Kübler

The fastest of their kind
Sendix EtherCAT encoders

Second generation. The absolute singleturn and multiturn Sendix EtherCAT encoders – with a position update within 62.5 µs – are currently the fastest encoders on the market.
The use of CoE (CAN over Ethernet) allows many standardised field bus functionalities.

EtherCAT®
Conformance tested

Characteristics and advantages at a glance

- Minimal cycle time: position update within 62.5 µs
  - ► Realisation of highly dynamic systems and increase of plant performance
- CoE (CAN over Ethernet)
  - ► Standardised functionality from the field bus area
- Integration of the latest EtherCAT stack by Beckhoff
  - ► The use of the most up-to-date EtherCAT features is possible
- Dynamic mapping
  - ► Customer or application-specific optimisation is possible
- EtherCAT conformance tested
  - ► Problem-free integration in standard EtherCAT environments

Scan the QR code for further information

Applications

Industrial Ethernet is increasingly imposing itself as the communication standard in automation technology. The goal is to create a vertical integration – that is to say: only one core computer, from the control level up to the industrial production plants - that will be able to control any device.

A minimal cycle time of < 1 ms is the prerequisite for this. The Sendix EtherCAT encoders demonstrate their abilities in the following application examples: wood processing machines, printing machines, automotive industry and conveyor technology.

▪▪▪ *pulses for automation*

www.kuebler.com/ethercat_en

Absolute Encoders - Singleturn

Standard Optical	Sendix 5858 / 5878 (Shaft / Hollow shaft)	EtherCAT

The singleturn encoders 5858 and 5858 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

Ex 2/22   c UL us   RoHS

Safety-Lock™	High rotational speed	-40°… +80°C Temperature range	IP High protection level	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

Order code Shaft version

8.5858 . XX B2 . B2 12
Type   ⓐⓑⓒⓓ   ⓔ

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

ⓐ *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"]

ⓑ *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"

ⓒ *Interface / Power supply*
B = EtherCAT / 10 … 30 V DC

ⓓ *Type of connection removable bus terminal cover*
2 = 3 x M12 connector

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

optional on request
- Ex 2/22
- seawater-resistant

Order code Hollow shaft

8.5878 . XX B2 . B2 12
Type   ⓐⓑⓒⓓ   ⓔ

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

ⓐ *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"]

ⓑ *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"

ⓒ *Interface / Power supply*
B = EtherCAT / 10 … 30 V DC

ⓓ *Type of connection removable bus terminal cover*
2 = 3 x M12 connector

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

optional on request
- Ex 2/22
- seawater-resistant

[1] Preferred type only in conjunction with flange type 2
[2] Preferred type only in conjunction with flange type 1

Absolute Encoders - Singleturn

Standard Optical	Sendix 5858 / 5878 (Shaft / Hollow shaft)	EtherCAT

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		
Cylindrical pin, long for torque stops	With fixing thread	8.0010.4700.0000
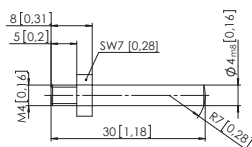
Connection technology		
Connector, self-assembly (straight)	Coupling M12 for Port IN and Port OUT	05.WASCSY4S
	Connector M12 for power supply	05.B8141-0
Cordset, pre-assembled	M12 for Port IN and Port OUT, 2 m [6.56'] PUR cable	05.00.6031.4411.002M
	M12 for power supply, 2 m [6.56'] PUR cable	05.00.6061.6211.002M

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

Max. speed	IP65 up to 70°C [158°F]		9 000 min^{-1}, 7 000 min^{-1} (continuous)
	IP65 up to T$_{max}$		7 000 min^{-1}, 4 000 min^{-1} (continuous)
	IP67 up to 70°C [158°F]		8 000 min^{-1}, 6 000 min^{-1} (continuous)
	IP67 up to T$_{max}$		6 000 min^{-1}, 3 000 min^{-1} (continuous)
Starting torque - at 20°C [68°F]		IP65	< 0.01 Nm
		IP67	< 0.05 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. 0.50 kg [17.64 oz]
Protection acc. to EN 60529			
	housing side		IP67
	shaft side		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		stainless steel
	flange		aluminium
	housing		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

Standard Optical	Sendix 5858 / 5878 (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, 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

Terminal assignment bus

Interface	Type of connection	Function	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	
B	2 (3 x M12 connector)	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	

Bus Port IN

Power supply

Bus Port OUT
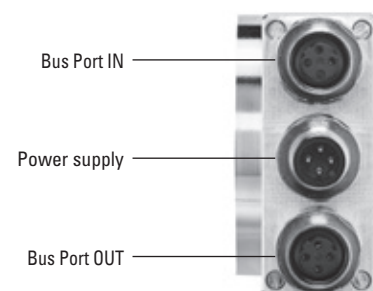
Standard Optical	Sendix 5858 / 5878 (Shaft / Hollow shaft)	EtherCAT

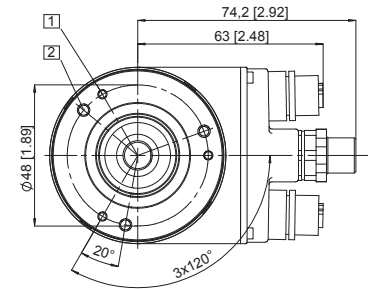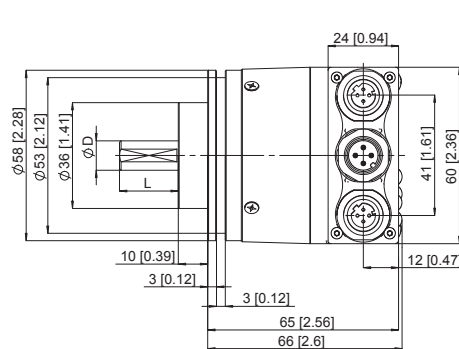## Dimensions shaft version, with removable bus terminal cover
Dimensions in mm [inch]

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

1 3 x M3, 6 [0.24] 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, ø 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
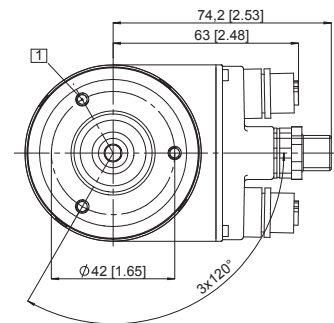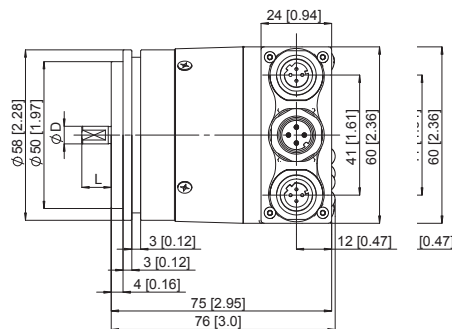
Square flange, □ 63.5 [2.5]
Flange type 5 and 7

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
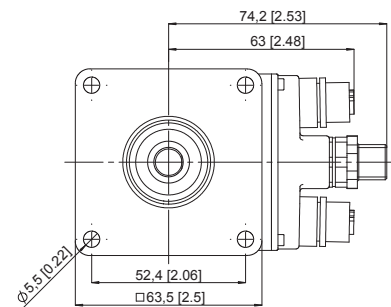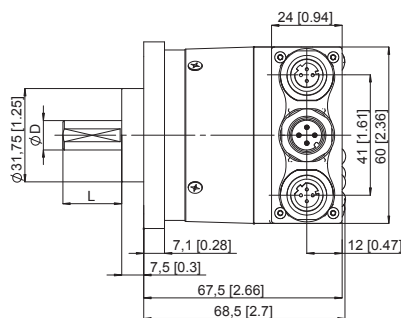
| Standard Optical	Sendix 5858 / 5878 (Shaft / Hollow shaft)	EtherCAT

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] Torque stop slot,
   Recommendation:
   Cylindrical pin DIN 7, ø 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]
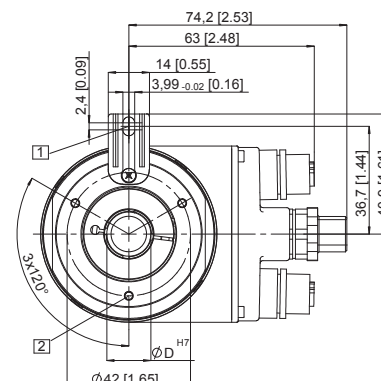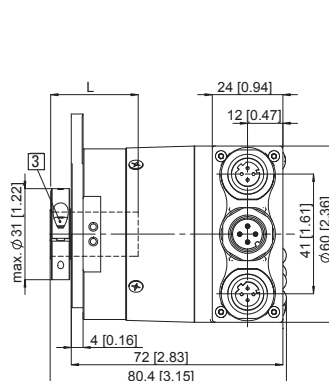
Flange with stator coupling, ø 63 [2.48]
Flange type 5 and 6

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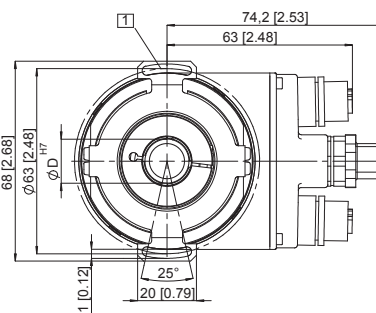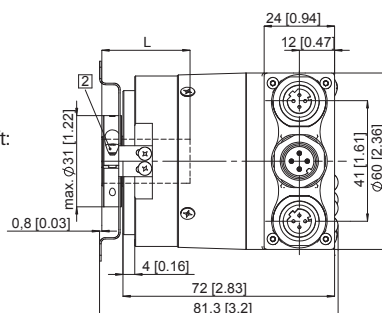
Flange with stator coupling, ø 65 [2.56]
Flange type 3 and 4

[1] Recommended torque for the
   clamping ring 0.6 Nm

L: Insertion depth for blind hollow shaft:
   30 [1.18]

Absolute Encoders Singleturn