

# Absolute encoders - parallel

Hollow shaft max.  $\varnothing$ 14 mm

Multiturn encoder 12 bit ST / 12 bit MT

## GXP1H - parallel



GXP1H with hollow shaft

### Features

- Encoder multiturn / parallel
- Optical sensing
- Resolution: singleturn 12 bit, multiturn 12 bit
- Hollow shaft  $\varnothing$ 14 mm
- Resolution, code and preset programmable
- Encoder programming by Windows software
- RS232 encoder programming interface
- Electronic setting to preset
- Cost-efficient mounting

### Technical data - electrical ratings

|                             |  |
|-----------------------------|--|
| Voltage supply              | 10...30 VDC  |
| Reverse polarity protection | Yes  |
| Consumption w/o load        | $\leq$ 50 mA (24 VDC)  |
| Initializing time (typ.)    | 50 ms after power on   |
| Interface                   | 24 parallel outputs  |
| Steps per turn              | 4096 / 12 bit  |
| Number of turns             | 4096 / 12 bit  |
| Absolute accuracy           | $\pm$ 0.03°  |
| Sensing method              | Optical  |
| Code                        | Gray, cut gray, BCD, binary programmable   |
| Code sequence               | CW/CCW coded by connection   |
| Inputs                      | TxD, RxD (RS232)<br>Control signals UP/DOWN and zero<br>ENABLE<br>STORE                                  |
| Output circuit              | PNP or NPN open collector  |
| Interference immunity       | DIN EN 61000-6-2   |
| Emitted interference        | DIN EN 61000-6-4   |
| Programming interface       | RS232  |
| Programmable parameters     | Steps per revolution<br>Number of revolutions<br>Code<br>2 presets (limits)<br>Rotation speed monitoring |
| Diagnostic functions        | Self-diagnosis<br>Code continuity check<br>Multiturn sensing   |
| Approval                    | UL approval / E63076   |

### Technical data - mechanical design

|                         |  |
|-------------------------|--|
| Housing                 | $\varnothing$ 75 mm  |
| Shaft                   | $\varnothing$ 14 mm hollow shaft   |
| Protection DIN EN 60529 | IP 54  |
| Operating speed         | $\leq$ 6000 rpm (mechanical)<br>$\leq$ 6000 rpm (electric)                               |
| Rotor moment of inertia | 20 gcm <sup>2</sup>  |
| Materials               | Housing: steel<br>Flange: aluminium  |
| Operating temperature   | -25...+70 °C   |
| Relative humidity       | 95 % non-condensing  |
| Resistance              | DIN EN 60068-2-6<br>Vibration 10 g, 16-2000 Hz<br>DIN EN 60068-2-27<br>Shock 200 g, 6 ms |
| Weight approx.          | 700 g  |
| E-connection            | Connector D-SUB, 37-pin, 1 m cable   |

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### Part number

GXP1H. 

|  |  |    |    |
|--|--|----|----|
|  |  | 41 | C1 |
|--|--|----|----|

E-connection

41 Cable 1 m radial, connector D-SUB, 37-pins

Voltage supply / signals

10 10...30 VDC / open collector NPN

20 10...30 VDC / open collector PNP

Hollow shaft

2 Hollow shaft  $\varnothing$ 14 mm clamping ring

3 Hollow shaft  $\varnothing$ 12 mm clamping ring

### Accessories

#### Connectors and cables (page %S)

Z 140.001 Female connector D-SUB, 37-pin

#### Mounting accessories (page %S)

Z 119.037 Rubber buffer element 18.5 mm long, as torque support

Z 119.039 Set of adjusting angles as torque support

Z 119.040 Shoulder screw M5 as torque support

Z 119.041 Torque support by rubber buffer element for encoders with 15 mm pin

Z 119.043 Spring coupling for GX and G1

#### Programming accessories (page %S)

Z 139.006 Programming cable for parallel hollow shaft encoders, CD with ProGeber software and manual

Z 150.008 CD with software ProGeber & manual

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| Terminal significance |  |
|-----------------------|--|
| UB                    | Encoder voltage supply.  |
| GND                   | Encoder ground connection relating to UB.  |
| Outputs D0-D23        | 24 parallel output signals.<br>For PNP it is recommended to utilize pull-down resistors for every data line, for NPN pull-up resistors of 4.7 k $\Omega$ .   |
| Outputs D19 - D23     | Special outputs<br>With inferior resolutions these outputs may be configured as special outputs.   |
| Zero setting          | Input for setting a zero point anywhere within the programmed encoder resolution. The zero setting operation is triggered by a High impulse and has to be in line with the selected direction of rotation (UP/DOWN). Connect to GND after setting operation for maximum interference immunity. Impulse duration $\geq 100$ ms. |
| UP/DOWN               | UP/DOWN counting direction input. Without potential this input is on High. UP/DOWN High means ascending output data with clockwise hollow shaft rotation when looking at flange. UP/DOWN-Low means ascending values with counterclockwise shaft rotation when looking at flange.   |
| ENABLE                | Input for activating the output drivers that are triggered by input level Low. Upon being on High (or less potential) the output drivers switch to high-impedance (Tristate).  |
| STORE                 | Input for output data storage. Upon a Low input level the encoder data are stored in the intermediate memory. Upon being on High (or less potential) the current encoder position data are switched to the output drivers. This line must be applied for reliable data readout in binary code.                                 |
| RxD                   | Encoder receiver input for RS232 programming interface.  |
| TxD                   | Encoder transmitter output for RS232 programming interface.  |

| Terminal assignment |              |              |
|---------------------|--------------|--------------|
| Connector           | Core colour  | Assignment   |
| Pin 1               | white        | Output D0    |
| Pin 2               | brown        | Output D1    |
| Pin 3               | green        | Output D2    |
| Pin 4               | yellow       | Output D3    |
| Pin 5               | grey         | Output D4    |
| Pin 6               | pink         | Output D5    |
| Pin 7               | black        | Output D6    |
| Pin 8               | violet       | Output D7    |
| Pin 9               | grey/pink    | Output D8    |
| Pin 10              | red/blue     | Output D9    |
| Pin 11              | white/green  | Output D10   |
| Pin 12              | brown/green  | Output D11   |
| Pin 13              | white/yellow | Output D12   |
| Pin 14              | yellow/brown | Output D13   |
| Pin 15              | white/grey   | Output D14   |
| Pin 16              | grey/brown   | Output D15   |
| Pin 17              | white/pink   | Output D16   |
| Pin 18              | pink/brown   | Output D17   |
| Pin 19              | white/black  | Output D18   |
| Pin 20              | brown/black  | Output D19   |
| Pin 21              | grey/green   | Output D20   |
| Pin 22              | yellow/grey  | Output D21   |
| Pin 23              | pink/green   | Output D22   |
| Pin 24              | yellow/pink  | Output D23   |
| Pin 25              | –            | –            |
| Pin 26              | –            | –            |
| Pin 27              | yellow/blue  | Zero setting |
| Pin 28              | brown/blue   | ENABLE       |
| Pin 29              | brown/red    | STORE        |
| Pin 30              | green/blue   | UP/DOWN      |
| Pin 31              | –            | –            |
| Pin 32              | –            | –            |
| Pin 33              | –            | –            |
| Pin 34              | white/blue   | TxD          |
| Pin 35              | white/red    | RxD          |
| Pin 36              | red          | UB           |
| Pin 37              | blue         | GND          |

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### Terminal assignment programming cable

| Encoder function | D-SUB connector 37-pins | Core colour   | PC connector D-SUB, 9-pins |
|------------------|-------------------------|---------------|----------------------------|
| UB               | Pin 36                  | brown         | –                          |
| RxD              | Pin 35                  | beige         | Pin 3                      |
| GND              | Pin 37<br>Pin 37        | black<br>blue | –<br>Pin 5                 |
| TxD              | Pin 34                  | green         | Pin 2                      |
|                  |                         |               | Jumper 4-6 and Jumper 7-8  |

Connect encoder to supply voltage using the supplementary connections (UB/red and GND/blue).

### Trigger level

| Control inputs          | Input circuit                |
|-------------------------|------------------------------|
| Input level High        | $>0.7 U_B$                   |
| Input level Low         | $<0.3 U_B$                   |
| Input resistance        | 10 k $\Omega$                |
| Parallel outputs        | Output circuit               |
|                         | Open collector circuit-proof |
| Output level High (PNP) | $>U_B - 4.5$ V (I = -15 mA)  |
| Output level Low (NPN)  | $<3.5$ V (I = 15 mA)         |
| Load High (PNP)         | $<20$ mA                     |
| Load Low (NPN)          | $<20$ mA                     |
| Tristate                | $<200$ $\mu$ A               |

### Dimensions

