

# 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



## 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/s<sup>2</sup> for 6 msec  
**Vibration:** 100 m/s<sup>2</sup> (10 to 2,000 Hz)  
**Humidity:** Up to 75%, (no condensation allowed)  
**Enclosure Rating:** IP64 or IP67



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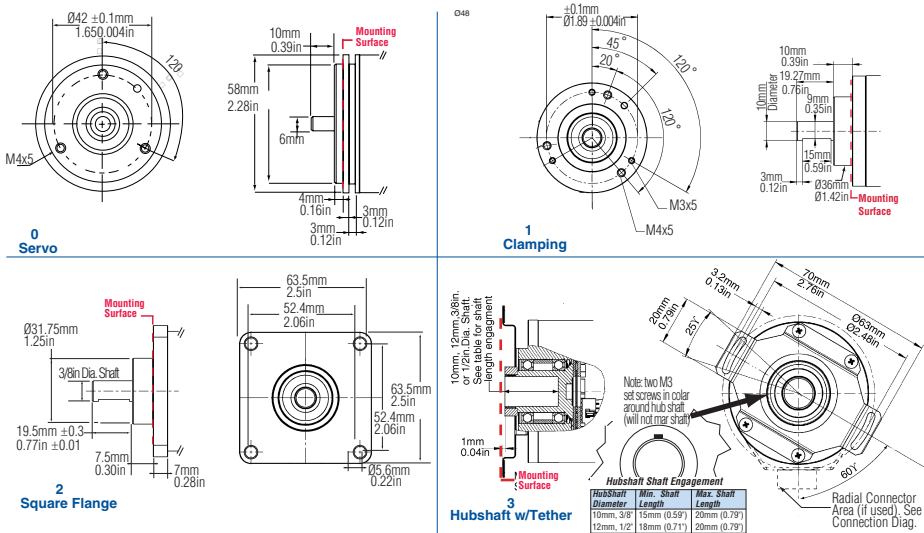
### Ordering Information

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

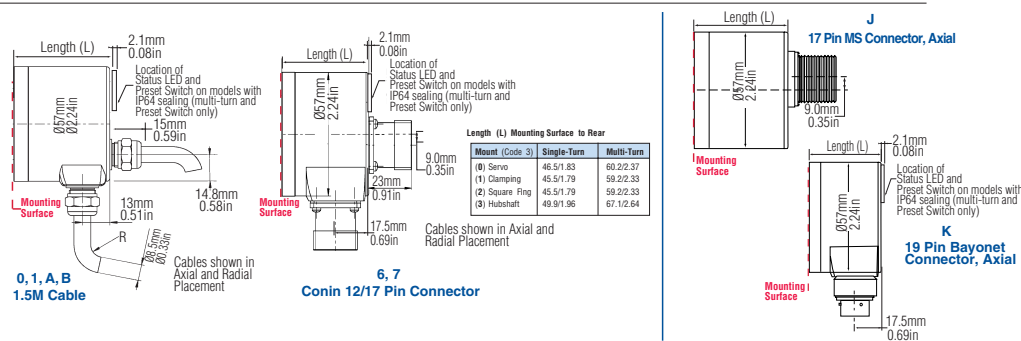
Code 1: Model	Code 2: Resolution	Code 3: Mounting	Code 4: Shaft Size	Code 5: Interface	Code 6: Electrical	Code 7: Termination
<b>AI25</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AI25 Size25 Absolute Encoder	<b>0010</b> 10 Bit ST	Available when Code 4 is 0 or A <b>0</b> Servo*	<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" Hubshaft <b>4</b> 12 mm Hubshaft	<b>0</b> Parallel Binary <b>1</b> Parallel Gray	<b>0</b> 5 VDC <b>2</b> 10-30 VDC	<b>0</b> Cable, axial <b>1</b> Cable, radial
	<b>0012</b> 12 Bit ST					Available when Code 4 is 1, 2 or B, C <b>1</b> Clamping* <b>2</b> Square Flange**
	<b>0013</b> 13 Bit ST	Available when Code 6 is 2 <b>0412</b> 4 Bit MT 12 Bit ST <b>0812</b> 8 Bit MT 12 Bit ST <b>1212</b> 12 Bit MT 12 Bit ST	Available when Code 4 is 3, 4, 5 or 6 <b>3</b> Hubshaft w/ Tether†  * 58mm Dia. ** 2.5" Square † 63mm BC	Available when Code 2 is 1212 <b>A</b> Cable 1.5m radial w/37 pin sub-D <b>B</b> Cable 1.5m axial w/37 pin sub-D		
	<b>0014</b> 14 Bit ST				Available when Code 2 is 00XX. Status LED and Preset Switch features not available with "J" <b>J</b> 17 pin MS axial	
<b>0360</b> 360 PPR (Gray excess)	Available when Code 2 is 00XX or 0720 <b>K</b> 19 pin Bayonet radial					
<b>0720</b> 720 PPR (Gray excess)						

### DIMENSIONS

Code 3: Mounting



Code 7: Connector



# SERIES AI25 Parallel



Explanation of Terms	
Tristate	+UB = Outputs at high impedance (Tristate mode) 0 V <sup>2)</sup> = Outputs active
Tristate	+UB <sup>2)</sup> = Outputs active 0 V = Outputs at high impedance (Tristate-Mode)
Latch	+UB <sup>2)</sup> = Encoder data continuously changing at output 0 V = Encoder data stored and constant at output
Direction	+UB <sup>2)</sup> = Ascending code value when turning cw 0 V = 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 <sup>3)</sup>	10 Bit/720 <sup>3)</sup>	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	Tristate D0...D8	Tristate D0...D9	Tristate D0.. D11
pnk	Latch <sup>4)</sup>	Latch <sup>4)</sup>	Latch <sup>4)</sup>
grn	Direction	Direction	Direction
blk	0 V	0 V	0 V
red	5/10...30VDC	5/10...30VDC	5/10...30VDC
brn	Alarm	Alarm	Alarm

3) Increments 4) Binary Only

Connector 17pol. (CONIN) 9-12 Bit			
Pin	9 Bit / 360 <sup>3)</sup>	10 Bit / 720 <sup>3)</sup>	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	Tristate S0...S8	Tristate S0...S9	S11 (MSB)
13	Latch <sup>4)</sup>	Latch <sup>4)</sup>	Latch <sup>4)</sup>
14	Direction	Direction	Direction
15	0 V	0 V	0 V
16	5/10...30VDC	5/10...30VDC	5/10...30VDC
17	Alarm	Alarm	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	Direction	S0 (LSB)
15	0 V	0 V
16	5/10...30VDC	5/10...30VDC
17	Latch (Binarycode) Alarm (Graycode)	Latch (Binarycode) 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	Alarm
yel/pnk	10	Direction
grn/blu	30	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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# SERIES AI25

## CONNECTOR WIRING

MS style 17 pin connectors					
Pin	Function		107865 Cable Accessory* Color Code	14 BIT	13 BIT
	12 Bit 4096 CPR	10 Bit 1024 CPR			
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 provided 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 <sup>4)</sup>	Latch <sup>4)</sup>
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	112077 Cable Accessory* Color Code	Function 13 bit	112076 Cable Accessory* Color Code	Function		110158 Cable Accessory* Color Code
	16384 CPR		8192 CPR		12 Bit 4096 CPR	10 Bit 1024 CPR	
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							

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