Absolute encoders - SSI

Shaft with clamping or synchro flange

Optical multiturn encoders 14 bit ST / 12 bit MT

GE400, GE401 - SSI

GE400 with clamping flange

Features

- **Encoder multiturn / SSI**
- **Stainless steel design**
- **Optical sensing**
- **Resolution: singleturn 14 bit, multiturn 12 bit**
- **Clamping or synchro flange**
- **Electronic setting of zero point**
- **Counting direction input**
- **High resistance to shock and vibrations**
- **Suitable for high positive, negative accelerations**

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
Number of turns	4096 / 12 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 Multiturn sensing
Approval	UL approval / E63076

Technical data - mechanical design

Housing	ø58 mm
Protection DIN EN 60529	IP 67
Operating speed	≤10000 rpm (mechanical) ≤6000 rpm (electric)
Starting torque	≤0.03 Nm
Rotor moment of inertia	20 gcm²
Admitted shaft load	≤20 N axial ≤40 N radial
Materials	Housing: stainless steel 1.4305 Flange: stainless steel 1.4305
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
GE400 - SSI	
Shaft	ø10 mm
Flange	Clamping flange
GE401 - SSI	
Shaft	ø6 mm
Flange	Synchro flange

GE400, GE401 - SSI

Part number

Clamping flange

GE400. | **A** | | **A1** | **02** |

E-connection
A1 Connector M23, 12-pin, radial

Voltage supply / signals
10 10...30 VDC / gray code 25 bit
12 10...30 VDC / binary code 25 bit
20 10...30 VDC / gray code 24 bit
90 10...30 VDC / gray code 26 bit

Flange / Shaft
A Clamping flange / ø10 mm IP 67

Synchro flange

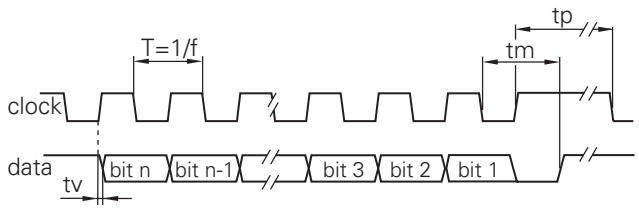
GE401. | **B** | | **A1** | **02** |

E-connection
A1 Connector M23, 12-pin, radial

Voltage supply / signals
10 10...30 VDC / gray code 25 bit
12 10...30 VDC / binary code 25 bit
20 10...30 VDC / gray code 24 bit
90 10...30 VDC / gray code 26 bit

Flange / Shaft
B Synchro flange / ø6 mm IP 67

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

Mounting accessories for GE400 - SSI

Z 119.017	Mounting angle for clamping flange

Absolute encoders - SSI

Shaft with clamping or synchro flange

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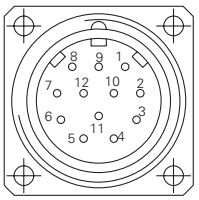
Terminal significance	
UB	Encoder voltage supply.
GND	Encoder ground connection relating to UB.
Data+	Positive, serial data output of differential linedriver.
Data-	Negative, serial data output of differential linedriver.
Clock+	Positive SS clock input. Clock+ together with clock- forms a current loop. 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/$\overline{\text{DOWN}}$). 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.
$\overline{\text{DATAVALID MT}}$	Diagnostic output for monitoring the multiturn sensor voltage supply. Upon dropping below a defined voltage level the $\overline{\text{DV MT}}$ output is switched to Low.
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	Assignment
Pin 1	UB
Pin 2	GND
Pin 3	Clock+
Pin 4	Data+
Pin 5	Zero setting
Pin 6	Data-
Pin 7	Clock-
Pin 8	$\overline{\text{DATAVALID}}$
Pin 9	UP/$\overline{\text{DOWN}}$
Pin 10	$\overline{\text{DATAVALID MT}}$
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

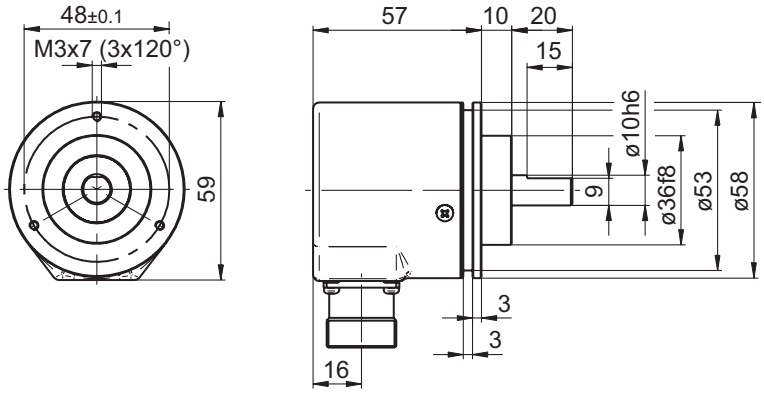
Control inputs	**Input circuit**
Input level High	>0.7 UB
Input level Low	<0.3 UB
Input resistance	10 kΩ

Diagnostic 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

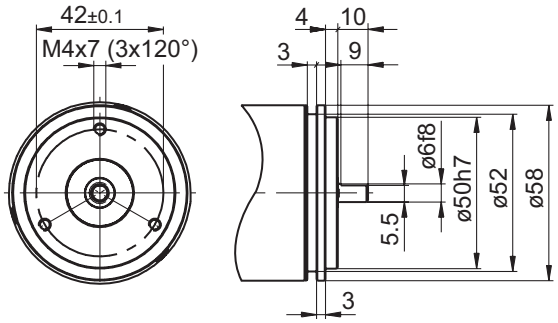
GE400, GE401 - SSI

Dimensions

GM400 clamping flange



GE401 Synchro flange



GE400, GE401 connector dimensions