

# Absolute encoders - SSI

End shaft max.  $\varnothing 14$  mm

Optical singleturn encoder 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
- For high positive and negative acceleration
- 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)
Steps per turn	16384 / 14 bit
Incremental output	2048 pulses A90° B + inverted
Absolute accuracy	$\pm 0.025^\circ$
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 <sup>2</sup>
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
E-connection	Connector, 12-pin

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## Part number

Singleturn

GXA2S.

### Pulses / Incremental output

- 02 No incremental output
- 04 2048 pulses / push-pull
- 06 2048 pulses / RS422
- 07 2048 pulses / sine 1 Vpp

### E-connection

- A1 Connector M23, 12-pin, radial
- A3 Connector M23, 12-pin, radial, for incremental output 04/06/07

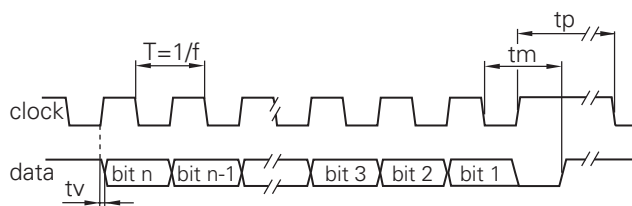
### Voltage supply / signals

- 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 $\mu$ s + T/2
Clock interval tp	30 $\mu$ s

## 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
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 (page %S)

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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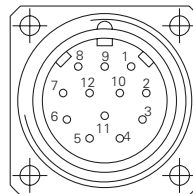
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## GXA2S - SSI

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 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 $\geq 100$ 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		
<b>GXA2S</b>		
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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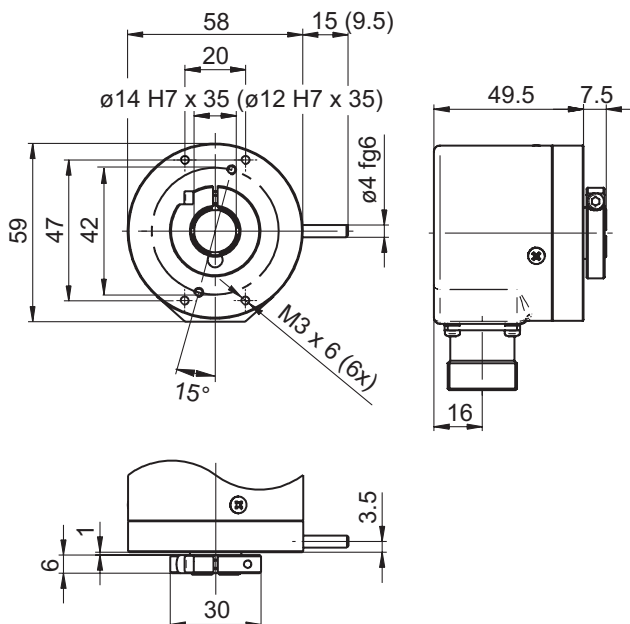
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### Trigger level

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 <sub>pp</sub> $\pm 10$ %
Input level Low	<0.3 UB	Load	<10 mA
Input resistance	10 k $\Omega$		
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

