# MODEL A58SB - ABSOLUTE SHAFT ENCODER

Ø58 mm

## FEATURES

Single Turn/Multi-Turn Absolute Encoder (16 Bit ST / 43 Bit MT)
SSI, CANopen®, or SAE J1939 communication
Maintenance-free and environmentally friendly magnetic design
Energy harvesting magnetic multi-turn technology
No gears or batteries
58 mm (2.28") diameter shaft encoder
Heavy duty IP69K option available
Meets CE/EMC standards for immunity and emissions

The Model A58SB absolute encoder offers a high performance solution for your absolute feedback needs. It provides maintenance-free feedback thanks to its innovative battery-free and gear-free multi-turn technology. This encoder is especially suited for applications where position information must be retained after loss of system power. Its rugged magnetic technology and high IP rating, up to IP69K, make the Model A58SB an excellent choice, even in tough industrial environments. Available with two shaft sizes, 6 mm or 10 mm, and two mounting options, the Model A58SB is easily designed into a variety of applications.

## COMMON APPLICATIONS

Robotics, Telescopes, Antennas, Medical Scanners, Wind Turbines, Elevators, Lifts, Motors, Automatic Guided Vehicles, Heavy Duty Vehicles, Cranes, Rotary and X/Y Positioning Tables

## MODEL A58SB ORDERING GUIDE

Blue type indicates price adder options

| Model | Mechanical | | Electrical | | | | | | | | Environmental |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A58SB | 06 | MH | 14 | 18 | CO | A | B | V2 | RMJ | NR | S7 |

**Model**
**A58SB** Absolute series

**MOUNTING TYPE**
**MH** Clamping flange[1]
**MK** Synchro flange

**MULTI-TURN RESOLUTION**
**00** Single Turn
**01 to 43** Multi-Turn

**SOFTWARE REV**
**A** Revision A

**INPUT VOLTAGE**
**5** 5 VDC[6]
**V2** 5 to 32 VDC

**Terminating Resistor[8]**
**NR** None (Std)
**RS** Internal resistor option (fixed 120 Ohm)

**Sealing**
**S7** IP65+IP67
**S8** IP67+IP69K[1]

**SHAFT SIZE**
**06** 6 mm
**10** 10mm[1]

**SINGLE TURN RESOLUTION**
**01 to 16** Bit

**COMMUNICATION PROTOCOL**
**CO** CANopen[2]
**CJ** SAE J1939[3,4]
**SI** SSI[5]

**OUTPUT CODE**
**B** Binary
**G** Gray[6]

**CONNECTOR TYPE[7]**
**AMJ** 5-pin M12 axial mount[8]
**AMK** 8-pin M12 axial mount[6]
**RMJ** 5-pin M12 radial mount[8]
**RMK** 8-pin M12 radial mount[6]

**Notes:**
1   S8 Sealing option only available with 10mm shaft and MH Clamping Flange. S7 sealing option is shaft sealed to IP65. S8 sealing option is shaft sealed to IP67.
2   Please refer to CANopen Interface Technical Reference Manual at encoder.com.
3   Please refer to Technical Bulletin TB-546: SAE J1939 Interface and Process Data at encoder.com.
4   SAE J1939 can transmit a maximum of 32 bits in process data. The sum of single turn and multiturn results in a maximum of 32 bits. This can be, for example, 12-bit MT or 16-bit ST and 16-bit MT.
5   Please refer to Technical Bulletin TB-529: Understanding EPC's SSI Encoders at encoder.com.
6   Available with SSI only.
7   For mating connectors, cables, and cordsets see Accessories at encoder.com.
8   Available with CANopen and SAE J1939 only.

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See encoder.com for more information.

## Electrical

| | |
|---|---|
| Input Voltage | 5 to 32 VDC max<br>5 VDC SSI Only |
| Input Current | 50 mA typical for 5 to 32 VDC<br>80 mA typical for 5 VDC |
| Power Consumption | 0.5 W max |
| Resolution (Single) | 01 to 16 bit |
| Resolution (Multi) | 01 to 43 bit |
| Accuracy | <±0.0878° |
| Repeatability | <±0.0878° |
| CE/EMC | Immunity tested per EN 61000-6-2:2006<br>Emissions tested per EN 61000-6-3:2011 |

## Mechanical

| | |
|---|---|
| Max Shaft Speed | 8000 RPM<br>3600 RPM for IP69K |
| Shaft Rotation | Bi-directional |
| Radial Shaft Load | Bearing life of 1x10$^9$ revolutions:<br>6mm dia. 28 lbs (125N)<br>10 mm dia. 49 lbs (220 N) |
| Axial Shaft Load | Bearing life of 1x10$^9$ revolutions:<br>6mm dia. 27 lbs (120N)<br>10 mm dia. 27 lbs (120 N) |
| Starting Torque | 2.3 oz-in typical |
| Housing | All metal with protective finish |
| Bearings | 5 oz typical |
| Weight | 7.5 oz typical |

## Environmental

| | |
|---|---|
| Operating Temp | -40° C to 85° C |
| Storage Temp | -40° C to 100° C |
| Vibration | 30.6 g (10 Hz up to 2000 Hz) |
| Shock | 510 g (6 ms) |
| Sealing | IP67, shaft sealed to IP65; IP69K, shaft sealed to IP67 |

## CANopen Interface

| | |
|---|---|
| Protocol | CANopen<br>Communication profile CiA 301<br>Device profile for encoder CiA 406 V3.2 class C2 |
| Node Number | 0 to 127 (default 127) |
| Baud Number | 10 Kbaud to 1 Mbaud with automatic bit rate detection |

NOTE: The standard settings as well as any customization in the software can be changed via LSS (CiA 205) and the SDO protocol (e.g. PDOs, scaling, heartbeat, node-ID, baud rate, etc.)

## Programmable CANopen Transmission Modes

| | |
|---|---|
| Synchronis | When a synchornization telegram (SYNC) is received from another bus node, PDOs are transmitted independently |
| Asynchronis | A PDO message is triggered by an internal event (e.g. change of measured value, internal timer, etc.) |

## SAE J1939

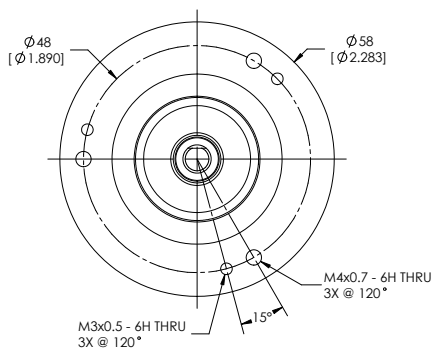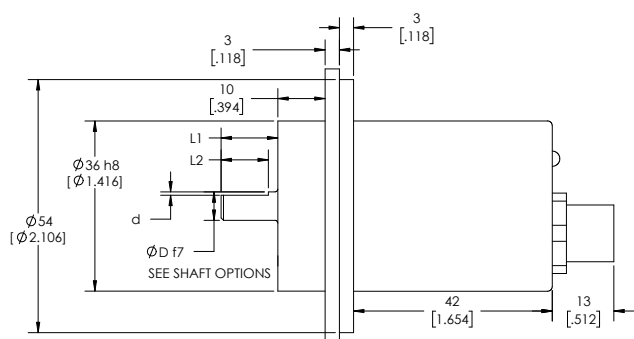| | |
|---|---|
| CAN physical layer | ISO 11898 (High Speed CAN) |
| Protocol | ISO 11898 (High Speed CAN) |
| Baud Rate | Auto-Baud-Detection |
| Standard Preset configuration | (other configurations on request) |
| Direction of counting | CCW (view from shaft end) |
| ECU-address | 0x0A |
| Process data Identifier | 0x18FF000A |
| PGN | 0xFF00 |
| Process data mapping | Byte 0-3 32 Bit Position Value<br>Byte 4      8 Bit Error Register<br>PDU timer and Position Preset can be adjusted by PGN configuration 0xEF00 (Prop. A) |
| PDU - Time | 50ms (default) |
| Configuration - PGN | 0xEF 00 (Prop. A) |
| Byte 0 | 0x01 |
| Byte 1 | 0xFF |
| Byte 2 | PDU time LSB |
| Byte 3 | PDU time MSB |
| Byte 4 | Preset LSB |
| Byte 5,6 | Preset |
| Byte 7 | Preset MSB |

## SSI Interface

| | |
|---|---|
| Clock Input | Via opto coupler |
| Clock Frequency | 100Kz to 500Kz, Higher frequencies may be available. Contact Customer Service. |
| Data Output | RS485/RS422 compatible |
| Output Code | Gray or binary |
| SSI Output | Angular position value |
| Parity Bit | Optional (even/odd) |
| Error Bit | Optional |
| Turn On Time | < 1.5 sec |
| Pos Counting Dir | Connect DIR to GND for CW<br>Connnect DIR to VDC for CCW<br>(when viewed from shaft end) |
| Set to Zero | Yes, see Technical Bulletin TB529: Understanding EPC's SSI Encoders |
| Protection | Galvanic Isolation with SSI option |

## MODEL A58SB CLAMPING FLANGE (MH) RADIAL CONNECTOR
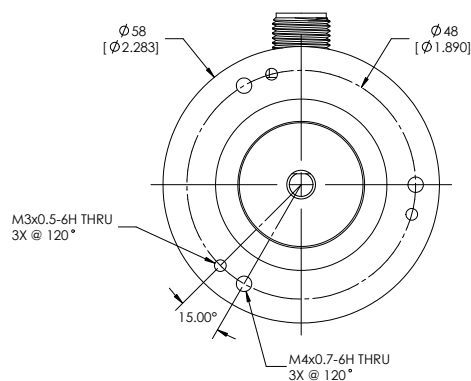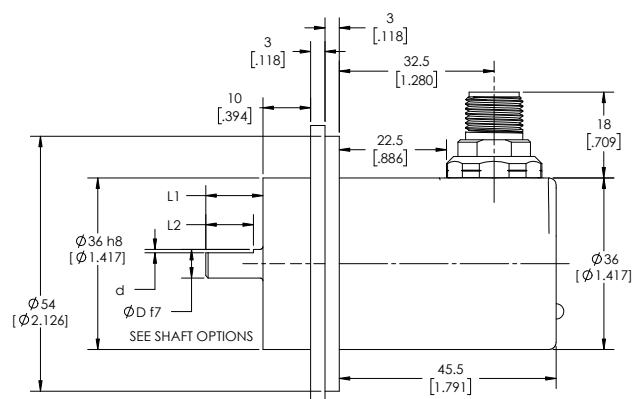


## MODEL A58SB CLAMPING FLANGE (MH) AXIAL CONNECTOR



*Primary dimensions are in mm, secondary dimensions [inches] in brackets for reference only.*

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## MODEL A58SB SYNCHRO FLANGE (MK) RADIAL CONNECTOR



## MODEL A58SB SYNCHRO FLANGE (MK) AXIAL CONNECTOR



## SHAFT SIZES

| SHAFT SIZE | ØD | L1 | d | L2 |
|---|---|---|---|---|
| 6mm | 6 [0.236] | 12 [0.472] | 0.70 [0.028] | 10 [0.394] |
| 10mm | 10 [0.394] | 20 [0.787] | no flat | n/a |

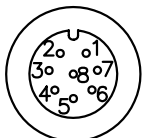*Primary dimensions are in mm, secondary dimensions [inches] in brackets for reference only.*

## WIRING TABLE

For EPC-supplied mating cables, refer to wiring table provided with cable.

For CE (Conformity European) requirements, use M12 cordset with shield connected to M12 coupling nut. Trim back and insulate unused wires.
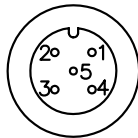
**SSI Encoders**
8-pin M12

| Function | 8-Pin M12 |
| --- | --- |
| Ground (GND) | 1 |
| +VDC | 2 |
| SSI CLK+ | 3 |
| SSI CLK- | 4 |
| SSI DATA+ | 5 |
| SSI DATA- | 6 |
| PRESET | 7 |
| DIR | 8 |
| Shield | Housing |

**CANopen and SAE J1939 Encoders**
5-pin M12

| Function | 5-Pin M12 |
| --- | --- |
| +VDC | 2 |
| Ground (GND) | 3 |
| CAN$_{High}$ | 4 |
| CAN$_{Low}$ | 5 |
| CAN$_{GND}$ / Shield | 1 |

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