

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
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/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 gcm ²
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
E-connection	Connector, 12-pin

Absolute encoders - SSI

End shaft ø12 mm

Magnetic multiturn encoder 12 bit ST / 12 bit MT

GCM2S - SSI

Part number

GCM2S. A1 01

E-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

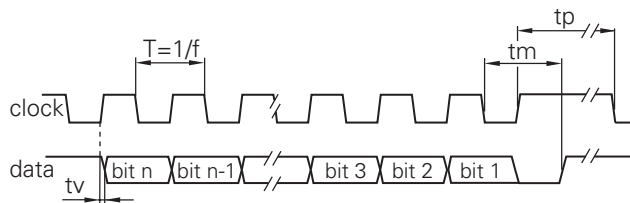
20 10...30 VDC / gray code 24 bit

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 (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 (page %S)

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

Absolute encoders - SSI

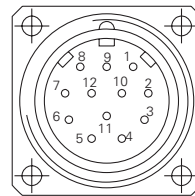
End shaft $\varnothing 12$ mm

Magnetic multiturn encoder 12 bit ST / 12 bit MT

GCM2S - SSI

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/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 drained by the downstream electronics.
$\overline{\text{DATAVALID MT}}$	Diagnostic output. Multiturn sensor supply control. Upon dropping below a defined voltage level the $\overline{\text{DV MT}}$ output is switched to Low.
$\overline{\text{UP/DOWN}}$	$\overline{\text{UP/DOWN}}$ counting direction input. This input is standard on High. $\overline{\text{UP/DOWN}}$ means ascending output data with clockwise shaft rotation when looking at flange. $\overline{\text{UP/DOWN}}$ -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	$\overline{\text{DATAVALID}}$
Pin 9	pink	$\overline{\text{UP/DOWN}}$
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 level High	> 0.7 UB
Input level Low	< 0.3 UB
Input resistance	10 k Ω
Diagnostic outputs	
	Output circuit Push-pull circuit-proof
Output level High	$> \text{UB} - 3.5 \text{ V}$ (I = -20 mA)
Output level Low	$< 0.7 \text{ V}$ (I = 20 mA)
Load High	$< 20 \text{ mA}$
Load Low	$< 20 \text{ mA}$

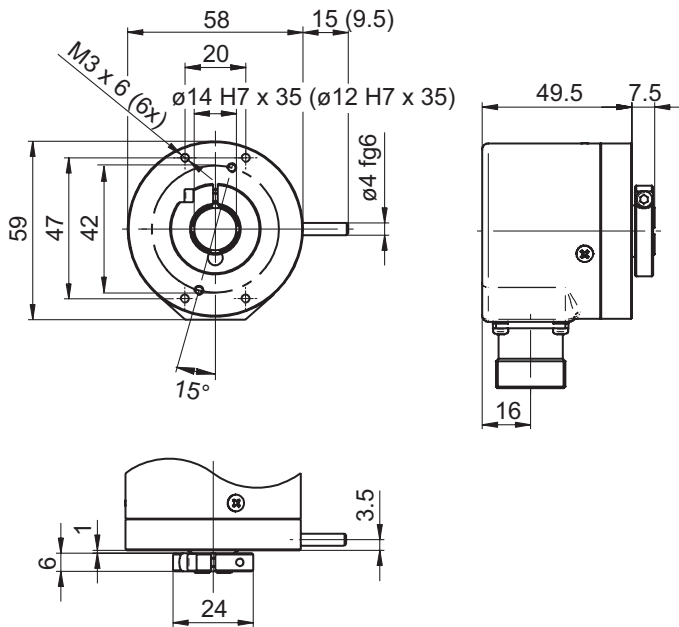
Absolute encoders - SSI

End shaft ø12 mm

Magnetic multiturn encoder 12 bit ST / 12 bit MT

GCM2S - SSI

Dimensions



Connector dimensions

