

Absolute Encoders – Multiturn

Standard mechanical Multiturn, optical

Sendix 5868 / 5888 (Shaft / Hollow shaft)

EtherCAT



The multiturn encoders Sendix 5868 and 5888 with second-generation EtherCAT interface and optical sensor technology are ideal for use in all applications with an EtherCAT interface.

The data communication is based on CAN over EtherNet and ideally suited for use in real time applications.

These encoders are available with a solid shaft up to a maximum of 10 mm or a blind hollow shaft up to 15 mm.



EtherCAT
Conformance tested



Mechanical drive



Safety-Lock™



High rotational speed



Temperature range
-40...+80°C



High protection level
IP67



High shaft load capacity



Shock / vibration resistant



Magnetic field proof



Reverse polarity protection



Optical sensor



Seawater-resistant version on request

Reliable

- EtherCAT conformance tested
- Integration of the latest Slave – EtherCAT stack from Beckhoff, Version 5.01
- Ideally suited for use in harsh outdoor environments, thanks to IP67 protection and rugged housing construction

Flexible

- Use of CoE (CAN over EtherNet)
- Genuine new position information as a result of minimal cycle time of 62.5 µs in the DC mode
- Faster, easier error-free connection thanks to M12 connectors

Order code Shaft version

8.5868 . **XXB2** . **B2 12**

If for each parameter of an encoder the underlined preferred option is selected, then the delivery time will be 10 working days for a maximum of 10 pieces. Qts. up to 50 pcs. of these types generally have a delivery time of 15 working days.



a Flange

- 1** = clamping flange, IP65 ø 58 mm [2.28"]
- 3 = clamping flange, IP67 ø 58 mm [2.28"]
- 2** = synchro flange, IP65 ø 58 mm [2.28"]
- 4 = synchro flange, IP67 ø 58 mm [2.28"]
- 5 = square flange, IP65 □ 63.5 mm [2.5"]
- 7 = square flange, IP67 □ 63.5 mm [2.5"]

b Shaft (ø x L), with flat

- 1** = 6 x 10 mm [0.24 x 0.39"]¹⁾
- 2** = 10 x 20 mm [0.39 x 0.79"]²⁾
- 3 = 1/4" x 7/8"
- 4 = 3/8" x 7/8"

c Interface / Power supply

- B** = EtherCAT / 10 ... 30 V DC

e Fieldbus profile

- B2** = EtherCAT with CoE (CAN over EtherNet)

d Type of connection

- 2** = 3 x M12 connector, 4-pin

optional on request
- Ex 2/22
- seawater-resistant

Order code Hollow shaft

8.5888 . **XXB2** . **B2 12**

If for each parameter of an encoder the underlined preferred option is selected, then the delivery time will be 10 working days for a maximum of 10 pieces. Qts. up to 50 pcs. of these types generally have a delivery time of 15 working days.



a Flange

- 1 = with spring element long, IP65
- 2 = with spring element long, IP67
- 3 = with stator coupling, IP65 ø 65 mm [2.56"]
- 4 = with stator coupling, IP67 ø 65 mm [2.56"]
- 5** = with stator coupling, IP65 ø 63 mm [2.48"]
- 6 = with stator coupling, IP67 ø 63 mm [2.48"]

b Hollow shaft

- 3 = ø 10 mm [0.39"]
- 4** = ø 12 mm [0.47"]
- 5 = ø 14 mm [0.55"]
- 6 = ø 15 mm [0.59"]
- 8 = ø 3/8"
- 9 = ø 1/2"

c Interface / Power supply

- B** = EtherCAT / 10 ... 30 V DC

e Fieldbus profile

- B2** = EtherCAT with CoE (CAN over EtherNet)

d Type of connection

- 2** = 3 x M12 connector, 4-pin

optional on request
- Ex 2/22
- seawater-resistant

1) Preferred type only in conjunction with flange type 2
2) Preferred type only in conjunction with flange type 1

Absolute Encoders – Multiturn

| Standard mechanical Multiturn, optical | Sendix 5868 / 5888 (Shaft / Hollow shaft) | EtherCAT |
|---|--|-----------------------------|
| Mounting accessory for shaft encoders | | Order No. |
| Coupling | Bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"] | 8.0000.1101.0606 |
| | Bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"] | 8.0000.1101.1010 |
| Mounting accessory for hollow shaft encoders | | |
| Cylindrical pin, long for torque stops | With fixing thread | 8.0010.4700.0000 |
| | | |
| Connection technology | | |
| Connector, self-assembly (straight) | Coupling M12 for Port IN and Port OUT | 05.WASCSY4S |
| | Connector M12 for power supply | 05.B8141-0 |
| Cordset, pre-assembled | M12 for Port IN and Port OUT, 2 m [6.56'] PUR cable | 05.00.6031.4411.002M |
| | M12 for power supply, 2 m [6.56'] PUR cable | 05.00.6061.6211.002M |

Further accessories can be found in the accessories section or in the accessories area of our website at: www.kuebler.com/accessories
 Additional connectors can be found in the connection technology section or in the connection technology area of our website at: www.kuebler.com/connection_technology

Technical data

| Mechanical characteristics | | |
|---|-----------------------------|--|
| Max. speed | IP65 up to 70°C [158°F] | 9 000 min ⁻¹ , 7 000 min ⁻¹ (continuous) |
| | IP65 up to T _{max} | 7 000 min ⁻¹ , 4 000 min ⁻¹ (continuous) |
| | IP67 up to 70°C [158°F] | 8 000 min ⁻¹ , 6 000 min ⁻¹ (continuous) |
| | IP67 up to T _{max} | 6 000 min ⁻¹ , 3 000 min ⁻¹ (continuous) |
| Starting torque - at 20°C [68°F] | IP65 | < 0.01 Nm |
| | IP67 | < 0.05 Nm |
| Moment of inertia | Shaft version | 3.0 x 10 ⁻⁶ kgm ² |
| | Hollow shaft version | 7.5 x 10 ⁻⁶ kgm ² |
| Load capacity of shaft | radial | 80 N |
| | axial | 40 N |
| Weight | | approx. 0.54 kg [19.05 oz] |
| Protection acc. to EN 60529 | housing side | IP67 |
| | shaft side | IP65, opt. IP67 |
| EX approval for hazardous areas | | optional Zone 2 and 22 |
| Working temperature range | | -40°C ... +80°C [-40°F ... +176°F] |
| Material | shaft/hollow shaft | stainless steel |
| | flange | aluminium |
| | housing | zinc die-cast housing |
| Shock resistance acc. EN 60068-2-27 | | 2500 m/s ² , 6 ms |
| Vibration resistance acc. EN 60068-2-6 | | 100 m/s ² , 55 ... 2000 Hz |

| Electrical characteristics | |
|---|---------------------------|
| Power supply | 10 ... 30 V DC |
| Power consumption (no load) | max. 120 mA |
| Reverse polarity protection of the power supply (+V) | yes |
| UL approval | File 224618 |
| CE compliant acc. to | EMC guideline 2004/108/EC |
| RoHS compliant acc. to | guideline 2011/65/EU |

| Device characteristics | |
|------------------------------|--|
| Singleturn resolution | 1 ... 65535 (16 bit), scaleable |
| Default value | 8192 (13 bit) |
| Multiturn resolution | max. 4096 (12 bit) scalable only via the total resolution |
| Total resolution | 1 ... 268.435.456 (28 bit), scaleable |
| Code | binary |
| Protocol | EtherNet / EtherCAT |

| Diagnostic LED (red) |
|--|
| LED is ON with the following fault conditions: Sensor error (internal code or LED error), low voltage, over-temperature |

| Run LED (green) |
|---|
| LED is ON with the following conditions: Preop-, Safeop and Op-State (EtherCAT Status machine) |

| 2 x Link LEDs (yellow) |
|--|
| LED is ON with the following conditions (Port IN and Port OUT): Link detected |

| Modes |
|----------------------------|
| Freerun, Distributed Clock |

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EtherCAT

General information about CoE (CAN over EtherNet)

The EtherCAT encoders support the CANopen communication profile according to DS301. In addition device-specific profiles like the encoder profile DS406 are available.

Scaling, preset values, limit switch values and many other parameters can be programmed via the EtherCAT bus.

When switching the device on, all parameters are loaded from an EEPROM, where they were saved previously to protect them against power-failure.

The following output values may be combined as PDO (PDO mapping): **position, speed, temperature values** and **working area state** as well as other process values.

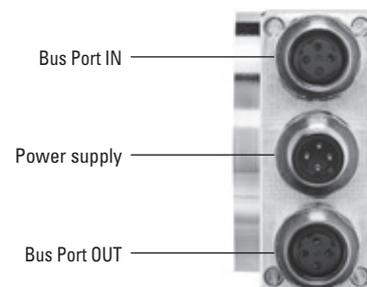
CANopen encoder profile 3.2.10 CoE (CAN over EtherNet)

The following parameters are programmable:

- Position update time of 62.5 µs
- EtherCAT certificate of conformity
- Speed with sign
- Four units for speed calculation: Steps/sec, Steps/100 ms, Steps/10 ms, RPM
- Time stamp as system time at the point in time when the position is read out
- Two working area state registers
- Along with the scaled position, the raw data – position as process value – is also mappable
- Dynamic Mapping
- Gating Time: setting of the time interval, via which the speed value can be interpolated
- Sensor temperature in degrees Celsius
- Comprehensive plausibility test when downloading parameters to the encoder
- Alarm and warning messages
- User interface with visual display of bus and fault status – 4 LEDs
- Extended error management for position sensing with integrated temperature control
- Implementation of the latest CANopen profile 3.2.10 from the 18th February 2011

Terminal assignment bus

| Interface | Type of connection | Function | M12 connector | | | | | Diagram |
|-----------|--------------------------|--------------|---------------|----------------|---------------|-----------------|----------------|---------|
| | | | Signal: | Transmit data+ | Receive data+ | Transmit data - | Receive data - | |
| B | 2 (3 x M12 connector) | Bus Port IN | Signal: | Transmit data+ | Receive data+ | Transmit data - | Receive data - | |
| | | | Abbreviation: | TxD+ | RxD+ | TxD- | RxD- | |
| | | | Pin: | 1 | 2 | 3 | 4 | |
| | | Power supply | Signal: | Voltage + | – | Voltage – | – | |
| | | | Abbreviation: | + V | – | 0 V | – | |
| | | | Pin: | 1 | 2 | 3 | 4 | |
| | | Bus Port OUT | Signal: | Transmit data+ | Receive data+ | Transmit data - | Receive data - | |
| | | | Abbreviation: | TxD+ | RxD+ | TxD- | RxD- | |
| | | | Pin: | 1 | 2 | 3 | 4 | |



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| | | |
|---|--|-----------------|
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|---|--|-----------------|

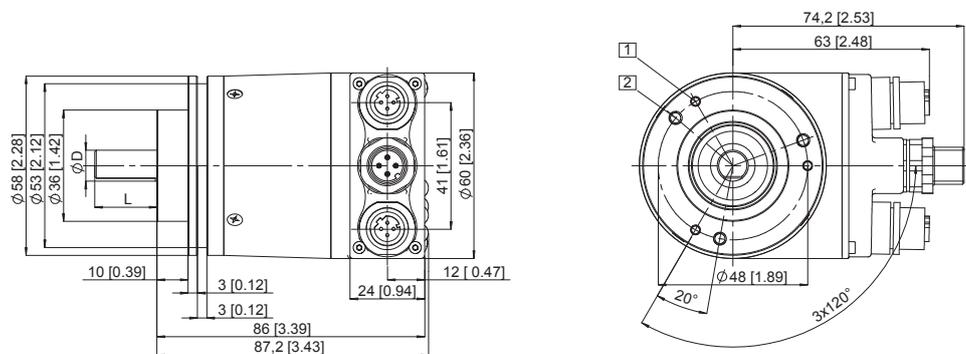
Dimensions shaft version, with removable bus terminal cover

Dimensions in mm [inch]

Clamping flange, \varnothing 58 [2.28] Flange type 1 and 3

- 1 3 x M3, 6.0 [0.24] deep
- 2 3 x M4, 8.0 [0.31] deep

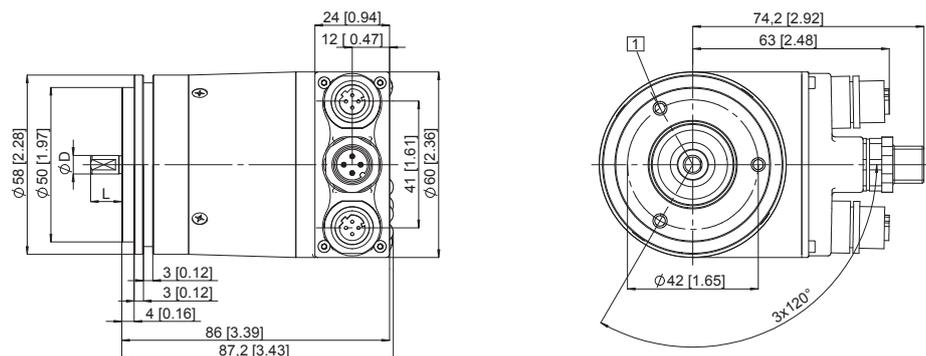
| D | L | Fit |
|-----------|-----------|-----|
| 6 [0.24] | 10 [0.39] | h7 |
| 10 [0.39] | 20 [0.79] | f7 |
| 1/4" | 7/8" | h7 |
| 3/8" | 7/8" | h7 |



Synchro flange, \varnothing 58 [2.28] Flange type 2 and 4

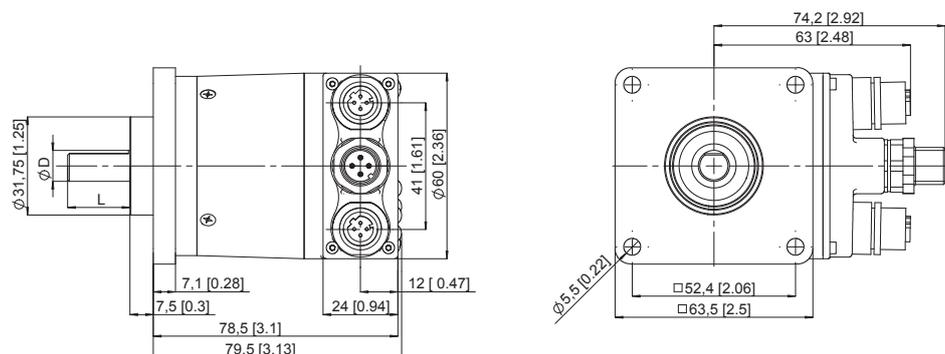
- 1 M4, 6.0 [0.24] deep

| D | L | Fit |
|-----------|-----------|-----|
| 6 [0.24] | 10 [0.39] | h7 |
| 10 [0.39] | 20 [0.79] | f7 |
| 1/4" | 7/8" | h7 |
| 3/8" | 7/8" | h7 |



Square flange, \square 63.5 [2.5] Flange type 5 and 7

| D | L | Fit |
|-----------|-----------|-----|
| 6 [0.24] | 10 [0.39] | h7 |
| 10 [0.39] | 20 [0.79] | f7 |
| 1/4" | 7/8" | h7 |
| 3/8" | 7/8" | h7 |



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Multiturn

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mechanical Multiturn, optical**

Sendix 5868 / 5888 (Shaft / Hollow shaft)

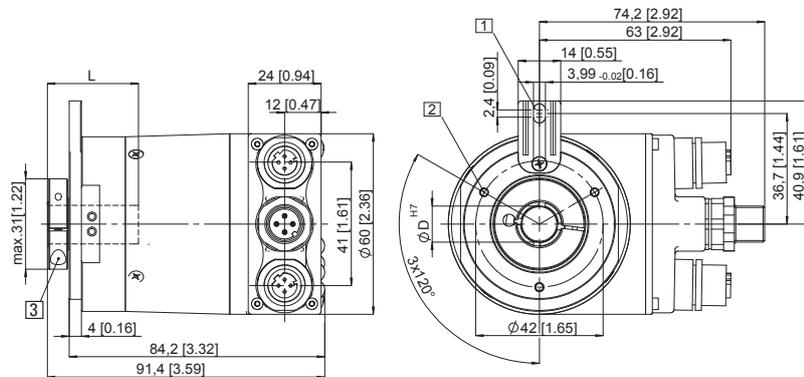
EtherCAT

Dimensions hollow shaft version (blind hollow shaft), with removable bus terminal cover

Dimensions in mm [inch]

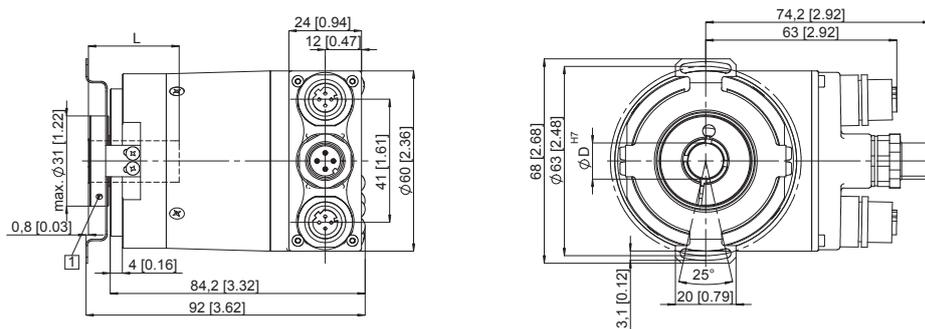
Flange with spring element long Flange type 1 and 2

- 1 Torque stop slot,
Recommendation:
Cylindrical pin DIN 7, $\varnothing 4$ [0.16]
 - 2 M3, 5.5 [0.21] deep
 - 3 Recommended torque for the
clamping ring 0.6 Nm
- L: Insertion depth for blind
hollow shaft: 30 [1.18]



Flange with stator coupling, $\varnothing 63$ [2.48] Flange type 5 and 6

- 1 Recommended torque for the
clamping ring 0.6 Nm
- L: Insertion depth for blind
hollow shaft: 30 [1.18]



Flange with stator coupling, $\varnothing 65$ [2.56] Flange type 3 and 4

- 1 Recommended torque for the
clamping ring 0.6 Nm
- L: Insertion depth for blind
hollow shaft: 30 [1.18]

