Absolute encoders - SSI

Shaft with clamping or synchro flange

Optical singleturn encoder 14 bit

GA240, GA241 - SSI



GA240 with clamping flange

Features

- **Encoder singleturn / SSI**
- **Optical sensing**
- **Resolution: 14 bit**
- **Clamping flange or synchro flange**
- **Permanent check of code continuity**
- **Extreme resistance to shock and vibration**
- **Encoder with electronic reset**

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
Interface	SSI
Steps per turn	16384 / 14 bit
Absolute accuracy	±0.025°
Sensing method	Optical
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
Approval	UL approval / E63076

Technical data - mechanical design

Housing	ø58 mm
Protection DIN EN 60529	IP 54 without shaft seal IP 65 with shaft seal
Operating speed	≤10000 rpm (mechanical) ≤6000 rpm (electric)
Rotor moment of inertia	14.5 gcm²
Admitted shaft load	≤20 N axial ≤40 N radial
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.	250 g
E-connection	Connector or cable
GA240 - SSI	
Shaft	ø10 mm
Flange	Clamping flange
Starting torque	≤0.015 Nm IP 54 ≤0.03 Nm IP 65
GA241 - SSI	
Shaft	ø6 mm
Flange	Synchro flange
Starting torque	≤0.01 Nm IP 54 ≤0.015 Nm IP 65

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GA240, GA241 - SSI

Part number

Clamping flange

GA240. [ ][ ][ ] **05**

E-connection
- A0 Connector M23, 12-pin, axial
- A1 Connector M23, 12-pin, radial
- 11 Cable 1 m, axial
- 21 Cable 1 m, radial

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

Flange / Shaft
- 0 Clamping flange / ø10 mm IP 54
- A Clamping flange / ø10 mm IP 65

Synchro flange

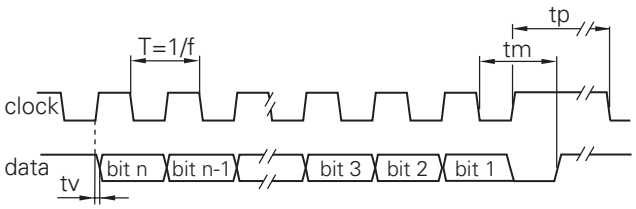
GA241. [ ][ ][ ] **05**

E-connection
- A0 Connector M23, 12-pin, axial
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- 11 Cable 1 m, axial
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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

Flange / Shaft
- 1 Synchro flange / ø6 mm IP 54
- B Synchro flange / ø6 mm IP 65

Data transfer



Clock frequency f	62.5...1500 kHz
Scan ratio of T	40...60 %
Time lag tv	150 ns
Monoflop time tm	25 µs + T/2
Clock interval tp	30 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 for GA240 - SSI (page %S)

Z 119.006	Eccentric fixing, single
Z 119.013	Adaptor plate for clamping flange for modification into synchro flange
Z 119.017	Mounting angle for clamping flange
Z 119.025	Adaptor plate for clamping flange, mounting by eccentric fixings (order separately)

Mounting accessories for GA241 - SSI (page %S)

Z 119.006	Eccentric fixing, single
Z 119.015	Mounting adaptor for synchro flange
Z 119.035	Bearing flange for encoders with synchro flange

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Absolute encoders - SSI

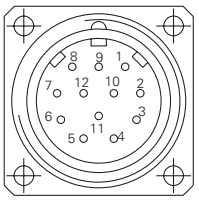
Shaft with clamping or synchro flange

Optical singleturn encoder 14 bit

GA240, GA241 - 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/$\overline{\text{DOWN}}$). 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 downstram electronics.
UP/$\overline{\text{DOWN}}$	UP/$\overline{\text{DOWN}}$ counting direction input. This input is standard on High. UP/$\overline{\text{DOWN}}$ means ascending output data with clockwise shaft rotation when looking at flange. UP/$\overline{\text{DOWN}}$-Low means ascending values with counterclockwise shaft rotation when looking at flange.

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	UP/$\overline{\text{DOWN}}$
Pin 10	black/yellow	–
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

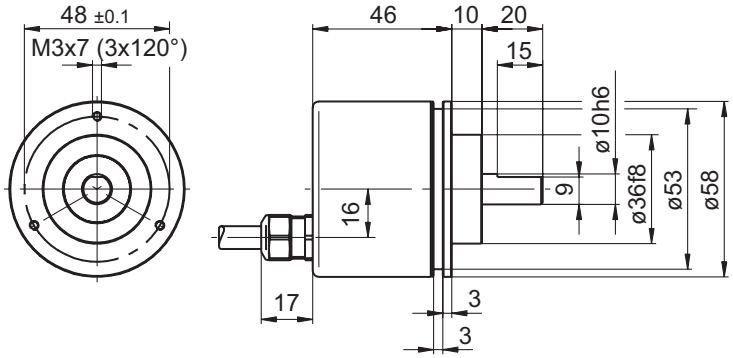
Diagnostic outputs	**Output circuit** NPN-OC 10 kΩ against UB
Output level Low	<0.5 V (I = 20 mA)
Load Low	<20 mA

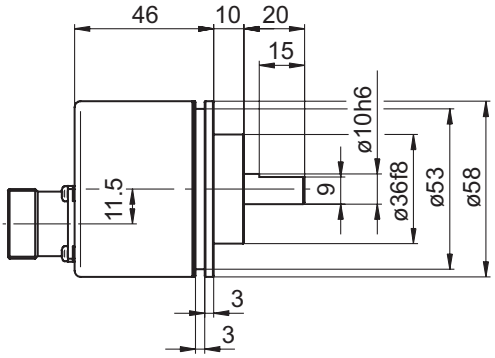
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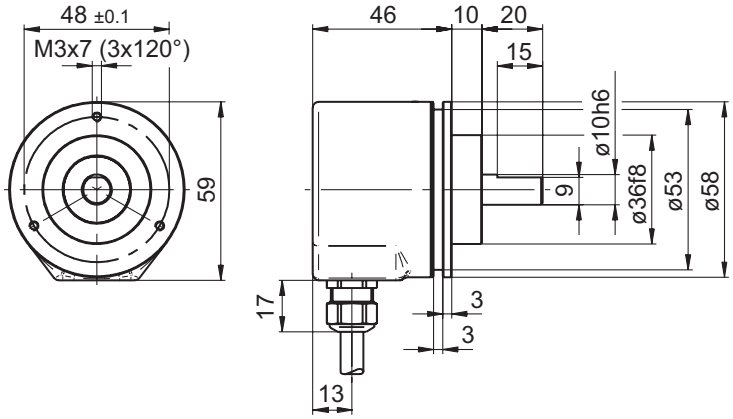
GA240, GA241 - SSI

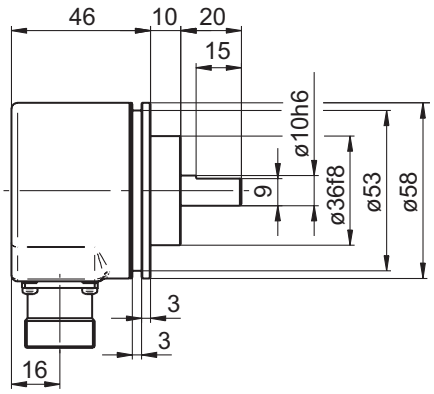
Dimensions

GA240 SSI clamping flange

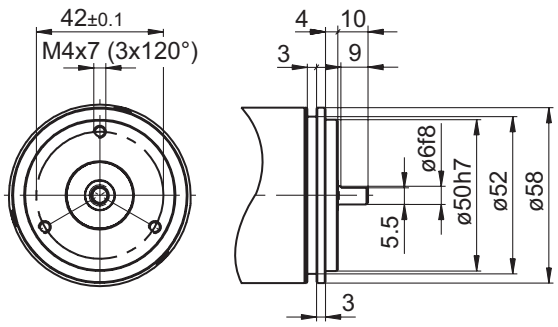




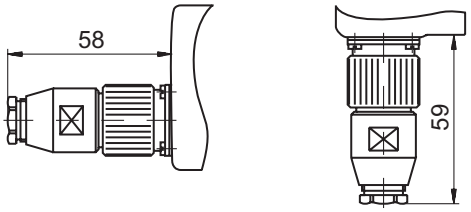




GA241 SSI synchro flange



GA240, GA241 SSI connector dimensions



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