

Absolute encoders - SSI

End shaft max. \varnothing 14 mm

Optical singleturn encoders 14 bit

GXA2S - SSI



GXA2S with end shaft

Features

- Encoder singleturn / SSI
- Optical sensing
- Resolution: 14 bit
- End shaft \varnothing 12 mm / \varnothing 14 mm
- Electronic setting of zero point
- Permanent check of code continuity
- Counting direction input
- Suitable for high positive, negative accelerations
- Available with additional incremental output

Technical data - electrical ratings

Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	\leq 50 mA (24 VDC)
Initializing time (typ.)	20 ms after power on
Interfaces	SSI, Incremental A 90° B (optional)
Function	Singleturn
Steps per turn	16384 / 14 bit
Incremental output	2048 pulses A90°B + inverted
Absolute accuracy	\pm 0.025 °
Sensing method	Optical
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 and incremental outputs
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Diagnostic functions	Self-diagnosis Code continuity check
Approval	UL approval / E63076

Technical data - mechanical design

Housing	\varnothing 58 mm
Shaft	\varnothing 12 mm end shaft \varnothing 14 mm end shaft
Protection DIN EN 60529	IP 54
Operating speed	\leq 6000 rpm (mechanical) \leq 6000 rpm (electric)
Starting torque	\leq 0.015 Nm IP 54
Rotor moment of inertia	20 gcm ²
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 100 g, 6 ms
Weight approx.	250 g
Connection	Connector, 12-pin

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Part number

Singleturn

GXA2S.

Pulses / Incremental output

- 05 No incremental output
- 14 2048 pulses / push-pull
- 16 2048 pulses / RS422
- 17 2048 pulses / sine 1 Vpp

Connection

- A1 Connector M23, 12-pin, radial
- A5 Connector M23, 12-pin, radial, for incremental output 04/06/07

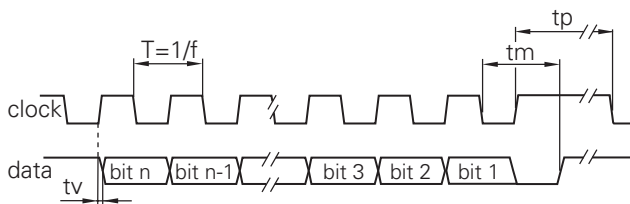
Voltage supply / signals

- 30 10...30 VDC / gray code 13 bit
- 32 10...30 VDC / binary code 13 bit
- 90 10...30 VDC / gray code 14 bit
- 92 10...30 VDC / binary code 14 bit

End shaft

- 0 End shaft \varnothing 12 mm without pin
- 1 End shaft \varnothing 12 mm with pin 15 mm
- B End shaft \varnothing 12 mm with pin 9.5 mm
- 4 End shaft \varnothing 14 mm without pin
- 5 End shaft \varnothing 14 mm with pin 15 mm
- F End shaft \varnothing 14 mm with pin 9.5 mm

Data transfer



Clock frequency f	62.5...1500 kHz
Scan ratio of T	40...60 %
Time lag tv	150 ns
Monoflop time tm	25 μ s + T/2
Clock interval tp	30 μ s

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
Z 182.001	Female connector M23, 12-pin, less cable (incr.)
Z 182.003	Female connector M23, 12-pin, 2 m (incr.)
Z 182.005	Female connector M23, 12-pin, 5 m (incr.)

Mounting accessories

Z 119.023	Spring coupling for encoders with \varnothing 58 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 \varnothing 58 mm housing, hole distance 73 mm
Z 119.073	Spring coupling for encoders with \varnothing 58 mm housing, hole distance 68 mm
Z 119.076	Spring coupling for encoders with \varnothing 58 mm housing
Z 119.082	Spring coupling for encoders with \varnothing 58 mm housing, hole distance 63 mm

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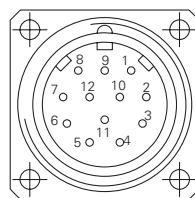
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Terminal significance	
UB	Encoder voltage supply.
GND	Encoder ground connection relating to UB.
Data+	Positive, serial data output of differential linedriver.
Data-	Negative, serial data output of differential linedriver.
Clock+	Positive SS clock input. 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.
$\overline{\text{UP/DOWN}}$	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 when looking at flange.
Incremental Outputs	Incremental tracks A 90° B and inverted.

Terminal assignment		
GXA2S		
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/DOWN
Pin 10	–	–
Pin 11	–	–
Pin 12	–	–

GXA2S with incremental tracks		
Connector	Core colour	Assignment
Pin 1	brown	UB
Pin 2	white	GND
Pin 3	blue	Clock+
Pin 4	green	Data+
Pin 5	grey	Zero setting
Pin 6	yellow	Data-
Pin 7	red	Clock-
Pin 8	red/blue	Track B inv.
Pin 9	pink	UP/DOWN
Pin 10	violet	Track A inv.
Pin 11	black	Track A
Pin 12	grey/pink	Track B



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

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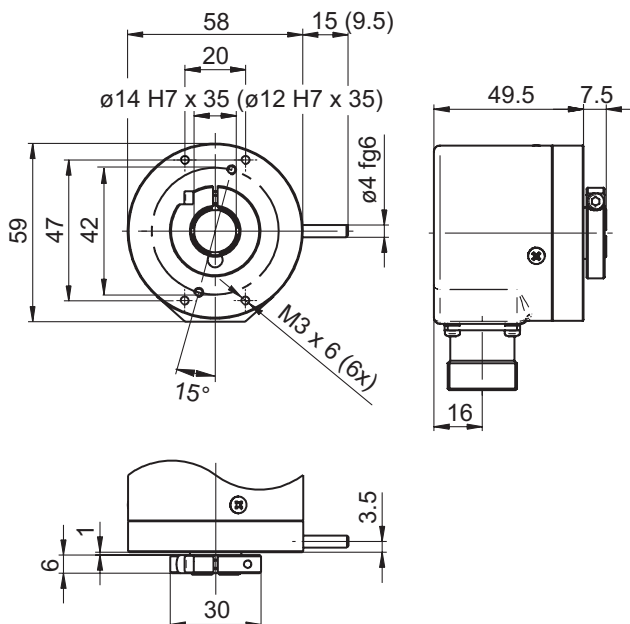
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Trigger level

SSI	Circuit	Incremental outputs	Linedriver RS422
SSI-Clock	Optocoupler	Output level High	>2.5 V (I = -20 mA)
SSI-Data	Linedriver RS485	Output level Low	<0.5 V (I = 20 mA)
		Load High	<20 mA
		Load Low	<20 mA
Control inputs	Input circuit	Outputs	Sine / Cosine
Input level High	>0.7 UB	Input level	1 V _{pp} ±10 %
Input level Low	<0.3 UB	Load	<10 mA
Input resistance	10 k Ω		
Diagnostic outputs or Incremental outputs	Output circuit Push-pull circuit-proof		
Output level High	>UB -3.5 V (I = -20 mA)		
Output level Low	<0.5 V (I = 20 mA)		
Load High	<20 mA		
Load Low	<20 mA		

Dimensions

GXA2S



Connector dimensions

