Absolute encoders - bus interfaces

End shaft max. ø14 mm

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

GXM7S - RS485



GXM7S with end shaft

Features

- **Encoder multiturn / RS485**
- **Optical sensing**
- **Resolution: singleturn 13 bit, multiturn 12 bit**
- **End shaft ø12 mm / ø14 mm**
- **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	ø12 mm end shaft ø14 mm end shaft
Protection DIN EN 60529	IP 54
Operating speed	≤6000 rpm (mechanical) ≤6000 rpm (electric)
Starting torque	≤0.015 Nm IP 54
Rotor moment of inertia	20 gcm²
Materials	Housing: steel Flange: steel
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 100 g, 6 ms
Weight approx.	600 g
E-connection	Connector or cable

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Part number

GXM7S. | | **10** | | **01** |

Interface
- 01 RS485

E-connection
- A1 Connector M23, 12-pin, radial
- 21 Cable 1 m, radial

End shaft
- 0 End shaft ø12 mm without pin
- 1 End shaft ø12 mm with pin 15 mm
- B End shaft ø12 mm with pin 9.5 mm
- 4 End shaft ø14 mm without pin
- 5 End shaft ø14 mm with pin 15 mm
- F End shaft ø14 mm with pin 9.5 mm

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 119.024	Torque support and spring washer for encoders with 9.5 mm pin
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 119.072	Spring coupling for encoders with ø58 mm housing, hole distance 73 mm
Z 119.073	Spring coupling for encoders with ø58 mm housing, hole distance 68 mm
Z 119.076	Spring coupling for encoders with ø58 mm housing
Z 119.082	Spring coupling for encoders with ø58 mm housing, hole distance 63 mm

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

Structur of data fields

Demand from master

SOH	80h	ADR	80h	EOT

Reply of encoder

SOH	EAD	MT_H	MT_L	ST_H	ST_L	LRC	EOT

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 M_T_L XOR ST_H XOR ST_L

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Absolute encoders - bus interfaces

End shaft max. ø14 mm

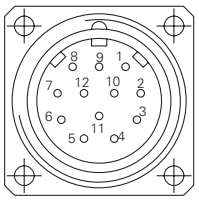
Optical multiturn encoders 13 bit ST / 12 bit MT, RS485

GXM7S - 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/$\overline{\text{DOWN}}$). Connect to GND after setting operation for maximum interference immunity. Impulse duration ≥100 ms.
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.
Ident 1...2	Ident 1...2 are utilized for setting the en coder addresses (identifiers). Less poten tial 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	Assingment
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/$\overline{\text{DOWN}}$
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.

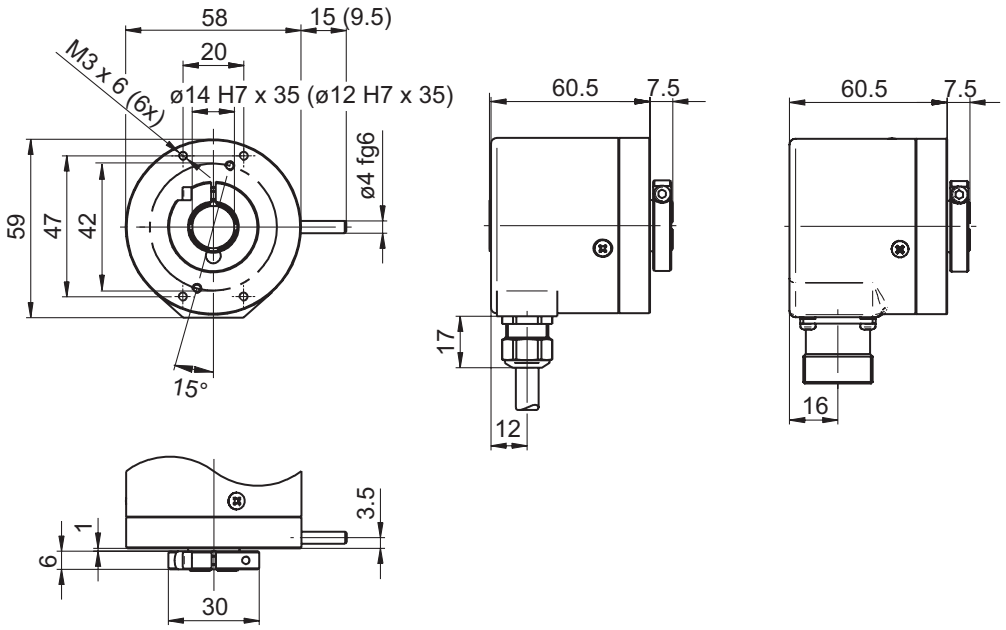
Trigger level	
Interface	**Circuit**
Data	Linedriver RS485

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

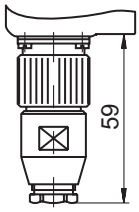
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GXM7S - RS485

Dimensions



GXM7S connector dimensions



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