

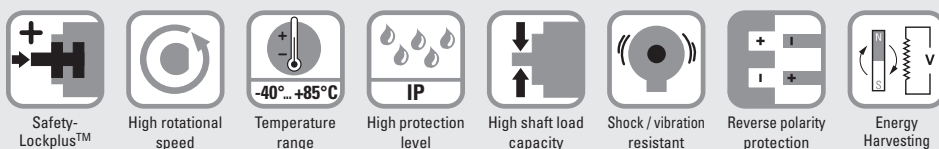
# Absolute encoders – multiturn

<b>Standard electronic multiturn, magnetic</b>	<b>Sendix M5868 (shaft)</b>	<b>CANopen</b>
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The Sendix M58 with Energy Harvesting Technology is an electronic multiturn encoder without gear and without battery – in the standard format with 58 mm flange.

High robustness and high resolution make this encoder the ideal device for use in demanding applications.



## Highest robustness

- Sturdy bearing construction in Safety-Lockplus™ design for particularly high resistance.
- Extra large bearings.
- Mechanically protected shaft seal.
- Wide temperature range -40°C ... +85°C.
- Without gear and without battery, thanks to the Energy Harvesting technology.

## Up-to-the-minute fieldbus performance

- LSS services for configuration of the node address and baud rate.
- Variable PDO mapping in the memory.
- Universal scaling function.
- Configuration management (bootloader).

**Order code** 8.M5868 .XX2X.2122  
**Shaft version** Type

<p><b>a</b> Version</p> <p>3 = clamping flange, IP65, ø 58 mm [2.28"]          4 = synchro flange, IP65, ø 58 mm [2.28"]</p> <p><b>b</b> Shaft (ø x L), with flat</p> <p>1 = ø 6 x 12.5 mm [0.24 x 0.49"]          5 = ø 10 x 20 mm [0.39 x 0.79"]</p> <p><b>c</b> Interface / power supply</p> <p>2 = CANopen DS301 V4.2 / 10 ... 30 V DC</p>	<p><b>d</b> Type of connection</p> <p>2 = radial cable, 1 m [3.28'] PVC          B = radial cable, special length PVC *)          4 = radial M12 connector, 5-pin</p> <p>*) Available special lengths (connection types B):          2, 3, 5, 8, 10, 15 m [5.56, 9.84, 16.40, 26.25, 32.80, 49.21']          order code expansion .XXXX = length in dm          ex.: 8.M5868.312B.2122.0030 (for cable length 3 m)</p>	<p><b>e</b> Fieldbus profile</p> <p>21 = CANopen</p> <p><i>Optional on request</i></p> <p>- Ex 2/22 (only for connection type 4)</p>
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Connection technology		Order no.
<b>Coupling</b>	Bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"]	<b>8.0000.1102.1010</b>
Connection technology		Order no.
<b>Cordset, pre-assembled</b>	M12 female connector with coupling nut, 5-pin 5 m [16.40'] PVC cable	<b>05.00.6091.A211.005M</b>
	M12 female connector with coupling nut, 5-pin 1 m [3.28'] PVC cable	<b>05.00.6091.22C7.001M</b>
	Deutsch connector, 6-pin, DT04	
<b>Connector, self-assembly (straight)</b>	M12 female connector with coupling nut, 5-pin	<b>8.0000.5116.0000</b>

Further accessories can be found in the accessories section or in the accessories area of our website at: [kuebler.com/accessories](http://kuebler.com/accessories).  
 Additional connectors can be found in the connection technology section or in the connection technology area of our website at: [kuebler.com/connection\\_technology](http://kuebler.com/connection_technology).

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## Technical data

Mechanical characteristics	
<b>Maximum speed</b>	4000 min <sup>-1</sup> 2000 min <sup>-1</sup> (continuous)
<b>Starting torque at 20°C [68°F]</b>	< 0.01 Nm
<b>Shaft load capacity</b>	radial 80 N axial 40 N
<b>Weight</b>	approx. 0.2 kg [7.06 oz]
<b>Protection acc. to EN 60529/DIN 40050-9</b>	IP65
<b>Working temperature range</b>	-40°C ... +85°C [-40°F ... +185°F]
<b>Materials</b>	shaft V2A flange aluminum housing zinc die-cast cable PVC
<b>Shock resistance acc. to EN 60068-2-27</b>	5000 m/s <sup>2</sup> , 4 ms
<b>Vibration resistance acc. to EN 60068-2-6</b>	300 m/s <sup>2</sup> , 10 ... 2000 Hz

Electrical characteristics	
<b>Power supply</b>	10 ... 30 V DC
<b>Current consumption (no load)</b>	max. 30 mA
<b>Reverse polarity protection of the power supply</b>	yes
<b>Short-circuit proof outputs</b>	yes <sup>1)</sup>
<b>CE compliant acc. to</b>	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

Interface characteristics CANopen	
<b>Resolution singleturn</b>	1 ... 16.384 (14 bit), scalable default: 16.384 (14 bit)
<b>Absolute accuracy <sup>2)</sup></b>	±1°
<b>Repeat accuracy</b>	±0.2°
<b>Number of revolutions (multiturn)</b>	max. 536.870.912 (29 bit) scalable only via the total resolution default: 262.144 (18 bit)
<b>Total resolution</b>	1 ... 8.796.093.022.208 (43 bit), scalable default: 4.294.967.296 (32 bit)
<b>Interface</b>	CAN high-speed acc. to ISO 11898, Basic- and Full-CAN, CAN specification 2.0 B
<b>Protocol</b>	CANopen profile DS406 V4.0 with manufacturer-specific add-ons, LSS-Service, bootloader
<b>Power-ON time</b>	< 1200 ms
<b>SDO timeout</b>	< 1000 ms
<b>Baud rate</b>	10 ... 1000 kbit/s software configurable
<b>Node address</b>	1 ... 127 software configurable
<b>Termination</b>	software configurable
<b>LSS protocol</b>	CIA LSS protocol DS305, global command support for node address and baud rate, selective commands via attributes of the identity object
<b>Bootloader</b>	configuration management CIA DS 302-3

1) Short circuit proof to 0 V or to output when power supply correctly applied.

2) Over the whole temperature range.

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## General information about CANopen

The CANopen encoders support the latest CANopen communication profile according to DS301 V4.02 . In addition, device-specific profiles like the encoder profile DS406 V3.2, DS305 (LSS) and DS302 (Bootloader) are available.

The following operating modes may be selected: Polled Mode, Cyclic Mode, Sync Mode. Moreover, scale factors, preset values, limit switch values and many other additional parameters can be programmed via the CANbus. When switching the device on, all parameters, which have been saved on a flash memory to protect them against power failure, are loaded again.

The following output values may be combined in a freely variable way as PDO (PDO mapping): **position, speed, acceleration** as well as the **status of the working area**.

The encoders are available with a connector or a cable connection.

The device address and baud rate can be set/modified by means of the software.

The two-color LED located on the back indicates the operating or fault status of the CAN-bus, as well as the status of the internal diagnostics.

## CANbus connection

The CANopen encoders are equipped with a bus trunk line in various lengths or a M12 connector and can be terminated in the device.

The devices do not have an integrated T-coupler nor they are looped internally and must therefore only be used as end devices.

## LSS layer setting services DS305 V2.0

- Global command support for node ID and baud rate configuration.
- Selective protocol via identity object (1018h).

## CANopen communication profile DS301 V4.2

Among others, the following functionality is integrated. (Class C2 functionality):

- NMT Slave.
- Heartbeat Protocol.
- Identity Object.
- Error Behavior Object.
- Variable PDO Mapping self-start programmable (Power on to operational), 3 Sending PDO's.
- Node address, baud rate and CANbus / programmable termination.

## CANopen encoder profile DS406 V4.0

The following parameters can be programmed:

- Event mode, start optional.
- 1 work area with upper and lower limit and the corresponding output states.
- Variable PDO mapping for position, speed, work area status, error and acceleration.
- Extended failure management for position sensing.
- User interface with visual display of bus and failure status 1 LED two colors.
- Customer-specific protocol.
- "Watchdog controlled" device.

## Bootloader functionality DS302-3

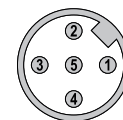
Configuration Management:

- Program download.
- Program start.
- Program erase.

## Terminal assignment

Interface	Type of connection	Cable (isolate unused wires individually before initial start-up)					
2	2, B	Signal:	+V	0 V	CAN_GND	CAN_H	CAN_L
		Cable color:	BN	WH	GY	GN	YE
Interface	Type of connection	M12 connector, 5-pin					
2	4	Signal:	+V	0 V	CAN_GND	CAN_H	CAN_L
		Pin:	2	3	1	4	5

Top view of mating side, male contact base



M12 connector, 5-pin

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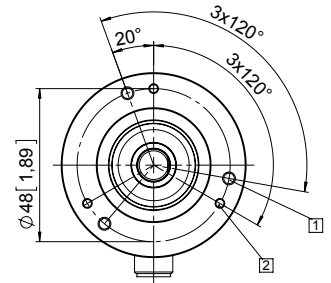
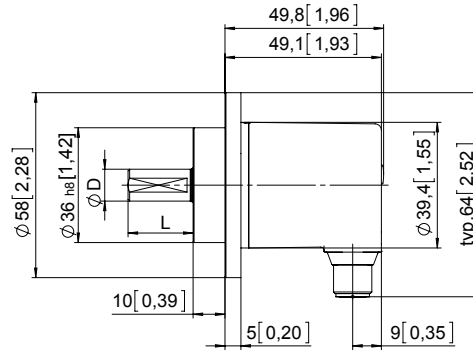
## Dimensions

Dimensions in mm [inch]

### Clamping flange, ø 58 [2.28] Flange type 3

- 1 3 x M4, 10 [0.39] deep
- 2 3 x M3, 6 [0.24] deep

D	Fit	L
6 [0.24]	h7	12.5 [0.49]
10 [0.39]	f7	20 [0.79]



### Synchro flange, ø 58 [2.28] Flange type 4

- 1 3 x M4, 10 [0.39] deep

D	Fit	L
6 [0.24]	h7	12.5 [0.49]
10 [0.39]	f7	20 [0.79]

