Absolute Multi-Turn Encoder

MH900

Absolute Multi-Turn Blind Hollow Shaft Encoder

- Housing Size: Ø 90 mm
- Gearless and Battery-Free Design
- Bore Diameter: 35 to 50 mm
- Variable Interfaces with Different Resolutions Available
- Binary and Gray Code

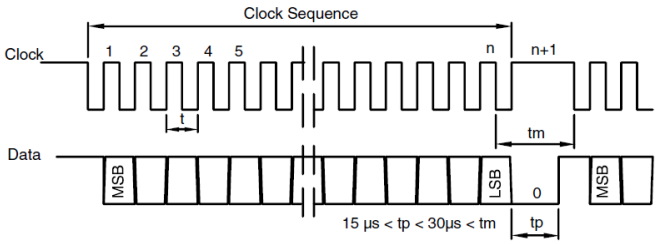
Mechanical Specification

Material Body & Cover	Aluminum
Material Shaft	Stainless Steel
Max. Speed	6000 RPM
Mass Moment of Inertia	$\leq 2.5 \cdot 10^{-6}$ kgm^2
Starting Torque *(at 25 °C)*	> 0.05 Nm
Max. Loading on Shaft	Axial 50 N, Radial 80 N
Shock Resistance *(6 ms)*	≤ 1000 m/s^2
Vibration Resistance *(55-2000 Hz)*	≤ 50 m/s^2
Protection Class *(DIN EN 60529)*	IP65
Operating Temperature	-20 °C to +70 °C [-4 °F to +158 °F]
Weight	ca. 0.110 kg [0.242 lb]

Electrical Specification SSI

Supply Voltage V_{cc}	5 VDC, 10–30 VDC
Current Consumption *(no load)*	Max. 80 mA at 27 VDC
Output Circuit	RS485/RS422 compatible
Pulse Frequency	Max. 500 kHz
Direction Setting DIR <->	DIR = GND → cw, DIR = V_{cc} → ccw
Preset/Reset Setting	Set: Preset = V_{cc} for 2s Reset: Preset = GND
Short Circuit Protection	100 %

Signals SSI



SSI Single Transmission Protocol

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Electrical Specification CANopen

Supply Voltage V_{cc}	4.75–30 VDC
Current Consumption	ca. 50 mA
Protocol	Communication CiA 301, Device Profile for Encoder CiA 406 v 3.2 Class C2
Coding	Binary
Node Number	1 to 127 (127 Default)
Baud Rate	10 kBaud to 1 MBaud with Automatic Bit Rate Detection
Programmable CAN	Synchronous Mode
Transmission Modes	Asynchronous Mode

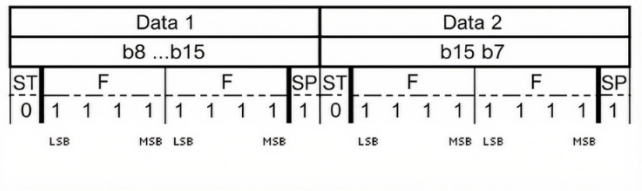
Electrical Specification CAN SAE J1939

Supply Voltage V_{cc}	4.75–30 VDC
Current Consumption	ca. 50 mA
Protocol	Communication CiA 301, Device Profile for Encoder CiA 406 v 3.2 Class C2
Coding	Binary
Node Number	1 to 127 (127 Default)
Baud Rate	10 kBaud to 1MBaud with Automatic Bit Rate Detection
Programmable CAN	Synchronous Mode
Transmission Modes	Asynchronous Mode

Electrical Specification RS485

Supply Voltage V_{cc}	5 VDC, 10–30 VDC
Current Consumption *(no load)*	Max. 80 mA at 27 VDC
Output Circuit	RS485/RS422 compatible
Pulse Frequency	Max. 500 kHz
Coding	Binary
Direction Setting DIR <->	DIR = GND → cw,
(view on shaft)	DIR = V_{cc} → ccw
Set to Zero	Preset = V_{cc} for 2s
Baud Rate	Standard: 9600 bit/s *Other baud rates per request*
Polling Cycle	20 ± 2 ms *Other polling cycles per request*
Telegram Length	Single-Turn 6 Byte, Multi-Turn 8 Byte
Telegram Composition	2 Byte Preamble, 2/4-Byte User Data, 2 Byte CRC Start Bit (0) + Stop Bit (1)
Byte Composition	Bytes are Big-Endian and LSB First, No Parity Bit

Protocol RS485



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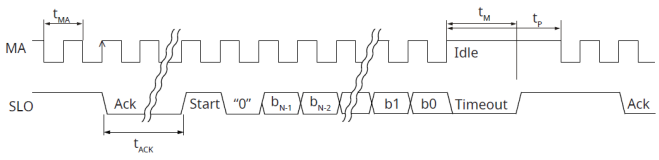
Electrical Specification BiSS-C

Supply Voltage V_{CC}	5 VDC
Current Consumption *(no load)*	Typ. 65 mA
Output Circuit	RS422 Compatible
Coding	Binary
Set-up Time	100 ms (Worst Case: 200 ms)
Position Update Rate	50 kHz
Repeatability	± 2 LSB (Counts, Unidirectional)
Accuracy	± 0.5 °
Digital Hysteresis	± 2 LSB (Counts)

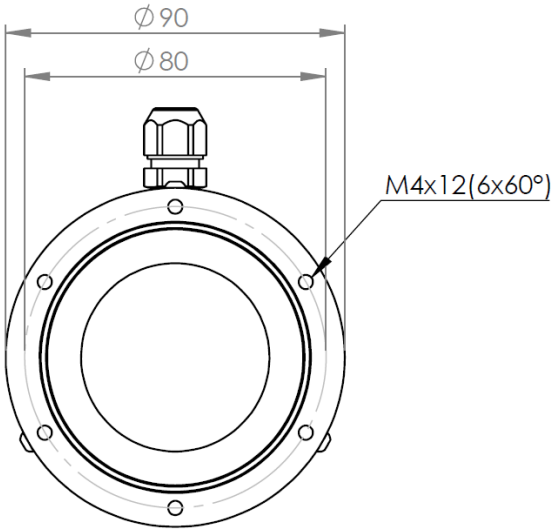
Signals BiSS-C

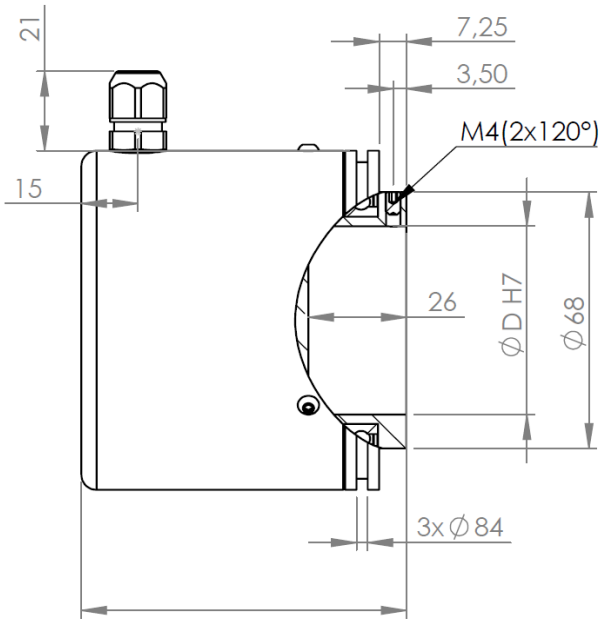


Geometry

Dimension in mm (drawing available as: dxf-,iges-, step-,sld-file)

Different Bore Diameters (D) Available—see ordering code





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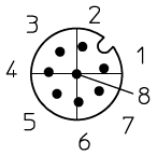
Connections

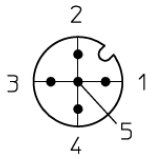
Function SSI	Cable Color Code	Pin *(8 Pin M12, 12 Pin M23)*
GND	white	1
V_{cc}	brown	2
SSI Clock +	green	3
SSI Clock -	yellow	4
SSI Data +	grey	5
SSI Data –	pink	6
Preset/ Reset	blue	7
Direction Setting/DIR	red	8

Pinout



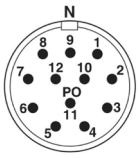
8 Pin M12 A-code

Function CANopen	Cable Color Code	Pin *(5 Pin M12)*
GND	white	3
V_{cc}	brown	2
CAN HIGH	green	4
CAN LOW	yellow	5
CAN GND/Screen	Screen	1



5 Pin M12 A-code

Function CAN SAE J1939	Cable Color Code	Pin *(5 Pin M12)*
GND	white	3
V_{cc}	brown	2
CAN HIGH	green	4
CAN LOW	yellow	5
CAN GND/Screen	Screen	1



12 Pin M23

Function RS485	Cable Color Code	Pin *(8 Pin M12, 12 Pin M23)*
GND	white	1
V_{cc}	brown	2
A (Data +)	grey	5
B (Data –)	pink	6
Preset/Reset	blue	7
Direction Setting/DIR	red	8

Function BiSS-C	Cable Color Code	Pin *(8 Pin M12, 12 Pin M23)*
GND	white	1
V_{cc}	brown	2
MA +	green	3
MA -	yellow	4
SLO +	grey	5
SLO –	pink	6

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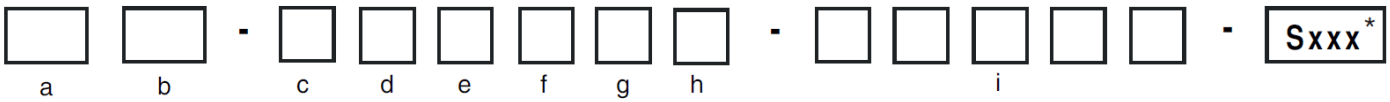
Ordering Code



a. = Group Function
MH = Multi-Turn Blind Hollow Shaft Encoder

b. = Basic Series Number
900

c. = Shaft Size
Selectable from 35 to 50 mm
35 = 35 mm, 47 = 47 mm, 50 = 50 mm

d. = Mechanical Option
0 = None

e. = Connection Type
0 = 2 m Cable [6`]
7 = 12 Pin M23 Plug
P = 5 Pin M12 Plug (A-code)
Q = 8 Pin M12 Plug (A-code)

f. = Connector Location
A = Axial
R = Radial

g. = Output Signals/Interface
1 = CAN SAE J1939
J = Binary Code SSI
O = RS-485
Q = BiSS-C
R = CANopen
Y = Gray Code SSI

h. = Output, Supply Voltage
1 = 5 VDC
3 = 4.75–30 VDC
F = SSI, 5 VDC
G = SSI, 10–30 VDC

i. = Resolution
Single-Turn: Selectable from 1 to 16 Bits
Multi-Turn: Selectable from 1 to 32 Bits
12x18 = 12 Bits Single-Turn, 18 Bits Multi-Turn
(Biss-C only 14 Bits Single-Turn x 16 Bits Multi-Turn Available)

* Any special functions and design will be designated by a code (Sxxx) at the end of the part number. Consult our Office for your region for further details. If this encoder does not fit your needs, please also consult us for help.

Accessories MH900

Mating Connector/Female Plug

KD-12-M23 – Mating Connector/Female Plug 12 Pin M23

KD-5-M12 – Mating Connector/Female Plug 5 Pin M12

KD-8-M12 – Mating Connector/Female Plug 8 Pin M12