

# Абсолютный энкодер AI25 Parallel

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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



EN 61326-1



## SPECIFICATIONS

### STANDARD OPERATING CHARACTERISTICS:

**Code:** Absolute, Optical

**Resolution Single-turn:** 12-22 Bit

**Resolution Multi-turn:** 12 Bit

**Absolute Accuracy:**  $\pm 0.01^\circ$  mechanical (36 arc-sec.)

**Repeatability:**  $\pm 0.002^\circ$  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:** 20 $\mu$ Sec.

**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):**  $\pm 1.5$  mm axial,  $\pm 0.2$  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)

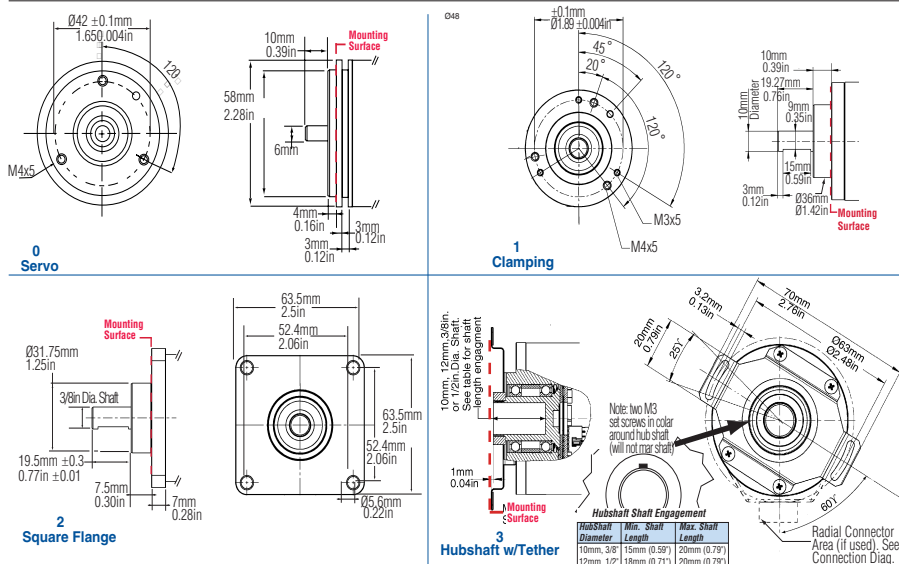
**Humidity:** Up to 75%, (no condensation allowed)

**Enclosure Rating:** IP64 or IP67

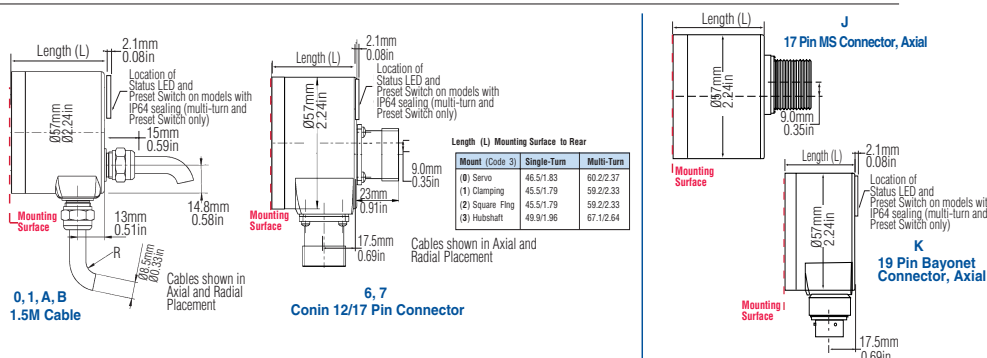
To order, complete the model number with code numbers from the table below:

| 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 | <b>0010</b> 10 Bit ST<br><b>0012</b> 12 Bit ST<br><b>0013</b> 13 Bit ST<br><b>0014</b> 14 Bit ST<br><b>0360</b> 360 PPR (Gray excess)<br><b>0720</b> 720 PPR (Gray excess) | Available when Code 4 is 0 or A<br><b>0</b> Servo*<br>Available when Code 4 is 1, 2 or B, C<br><b>1</b> Clamping*<br><b>2</b> Square Flange**<br>Available when Code 4 is 3, 4, 5 or 6<br><b>3</b> Hubshaft w/ Tether†<br><br>* 58mm Dia.<br>** 2.5" Square<br>† 63mm BC | <b>w/o shaft seal (IP64)</b><br><b>0</b> 6 mm<br><b>1</b> 3/8"<br><b>2</b> 10 mm<br><b>3</b> 3/8" Hubshaft<br><b>4</b> 12 mm Hubshaft<br><b>5</b> 1/2" Hubshaft<br><b>6</b> 10 mm Hubshaft<br><br><b>w/ shaft seal (IP67)</b><br><b>A</b> 6 mm<br><b>B</b> 3/8"<br><b>C</b> 10 mm | <b>0</b> Parallel Binary<br><br><b>1</b> Parallel Gray | <b>0</b> 5 VDC<br><b>2</b> 10-30 VDC | <b>0</b> Cable, axial<br><b>1</b> Cable, radial<br><br>Available when Code 2 is 00XX, 0360 or 0720<br><b>6</b> M23 Conin 17 pin axial, CW<br><b>7</b> M23 Conin 17 pin radial, CW<br><b>8</b> 17 pin Conin axial, CCW<br><b>9</b> 17 pin Conin radial, CCW<br><br>Available when Code 2 is 1212<br><b>A</b> Cable 1.5m radial w/37 pin sub-D<br><b>B</b> Cable 1.5m axial w/37 pin sub-D<br><br>Available when Code 2 is 00XX. Status LED and Preset Switch features not available with "J"<br><b>J</b> 17 pin MS axial<br><br>Available when Code 2 is 00XX or 0720<br><b>K</b> 19 pin Bayonet radial |
|                              | Available when Code 6 is 2<br><b>0412</b> 4 Bit MT 12 Bit ST<br><b>0812</b> 8 Bit MT 12 Bit ST<br><b>1212</b> 12 Bit MT 12 Bit ST                                          |                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                   |                                                        |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

## Code 3: Mounting



Code 7: Connector



# SERIES AI25 Parallel



## Explanation of Terms

|                         |                                                                                                                      |
|-------------------------|----------------------------------------------------------------------------------------------------------------------|
| Tristate                | +UB = Outputs at high impedance (Tristate mode)<br>0 V = Outputs active                                              |
| Tristate                | +UB <sup>2)</sup> = Outputs active<br>0 V = Outputs at high impedance (Tristate-Mode)                                |
| Latch                   | +UB <sup>2)</sup> = Encoder data continuously changing at output<br>0 V = Encoder data stored and constant at output |
| Direction               | +UB <sup>2)</sup> = Ascending code value when turning cw<br>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)<br>Alarm (Graycode) | Latch (Binarycode)<br>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         |

## CONNECTOR WIRING

| MS style 17 pin connectors                                                                             |                          |                    |                                             |           |           |
|--------------------------------------------------------------------------------------------------------|--------------------------|--------------------|---------------------------------------------|-----------|-----------|
| Pin                                                                                                    | Function                 |                    | 107865<br>Cable<br>Accessory*<br>Color Code | 14 BIT    | 13 BIT    |
|                                                                                                        | 12 Bit<br>4096 CPR       | 10 Bit<br>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<br>MS3106A-20-29S part # MCN-N8                                      |                          |                    |                                             |           |           |
| *This is a mating connector/cable assembly.<br>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 <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<br>14 Bit | 112077 Cable<br>Accessory* | Function<br>13 it        | 112076 Cable<br>Accessory* | Function                 |                    | 110158 Cable<br>Accessory* |
|                                                                        | 16384 CPR          | Color Code                 | 8192 CPR                 | Color Code                 | 12 Bit<br>4096 CPR       | 10 Bit<br>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

## По вопросам продаж и поддержки обращайтесь:

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