

Compact optical

Sendix F3658 / F3678 (shaft / hollow shaft)

CANopen



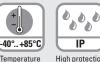
The Sendix F36 singleturn with the patented Intelligent Scan Technology™ and CANopen interface boasts exceptional ruggedness and compact dimensions.

With a size of just 36 x 42 mm it offers a shaft or a blind hollow shaft of up to 10 mm. Its high-precision optical sensor technology can achieve a resolution of up to 16 bits.





range







capacity



resistant









protection







Technology™ salt spray-tested

Reliable and magnetically insensitive

- Sturdy bearing construction in Safety-Lock™ design for resistance against vibration and installation errors.
- · Ideal for use outdoors thanks to IP67 protection and wide temperature range from -40°C up to +85°C.
- Patented Intelligent Scan Technology™ with all singleturn and multiturn functions on one single OptoASIC - offering highest reliability, a high resolution up to 16 bits and 100 % magnetic field insensitiveness.

Up-to-the-minute fieldbus performance

- · CANopen with current encoder profile.
- · LSS services for configuration of the node address and baud rate.
- · Variable PDO mapping in the memory.

Order code Shaft version 8.F3658|.

|X|X|2|X|. 21 **000** 0

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. Ω ts. up to 50 pcs. of these types generally have a delivery time of 15 working days.



a Flange

1 = clamping flange, IP67, ø 36 mm [1.42"]

3 = clamping flange, IP65, ø 36 mm [1.42"]

2 = synchro flange, IP67, ø 36 mm [1.42"]

4 = synchro flange, IP65, ø 36 mm [1.42"]

Shaft (ø x L), with flat

 $1 = \emptyset 6 \times 12.5 \text{ mm} [0.24 \times 0.49"]$

 $3 = \emptyset 8 \times 15 \text{ mm} [0.32 \times 0.49"]$

 $5 = \emptyset 10 \times 20 \text{ mm} [0.39 \times 0.79]$

 $2 = \emptyset 1/4" \times 12.5 \text{ mm } [0.49"]$

 $4 = \emptyset 3/8" \times 5/8"$

Interface / power supply

2 = CANopen DS301 V4.02 / 10 ... 30 V DC

Type of connection

1 = tangential cable, 1 m [3.28'] PUR

3 = tangential cable, 5 m [16.40'] PUR

F = tangential cable, special length PUR *)

*) Available special lengths (connection type F): 2, 3, 8, 10, 15 m [6.56, 9.84, 26.25, 32.80, 49.21'] order code expansion .XXXX = length in dm ex.: 8.F3658.432F.2112.0030 (for cable length 3 m) Fieldbus profile 21 = CANopen

Optional on request

- surface protection salt spray tested

Order code **Hollow** shaft

8.F3678 |X|X|2|X|**a b e d** 0 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



a Flange

1 = with spring element, short, IP65

3 = with spring element, long, IP65

2 = with stator coupling, IP65, ø 46 mm [1.81"]

Blind hollow shaft

(insertion depth max. 14.5 mm [0.57"])

 $5 = \emptyset 6 \text{ mm} [0.24"]$

 $7 = \emptyset 8 \text{ mm} [0.32"]$

4 = ø 10 mm [0.39"]

 $6 = \emptyset 1/4''$

C Interface / power supply

2 = CANopen DS301 V4.02 / 10 ... 30 V DC

Type of connection

1 = tangential cable, 1 m [3.28'] PUR

3 = tangential cable, 5 m [16.40'] PUR

F = tangential cable, special length PUR *)

*) Available special lengths (connection type F): 2, 3, 8, 10, 15 m [6.56, 9.84, 26.25, 32.80, 49.21'] order code expansion .XXXX = length in dm ex.: 8.F3678.242F.2112.0030 (for cable length 3 m) e Fieldbus profile 21 = CANopen

Optional on request

- surface protection salt spray tested



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Mounting accessory for shaft encoders					
Coupling	bellows coupling ø 19 mm [0.75"] for shaft 8 mm [0.32"]	8.0000.1102.0808			
Mounting accessory for hollow shaft encoders	Dimensions in mm [inch]	Order no.			
Cylindrical pin, long for flange with spring element (flange type 1 + 3)	with fixing thread 8 [0,31]	8.0010.4700.0000			

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 ch	aracteristics		
Maximum speed shaft version with or blind hollow sha	out shaft seal (IP65) aft version	12000 min ⁻¹ 10000 min ⁻¹ (continuous)	
shaft version with	shaft seal (IP67)	10000 min ⁻¹ 8000 min ⁻¹ (continuous)	
Starting torque at	20°C [68°F] without shaft seal with shaft seal (IP67)	< 0.007 Nm < 0.01 Nm	
Shaft load capaci	ty radial axial	40 N 20 N	
Weight		approx. 0.2 kg [7.06 oz]	
Protection acc. to EN 60529	housing side shaft side	IP67 IP65 (solid shaft version opt. IP67)	
Working temperat	ture range	-40°C +85°C [-40°F +185°F]	
Materials	shaft / hollow shaft flange housing cable	stainless steel aluminum zinc die-cast PUR	
Shock resistance	acc. to EN 60068-2-27	2500 m/s ² , 6 ms	
Vibration resistance	ee acc. to EN 60068-2-6	100 m/s², 55 2000 Hz	

Electrical characteristics				
Power supply	10 30 V DC			
Current consumption (no load)	max. 80 mA			
Reverse polarity protection of the power supply	ja			
UL approval	file no. E224618			
CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU			

Interface characteristics CANopen				
Resolution	1 65536 (16 bit), scalable default: 8192 (13 bit)			
Interface	CAN high-speed acc. to ISO 11898, Basic- and Full-CAN, CAN specification 2.0 B			
Protocol	CANopen profile DS406 V3.2 with manufacturer-specific add-ons, LSS-Service DS305 V2.0			
Baud rate	10 1000 kbit/s software configurable			
Node address	1 127 software configurable			
Termination	software configurable			
LSS protocol	CIA LSS protocol DS305, global command support for node address and baud rate, selective commands via attributes of the identity object			

Diagnostic LED (two-color, red/green)			
LED ON or blinking		error display status display	



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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 and DS305 (LSS) 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** 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.

CANopen communication profile DS301 V4.02

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 V3.2

The following parameters can be programmed:

- Event mode.
- 1 work area with upper and lower limit and the corresponding output states.
- Variable PDO mapping for position, speed, work area status.
- Extended failure management for position sensing.
- User interface with visual display of bus and failure status 1 LED two colors.
- · Customer-specific memory 16 Bytes.
- · Customer-specific protocol.
- "Watchdog controlled" device.

LSS layer setting services DS305 V2.0

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

CANbus connection

The CANopen encoders are equipped with a Bus trunk line in various lengths 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.

If possible, drop lines should be avoided, as in principle they lead to signal reflections. As a rule the reflections caused by the drop lines are not critical, if they have completely decayed before the point in time when the scanning

The sum of all the drop lines should not, for a particular baud rate, exceed the maximum length ${\sf Lu.}$

Lu < 5 m [16.40'] cable length for 125 Kbit

Lu < 2 m [6.56'] cable length for 250 Kbit

Lu < 1 m [3.28'] cable length for 1 Mbit

When used as a drop line, the termination resistor should not be activated.

For a network with 3 encoders and 250 Kbit the maximum length of the drop line/encoder must not exceed 70 cm.

Terminal assignment

Interface	Type of connection	Cable (isolate unused cores individually before initial start-up)					
2	1, 3, F	Signal:	+V	0 V	CAN_GND	CAN_H	CAN_L
		Core color:	BN	WH	GY	GN	YE



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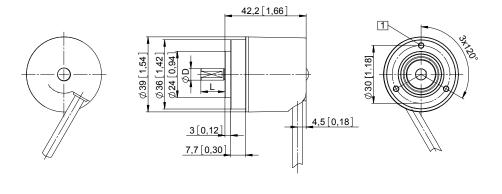
Dimensions shaft version

Dimensions in mm [inch]

Clamping flange, ø 36 [1.42] Flange type 1 and 3

1 3 x M3, 6 [0.24] deep

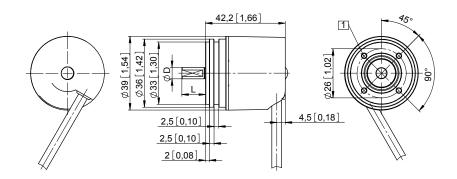
D	Fit	L
6 [0.24]	h7	12.5 [0.49]
8 [0.32]	h7	15 [0.59]
10 [0.39]	f7	20 [0.79]
1/4"	h7	12.5 [0.49]
3/8"	h7	5/8"



Synchro flange, ø 36 [1.42] Flange type 2 and 4

1 4 x M3, 6 [0.24] deep

D	Fit	L
6 [0.24]	h7	12.5 [0.49]
8 [0.32]	h7	15 [0.59]
10 [0.39]	f7	20 [0.79]
1/4"	h7	12.5 [0.49]
3/8"	h7	5/8"





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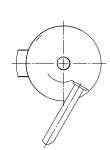
Dimensions hollow shaft version

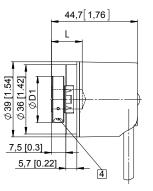
Dimensions in mm [inch]

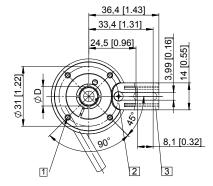
Flange with spring element Flange type 1 and 3

(drawing with spring element short, spring element long is shown dashed)

- 1 4 x M2.5, 5 [0.2] deep
- 2 Slot spring element, short recommendation: cylindrical pin DIN 7, ø 4 [0.16]
- 3 Slot spring element, long recommendation: cylindrical pin DIN 7, ø 4 [0.16]
- A Recommended torque for the clamping ring 0.7 Nm



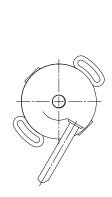


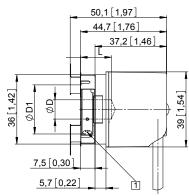


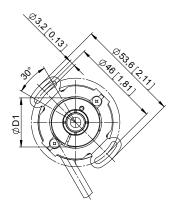
D	Fit	L	D1
6 [0.24]	H7	14.5 [0.57]	24 [0.94]
8 [0.32]	H7	14.5 [0.57]	25.5 [1.00]
10 [0.39]	H7	14.5 [0.57]	25.5 [1.00]
1/4"	H7	14.5 [0.57]	24 [0.94]
I = insertion denth max blind hollow shaft			

Flange with stator coupling, ø 46 [1.81"] Flange type 2

1 Recommended torque for the clamping ring 0.7 Nm







D	Fit	L	D1
6 [0.24]	H7	14.5 [0.57]	24 [0.94]
8 [0.32]	H7	14.5 [0.57]	25.5 [1.00]
10 [0.39]	H7	14.5 [0.57]	25.5 [1.00]
1/4"	H7	14.5 [0.57]	24 [0.94]
L = insertion depth max. blind hollow shaft			