

# 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
Function	Multiturn
Steps per turn	4096 / 12 bit
Number of turns	4096 / 12 bit
Absolute accuracy	$\pm 0.03^\circ$
Sensing method	Optical
Code	Gray, cut gray, BCD, binary programmable
Code sequence	CW/CCW coded by connection
Inputs	TxD, RxD (RS232) Control signals UP/DOWN and zero ENABLE 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 Number of revolutions Code 2 presets (limits) Rotation speed monitoring
Diagnostic functions	Self-diagnosis Code continuity check 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) $\leq 6000$ rpm (electric)
Starting torque	$\leq 0.05$ Nm IP 54
Rotor moment of inertia	20 gcm <sup>2</sup>
Materials	Housing: steel Flange: aluminium
Operating temperature	-25...+70 °C
Relative humidity	95 % non-condensing
Resistance	DIN EN 60068-2-6 Vibration 10 g, 16-2000 Hz DIN EN 60068-2-27 Shock 200 g, 6 ms
Weight approx.	700 g
Connection	Connector D-SUB, 37-pin, 1 m cable

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### Part number

GXP1H. 

		41	C1
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#### Connection

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

#### 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

Z 140.001 Female connector D-SUB, 37-pin

#### Mounting accessories

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

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. 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 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 Pin 37	black blue	– 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

