

Absolute Encoders - Singleturn

Standard Optical	Sendix 5858 / 5878 (Shaft / Hollow shaft)	EtherCAT
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The singleturn encoders 5858 and 5878 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.



EtherCAT
Conformance tested

Safety-Lock™	High rotational speed	Temperature range -40°...+80°C	High protection level IP	High shaft load capacity	Shock / vibration resistant	Magnetic field proof	Short-circuit proof	Reverse polarity protection	Optical sensor	Seawater-resistant version on request

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

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Order code	8.5858	. X X B 2 . B2 12	<p>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.</p>					
Shaft version	Type	<table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">a</td> <td style="text-align: center;">b</td> <td style="text-align: center;">c</td> <td style="text-align: center;">e</td> </tr> </table>	a	b	c	e		
a	b	c	e					
<p>a Flange</p> <p><u>1</u> = clamping flange, IP65 ø 58 mm [2.28"]</p> <p>3 = clamping flange, IP67 ø 58 mm [2.28"]</p> <p><u>2</u> = synchro flange, IP65 ø 58 mm [2.28"]</p> <p>4 = synchro flange, IP67 ø 58 mm [2.28"]</p> <p>5 = square flange, IP65 □ 63.5 mm [2.5"]</p> <p>7 = square flange, IP67 □ 63.5 mm [2.5"]</p>		<p>b Shaft (ø x L), with flat</p> <p><u>1</u> = 6 x 10 mm [0.24 x 0.39"]¹⁾</p> <p><u>2</u> = 10 x 20 mm [0.39 x 0.79"]²⁾</p> <p>3 = 1/4" x 7/8"</p> <p>4 = 3/8" x 7/8"</p>		<p>c Interface / Power supply</p> <p><u>B</u> = EtherCAT / 10 ... 30 V DC</p>				
<p>1 = with spring element long, IP65</p> <p>2 = with spring element long, IP67</p> <p>3 = with stator coupling, IP65 ø 65 mm [2.56"]</p> <p>4 = with stator coupling, IP67 ø 65 mm [2.56"]</p> <p><u>5</u> = with stator coupling, IP65 ø 63 mm [2.48"]</p> <p>6 = with stator coupling, IP67 ø 63 mm [2.48"]</p>		<p>d Type of connection</p> <p>removable bus terminal cover</p> <p><u>2</u> = 3 x M12 connector</p>		<p>e Fieldbus profile</p> <p><u>B2</u> = EtherCAT with CoE (CAN over EtherNet)</p> <p style="text-align: right;">optional on request</p> <p style="text-align: right;">- Ex 2/22</p> <p style="text-align: right;">- seawater-resistant</p>				

Order code	8.5878	. X X B 2 . B2 12	<p>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.</p>					
Hollow shaft	Type	<table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">a</td> <td style="text-align: center;">b</td> <td style="text-align: center;">c</td> <td style="text-align: center;">e</td> </tr> </table>	a	b	c	e		
a	b	c	e					
<p>a Flange</p> <p>1 = with spring element long, IP65</p> <p>2 = with spring element long, IP67</p> <p>3 = with stator coupling, IP65 ø 65 mm [2.56"]</p> <p>4 = with stator coupling, IP67 ø 65 mm [2.56"]</p> <p><u>5</u> = with stator coupling, IP65 ø 63 mm [2.48"]</p> <p>6 = with stator coupling, IP67 ø 63 mm [2.48"]</p>		<p>b Hollow shaft</p> <p>3 = ø 10 mm [0.39"]</p> <p><u>4</u> = ø 12 mm [0.47"]</p> <p>5 = ø 14 mm [0.55"]</p> <p>6 = ø 15 mm [0.59"]</p> <p>8 = ø 3/8"</p> <p>9 = ø 1/2"</p>		<p>c Interface / Power supply</p> <p><u>B</u> = EtherCAT / 10 ... 30 V DC</p>				
<p>1 = with spring element long, IP65</p> <p>2 = with spring element long, IP67</p> <p>3 = with stator coupling, IP65 ø 65 mm [2.56"]</p> <p>4 = with stator coupling, IP67 ø 65 mm [2.56"]</p> <p><u>5</u> = with stator coupling, IP65 ø 63 mm [2.48"]</p> <p>6 = with stator coupling, IP67 ø 63 mm [2.48"]</p>		<p>d Type of connection</p> <p>removable bus terminal cover</p> <p><u>2</u> = 3 x M12 connector</p>		<p>e Fieldbus profile</p> <p><u>B2</u> = EtherCAT with CoE (CAN over EtherNet)</p> <p style="text-align: right;">optional on request</p> <p style="text-align: right;">- Ex 2/22</p> <p style="text-align: right;">- seawater-resistant</p>				

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

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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"]	8.0000.1101.0606
	Bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"]	8.0000.1101.1010

Mounting accessory for hollow shaft encoders		Order No.
Cylindrical pin, long for torque stops	With fixing thread 	8.0010.4700.0000

Connection technology		
Connector, self-assembly (straight)	Coupling M12 for Port IN and Port OUT Connector M12 for power supply	05.WASCSY4S 05.B8141-0
Cordset, pre-assembled	M12 for Port IN and Port OUT, 2 m [6.56'] PUR cable M12 for power supply, 2 m [6.56'] PUR cable	05.00.6031.4411.002M 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		
Max. speed	IP65 up to 70°C [158°F] IP65 up to T _{max} IP67 up to 70°C [158°F] IP67 up to T _{max}	9 000 min ⁻¹ , 7 000 min ⁻¹ (continuous) 7 000 min ⁻¹ , 4 000 min ⁻¹ (continuous) 8 000 min ⁻¹ , 6 000 min ⁻¹ (continuous) 6 000 min ⁻¹ , 3 000 min ⁻¹ (continuous)
Starting torque - at 20°C [68°F]	IP65 IP67	< 0.01 Nm < 0.05 Nm
Moment of inertia	shaft version hollow shaft version	3.0 x 10 ⁻⁶ kgm ² 6.0 x 10 ⁻⁶ kgm ²
Load capacity of shaft	radial axial	80 N 40 N
Weight		approx. 0.50 kg [17.64 oz]
Protection acc. to EN 60529	housing side shaft side	IP67 IP65, opt. IP67
EX approval for hazardous areas		optional Zone 2 and 22
Working temperature range		-40°C ... +80°C [-40°F ... +176°F]
Material	shaft/hollow shaft flange housing	stainless steel aluminium zinc die-cast housing
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	
Power supply	10 ... 30 V DC
Power consumption (no load)	max. 110 mA
Reverse polarity protection of the power supply (+V)	yes
UL approval	File 224618
CE compliant acc. to	EMC guideline 2004/108/EC
RoHS compliant acc. to	guideline 2011/65/EU

Device characteristics	
Singleturn resolution	1 ... 65535 (16 bit), scaleable
Default value	8192 (13 bit)
Total resolution	scaleable from 1 up to 65535 (16 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)

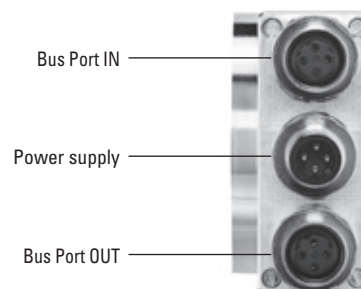
The following parameters are programmable:

- Position update time of 62.5 μ s
- EtherCAT certificate of conformity
- Speed with sign
- Four units for speed calculation: Steps/sec, Steps/100 ms, Steps/10 ms, RPM
- 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

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Terminal assignment bus

Interface	Type of connection	Function	M12 connector					Diagram
			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 -	
			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 -	
			Abbreviation:	TxD+	RxD+	TxD-	RxD-	
			Pin:	1	2	3	4	



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**Standard
Optical**

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EtherCAT

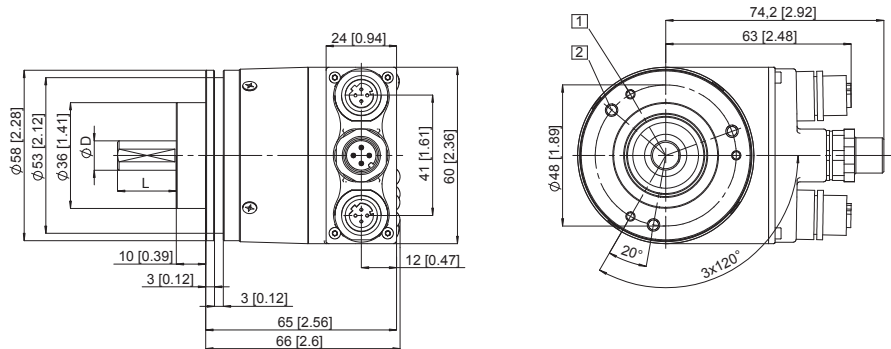
Dimensions shaft version, with removable bus terminal cover

Dimensions in mm [inch]

Clamping flange, \varnothing 58 [2.28]
Flange type 1 and 3

- 1 3 x M3, 6 [0.24] deep
- 2 3 x M4, 8 [0.32] deep

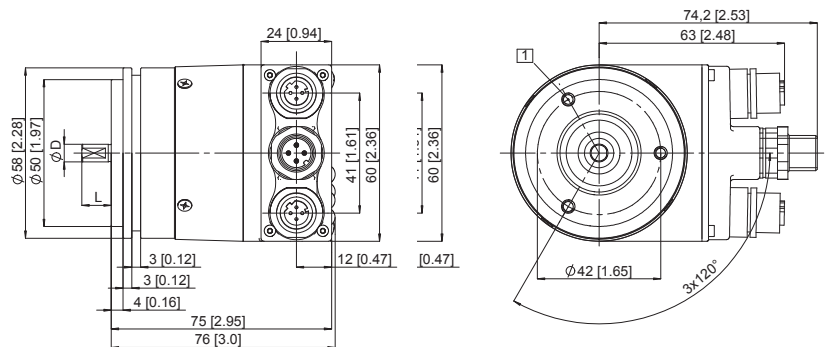
D	L	Fit
6 [0.24]	10 [0.39]	h7
10 [0.39]	20 [0.79]	f7
1/4"	7/8"	h7
3/8"	7/8"	h7



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

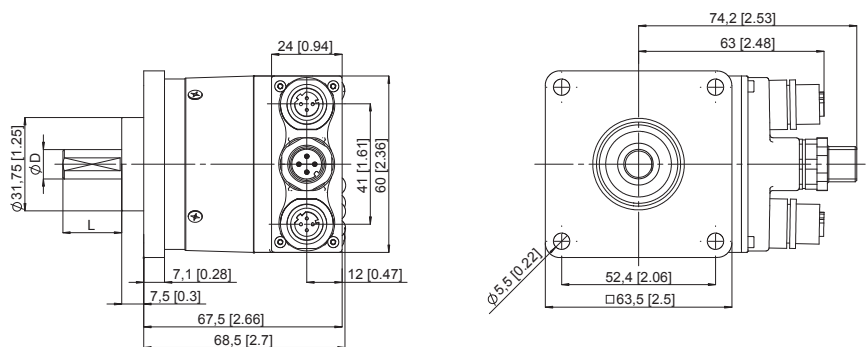
- 1 3 x M4, 6 [0.24] deep

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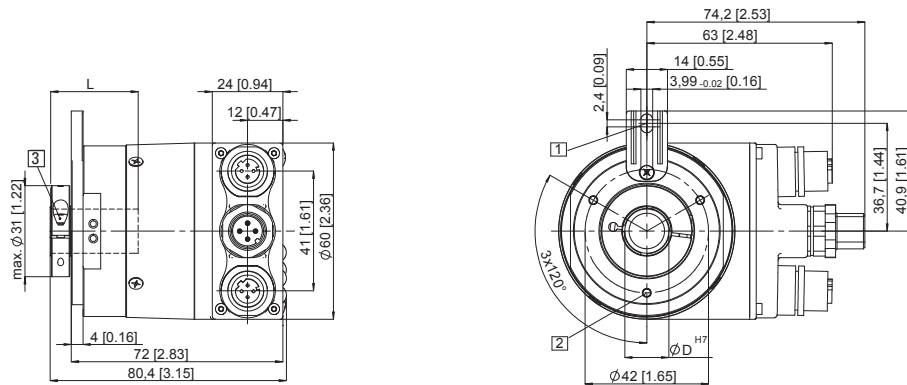
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Dimensions hollow shaft version (blind hollow shaft), with removable bus terminal cover

Dimensions in mm [inch]

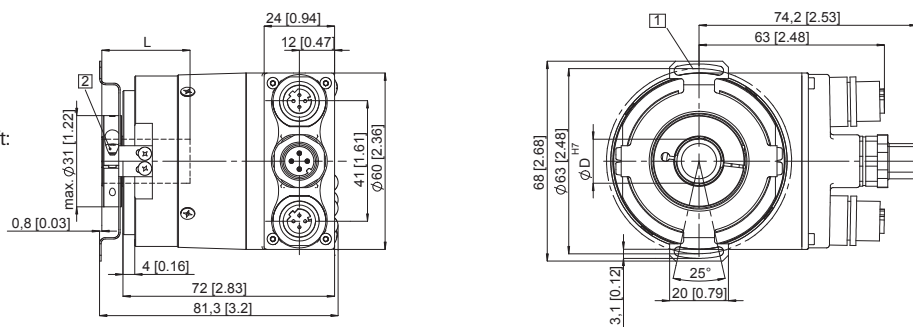
Flange with spring element long Flange type 1 and 2

- 1 Torque stop slot,
Recommendation:
Cylindrical pin DIN 7, $\varnothing 4$ [0.16]
 - 2 3 x 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, $\varnothing 63$ [2.48] Flange type 5 and 6

- 1 Fixing screws DIN 912 M3 x 8
(Washer included in delivery)
 - 2 Recommended torque for the
clamping ring 0.6 Nm
- L: Insertion depth for blind hollow shaft:
30 [1.18]



Flange with stator coupling, $\varnothing 65$ [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]

