

Absolute encoders - bus interfaces

Ex approval Ex II 2D/2G (ATEX)

Optical multiturn encoders 18 bit ST / 14 bit MT

X 700 - CANopen®



X 700 with CANopen®

Features

- Encoder multiturn / CANopen® / ATEX
- Optical sensing method
- Resolution: singleturn 18 bit, multiturn 14 bit
- Clamping flange with solid shaft $\varnothing 10$ mm
- Explosion protection per Ex II 2D/2G (ATEX)
- Device class 2 / zone 1 (gas), zone 21 (dust)
- Galvanic isolation
- Maximum resistant against magnetic fields

Technical data - electrical ratings

Voltage supply	10...30 VDC
Reverse polarity protection	Yes
Consumption w/o load	≤ 50 mA (24 VDC)
Initializing time typ.	250 ms after power on
Interface	CANopen®
Function	Multiturn
Transmission rate	10...1000 kBaud
Operating mode	Event-triggered / Time-triggered Remotely-requested Sync (cyclic) / Sync (acyclic)
Identifier	11 bit
Steps per revolution	≤ 262144 / 18 bit
Number of revolutions	≤ 16384 / 14 bit
Absolute accuracy	$\pm 0.025^\circ$
Sensing method	Optical
Code	Binary
Code sequence	CW/CCW programmable
Output stages	CAN bus standard ISO / DIS 11898
Interference immunity	DIN EN 61000-6-2
Emitted interference	DIN EN 61000-6-4
Programmable parameters	Operating modes Total resolution Scaling Rotation speed monitoring
Diagnostic functions	Position or parameter error Multiturn sensing

Technical data - mechanical design

Size (flange)	$\varnothing 70$ mm
Shaft type	$\varnothing 10$ mm solid shaft (clamping flange)
Flange	Clamping flange
Protection DIN EN 60529	IP 67
Operating speed	≤ 6000 rpm (mechanical) ≤ 6000 rpm (electric)
Starting acceleration	≤ 1000 U/s ²
Starting torque	≤ 0.4 Nm (+25 °C)
Admitted shaft load	≤ 60 N axial ≤ 50 N radial
Materials	Housing: stainless steel Flange: stainless steel
Operating temperature	-20...+70 °C
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
Explosion protection	Ex II 2G Ex d IIC T6 Ex II 2D
Weight approx.	1300 g
Connection	Cable 2 m (other length upon request)

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Part number

X 700.P

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Interface

- 05 CANopen® DSP 406 / 10-core cable
- 15 CANopen® DSP 417 / 10-core cable
- A5 CANopen® DSP 406 / 5-core cable
- B5 CANopen® DSP 417 / 5-core cable

Connection

- 12 Cable 2 m, axial
- 19 Cable 20 m, axial

Voltage supply / signals

- 1 10...30 VDC / 13 + 16 bit
- 3 10...30 VDC / 18 + 14 bit (only with CANopen® DSP 406)

Flange / Solid shaft

- 1 Clamping flange / ø10 mm, IP 67

CD with file descriptions is not included in the delivery. You may order them on CD as accessory.

Accessories

Programming accessories

10146710 CD with describing files & manuals (Z 150.022)

CANopen® features

Bus protocol	CANopen
Device profile	CANopen - CiA DSP 406, CANopen - CiA DSP 417 (Device Class 2, CAN 2.0B)
Operating modes	Event-triggered / Time-triggered Remotely-requested Sync (cyclic) / Sync (acyclic)
Preset	Parameter for setting the encoder to a requested position value assigned to a defined shaft position of the system. The offset of encoder zero point and mechanical zero point is stored in the encoder.
Rotating direction	Parameter for defining the rotating direction in which there have to be ascending or descending position values.
Scaling	Parameter defining the steps per turn as well as the total resolution.
Diagnosis	The encoder supports the following error warnings: - Position and parameter error - Lithium battery voltage control (Multiturn)
Node Monitoring	Heartbeat or Nodeguarding
Default	DSP 406 50 kbit/s, Node ID 1 DSP 417 250 kbit/s, Node ID 4

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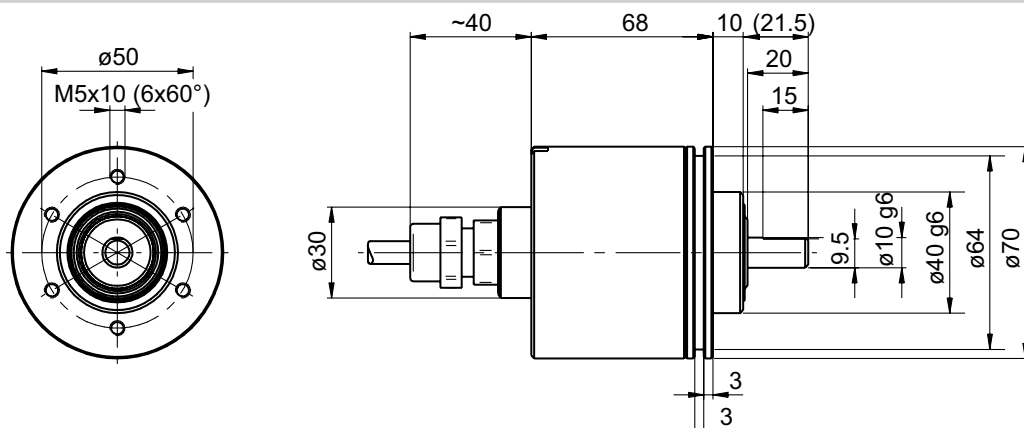
Terminal significance

UB	Encoder voltage supply
GND B	Encoder ground connection relating to UB
CAN_L	CAN bus signal (dominant Low)
CAN_H	CAN bus signal (dominant High)
CAN_GND	GND relating to CAN interface. Separated from GND B either by galvanic isolation.

Terminal assignment

Core colour	Assignment 05/15	Assignment A5/B5
brown	UB (IN)	UB
white	GNDB (IN)	GND
green	CAN_H (IN)	CAN_H
yellow	CAN_L (IN)	CAN_L
black	CAN_GND (IN)	–
red	UB (OUT)	–
blue	GNDB (OUT)	–
grey	CAN_H (OUT)	CAN GND
pink	CAN_L (OUT)	–
violet	CAN_GND (OUT)	–

Dimensions



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Checklist for EX protection data collection

For the design of explosion-proof encoders of the X 700 series according to EU Directive 2014/34/EU, it is absolutely necessary to complete this checklist in order to be able to resolve all open questions regarding explosion protection and application conscientiously.

Company: _____

Address: _____

Department: _____ Phone-No.: _____

Clerk/Technician: _____

Email: _____ Fax: _____

Responsibility:

The operator is responsible for maintaining the performance limit of the devices (see datasheet)

Equipment group:	Please select
Equipment group I, M2 Mining (underground /above-ground mining)	
Equipment group II, 2G/2D all other areas	

Equipment Use / Field Application: (i.e.: paint line, process engineering, gas storage etc.)

Information on operating temperature and ambient temperature	Enter values
Expected operating temperature:	
Operating temperature: Standard: -20...+70 °C, optional 100 °C	datasheet
Ambient temperature in the field:	

Mechanical load	Enter values
Numbers of Revolutions: RMP max. 3000 RMP	
Axial shaft load: (N)	
Radial shaft load: (N)	
Environmental influences (Salt, alkalis, etc.):	

Date:	Stamp:
Signature:	