HAZARDOUS DUTY

HENGSTLER
SERIES AI25 SSI/BISS

DYNAPAR™

Absolute Encoder

Key Features

- **UL Certified for Class 1, Div 2 Group A,B,C,D Hazardous Applications**
- **Up to 22 Bit Singleturn and 12 Bit Multiturn**
- **Onboard Alarm Diagnostics**
- **SSI, SSI +Incr, BiSS-B, BiSS-C Interface**
- **Approved PLTC Cable Included**
- **Enclosure ratings of IP64 or IP66**

HAZ Hazardous Duty

Class 1, Div 2
Group A,B,C&D
c UL us LISTED

CE EN 61326-1

RoHS

SPECIFICATIONS

STANDARD OPERATING CHARACTERISTICS:

Code: Absolute, Optical
Resolution Single-turn: 12-22 Bit
Resolution Multi-turn: 12 Bit
Linearity: ± ½ LSB (± 1 LSB for resolution > 13 Bit
Absolute Accuracy: ± 0.01° mechanical (36 arc-sec.)
Repeatability: ± 0.002° mechanical (7.2 arc-sec.)

ELECTRICAL:

Interface: SSI, BiSS
Output Code: Binary, Gray, Gray Excess
Input Voltage: 5 VDC ±10% or 7-30 VDC
Current w/o Load (typ.):
5V: 100 mA (ST), 150 mA (MT);
10-30V: 100 mA (ST), 150 mA (MT)
Permissible Load: max 60mA
Frequency Response (Baud Rate): 500 kHz
Max Pulse Frequency (Incremental): 200KHz
Maximum Transmission Length (SSI/BISS):

Cable Length	Frequency
<50m	<400kHz
<100m	<300kHz
<200m	<200kHz
<400m	<100kHz

Control Inputs: Direction
Alarm Output: Alarm bit
Preset Function: Sets encoder to zero output at present mechanical position)
Noise Immunity: Tested to EN61326-1
Electrical Immunity: Tested to EN61326-1
Termination: Cable, 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 ±0.5mm; Radial ±0.05mm
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 ...+80 °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 IP66

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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	Code 8: Options
AI25	☐☐☐☐	☐	☐	☐	☐	☐	☐
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 **1212** 12 Bit MT 12 Bit ST **1213** 12 Bit MT 13 Bit ST **1214** 12 Bit MT 14 Bit ST **1217** 12 Bit MT 17 Bit ST **1219** 12 Bit MT 19 Bit ST **1222** 12 Bit MT 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** Available when Code 4 is 3, 4, 5 or 6 **3** Hubshaft w/ Tether† * 58mm Dia. ** 2.5" Square † 63mm BC	**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 **w/ shaft seal (IP66)** **A** 6 mm **B** 3/8" **C** 10 mm Available only when Code 2 is ST (Single Turn) **K** 1/4" 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)** **A** BiSS-B **(BI)** **L** BiSS-B (+SIN-COS 1VPP) **(BC)** **M** BiSS-C **(BE)** **N** BiSS-C (+SIN-COS 1VPP) **(BV)** Available when Code 6 is 2 **H** SSI Gray (+512 PPR Push-Pull Out) **(SM)** **J** SSI Gray (+1024 PPR Push-Pull Out) **(SN)** **K** SSI Gray (+2048 PPR Push-Pull Out) **(SO)**	**0** 5 VDC **2** 7-30 VDC	**1** Cable, radial, 30ft, 12 Pos	**D2**

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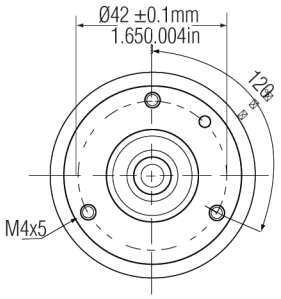
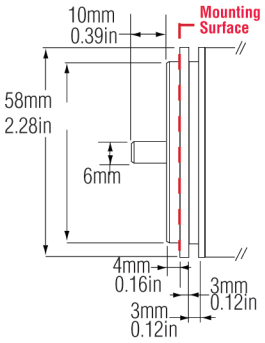
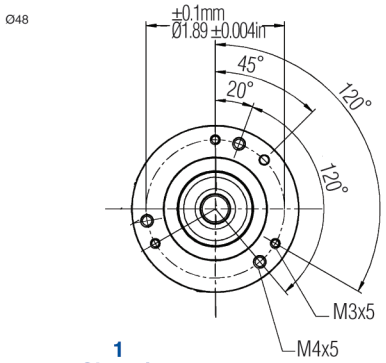
DIMENSIONS

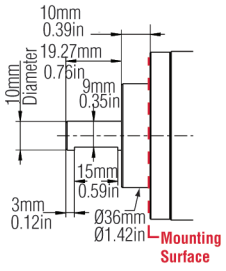
Code 3: Mounting



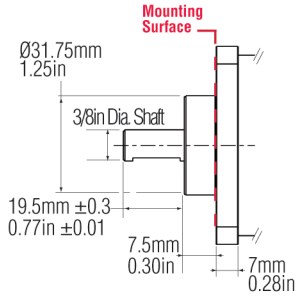


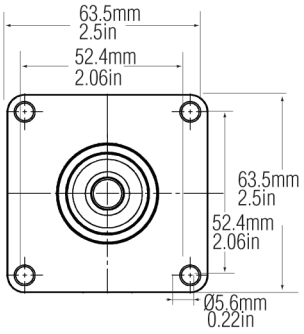
0
Servo



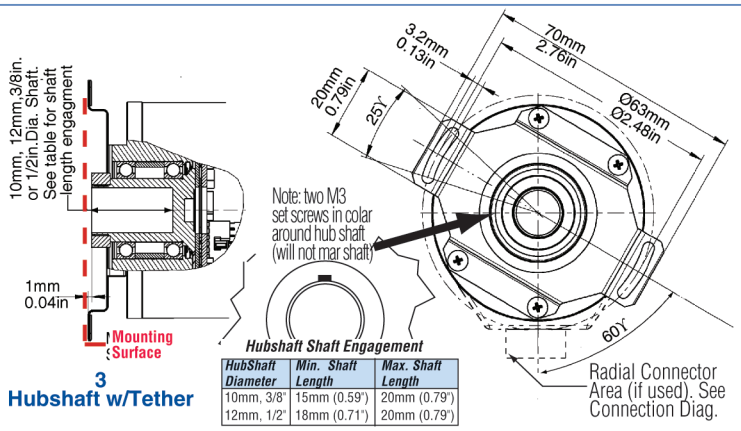


1
Clamping





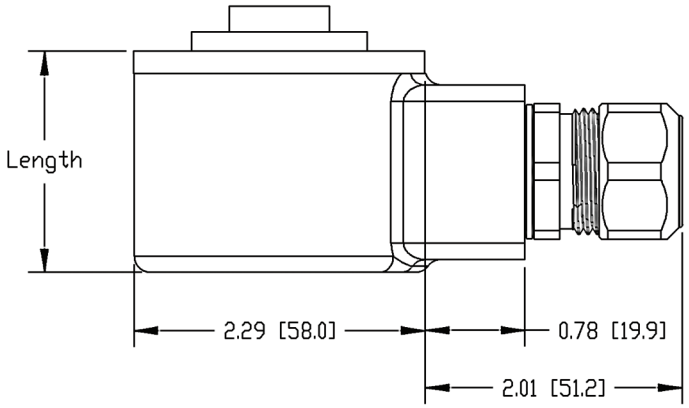
2
Square Flange



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")



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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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.
M11, M10 Data Bits for number of turns.
T1, T2 SSI Clock number

S9 - S0 Data Bits S9, S8, S7, S6, S5, S4, S3 Etc.
M11- M0 Turn Data Bits M11, M10, M9, M8, Etc.

ELECTRICAL CONNECTIONS

Pair #	Cable Color	Function (Code 5 = H, J, K)	Function (Code 5 = 2, 3, A, M, R)	Function (Code 5 = E, F, L, N)	Function (Code 5 = P, Q)
1	**RED**	VCC (DC 5/7-30 V)	VCC (DC 5/7-30 V)	VCC (DC 5/7-30 V)	VCC (DC 5/7-30 V)
	BLACK	COMMON (0V)	COMMON (0 V)	COMMON (0 V)	COMMON (0 V)
2	**WHITE**	DATA	DATA	DATA	DATA
	BLACK	$\overline{\text{DATA}}$	$\overline{\text{DATA}}$	$\overline{\text{DATA}}$	$\overline{\text{DATA}}$
3	**GREEN**	CLOCK	CLOCK	CLOCK	CLOCK
	BLACK	$\overline{\text{CLOCK}}$	$\overline{\text{CLOCK}}$	$\overline{\text{CLOCK}}$	$\overline{\text{CLOCK}}$
4	**BLUE**	A+ (Incremental)	N.C.	A+ (Sin/Cos)	N.C.
	BLACK	A- (Incremental)	N.C.	A- (Sin/Cos)	N.C.
5	**YELLOW**	B+ (Incremental)	N.C.	B+ (Sin/Cos)	N.C.
	BLACK	B- (Incremental)	N.C.	B- (Sin/Cos)	N.C.
6	**BROWN**	PRESET [3]	0V CONNECTION or SENSE [4]	0V CONNECTION or SENSE [4]	PRESET [3]
	BLACK	DIRECTION [1]	$\overline{\text{DIRECTION}}$ [2]	$\overline{\text{DIRECTION}}$ [2]	DIRECTION [1]

1 Direction: VCC or Unconnected = Descending code values with clockwise (CW) rotation. 0V = Ascending code values with CW rotation.
2 $\overline{\text{Direction}}$: VCC or Unconnected = Ascending code values with clockwise (CW) rotation. 0V = Descending code values with CW rotation.
3 Active High Signal. Signal Level high >70% VCC; Signal Level Low <20% VCC or unconnected. Sets encoder to zero output at present mechanical position.
4 Connected internally to 0V in encoder. Alternative implementation is a ground sensing loop for external voltage regulation.

Worldwide Brands: NorthStar™ • Dynapar™ • Hengstler™ • Harowe™

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