

Absolute Encoders - Singleturn

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| Standard ATEX/IECEx – Zone 1/21, optical | Sendix 7053 (Shaft) | SSI / BiSS-C |
|--|----------------------------|---------------------|



The Sendix 7053 absolute encoders – Singleturn offer Ex protection in a compact 70 mm seawater resistant aluminium housing, with an SSI or BiSS-C interface and optical sensor technology.

These shock and vibration-resistant encoders operate flexibly with a resolution of up to 17 bits; they are also available with axial and radial cable outlets.



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Singleturn

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|-------------|--------------|-----------------------|-----------------------|--------------------------|-----------------------------|----------------------|---------------------|-----------------------------|----------------|--------------------|
| | | | | | | | | | | |
| Ex approval | Safety-Lock™ | High rotational speed | High protection level | High shaft load capacity | Shock / vibration resistant | Magnetic field proof | Short-circuit proof | Reverse polarity protection | Optical sensor | Seawater-resistant |

Compact and safe

- Can be used even when space is tight
- Minimal installation depth, diameter 70 mm
- Compact cable outlet axial or radial
- Can be operated in marine environments – housing and flange manufactured from seawater-resistant aluminium
- Remains sealed even in harsh everyday use and ensures highest safety against field breakdowns (IP67 protection)

Explosion protection

- “Flameproof-enclosure” version
- ATEX with EC type examination certificate
- IECEx with Certificate of Conformity (CoC)

| | | | | | | | | | | |
|-----------------------------------|---|----------------------------------|--|--|--|------------------|---------------|--|---|---|
| Order code | 8.7053 | 1 | X | 2 | X | X | X | 2 | 1 | XXXX |
| Shaft version | Type | a | b | c | d | e | f | g | h | i ¹⁾ |
| a Flange | 1 = clamping-synchronous flange, IP67, ø 70 mm [2.76"] | e Code | B = SSI, Binary C = BiSS-C, Binary G = SSI, Gray | g Inputs / Outputs²⁾ | 2 = SET, DIR input additional status output | h Options | 1 = no option | i Cable length in dm¹⁾ | 0050 = 5 m [16.40'] 0100 = 10 m [32.81'] 0150 = 15 m [49.21'] | <i>optional on request - special cable length</i> |
| b Shaft (ø x L) | 2 = 10 x 20 mm [0.39 x 0.79"], with flat 1 = 12 x 25 mm [0.47 x 0.98"], with keyway for 4 x 4 mm [0.16 x 0.16"] key | f Resolution²⁾ | A = 10 bit ST 1 = 11 bit ST 2 = 12 bit ST 3 = 13 bit ST 4 = 14 bit ST 7 = 17 bit ST | | | | | | | |
| c Interface / Power supply | 2 = SSI or BiSS-C / 10 ... 30 V DC | | | | | | | | | |
| d Type of connection | 1 = axial cable, 2 m [6.56'] PUR 2 = radial cable, 2 m [6.56'] PUR A = axial cable, length > 2 m [6.56'] B = radial cable, length > 2 m [6.56'] preferred length see i , e. g.: 0100 = 10 m [32.81'] | | | | | | | | | |

| | |
|--|--|
| Mounting accessory for shaft encoders | Order No. |
| Coupling | Bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"] |
| | 8.0000.1101.1010 |

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

1) Not applicable with connection types 1 and 2
2) Resolution, preset value and counting direction factory-programmable

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Technical data

| Explosion protection ATEX | |
|--|---|
| EC type-examination certificate | PTB09 ATEX 1106 X |
| Category (gas) | II 2 G Ex d IIC T4 - T6 Gb |
| Category (dust) | II 2D Ex tb IIIC T135°C - T85°C Db IP6x |
| Directive 94/9/EC | EN 60079-0: 2009; EN 60079-1: 2007; EN 60079-31: 2009 |

| Explosion protection IECEx | |
|--|---|
| Certificate of Conformity (CoC) | IECEx PTB 13.0026 X |
| Category (gas) | Ex d IIC T4 - T6 Gb |
| Category (dust) | Ex tb IIIC T135°C - T85°C Db IP6x |
| IECEx | IEC 60079-0:2007; IEC 60079-1:2007; IEC 60079-31:2008 |

| Mechanical characteristics | |
|---|---|
| Max. speed | 6 000 min ⁻¹ (continuous) |
| Starting torque - at 20°C [68°F] | < 0.05 Nm |
| Moment of inertia | 4.0 x 10 ⁻⁶ kgm ² |
| Load capacity of shaft | radial 80 N axial 40 N |
| Weight | approx. 1.3 kg [45.86 oz] |
| Protection acc. to EN 60529 | IP67 |
| Working temperature range | -40°C ... +60°C [-40 ... +140°F] |
| Material | shaft stainless steel flange / housing seawater-resistant Al, type AISiMgMn (EN AW-6082) (stainless steel on request) cable PUR |
| 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 |
| Current consumption (no load) | max. 45 mA |
| Reverse polarity protection for power supply (+V) | yes |
| Short-circuit proof outputs | yes ¹⁾ |
| CE compliant acc. to | EMC guideline 2004/108/EC ATEX guideline 94/9/EC |
| RoHS compliant acc. to | guideline 2011/65/EU |

| DIR input | |
|---|--|
| A High signal switches the direction of rotation from the default CW to CCW. The reverse function can also be factory-programmed. | |
| If DIR is reversed when the device is already switched on, this will be interpreted as an error. The status output switches to LOW. | |

| Power-ON delay | |
|---|--|
| After Power-ON, the device requires a time of approximately 150 ms before valid data can be read. | |

| SSI interface | |
|--|--|
| Output driver | RS485 Transceiver type |
| Permissible load/channel | max. 20 mA |
| Signal level | HIGH typ 3.8 V LOW at I _{Load} = 20 mA typ 1.3 V |
| Singleturn resolution | 10...14 bit and 17 bit ²⁾ |
| Number of revolutions | 4096 (12 bit) |
| Code | Binary or Gray |
| SSI clock rate | 50 kHz ... 2 MHz |
| Monoflop time | < 15 μs ²⁾ |
| Note: if clock starts cycling within monoflop time a second data transfer starts with the same data. If clock starts cycling after monoflop time, the data transfer starts with updated values. The update rate depends on clock speed, data length and monoflop time. | |
| Data refresh rate | resolution ≤ 14 bit < 1 μ resolution ≥ 15 bit < 4 μs |
| Status and parity bit | on request |

| BiSS-C interface | |
|------------------------------|---|
| Singleturn resolution | 10 ... 14 bit and 17 bit ²⁾ |
| Code | Binary |
| Clock rate | up to 10 MHz |
| Max. update rate | < 10 μs, depends on the clock rate and the data length |
| Data refresh rate | ≤ 1 μs |
| Note: | – Bidirectional, factory programmable parameters are: resolution, code, direction, alarms and warnings – CRC data verification |

| SET input | |
|---|--|
| Input | HIGH active |
| Input type | Comparator |
| Signal level (+V = Power supply) | HIGH min. 60 % of +V max. +V LOW max. 25 % of +V |
| Input current | < 0.5 mA |
| Min. pulse duration (SET) | 10 ms |
| Timeout after SET signal | 14 ms |
| Response time (DIR input) | 1 ms |

The encoder can be set to zero at any position by means of a HIGH signal on the SET input. Other preset values can be factory-programmed. The SET input has a signal delay time of approximately 1 ms. Once the SET function has been triggered, the encoder requires an internal processing time of approximately 15 ms before the new position data can be read.

| Status output | |
|-------------------------|---|
| Output driver | Open Collector, internal pull-up resistor 22 kOhm |
| Permissible load | max. 20 mA |
| Signal level | HIGH +V LOW < 1 V |
| Active at | LOW |

The status output serves to display various alarm or error messages. The status output is HIGH (Open Collector with internal pull-up 22k) in normal operation.

1) Short-circuit with 0 V or output, only one channel at a time, power supply correctly applied
2) Other options on request

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Terminal assignment

| Interface | Type of connection | Features | Cable (isolate unused wires individually before initial start-up) | | | | | | | | | | | | | |
|-----------|--------------------|----------|---|-----|----|----|----|----|----|-----|-----|------|-------|--------|--|--|
| | | | Signal: | 0 V | +V | C+ | C- | D+ | D- | SET | DIR | Stat | ⊥ | | | |
| 2 | 1, 2, A, B | SET, DIR | Cable marking: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | YE/GN | shield | | |

- +V: Encoder power supply +V DC
- 0 V: Encoder power supply ground GND (0 V)
- C+, C-: Clock signal
- D+, D-: Data signal
- SET: Set input. The current position becomes defined as position zero.
- DIR: Direction input: If this input is active, output values are counted backwards (decrease) when the shaft is turning clockwise.
- Stat: Status output
- ⊥: Protective earth

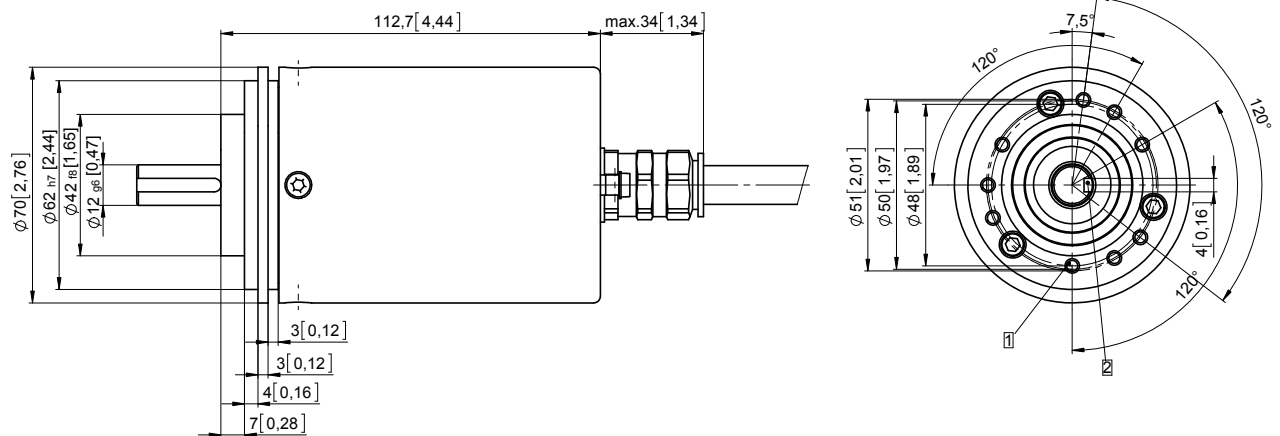
Dimensions

Dimensions in mm [inch]

Clamping-synchronous flange, \varnothing 70 [2.76]

Shaft type 1 with axial cable outlet

- 1 6 x M4, 10 [0.39] deep
- 2 Keyway for DIN 6885-A-4x4x25 key



Clamping-synchronous flange, \varnothing 70 [2.76]

Shaft type 2 with radial cable outlet

- 1 6 x M4, 10 [0.39] deep

