CE cULus CANopen

Model Number

CSM58O-F2ABDR0BY-1213

Features

- **High resistance to salt water**
- **Suitable for usage in corrosive enviroments of C4 category**
- **Two color status LED for easy installation**
- **25-bit multiturn**
- **Y: Device specific encoder parameter settings**

Description

The CANOpen encoder CSM58O was specially developed for use in regions heavily influenced by maritime conditions or for offshore use.

The sea water-resistant coated housing and flange material and the stainless steel shaft are properly suited for these tough enviromental influences.

The internal electronics also meets these high requirements.

Technical data

General specifications

Detection type	magnetic sampling
Device type	Multiturn absolute encoder
Linearity error	± 0.1 °

Functional safety related parameters

$MTTF_d$	14.3 a
L_{10}	74 E+8 at 3000 rpm and 20/40 N axial/radial shaft load

Electrical specifications

Operating voltage U_B	10 ... 32 V DC
No-load supply current I_0	max. 120 mA at 10 V DC max. 50 mA at 24 V DC
Output code	binary code
Code course (counting direction)	cw ascending (clockwise rotation, code course ascending) cw descending (clockwise rotation, code course descending)

Interface

Interface type	CANopen
Resolution	
Single turn	13 Bit
Multiturn	12 Bit
Overall resolution	25 Bit
Transfer rate	max. 500 kBit/s

Connection

Connector	M12 connector, 5-pin, A-coded for DeviceNet, CANopen

Standard conformity

Degree of protection	DIN EN 60529, IP66
Climatic testing	DIN EN ISO 9227-NSS , salt spray
Emitted interference	EN 61000-6-4:2007
Noise immunity	EN 61000-6-2:2005
Shock resistance	DIN EN 60068-2-27, 100 g, 6 ms
Permanent shock resistance	DIN EN 60069-2-29: ≤ 10 g, 16 ms
Vibration resistance	DIN EN 60068-2-6, 10 g, 10 ... 1000 Hz

Ambient conditions

Operating temperature	-40 ... 85 °C (-40 ... 185 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)

Mechanical specifications

Material	
Housing	Steel with cathodic corrosion protection and wet coating
Flange	Aluminium with special anodised coating
Shaft	stainless steel V4A
Rotational speed	≤ 3000 min^{-1}
Moment of inertia	30 gcm^2
Starting torque	≤ 3 Ncm (version without shaft seal)
Shaft load	
Axial	20 N
Radial	40 N

Approvals and certificates

UL approval	cULus Listed, General Purpose, Class 2 Power Source

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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Dimensions
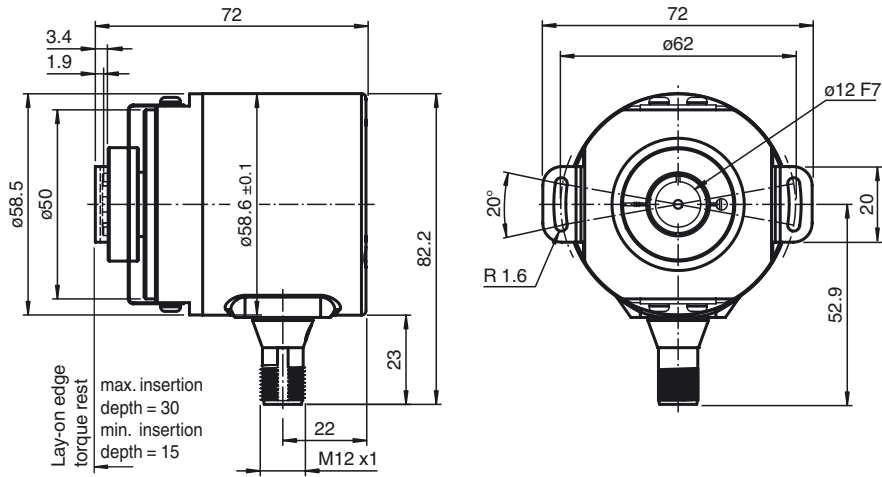
Electrical connection

Signal	Wire end	5-pin, M12 x 1 connector
CAN GND	green	1
+V_S	red	2
GND	yellow	3
CAN-High	white	4
CAN-Low	brown	5
Shielding	Shielding	Housing
Pinout		

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Indicating and operating elements

Description of the two color status LED

The rotary encoder is equipped with a two color status LED integrated in the M12 connector. The LED lights up both red and green. It displays the physical bus status and the status of the CANopen state machine.

- Green color represents the run level and is entitled „Run LED (green)" below
- Red color represents the error statuses and is entitled „Error LED (red)" below

The behavior of the LED inidicator is defined as follows:

- LED on
- LED off
- LED flickering (rapid flashing at approx. 10 Hz)
- LED flashing (slow flashing at approx. 2.5 Hz)
- Single flash (LED flashes once briefly, followed by a pause of approx. 1 s)
- Double flash (LED flashes twice briefly, followed by a pause of approx. 1 s)
- Triple flash (LED flashes three times briefly, followed by a pause of approx. 1 s)
- Quadruple flash (LED flashes four times briefly, followed by a pause of approx. 1 s)

If there is any conflict as to wether the red or the green color of the LED should be activated, only the red color (Error) is activated. In all other instances the two color LED will combine the behavior of the „Error LED (red)" and „Run LED (green)".

Description of the Run LED (green) and the Error LED (red) statuses

Run LED (green)	Status	Description
flickering	AutoBitrate / LSS	Auto-bitrate detection is in progress or LSS services are in progress
flashing	PREOPERATIONAL	Encoder is in status PREOPERATIONAL
single flash	STOPPED	Encoder is in status STOPPED
double flash		reserved
triple flash	Program / Firmware download	a software download is running on the encoder
on	OPERATIONAL	the encoder is in status OPERATIONAL

Error LED (red)	Status	Description
off	no error	the encoder is in working condition
flickering	AutoBitrate / LSS	Auto-bitrate detection is in progress or LSS services are in progress (alternating with Run LED (green)
flashing	invalid configuration	general configuration error
single flash	Warning limit reached	at least one of the error counters of the CAN controller has reached or exceeded the warning level (too many error frames)
double flash	Error control event	a guard event (NMT-slave or NMT-master) or a heartbeat event (heartbeat consumer) has occured
triple flash	Sync. error	the sync. message has not been received within the configured communication cycle period time out (see objekt 1006h)
quadruple flash	Error, event-timer	an expected PDO has not been received before the even-timer elapsed
on	Bus off	the CAN controller is bus off

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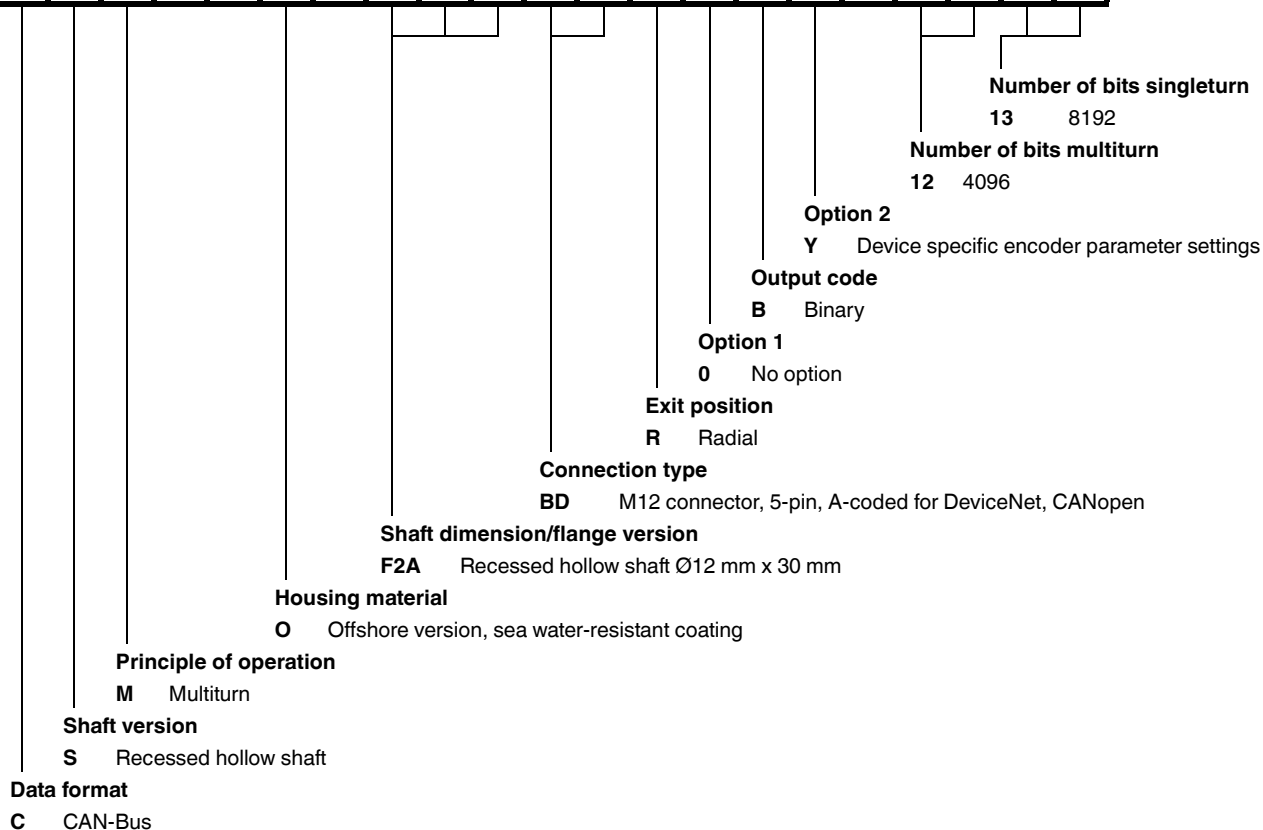
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Device specific encoder parameter settings

Depending on the part number (PN#) 295859 or 299042 device specific encoder parameter settings are defined.

S11x	S9x
#295859 CSM58O-F2ABDR0BY-1213	**#299042** CSM58O-F2ABDR0BY-1213
Settings according to customized EDS-File	Settings according to customized EDS-File
Predefined parameter set:	Predefined parameter set:
Node ID: 10	Node ID: 1
Baud rate: 500 kBit/s	Baud rate: 500 kBit/s
Terminating resistor: deactivated => resistor off	Terminating resistor: activated => resistor on
Single turn resolution: 13 Bit	Single turn resolution: 13 Bit
Multi turn resolution: 12 Bit	Multi turn resolution: 12 Bit
Total resolution: 25 Bit	Total resolution: 25 Bit
PDO1: Position output	PDO1: Position output
Settings for PDO1 (1800):	Settings for PDO1 (1800):
Transmission type: 0x4	Transmission type: 0xFE
Inhibit Time : 0	Inhibit Time : 0
Event Time: 0	Event Time: 10
PDO2: Speed output	
Settings PDO2 (1801):	
Transmission type : 0x1	
Inhibit Time: 0	
Event Time : 0	

Order code

| C | S | M | 5 | 8 | O | – | F | 2 | A | B | D | R | 0 | B | Y | – | 1 | 2 | 1 | 3 |

Number of bits singleturn
13　8192

Number of bits multiturn
12　4096

Option 2
Y　Device specific encoder parameter settings

Output code
B　Binary

Option 1
0　No option

Exit position
R　Radial

Connection type
BD　M12 connector, 5-pin, A-coded for DeviceNet, CANopen

Shaft dimension/flange version
F2A　Recessed hollow shaft Ø12 mm x 30 mm

Housing material
O　Offshore version, sea water-resistant coating

Principle of operation
M　Multiturn

Shaft version
S　Recessed hollow shaft

Data format
C　CAN-Bus

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