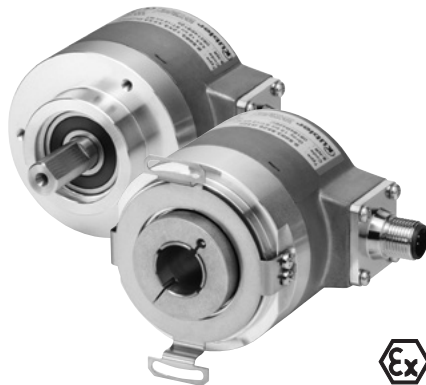


# Absolute encoders – multiturn

<b>Standard electronic multiturn, optical</b>	<b>Sendix F5868 / F5888 (shaft / hollow shaft)</b>	<b>Modbus</b>
-----------------------------------------------	----------------------------------------------------	---------------



The Sendix F58 multiturn with patented Intelligent Scan Technology™ is a particularly high resolution optical multiturn encoder without gears and with 100 percent magnetic insensitivity.

32 bits total resolution, through hollow shaft up to 15 mm and Modbus RTU interface.



16 bit MT Multiturn resolution	Safety-Lock™	High rotational speed	Temperature range -40°...+80°C	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
-----------------------------------	--------------	-----------------------	-----------------------------------	-----------------------	--------------------------	-----------------------------	----------------------	-----------------------------	------------------------------	-----------------------------------------------

### Reliable and 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 +80°C.
- Patented Intelligent Scan Technology™ with all singleturn and multiturn functions on one single OptoASIC - offering the highest reliability, a high resolution up to 32 bits and 100 % magnetic field insensitivity.

### Current Modbus performance

- Modbus register for configuration of the node address and baud rate.
- Scaling function.
- 32 bits total resolution (16 bit MT + 16 bit ST).
- Preset function.
- Diagnostic functions.
- Limit switch function.

Absolute encoders multiturn

<b>Order code</b>	<b>8.F5868</b>	<b>.XX6E.6112</b>					
<b>Shaft version</b>	Type	<table border="1" style="font-size: small; text-align: center;"> <tr> <td style="width: 15px;">a</td><td style="width: 15px;">b</td><td style="width: 15px;">c</td><td style="width: 15px;">d</td><td style="width: 15px;">e</td> </tr> </table>	a	b	c	d	e
a	b	c	d	e			
<b>a</b> Flange	<ul style="list-style-type: none"> <li>1 = clamping flange, IP65 ø 58 mm [2.28"]</li> <li>3 = clamping flange, IP67 ø 58 mm [2.28"]</li> <li>2 = synchro flange, IP65 ø 58 mm [2.28"]</li> <li>4 = synchro flange, IP67 ø 58 mm [2.28"]</li> </ul>	<ul style="list-style-type: none"> <li><b>b</b> Shaft (ø x L), with flat</li> <li>1 = 6 x 10 mm [0.24 x 0.39"]</li> <li>2 = 10 x 20 mm [0.39 x 0.79"]</li> <li>3 = 1/4" x 7/8"</li> <li>4 = 3/8" x 7/8"</li> </ul>	<ul style="list-style-type: none"> <li><b>d</b> Type of connection</li> <li>E = 1 x radial M12 connector, 5-pin</li> </ul>				
	<ul style="list-style-type: none"> <li><b>c</b> Interface / power supply</li> <li>6 = Modbus RTU, 10 ... 30 V DC</li> </ul>	<ul style="list-style-type: none"> <li><b>e</b> Fieldbus profile</li> <li>61 = Modbus RTU Application Protocol V1.1b3</li> </ul>	<p><i>Optional on request</i></p> <ul style="list-style-type: none"> <li>- Ex 2/22</li> <li>- surface protection salt spray tested</li> </ul>				

<b>Order code</b>	<b>8.F5888</b>	<b>.XX6E.6112</b>					
<b>Hollow shaft</b>	Type	<table border="1" style="font-size: small; text-align: center;"> <tr> <td style="width: 15px;">a</td><td style="width: 15px;">b</td><td style="width: 15px;">c</td><td style="width: 15px;">d</td><td style="width: 15px;">e</td> </tr> </table>	a	b	c	d	e
a	b	c	d	e			
<b>a</b> Flange	<ul style="list-style-type: none"> <li>1 = with spring element, long, IP65</li> <li>2 = with spring element, long, IP67</li> <li>3 = with stator coupling, IP65 ø 65 mm [2.56"]</li> <li>4 = with stator coupling, IP67 ø 65 mm [2.56"]</li> <li>5 = with stator coupling, IP65 ø 63 mm [2.48"]</li> <li>6 = with stator coupling, IP67 ø 63 mm [2.48"]</li> </ul>	<ul style="list-style-type: none"> <li><b>b</b> Through hollow shaft</li> <li>3 = ø 10 mm [0.39"]</li> <li>4 = ø 12 mm [0.47"]</li> <li>5 = ø 14 mm [0.55"]</li> <li>6 = ø 15 mm [0.59"]</li> </ul>	<ul style="list-style-type: none"> <li><b>d</b> Type of connection</li> <li>E = 1 x radial M12 connector, 5-pin</li> </ul>				
	<ul style="list-style-type: none"> <li><b>c</b> Interface / power supply</li> <li>6 = Modbus RTU, 10 ... 30 V DC</li> </ul>	<ul style="list-style-type: none"> <li><b>e</b> Fieldbus profile</li> <li>61 = Modbus RTU Application Protocol V1.1b3</li> </ul>	<p><i>Optional on request</i></p> <ul style="list-style-type: none"> <li>- Ex 2/22</li> <li>- surface protection salt spray tested</li> </ul>				

# Absolute encoders – multiturn

<b>Standard electronic multiturn, optical</b>	<b>Sendix F5868 / F5888 (shaft / hollow shaft)</b>	<b>Modbus</b>
<b>Mounting accessory for shaft encoders</b>		Order no.
<b>Coupling</b>	bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"]	<b>8.0000.1102.0606</b>
	bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"]	<b>8.0000.1102.1010</b>
<b>Mounting accessory for hollow shaft encoders</b>		Order no.
<b>Cylindrical pin, long</b> for flange with spring element (flange type 1 + 2)	with fixing thread	<b>8.0010.4700.0000</b>
<b>Connection technology</b>		Order no.
<b>Cordset, pre-assembled</b>	M12 female connector with coupling for bus in, 5-pin 2 m [6.56'] PVC cable	<b>05.00.6091.A211.002M</b>
<b>Connector, self-assembly (straight)</b>	M12 female connector with coupling for bus in, 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: [www.kuebler.com/accessories](http://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](http://www.kuebler.com/connection_technology).

Technical data									
<b>Mechanical characteristics</b>									
<b>Maximum speed shaft version</b>	<table border="0"> <tr> <td>IP65 up to 70°C</td> <td>12000 min<sup>-1</sup>, 10000 min<sup>-1</sup> (continuous)</td> </tr> <tr> <td>IP65 up to T<sub>max</sub></td> <td>8000 min<sup>-1</sup>, 5000 min<sup>-1</sup> (continuous)</td> </tr> <tr> <td>IP67 up to 70°C</td> <td>11000 min<sup>-1</sup>, 9000 min<sup>-1</sup> (continuous)</td> </tr> <tr> <td>IP67 up to T<sub>max</sub></td> <td>8000 min<sup>-1</sup>, 5000 min<sup>-1</sup> (continuous)</td> </tr> </table>	IP65 up to 70°C	12000 min <sup>-1</sup> , 10000 min <sup>-1</sup> (continuous)	IP65 up to T <sub>max</sub>	8000 min <sup>-1</sup> , 5000 min <sup>-1</sup> (continuous)	IP67 up to 70°C	11000 min <sup>-1</sup> , 9000 min <sup>-1</sup> (continuous)	IP67 up to T <sub>max</sub>	8000 min <sup>-1</sup> , 5000 min <sup>-1</sup> (continuous)
IP65 up to 70°C	12000 min <sup>-1</sup> , 10000 min <sup>-1</sup> (continuous)								
IP65 up to T <sub>max</sub>	8000 min <sup>-1</sup> , 5000 min <sup>-1</sup> (continuous)								
IP67 up to 70°C	11000 min <sup>-1</sup> , 9000 min <sup>-1</sup> (continuous)								
IP67 up to T <sub>max</sub>	8000 min <sup>-1</sup> , 5000 min <sup>-1</sup> (continuous)								
<b>Maximum speed hollow shaft version</b>	<table border="0"> <tr> <td>IP65 up to 70°C</td> <td>9000 min<sup>-1</sup>, 6000 min<sup>-1</sup> (continuous)</td> </tr> <tr> <td>IP65 up to T<sub>max</sub></td> <td>6000 min<sup>-1</sup>, 3000 min<sup>-1</sup> (continuous)</td> </tr> <tr> <td>IP67 up to 70°C</td> <td>8000 min<sup>-1</sup>, 4000 min<sup>-1</sup> (continuous)</td> </tr> <tr> <td>IP67 up to T<sub>max</sub></td> <td>4000 min<sup>-1</sup>, 2000 min<sup>-1</sup> (continuous)</td> </tr> </table>	IP65 up to 70°C	9000 min <sup>-1</sup> , 6000 min <sup>-1</sup> (continuous)	IP65 up to T <sub>max</sub>	6000 min <sup>-1</sup> , 3000 min <sup>-1</sup> (continuous)	IP67 up to 70°C	8000 min <sup>-1</sup> , 4000 min <sup>-1</sup> (continuous)	IP67 up to T <sub>max</sub>	4000 min <sup>-1</sup> , 2000 min <sup>-1</sup> (continuous)
IP65 up to 70°C	9000 min <sup>-1</sup> , 6000 min <sup>-1</sup> (continuous)								
IP65 up to T <sub>max</sub>	6000 min <sup>-1</sup> , 3000 min <sup>-1</sup> (continuous)								
IP67 up to 70°C	8000 min <sup>-1</sup> , 4000 min <sup>-1</sup> (continuous)								
IP67 up to T <sub>max</sub>	4000 min <sup>-1</sup> , 2000 min <sup>-1</sup> (continuous)								
<b>Starting torque</b> at 20°C [68°F]	<table border="0"> <tr> <td>IP65</td> <td>&lt; 0.01 Nm</td> </tr> <tr> <td>IP67</td> <td>&lt; 0.05 Nm</td> </tr> </table>	IP65	< 0.01 Nm	IP67	< 0.05 Nm				
IP65	< 0.01 Nm								
IP67	< 0.05 Nm								
<b>Mass moment of inertia</b>	<table border="0"> <tr> <td>shaft version</td> <td>3.0 x 10<sup>-6</sup> kgm<sup>2</sup></td> </tr> <tr> <td>hollow shaft version</td> <td>6.0 x 10<sup>-6</sup> kgm<sup>2</sup></td> </tr> </table>	shaft version	3.0 x 10 <sup>-6</sup> kgm <sup>2</sup>	hollow shaft version	6.0 x 10 <sup>-6</sup> kgm <sup>2</sup>				
shaft version	3.0 x 10 <sup>-6</sup> kgm <sup>2</sup>								
hollow shaft version	6.0 x 10 <sup>-6</sup> kgm <sup>2</sup>								
<b>Load capacity of shaft</b>	<table border="0"> <tr> <td>radial</td> <td>80 N</td> </tr> <tr> <td>axial</td> <td>40 N</td> </tr> </table>	radial	80 N	axial	40 N				
radial	80 N								
axial	40 N								
<b>Weight</b>	approx. 0.45 kg [15.87 oz]								
<b>Protection acc. to EN 60529</b>	<table border="0"> <tr> <td>housing side</td> <td>IP67</td> </tr> <tr> <td>shaft side</td> <td>IP65, opt. IP67</td> </tr> </table>	housing side	IP67	shaft side	IP65, opt. IP67				
housing side	IP67								
shaft side	IP65, opt. IP67								
<b>Working temperature range</b>	-40°C ... +80°C [-40°F ... +176°F]								
<b>Material</b>	<table border="0"> <tr> <td>shaft/hollow shaft</td> <td>stainless steel</td> </tr> <tr> <td>flange</td> <td>aluminum</td> </tr> <tr> <td>housing</td> <td>zinc die-cast</td> </tr> </table>	shaft/hollow shaft	stainless steel	flange	aluminum	housing	zinc die-cast		
shaft/hollow shaft	stainless steel								
flange	aluminum								
housing	zinc die-cast								
<b>Shock resistance</b> acc. to EN 60068-2-27	2500 m/s <sup>2</sup> , 6 ms								
<b>Vibration resistance</b> acc. to EN 60068-2-6	100 m/s <sup>2</sup> , 55 ... 2000 Hz								
<b>Electrical characteristics</b>									
<b>Power supply</b>	10 ... 30 V DC								
<b>Power consumption (no load)</b>	max. 80 mA								
<b>Reverse polarity protection of the power supply</b>	yes								
<b>UL approval</b>	file 224618								
<b>CE compliant acc. to</b>	EMC guideline 2014/30/EU RoHS guideline 2011/65/EU								
<b>Diagnostic LED (two-color, red/green)</b>									
<b>LED ON or blinking</b>	<table border="0"> <tr> <td>red</td> <td>error display</td> </tr> <tr> <td>green</td> <td>status display</td> </tr> <tr> <td>combination red / green</td> <td>error code</td> </tr> </table>	red	error display	green	status display	combination red / green	error code		
red	error display								
green	status display								
combination red / green	error code								
<b>Interface characteristics Modbus</b>									
<b>Resolution singleturn</b>	1 ... 65536 (16 bit), scalable default: 65536 (16 bit)								
<b>Number of revolutions (multiturn)</b>	max. 65536 (16 bit) scalable only via the total resolution								
<b>Total resolution</b>	1 ... 4.294.967.296 (32 bit), scalable								
<b>Code</b>	binary								
<b>Interface</b>	Modbus V1.02								
<b>Protocol</b>	Modbus RTU V1.1b3								
<b>Baud rate</b>	9600 ... 115200 kbit/s software configurable								
<b>Node address</b>	1 ... 63 software configurable								
<b>Termination</b>	software configurable								

# Absolute encoders – multiturn

<b>Standard electronic multiturn, optical</b>	<b>Sendix F5868 / F5888 (shaft / hollow shaft)</b>	<b>Modbus</b>
-----------------------------------------------	----------------------------------------------------	---------------

### Read holding register

Register	Data name
40257	Baud rate Number Data Parity Stopbits
40261	Comm Update
40262	Node Address
40263	Node Update
40264	Presetvalue
40266	Preset Update
40267	Count Direct
40268	Count Update
40269	Termination
40270	Term Update

### Write holding register

Register	Data name
40275	Lower Limit
40276	Upper Limit
40277	Compare Activ
40278	MUR (MSB)
40279	MUR (LSB)
40280	TMR (MSB)
40281	TMR (LSB)
40282	Scaling Function
40283	Delay Prescaler

### Modbus Communication Profile V 1.02

- Node address, baud rate and bus termination programmable.

### Modbus Application Protocol V1.1b3

The following parameters can be programmed:

- 2 working areas with 2 upper and lower limits and the corresponding output states.
- Extended failure management for position sensing.
- User interface with visual display of bus and failure status.
- "Watchdog controlled" device.
- Extended diagnostic modes.

### Terminal assignment

Interface	Type of connection	1 x M12 connector, 5-pin						
6	E Bus in	Signal:	0 V power supply	+V power supply	D0	D1		TG
		Pin:	3	2	5	4		1

Absolute encoders  
multiturn

# Absolute encoders – multiturn

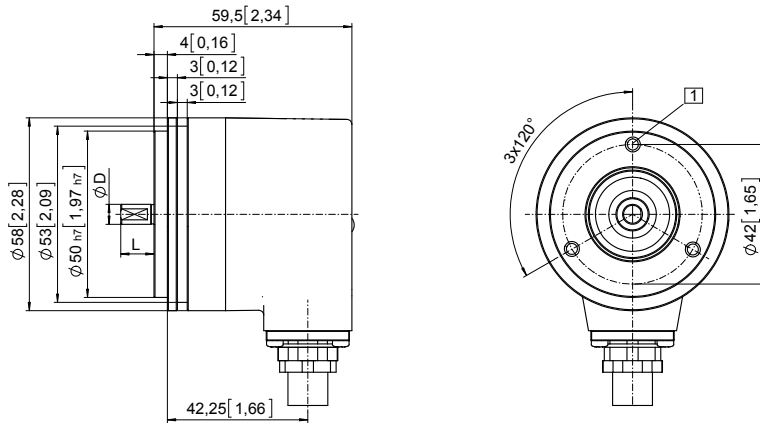
<b>Standard electronic multiturn, optical</b>	<b>Sendix F5868 / F5888 (shaft / hollow shaft)</b>	<b>Modbus</b>
-----------------------------------------------	----------------------------------------------------	---------------

## Dimensions shaft version

Dimensions in mm [inch]

### Synchro flange, ø 58 [2.28] Flange type 2 and 4

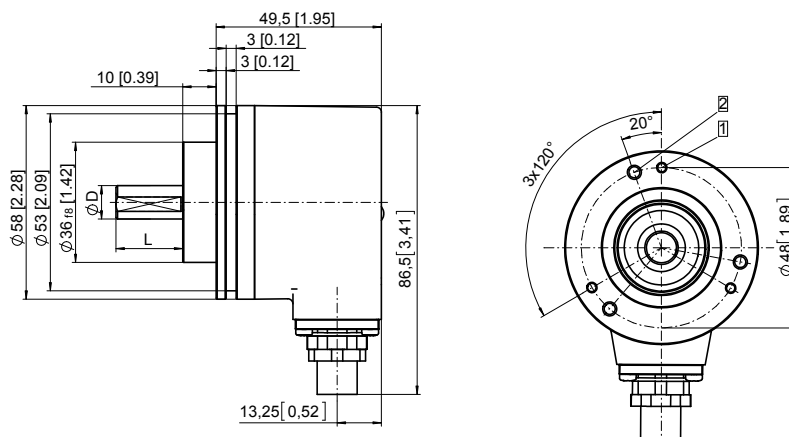
- 1 3 x M4, 6 [0.24] deep



D	Fit	L
6 [0.24]	h7	10 [0.39]
10 [0.39]	f7	20 [0.79]
1/4"	h7	7/8"
3/8"	h7	7/8"

### 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	Fit	L
6 [0.24]	h7	10 [0.39]
10 [0.39]	f7	20 [0.79]
1/4"	h7	7/8"
3/8"	h7	7/8"

# Absolute encoders – multiturn

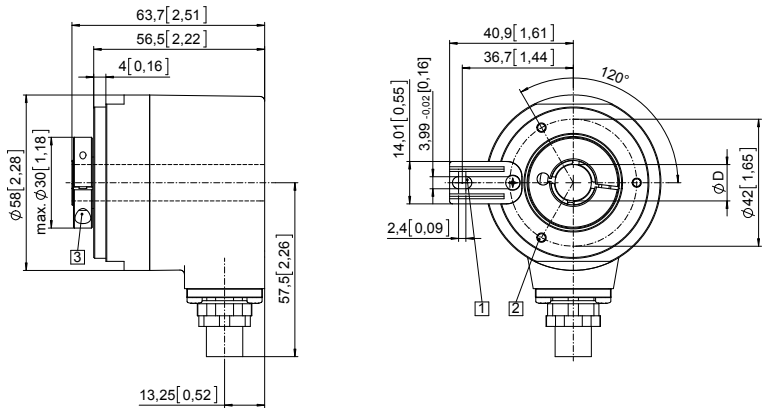
<b>Standard electronic multiturn, optical</b>	<b>Sendix F5868 / F5888 (shaft / hollow shaft)</b>	<b>Modbus</b>
-----------------------------------------------	----------------------------------------------------	---------------

## Dimensions hollow shaft version

Dimensions in mm [inch]

### Flange with spring element, long Flange type 1 and 2

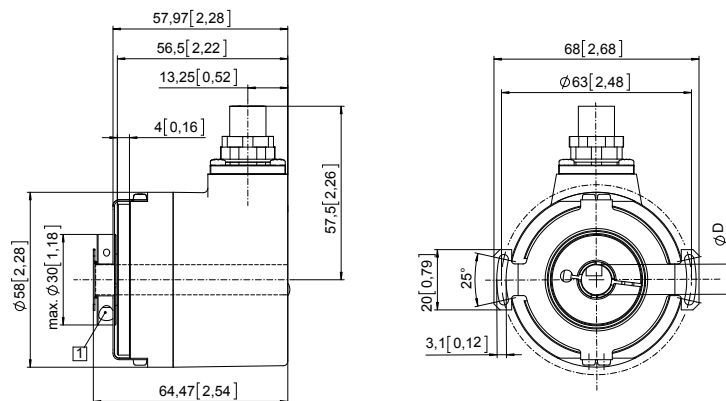
- 1 Slot spring element, recommendation: cylindrical pin DIN 7,  $\varnothing$  4 [0.16]
- 2 3 x M3, 6 [0.24] deep
- 3 Recommended torque for the clamping ring 0.6 Nm



D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7

### Flange with stator coupling, $\varnothing$ 63 [2.48] Flange type 5 and 6

- 1 Recommended torque for the clamping ring 0.6 Nm



D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7

Absolute encoders  
multiturn