

Rotary Measuring Technology

Absolute singleturn encoder shaft version

Universal Type 5850



- Highest shock resistance on the market ($\geq 2500 \text{ m/s}^2$, 6 ms acc. to DIN IEC 68-2-27)
- SSI, parallel or current (4 ... 20 mA) interface
- Divisions: up to 16384 (14 bits), singleturn
- Housing \varnothing 58 mm
- IP 65
- Various options (e.g. LATCH, SET...)
- Gray, Binary or BCD code
- Temperature and ageing compensation
- Short-circuit proof outputs
- Patented new type of construction integrates all components; use of an opto-asic and 6-layer multilayer technology now on just a single PCB with resolution of up to 14 bits.
- 4 ... 20 mA output
- available as explosion proof zone 2 and 22

Mechanical characteristics:

| | |
|--|---|
| Speed: | max. 12000 min ⁻¹ |
| Rotor moment of inertia: | appr. 1,8 x 10 ⁻⁶ kgm ² |
| Starting torque: | < 0,01 Nm |
| Radial load capacity of shaft: | 80 N |
| Axial load capacity of shaft:: | 40 N |
| Weight: | appr. 0,4 kg |
| Protection acc. to EN 60 529: | IP 65 |
| Working temperature: | -20° C ... +85 °C ¹⁾ |
| Operating temperature: | -20° C ... +90 °C ¹⁾ |
| Shaft: | stainless steel |
| Shock resistance acc. to DIN-IEC 68-2-27 | 2500 m/s ² , 6 ms |
| Vibration resistance acc. to DIN-IEC 68-2-6: | 100 m/s ² , 10...2000 Hz |

¹⁾ 80 °C with cable

Divisions and code types available at short notice

Gray/Binary
250, **360**, 500, **720**, 900, **1000**,
1024 (10 Bit), 1250, 1440, 1800, 2000, 2500,
2880, **3600**, 4000, **4096** (12 Bit), 5000, 7200,
8192 (13 Bit), **16384** (14 Bit)

BCD
250, **360**, 500, **720**, 900, **1000**,
1024, 1250, 1440, 1800, 2000
Other on request

Preferred divisions are bold
(reduced delivery time).

Electrical characteristics SSI or parallel interface:

| Interface type: | Synchronous-Serial (SSI) | Synchronous-Serial (SSI) | Parallel | Parallel |
|---|--------------------------|--------------------------|----------------|-----------------------------|
| Supply voltage (U _B): | 5 V DC (± 5 %) | 10 ... 30 V DC | 5 V DC (± 5 %) | 10 ... 30 V DC |
| Output driver: | RS 485 | RS 485 | Push-pull | Push-pull |
| Current consumption typ.: | 89 mA | 89 mA | 109 mA | 109 mA |
| (no load) max.: | 138 mA | 138 mA | 169 mA | 169 mA |
| Permissible load/channel: | max. +/- 20 mA | max. +/- 20 mA | max. +/- 10 mA | max. +/- 10 mA |
| Word change frequency | max. 15.000/s | max.15.000/s | 40.000/s | 40.000/s |
| SSI pulse rate min./max.: | 100 kHz/500 kHz | 100 kHz/500 kHz | - | - |
| Signal level high: | typ. 3,8 V | typ. 3,8 V | min.3,4 V | min. U _B – 2,8 V |
| Signal level low (I _{Load} = 20 mA): | typ. 1,3 V | typ. 1,3 V | - | - |
| (I _{Load} = 10 mA): | - | - | max. 1,5 V | max. 1,8 V |
| (I _{Load} = 1 mA): | - | - | max. 0,3 V | - |
| Rise time t _r (without cable): | max. 100 ns | max. 100 ns | max. 0,2 μs | max. 1 μs |
| Fall time t _f (without cable): | max. 100 ns | max. 100 ns | max. 0,2 μs | max. 1 μs |
| Short circuit proof outputs: ¹⁾ | yes | yes ²⁾ | yes | yes |
| Reverse connection protection at U _B : | no | yes | no | yes |
| Conforms to CE requirements acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3 | | | | |

¹⁾When supply voltage correctly applied

²⁾Only one channel at a time: when U_B = 5 V DC, short-circuit to channel, 0 V or U_B is permitted.
When U_B = 10 ... 30 V DC short-circuit to channel or 0 V is permitted.

Universal Type 5850

Electrical characteristics current interface 4 ... 20 mA

Sensor part

| | | |
|-----------------------------------|----------------|---------------|
| Interface type: | 4 ... 20 mA | 4 ... 20 mA |
| Supply voltage (U _B): | 10 ... 30 V DC | 5 V DC |
| Current consumption typ.: | 70 mA | 70 mA |
| (no load) max.: | 84 mA | 84 mA |
| Word change frequency: | max. 15.000/s | max. 15.000/s |

Current loop

| | |
|---|----------------|
| Supply voltage: | 10 ... 30 V DC |
| Analogue signal: | 4 ... 20 mA |
| max. input resistance of the input circuit: | 200 Ω |
| Measuring range: | 0 ... 360 ° |
| Max. Failure (25 °C): | 0,2 ° |
| Resolution: | 13 Bit |
| Building up time: | max. 2 ms |
| Temperature coefficient: | 0,1°/10 K |
| Current if detector error: | ≤ 3,5 mA |

Sensor and current loop are galvanically insulated

Conforms to CE requirements acc. to EN 61000-6-1, EN 61000-6-4 and EN 61000-6-3

Control inputs:

Up/down input to switch the counting direction

As a standard, absolute encoders deliver increasing code values when the shaft rotates clockwise (cw), when looking from the shaft side. When the shaft rotates counter-clockwise (ccw), the output delivers accordingly decreasing code values. The same applies to models with current interfaces. When the shaft rotates clockwise, the output delivers increasing current values, and decreasing values when it rotates counter-clockwise.

As long as the Up/down input receives the corresponding signal (high), this feature is reversed. Clockwise rotation will deliver decreasing code/current values while counter-clockwise rotation will deliver increasing code/current values.

The response time is : for 5 V DC supply voltage, 0.4 ms
 for 10-30 V DC supply voltage, 2 ms.

Switching level of the control inputs:

| | | |
|-----------------|--------|----------------|
| Supply voltage: | 5 V DC | 10 ... 30 V DC |
| low | ≤1,7 V | ≤ 4,5 V |
| high | ≥3,4 V | ≥8,7 V |

SET input

This input is used to reset (to zero) the encoder. A control pulse (high) sent to this input allows storing the current position value as new zero position in the encoder.

For models equipped with a current interface, the analogue output (4 ... 20 mA) will be set accordingly to the value 4 mA.

Note : before activating the SET input after supplying the encoder with the supply voltage, a counting direction (cw or ccw) must be defined univocally on the Up/down input!

The response time is : for 5 V DC supply voltage, 0.4 ms
 for 10 ... 30 V DC supply voltage, 2 ms.

LATCH input

This input is used to „freeze“ the current position value. The position value will be statically available on the parallel output as long as this input will remain active (high).

The response time is : for 5 V DC supply voltage, 140 µs,
 for 10 ... 30 V DC
 supply voltage, 200 µs.

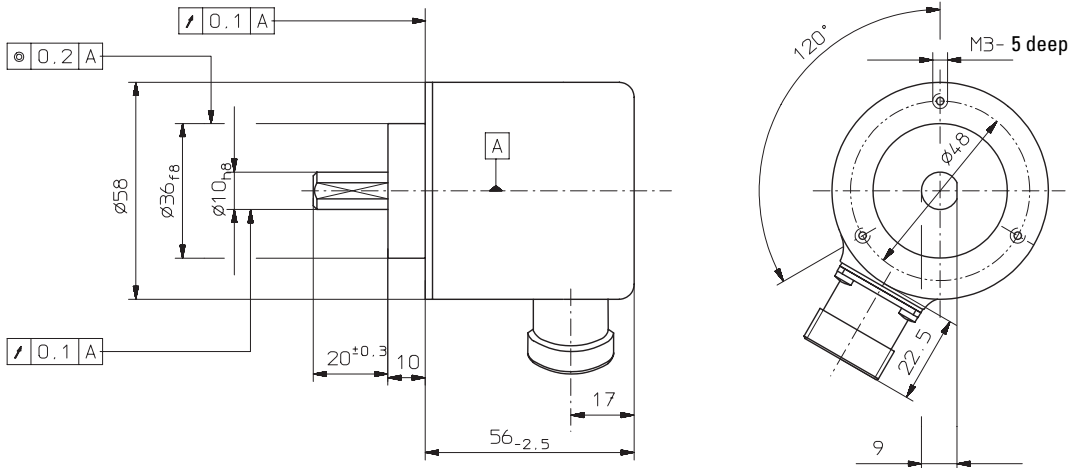
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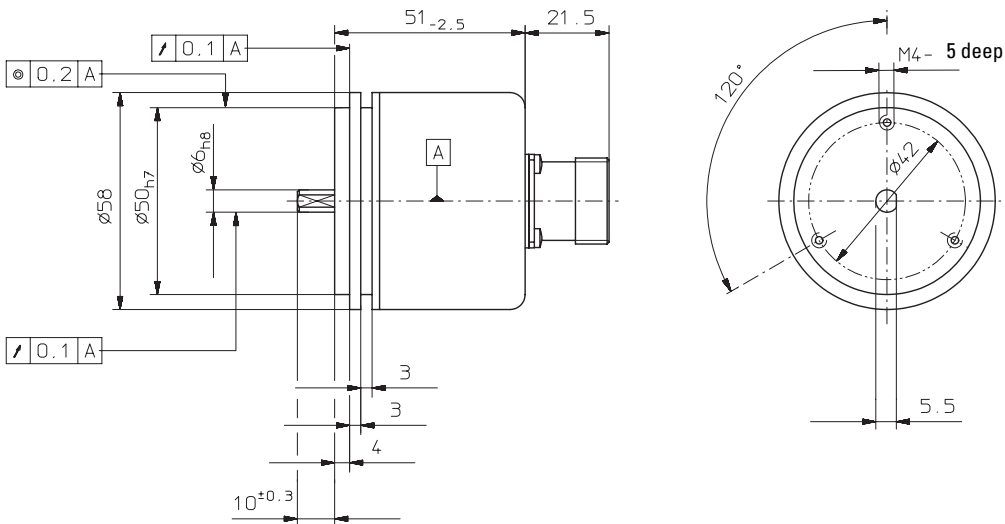
Universal Type 5850

Dimensions:

Clamping flange with Shaft $\varnothing 10$



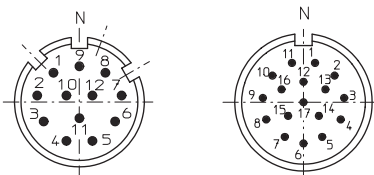
Synchronous flange with shaft $\varnothing 6$ mm



Top view of mating side, male contact base:

12 pin plug

17 pin plug



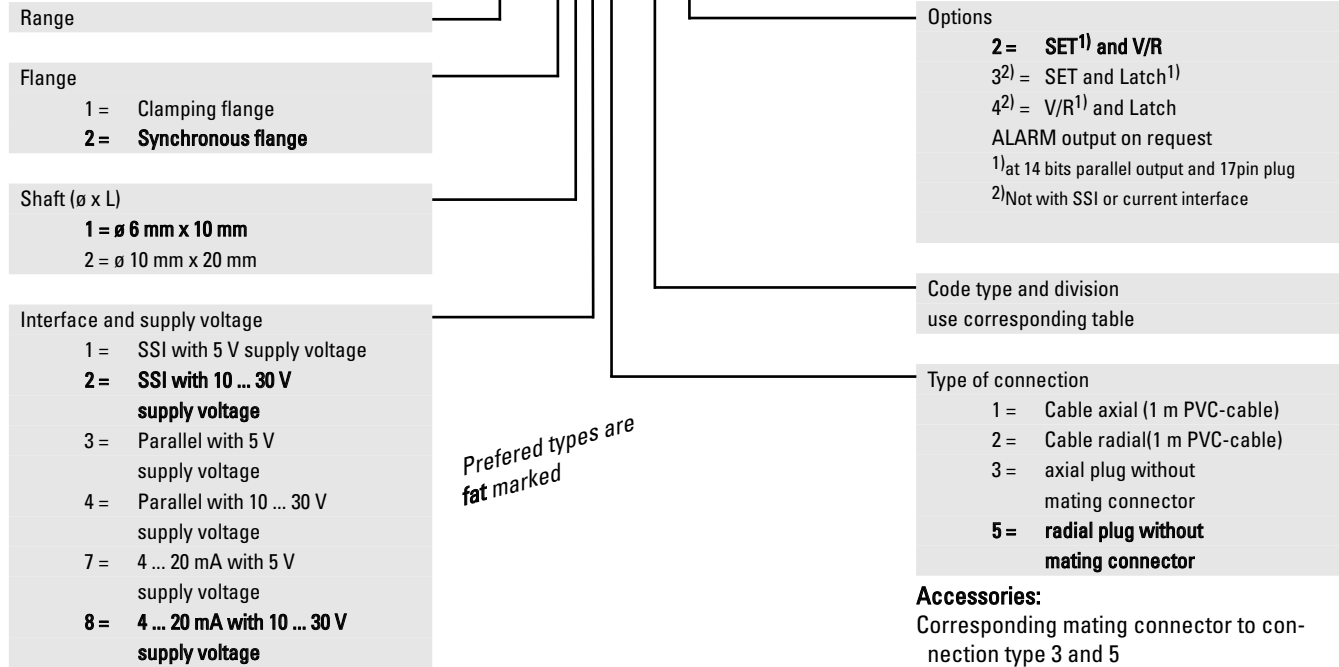
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Order code:

8.5850.XXXX.XXXX



| Stock types |
|------------------|
| 8.9000.1145.5000 |

Code type and division for encoder with parallel output (Interface and supply voltage, version 3 or 4)

| Division | Order code | Order code | Order code |
|-----------------------|------------------|------------|------------|
| | Gray/Gray-Excess | Binary | BCD |
| 250 | E02 | B02 | D02 |
| 360 | E03 | B03 | D03 |
| 500 | E05 | B05 | D05 |
| 720 | E07 | B07 | D07 |
| 900 | E09 | B09 | D09 |
| 1000 | E01 | B01 | D01 |
| 1024 (10 Bit) | G10 | B10 | D10 |
| 1250 | E12 | BA2 | DA2 |
| 1440 | E14 | BA1 | DA1 |
| 1800 | E18 | B18 | D18 |
| 2000 | E20 | B20 | D20 |
| 2500 | E25 | B25 | |
| 2880 | E28 | B28 | |
| 3600 | E36 | B36 | |
| 4000 | E40 | B40 | |
| 4096 (12 Bit) | G12 | B12 | |
| 5000 | E50 | B50 | |
| 7200 | E72 | B72 | |
| 8192 (13 Bit) | G13 | B13 | |
| 16384 (14 Bit) | G14 | B14 | |

Preferred divisions are bold

Code type and division for encoder with SSI output

Interface and supply voltage, version 1 or 2

| Division | Order code | Order code |
|----------------|------------|------------|
| | Gray | Binary |
| 1024 (10 Bit) | G10 | B10 |
| 4096 (12 Bit) | G12 | B12 |
| 8192 (13 Bit) | G13 | B13 |
| 16384 (14 Bit) | G14 | B14 |

Code type and division for encoder with analogue output

Interface and supply voltage, version 7 or 8
(4 ... 20 mA)

| | |
|---------------|-----|
| 8192 (13 Bit) | G13 |
|---------------|-----|