Absolute Encoders – Multiturn

Standard mechanical Multiturn, optical	Sendix 5868 / 5888 (Shaft / Hollow shaft)	PROFIBUS DP

The multiturn encoders Sendix 5868 and 5888 with Profibus interface and optical sensor technology are the ideal solution for all Profibus applications.

With a maximum resolution of 28 bits these encoders are available with blind hollow shaft up to 15 mm.

Ex 2/22   c UL us   RoHS   PROFI BUS®

Mechanical drive	Safety-Lock™	High rotational speed	Temperature range -40°...+80°C	High protection level IP	High shaft load capacity	Shock / vibration resistant	Magnetic field proof	Reverse polarity protection	Optical sensor	Seawater-resistant version on request

Reliable

- Tried-and-tested in applications with the highest demands, such as in wind energy or mobile automation
- Absolutely reliable operation in areas with strong magnetic fields, thanks to mechanical gear with optical sensor technology

Flexible

- Fast, simple, error-free connection using versions with M12 connector
- Wide-ranging programming options thanks to latest encoder profile

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Order code Shaft version

8.5868 . X X 3 X . 31 1 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 types. Qts. up to 50 pcs. of these types generally have a delivery time of 15 working days.

10 by 10

ⓐ *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"]
5 = square flange, IP65 □ 63.5 mm [2.5"]
7 = square flange, IP67 □ 63.5 mm [2.5"]

ⓑ *Shaft (ø x L), with flat*
1 = 6 x 10 mm [0.24 x 0.39"] [1]
2 = 10 x 20 mm [0.39 x 0.79"] [2]
3 = 1/4" x 7/8"
4 = 3/8" x 7/8"

ⓒ *Interface / Power supply*
3 = PROFIBUS DP V0 encoder profile V 1.1, 10 ... 30 V DC

ⓓ *Type of connection*
1 = removable bus terminal cover, with cable gland fitting, radial
2 = removable bus terminal cover, with 3 x M12 connectors, radial, 5-pin

ⓔ *Fieldbus profile*
31 = PROFIBUS DP V0 encoder profile Class 2

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

optional on request
- Ex 2/22
- seawater-resistant

Order code Hollow shaft

8.5888 . X X 3 X . 31 1 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

ⓐ *Flange with torque stop*
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"]

ⓑ *Blind 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"]
8 = ø 3/8"
9 = ø 1/2"

ⓒ *Interface / Power supply*
3 = PROFIBUS DP V0 encoder profile V 1.1, 10 ... 30 V DC

ⓓ *Type of connection*
1 = removable bus terminal cover, with cable gland fitting, radial
2 = removable bus terminal cover, with 3 x M12 connectors, radial, 5-pin

ⓔ *Fieldbus profile*
31 = PROFIBUS DP V0 encoder profile Class 2

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

optional on request
- Ex 2/22
- seawater-resistant

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[1] Preferred type only in conjunction with flange type 2
[2] Preferred type only in conjunction with flange type 1

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Mounting accessory for shaft encoders		Order No.
Coupling	Bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"]	**8.0000.1101.0606**
	Bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"]	**8.0000.1101.1010**

Mounting accessory for hollow shaft encoders		
Cylindrical pin, long for torque stops	With fixing thread	**8.0010.4700.0000**

Connection technology		
Connector, self-assembly (straight)	Coupling M12 for Bus in	**05.BMWS 8151-8.5**
	Connector M12 for Bus out	**05.BMSWS 8151-8.5**
	Connector M12 for power supply	**05.B8141-0**
Cordset, pre-assembled	M12 cordset for Bus in , 6 m [19.68'] PUR cable	**05.00.6011.3211.006M**
	M12 cordset for Bus out, 6 m [19.68'] PUR cable	**05.00.6011.3411.006M**
	M12 cordset for power supply, 2 m [6.56'] PUR cable	**05.00.6061.6211.002M**

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 characteristics

Max. speed	IP65 up to 70°C [158°F]	9 000 min⁻¹, 7 000 min⁻¹ (continuous)
	IP65 up to Tmax	7 000 min⁻¹, 4 000 min⁻¹ (continuous)
	IP67 up to 70°C [158°F]	8 000 min⁻¹, 6 000 min⁻¹ (continuous)
	IP67 up to Tmax	6 000 min⁻¹, 3 000 min⁻¹ (continuous)
Starting torque - at 20°C [68°F]	IP65	< 0.01 Nm
	IP67	< 0.05 Nm
Moment of inertia		
	Shaft version	4.0×10^{-6} kgm^2
	Hollow shaft version	7.5×10^{-6} kgm^2
Load capacity of shaft	radial	80 N
	axial	40 N
Weight	with bus terminal cover	approx. 0.57 kg [10.11 oz]
	with fixed connection	approx. 0.52 kg [18.34 oz]
Protection acc. to EN 60529		
	housing side	IP67
	shaft side	IP65, opt. IP67
EX approval for hazardous areas		optional zone 2 and 22
Working temperature range		-40°C ... +80°C [-40°F ... +176°F]
Materials	shaft / hollow shaft	stainless steel
	flange	aluminium
	housing	zinc die-cast housing
	cable	PVC
Shock resistance acc. EN 60068-2-27		2500 m/s^2, 6 ms
Vibration resistance acc. EN 60068-2-6		100 m/s^2, 55 ... 2000 Hz

Electrical characteristics

Power supply	10 ... 30 V DC
Power consumption (no load)	max. 120 mA
Reverse polarity protection of the power supply (+V)	yes
UL approval	File 224618
CE compliant acc. to	EMC guideline 2004/108/EC
RoHS compliant acc. to	guideline 2011/65/EU

SET button (zero or defined value, option)

Protection against accidental activation.
Button can only be operated with a ball-pen or pencil.

Diagnostic LED (yellow)

LED is ON with following errors	Sensor error (Profibus error)

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Interface characteristics PROFIBUS-DP

Singleturn resolution	1 ... 65536 (16 bit), scaleable
Default value	8192 (13 bit)
Total resolution	28 bit (scaleable 1 ... 2^{28} steps)
Number of revolutions	4096 (12 bit), scaleable: 1 ... 4096
Code	Binary
Interface	Interface specification acc. to PROFIBUS-DP 2.0 / Standard (DIN 19245 Part 3) / RS485 driver galvanically isolated
Protocol	Profibus Encoder Profile V1.1 Class1 and Class 2 with manufacturer-specific add-ons
Baud rate	max. 12 Mbit/s
Device address	1 ... 127 (set by rotary switches)
Termination switchable	set by DIP switches

Profibus Encoder-Profile V1.1

The PROFIBUS DP device profile describes the functionality of the communication and the user-specific component within the Profibus field bus system. For encoders, the encoder profile is definitive. Here the individual objects are defined independent of the manufacturer. Furthermore, the profiles offer space for additional manufacturer-specific functions; this means that Profibus-compliant device systems can be used now with the guarantee that they are ready for the future too.

The following parameters can be programmed

- Direction of rotation
- Scaling (Number of steps per revolution)
- Preset value
- Diagnostics mode

The following functionality is integrated

- Galvanic isolation of the bus stage with DC/DC converter
- Line driver acc. to RS485 max. 12 MB
- Address programmable via DIP switches
- Diagnostics LED
- Full Class 1 and Class 2 functionality

Terminal assignment terminal box

Interface	Type of connection		BUS IN				BUS OUT				
3	1	Signal:	B	A	0 V	+ V	0 V	+ V	B	A	The shield of the connection cable must be connected over a large area via the cable gland.
	(terminal box)	Terminal:	1	2	3	4	5	6	7	8	

Interface	Type of connection	Function						
3	2 (3 x M12 connector)	Bus in	Signal:	–	PB_A	–	PB_B	Shield	
			Pin:	1	2	3	4	5	
		Power supply	Signal:	+V	–	0 V	–		
			Pin:	1	2	3	4		
		Bus out	Signal:	BUS_VDC[1]	PB_A	BUS_GND[1]	PB_B	Shield	
			Pin:	1	2	3	4	5	

1) For supplying an external Profibus termination resistor

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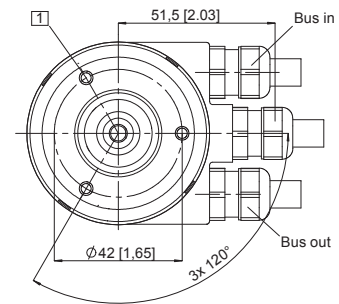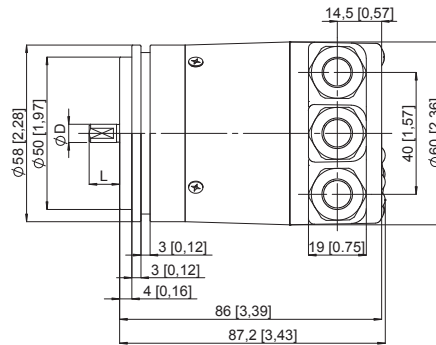**Dimensions shaft version, with removable bus terminal cover**

Dimensions in mm [inch]

Synchro flange, ø 58 [2.28]
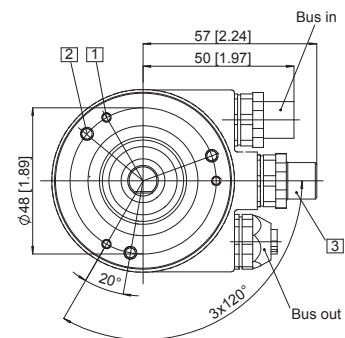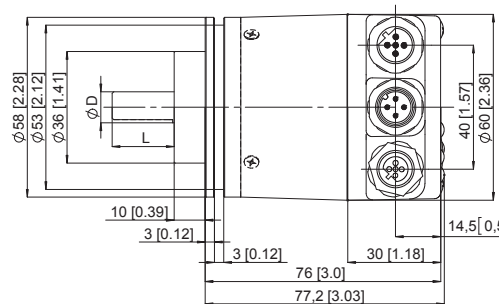**Flange type 2 and 4**
(Drawing with cable)

1 M4, 6 [0.24] deep

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

Clamping flange, ø 58 [2.28]
Flange type 1 and 3
(Drawing with 2 x M12 connector)

1 3 x M3, 6 [0.24] deep
2 3 x M4, 8 [0.32] deep

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

Square flange, □ 63.5 [2.5]
Flange type 5 and 7
(Drawing with cable)
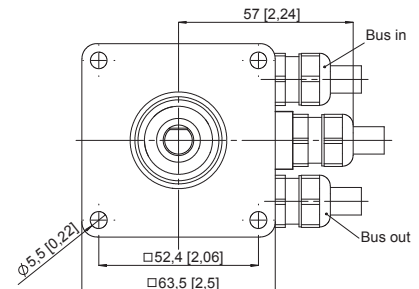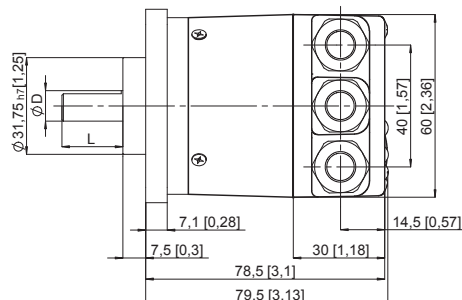
D	L	Fit
6 [0.24]	10 [0.39]	h7
10 [0.39]	20 [0.79]	f7
1/4"	7/8"	h7
3/8"	7/8"	h7

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Multiturn

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Dimensions hollow shaft version (blind hollow shaft), with removable bus terminal cover
Dimensions in mm [inch]

Flange with spring element long
Flange type 1 and 2
(drawing with 3 x M12 connector)

1   Torque stop slot,
Recommendation:
Cylindrical pin DIN 7, ø 4 [0.16]

2   3 x M3, 5.5 [0.21] deep

3   Recommended torque for the
clamping ring 0.6 Nm

L: Insertion depth for blind
hollow shaft: 30 [1.18]
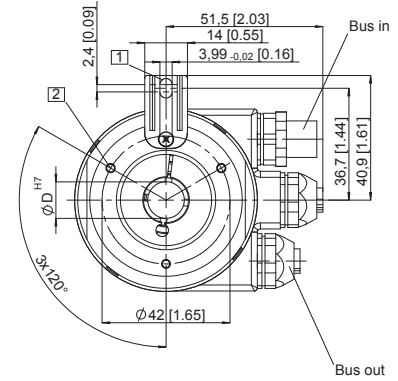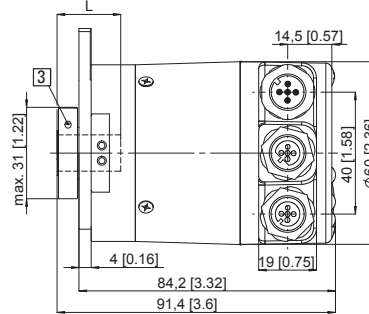
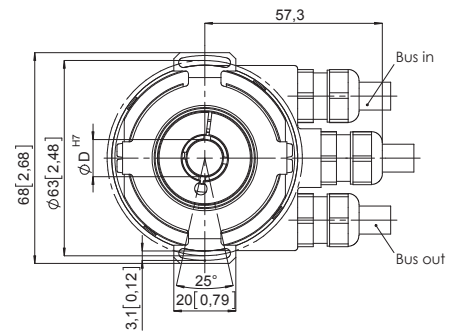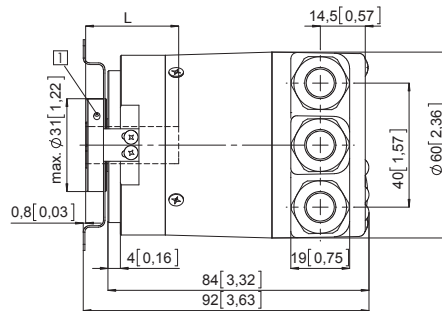**Flange with stator coupling, ø 63 [2.48]**
Flange type 5 and 6
Pitch circle diameter for fixing screws 63 [2.48]
(Drawing with cable)

1   Recommended torque for the
clamping ring 0.6 Nm

L: Insertion depth for blind
hollow shaft: 30 [1.18]

Flange with stator coupling, ø 65 [2.56]
Flange type 3 and 4
Pitch circle diameter for fixing screws 65 [2.56]
(drawing with 3 x M12 connector)

1   Recommended torque for the
clamping ring 0.6 Nm

L: Insertion depth for blind
hollow shaft: 30 [1.18]