

Absolute encoders – multiturn

Standard mechanical multiturn, optical	Sendix 5868 / 5888 (shaft / hollow shaft)	EtherCAT
---	--	-----------------



EtherCAT
Conformance tested

The multiturn encoders Sendix 5868 and 5888 with second-generation EtherCAT interface and optical sensor technology are ideal for use in all applications with an EtherCAT interface.

The data communication is based on CAN over EtherNet and ideally suited for use in real time applications.

These encoders are available with a solid shaft up to a maximum of 10 mm or a blind hollow shaft up to 15 mm.

Mechanical drive	Safety-Lock™	High rotational speed	Temperature range -40°...+80°C	High protection level IP	High shaft load capacity	Shock / vibration resistant	Magnetic field proof	Reverse polarity protection	Optical sensor	Surface protection salt spray-tested optional

Reliable

- EtherCAT conformance tested.
- Integration of the latest slave – EtherCAT stack from Beckhoff, Version 5.01.
- Ideally suited for use in harsh outdoor environments, thanks to IP67 protection and rugged housing construction.

Flexible

- Use of CoE (CAN over EtherNet).
- Genuine new position information as a result of minimal cycle time of 62.5 µs in the DC mode.
- Faster, easier error-free connection thanks to M12 connectors.
- Supports Hot Connect.

Order code Shaft version	8.5868 Type	. X X B 2 . B 2 1 2 a b c d e	If for each parameter of an encoder the <u>underlined preferred option</u> 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.	
a Flange	b Shaft (ø x L), with flat	c Interface / power supply	<i>Optional on request</i> - Ex 2/22 - surface protection salt spray tested	
1 = <u>clamping flange, IP65 ø 58 mm [2.28"]</u> 3 = clamping flange, IP67 ø 58 mm [2.28"] 2 = <u>synchro flange, IP65 ø 58 mm [2.28"]</u> 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"]	1 = <u>6 x 10 mm [0.24 x 0.39"]</u> ¹⁾ 2 = <u>10 x 20 mm [0.39 x 0.79"]</u> ²⁾ 3 = 1/4" x 7/8" 4 = 3/8" x 7/8"	B = <u>EtherCAT / 10 ... 30 V DC</u> d Type of connection removable bus terminal cover 2 = <u>3 x M12 connector, 4-pin</u> e Fieldbus profile B2 = <u>EtherCAT with CoE (CAN over EtherNet)</u>		

Order code Hollow shaft	8.5888 Type	. X X B 2 . B 2 1 2 a b c d e	If for each parameter of an encoder the <u>underlined preferred option</u> 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.	
a Flange	b Blind hollow shaft	c Interface / power supply	<i>Optional on request</i> - Ex 2/22 - surface protection salt spray tested	
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 = <u>with stator coupling, IP65 ø 63 mm [2.48"]</u> 6 = with stator coupling, IP67 ø 63 mm [2.48"]	3 = ø 10 mm [0.39"] 4 = <u>ø 12 mm [0.47"]</u> 5 = ø 14 mm [0.55"] 6 = ø 15 mm [0.59"] 8 = ø 3/8" 9 = ø 1/2"	B = <u>EtherCAT / 10 ... 30 V DC</u> d Type of connection removable bus terminal cover 2 = <u>3 x M12 connector, 4-pin</u> e Fieldbus profile B2 = <u>EtherCAT with CoE (CAN over EtherNet)</u>		

1) Preferred type only in conjunction with flange type 2.
2) Preferred type only in conjunction with flange type 1.

Absolute encoders – multiturn

Standard mechanical multiturn, optical		Sendix 5868 / 5888 (shaft / hollow shaft)	EtherCAT
Mounting accessory for shaft encoders			Order no.
Coupling	bellows coupling \varnothing 19 mm [0.75"] for shaft 6 mm [0.24"]		8.0000.1102.0606
	bellows coupling \varnothing 19 mm [0.75"] for shaft 10 mm [0.39"]		8.0000.1102.1010
Mounting accessory for hollow shaft encoders			Order no.
Cylindrical pin, long	with fixing thread		8.0010.4700.0000
for flange with spring element (flange type 1 + 2)			
Connection technology			Order no.
Cordset, pre-assembled	M12 male connector with external thread for port IN and port OUT, 4-pin 2 m [6.56'] PUR cable		05.00.6031.4411.002M
	M12 female connector with coupling nut for power supply, 4-pin 2 m [6.56'] PUR cable		05.00.6061.6211.002M
Connector, self-assembly (straight)	M12 male connector with external thread for port IN and port OUT, 4-pin		05.WACSY4S
	M12 female connector with coupling nut for power supply, 4-pin		05.B8141-0

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.

Technical data		
Mechanical characteristics		
Maximum speed	IP65 up to 70°C [158°F]	9000 min ⁻¹ , 7000 min ⁻¹ (continuous)
	IP65 up to T _{max}	7000 min ⁻¹ , 4000 min ⁻¹ (continuous)
	IP67 up to 70°C [158°F]	8000 min ⁻¹ , 6000 min ⁻¹ (continuous)
	IP67 up to T _{max}	6000 min ⁻¹ , 3000 min ⁻¹ (continuous)
Starting torque - at 20°C [68°F]	IP65	< 0.01 Nm
	IP67	< 0.05 Nm
Mass moment of inertia	shaft version	3.0 x 10 ⁻⁶ kgm ²
	hollow shaft version	7.5 x 10 ⁻⁶ kgm ²
Load capacity of shaft	radial	80 N
	axial	40 N
Weight	approx. 0.54 kg [19.05 oz]	
Protection acc. to EN 60529	housing side	IP67
	shaft side	IP65, opt. IP67
Working temperature range	-40°C ... +80°C [-40°F ... +176°F]	
Material	shaft/hollow shaft	stainless steel
	flange	aluminum
	housing	zinc die-cast
Shock resistance acc. to EN 60068-2-27	2500 m/s ² , 6 ms	
Vibration resistance acc. to EN 60068-2-6	100 m/s ² , 55 ... 2000 Hz	
Electrical characteristics		
Power supply	10 ... 30 V DC	
Power consumption (no load)	max. 120 mA	
Reverse polarity protection of the power supply	yes	
UL approval	file no. E224618	
CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU	
Interface characteristics EtherCAT		
Resolution singleturn	1 ... 65535 (16 bit), scalable default: 8192 (13 bit)	
Number of revolutions (multiturn)	max. 4096 (12 bit) scalable only via the total resolution	
Total resolution	1 ... 268.435.456 (28 bit), scalable default: 33.554.432 (25 bit)	
Protocol	EtherNet / EtherCAT	
Diagnostic LED (red)		
LED is ON with the following fault conditions: Sensor error (internal code or LED error), low voltage, over-temperature		
Run LED (green)		
LED is ON with the following conditions: Preop-, Safeop and Op-State (EtherCAT status machine)		
2 x Link LEDs (yellow)		
LED is ON with the following conditions (port IN and port OUT): Link detected		
Modes		
Freerun, distributed clock		

Absolute encoders – multiturn

Standard mechanical multiturn, optical	Sendix 5868 / 5888 (shaft / hollow shaft)	EtherCAT
---	--	-----------------

General information about CoE (CAN over EtherNet)

The EtherCAT encoders support the CANopen communication profile according to DS301. In addition device-specific profiles like the encoder profile DS406 are available.

Scaling, preset values, limit switch values and many other parameters can be programmed via the EtherCAT bus.

When switching the device on, all parameters are loaded from an EEPROM, where they were saved previously to protect them against power-failure.




The following output values may be combined as PDO (PDO mapping): **position**, **speed**, **temperature values** and **working area state** as well as other process values.

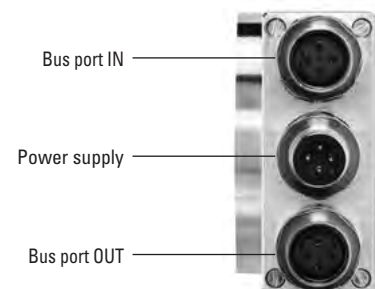
CANopen encoder profile 3.2.10 CoE (CAN over EtherNet)

The following parameters are programmable:

- Position update time of 62.5 µs.
- EtherCAT certificate of conformity.
- Speed with sign.
- Four units for speed calculation: steps/sec, steps/100 ms, steps/10 ms, min⁻¹.
- Time stamp as system time at the point in time when the position is read out.
- Two working area state registers.
- Along with the scaled position, the raw data – position as process value – is also mappable.
- Dynamic mapping.
- Gating time: setting of the time interval, via which the speed value can be interpolated.
- Sensor temperature in degrees Celsius.
- Comprehensive plausibility test when downloading parameters to the encoder.
- Alarm and warning messages.
- User interface with visual display of bus and fault status – 4 LEDs.
- Extended error management for position sensing with integrated temperature control.
- Implementation of the latest CANopen profile 3.2.10 from the 18th February 2011.
- Hot-Connect – Support for rapid change of Bus-topology.

Terminal assignment bus

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



Absolute encoders – multiturn

**Standard
mechanical multiturn, optical**

Sendix 5868 / 5888 (shaft / hollow shaft)

EtherCAT

Dimensions shaft version, with removable bus terminal cover

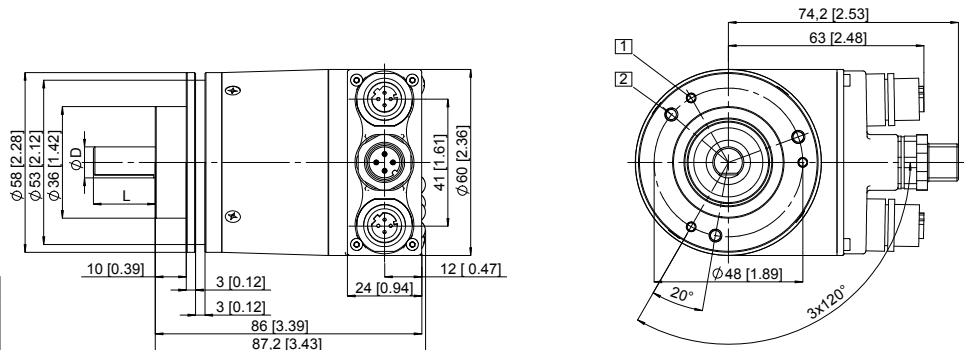
Dimensions in mm [inch]

Clamping flange, \varnothing 58 [2.28]

Flange type 1 and 3

- 1 3 x M3, 6.0 [0.24] deep
- 2 3 x M4, 8.0 [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"

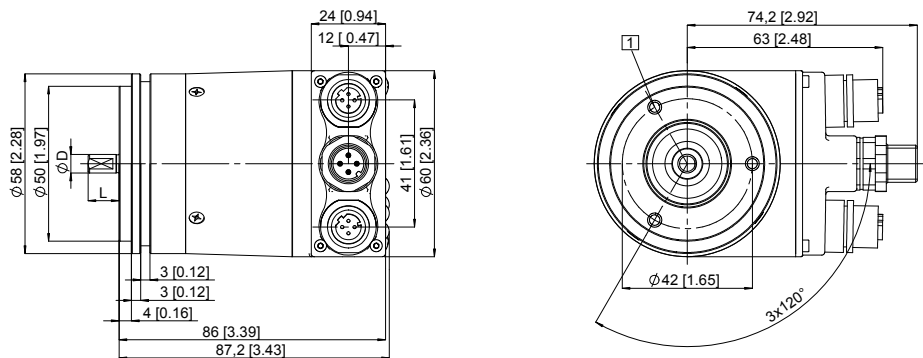


Synchro flange, \varnothing 58 [2.28]

Flange type 2 and 4

- 1 3 x M4, 6.0 [0.24] deep

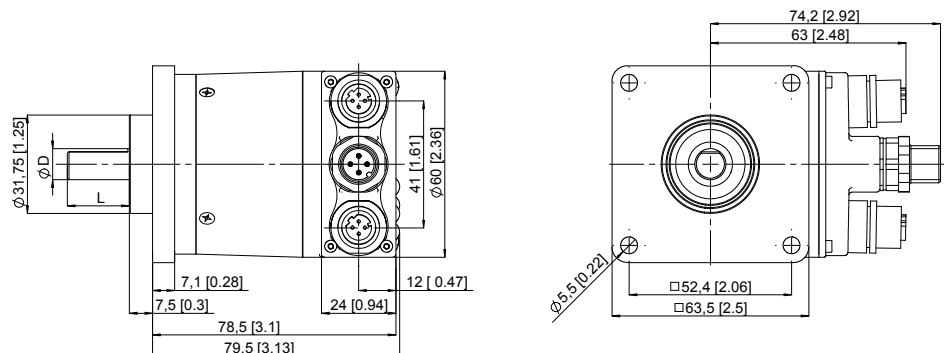
D	Fit	L
6 [0.24]	h7	10 [0.39]
10 [0.39]	f7	20 [0.79]
1/4"	h7	7/8"
3/8"	h7	7/8"



Square flange, \square 63.5 [2.5]

Flange type 5 and 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"



Absolute encoders – multiturn

Standard mechanical multiturn, optical	Sendix 5868 / 5888 (shaft / hollow shaft)	EtherCAT
---	--	-----------------

Dimensions hollow shaft version (blind hollow shaft), with removable bus terminal cover

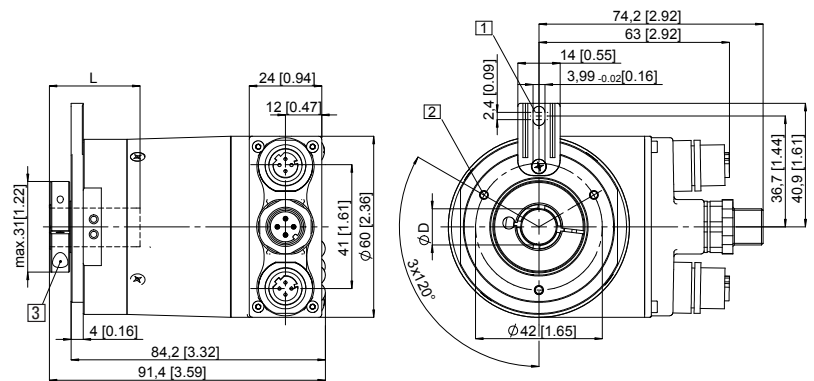
Dimensions in mm [inch]

Flange with spring element, long Flange type 1 and 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

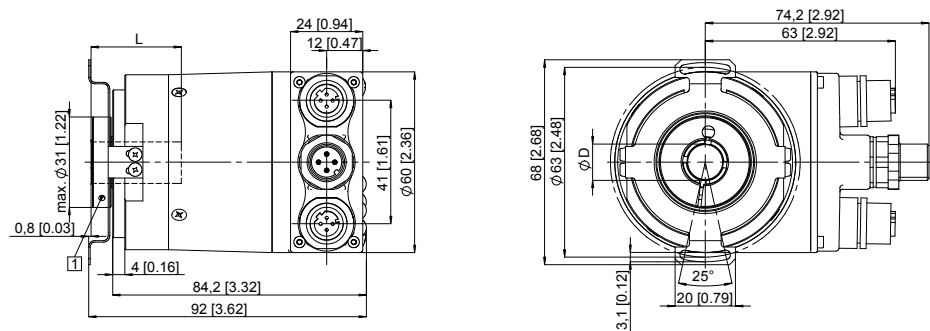


Flange with stator coupling, $\varnothing 63$ [2.48] Flange type 5 and 6

- 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



Flange with stator coupling, $\varnothing 65$ [2.56] Flange type 3 and 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

