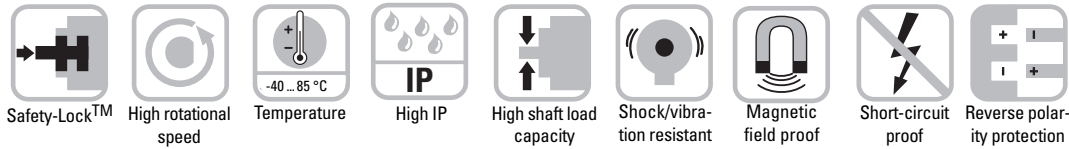


### Sendix incremental Type 5000 (Shaft) / 5020 (Hollow shaft)



#### Flexible in use:

- **The right connection variant for every application:** Cable, M23 connector or M12 connector
- **Reliable mounting in a wide variety of installation situations:** Comprehensive and proven mounting options
- **Standard encoder for use worldwide:** compatible with all US and European standards, supply voltage 5 ... 30 V DC, various interface options, max. 5000 ppr.



Sendix® inkremental

#### Compact

- **Can be used even where space is tight:** outer diameter 50 mm, installation depth max. 47 mm.

#### Rugged & Tough

- **Increased resistance against vibrations and installation mistakes:** Avoids machine stops and repair work. Sturdy "Safety-Lock™ Design" bearing structure
- **Remains sealed, even in roughest environments:** ensures highest safety against field breakdowns and is thus suitable also for outside use. Resistant die-cast housing and protection up to IP 67
- **Can be used in a wide temperature range:** Wide temperature range (-40°C...+85°C)
- **also available in seawater resistant version,** certified acc. to salt-spray test IEC 68-2-11 => 672 hours.

#### Mechanical characteristics:

Speed IP 65 <sup>1)</sup> :	max. 12000 min <sup>-1</sup>	Weight:	approx. 0.4 kg
Speed IP 67 <sup>2)</sup> :	max. 6000 min <sup>-1</sup>	Protection acc. to EN 60 529 without shaft sealing:	IP 65
Rotor moment of inertia:		Protection acc. to EN 60 529 with shaft sealing:	IP 67
Shaft version:	approx. 1.8 x 10 <sup>-6</sup> kgm <sup>2</sup>	EX approval for hazardous areas:	optional zone 2 and 22
Hollow shaft version:	approx. 6 x 10 <sup>-6</sup> kgm <sup>2</sup>	Working temperature:	-40 °C <sup>3)</sup> ... +85 °C
Starting torque:	< 0.01 Nm, IP 65	Shaft:	stainless steel,
	< 0.05 Nm, IP 67	Shock resistance acc. to DIN-IEC 68-2-27:	2500 m/s <sup>2</sup> , 6 ms
Radial load capacity shaft:	80 N	Vibration resistance to DIN-IEC 68-2-6:	100 m/s <sup>2</sup> , 10...2000 Hz
Axial load capacity shaft:	40 N		

<sup>1)</sup> For continuous operation 6000 min<sup>-1</sup>

<sup>2)</sup> For continuous operation max. 3000 min<sup>-1</sup>

<sup>3)</sup> with connector: -40 °C,

cable fixed: -30 °C, cable moved: -20 °C

#### Electrical characteristics:

Output circuit:	RS 422 (TTL compatible)	RS 422 (TTL compatible)	Push-Pull	Push-Pull (7272)
Supply voltage:	5 ... 30 V DC	5 V ±5%	10 ... 30 V DC	5 ... 30 V DC
Power consumption (no load):	typ. 40 mA / max. 90 mA	typ. 40 mA max. 90 mA	typ. 50 mA max. 100 mA	typ. 50 mA max. 100 mA
Permissible load/channel:	max. ±20 mA	max. ±20 mA	max. ±30 mA	max. ±20 mA
Pulse frequency:	max. 300 kHz	max. 300 kHz	max. 300 kHz	max. 300 kHz <sup>3)</sup>
Signal level high:	min. 2.5 V	min. 2.5 V	min. UB - 1V	min. UB-2.0 V
Signal level low:	max. 0.5 V	max. 0.5 V	max. 0.5 V	max. 0.5 V
Rise time t <sub>r</sub>	max. 200 ns	max. 200 ns	max. 1 μs	max. 1 μs
Fall time t <sub>f</sub>	max. 200 ns	max. 200 ns	max. 1 μs	max. 1 μs
Short circuit proof outputs <sup>1)</sup> :	yes <sup>2)</sup>	yes <sup>2)</sup>	Yes	yes
Reverse connection protection at U <sub>B</sub> :	yes	no	Yes	no
UL certified	File 224618			
Conforms to CE requirements acc. to EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3				
RoHS compliant acc. to EU guideline 2002/95/EG				

<sup>1)</sup> If supply voltage correctly applied

<sup>3)</sup> Max. recommended cable length 30 m

<sup>2)</sup> Only one channel allowed to be shorted-out:

(If UB=5 V, short-circuit to channel, 0 V, or +UB is permitted.)

(If UB=5-30 V, short-circuit to channel or 0 V is permitted.)

### Sendix incremental Type 5000 (Shaft) / 5020 (Hollow shaft)

#### Terminal assignment:

Signal:	0 V GND	+U <sub>B</sub>	0 V Sens	+U <sub>b</sub> Sens	A	$\bar{A}$	B	$\bar{B}$	0	$\bar{0}$	Shield
M23, 12 pin connector, Pin:	10	12	11	2	5	6	8	1	3	4	-1)
M12, 8 pin connector, Pin:	1	2			3	4	5	6	7	8	-1)
MIL (MS styled), 10 pin con. Pin:	F	D		E	A	G	B	H	C	I	J <sup>1)</sup>
Cable colour:	WH	BN	GY PK	RD BU	GN	YE	GY	PK	BU	RD	Shield

1) Shield is attached to connector housing

Isolate unused outputs before initial startup

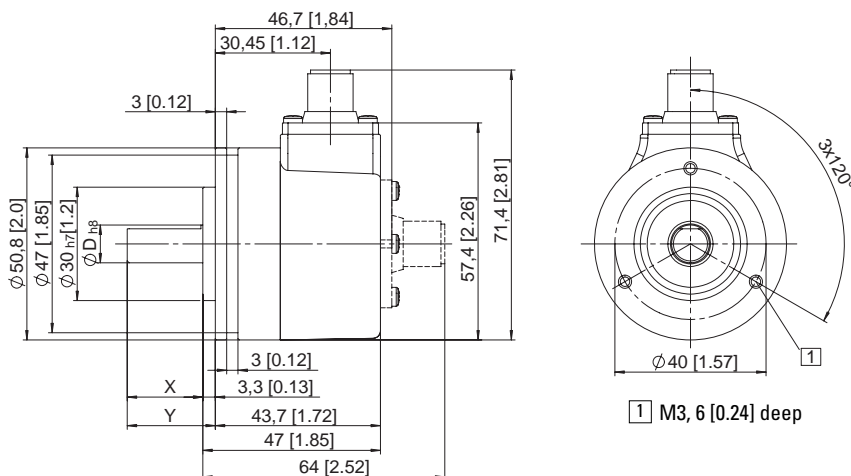
#### Top view of mating side, male contact base:

Type	8 pin M12 connector	12 pin M23 connector	MIL connector 10 pin
View			
Order code:	8.5000.XXX3.XXXX 8.5000.XXX4.XXXX	8.5000.XXX7.XXXX 8.5000.XXX8.XXXX	8.5000.XXXY.XXXX
Corresponding mating connector:	05.CMB-8181-0	8.0000.5012.0000	8.0000.5062.0000

#### Dimensions shaft version:

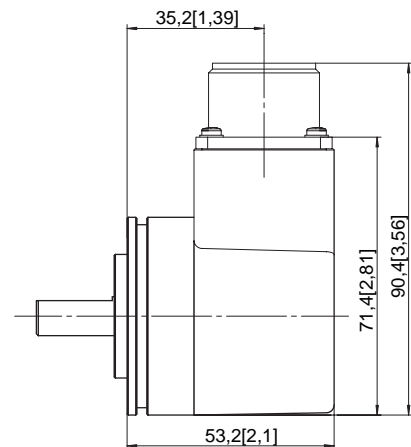
##### Synchronous flange

ø 50,8 mm [2.0 inch]  
M12, M23 and cable version  
(Flange type 5 and 6)



##### Synchronous flange

ø 50,8 mm [2 inch]  
MIL-connector version



#### Shaft versions

Order code for shaft	Shaft	length X	length Y
1	ø 6 mm	10 mm	13.3 mm
2	ø 1/4 "	5/8"	3/4"
3	ø 10 mm	20 mm	23.3 mm
4	ø 3/8 "	5/8"	3/4"
5	ø 12 mm	20 mm	23.3 mm
6	ø 8 mm	15 mm	18.3 mm

#### Mounting advice:

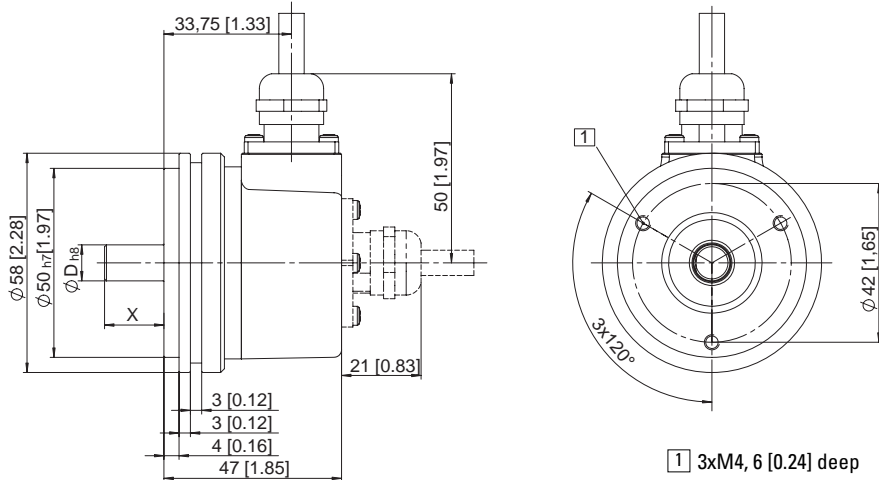
The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time! We recommend the use of suitable couplings (see Accessories section).

### Sendix incremental Type 5000 (Shaft) / 5020 (Hollow shaft)

Dimensions shaft version:

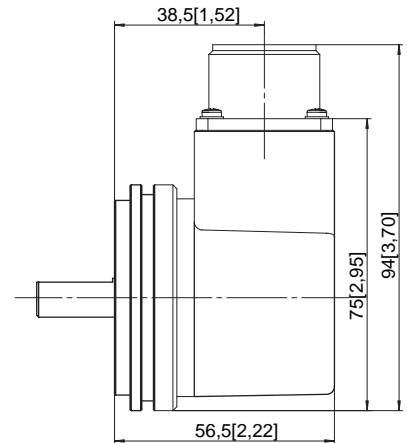
#### Synchronous flange

ø 58 mm  
M12, M23 and cable versions  
(Flange type A and B)



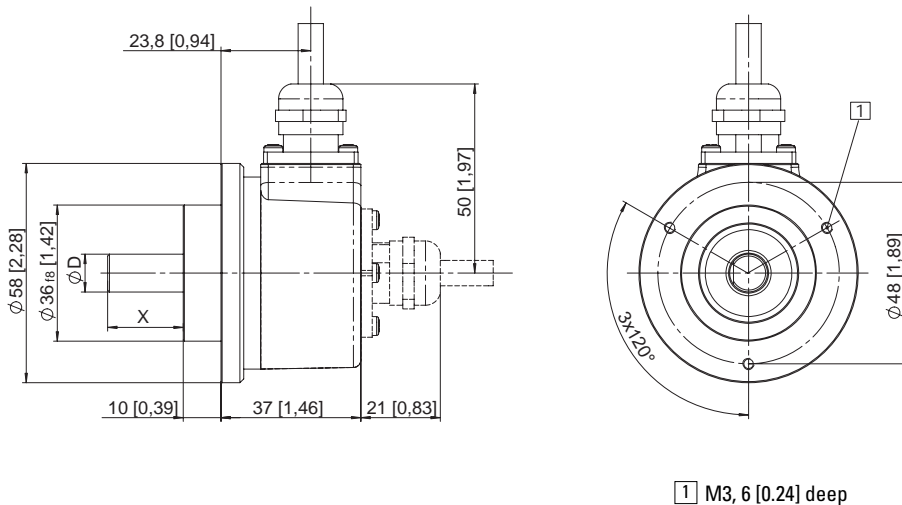
#### Synchronous flange

ø 58 mm  
MIL-connector version



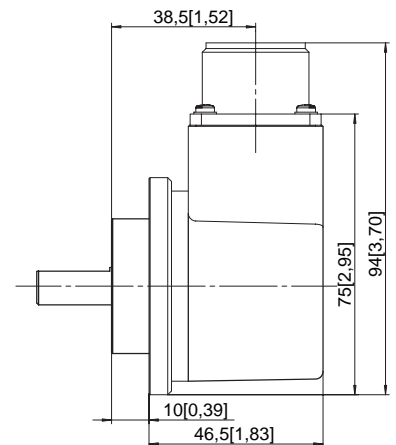
#### Clamping flange

ø 58 mm  
M12, M23 connector and cable versions  
(Flange type 7 and 8)



#### Clamping flange

ø 58 mm  
MIL-connector version



#### Shaft versions

Order code for shaft	Shaft	length X
1	ø 6 mm	10 mm
2	ø 1/4 "	5/8"
3	ø 10 mm	20 mm
4	ø 3/8 "	5/8"
5	ø 12 mm	20 mm
6	ø 8 mm	15 mm

#### Mounting advice:

The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time! We recommend the use of suitable couplings (see Accessories section).

### Sendix incremental Type 5000 (Shaft) / 5020 (Hollow shaft)

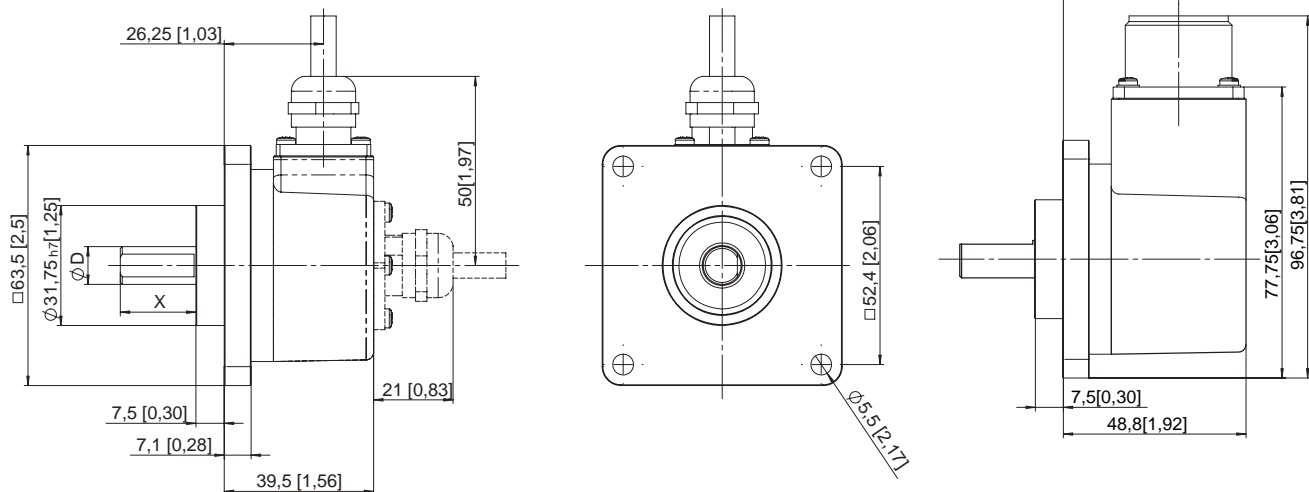
#### Dimensions shaft version:

##### Rectangular flange

- 63.5 mm [2.5 inch]
- M12, M23 connector and cable versions (Flange type C and D)

##### Rectangular flange

- 63.5 mm [2.5 inch]
- MIL-connector version



#### Shaft versions

Order code for shaft	Shaft length X			
1	Ø 6 mm	10 mm	4	Ø 3/8" 5/8"
2	Ø 1/4"	5/8"	5	Ø 12 mm 20 mm
3	Ø 10 mm	20 mm	6	Ø 8 mm 15 mm

#### Order code shaft version:

**8.5000.XXXX.XXXX**



- Type
- Flange
- 5 = Synchronous flange, metric, Ø 50,8, IP 67
  - 6 = Synchronous flange, metric, Ø 50,8, IP 65
  - 7 = Clamping flange, metric, Ø 58, IP 67
  - 8 = Clamping flange, metric, Ø 58, IP65**
  - A = Synchronous flange, Ø 58, IP 67
  - B = Synchronous flange, Ø 58, IP 65**
  - C = Rectangular flange 2.5", IP 67
  - D = Rectangular flange 2.5", IP 65

- Shaft (Ø x L)
- 1 = Ø 6 mm x 10 mm**
  - 2 = Ø 1/4" x 5/8"
  - 3 = Ø 10 mm x 20 mm**
  - 4 = Ø 3/8" x 5/8"
  - 5 = Ø 12 mm x 20 mm
  - 6 = Ø 8 mm x 15 mm

**Stock types**

8.5000.8358.0200	8.5000.B147.2500
8.5000.8358.0360	8.5000.B147.5000
8.5000.8358.0500	8.5000.B157.1024
8.5000.8358.1000	8.5000.B157.2500
8.5000.8358.5000	8.5000.B157.5000
8.5000.B147.1000	8.5000.8354.1024
8.5000.B147.1024	8.5000.8354.5000

#### Accessories:

Cables and connectors see Connection Technology section. Mounting attachments and couplings can be found in the Chapter Accessories

Corresponding mating connector:  
M12: 05.CMB-8181-0  
M23: 8.0000.5012.0000  
MIL-connector 10-pin:  
8.0000.5062.0000

- Pulse rate
- 1, 5, 10, 12, 36, 100, 200, 250, 256, **360**, 400, 500, **512**, 600, 800, **1000**, **1024**, 1200, 2000, **2048**, **2500**, **3600**, **4096**, **5000**
  - (e.g. 500 pulses => 0500)
  - Other pulse rates available on request

- Type of connection
- 1 = Cable axial (1 m PVC cable)
  - 2 = Cable radial (1 m PVC cable)**
  - 3 = Connector axial 8 pin M12
  - 4 = Connector radial 8 pin M12**
  - 7 = Connector axial 12 pin M23
  - 8 = Connector radial 12 pin M23**
  - Y = Connector radial 10 pin MIL-specified

Note: all connector versions without mating connector

- Output circuit and supply voltage
- 1 = RS 422 (with inverted signal) 5 ... 30 V supply voltage
  - 2 = Push-pull (7272 with inverted signal) 5 ... 30 V supply voltage
  - 4 = RS 422 (with inverted signal) 5 V supply voltage**
  - 5 = Push-pull (with inverted signal) 10 ... 30 V supply voltage**

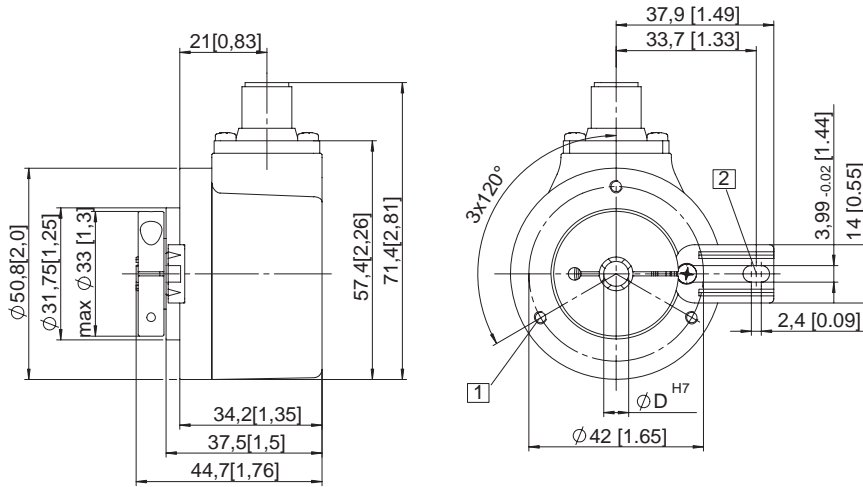
- seawater resistant version on request

*Preferred types are indicated in bold*

### Sendix incremental Type 5000 (Shaft) / 5020 (Hollow shaft)

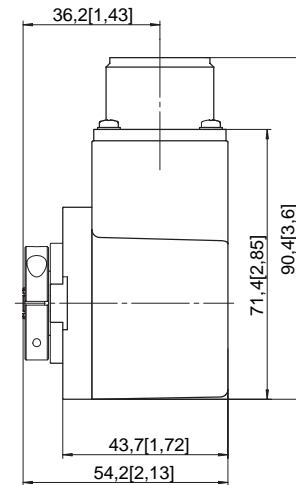
Dimensions hollow shaft version:  
Flange with long torque stop

ø 50.8 mm [2 inch]  
M12, M23 connectors and cable versions  
(Flange type 1 and 2)



Flange with long torque stop

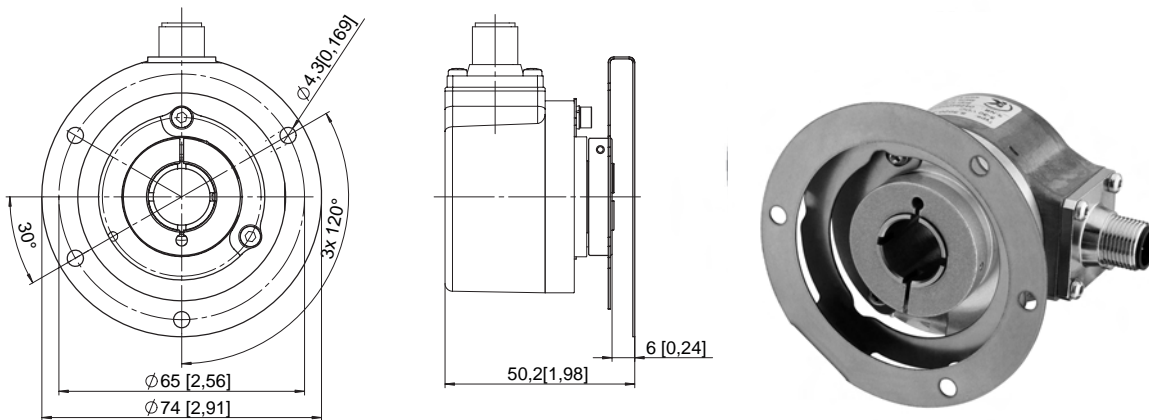
ø 50.8 mm [2 inch]  
MIL-connector version



- 1 M3, 6 [0.24] deep
  - 2 Torque stop slot
- Recommendation: cyl. pin acc. DIN 7 ø 4

Flange with stator coupling

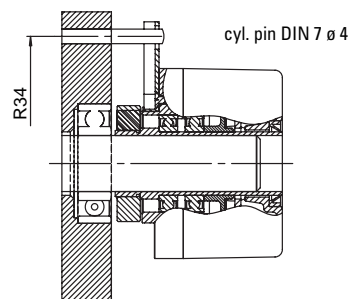
Pitch circle 65 mm  
(Flange type 7 and 8)



#### Mounting advice:

The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time!

We recommend the use of suitable couplings (see Accessories section).

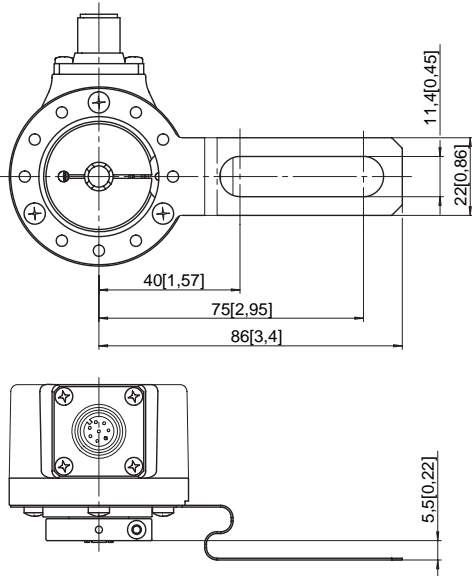


### Sendix incremental Type 5000 (Shaft) / 5020 (Hollow shaft)

Dimensions hollow shaft version:

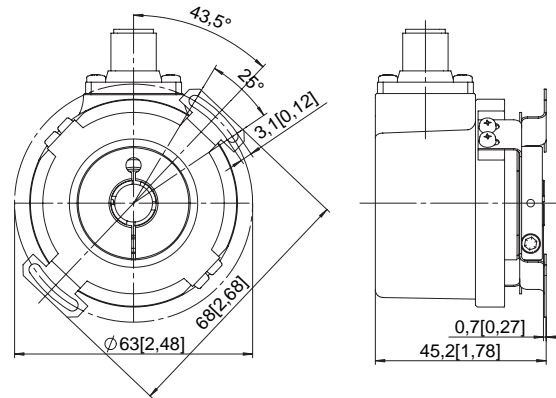
#### Flange with tether arm

(Flange type 3 and 4)



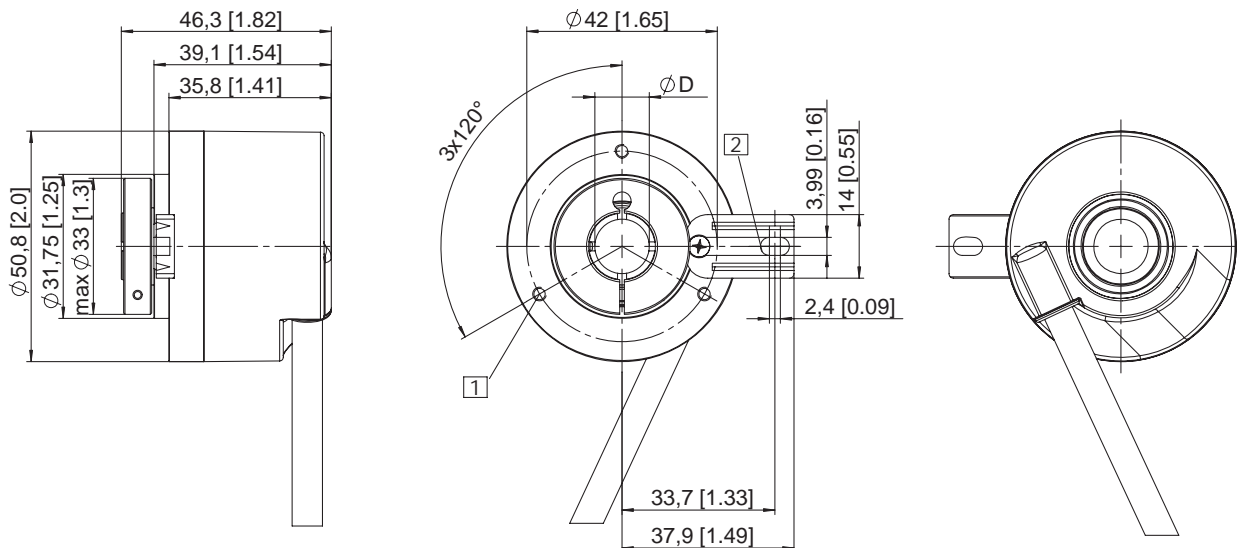
#### Flange with stator coupling

pitch circle  $\varnothing$  63 mm  
(Flange type C and D)



#### Flange with long torque stop and tangential cable outlet

(Type of connection E)



1 M3, 6 [0.24] deep

2 Torque stop slot

Recommendation: cyl. pin acc. DIN 7  $\varnothing$  4

# Rotary Measuring Technology

## Incremental encoders

### Sendix incremental Type 5000 (Shaft) / 5020 (Hollow shaft)

#### Isolation/ adapter inserts for hollow shaft encoders

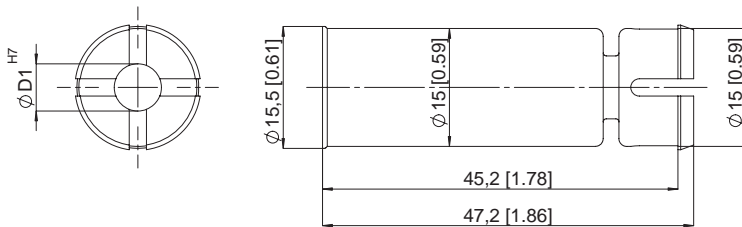


#### Thermal and electrical isolation of the encoders:

Isolation inserts prevent currents from passing through the encoder bearings. These currents can occur when using inverter controlled three-phase or AC vector motors and considerably shorten the service life of the encoder bearings. In addition the encoder is thermally isolated as the plastic does not transfer the heat to the encoder.

#### Tip:

By using these adapter inserts you can achieve six different hollow shaft diameters, all on the basis of one encoder.



Isolation insert	D1 [mm]	D1 [Inch]
8.0010.4021.0000	6	0,24
8.0010.4022.0000	6,35	0,25
8.0010.4023.0000	10	0,39
8.0010.4024.0000	9,53	0,38
8.0010.4025.0000	12	0,47
8.0010.4026.0000	12,7	0,50

#### Order code hollow shaft version:

8.5020.XXXX.XXXX

- Type
- Flange
  - 1 = Flange with torque stop IP 67
  - 2 = Flange with torque stop IP 65**
  - 3 = Flange with tether arm IP 67
  - 4 = Flange with tether arm IP 65
  - 7 = Flange with stator coupling  $\varnothing$  65 mm, IP67
  - 8 = Flange with stator coupling  $\varnothing$  65 mm, IP65**
  - C = Flange with stator coupling  $\varnothing$  63 mm, IP67
  - D = Flange with stator coupling  $\varnothing$  63 mm, IP65**
- Shaft (end to end hollow shaft)
  - 1 =  $\varnothing$  6 mm
  - 2 =  $\varnothing$  1/4 inch
  - 3 =  $\varnothing$  10 mm**
  - 4 =  $\varnothing$  3/8 inch
  - 5 =  $\varnothing$  12 mm**
  - 6 =  $\varnothing$  1/2 inch
  - 7 =  $\varnothing$  5/8 inch
  - 8 =  $\varnothing$  15 mm**
  - 9 =  $\varnothing$  8 mm**
  - A =  $\varnothing$  14 mm



- Pulse rate
  - 1, 5, 10, 12, 36, 100, 200, 250, 256, **360**, 400, 500, **512**, 600, 800, **1000**, **1024**, 1200, 2000, **2048**, **2500**, **3600**, **4096**, **5000**
  - (e.g. 500 pulses => 0500)
  - Other pulse rates available on request

- Type of connection
  - 1 = Cable radial (1 m PVC-cable)**
  - 2 = Connector radial 8 pin M12**
  - 4 = Connector radial 12 pin M23**
  - 7 = Connector 10 pin MIL.-specified radial
  - E = Tangential cable outlet (1 m PVC-cable)

Note: all connector versions without mating connector

- Output circuit and supply voltage
  - 1 = RS 422 (with inverted signal) 5 ... 30 V supply voltage
  - 2 = Push-pull (7272, with inverted signal) 5 ... 30 V supply voltage
  - 4 = RS 422 (with inverted signal) 5 V supply voltage**
  - 5 = Push-Pull; 10 ... 30 V with inverted signal**

- seawater resistant version on request

*Preferred types are indicated in bold*

Stock types	
8.5020.2351.1000	8.5020.2844.5000
8.5020.2351.2500	8.5020.2844.1000
8.5020.2511.5000	8.5020.2854.0500
8.5020.2551.0500	8.5020.2854.1000
	8.5020.8552.1024
	8.5020.8552.5000

- Accessories:**
  - Cables and connectors, also pre-assembled, can be found in the chapter Counting Technology
  - Mounting attachments and couplings can be found in the Chapter Accessories

Corresponding mating connector:  
 M12: 05.CMB.8181-0  
 M23: 8.0000.5012.0000  
 MIL-connector  
 10-pin: 8.0000.5062.0000