

Absolute encoders - SSI

Hollow shaft max. $\varnothing 14$ mm

Optical singleturn encoders 18 bit

GBA2H - SSI



GBA2H hollow shaft

Features

- Encoder singleturn / SSI
- Optical sensing
- Resolution: 18 bit
- Hollow shaft max. $\varnothing 14$ mm
- Compact design
- Cost-efficient mounting
- High reliability by self-diagnostics
- Counting direction input
- Electronic setting of zero point
- Available with additional incremental output

Technical data - electrical ratings

Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	≤ 50 mA (24 VDC)
Initializing time (typ.)	20 ms after power on
Interfaces	SSI, Incremental A 90° B (optional)
Function	Singleturn
Steps per turn	262144 / 18 bit
Incremental output	2048 pulses A90°B + inverted
Absolute accuracy	$\pm 0.01^\circ$
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

Dimensions (flange)	$\varnothing 58$ mm
Shaft	$\varnothing 12$ mm hollow shaft $\varnothing 14$ mm hollow shaft
Protection DIN EN 60529	IP 54
Operating speed	≤ 6000 rpm (mechanical) ≤ 6000 rpm (electric)
Starting torque	≤ 0.04 Nm (IP 54)
Rotor moment of inertia	20 gcm ²
Materials	Housing: aluminium 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 200 g, 6 ms
Weight approx.	400 g
Connection	Connector M23, 12-pin Cable 1 m

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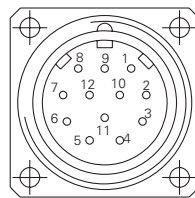
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Terminal significance	
UB	Encoder voltage supply.
GND	Encoder ground connection relating to UB.
Data+	Positive, serial data output of differential linedriver.
Data-	Negative, serial data output of differential linedriver.
Clock+	Positive SSI clock 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 filtered 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		
GBA2H		
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	black/yellow	–
Pin 11	–	–
Pin 12	–	–

GBA2H 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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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 / Low	<20 mA
Control inputs	Input circuit	Outputs	Sine / Cosine
Input level High	>0.7 UB	Output level	1 Vpp ± 10 %
Input level Low	<0.3 UB	Load	<10 mA
Input resistance	10 k Ω		
Incremental outputs	Output circuit Push-pull circuit-proof	Diagnostic output	
Output level High	$>UB - 3.5$ V (I = -20 mA)	NPN-Open Collector – 10 k Ω to UB internally connected	
Output level Low	<0.5 V (I = 20 mA)	Output level Low	≤ 0.5 V (I = 20 mA)
Load High / Low	<20 mA	Load Low	≤ 40 mA

Dimensions

