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SERIES AI25 Parallel

HENGSTLER

Absolute Encoder

Key Features

- **Up to 14 Bit of Singleturn and 12 Bits of True Multiturn Absolute Positioning**
- **Onboard Diagnostics**
- **Parallel Interface**
- **Available with multiple shaft configurations**
- **Enclosure ratings of IP64 or IP67**



E321846
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
Absolute Accuracy: ± 0.01° mechanical (36 arc-sec.)
Repeatability: ± 0.002° mechanical (7.2 arc-sec.)

ELECTRICAL:

Interface: Parallel
Output Code: Binary, Gray, Gray Excess
Input Power: 5 VDC -5%/+10% or 10-30 VDC
Intrinsic Current Consumption: 5V: 150 mA (ST), 300 mA (MT); 10-30V:200 mA (ST), 300 mA (MT)
Output Current: 60 mA per bit, short circuit protected on single-turn, 1.5m cable.
Frequency Response (Baud Rate): 500 kHz on single-turn, 1.5m cable.**Update Rate:** 1mHz for Single-turn; 100kHz for Multi-turn
Latch Delay: 20µSec.
Alarm Output: NPN open collector max 5 mA
Maximum Cable Length: 100 m
Status LED: Green = OK, Red = Alarm (IP64 only, not available on connector type J)
Preset Switch: Sets encoder to zero output at present mechanical position (Multi-turn IP64 only, not available on connector type J)

ELECTRICAL (Cont.)

Control Inputs: Latch, Direction, Tri-state (see table below)
Noise Immunity: Tested to EN 61326-1
Electrical Immunity: Tested to EN 61326-1
Termination: Cable, Conin Connector, MS Connector, Cable with Sub-D Connector (MT only)

Control Inputs		
Input	**Logic Level**	**Function**
Direction	1	Ascending code values when turning clockwise
	0	Descending code values when turning clockwise
Latch	1	Encoder data continuously changing at output
	0	Encoder data stored and constant at output
Tristate (ST)	1	Outputs active
	0	Outputs at high impedance (Tristate mode)
Tristate (MT)	1	Outputs at high impedance (Tristate mode)
	0	Outputs active

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
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
Housing Material: Aluminum
Shaft Material: Stainless Steel
Disc Material: Glass
Weight:
Single-Turn: approx. 12.3 oz (350 g)
Multi-Turn: approx. 14.1 oz. (400 g)

ENVIRONMENTAL:

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

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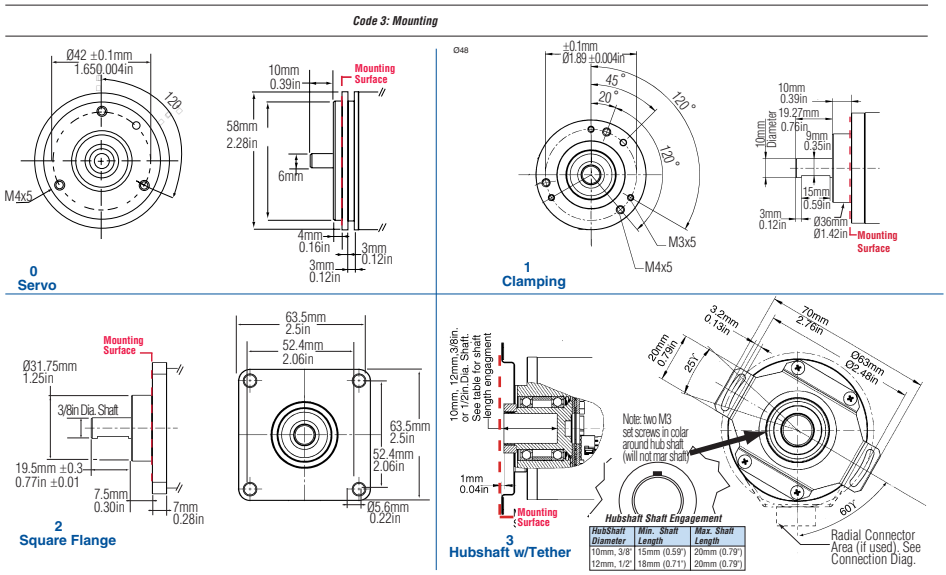
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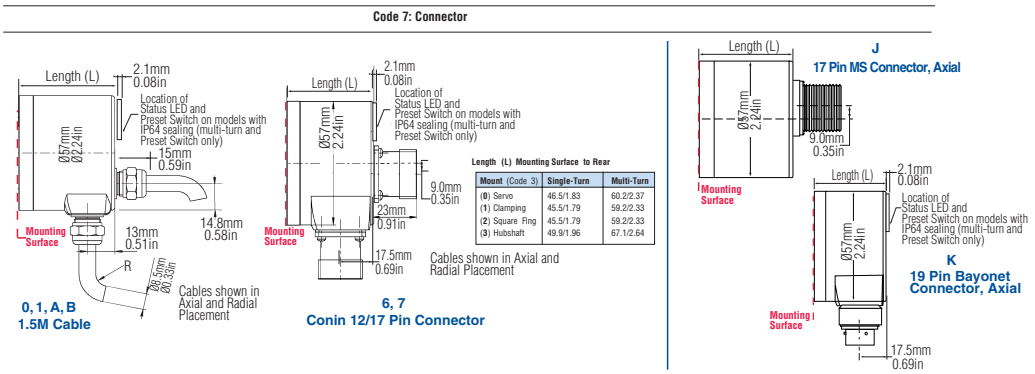
Ordering Information

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: Electrical	Code 7: Termination
AI25	☐☐☐☐	☐	☐	☐	☐	☐
AI25 Size25 Absolute Encoder	**0010** 10 Bit ST **0012** 12 Bit ST **0013** 13 Bit ST **0014** 14 Bit ST **0360** 360 PPR (Gray excess) **0720** 720 PPR (Gray excess) Available when Code 6 is 2 **0412** 4 Bit MT 12 Bit ST **0812** 8 Bit MT 12 Bit ST **1212** 12 Bit MT 12 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** 10 mm Hubshaft **w/ shaft seal (IP67)** **A** 6 mm **B** 3/8" **C** 10 mm	**0** Parallel Binary **1** Parallel Gray	**0** 5 VDC **2** 10-30 VDC	**0** Cable, axial **1** Cable, radial Available when Code 2 is 00XX, 0360 or 0720 **6** M23 Conin 17 pin axial, CW **7** M23 Conin 17 pin radial, CW **8** 17 pin Conin axial, CCW **9** 17 pin Conin radial, CCW Available when Code 2 is 1212 **A** Cable 1.5m radial w/37 pin sub-D **B** Cable 1.5m axial w/37 pin sub-D Available when Code 2 is 00XX. Status LED and Preset Switch features not available with "**J**" **J** 17 pin MS axial Available when Code 2 is 00XX or 0720 **K** 19 pin Bayonet radial

DIMENSIONS





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by DYNAPAR

Explanation of Terms		
Tristate	+UB = 0 V[2] =	Outputs at high impedance (Tristate mode) Outputs active
$\overline{\text{Tristate}}$	+UB[2] = 0 V =	Outputs active Outputs at high impedance (Tristate-Mode)
$\overline{\text{Latch}}$	+UB[2] = 0 V =	Encoder data continuously changing at output Encoder data stored and constant at output
$\overline{\text{Direction}}$	+UB[2] = 0 V =	Ascending code value when turning cw Descending code value when turning cw
N.C.	=	Not Connected
LSB	=	Least Significant Bit
MSB	=	Most Significant Bit
S0, S1, ...	=	Data bits for resolution per turn
M0, M1, ... (Multiturn)	=	Data bits for number of turns

2) Or unattached (floating)

PVC-cable (Singleturn) 9-12 Bit			
Color	**9 Bit / 360 [3]**	**10 Bit/720 [3]**	**12 Bit**
brn/gry	N.C.	N.C.	S0 (LSB)
red/blu	N.C.	N.C.	S1
vio	N.C.	S0 (LSB)	S2
wht/brn	S0 (LSB)	S1	S3
wht/grn	S1	S2	S4
wht/yel	S2	S3	S5
wht/gry	S3	S4	S6
wht/pnk	S4	S5	S7
wht/blu	S5	S6	S8
wht/red	S6	S7	S9
wht/blk	S7	S8	S10
brn/grn	S8 (MSB)	S9 (MSB)	S11 (MSB)
yel	$\overline{\text{Tristate}}$ D0...D8	$\overline{\text{Tristate}}$ D0...D9	$\overline{\text{Tristate}}$ D0.. D11
pnk	$\overline{\text{Latch}}$ [4]	$\overline{\text{Latch}}$ [4]	$\overline{\text{Latch}}$ [4]
grn	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$
blk	0 V	0 V	0 V
red	5/10...30VDC	5/10...30VDC	5/10...30VDC
brn	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$

3) Increments 4) Binary Only

Connector 17pol. (CONIN) 9-12 Bit			
Pin	**9 Bit / 360 [3]**	**10 Bit / 720 [3]**	**12 Bit**
1	S0 (LSB)	S0 (LSB)	S0 (LSB)
2	S1	S1	S1
3	S2	S2	S2
4	S3	S3	S3
5	S4	S4	S4
6	S5	S5	S5
7	S6	S6	S6
8	S7	S7	S7
9	S8 (MSB)	S8	S8
10	N.C.	S9 (MSB)	S9
11	N.C.	N.C.	S10
12	$\overline{\text{Tristate}}$ S0...S8	$\overline{\text{Tristate}}$ S0...S9	S11 (MSB)
13	$\overline{\text{Latch}}$ [4]	$\overline{\text{Latch}}$ [4]	$\overline{\text{Latch}}$ [4]
14	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$	$\overline{\text{Direction}}$
15	0 V	0 V	0 V
16	5/10...30VDC	5/10...30VDC	5/10...30VDC
17	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$	$\overline{\text{Alarm}}$

3) Increments 4) Binary Only

CONNECTOR WIRING

Connector 17pol. (CONIN) 13-14 Bit		
Pin	**13 Bit**	**14 Bit**
1	S12 (MSB)	S13 (MSB)
2	S11	S12
3	S10	S11
4	S9	S10
5	S8	S9
6	S7	S8
7	S6	S7
8	S5	S6
9	S4	S5
10	S3	S4
11	S2	S3
12	S1	S2
13	S0 (LSB)	S1
14	$\overline{\text{Direction}}$	S0 (LSB)
15	0 V	0 V
16	5/10...30VDC	5/10...30VDC
17	$\overline{\text{Latch}}$ (Binarycode) $\overline{\text{Alarm}}$ (Graycode)	$\overline{\text{Latch}}$ (Binarycode) $\overline{\text{Alarm}}$ (Graycode)

TPE-cable (Multiturn 13-14 Bit) 37 pol. Sub-D		
Color	**Pin**	
brn	2	S0
grn	21	S1
yel	3	S2
gry	22	S3
pnk	4	S4
vio	23	S5
gry/pnk	5	S6
red/blu	24	S7
wht/grn	6	S8
brn/grn	25	S9
wht/yel	7	S10
yel/brn	26	S11
wht/gry	8	M0
gry/brn	27	M1
wht/pnk	9	M2
pnk/brn	28	M3
wht/blu	14	M4
brn/blu	33	M5
wht/red	15	M6
brn/red	34	M7
wht/blk	16	M8
brn/blk	35	M9
gry/grn	17	M10
yel/gry	36	M11
pnk/grn	18	$\overline{\text{Alarm}}$
yel/pnk	10	$\overline{\text{Direction}}$
grn/blu	30	$\overline{\text{Latch}}$
yel/blu	12	Tristate
red	13	10...30 VDC
wht	31	10...30 VDC
blu	1	0 V
blk	20	0 V

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CONNECTOR WIRING

MS style 17 pin connectors

Pin	Function 12 Bit 4096 CPR	Function 10 Bit 1024 CPR	107865 Cable Accessory* Color Code	14 BIT	13 BIT
A	Vin		Red	D13 (MSB)	D12 (MSB)
B	N.C.		Violet	D12	D11
C	Latch (binary only)		Green	D11	D10
D	Direction		Orange	D10	D9
E	S1	N.C.	White	D9	D8
F	S3	S1	White/Brown	D8	D7
G	S5	S3	White/Orange	D7	D6
H	S7	S5	White/Green	D6	D5
J	S8	S6	White/Blue	D5	D4
K	S9	S7	White/Violet	D4	D3
L	S11 (MSB)	S9 (MSB)	White/Black/Brown	D3	D2
M	GND		Black	D2	D1
N	S4	S2	White/Red	D1	D0 (LSB)
P	S0 (LSB)	N.C.	Gray	D0 (LSB)	Direction
R	S2	S0 (LSB)	White/Black	GND	GND
S	S6	S4	White/Yellow	Latch	Latch
T	S10	S8	White/Grey	Vin	Vin
	10ft Cable # 107865-0010			NA	

Mating Connector: MS 17 pin style
MS3106A-20-29S part # MCN-N8

*This is a mating connector/cable assembly.
Color coding information is provides here for reference

PVC-cable (Singleturn 13-14 Bit)		
Color	**13 Bit**	**14 Bit**
gry/pnk	N.C	S0 (LSB)
brn/yel	S0 (LSB)	S1
brn/gry	S1	S2
red/blu	S2	S3
vio	S3	S4
wht/brn	S4	S5
wht/grn	S5	S6
wht/yel	S6	S7
wht/gry	S7	S8
wht/pnk	S8	S9
wht/blu	S9	S10
wht/red	S10	S11
wht/blk	S11	S12
brn/grn	S12 (MSB)	S13 (MSB)
yel	Tristate S0...S12	Tristate S0...S13
pnk	Latch [4]	Latch [4]
grn	Direction	Direction
blk	0 V	0 V
red	5/10...30VDC	5/10...30VDC
brn	Alarm	Alarm

4) Binary Only

Bayonet style 19 pin connectors

Pin	Function 14 Bit 16384 CPR	112077 Cable Accessory* Color Code	Function 13 it 8192 CPR	112076 Cable Accessory* Color Code	Function 12 Bit 4096 CPR	Function 10 Bit 1024 CPR	110158 Cable Accessory* Color Code
A	S13 (MSB)	White/Black/Brown	S12	White/Black/Brown	S11 (MSB)	S9 (MSB	White/Black/Brown
B	S12	White/Grey	S11	White/Grey	S10	S8	White/Grey
C	S11	White/Violet	S10	White/Violet	S9	S7	White/Violet
D	S10	White/Blue	S9	White/Blue	S8	S6	White/Blue
E	S9	White/Green	S8	White/Green	S7	S5	White/Green
F	S8	White/Orange	S7	White/Orange	S6	S4	White/Orange
G	S7	White/Yellow	S6	White/Yellow	S5	S3	White/Yellow
H	S6	White/Red	S5	White/Red	S4	S2	White/Red
J	S5	White/Brown	S4	White/Brown	S3	S1	White/Brown
K	S4	White/Black	S3	White/Black	S2	S0 (LSB)	White/Black
L	S3	Brown	S2	Blue	S1	N.C.	White
M	S2	Blue	S1	White	S0 (LSB)	N.C.	Grey
N	S1	White	S0 (LSB)	Grey	N.C	N.C.	
P	S0 (LSB)	Grey	GND	Black	GND		Black
R	Direction	Orange	Direction	Orange	Direction		Orange
S	Case	Violet	Case	Violet	Case		Violet
T	GND	Black	GND	Yellow	GND		Yellow
U	Latch	Green	Latch	Green	Latch (binary only)		Green
V	Vin	Red	Vin	Red	Vin		Red
	10ft Cable # 112077-0010		**10ft Cable #** 112076-0010		**10ft Cable #** 110158-0010		

Mating Connector: 19 pin Bayonet style PT06E-14-19S part # 606219-0001

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