

Absolute encoders – multiturn

Standard electronic multiturn, optical	Sendix F5868 / F5888 (shaft / hollow shaft)	PROFINET IO
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The Sendix F58 multiturn with patented Intelligent Scan Technology™ is a particularly high resolution optical encoder without gears and with 100 percent magnetic insensitivity. 43 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.



Multiturn resolution	Safety-Lock™	High rotational speed	Temperature range	High protection level	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.
- Patented Intelligent Scan Technology™ with all singleturn and multiturn functions on one single OptoASIC - offering the highest reliability, a high resolution up to 43 bits and 100% magnetic field insensitivity.

Order code	8.F5868	.XXCN.	C1	2	2	
Shaft version	Typ	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 / Supply voltage 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		

Order code	8.F5888	.XXCN.	C1	2	2	
Hollow shaft	Typ	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 / Supply voltage 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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Mounting accessory for shaft encoders			Order no.
Coupling	bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"]		8.0000.1102.0606
	bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"]		8.0000.1102.1010
Mounting accessory for hollow shaft encoders Dimensions in mm [inch]			Order no.
Cylindrical pin, long for flange with spring element (flange type 1)	with fixing thread		8.0010.4700.0000
Connection technology			Order no.
Cordset, pre-assembled	M12 male connector with external thread, 4-pin, D coded, straight single-ended 2 m [6.56'] PUR cable	port 1 + port 2	05.00.6031.4411.002M
	M12 male connector with external thread, 4-pin, D coded, right-angle single-ended 2 m [6.56'] PUR cable	port 1 + port 2	05.00.6031.4511.002M
	M12 female connector with coupling nut, 4-pin, A coded, straight single-ended 2 m [6.56'] PUR cable	power supply	05.00.6061.6211.002M
	M12 female connector with coupling nut, 4-pin, A coded, right-angle single-ended 2 m [6.56'] PUR cable	power supply	05.00.6061.6311.002M
Connector, self-assembly	M12 female connector with coupling nut, 4-pin, A coded, straight (plastic)		05.B8141-0
	M12 female connector with coupling nut, 5-pin, A coded, right-angle (plastic)		05.B-8251-0/9

Further Kübler accessories can be found at: kuebler.com/accessories
 Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

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Technical data

Mechanical characteristics		
Max. speed	9000 min ⁻¹ (short-term – 10 min) 6000 min ⁻¹ (continuous)	
Starting torque at 20 °C [68 °F]	< 0.01 Nm	
Moment of inertia	shaft version	3.0 x 10 ⁻⁶ kgm ²
	hollow shaft version	6.0 x 10 ⁻⁶ kgm ²
Load capacity of shaft	radial	80 N
	axial	40 N
Weight	approx. 0.45 kg [15.87 oz]	
Protection acc. to EN 60529	IP67	
Working temperature range	-40 °C ... +80 °C [-40 °F ... +176 °F]	
Material	shaft/hollow shaft	stainless steel
	flange	aluminum
	housing	aluminum
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	
Supply voltage	10 ... 30 V DC
Power consumption (no load)	max. 250 mA
Reverse polarity protection of the supply voltage (+V)	yes
UL approval	File no. E224618
CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

Interface characteristics PROFINET IO	
Resolution singleturn	1 ... 524.288 (19 bit), scalable default: 8.192 (13 bit)
Number of revolutions (multiturn)	max. 16.777.216 (24 bit) scalable only via the total resolution
Total resolution	1... 8.796.093.022.208 (43 bit), scalable default: 33.554.432 (25 bit)
Protocol	PROFINET IO
Classifications	RT Class 3 (IRT) Conformance Class C Application Class 6 Encoder Class 4 Netload Class III
Features	<ul style="list-style-type: none"> - 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.

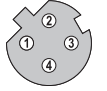

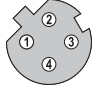
PROFINET IO

- 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 Start-up ensures an up to 3x faster availability after a plant start-up.

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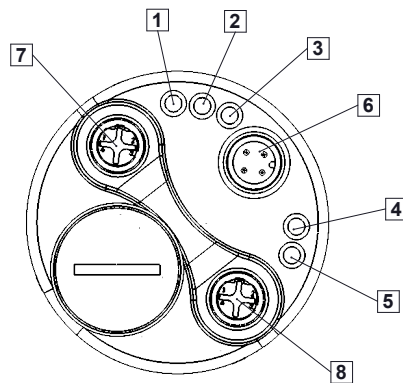
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Terminal assignment bus

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 -	-	 D coded
			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



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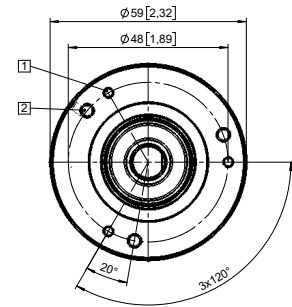
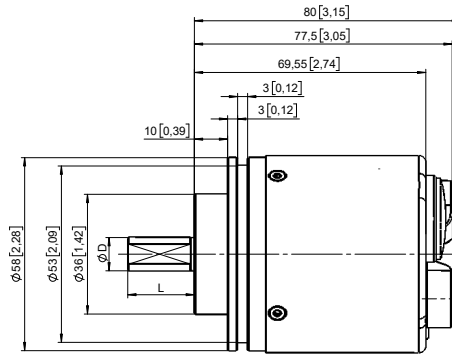
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Dimensions shaft version

Dimensions in mm [inch]

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

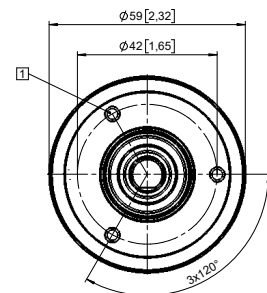
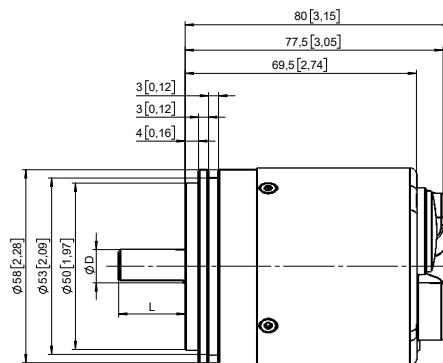
- 1 3 x M3, 6 [0.24] deep
- 2 3 x M4, 8 [0.31] deep



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"

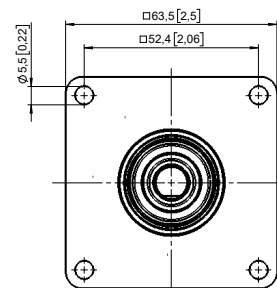
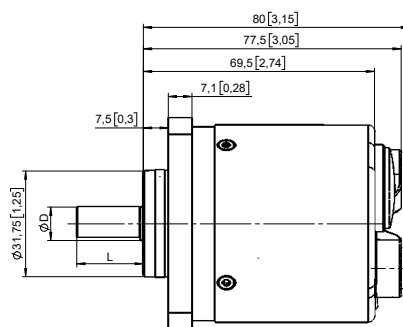
Synchro flange, ø 58 [2.28] Flange type 2 + 4

- 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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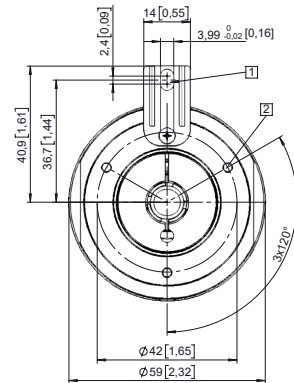
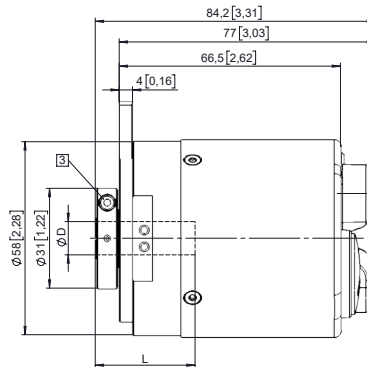
PROFINET IO

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

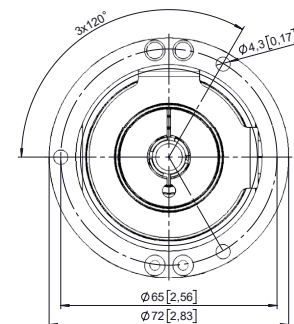
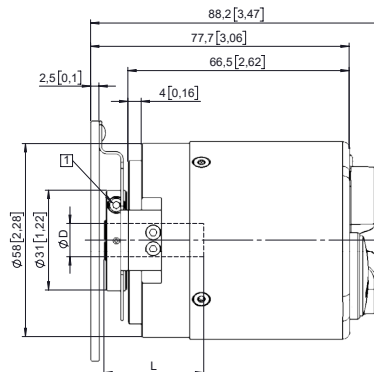


D	Fit	L
10 [0.39]	H7	30 [1.18]
12 [0.47]	H7	30 [1.18]
14 [0.55]	H7	30 [1.18]
15 [0.59]	H7	30 [1.18]
3/8"	H7	30 [1.18]
1/2"	H7	30 [1.18]

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

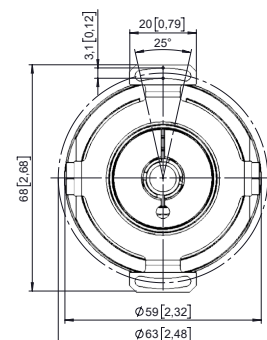
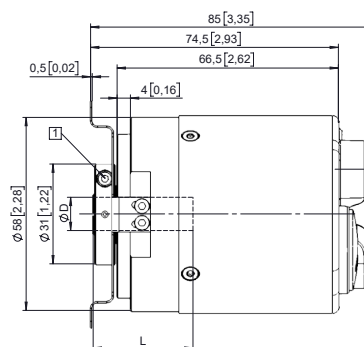


D	Fit	L
10 [0.39]	H7	30 [1.18]
12 [0.47]	H7	30 [1.18]
14 [0.55]	H7	30 [1.18]
15 [0.59]	H7	30 [1.18]
3/8"	H7	30 [1.18]
1/2"	H7	30 [1.18]

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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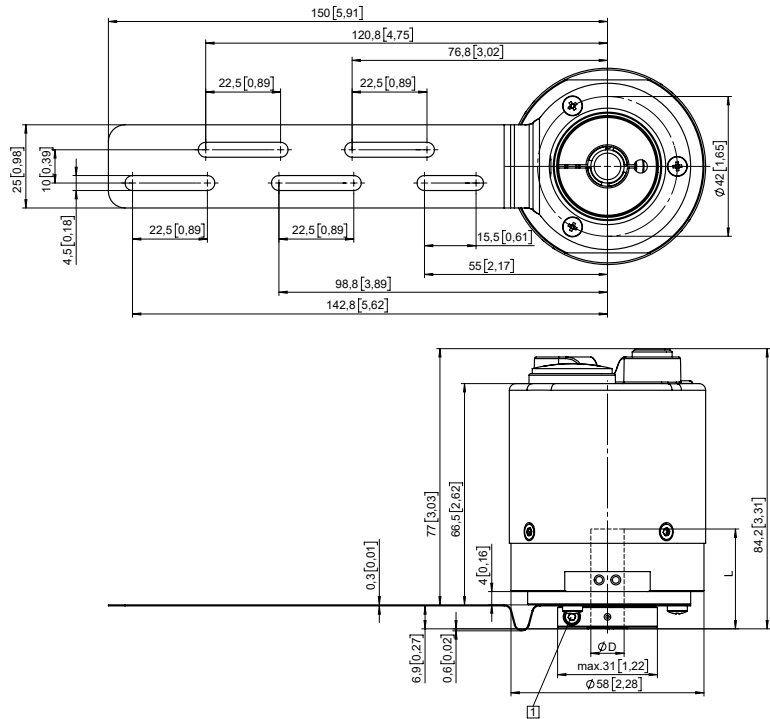
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Dimensions hollow shaft version

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