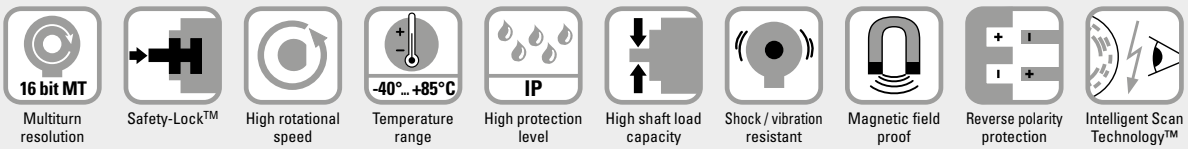
Standard
Motor-Line, electronic multiturn, optical | **Sendix F5888M (hollow shaft)** | **CANopen**



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.



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 very high resolution 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.
- Universal scaling function.
- 43 bits total resolution (19 bit MT + 24 bit ST).

Order code Hollow shaft

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

a *Flange*
1 = with spring element, long
5 = with stator coupling, ø 63 mm [2.48"]
9 = with torque stop, flexible

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 / supply voltage*
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)
7 = CANopen DS301 V4.2, 10 ... 30 V DC with 2048 ppr incremental track (HTL compatible)

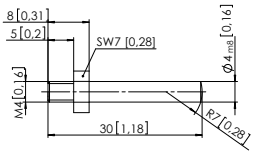
d *Type of connection*
L = tangential cable, 1 m [3.28'] PVC
M = tangential cable, special length PVC *)
*) Available special lengths (connection type M): 2, 3, 5, 8, 10, 15 m [6.56, 9.84, 16.40, 26.25, 32.80, 49.21']
order code expansion .XXXX = length in dm
ex.: 8.F5888M.542M.2123.0030 (for cable length 3 m)

e *Fieldbus profile*
21 = CANopen

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

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

Mounting accessory for hollow shaft encoders	Dimensions in mm [inch]	Order no.
Torque pin, ø 4 mm for flange with spring element (flange type 1)	with fixing thread 	**8.0010.4700.0000**

Further Kübler accessories can be found at: kuebler.com/accessories
Further Kübler cables and connectors can be found at: 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
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	stainless steel
	flange	aluminum
	housing	zinc die-cast
	cable	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

Supply voltage	10 ... 30 V DC
Power consumption (no load)	max. 100 mA
Reverse polarity protection of the supply voltage	yes

Incremental track characteristics

		RS422 (TTL-compatible)	Push-pull (HTL-compatible)
Output driver			
Permissible load / channel		max. +/- 20 mA	max. +/- 40 mA
Signal level			
	HIGH	typ. 3.8 V	typ. U_B -2 V
	LOW	typ. 1.3 V	max. 0.5 V
Short circuit proof outputs		yes [2]	yes [2]
Resolution		2048 ppr	2048 ppr

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 (MUR)		
	raw value	max. 524 288 (19 bit)
	scalable	1 ... 65 536 (16 bit)
	default	8 192 (13 bit)
Number of revolutions (NDR)		1 ... 16 777 215 (24 bit) scalable only via the total resolution
Total resolution (TMR)		
	raw value	max. 8 796 093 022 208 (43 bit)
	scalable	1 ... 4 294 967 296 (32 bit)
	default	33 554 432 (25 bit)
Interface		CAN high-speed acc. to ISO 11898, Basic- and Full-CAN, CAN Specification 2.0 B
Protocol		CANopen CiA 301 version 4.2.0 Encoder Profil CiA 406 version 4.1.0 Encoder Class 2
Baud rate		10 ... 1000 kbit/s software configurable
Node address		1 ... 127 software configurable
	Default	63
Termination switchable		software configurable
	Default	termination = ON
LSS protocol		CIA LSS protocol DS305, global command support for node address and baud rate, selective commands via attributes of the identity object

Approvals

UL compliant in accordance with	File no. E224618
CE compliant in accordance with	
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU

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, supply voltage correctly applied.

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

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 V4.1.0 Encoder Class 2 and DS305 (LSS) are available.

The following operating modes may be selected: Event mode in case of a value change, 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 + acceleration**, **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 V4.1

The following parameters can be programmed:

- Event mode: value change and/or event timer.
- 2 working areas with 2 upper and lower limits and the corresponding output states.
- Variable PDO mapping for position, speed and acceleration, work area status, error message, raw data.
- User interface with visual display of bus and failure status.
- Universal Scaling Function (USF).

LSS layer setting services DS305 V2.0

- Global support of node-ID and baud rate
- Selective protocol via identity object (1018h)
- Firmware update possible via CANopen CiA 302-3.

Terminal assignment

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

Interface	Type of connection	Features	Cable (isolate unused cores individually before initial start-up)								
5, 7	L, M	Bus IN	Signal:	0 V supply voltage	+V supply voltage	CAN_L	CAN_H	CAN_GND	A	$\overline{A}$	B	$\overline{B}$
			Core color:	WH	BN	YE	GN	GY	BK	VT	GY-PK	RD-BU

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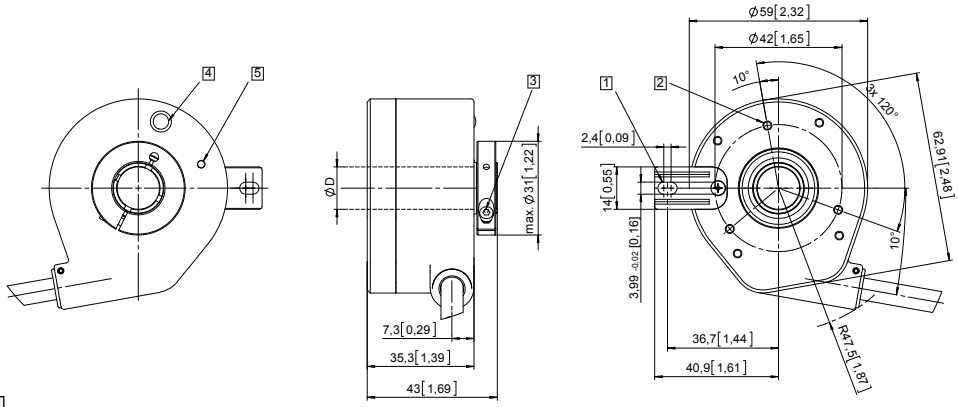
Standard
Motor-Line, electronic multiturn, optical | **Sendix F5888M (hollow shaft)** | **CANopen**

Dimensions

Dimensions in mm [inch]

Flange with spring element, long
Flange type 1

1 Slot spring element, recommendation: torque 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

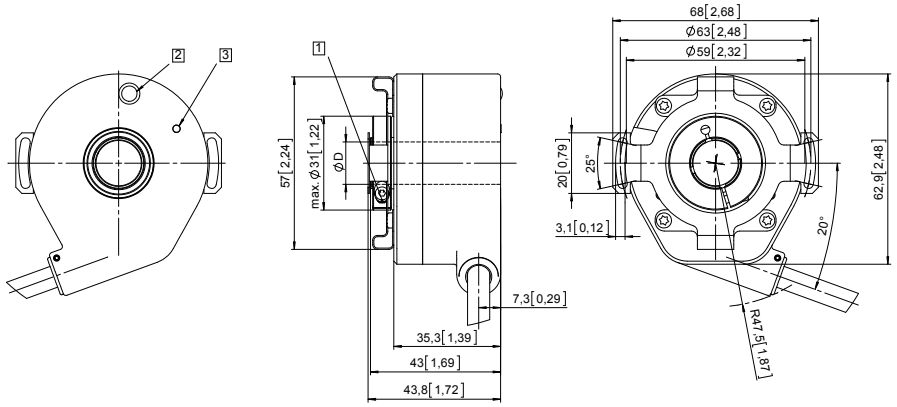


D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7
1/2 "	H7

Flange with stator coupling, ø 63 [2.48]
Flange type 5

Pitch circle diameter for fixing screws 63 mm [2.48]

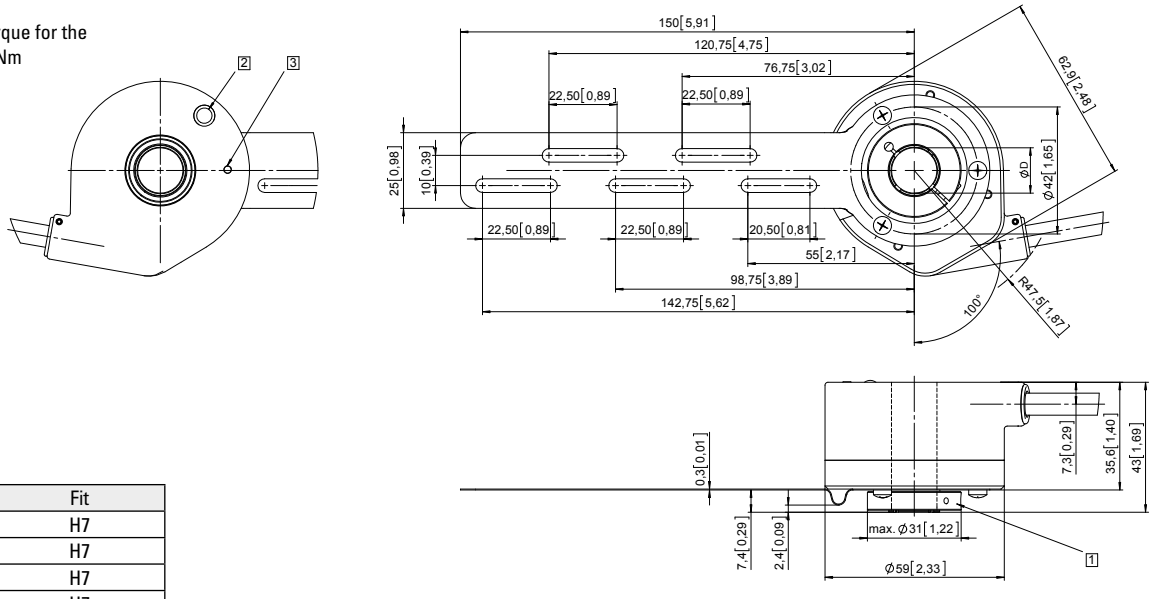
1 Recommended torque for the clamping ring 0.6 Nm
2 Status-LED
3 SET button



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

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