

# Absolute encoders – singleturn

<b>Standard optical</b>	<b>Sendix F5858 / F5878 (shaft / hollow shaft)</b>	<b>PROFINET IO</b>
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The Sendix F58 singleturn is a particularly high resolution optical encoder without gears and with 100 percent magnetic insensitivity.

19 bits total resolution, shaft up to 10 mm, blind hollow shaft up to 15 mm and certified PROFINET functionality. A minimum cycle time of 250 µs, the PROFIdrive application profile and a web server for FW updates are supported.



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

## Latest PROFINET functionality

- PROFINET IO, RT, IRT allows integration in applications with different performance requirements.
- Supports the Isochronous Mode, can thus be implemented in networks for hard real-time requirements with clock cycles up to 250 µs.
- Encoder profile V 4.2 with full support of various Profinet features.
- Ideal for highly synchronous applications, such as e. g. axis synchronization.
- Interoperability between many different control and drive manufacturers thanks to the PROFIdrive profile.

## Reliable and insensitive

- Sturdy bearing construction in Safety-Lock™ Design for resistance against vibration and installation errors.
- Wide temperature range, -40 °C ... +80 °C.

<b>Order code</b>	<b>8.F5858</b>	<b>.XXCN</b>	<b>.C1</b>	<b>2</b>	<b>2</b>
<b>Shaft version</b>	Type	a b c d	e		

### 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"]
- 2 = 10 x 20 mm [0.39 x 0.79"]
- 3 = 1/4" x 7/8"
- 4 = 3/8" x 7/8"

### c Interface / Power supply

C = PROFINET IO / 10 ... 30 V DC

### e Fieldbus profile

C1 = PROFINET IO

### d Type of connection

N = 3 x axial M12 connector, 4-pin

Optional on request

- Ex 2/22
- surface protection salt spray tested

<b>Order code</b>	<b>8.F5878</b>	<b>.XXCN</b>	<b>.C1</b>	<b>2</b>	<b>2</b>
<b>Hollow version</b>	Type	a b c d	e		

### 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"]
- 9 = with torque stop, flexible, IP65
- J = with torque stop, flexible, IP67

### b Blind hollow shaft

(insertion depth max. 30 mm [1.18"])

- A = ø 10 mm [0.39"]
- B = ø 12 mm [0.47"]
- C = ø 14 mm [0.55"]
- D = ø 15 mm [0.59"]
- E = ø 3/8"
- F = ø 1/2"

### c Interface / Power supply

C = PROFINET IO / 10 ... 30 V DC

### e Fieldbus profile

C1 = PROFINET IO

### d Type of connection

N = 3 x axial M12 connector, 4-pin

Optional on request

- Ex 2/22
- surface protection salt spray tested

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Standard optical		Sendix F5858 / F5878 (shaft / hollow shaft)	PROFINET IO
<b>Mounting accessory for shaft encoders</b>			Order no.
<b>Coupling</b>	bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"]		<b>8.0000.1102.0606</b>
	bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"]		<b>8.0000.1102.1010</b>
<b>Mounting accessory for hollow shaft encoders</b> Dimensions in mm [inch]			Order no.
<b>Cylindrical pin, long</b> for flange with spring element (flange type 1)	with fixing thread		<b>8.0010.4700.0000</b>
<b>Connection technology</b>			Order no.
<b>Cordset, pre-assembled</b>	M12 male connector with external thread, 4-pin, D coded, straight single-ended 2 m [6.56'] PUR cable	port 1 + port 2	<b>05.00.6031.4411.002M</b>
	M12 male connector with external thread, 4-pin, D coded, right-angle single-ended 2 m [6.56'] PUR cable	port 1 + port 2	<b>05.00.6031.4511.002M</b>
	M12 female connector with coupling nut, 4-pin, A coded, straight single-ended 2 m [6.56'] PUR cable	power supply	<b>05.00.6061.6211.002M</b>
	M12 female connector with coupling nut, 4-pin, A coded, right-angle single-ended 2 m [6.56'] PUR cable	power supply	<b>05.00.6061.6311.002M</b>
<b>Connector, self-assembly</b>	M12 female connector with coupling nut, 4-pin, A coded, straight (plastic)		<b>05.B8141-0</b>
	M12 female connector with coupling nut, 5-pin, A coded, right-angle (plastic)		<b>05.B-8251-0/9</b>

Further Kübler accessories can be found at: [kuebler.com/accessories](http://kuebler.com/accessories)  
 Further Kübler cables and connectors can be found at: [kuebler.com/connection-technology](http://kuebler.com/connection-technology)

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<b>Standard optical</b>	<b>Sendix F5858 / F5878 (shaft / hollow shaft)</b>	<b>PROFINET IO</b>
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## Technical data

Mechanical characteristics		
<b>Max. speed</b>		9000 min <sup>-1</sup> (short-term – 10 min) 6000 min <sup>-1</sup> (continuous)
<b>Starting torque at 20 °C [68 °F]</b>		< 0.01 Nm
<b>Moment of inertia</b>	shaft version	3.0 x 10 <sup>-6</sup> kgm <sup>2</sup>
	hollow shaft version	6.0 x 10 <sup>-6</sup> kgm <sup>2</sup>
<b>Load capacity of shaft</b>	radial	80 N
	axial	40 N
<b>Weight</b>		approx. 0.45 kg [15.87 oz]
<b>Protection acc. to EN 60529</b>		IP67
<b>Working temperature range</b>		-40 °C ... +80 °C [-40 °F ... +176 °F]
<b>Material</b>	shaft/hollow shaft	stainless steel
	flange	aluminum
	housing	aluminum
<b>Shock resistance acc. EN 60068-2-27</b>		2500 m/s <sup>2</sup> , 6 ms
<b>Vibration resistance acc. EN 60068-2-6</b>		100 m/s <sup>2</sup> , 55 ... 2000 Hz

Electrical characteristics		
<b>Power supply</b>		10 ... 30 V DC
<b>Power consumption (no load)</b>		max. 250 mA
<b>Reverse polarity protection of the power supply (+V)</b>		yes
<b>UL approval</b>		file no. E224618
<b>CE compliant acc. to</b>		EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

Interface characteristics PROFINET IO	
<b>Resolution</b>	1 ... 524.288 (19 bit), scalable default: 8192 (13 bit)
<b>Protocol</b>	PROFINET IO
<b>Classifications</b>	RT Class 3 (IRT) Conformance Class C Application Class 6 Encoder Class 4 Netload Class III
<b>Features</b>	- I&M 0...3 - standard telegrams (81, 82, 83, 84, 86, 88) - IRT up to 250 µs - Isochronous Mode - MRP - LLDP - PDEV - SNMP - FSU

Link 1 and 2, LED (green / yellow)			
Two colored	green	active link	
	yellow	data transfer	

Error LED (red) / PWR LED (green)
Functionality see manual

### General information about PROFINET IO

The PROFINET encoder implements the Encoder Profile 4.2.

It permits scaling and preset values, as well as many other additional parameters to be programmed.

When switching on, all parameters are loaded from an EEPROM, where they were saved previously to protect them against power-failure, or taken over by the controller in the start-up phase.

Position, speed and many other states of the encoder can be transmitted.




### PROFINET IO

- Implementation of the whole encoder profile according to Encoder Profile Version 4.2.
- The product has been developed with regard to the Enhanced Motion Control requirements and complies with Conformance Class C - Encoder Class 4.
- Identification & maintenance functionality version 1.16 is implemented. IM-Block 0 is supported.
- The Media Redundancy Protocol (MRP) is implemented in addition.
- ProfiDrive meets the requirements of Application Class 6 and includes the Fault Buffer and Position Feedback Interface functionalities.
- Isochronous Real Time (IRT) with a max. jitter of max. ± 1 µs.
- Neighborhood detection is possible via LLDP.
- Shared Devices allows several PLC's to access to the encoder.
- Fast Startup ensures an up to 3x faster availability after a plant start-up.

# Absolute encoders – singleturn

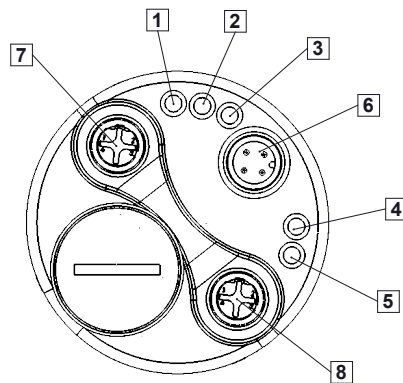
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## Terminal assignment bus

Interface	Type of connection	Function	M12 connector, 4-pin					
C	N (3 x M12 connector)	Bus Port 1	Signal:	Transmit data+	Receive data+	Transmit data -	Receive data -	 D coded
			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 2	Signal:	Transmit data+	Receive data+	Transmit data -	Receive data -	 D coded
			Abbreviation:	TxD+	RxD+	TxD-	RxD-	
			Pin:	1	2	3	4	

## Rear side connections and display elements

- 1 LED: Link 2
- 2 LED: Bus error
- 3 LED: Collecting error
- 4 LED: ENC
- 5 LED: Link 1
- 6 Power
- 7 Link 2
- 8 Link 1



# Absolute encoders – singleturn

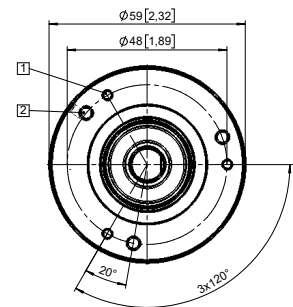
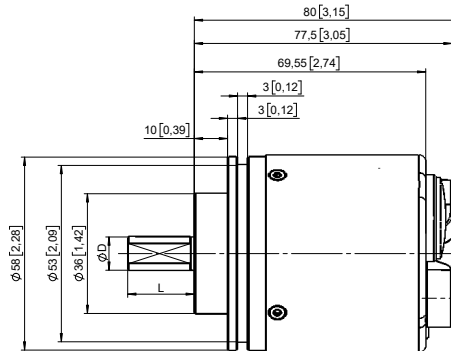
<b>Standard optical</b>	<b>Sendix F5858 / F5878 (shaft / hollow shaft)</b>	<b>PROFINET IO</b>
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## Dimensions shaft version

Dimensions in mm [inch]

### Clamping flange, ø 58 [2.28] Flange type 1 + 3

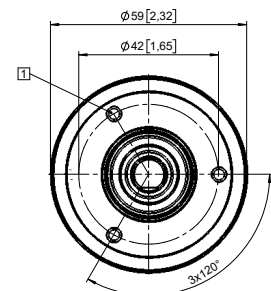
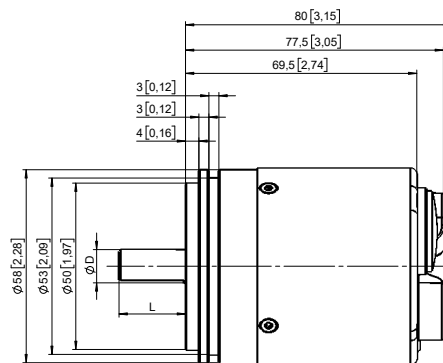
- 1 3 x M3, 6 [0.24] deep
- 2 3 x M4, 8 [0.31] deep



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

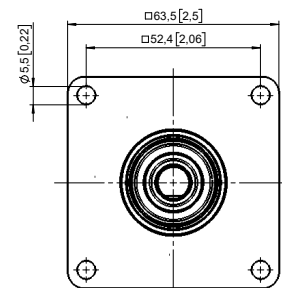
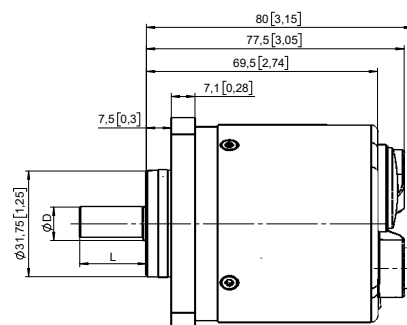
### Synchro flange, ø 58 [2.28] Flange type 2 + 4

- 1 3 x M3, 6 [0.24] deep



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

### Square flange, □ 63.5 [2.5] Flange type 5 + 7



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

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## Standard optical

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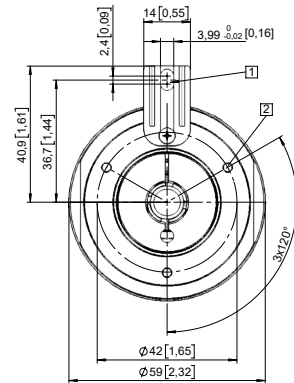
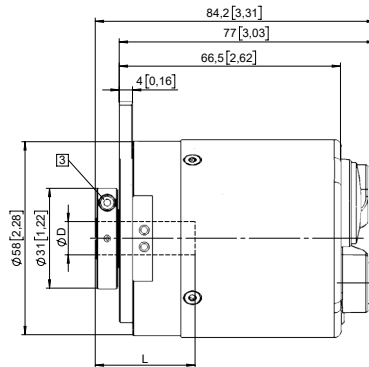
## PROFINET IO

### Dimensions hollow shaft version

Dimensions in mm [inch]

#### Flange with spring element, long Flange type 1 + 2

- 1 Slot spring element, recommendation: cylindrical pin DIN 7,  $\varnothing 4$  [0.16]
- 2 3 x M3, 5.5 [0.22] deep
- 3 Recommended torque for the clamping ring 0.6 Nm

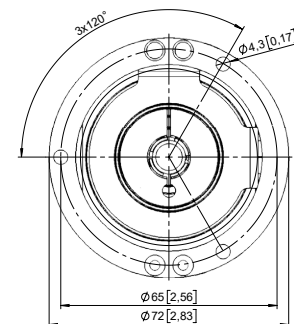
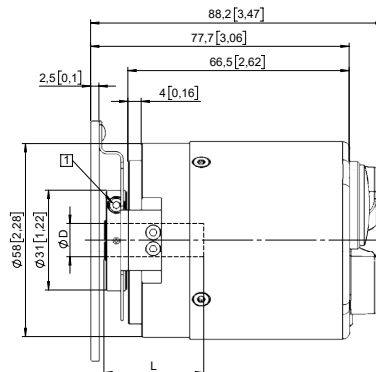


D	Fit	L
10 [0.39]	H7	30 [1.18]
12 [0.47]	H7	30 [1.18]
14 [0.55]	H7	30 [1.18]
15 [0.59]	H7	30 [1.18]
3/8"	H7	30 [1.18]
1/2"	H7	30 [1.18]

L = insertion depth max. blind hollow shaft

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

- 1 Recommended torque for the clamping ring 0.6 Nm

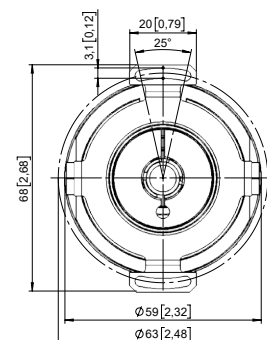
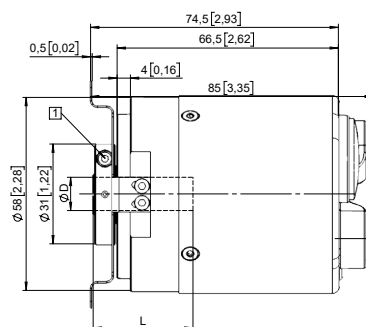


D	Fit	L
10 [0.39]	H7	30 [1.18]
12 [0.47]	H7	30 [1.18]
14 [0.55]	H7	30 [1.18]
15 [0.59]	H7	30 [1.18]
3/8"	H7	30 [1.18]
1/2"	H7	30 [1.18]

L = insertion depth max. blind hollow shaft

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

- 1 Recommended torque for the clamping ring 0.6 Nm



D	Fit	L
10 [0.39]	H7	30 [1.18]
12 [0.47]	H7	30 [1.18]
14 [0.55]	H7	30 [1.18]
15 [0.59]	H7	30 [1.18]
3/8"	H7	30 [1.18]
1/2"	H7	30 [1.18]

L = insertion depth max. blind hollow shaft

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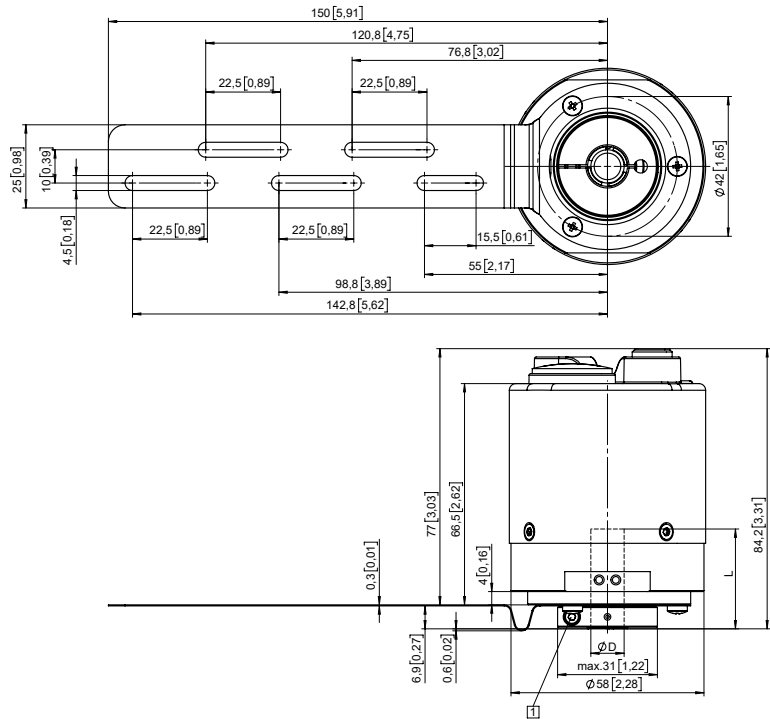
<b>Standard optical</b>	<b>Sendix F5858 / F5878 (shaft / hollow shaft)</b>	<b>PROFINET IO</b>
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## Dimensions hollow shaft version

Dimensions in mm [inch]

### Flange with torque stop, flexible Flange type 9 + J

- 1 Recommended torque for the clamping ring 0.6 Nm



D	Fit	L
10 [0.39]	H7	30 [1.18]
12 [0.47]	H7	30 [1.18]
14 [0.55]	H7	30 [1.18]
15 [0.59]	H7	30 [1.18]
3/8"	H7	30 [1.18]
1/2"	H7	30 [1.18]

L = insertion depth max. blind hollow shaft