

Absolute encoders - SSI

Through hollow shaft up to $\varnothing 25.4$ mm

Optical multiturn encoders 13 bit ST / 12 bit MT

G1M2H



G1M2H with through hollow shaft

Features

- Encoder multiturn / SSI
- Optical sensing method
- Resolution: singleturn 13 bit, multiturn 12 bit
- Through hollow shaft of 1" diameter
- Electronic setting of zero point
- Counting direction input
- High resistance to shock and vibrations
- Suitable for high positive, negative accelerations

Technical data - electrical ratings

Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	≤ 50 mA (24 VDC)
Initializing time typ.	20 ms after power on
Interface	SSI
Function	Multiturn
Steps per revolution	8192 / 13 bit
Number of revolutions	4096 / 12 bit
Absolute accuracy	$\pm 0.025^\circ$
Sensing method	Optical
Code	Gray or binary
Code sequence	CW/CCW coded by connection
Inputs	SSI clock Control signals UP/DOWN inv. and zero
Output stages	SSI data: linedriver RS485 Diagnostic outputs push-pull
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Diagnostic functions	Self-diagnosis Multiturn sensing
Approval	UL approval / E63076

Technical data - mechanical design

Size (flange)	$\varnothing 90$ mm
Shaft type	$\varnothing 25.4$ mm (through hollow shaft)
Protection DIN EN 60529	IP 54, IP 65 (optional)
Operating speed	≤ 3800 rpm (mechanical) ≤ 6000 rpm (electric)
Starting torque	≤ 0.35 Nm (+25 °C)
Rotor moment of inertia	2000 gcm ²
Materials	Housing: aluminium Flange: aluminium
Operating temperature	-25...+85 °C
Relative humidity	95 % non-condensing
Resistance	DIN EN 60068-2-6 Vibration ± 0.75 mm - 10-58 Hz 10 g - 58-2000 Hz DIN EN 60068-2-27 Shock 200 g, 6 ms
Weight approx.	890 g
Connection	Connector M23, 12-pin

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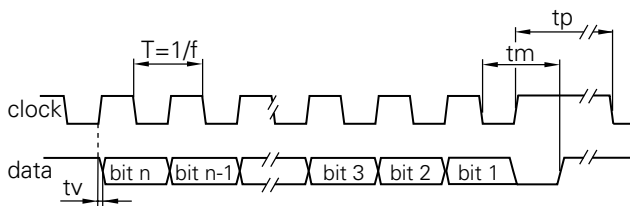
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Part number

G1M2H. A1 02

	<u>Connection</u>
	A1 Connector M23, 12-pin, radial
	<u>Voltage supply / signals</u>
10	10...30 VDC / gray code 25 bit (ST 13 + MT 12)
12	10...30 VDC / binary code 25 bit (ST 13 + MT 12)
	<u>Through hollow shaft</u>
0	$\varnothing 25.4$ mm, pin 15 mm
1	$\varnothing 20$ mm, pin 15 mm

Data transfer



Clock frequency f	62.5...1500 kHz
Duty cycle of T	40...60 %
Delay time tv	150 ns
Monoflop time tm	20 μ s
Clock interval tp	25 μ s

Accessories

Connectors and cables

11034154	Female connector M23, 12-pin, without cable (Z 130.001)
10138559	Female connector M23, 12-pin, 2 m cable (Z 130.003)
10126594	Female connector M23, 12-pin, 5 m cable (Z 130.005)
10129757	Female connector M23, 12-pin, 10 m cable (Z 130.007)

Mounting accessories

11034095	Rubber buffer element 18.5 mm long, as torque support (Z 119.037)
11034096	Set of adjusting angles as torque support (Z 119.039)
11034097	Shoulder screw M5 as torque support (Z 119.040)
10139345	Torque support by rubber buffer for encoders with 15 mm pin (Z 119.041)
10143969	Spring coupling for GX and G1 (Z 119.043)
10147837	Spring coupling for one-side attachment, length 35 mm (Z 119.050)
11210157	Clamping ring set 28.4/50x12 - stainless steel (Z 119.102)

Subject to modification in technic and design. Errors and omissions excepted.

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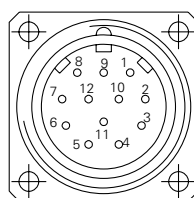
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Terminal significance	
UB	Encoder voltage supply.
GND	Encoder ground connection relating to UB.
Data+	Positive, serial data output of differential linedriver.
Data-	Negative, serial data output of differential linedriver.
Clock+	Positive SSI clock input. Clock+ together with clock- forms a current loop. A current of approx. 7 mA towards clock+ input means logic 1 in positive logic.
Clock-	Negative SSI clock input. Clock- together with clock+ forms a current loop. A current of approx. 7 mA towards clock- input means logic 0 in positive logic.
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 inv.). Connect to GND after setting operation for maximum interference immunity. Impulse duration >100 ms.
DATAVALID inv.	Diagnostic output. An error warning is given at level Low. Important: Interferences must be filtered by the downstream electronics.
DATAVALID MT inv.	Diagnostic output for monitoring the multiturn sensor voltage supply. Upon dropping below a defined voltage level the DV MT inv. output is switched to Low.
UP/DOWN inv.	UP/DOWN inv. counting direction input. This input is standard on High. UP/DOWN inv. means ascending output data with clockwise shaft rotation when looking at flange. UP/DOWN inv.-Low means ascending values with counterclockwise shaft rotation when looking at flange.

Terminal assignment		
Connector	Core colour	Assignment
Pin 1	brown	UB
Pin 2	black	GND
Pin 3	blue	Clock+
Pin 4	beige	Data+
Pin 5	green	Zero setting
Pin 6	yellow	Data-
Pin 7	violet	Clock-
Pin 8	brown/yellow	DATAVALID inv.
Pin 9	pink	UP/DOWN inv.
Pin 10	black/yellow	DATAVALID MT inv.
Pin 11-12	–	–



Please use cores twisted in pairs (for example clock+ / clock-) for extension cables of more than 10 m length.

Trigger level	
SSI	Circuit
SSI-Clock	Optocoupler
SSI-Data	Linedriver RS485
Control inputs	
Control inputs	Input circuit
Input level High	>0.7 UB
Input level Low	<0.3 UB
Input resistance	10 k Ω

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Dimensions

