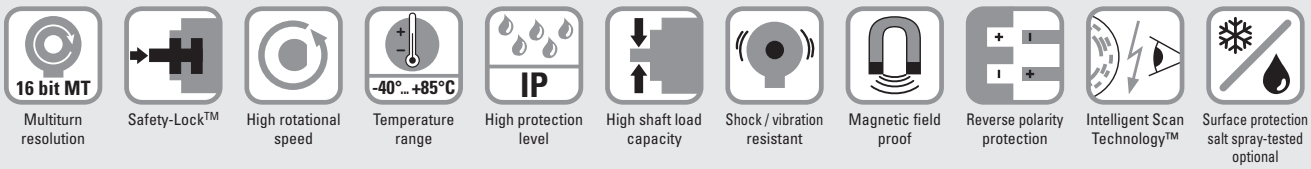
Standard
Motor-Line, electronic multiturn, optical | **Sendix F5888M (hollow shaft)** | **CANopen**

The optical Sendix F5888 multiturn encoder in the Motor-Line version stands out particularly because of its reduced overall depth of only 43 mm with a through hollow shaft up to 15 mm.

This opens up new possibilities when dimensioning the motors and for installation in tight mounting spaces. Its technical features make the F5888 Motor-Line the ideal device for use in geared motors.



Multiturn resolution | Safety-Lock™ | High rotational speed | Temperature range | High protection level | High shaft load capacity | Shock / vibration resistant | Magnetic field proof | Reverse polarity protection | Intelligent Scan Technology™ | Surface protection salt spray-tested optional

Compact and robust

- Suitable for restricted mounting spaces thanks to its small construction depth of 43 mm and its tangential cable outlet.
- Sturdy bearing construction in Safety-Lock™ design for resistance against vibration and installation errors.
- Patented Intelligent Scan Technology™ with all singleturn and multiturn functions on one single OptoASIC - offering the highest reliability, a high resolution up to 41 bits and 100 % magnetic field insensitivity.

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.
- Universal scaling function.
- 32 bits total resolution (16 bit MT + 16 bit ST).

Order code Hollow shaft

8.F5888M	.	X	X	X	X	.	21	2	X
Type		a	b	c	d		e		f

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
5 = with stator coupling, IP65, ø 63 mm [2.48"]
9 = with torque stop, flexible, IP65

b *Through hollow shaft*
Clamping on the flange side
3 = ø 10 mm [0.39"]
4 = ø 12 mm [0.47"]
5 = ø 14 mm [0.55"]
6 = ø 15 mm [0.59"]
9 = ø 1/2"

Clamping on the cover side
A = ø 12 mm [0.39"]
B = ø 14 mm [0.55"]
C = ø 15 mm [0.59"]

c *Interface / power supply*
2 = CANopen DS301 V4.2 / 10 ... 30 V DC
5 = CANopen DS301 V4.2, 10 ... 30 V DC with 2048 ppr incremental track (TTL compatible)

d *Type of connection*
L = tangential cable, 1 m [3.28'] PVC
M = tangential cable, special length PVC *)

*) Available special lengths (connection type M): 2, 3, 5, 8, 10, 15 m [6.56, 9.84, 16.40, 26.25, 32.80, 49.21'] order code expansion .XXXX = length in dm ex.: 8.F5888M.542M.2123.0030 (for cable length 3 m)

e *Fieldbus profile*
21 = CANopen

f *Options (service)*
2 = no option
3 = SET button

Optional on request
- surface protection salt spray tested

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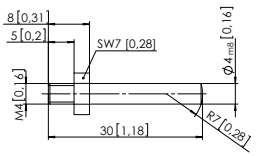
Mounting accessory for hollow shaft encoders	Dimensions in mm [inch]	Order no.
Cylindrical pin, long for flange with spring element (flange type 1)	with fixing thread 	**8.0010.4700.0000**

Further accessories can be found in the accessories section or in the accessories area of our website at: www.kuebler.com/accessories.
Suitable 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		9000 min^{-1}, 6000 min^{-1} (continuous)
Starting torque at 20°C [68°F]		< 0.01 Nm
Mass moment of inertia		6.0 x 10^{-6} kgm^2
Load capacity of shaft	radial axial	80 N 40 N
Weight		approx. 0.45 kg [15.87 oz]
Protection		IP65
Working temperature range		-40°C ... +85°C [-40°F ... +185°F] 1)
Material	hollow shaft flange housing cable	stainless steel aluminum zinc die-cast PVC
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. 80 mA
Reverse polarity protection of the power supply	yes
UL approval	file 224618
CE compliant acc. to	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU

Diagnostic LED (two-color, red/green)

LED ON or blinking	red	error display
	green	status display
	combination red / green	error code

Interface characteristics CANopen

Resolution singleturn	1 ... 65536 (16 bit), scalable default: 8192 (13 bit)
Number of revolutions (multiturn)	max. 65536 (16 bit) scalable only via the total resolution
Total resolution	1 ... 4.294.967.296 (32 bit) default: 25 bit
Code	binary
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 switchable	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

Incremental track characteristics

Output driver		RS422 (TTL-compatible)
Permissible load / channel		max. +/- 20 mA
Signal level	HIGH LOW	typ. 3.8 V typ. 1.3 V
Short circuit proof outputs		yes 2)
Resolution		2048 ppr

1) Temperature measured on the flange – max. 80°C allowable on the cable (fixed installation).
2) Short circuit to 0 V or to output, only one channel at a time, power supply correctly applied.

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General information about CANopen

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

The following operating modes may be selected: Polled Mode, Cyclic Mode, Sync Mode and a High Resolution Sync Protocol. Moreover, scale factors, preset values, limit switch values and many other additional parameters can be programmed via the CAN bus.
When switching the device on, all parameters, which have been saved on an EEPROM 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**, **temperature** 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.

Universal scaling function

At the end of the physical resolution of an encoder, **when scaling is active**, an error appears if the division of the physical limit (GP_U) by the programmed total resolution (TMR) does not produce an integer.

The universal scaling function remedies this problem.

CANopen Communication Profile DS301 V4.2

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

- NMT slave.
- Identity object.
- Error behavior object.
- Variable PDO mapping self-start programmable (power on to operational), 4 sending PDO's.
- Node address, baud rate and CANbus / programmable termination.
- Producer / consumer heartbeat.

CANopen encoder profile DS406 V3.2

The following parameters can be programmed:

- Event mode.
- 2 working areas with 2 upper and lower limits and the corresponding output states.
- Variable PDO mapping for position, speed, work area status, error message, raw data.
- Extended failure management for position sensing.
- User interface with visual display of bus and failure status.
- Customer-specific memory 16 Byte.
- Customer-specific protocol.
- Universal Scaling Function (USF).
- "Watchdog controlled" device.
- Extended diagnostic modes.

LSS layer setting services DS305 V2.0

- Global support of node-ID and baud rate
- Selective protocol via identity object (1018h)

Terminal assignment

Interface	Type of connection	Features	Cable (isolate unused wires individually before initial start-up)					
2	L, M	Bus IN	Signal:	0 V power supply	+V power supply	CAN_L	CAN_H	CAN_GND
			Cable color:	WH	BN	YE	GN	GY

Interface	Type of connection	Features	Cable (isolate unused wires individually before initial start-up)									
5	L, M	Bus IN	Signal:	0 V power supply	+V power supply	CAN_L	CAN_H	CAN_GND	A	$\overline{A}$	B	$\overline{B}$
			Cable color:	WH	BN	YE	GN	GY	BK	VT	GY-PK	RD-BU

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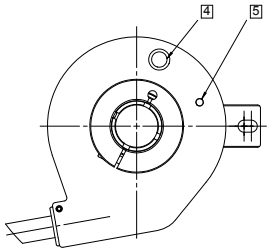
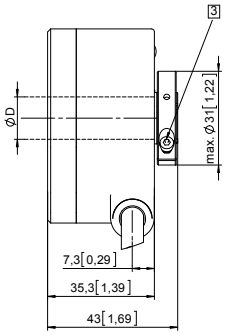
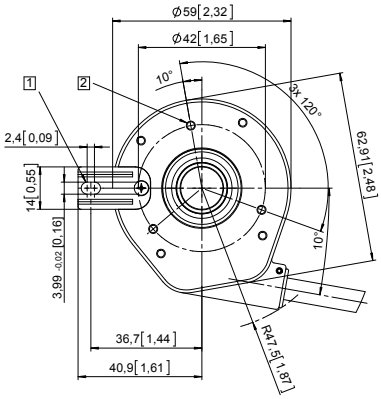
Dimensions

Dimensions in mm [inch]

Flange with spring element, long
Flange type 1



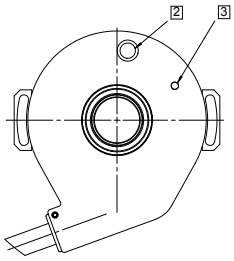


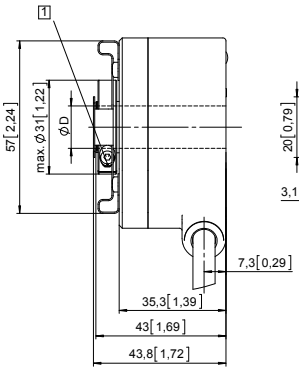


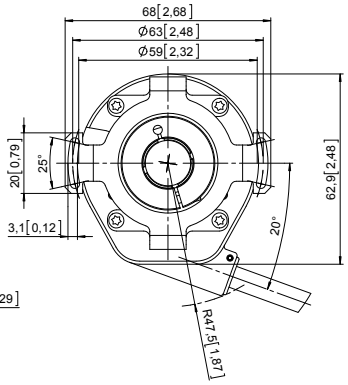
1 Slot spring element, recommendation: cylindrical pin DIN 7, ø 4 [0.16]
2 3 x M3, 6 [0.24] deep
3 Recommended torque for the clamping ring 0.6 Nm
4 Status-LED
5 SET button

D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7
1/2 "	H7

Flange with stator coupling, ø 63 [2.48]
Flange type 5
Pitch circle diameter for fixing screws 63 mm [2.48]



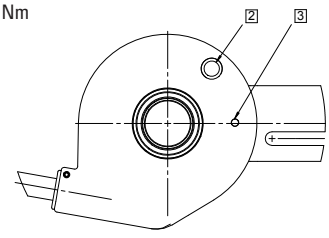




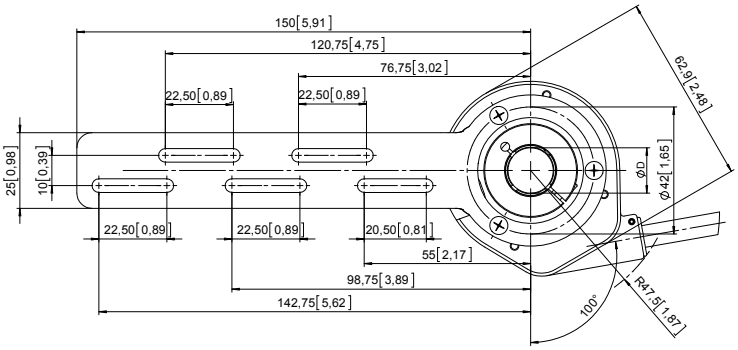
1 Recommended torque for the clamping ring 0.6 Nm
2 Status-LED
3 SET button

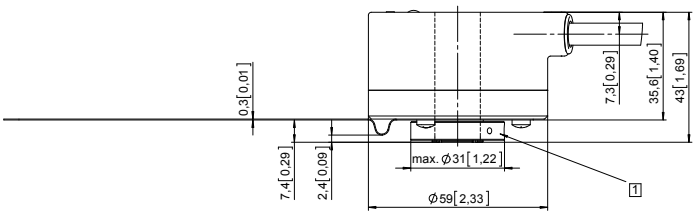
D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7
1/2 "	H7

Flange with torque stop, flexible
Flange type 9



1 Recommended torque for the clamping ring 0.6 Nm
2 Status-LED
3 SET button





D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7
1/2 "	H7