**Standard, optical** | **Sendix 5000 / 5020 (Shaft / Hollow shaft)** | **Push-Pull / RS422**

**Due to their sturdy bearing construction in Safety Lock™ Design, the Sendix 5000 and 5020 offer high resistance against vibration and installation errors.**

**The rugged housing, high protection level of up to IP67, as well as the wide temperature range of -40°C up to +85°C, make this product range the perfect encoder for all applications.**




Safety-Lock™ | High rotational speed | Temperature | High IP value | High shaft load capacity | Shock / vibration resistant | Magnetic field proof | Short-circuit proof | Reverse polarity protection | Optical sensor | Seawater-resistant version on request

## Robust performance

- Increased resistance against vibrations and tolerance of installation errors, elimination of machine downtime and repairs thanks to sturdy bearing construction in "Safety-Lock™ Design"
- Ensures highest safety against field breakdowns and is thus suitable also for outside use thanks to its resistant die-cast housing and protection up to IP67
- Wide temperature range (-40°C...+85°C)
- Also available in seawater resistant version

## Many variants

- Suitable connection variant for every specific case: Cable connection, M23 connector, M12 connector
- Reliable mounting in a wide variety of installation situations: Comprehensive and proven fixing possibilities
- Compatible with all US and European standards,
- Max. 5000 pulses per revolution

## Order code Shaft version

| 8.5000 | . | X | X | X | X | . | XXXX |
|---|---|---|---|---|---|---|---|
| Type | | a | b | c | d | | e |

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

**a** *Flange*
5 = synchro flange, ø 50,8 mm, IP67
6 = synchro flange, ø 50,8 mm, IP65
7 = clamping flange, ø 58 mm, IP67
**8 = clamping flange, ø 58 mm, IP65**
A = synchro flange, ø 58 mm, IP67
**B = synchro flange, ø 58 mm, IP65**
C = square flange, 63.5 mm, IP67
D = square flange, 63.5 mm, IP65
G = Euro flange, 115 mm, IP67 [1]

**b** *Shaft (ø x L), with flat*
**1 = ø 6 x 10 mm**
2 = ø 6,35 x 15,875 mm (1/4" x 5/8")
**3 = ø 10 x 20 mm**
4 = ø 9,5 x 15,875 mm (3/8" x 5/8")
5 = ø 12 x 20 mm
6 = ø 8 x 15mm
B = ø 11 x 33 mm, with feather key shaft slot [2]

**c** *Output circuit / Power supply*
1 = RS422 (with inverted signal) / 5 ... 30 V DC
2 = Push-Pull (7272 with inverted signal) / 5 ... 30 V DC
**4 = RS422 (with inverted signal) / 5 V DC**
**5 = Push-Pull (with inverted signal) / 10 ... 30 V DC**

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

**e** *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. 100 pulses => 0100)
Other pulse rates on request

*Stock types*

| | |
|---|---|
| 8.5000.8358.0200 | 8.5000.B157.1024 |
| 8.5000.8358.0360 | 8.5000.B157.5000 |
| 8.5000.8358.0500 | 8.5000.8354.1024 |
| 8.5000.8358.1000 | 8.5000.8354.5000 |
| 8.5000.8358.5000 | |

*optional on request*
- Ex 2/22
- seawater-resistant
- special cable length

1) Only in conjunction with shaft B
2) Only in conjunction with flange G

## Standard, optical | Sendix 5000 / 5020 (Shaft / Hollow shaft) | Push-Pull / RS422

**Order code Hollow shaft**

8.5020 . X X X X . XXXX
Type — a b c d — e

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

**a** *Flange*
1 = with torque stop, IP67
**2 = with torque stop, IP65**
3 = with fastening arm, IP67
4 = with fastening arm, IP65
7 = with stator coupling, ø 65 mm, IP67
**8 = with stator coupling, ø 65 mm, IP65**
C = with stator coupling, ø 63 mm, IP67
**D = with stator coupling, ø 63 mm, IP65**

**b** *Hollow shaft*
1 = ø 6 mm
2 = ø 6.35 mm (1/4")
**3 = ø 10 mm**
4 = ø 9.52 mm (3/8")
**5 = ø 12 mm**
6 = ø 12.75 mm (1/2")
7 = ø 15.875 mm (5/8")
**8 = ø 15 mm**
**9 = ø 8 mm**
A = ø 14 mm

**c** *Output circuit / Power supply*
1 = RS422 (with inverted signal) / 5 ... 30 V DC
2 = Push-Pull (7272 with inverted signal) / 5 ... 30 V DC
**4 = RS422 (with inverted signal) / 5 V DC**
**5 = Push-Pull (with inverted signal) / 10 ... 30 V DC**

**d** *Type of connection*
1 = radial cable (1 m PVC cable)
**2 = M12 connector, 8-pin, radial**
**4 = M23 connector, 12-pin, radial**
7 = MIL connector, 10-pin, radial
**E = tangential cable outlet (1 m PVC cable)**
H = tangential cable outlet (0.3 m PVC cable, including M12 connector for central fastening)

**e** *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. 100 pulses => 0100)
Other pulse rates on request

*Stock types*
8.5020.2351.1000
8.5020.2351.2500
8.5020.2551.0500
8.5020.8552.1024
8.5020.8552.5000

*optional on request*
- Ex 2/22
- seawater-resistant
- special cable length

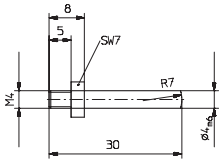
## Mounting accessory for shaft encoders

| | | |
|---|---|---|
| **Coupling** | Bellows coupling ø 19 mm for shaft 10 mm | **8.0000.1101.1010** |
| | Bellows coupling ø 19 mm for shaft 6 mm | **8.0000.1101.0606** |

## Mounting accessory for hollow shaft encoders

**Cylindrical pin, long**

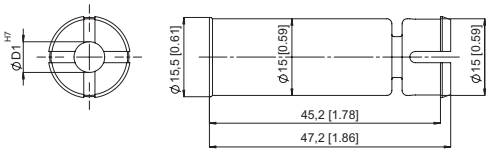
for torque stops




With fixing thread **8.0010.4700.0000**

### Isolation / adapter inserts for hollow shaft encoders

**Thermal and electrical isolation of the encoders (Temperature range -40 ... +115°C)**
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 with 15 mm hollow shaft.

| D1 | Isolation insert |
|---|---|
| 6 mm [0.24"] | **8.0010.4021.0000** |
| 6.35 mm [0.25"] | **8.0010.4022.0000** |
| 8 mm [0.32"] | **8.0010.4020.0000** |
| 9.53 mm [0.38"] | **8.0010.4024.0000** |
| 10 mm [0.39"] | **8.0010.4023.0000** |
| 12 mm [0.47"] | **8.0010.4025.0000** |
| 12.7 mm [0.50"] | **8.0010.4026.0000** |

## Connection Technology

| | | |
|---|---|---|
| **Connector, self-assembly** | M12 | **05.CMB-8181-0** |
| | M23 | **8.0000.5012.0000** |
| | MIL | **8.0000.5062.0000** |
| **Cordset, pre-assembled with 2 m PVC cable** | M12 | **05.WAKS8-2/P00** |
| | M23 | **8.0000.6201.0002** |

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.

## Standard, optical | Sendix 5000 / 5020 (Shaft / Hollow shaft) | Push-Pull / RS422

### Mechanical characteristics

| | | |
|---|---|---|
| **Max. Speed** | IP65 | 12 000 min$^{-1}$<br>6 000 min$^{-1}$ (continuous) |
| | IP67 | 6 000 min$^{-1}$<br>3 000 min$^{-1}$ (continuous) |
| **Rotor moment of inertia** | | |
| | shaft version | approx. 1.8 x 10$^{-6}$ kgm$^2$ |
| | hollow shaft version | approx. 6 x 10$^{-6}$ kgm$^2$ |
| **Starting torque** | IP65 | < 0.01 Nm |
| | IP67 | < 0.05 Nm |
| **Shaft load capacity** | radial | 80 N |
| | axial | 40 N |

| | | |
|---|---|---|
| **Weight** | | ca. 0.4 kg |
| **Protection to EN 60529** | without shaft seal | IP 65 |
| | with shaft seal | IP 67 |
| **EX approval for hazardous areas** | | optional Zone 2 and 22 |
| **Working temperature range** | | -40°C [1] ... +85°C |
| **Materials** | shaft | stainless steel |
| **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$^2$, 10 ... 2000 Hz |

### Electrical characteristics

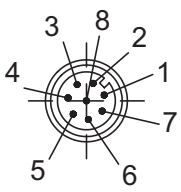
| | | | | | |
|---|---|---|---|---|---|
| **Output circuit** | | **RS422**<br>(TTL compatible) | **RS422**<br>(TTL compatible) | **Push-Pull** | **Push-Pull**<br>(7272) |
| **Supply voltage** | | 5 ... 30 V DC | 5 V ±5% | 10 ... 30 V DC | 5 ... 30 V DC |
| **Power consumption with inverted signal** (no 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. ±20 mA | max. ±20 mA |
| **Pulse frequency** | | max. 300 kHz | max. 300 kHz | max. 300 kHz | max. 300 kHz [2] |
| **Signal level** | high | min. 2.5 V | min. 2.5 V | min $U_B$ - 1 V | min. $U_B$ - 2.0 V |
| | low | max. 0.5 V | max. 0.5 V | max. 0.5 V | max. 0.5 V |
| **Rising edge time $t_r$** | | max. 200 ns | max. 200 ns | max. 1 µs | max. 1 µs |
| **Falling edge time $t_f$** | | max. 200 ns | max. 200 ns | max. 1 µs | max. 1 µs |
| **Short circuit proof outputs** [3] | | yes [4] | yes [4] | yes | yes |
| **Reverse connection of the supply voltage** | | yes | no | yes | no |
| **UL-certified** | | File 224618 | | | |
| **CE compliant** acc. to | | EN 61000-6-2, EN 61000-6-4 and EN 61000-6-3 | | | |
| **RoHS compliant** acc. to | | EU guideline 2002/95/EG | | | |

### Terminal assignment

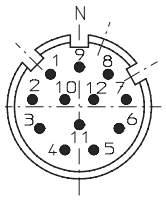
| Signal | | 0 V GND | +UB | 0 V Sens | +UB Sens | A | $\overline{A}$ | B | $\overline{B}$ | 0 | $\overline{0}$ | shield |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M23 connector multifast, 12-pin | Pin: | 10 | 12 | 11 | 2 | 5 | 6 | 8 | 1 | 3 | 4 | [5] |
| M12 connector eurofast, 8-pin | Pin: | 1 | 2 | | | 3 | 4 | 5 | 6 | 7 | 8 | [5] |
| MIL connector (MS styled),10-pin | Pin: | F | D | | E | A | G | B | H | C | I | J [5] |
| Cable | colour: | WH | BN | GY PK | RD BU | GN | YE | GY | PK | BU | RD | shield |

**Isolate unused outputs before initial startup**

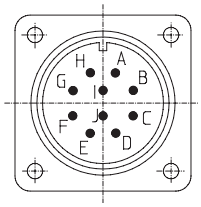
### Top view of mating side, male contact base



M12 connector, 8-pin



M23 connector, 12-pin



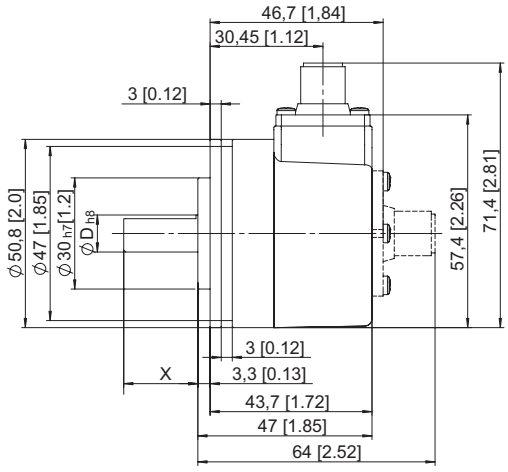
MIL connector, 10-pin

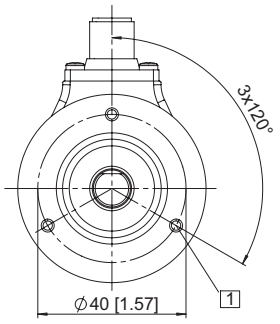
1) With connector: -40°C, cable fixed: -30°C, cable moved: -20°C
2) Max. recommended cable length 30 m
3) If supply voltage correctly applied.
4) Only one channel allowed to be shorted-out:
If $U_B$= 5 V, short-circuit to channel, 0 V, or +$U_B$ is permitted.
If $U_B$= 5 - 30 V, short-circuit to channel or 0 V is permitted.
5) Shield is attached to connector housing.

**Standard, optical** | **Sendix 5000 / 5020 (Shaft / Hollow shaft)** | **Push-Pull / RS422**

## Dimensions shaft version

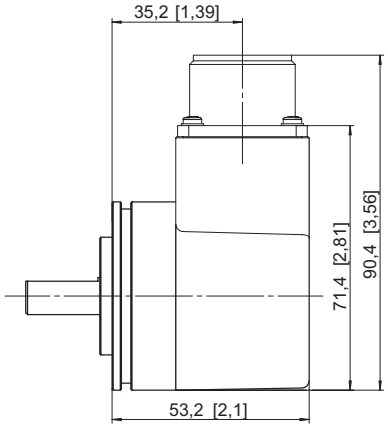
**Synchro flange, ø 50,8 mm** [2.0"]
**Flange type 5 and 6**



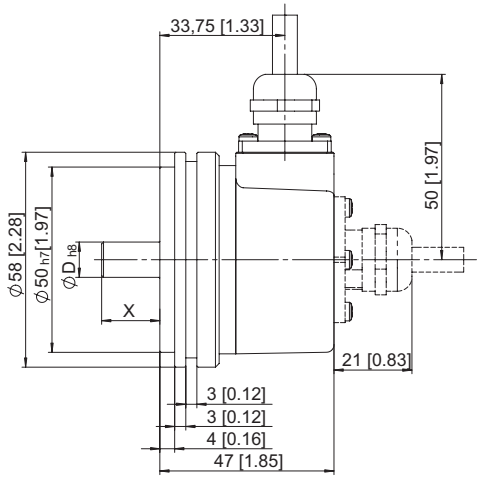



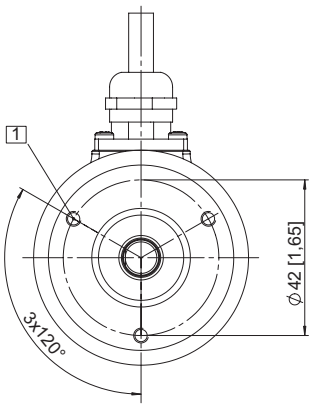

1 M3, 6 [0.24] deep

MIL-connector version



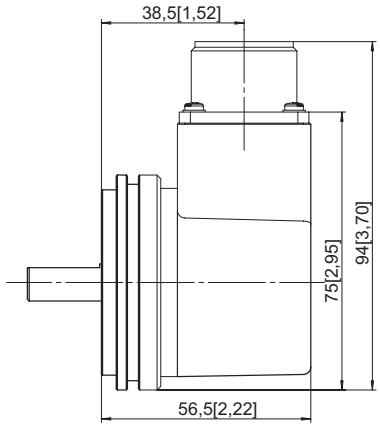

**Synchro flange, ø 50.8 mm** [2.0"]
**Flange type A and B**



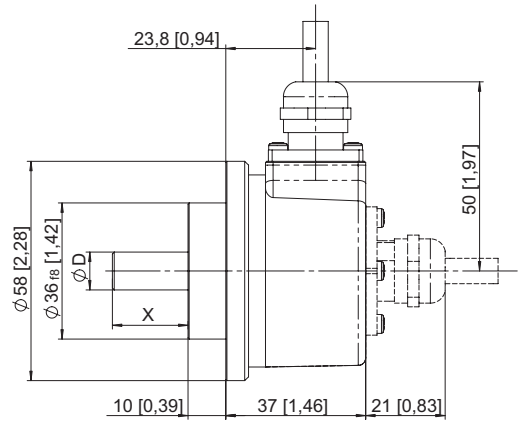



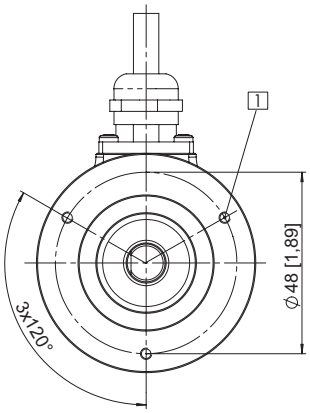

1 M3, 6 [0.24] deep

MIL-connector version



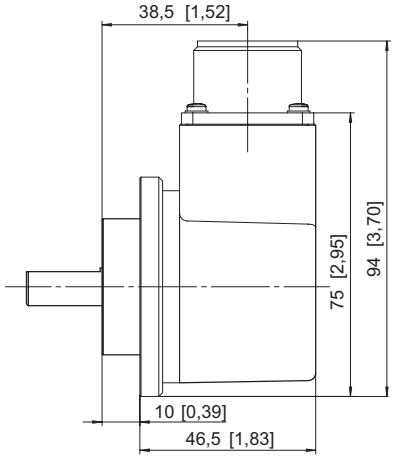

**Clamping flange, ø 50.8 mm** [2.0"]
**Flange type 7 and 8**




1 M3, 6 [0.24] deep

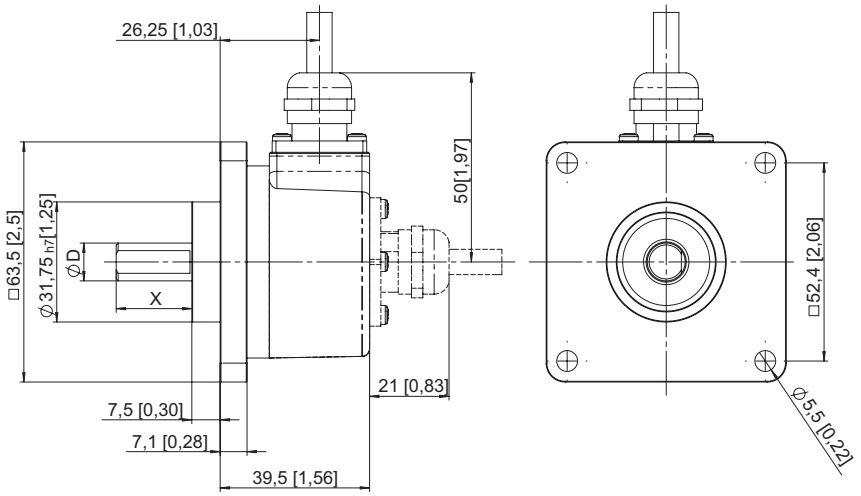
MIL-connector version



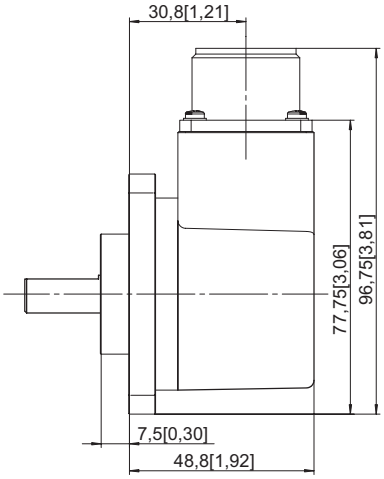
**Standard, optical** | **Sendix 5000 / 5020 (Shaft / Hollow shaft)** | **Push-Pull / RS422**

### Dimensions shaft version

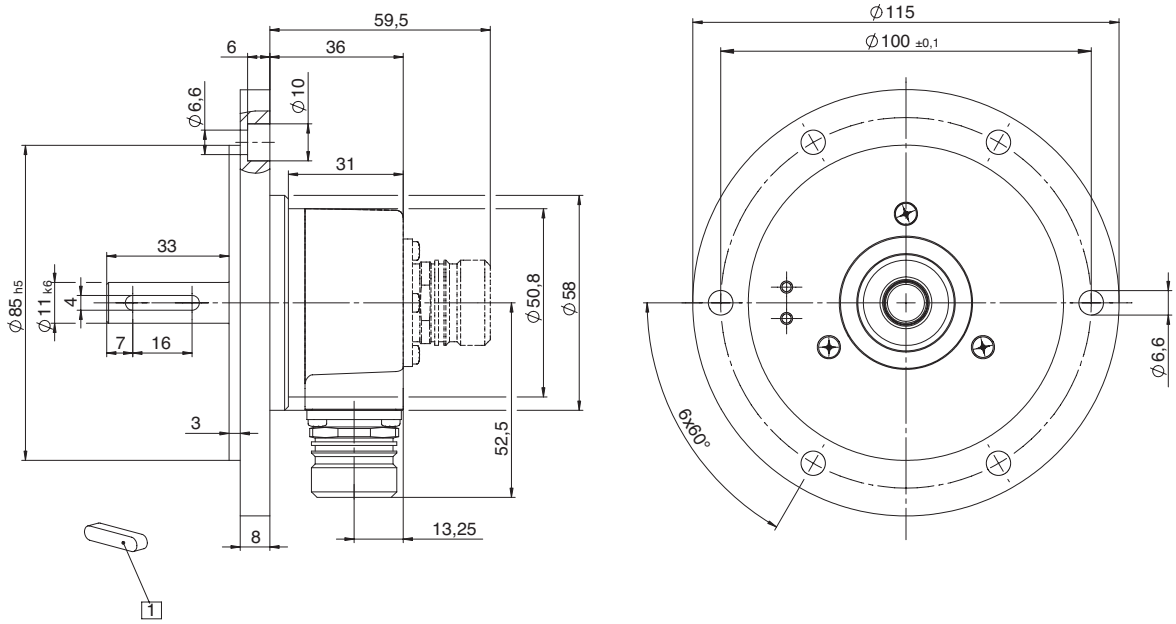
**Rectangular flange, □ 63.5 mm** [2.5“]
**Flange type C and D**




MIL-connector version




**Euro flange, ø 115 mm**
**Flange type G**




1 215342 Set attached

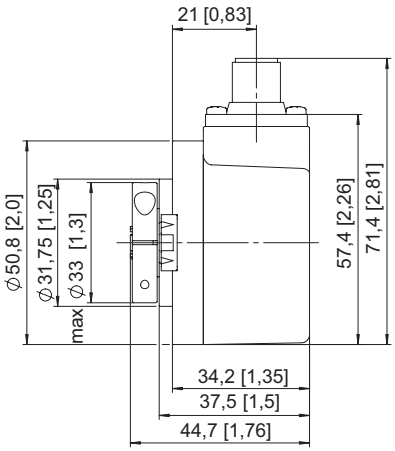
**Mounting advice**

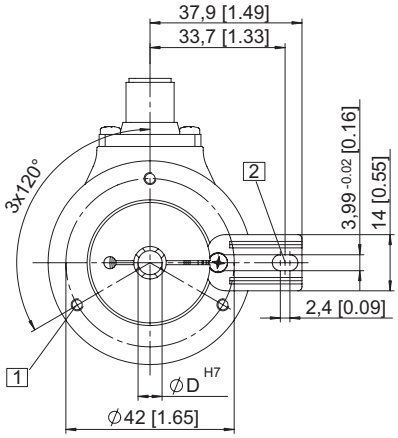
The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time!
We recommend the use of suitable couplings (see Accessories section).

**Standard, optical** | **Sendix 5000 / 5020 (Shaft / Hollow shaft)** | **Push-Pull / RS422**

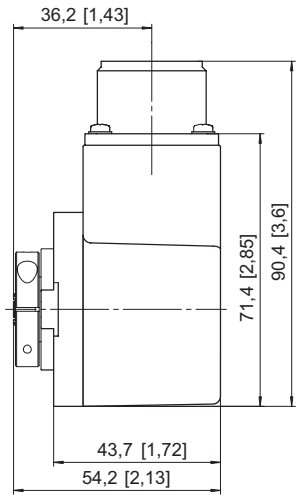
## Dimensions hollow shaft version

**Flange with long torque stop, ø 50.8 mm** [2.0 “]
**Flange type 1 and 2**




MIL-connector version

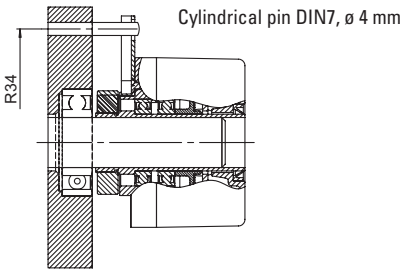



1 M3, 6 [0.24] deep

2 Torque stop slot,
Recommendation: Cylindrical pin DIN7, ø 4 mm

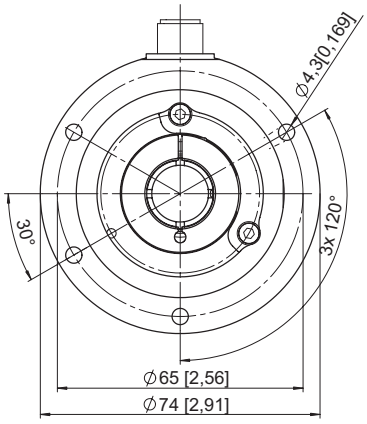
**Mounting advice**

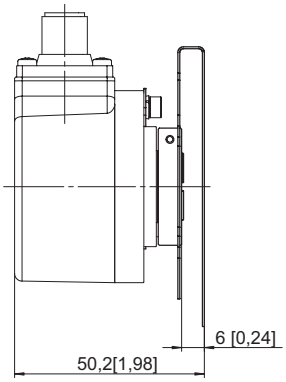
The flanges and shafts of the encoder and drive should not both be rigidly coupled together at the same time!
We recommend the use of suitable couplings (see Accessories section).




**Flange with stator coupling**
**Flange type 7 and 8**

Pitch circle 65 mm

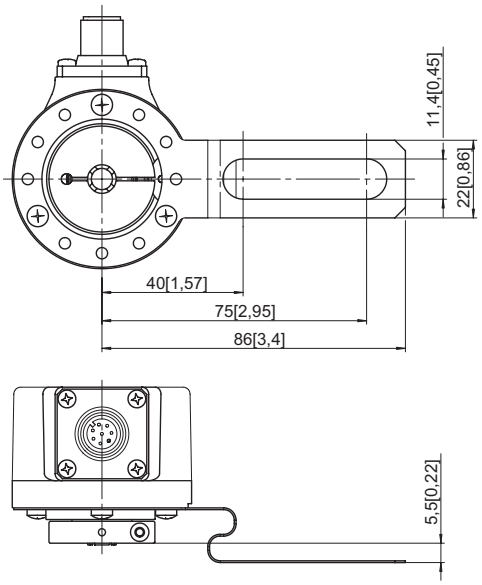


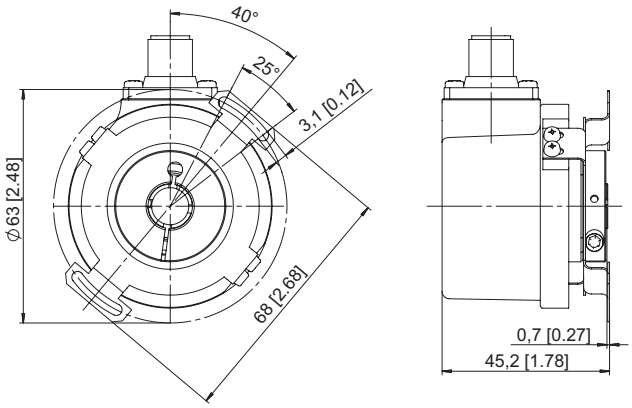

**Standard, optical** | **Sendix 5000 / 5020 (Shaft / Hollow shaft)** | **Push-Pull / RS422**

### Dimensions hollow shaft version

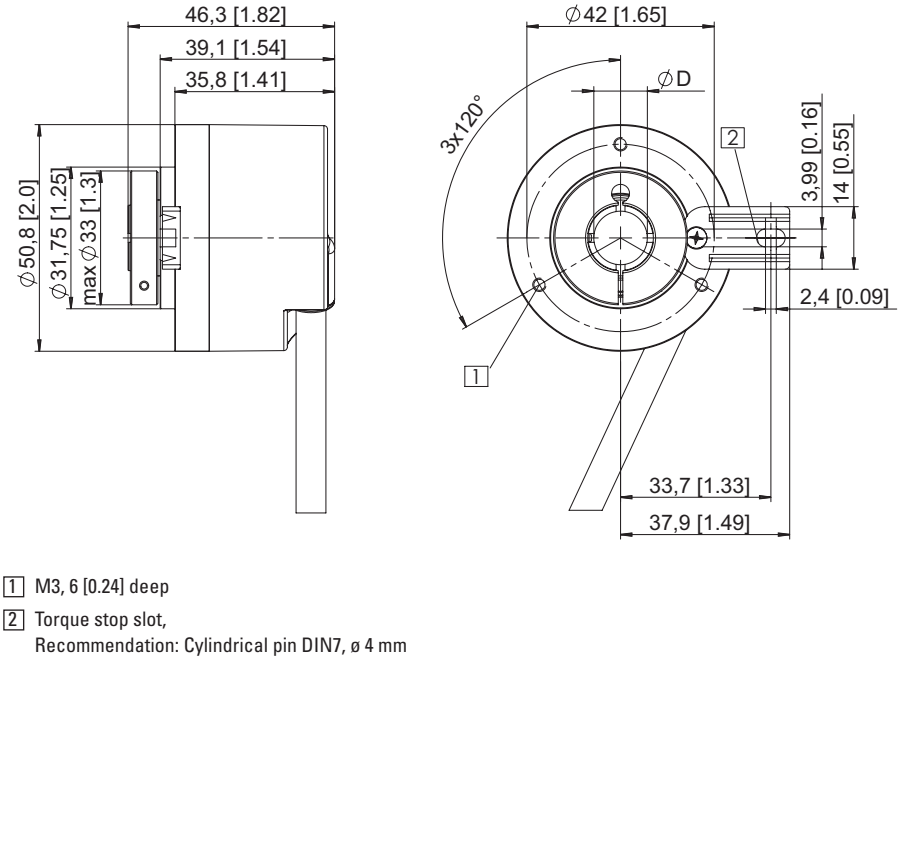
**Flange with fastening arm, long**
**Flange type 3 and 4**

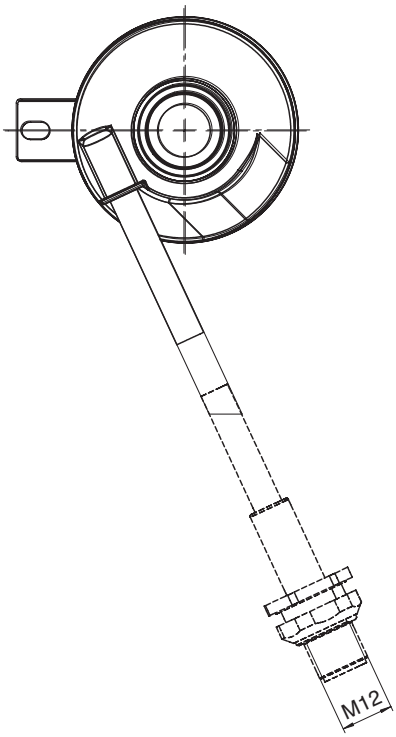



**Flange with stator coupling, double-winged, ø 63 mm**
**Flange type C and D**




**Flange with long torque stop and tangential cable outlet**
**Type of connection E**




1 M3, 6 [0.24] deep

2 Torque stop slot,
Recommendation: Cylindrical pin DIN7, ø 4 mm