Standard
mechanical multiturn, optical

Sendix 5868 / 5888 (shaft / hollow shaft)

EtherCAT

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.

Ex 2/22 · cULus · RoHS · EtherCAT Conformance tested

Mechanical drive · 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 · 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.

Order code Shaft version

8.5868	.	X	X	B	2	.	B2	12
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, 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"]** 1)
- **2 = 10 x 20 mm [0.39 x 0.79"]** 2)
- 3 = 1/4" x 7/8"
- 4 = 3/8" x 7/8"

c *Interface / power supply*
- **B = EtherCAT / 10 ... 30 V DC**

d *Type of connection*
removable bus terminal cover
- **2 = 3 x M12 connector, 4-pin**

e *Fieldbus profile*
- **B2= EtherCAT with CoE (CAN over EtherNet)**

Optional on request
- Ex 2/22
- surface protection salt spray tested

Order code Hollow shaft

8.5888	.	X	X	B	2	.	B2	12
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 = 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"]

b *Blind hollow shaft*
- 3 = ø 10 mm [0.39"]
- **4 = ø 12 mm [0.47"]**
- 5 = ø 14 mm [0.55"]
- 6 = ø 15 mm [0.59"]
- 8 = ø 3/8"
- 9 = ø 1/2"

c *Interface / power supply*
- **B = EtherCAT / 10 ... 30 V DC**

d *Type of connection*
removable bus terminal cover
- **2 = 3 x M12 connector, 4-pin**

e *Fieldbus profile*
- **B2= EtherCAT with CoE (CAN over EtherNet)**

Optional on request
- Ex 2/22
- surface protection salt spray tested

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

Absolute encoders – multiturn

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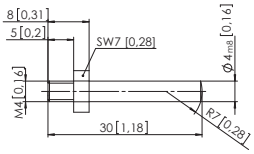
Mounting accessory for shaft encoders		Order no.
Coupling	bellows coupling ø 19 mm [0.75“] for shaft 6 mm [0.24“]	**8.0000.1102.0606**
	bellows coupling ø 19 mm [0.75“] for shaft 10 mm [0.39“]	**8.0000.1102.1010**

Mounting accessory for hollow shaft encoders		Order no.
Cylindrical pin, long for torque stops		with fixing thread	**8.0010.4700.0000**

Connection technology		Order no.
Connector, self-assembly (straight)	coupling M12 for port IN and port OUT	**05.WASCSY4S**
	connector M12 for power supply	**05.B8141-0**
Cordset, pre-assembled	M12 for port IN and port OUT, 2 m [6.56’] PUR cable	**05.00.6031.4411.002M**
	M12 for power supply, 2 m [6.56’] PUR cable	**05.00.6061.6211.002M**

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	aluminium
	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 224618
CE compliant acc. to	EMC guideline 2004/108/EC RoHS guideline 2011/65/EU

Interface characteristics EtherCAT

Resolution singleturn	1 ... 65535 (16 bit), scaleable 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), scaleable default: 33.554.432 (25 bit)
Code	binary
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

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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.

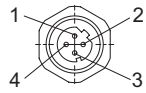
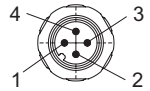
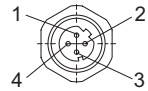
The following output values may be combined as PDO (PDO mapping): **position, speed, temperature values** and **working area state** as well as other process values.

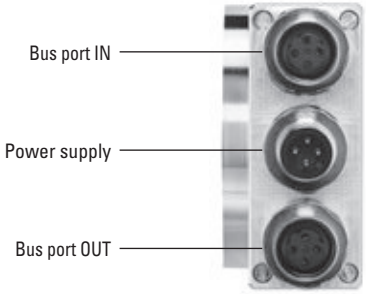
CANopen encoder profile 3.2.10 CoE (CAN over EtherNet)

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.

Terminal assignment bus

Interface	Type of connection	Function	M12 connector					
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 –	–	
			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	



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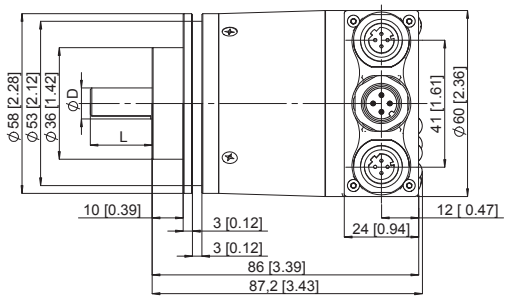
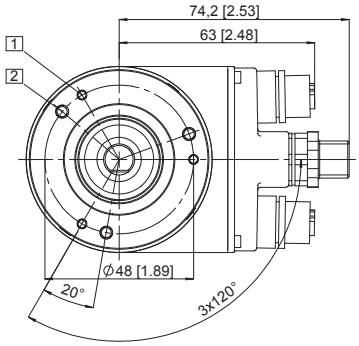
Dimensions shaft version, with removable bus terminal cover

Dimensions in mm [inch]

Clamping flange, ø 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

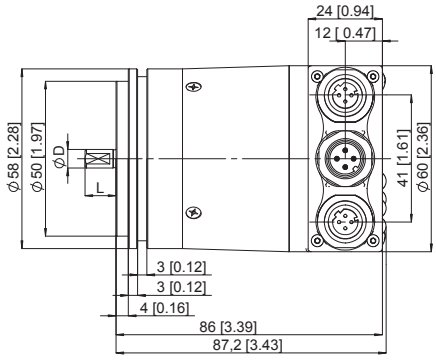


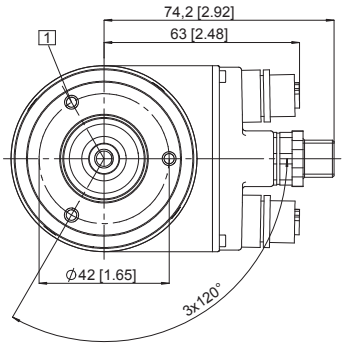


D	L	Fit
6 [0.24]	10 [0.39]	h7
10 [0.39]	20 [0.79]	f7
1/4"	7/8"	h7
3/8"	7/8"	h7

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

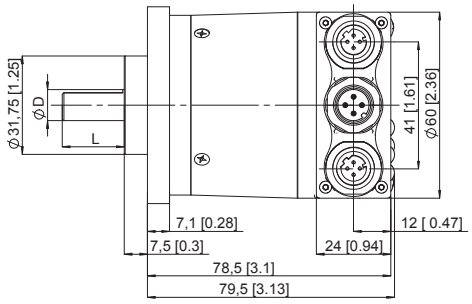
1 M4, 6.0 [0.24] deep

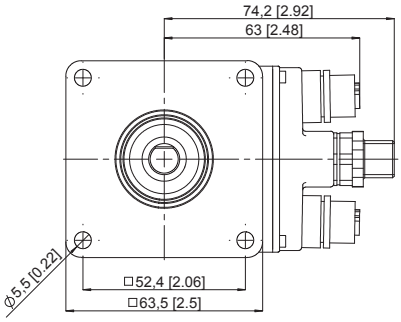




D	L	Fit
6 [0.24]	10 [0.39]	h7
10 [0.39]	20 [0.79]	f7
1/4"	7/8"	h7
3/8"	7/8"	h7

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





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

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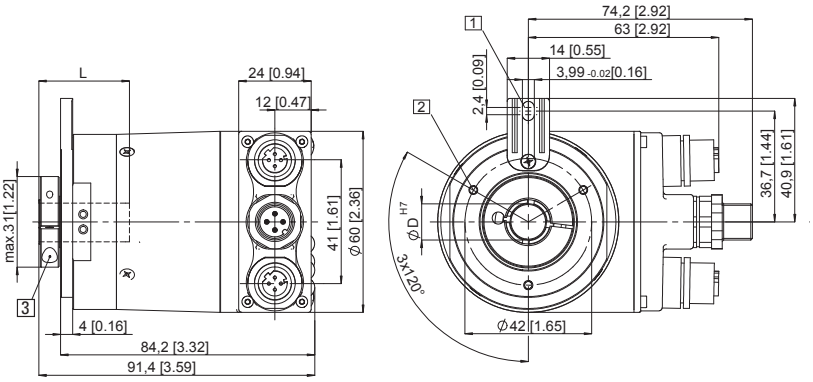
Dimensions hollow shaft version (blind hollow shaft), with removable bus terminal cover

Dimensions in mm [inch]

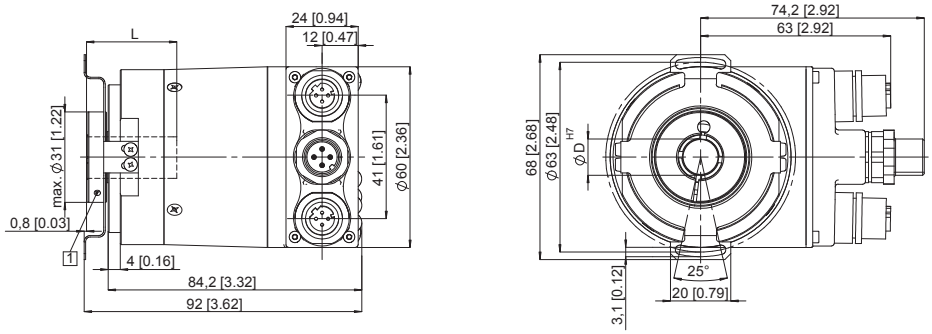
Flange with spring element, long
Flange type 1 and 2

1 Torque stop slot, recommendation: cylindrical pin DIN 7, ø 4 [0.16]
2 M3, 5.5 [0.21] deep
3 Recommended torque for the clamping ring 0.6 Nm
L: Insertion depth for blind hollow shaft: 30 [1.18]



Flange with stator coupling, ø 63 [2.48]
Flange type 5 and 6

1 Recommended torque for the clamping ring 0.6 Nm
L: Insertion depth for blind hollow shaft: 30 [1.18]



Flange with stator coupling, ø 65 [2.56]
Flange type 3 and 4

1 Recommended torque for the clamping ring 0.6 Nm
L: Insertion depth for blind hollow shaft: 30 [1.18]