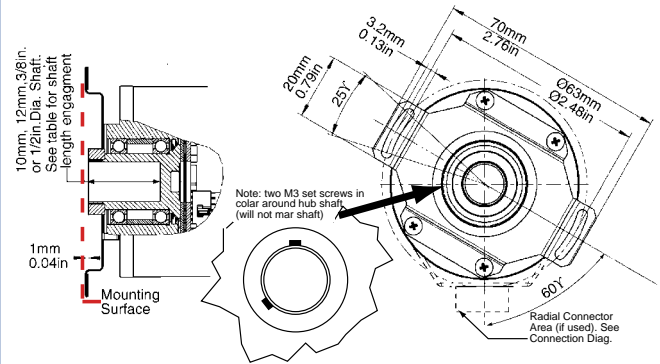
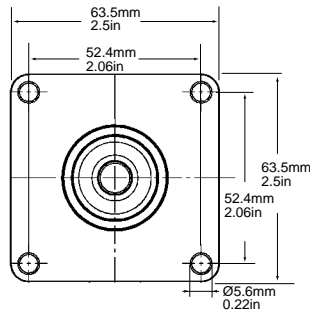
**0**  
Servo



**1**  
Clamping



**2**  
Square Flange

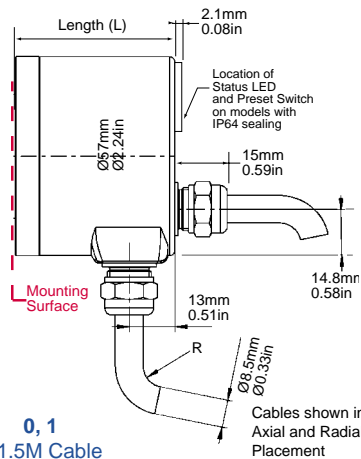


**3**  
Hubshaft w/Tether

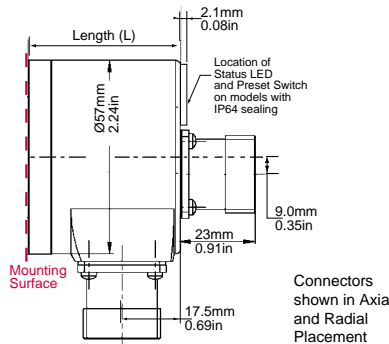
Hubshaft Shaft Engagement

HubShaft Diameter	Min. Shaft Length	Max. Shaft Length
10mm, 3/8"	15mm (0.59")	20mm (0.79")
12mm, 1/2"	18mm (0.71")	20mm (0.79")

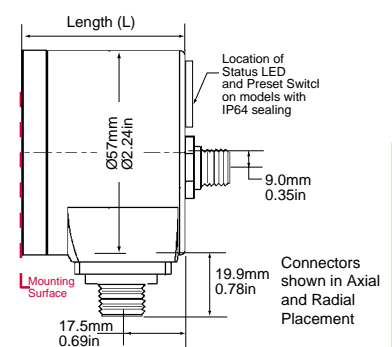
## Code 7: Connector



**0, 1**  
2.1.5M Cable



**2, 3**  
Conin 12 Pin Connector



**C, D**  
M12, 8-pole Connector

Length (L) Mounting Surface to Rear

Mount (Code 3)	Single-Turn	Multi-Turn
(0) Servo	46.5/1.83	46.5/1.83
(1) Clamping	45.5/1.79	45.5/1.79
(2) Square Flng	45.5/1.79	45.5/1.79
(3) Hubshaft	53.4/2.1	53.4/2.1

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