

Absolute encoders – multiturn

Standard electronic multiturn, optical	Sendix F5868 / F5888 (shaft / hollow shaft)	Modbus
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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.



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

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.

Order code	8.F5868	.XX6E.6112					
Shaft version	Type	<table border="1"> <tr> <td style="text-align: center;">a</td> <td style="text-align: center;">b</td> <td style="text-align: center;">c</td> <td style="text-align: center;">d</td> <td style="text-align: center;">e</td> </tr> </table>	a	b	c	d	e
a	b	c	d	e			
a Flange	1 = clamping flange, IP65 ø 58 mm [2.28"] 3 = clamping flange, IP67 ø 58 mm [2.28"] 2 = synchro flange, IP65 ø 58 mm [2.28"] 4 = synchro flange, IP67 ø 58 mm [2.28"]	b Shaft (ø x L), with flat 1 = 6 x 10 mm [0.24 x 0.39"] 2 = 10 x 20 mm [0.39 x 0.79"] 3 = 1/4" x 7/8" 4 = 3/8" x 7/8"	d Type of connection E = 1 x radial M12 connector, 5-pin	e Fieldbus profile 61 = Modbus RTU Application Protocol V1.1b3			
		c Interface / power supply 6 = Modbus RTU, 10 ... 30 V DC	<i>Optional on request</i> - Ex 2/22 - surface protection salt spray tested				

Order code	8.F5888	.XX6E.6112					
Hollow shaft	Type	<table border="1"> <tr> <td style="text-align: center;">a</td> <td style="text-align: center;">b</td> <td style="text-align: center;">c</td> <td style="text-align: center;">d</td> <td style="text-align: center;">e</td> </tr> </table>	a	b	c	d	e
a	b	c	d	e			
a Flange	1 = with spring element, long, IP65 2 = with spring element, long, IP67 3 = with stator coupling, IP65 ø 65 mm [2.56"] 4 = with stator coupling, IP67 ø 65 mm [2.56"] 5 = with stator coupling, IP65 ø 63 mm [2.48"] 6 = with stator coupling, IP67 ø 63 mm [2.48"]	b Through hollow shaft 3 = ø 10 mm [0.39"] 4 = ø 12 mm [0.47"] 5 = ø 14 mm [0.55"] 6 = ø 15 mm [0.59"]	d Type of connection E = 1 x radial M12 connector, 5-pin	e Fieldbus profile 61 = Modbus RTU Application Protocol V1.1b3			
		c Interface / power supply 6 = Modbus RTU, 10 ... 30 V DC	<i>Optional on request</i> - Ex 2/22 - surface protection salt spray tested				

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Mounting accessory for shaft encoders		Order no.
Coupling	bellows coupling \varnothing 19 mm [0.75"] for shaft 6 mm [0.24"]	8.0000.1102.0606
	bellows coupling \varnothing 19 mm [0.75"] for shaft 10 mm [0.39"]	8.0000.1102.1010
Mounting accessory for hollow shaft encoders Dimensions in mm [inch]		Order no.
Torque pin, \varnothing 4 mm for flange with spring element (flange type 1)	with fixing thread 	8.0010.4700.0000
Cables and connectors		Order no.
Preassembled cables	M12 female connector with coupling nut, 5-pin, A coded, straight – Bus in single-ended 5 m [16.40'] PVC cable	05.00.6091.A211.005M
Connectors	M12 female connector with coupling nut, 5-pin, A coded, straight (metal) – Bus in	8.0000.5116.0000

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 shaft version	<table border="1"> <tr> <td>IP65 up to 70 °C</td> <td>12000 min⁻¹, 10000 min⁻¹ (continuous)</td> </tr> <tr> <td>IP65 up to T_{max}</td> <td>8000 min⁻¹, 5000 min⁻¹ (continuous)</td> </tr> <tr> <td>IP67 up to 70 °C</td> <td>11000 min⁻¹, 9000 min⁻¹ (continuous)</td> </tr> <tr> <td>IP67 up to T_{max}</td> <td>8000 min⁻¹, 5000 min⁻¹ (continuous)</td> </tr> </table>	IP65 up to 70 °C	12000 min ⁻¹ , 10000 min ⁻¹ (continuous)	IP65 up to T _{max}	8000 min ⁻¹ , 5000 min ⁻¹ (continuous)	IP67 up to 70 °C	11000 min ⁻¹ , 9000 min ⁻¹ (continuous)	IP67 up to T _{max}	8000 min ⁻¹ , 5000 min ⁻¹ (continuous)
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Maximum speed hollow shaft version	<table border="1"> <tr> <td>IP65 up to 70 °C</td> <td>9000 min⁻¹, 6000 min⁻¹ (continuous)</td> </tr> <tr> <td>IP65 up to T_{max}</td> <td>6000 min⁻¹, 3000 min⁻¹ (continuous)</td> </tr> <tr> <td>IP67 up to 70 °C</td> <td>8000 min⁻¹, 4000 min⁻¹ (continuous)</td> </tr> <tr> <td>IP67 up to T_{max}</td> <td>4000 min⁻¹, 2000 min⁻¹ (continuous)</td> </tr> </table>	IP65 up to 70 °C	9000 min ⁻¹ , 6000 min ⁻¹ (continuous)	IP65 up to T _{max}	6000 min ⁻¹ , 3000 min ⁻¹ (continuous)	IP67 up to 70 °C	8000 min ⁻¹ , 4000 min ⁻¹ (continuous)	IP67 up to T _{max}	4000 min ⁻¹ , 2000 min ⁻¹ (continuous)
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Starting torque at 20 °C [68 °F]	<table border="1"> <tr> <td>IP65</td> <td>< 0.01 Nm</td> </tr> <tr> <td>IP67</td> <td>< 0.05 Nm</td> </tr> </table>	IP65	< 0.01 Nm	IP67	< 0.05 Nm				
IP65	< 0.01 Nm								
IP67	< 0.05 Nm								
Mass moment of inertia	<table border="1"> <tr> <td>shaft version</td> <td>3.0 x 10⁻⁶ kgm²</td> </tr> <tr> <td>hollow shaft version</td> <td>6.0 x 10⁻⁶ kgm²</td> </tr> </table>	shaft version	3.0 x 10 ⁻⁶ kgm ²	hollow shaft version	6.0 x 10 ⁻⁶ kgm ²				
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hollow shaft version	6.0 x 10 ⁻⁶ kgm ²								
Load capacity of shaft	<table border="1"> <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				
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axial	40 N								
Weight	approx. 0.45 kg [15.87 oz]								
Protection acc. to EN 60529	<table border="1"> <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								
Working temperature range	-40 °C ... +80 °C [-40 °F ... +176 °F]								
Material	<table border="1"> <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								
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. 100 mA								
Reverse polarity protection of the power supply	yes								
Diagnostic LED (two-color, red/green)									
LED ON or blinking	<table border="1"> <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								
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Interface characteristics Modbus									
Resolution singleturn (MUR)	<table border="1"> <tr> <td>scalable</td> <td>1 ... 65 536 (16 bit)</td> </tr> <tr> <td>default</td> <td>65 536 (16 bit)</td> </tr> </table>	scalable	1 ... 65 536 (16 bit)	default	65 536 (16 bit)				
scalable	1 ... 65 536 (16 bit)								
default	65 536 (16 bit)								
Number of revolutions (NDR)	1 ... 65 536 (16 bit) scalable only via the total resolution								
Total resolution (TMR)	<table border="1"> <tr> <td>scalable</td> <td>1 ... 4 294 967 296 (32 bit)</td> </tr> <tr> <td>default</td> <td>268 435 456 (28 bit)</td> </tr> </table>	scalable	1 ... 4 294 967 296 (32 bit)	default	268 435 456 (28 bit)				
scalable	1 ... 4 294 967 296 (32 bit)								
default	268 435 456 (28 bit)								
Interface	Modbus V1.02								
Protocol	Modbus RTU V1.1b3								
Baud rate	9 600 ... 115 200 kbit/s software configurable								
Node address	1 ... 63 software configurable								
Termination	software configurable								
Approvals									
UL compliant in accordance with	File no. E224618								
CE compliant in accordance with	<table border="1"> <tr> <td>EMC Directive</td> <td>2014/30/EU</td> </tr> <tr> <td>RoHS Directive</td> <td>2011/65/EU</td> </tr> <tr> <td>ATEX Directive</td> <td>2014/34/EU (for Ex 2/22 variants)</td> </tr> </table>	EMC Directive	2014/30/EU	RoHS Directive	2011/65/EU	ATEX Directive	2014/34/EU (for Ex 2/22 variants)		
EMC Directive	2014/30/EU								
RoHS Directive	2011/65/EU								
ATEX Directive	2014/34/EU (for Ex 2/22 variants)								
UKCA compliant in accordance with	<table border="1"> <tr> <td>EMC Regulations</td> <td>S.I. 2016/1091</td> </tr> <tr> <td>RoHS Regulations</td> <td>S.I. 2012/3032</td> </tr> <tr> <td>UKEX Regulations</td> <td>S.I. 2016/1107 (for Ex 2/22 variants)</td> </tr> </table>	EMC Regulations	S.I. 2016/1091	RoHS Regulations	S.I. 2012/3032	UKEX Regulations	S.I. 2016/1107 (for Ex 2/22 variants)		
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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

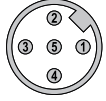
- Node address, baud rate and bus termination programmable.

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	

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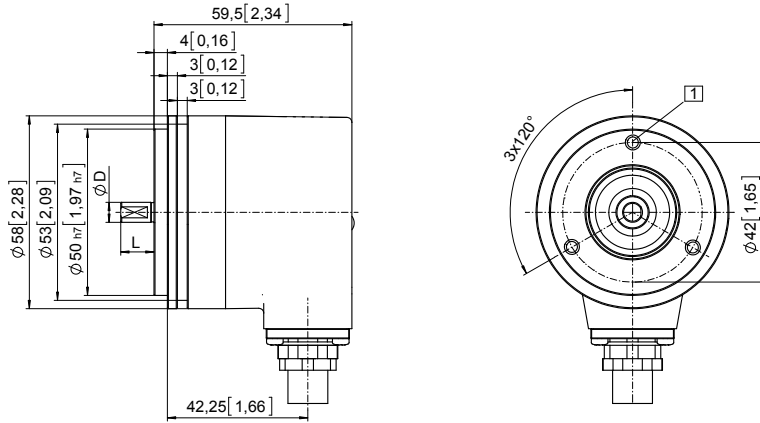
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Dimensions shaft version

Dimensions in mm [inch]

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

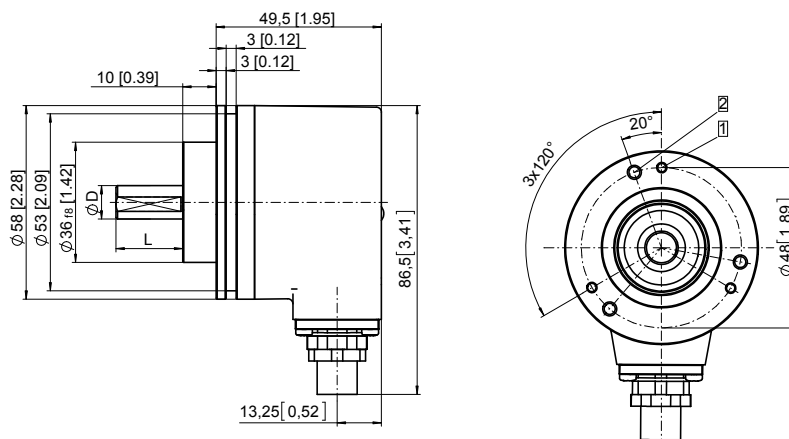
- 1 3 x M4, 6 [0.24] deep



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"

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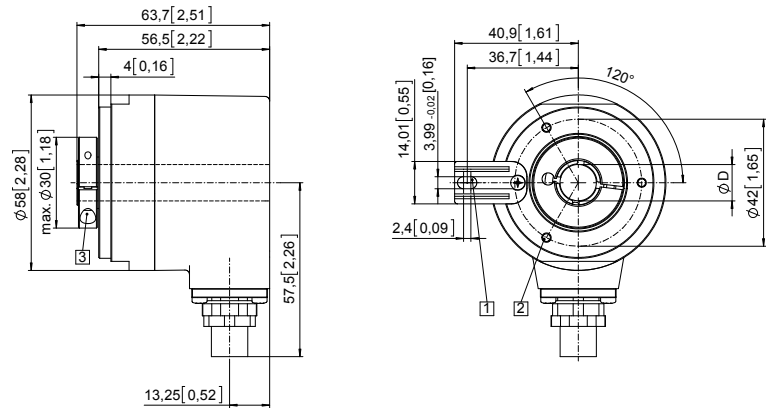
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Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with spring element, long Flange type 1 and 2

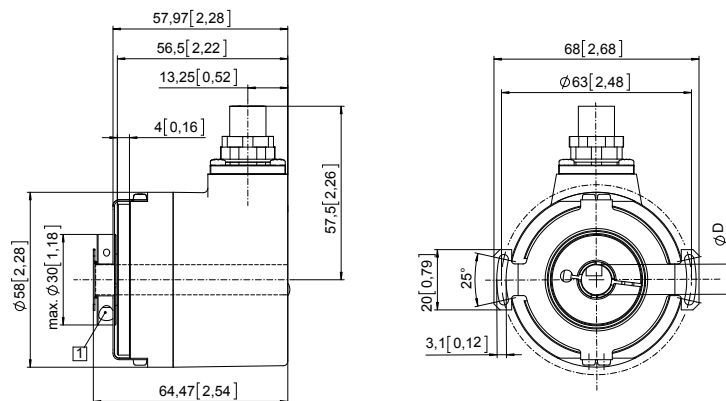
- 1 Slot spring element, recommendation: torque pin DIN 7, \varnothing 4 [0.16]
- 2 3 x M3, 6 [0.24] deep
- 3 Recommended torque for the clamping ring 0.6 Nm



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