Standard, optical / magnetic | **5862 / 5882 (Shaft / Hollow shaft)** | **SSI / RS485, programmable**

The Sendix multiturn encoders 5862 and 5882, with SSI or RS485 interface and combined optical and magnetic sensor technology, offer a maximum resolution of 25 bits.

These encoders are programmable via the Ezturn software.

The hollow shaft version boasts a minimal installation depth, facilitating use where space is tight.

High rotational speed | Temperature | High IP value | High shaft load capacity | Shock / vibration resistant | Short circuit proof | Reverse polarity protection

Compact

- Hollow shaft version with just 43 mm installation depth
- Hollow shaft version up to 12 mm diameter

Flexible

- With SSI or RS485 interface
- Programmable via Ezturn
- Numerous connection options due to wide range of connection types

Order code Shaft version

8.5862 . X X X X . XXXX
Type — a b c d — e

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. 10 by 10

a *Flange*
1 = clamping flange
2 = synchro flange

b *Shaft (ø x L), with flat*
1 = ø 6 x 10 mm
2 = ø 10 x 20 mm

c *Interface / Power supply*
2 = SSI / 5 ... 30 V DC, with 4 status outputs
3 = RS485, half-duplex / 5 ... 30 V DC, internal termination
5 = SSI / 5 ... 30 V DC, with incremental track A, B, $\overline{A}$, $\overline{B}$, 2048 PPR
7 = RS485, half-duplex / 5 ... 30 V DC, external termination
9 = SSI / 4.75 ... 30 V DC, with 2 status outputs and 2 sensor outputs for monitoring the voltage on the encoder

d *Type of connection*
1 = axial cable (1 m PVC)
2 = radial cable (1 m PVC)
3 = M23 connector axial, mating connector
4 = M23 connector, radial, without mating connector

d *SSI interface* [1]
2001 = 4096 x 4096 (24 bit), Binary
2002 = 8192 x 4096 (25 bit), Binary
2003 = 4096 x 4096 (24 bit), Gray
2004 = 8192 x 4096 (25 bit), Gray

RS485 interface, half-duplex
3001 = ESC Protocol, max. 38400 Baud

Order code Hollow shaft

8.5882 . X X X X . XXXX
Type — a b c d — e

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. 10 by 10

a *Flange*
1 = through hollow shaft torque stop, clamping side flange [2]
3 = through hollow shaft torque stop, clamping side flange [2]

b **Hollow shaft**
6 = ø 10 mm
8 = ø 12 mm

c *Interface / Power supply*
2 = SSI / 5 ... 30 V DC, with 4 status outputs
3 = RS485, half-duplex / 5 ... 30 V DC, internal termination
5 = SSI / 5 ... 30 V DC, with incremental track A, B, $\overline{A}$, $\overline{B}$, 2048 PPR
7 = RS485, half-duplex / 5 ... 30 V DC, external termination
9 = SSI / 4.75 ... 30 V DC, with 2 status outputs and 2 sensor outputs for monitoring the voltage on the encoder

d *Type of connection*
1 = radial cable (1 m PVC)
2 = M23 connector, radial, without mating connector

d *SSI interface* [1]
2001 = 4096 x 4096 (24 bit), Binary
2002 = 8192 x 4096 (25 bit), Binary
2003 = 4096 x 4096 (24 bit), Gray
2004 = 8192 x 4096 (25 bit), Gray

RS485 interface, half-duplex
3001 = ESC Protocol, max. 38400 Baud

1) This factory set (default) resolution (25 bit, Gray, cw) can be changed by using the Ezturn programming software.
2) Clamping side cover available on request

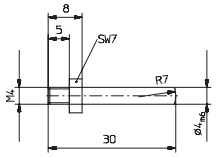
Absolute Encoders – Multiturn

Standard, optical / magnetic | **5862 / 5882 (Shaft / Hollow shaft)** | **SSI / RS485, programmable**

Mounting accessory for shaft encoders

Coupling	Bellows coupling ø 19 mm for shaft 6 mm	**8.0000.1101.0606**
	Bellows coupling ø 19 mm for shaft 10 mm	**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	M23	**8.0000.5012.0000**
Cordset, pre-assembled with 2 m PVC cable	M23	**8.0000.6901.0002.0031**

Programming set

including:	- Interface converter - Connection cable from interface converter to encoder - Power supply 90 ... 250 V AC - DVD with Ezturn® software	Minimum System Requirements: Operating system: Windows XP SP3 or higher Win7 in preparation Processor: 1 GHz RAM : 512 MB Required disk space: 500 MB	**8.0010.9000.0004**

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.

Mechanical characteristics

Speed		max. 6.000 min^{-1} [1]
Rotor moment of inertia	shaft version	approx. 1.8 x 10^{-6} kgm^2
	hollow shaft version	approx. 6 x 10^{-6} kgm^2
Starting torque	shaft version	< 0.01 Nm
	hollow shaft version	< 0.05 Nm
Load capacity of shaft	radial [2]	80 N
	axial [2]	40 N
Weight		ca. 0.4 kg
Protection acc. to EN 60 529		IP65
Temperature range		-20°C ... +85°C
Materials	shaft / hollow shaft	stainless steel h8
Shock resistance acc. EN 60068-2-27		2500 m/s^2, 6 ms
Vibration resistance acc. EN 60068-2-6		100 m/s^2, 10...2000 Hz

General electrical characteristics

Power supply (U_B)		5.0 ... 30 V DC [5]
Power consumption (no load)	typ.	89 mA
	max.	138 mA
Short circuit proof outputs [3]		yes [4]
Reverse connection at U_B		yes
CE compliant acc. to	EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3 Behaviour under magnetic influence acc. to EN 61000-4-8, Severity level 5	
UL-certified	File 224618	
RoHS compliant acc. to	EU-guideline 2002/95/EG	

SSI Interface

Output driver		RS485
Permissible load / channel		max. +/- 20 mA
Update rate for position data		approx. 1600/s
SSI clock rate		100 kHz / 500 kHz
Signal level	high	typ. 3.8 V
	low (I_{Load} = 20 mA)	typ. 1.3 V
Rising edge time t_r (without cable)		max. 100 ns
Falling edge time t_f (without cable)		max. 100 ns

Control inputs (V/R, SET)

Voltage		5 ... 30 V DC = U_B
Response time		10 ms
Switching level	low	max. 25% U_B
	high	min. 60% U_B, max. U_B
Max. Input current		≤ 0.5 mA

Control outputs

Output driver		Push-Pull
Max. Output current		± 9.0 mA
Signal level	high	min. U_B - 3.0 V
	low	max. 1.5 V
Rising edge time t_r		max. 240 µs
Falling edge time t_f		max. 300 µs

Incremental outputs (A/B)

Output driver		RS422 compatible
SSI clock rate min. / max. / pulse frequency		200 kHz
Signal level	high	4.5 V
	low (I_{Load} = 20 mA)	0.5 V
Rising edge time t_r (without cable)		max. 200 ns
Falling edge time t_f (without cable)		max. 200 ns

1) Hollow shaft version: For continuous operation max. 3000 min^{-1}
2) At shaft end
3) If supply voltage U_B correctly applied
4) Only one channel allowed to be shorted-out:
at U_B = 5 V short circuit to channel, 0 V, or +U_B is permitted.
at U_B = 5 ... 30 V short circuit to channel or 0 V is permitted.
5) The supply voltage at the encoder input must not be less than 4.75 V (5 V - 5%)

Standard, optical / magnetic | **5862 / 5882 (Shaft / Hollow shaft)** | **SSI / RS485, programmable**

Control inputs

Up/Down input to switch the counting direction

The encoder can output increasing code values when the shaft is rotated either clockwise or counter-clockwise (when looking from the shaft side).

There are two methods for selecting the appropriate option:

1. Via a hardware configuration of the V/R input BEFORE powering up the encoder
2. By programming the device using the Kübler „Ezturn®" programming tool.

The following table shows the choice of functions determined by the hardware and software settings:

Hardware configuration of the V/R input	Programmed selection using the EzTurn® programming tool	Function: increasing code value when the shaft is in the following direction:
„low" (0V) on the V/R-input (=cw)	cw	cw
„high" (+U_B) on the V/R-input (= ccw)	cw	ccw
„low" (0V) on the V/R-input (=cw)	ccw	ccw
„high" (+U_B) on the V/R-input (= ccw)	ccw	ccw

Notes:

– Any hardware configuration of the V/R input must take place BEFORE powering up the encoder!

– If the V/R input is not configured, then a 0 V configuration will apply (default condition)!

– If the direction of rotation is changed due to the V/R configuration, without activating the SET function again, and if the encoder is also then powered up again, a new position value may be outputted, even if the physical shaft position of the encoder has not moved! This is due to internal conversion processes.

– The start-up procedure for the encoder should therefore follow this sequence:

1. Determine the count direction of the encoder either via the V/R input or via programming
2. Apply power to the encoder
3. Activate the SET function, if desired (see SET input below)

– If using a cable wire to configure the V/R input, then for EMC reasons the wire should not remain open but should be tied either to 0 V or U_B!

– The response time of the V/R input with U_B = 5 ... 30 V DC power supply is 10 ms.

SET input

This input is used for a one-time alignment (zeroing) of the encoder immediately after installation. A high control pulse (+U_B) applied to this input for a minimum of 10 ms will reset the current encoder position to the pre-programmed setpoint value.

The programming of the setpoint can be carried out with Kübler's Ezturn® programming software or can, on request, be done in advance at the factory. The default value is zero. However anyvalue within the encoder's measuring range can be defined.

Notes:

- The SET function should only be implemented when the encoder shaft is at rest.
- For the duration of the SET pulse the SSI interface does not function and therefore does not output any valid position values! In order to avoid malfunctions, no SSI clock pulse should occur during the SET pulse.
- If a cable wire is used to configure the SET input, then for EMC reasons the wire should not remain open but should if at all possible be tied to 0 V, provided no SET pulse is triggered!
- The response time of the SET input with +U_B = 5 ... 30 V DC power supply is 10 ms.

Outputs [1]

Output	Default-function [2]
A1	battery control
A2	not activated
A3	not activated [3]
A4	not activated [3]

The outputs are not activated in the factory setting (default). They can be activated and defined with the optional Ezturn® programming software e.g. limit switch, overspeed and temperature control etc.

Functionality of the Ezturn® software

- Configuration function
- Setting of the communication parameters
- Setting of a drive factor by means of the modification of the resolution per revolution, the number of revolutions and the total resolution
- Programming of the direction of rotation and code type
- Setting of a preset/electronic zero point
- Setting of diagnostic functions
- Setting of the outputs A1 ... A4
  - Limit switch values, max. 2
  - Alarm and status information
  - Battery monitoring
- Limiting max. number of bit to interface with PLCs
- Diagnostics and information for the set-up operation
- Data transmission from the PC to the encoder and inversely, also during operation
- Print-out of the current data and set parameters
- Convenient position output with the current set data
- Terminal operation for direct instructions via the keyboard
- Diagnostics of the encoder connected

1) Not available for versions with incremental track
2) Programmable with the optional programming software Ezturn®
3) With the order code Interface 9 assigned to the sense outputs.

Standard, optical / magnetic | **5862 / 5882 (Shaft / Hollow shaft)** | **SSI / RS485, programmable**

Terminal assignment (SSI Synchronous Serial Interface with 12 pin connector)

Signal	0V	$+U_B$	+T	-T	+D	-D	ST	VR	A1	A2	A3 [1]	A4 [1]	⏚
Interface 9											0 V sense	$+U_B$ sense	
Pin	1	2	3	4	5	6	7	8	9	10	11	12	PH
Colour	WH	BN	GN	YE	GY	PK	BU	RD	BK	VT	GY / PK	RD / BU	

T: Clock signal

D: Data signal

ST: SET input. The current position value is stored as new zero position.

VR: Up/down input. As long as this input is active, decreasing code values are transmitted when shaft turning clockwise.

PH: Plug housing

A1, A2, A3, A4: outputs, can be modified using Ezturn®

Isolate unused outputs before initial start-up.

1) With the order code Interface 9 these outputs are assigned to the sense outputs. The sensor circuits are internally tied to the power supply. Special power supply units control the voltage drop in long cable runs via the voltage feedback. If the circuits are not being used, then they should be individually isolated and not connected.

Terminal assignment (RS485 interface 12 pin connector)

Signal	0V	$+U_B$	T/R-	T/R+	Term [3]	Term [3]		VR					⏚
Pin	1	2	3	4	5	6	7 [2]	8	9	10	11	12	PH
Colour	WH	BN	GN	YE				RD					

R: Receive channel

T: Transmit channel

VR: Up/down input. As long as this input (High-Level = + U_B) is active, decreasing code values are transmitted when shaft turning clockwise.

PH: Plug housing

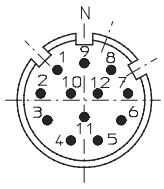
2) There is no SET input for the P3001 version but it can likewise be implemented using the command „<ESC> QP" (Write preset).

3) For the version with external termination:
If the termination is desired (terminating resistor 120 Ohm), then both connections are to be tied together by means of a jumper (0 Ohm).

Terminal assignment (SSI interface with incremental track (A/B))

Signal	0V	$+U_B$	+T	–T	+D	–D	ST	VR	$\bar{B}$	B	$\bar{A}$	A	⏚
Pin	1	2	3	4	5	6	7	8	9	10	11	12	PH

Top view of mating side, male contact base

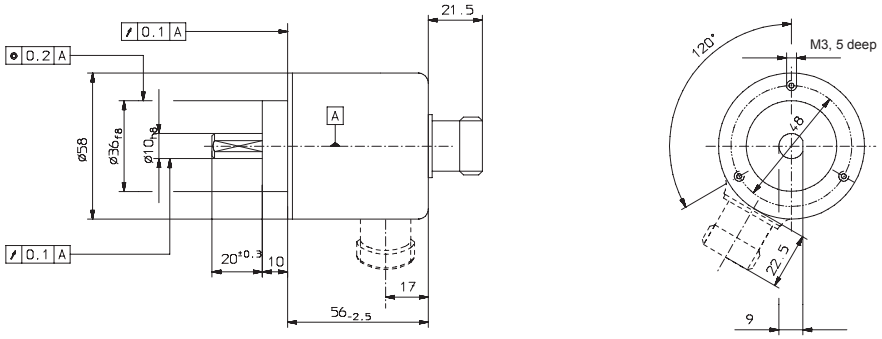


M23 connector, 12-pin

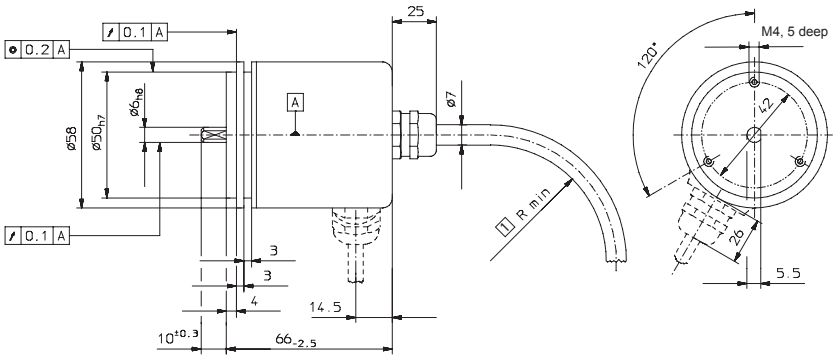
Standard, optical / magnetic | **5862 / 5882 (Shaft / Hollow shaft)** | **SSI / RS485, programmable**

Dimensions shaft version

Clamping flange



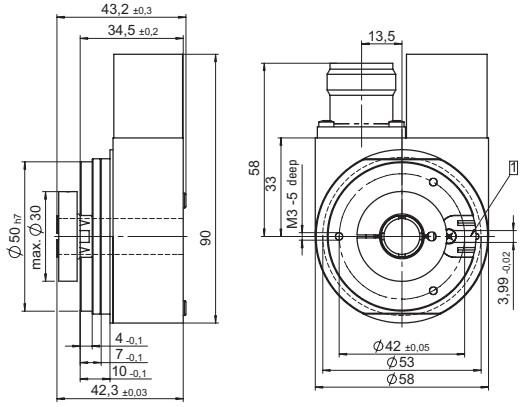
Syncro flange



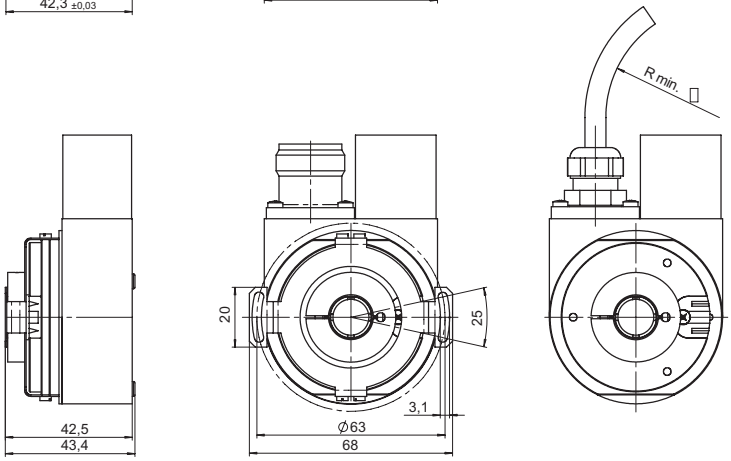
1 Cable,
– securely installed: 55 mm
– flexibly installed: 70 mm

Dimensions hollow shaft version

Flange type 1



Flange type 13 with stator coupling



1 Torque stop slot,
Recommendation:
Cylindrical pin DIN7, ø 4 mm

2 Cable,
– securely installed: 55 mm
– flexibly installed: 70 mm