Absolute encoders - SSI

End shaft ø12 mm

Magnetic multiturn encoder 12 bit ST / 12 bit MT

GCM2S - SSI

GCM2S with end shaft

Features

– **Encoder multiturn / SSI**

– **Magnetic sensing**

– **Resolution: singleturn 12 bit, multiturn 12 bit**

– **End shaft ø12 mm**

– **Encoder for heavy-duty applications**

– **New innovative sensing technology**

– **Electronic setting of zero point**

Technical data - electrical ratings	
Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	≤50 mA (24 VDC)
Initializing time (typ.)	200 ms after power on
Interface	SSI
Function	Multiturn
Steps per turn	4096 / 12 bit
Number of turns	4096 / 12 bit
Absolute accuracy	±1 °
Sensing method	Magnetic
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	
Housing	ø58 mm
Shaft	ø12 mm end shaft
Protection DIN EN 60529	IP 54
Operating speed	≤6000 rpm (mechanical) ≤6000 rpm (electric)
Starting torque	≤0.015 Nm
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 200 g, 6 ms
Weight approx.	600 g
Connection	Connector, 12-pin

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Part number

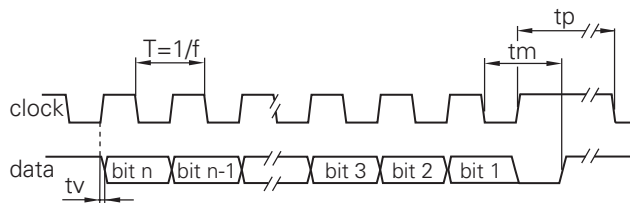GCM2S. ☐ ☐ | **A1** | **01**

Connection
A1 Connector M23, 12-pin, radial

Voltage supply / signals
10 10...30 VDC / gray code 22 bit
12 10...30 VDC / binary code 22 bit
20 10...30 VDC / gray code 24 bit

End shaft
0 End shaft ø12 mm clamping ring for spring coupling
1 End shaft ø12 mm clamping ring with pin

Data transfer

Clock frequency f	62.5...1000 kHz
Scan ratio of T	40...60 %
Time lag tv	150 ns
Monoflop time tm	20 µs + T/2
Clock interval tp	25 µs

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 119.023	Spring coupling for encoders with ø58 mm housing
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

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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/$\overline{DOWN}$). Connect to GND after setting operation for maximum interference immunity. Impulse duration ≥100 ms.
$\overline{DATAVALID}$	Diagnostic output. An error warning is given at level Low. Important: Interferences must be drained by the downstram electronics.
$\overline{DATAVALID\ MT}$	Diagnostic output. Multiturn sensor supply control. Upon dropping below a defined voltage level the $\overline{DV\ MT}$ output is switched to Low.
UP/$\overline{DOWN}$	UP/$\overline{DOWN}$ counting direction input. This input is standard on High. UP/$\overline{DOWN}$ means ascending output data with clockwise shaft rotation when looking at flange. UP/$\overline{DOWN}$-Low means ascending values with counterclockwise shaft rotation.

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	$\overline{DATAVALID}$
Pin 9	pink	UP/$\overline{DOWN}$
Pin 10	black/yellow	$\overline{DATAVALID\ MT}$
Pin 11	–	–
Pin 12	–	–
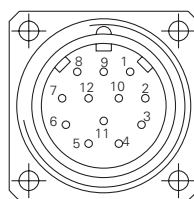
Please use cores twisted in pairs (for example clock+ / clock-) for extension cables of more than 10 m length.

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

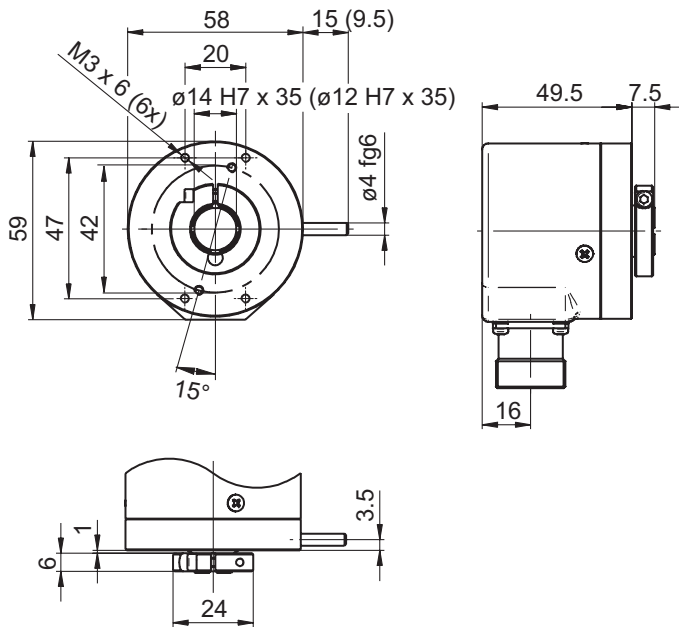| Diagnostic outputs	Output circuit Push-pull circuit-proof
Output level High	>UB -3.5 V (I = -20 mA)
Output level Low	<0.7 V (I = 20 mA)
Load High	<20 mA
Load Low	<20 mA

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Dimensions

Connector dimensions