Absolute encoders - SSI
Through hollow shaft up to ø50.8 mm
Optical multiturn encoders 13 bit ST / 12 bit MT

G1M2H, G2M2H

G1M2H with through hollow shaft

Features

– **Encoder multiturn / SSI**
– **Optical sensing method**
– **Resolution: singleturn 13 bit, multiturn 12 bit**
– **Through hollow shaft of 1" and 2" 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 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/$\overline{DOWN}$ 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

Protection DIN EN 60529	IP 54, IP 65 (optional)
Materials	Housing: aluminium Flange: aluminium
Operating temperature	-25...+85 °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
Connection	Connector M23, 12-pin
G1M2H	
Size (flange)	ø90 mm
Shaft type	ø25.4 mm (through hollow shaft)
Operating speed	≤3800 rpm (mechanical) ≤6000 rpm (electric)
Starting torque	≤0.35 Nm (+25 °C)
Rotor moment of inertia	2000 gcm²
Weight approx.	890 g
G2M2H	
Size (flange)	ø116 mm
Shaft type	ø50.8 mm (through hollow shaft)
Operating speed	≤2000 rpm (mechanical) ≤6000 rpm (electric)
Starting torque	≤0.5 Nm (+25 °C)
Rotor moment of inertia	11000 gcm²
Weight approx.	1200 g

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G1M2H, G2M2H

Part number

G1M2H.☐☐ A1 02

Connection
A1 Connector M23, 12-pin, radial

Voltage supply / signals
10 10...30 VDC / gray code 25 bit
(ST 13 + MT 12)
12 10...30 VDC / binary code 25 bit
(ST 13 + MT 12)

Through hollow shaft
0 ø25.4 mm, pin 15 mm
1 ø20 mm, pin 15 mm

G2M2H.☐☐ A1 02

Connection
A1 Connector M23, 12-pin, radial

Voltage supply / signals
10 10...30 VDC / gray code 25 bit
(ST 13 + MT 12)
12 10...30 VDC / binary code 25 bit
(ST 13 + MT 12)

Through hollow shaft
0 ø50.8 mm, clamping ring
1 ø50 mm, clamping ring

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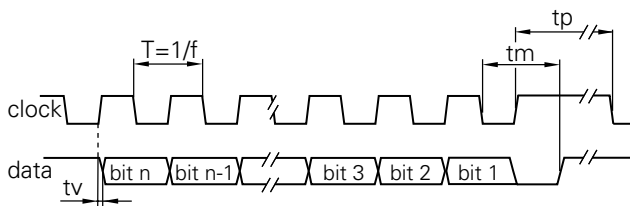
Clock frequency f	62.5...1500 kHz
Duty cycle of T	40...60 %
Delay time tv	150 ns
Monoflop time tm	20 µs
Clock interval tp	25 µs

Accessories

Connectors and cables

Z 130.001	Female connector M23, 12-pin, without 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

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 for encoders with 15 mm pin
Z 119.043	Spring coupling for GX and G1
Z 119.050	Spring coupling for one-side attachment, length 35 mm

Mounting accessories for G2M2H

|	
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 for encoders with 15 mm pin
Z 119.050	Spring coupling for one-side attachment, length 35 mm

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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 11-12	–	–
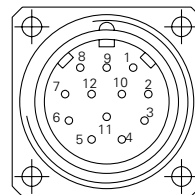
Please use cores twisted in pairs (for example clock+ / clock-) for extension cables of more than 10 m length.

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

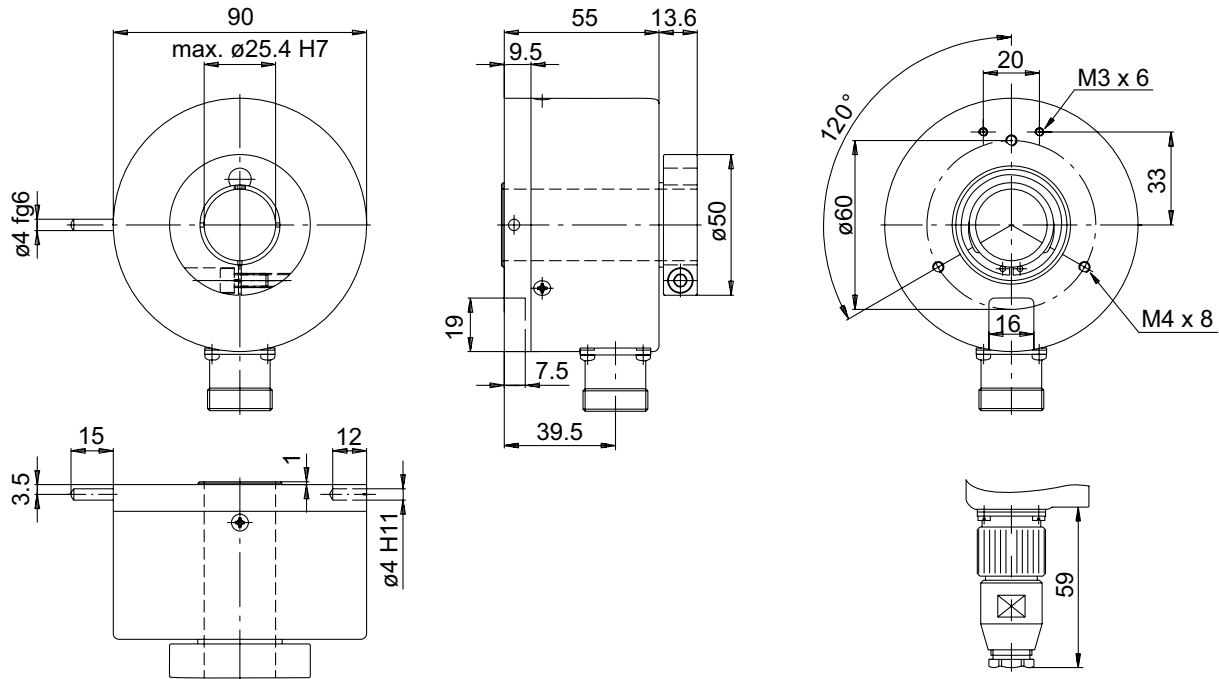| Control inputs	Input circuit
Input level High	>0.7 UB
Input level Low	<0.3 UB
Input resistance	10 kΩ

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Dimensions

G1M2H

G2M2H
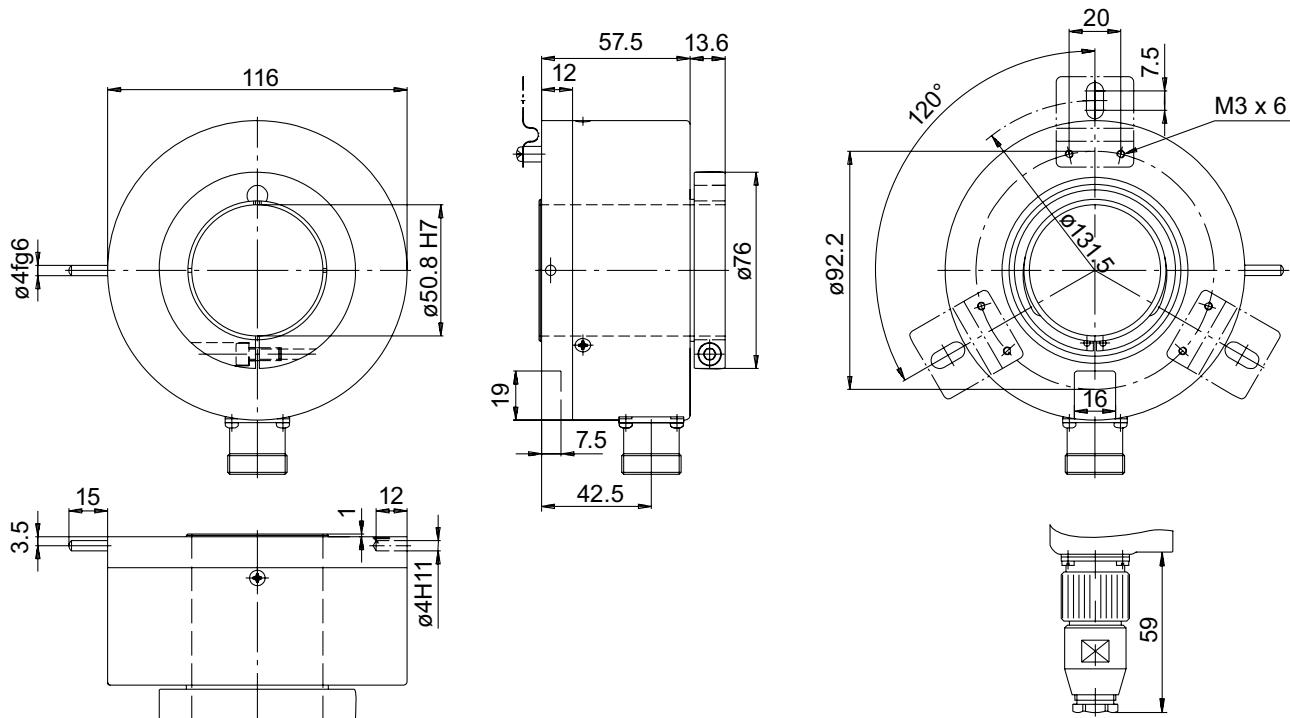

· Subject to modification in technic and design. Errors and omissions excepted.

14/6/2016