

SERIES AI25 SSI

HENGSTLER

Absolute Encoder

Key Features

- Up to 22 Bit True Singleturn Positioning
- Onboard Diagnostics
- SSI Interface
- Available with multiple shaft configurations
- Enclosure ratings of IP64 or IP67



SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS:

Code: Absolute, Optical
Resolution Single-turn: 12-22 Bit
Resolution Multi-turn: 12 Bit
Linearity: $\pm \frac{1}{2}$ LSB (± 1 LSB for resolution > 13 Bit)
Absolute Accuracy: $\pm 0.01^\circ$ mechanical (36 arc-sec.)
Repeatability: $\pm 0.002^\circ$ mechanical (7.2 arc-sec.)

ELECTRICAL:

Interface: SSI
Output Code: Binary, Gray, Gray Excess, parameterization through AcuroSoft
Parameterization: Resolution code type, sense of rotation, warning, alarm
Input Power: $\pm 10\%$ 5 VDC or 10-30 VDC
Intrinsic Current Consumption:
 5V: 100 mA (ST), 150 mA (MT);
 10-30V: 100 mA (ST), 150 mA (MT)
Permissible Load: max 30mA
Output Current: 60 mA per bit, short circuit protected
Frequency Response (Baud Rate): 500 kHz
Maximum Cable Length: 400 m
Control Inputs: Direction
Alarm Output: Alarm bit
Status LED: Green = OK, Red = Alarm (IP64 only)
Preset Switch: Sets encoder to zero output at present mechanical position (IP64 only)
Noise Immunity: Tested to EN61326-1
Electrical Immunity: Tested to EN61326-1
Termination: Cable, axial or radial;
 M23 connector (Conin), 12 pole, axial or radial;
 M12 connector, 8 pole, axial or radial

MECHANICAL:

Shaft Diameter: 6 mm (Servo Mount), 10 mm (Clamping Mount), 3/8" (Square Flange Mount),
Hubshaft: 10mm, 12 mm, 3/8", 1/2"
Shaft Load (axial/radial): 40N (9lb.) / 60N (13lb.)
Shaft Tolerance (hubshaft only): ± 1.5 mm axial, ± 0.2 mm radial
Shaft Load (hub shaft): Spring Tether Tolerance:
 Axial ± 0.5 mm; Radial ± 0.05 mm
Maximum Shaft Speed: 10,000 RPM (continuous), 12,000 RPM (peak)
Starting Torque: < 1.4 in-oz
Housing Material: Aluminum
Shaft Material: Stainless Steel
Disc Material: Glass
Weight:
 Single-Turn: approx. 9.2 oz (260 g)
 Multi-Turn: approx. 11 oz. (310 g)

ENVIRONMENTAL:

Operating Temperature: -40 °C ...+100 °C
Storage Temperature: -40 °C ...+100 °C
Shock: 100G, 1,000 m/s² for 6 msec
Vibration: 10G, 100 m/s² (10 to 2,000 Hz)
Humidity: Up to 75%, (no condensation allowed)
Enclosure Rating: IP64 or IP67

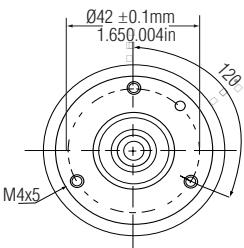
Ordering Information

To order, complete the model number with code numbers from the table below:

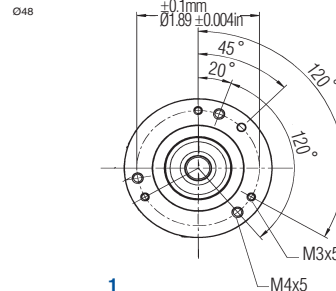
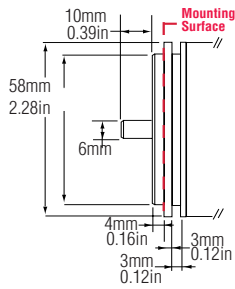
| Code 1: Model | Code 2: Resolution | Code 3: Mounting | Code 4: Shaft Size | Code 5: Interface | Code 6: Output | Code 7: Termination |
|--|---|---|---|---|--------------------------------------|--|
| AI25 | <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| AI25 Size25 Absolute Encoder | 0010 10 Bit ST 0012 12 Bit ST 0013 13 Bit ST 0014 14 Bit ST 0017 17 Bit ST 0019 19 Bit ST 0022 22 Bit ST | Available when Code 4 is 0 or A 0 Servo* Available when Code 4 is 1, 2 or B, C 1 Clamping* 2 Square Flange** | w/o shaft seal (IP64) 0 6 mm 1 3/8" 2 10 mm 3 3/8" Hubshaft 4 12 mm Hubshaft 5 1/2" Hubshaft 6 10mm Hubshaft | 2 SSI Gray (SG) 3 SSI Binary (SB) F SSI Gray (+Sin-Cos 1Vpp) (SC) Q SSI Binary + high active Preset (SR) P SSI Gray + high active Preset (SH) E SSI Binary (+ sin/cos 1Vpp) (SD) R SSI Binary Extended (SE) | 0 5 VDC 2 10-30 VDC | 0 Cable, axial 1 Cable, radial 2 M23 Conin 12 pin axial, CW 3 M23 Conin 12 pin radial, CW 4 M23 12 pin axial, CCW 5 M23 12 pin radial, CCW C M12 , 8-pole connector axial D M12 , 8-pole connector radial |
| | 1212 12 Bit MT 1213 12 Bit MT 1214 12 Bit MT 1217 12 Bit MT 1219 12 Bit MT 1222 12 Bit MT | Available when Code 4 is 3, 4, 5 or 6 3 Hubshaft w/ Tether† * 58mm Dia. ** 2.5" Square † 63mm BC | w/ shaft seal (IP67) A 6 mm B 3/8" C 10 mm | Available only when Code 2 is ST (Single Turn) K 1/4" Hubshaft | | |

DIMENSIONS

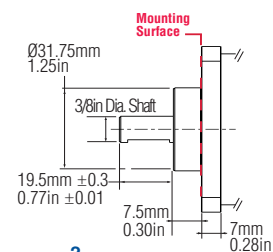
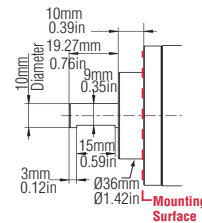
Code 3: Mounting



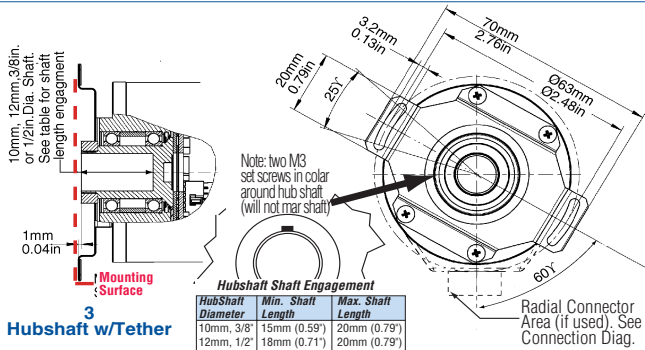
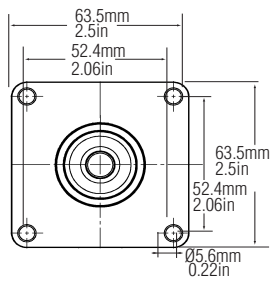
0
Servo



1
Clamping



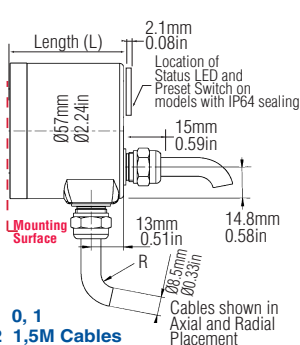
2
Square Flange



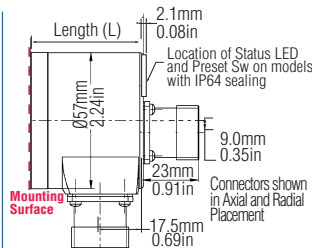
3
Hubshaft w/Tether

| 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") |

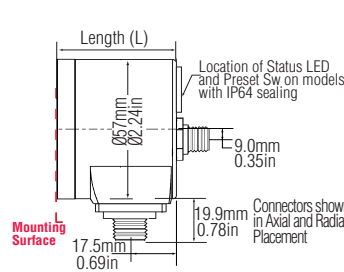
Code 7: Connector



0, 1
2 1.5M Cables



2, 3
Conin 12 Pin Connector



C, D
M12, 8-pole Connector

Length (L) Mounting Surface to RearFor connector and cable types

| 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 |

SERIES AI25 SSI



SSI Data Format

| Bits | T1 - T10 | T11 | T12 | T13 | T14 | T15 | T16 | T17 | T18 | T19 |
|------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 10 | S9 - S0 | 0 | 0 | 0 | 0 | S9 | S8 | S7 | S6 | S5 |
| 12 | S11 - S2 | S1 | S0 | 0 | 0 | S11 | S10 | S9 | S8 | S7 |
| 13 | S12 - S3 | S2 | S1 | S0 | 0 | S12 | S11 | S10 | S9 | S8 |
| 14 | S13 - S4 | S3 | S2 | S1 | S0 | 0 | S13 | S12 | S11 | S10 |
| 17 | S16 - S7 | S6 | S5 | S4 | S3 | S2 | S1 | S0 | 0 | S16 |

| Bits | T1 - T12 | T13 - T21 | T22 | T23 | T24 | T25 | T26 | T27 | T28 | T29 |
|------|----------|-----------|-----|-----|-----|-----|-----|-----|-----|-----|
| 1212 | M11 - M0 | S11 - S3 | S2 | S1 | S0 | 0 | 0 | M11 | M10 | M9 |
| 1213 | M11 - M0 | S12 - S4 | S3 | S2 | S1 | S0 | 0 | M11 | M10 | M9 |

S9, S8 Data Bits for resolution per turn.

S9 - S0 Data Bits S9, S8, S7, S6, S5, S4, S3 Etc.

M11, M10 Data Bits for number of turns.

M11- M0 Turn Data Bits M11, M10, M9, M8, Etc.

T1, T2 SSI Clock number

ELECTRICAL CONNECTIONS

M23 connector (Conin), 12 pole / cable
Interface SB and SG

| Cable | M23 (Conin) | Signal |
|--------------------|-------------|--------------------------------|
| brown ³ | 1 | 0 V (supply voltage) |
| pink | 2 | Data |
| yellow | 3 | Clock |
| | 4 | N.C. |
| blue | 5 | <u>Direction</u> ¹ |
| red | 6 | N.C. |
| violet | 7 | N.C. |
| white ³ | 8 | DC 5/ 10 - 30 V |
| | 9 | N.C. |
| grey | 10 | <u>Data</u> |
| green | 11 | <u>Clock</u> |
| black | 12 | 0 V-signal output ² |

¹ Direction: UB or unconnected = ascending code values with rotation cw
0 V = descending code values with rotation cw

² Connected with 0 V in the encoder.

Use this output to lay Direction on "0V" if required.

³ use only thin wires $\varnothing = 0.14$ mm)

M23 connector (Conin), 12 pole / cable
Interface SC

| Cable | M23 (Conin) | Signal |
|--------------------|-------------|-------------------------------|
| brown ² | 1 | 0 V (supply voltage) |
| pink | 2 | Data |
| yellow | 3 | Clock |
| white/green | 4 | A+ |
| blue | 5 | <u>Direction</u> ¹ |
| red/blue | 6 | B+ |
| brown/green | 7 | A- |
| white ² | 8 | DC 5/10 - 30 V |
| grey/pink | 9 | B- |
| grey | 10 | <u>Data</u> |
| green | 11 | <u>Clock</u> |
| black | 12 | Sense |

¹ Direction : +UB or unconnected = ascending code values with rotation cw
0 V = descending code values with rotation cw

² use only thin wires ($\varnothing = 0.14$ mm)

8 pole M12

| Colour | Pin | Signal |
|--------|-----|-------------------------------|
| white | 1 | DC 10 - 30 V |
| brown | 2 | 0 V |
| | 3 | N.C. |
| green | 4 | <u>Clock</u> |
| pink | 5 | Data |
| yellow | 6 | Clock |
| blue | 7 | <u>Direction</u> ¹ |
| grey | 8 | <u>Data</u> |



View on
connector

¹ Direction: + UB or unconnected = ascending code values with rotation cw
0 V = descending code values with rotation cw

| | |
|---------------------------------|---------------------------------|
| 12 pin CONIN Connector | Part Number: G3 539 202 |
| Bulk Cable (sold by the meter) | Part Number: 113101-0001 |
| Cable Assembly (with Connector) | |
| 3 meters | Part Number: G1 542 003 |
| 5 meters | Part Number: G1 542 004 |
| 10 meters | Part Number: G1 542 005 |
| 8 pin M12 Connector | Part Number: G3 539 597 |
| Bulk Cable (sold by the meter) | Part Number: G3 280 220 |
| Cable Assembly (with Connector) | |
| 3 meters | Part Number: G1 565 329 |
| 5 meters | Part Number: G1 565 330 |
| 10 meters | Part Number: G1 565 331 |

INDUSTRIAL DUTY

HENGSTLER



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