

# Absolute encoders - bus interfaces

Shaft with clamping or synchro flange

Optical multiturn encoders 13 bit ST / 12 bit MT, RS485

## GXM7W - RS485



GXM7W with clamping flange

### Features

- Encoder multiturn / RS485
- Optical sensing
- Resolution: singleturn 13 bit, multiturn 12 bit
- Clamping flange or synchro flange
- Fieldbus protocol
- Max. 4 bus users
- Bus access according to master/slave principle

### Optional

- Integration of customer-specific RS485 protocols

### Technical data - electrical ratings

Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	≤50 mA (24 VDC)
Initializing time (typ.)	250 ms after power on
Interface	RS485
Transmission rate	38.4 kBaud
User address	Coded by connection
Steps per turn	8192 / 13 bit
Number of turns	4096 / 12 bit
Absolute accuracy	±0.025°
Sensing method	Optical
Code	Binary
Code sequence	CW/CCW coded by connection
Output circuit	RS485
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Approval	UL approval / E63076

### Technical data - mechanical design

Housing	ø58 mm
Shaft	ø10 mm (clamping flange) ø6 mm (synchro flange)
Flange	Clamping or synchro flange
Protection DIN EN 60529	IP 54 without shaft seal IP 65 with shaft seal
Operating speed	≤10000 rpm (mechanical) ≤6000 rpm (electric)
Starting torque	≤0.015 Nm IP 54 ≤0.03 Nm IP 65
Rotor moment of inertia	20 gcm <sup>2</sup>
Admitted shaft load	≤20 N axial ≤40 N radial
Materials	Housing: steel Flange: 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
Weight approx.	400 g
E-connection	Connector or cable

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#### Part number

GXM7W.	10		01	
			01	Interface RS485
			A0	E-connection Connector M23, 12-pin, axial
			A1	Connector M23, 12-pin, radial
			11	Cable 1 m, axial
			21	Cable 1 m, radial
				Flange / Shaft
			0	Clamping flange / ø10 mm IP 54
			A	Clamping flange / ø10 mm IP 65
			1	Synchro flange / ø6 mm IP 54
			B	Synchro flange / ø6 mm IP 65

#### Accessories

##### Connectors and cables

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

Z 119.006	Eccentric fixing, single
Z 119.013	Adaptor plate for clamping flange for modification into synchro flange
Z 119.015	Mounting adaptor for synchro flange
Z 119.017	Mounting angle for clamping flange
Z 119.035	Bearing flange for encoders with synchro flange

#### Data transmission format

##### Basic settings of RS485 serial interface

- 1 start bit
- 8 data bits (least significant bit first)
- 1 stop bit
- Parity none
- Baud rate: 38.4 kBaud

##### Structure of data fields

Demand from master

SOH	80h	ADR	80h	EOT
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Reply of encoder

SOH	EAD	MT_H	MT_L	ST_H	ST_L	LRC	EOT
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##### Explanation

SOH	Value = 01h
ADR	Address of encoder, value 02h - 05h
EOT	Value = 04h
EAD	Bit 0 - 3 response of encoder address (bit 4 -7 not defined)
MT_H	High byte revolution
MT_L	Low byte revolution
ST_H	High byte steps
ST_L	Low byte steps
LRC	EAD XOR MT_H XOR MT_L XOR ST_H XOR ST_L

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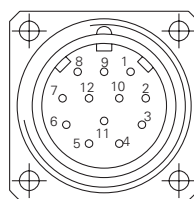
#### GXM7W - RS485

Terminal significance	
UB	Encoder voltage supply.
GND	Encoder ground connection relating to UB.
T,R IN T,R OUT	Serial data lines. To avoid stub lines the data lines are guided outside on a pair of 2 wires. The arriving bus is on T,R+ IN and T,R- IN, the departing bus on T,R+ OUT und T,R-. If the encoder serves as bus termination or is the only user, only the pair of wires T,R+ IN and T,R- IN is utilized. Note: External connection of terminating resistor 150 Ω to final user.
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. This input is standard on High. UP/DOWN means ascending output data with clockwise shaft rotation when looking at flange. UP/DOWN-Low means ascending values with counterclockwise shaft rotation.
Ident 1...2	Ident 1...2 are utilized for setting the encoder addresses (identifiers). Less potential the inputs are internally against UB (=“1”) by pull-up resistors what equals address 2.

Address	2	3	4	5
Ident 1	1	0	1	0
Ident 2	1	1	0	0

Terminal assignment		
Connector	Core colour	Assignment
Pin 1	brown	UB
Pin 2	black	GND
Pin 3	blue	T,R+ IN
Pin 4	beige	Ident 1
Pin 5	green	T,R- OUT
Pin 6	yellow	Ident 2
Pin 7	violet	T,R- IN
Pin 8	brown/yellow	UP/DOWN
Pin 9	pink	T,R+ OUT
Pin 10	black/yellow	Zero setting
Pin 11	–	–
Pin 12	–	–



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

Trigger level	
Interface	Circuit
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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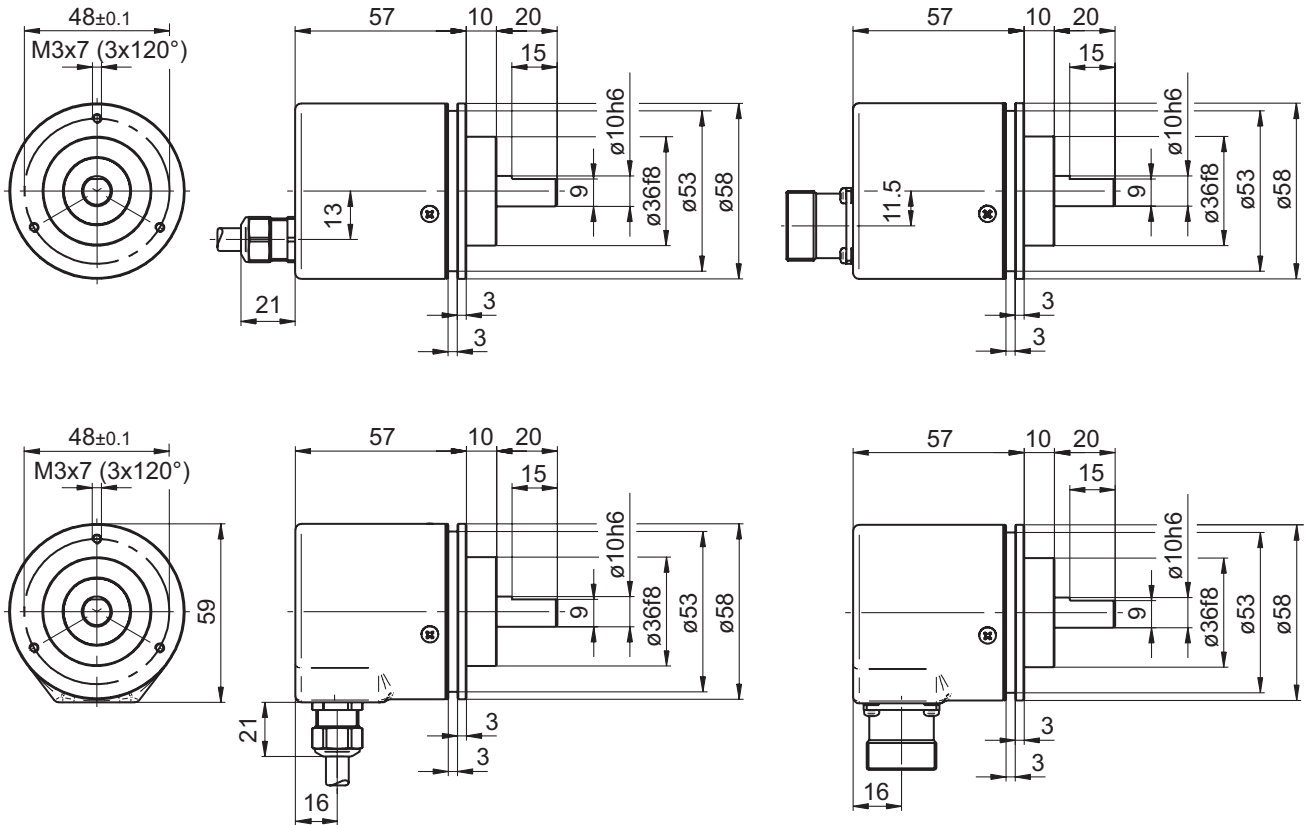
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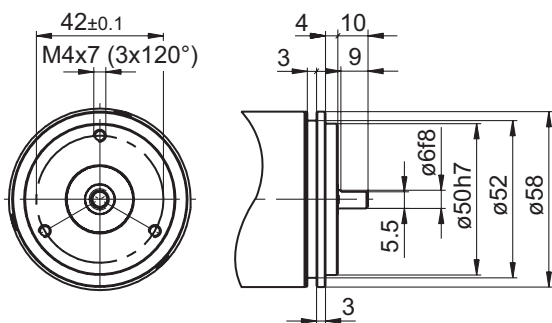
GXM7W - RS485

#### Dimensions

##### GXM7W clamping flange



##### GXM7W synchro flange



##### GXM7W connector dimensions

