Absolute encoders - bus interfaces

EX approval ATEX EEx d IIC T6

Optical multiturn encoders 18 bit ST / 14 bit MT

X 700 - CANopen

X 700 with CANopen

Features

–Encoder multiturn / CANopen / ATEX
–Optical sensing
–Resolution: singleturn 18 bit, multiturn 14 bit
–Clamping flange with shaft ø10 mm
–Explosion protection per EEx d IIC T6
–Area of application: EX I/II 2 GD / ATEX 133213X
–Device class 2 / zone 1 (gas), zone 21 (dust)
–Galvanic isolation

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 turn	≤262144 / 18 bit
Number of turns	≤16384 / 14 bit
Absolute accuracy	±0.025 °
Sensing method	Optical
Code	Binary
Code sequence	CW/CCW programmable
Output circuit	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
Approval	UL approval / E301461

Technical data - mechanical design

Dimensions (flange)	ø70 mm
Shaft	ø10 mm (clamping flange)
Flange	Clamping flange
Protection DIN EN 60529	IP 67
Operating speed	≤6000 rpm (mechanical) ≤6000 rpm (electric)
Starting torque	≤0.4 Nm
Shaft loading	≤60 N axial ≤50 N radial
Materials	Housing: stainless steel Flange: stainless steel
Operating temperature	-25...+60 °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
Weight approx.	1300 g
Connection	Cable 2 m (other length upon request)

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Part number

X 700.P | **1** | | | |

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

Flange / 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 free-of-charge.

Accessories

Programming accessories

Z 150.022	CD with describing files & manuals

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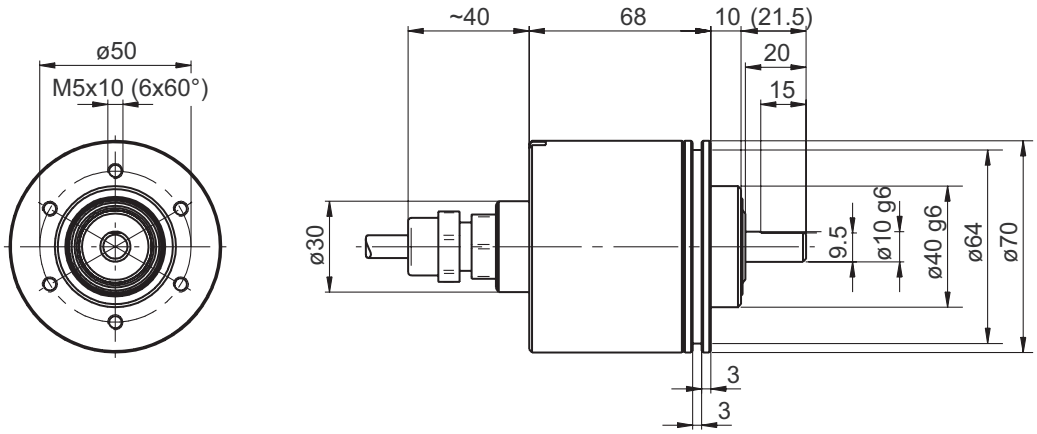
Terminal significance	
UB	Encoder voltage supply
GND B	Encoder ground connection relating to UB
CAN_L	CAN bus signal (dominant Low)
CAN_H	CAN bus signal (dominant High)
CAN_GND	GND relating to CAN interface. Separated from GND B either by galvanic isolation.

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



Check list for EX-approval

In compliance with EU standards 94/9/EG for potentially explosive areas it is imperative that the present checklist is duly completed and that all pending questions relating to explosion protection and application are clarified.

Company: _____

Address: _____

Division: _____

In charge: _____

Phone: _____ Fax: _____

e-mail: _____

Product name:	Version:	Resolution (ppr / code):	Supply voltage:
Kind of e-connection:	**Length of cable (m):**	**Output circuit:**	**Special options:**

Responsibility

- Our customer will receive all relevant information to verify a correct application.
- Our customer has to clarify all relevant criterions and characteristics.
- The operator shall be responsible for not exceeding the maximum performance limits of our devices (see data sheet).

Device utilization/application (E.g.: Lacquering line, manufacturing tech., gas storing vessel etc.)

_____

_____

_____

Device group, device category and zone classification

Device group		please tick
Device group I		☐
Device group II		☐
Category / Zone	**Ex-atmosphere prevailing**	
Category 1 (= Zone 0/20)	... permanently, long-term or frequently	☐
Category 2 (= Zone 1/21)	... only now and then	☐
Category 3 (= Zone 2/22)	... rarely or seldom	☐
Zone classification		
G (gases)	Zone 0, zone 1, zone 2	☐
D (dusts)	Zone 20, zone 21, zone 22	☐

Check list for EX-approval

Check list for EX-approval

Ignition protection		please tick
Ex d	Flameproof (pressure-proof capsule)	☐
Ex ia	Intrinsic safety	☐
Ex ib	Intrinsic safety	☐

Gas explosion group		please tick
Gases are classified into explosion groups. Danger increases from group II A to II C.		
II A	Propane	☐
II B	Ethylene	☐
II C	Hydrogen, Acetylene	☐

Temperature classes and groups of explosion			please tick
Temperature class	Max. surface temperature of operating equipment (°C)	Max. ignition temperature of combustible substances (°C)	
T1	450	> 450	void
T2	300	>300...< 450	void
T3	200	>200...< 300	void
T4	135	>135...< 200	void
T5	100	>100...< 135	void
T6	85	> 85...< 100	void

Information on ambient and operating temperature	
Expected operating temperature:	to be clarified
Field ambient temperature:	to be clarified

Mechanical strain	
Rotation speed (rpm)	
Axial shaft load (N)	
Radial shaft load (N)	
Ambient impacts (salt, lye, etc.)	

Date Signature

Stamp:

Date Release EExB / trained sales

Ignition protection please tick

Ex d Flameproof (pressure-proof capsule)

Ex ia Intrinsic safety

Ex ib Intrinsic safety

Gas explosion group please tick

Gases are classified into explosion groups. Danger increases from group II A to II C.

II A Propane

II B Ethylene

II C Hydrogen, Acetylene

Temperature classes and groups of explosion please tick

Temperature class | Max. surface temperature of operating equipment (°C) | Max. ignition temperature of combustible substances (°C)

T1 450 > 450 void

T2 300 >300...< 450 void

T3 200 >200...< 300 void

T4 135 >135...< 200 ☐

T5 100 >100...< 135 void

T6 85 > 85...< 100 ☐

Information on ambient and operating temperature

Expected operating temperature: to be clarified

Field ambient temperature: to be clarified

Mechanical strain

Rotation speed (rpm)

Axial shaft load (N)

Radial shaft load (N)

Ambient impacts (salt, lye, etc.)

Date Signature

Stamp:

Date Release EExB / trained sales