Absolute encoders - SSI

Hollow shaft max. ø50.8 mm

Optical multiturn encoder 13 bit ST / 12 bit MT

G1M2H, G2M2H - SSI

G1M2H with hollow shaft

Features

- **Encoder multiturn / SSI**
- **Optical sensing**
- **Resolution: singleturn 13 bit, multiturn 12 bit**
- **Hollow shaft of 1" and 2" diameter**
- **Electronic setting of zero point**
- **Permanent check of code continuity**
- **Counting direction input**
- **High resistance to shock and vibrations**
- **For high positive and negative acceleration**

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
Steps per turn	8192 / 13 bit
Number of turns	4096 / 12 bit
Absolute accuracy	±0.025°
Sensing method	Optical
Code	Gray or binary
Code sequence	CW/CCW coded by connection
Inputs	SSI clock Control signals UP/$\overline{\text{DOWN}}$ and zero
Output circuit	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 Code continuity check Multiturn sensing
Approval	UL approval / E63076

Technical data - mechanical design

Protection DIN EN 60529	IP 54
Materials	Housing: aluminium Flange: aluminium Bus cover: aluminium
Operating temperature	-25...+85 °C -40...+85 °C (optional)
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
E-connection	Connector, 12-pin
G1M2H - SSI	
Housing	ø90 mm
Shaft	ø25.4 mm hollow shaft
Operating speed	≤3800 rpm (mechanical) ≤6000 rpm (electric)
Rotor moment of inertia	2000 gcm²
Weight approx.	890 g
G2M2H - SSI	
Housing	ø116 mm
Shaft	ø50.8 mm hollow shaft
Operating speed	≤2000 rpm (mechanical) ≤6000 rpm (electric)
Rotor moment of inertia	11000 gcm²
Weight approx.	1200 g

G1M2H, G2M2H - SSI

Part number

G1M2H. | | | **A1** | **02** |

E-connection
A1 Connector M23, 12-pin, radial

Voltage supply / signals
10 10...30 VDC / gray code 25 bit
12 10...30 VDC / binary code 25 bit

Hollow shaft
0 Hollow shaft ø25.4 mm with pin 15 mm
1 Hollow shaft ø20 mm with pin 15 mm

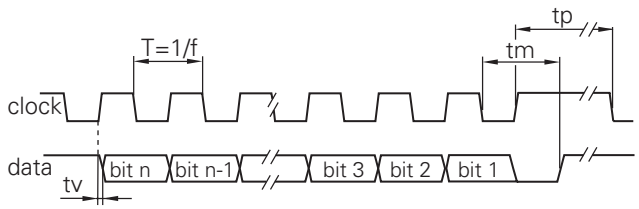
G2M2H. | | | **A1** | **02** |

E-connection
A1 Connector M23, 12-pin, radial

Voltage supply / signals
10 10...30 VDC / gray code 25 bit
12 10...30 VDC / binary code 25 bit

Hollow shaft
0 Hollow shaft ø50.8 mm clamping ring
1 Hollow shaft ø50 mm clamping ring

Data transfer



Clock frequency f	62.5...1500 kHz
Scan ratio of T	40...60 %
Time lag tv	150 ns
Monoflop time tm	20 µs
Clock interval tp	25 µs

Accessories

Connectors and cables (page %S)	
Z 130.001	Female connector M23, 12-pin, less cable
Z 130.003	Female connector M23, 12-pin, 2 m cable
Z 130.005	Female connector M23, 12-pin, 5 m cable
Z 130.007	Female connector M23, 12-pin, 10 m cable
Mounting accessories for G1M2H - SSI (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
Z 119.050	Spring coupling
Z 119.053	Spring coupling height 19.1 mm
Z 119.070	Spring coupling height 29.1 mm
Z 119.076	Spring coupling for encoders with ø58 mm housing
Mounting accessories for G2M2H - SSI (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 119.050	Spring coupling
Z 119.053	Spring coupling height 19.1 mm
Z 119.070	Spring coupling height 29.1 mm
Z 119.076	Spring coupling for encoders with ø58 mm housing

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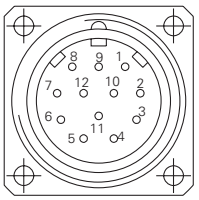
Terminal significance	
UB	Encoder voltage supply.
GND	Encoder ground connection relating to UB.
Data+	Positive, serial data output of differential linedriver.
Data-	Negative, serial data output of differential linedriver.
Clock+	Positive SSI clock input. Clock+ together with clock- forms a current loop. 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/$\overline{\text{DOWN}}$). Connect to GND after setting operation for maximum interference immunity. Impulse duration >100 ms.
$\overline{\text{DATAVALID}}$	Diagnostic output. An error warning is given at level Low. Important: Interferences must be filtered by the downstram electronics.
$\overline{\text{DATAVALID MT}}$	Diagnostic output for monitoring the multiturn sensor voltage supply. Upon dropping below a defined voltage level the $\overline{\text{DV MT}}$ output is switched to Low.
UP/$\overline{\text{DOWN}}$	UP/$\overline{\text{DOWN}}$ counting direction input. This input is standard on High. UP/$\overline{\text{DOWN}}$ means ascending output data with clockwise shaft rotation when looking at flange. UP/$\overline{\text{DOWN}}$-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	$\overline{\text{DATAVALID}}$
Pin 9	pink	UP/$\overline{\text{DOWN}}$
Pin 10	black/yellow	$\overline{\text{DATAVALID MT}}$
Pin 11	–	–
Pin 12	–	–



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

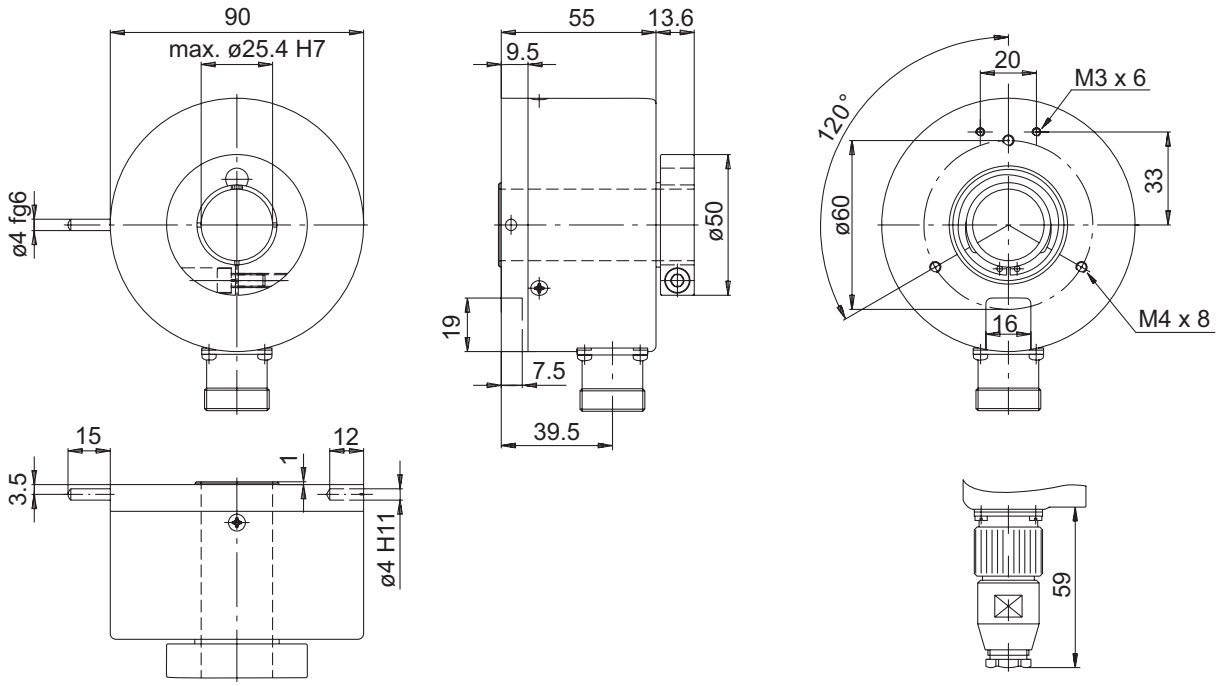
Trigger level	
SSI	**Circuit**
SSI-Clock	Optocoupler
SSI-Data	Linedriver RS485

Control inputs	**Input circuit**
Input level High	>0.7 UB
Input level Low	<0.3 UB
Input resistance	10 kΩ

G1M2H, G2M2H - SSI

Dimensions

G1M2H



G2M2H