

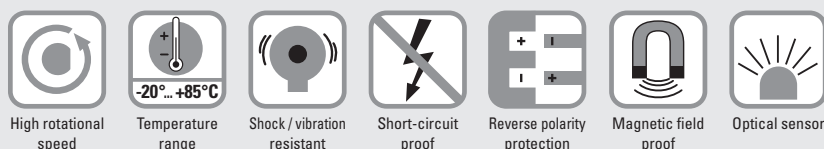
# Incremental encoders

| Compact optical | 3610 / 3620 (shaft / hollow shaft) | Push-pull / RS422 |
|-----------------|------------------------------------|-------------------|
|-----------------|------------------------------------|-------------------|



The compact incremental encoders type 3610 / 3620 with optical sensor technology are available with a resolution of up to 3600 pulses per revolution.

The versions with hollow shaft are designed for diameters up to 8 mm.



## Compact

- Only 36 mm outer diameter.
- Through hollow shaft up to 8 mm.
- Ideally suited for use where space is tight.

## Versatile

- Available with cable outlet or M12 connector.
- Maximum resolution of 3600 pulses per revolution.
- Power supply 5 ... 18 V DC or 8 ... 30 V DC.

## Order code Shaft version

|        |   |   |   |   |   |   |   |   |   |   |
|--------|---|---|---|---|---|---|---|---|---|---|
| 8.3610 | . | X | X | X | X | . | X | X | X | X |
| 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.



### a Flange

- 2 = synchro flange,  $\varnothing$  36.5 mm [1.44"]  
3 = clamping flange,  $\varnothing$  36.5 mm [1.44"]

### b Shaft ( $\varnothing \times L$ )

- 1 =  $\varnothing$  4 x 10 mm [0.16 x 0.39"]  
 2 =  $\varnothing$  5 x 10 mm [0.20 x 0.39"]  
3 =  $\varnothing$  6 x 12.5 mm [0.24 x 0.49"], with flat  
 5 =  $\varnothing$  1/4" x 12.5 mm [1/4" x 0.49"], with flat

### c Output circuit / power supply

- 2 = push-pull (with inverted signal) / 5 ... 18 V DC  
4 = push-pull (with inverted signal) / 8 ... 30 V DC  
 3 = push-pull (without inverted signal) / 8 ... 30 V DC  
 6 = RS422 (with inverted signal) / 5 V DC  
 5 = RS422 (with inverted signal) / 8 ... 30 V DC

### d Type of connection

- 1 = axial cable, 2 m [5.56'] PVC  
 A = axial cable, special length PVC \*)  
2 = radial cable, 2 m [5.56'] PVC  
 B = radial cable, special length PVC \*)  
 3 = axial M12 connector, 8-pin  
 4 = radial M12 connector, 8-pin  
 \*) Available special lengths (connection types A, B):  
 3, 5, 8, 10, 15 m [9.84, 16.40, 26.25, 32.80, 49.21']  
 order code expansion .XXXX = length in dm  
 ex.: 8.3610.334A.1024.0030 (for cable length 3 m)

### e Pulse rate

- 25, 100, 200, 360, 500, 512, 600,  
 1000, 1024, 1250, 1500, 2000, 2048,  
2500, 3600  
 (e.g. 500 pulses => 0500)

*Optional on request*  
 - other pulse rates

# Incremental encoders

|                        |                                           |                          |
|------------------------|-------------------------------------------|--------------------------|
| <b>Compact optical</b> | <b>3610 / 3620 (shaft / hollow shaft)</b> | <b>Push-pull / RS422</b> |
|------------------------|-------------------------------------------|--------------------------|

|                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Order code</b><br><b>Hollow shaft</b>                                                                                                                                                                                                                                                                                         | <b>8.3620</b><br>Type                                                                                                                                                                                                                                                                                                                                                            | <b>. XXXXX . XXXX</b><br><b>a b c d e</b>                                                                                                                                                                                                                 | <p>If for each parameter of an encoder the <u>underlined preferred option</u> is selected, then the delivery time will be 10 working days for a maximum of 10 pieces.</p> <p>Qts. up to 50 pcs. of these types generally have a delivery time of 15 working days.</p> <div><b>10 by 10</b></div> |
| <b>a</b> <i>Flange</i><br>1 = with spring element, short<br><b>2 = with spring element, long</b><br>5 = with stator coupling, ø 46 mm [1.81"]                                                                                                                                                                                    | <b>d</b> <i>Type of connection</i><br><b>E = radial cable, 2 m [5.56'] PVC</b><br>B = radial cable, special length PVC *)<br>4 = radial M12 connector, 8-pin<br><br>*) Available special lengths (connection type B):<br>3, 5, 8, 10, 15 m [9.84, 16.40, 26.25, 32.80, 49.21']<br>order code expansion .XXXX = length in dm<br>ex.: 8.3620.224B.1024.0030 (for cable length 3 m) | <b>e</b> <i>Pulse rate</i><br>25, 100, <b>200</b> , 360, <b>500</b> , 512, 600,<br>1000, <b>1024</b> , 1250, 1500, 2000, <b>2048</b> ,<br><b>2500</b> , <b>3600</b><br>(e.g. 500 pulses => 0500)<br><br><i>Optional on request</i><br>- other pulse rates |                                                                                                                                                                                                                                                                                                  |
| <b>b</b> <i>Through hollow shaft</i><br><b>2 = ø 6 mm [0.24"]</b><br>4 = ø 8 mm [0.32"]<br>3 = ø 1/4"                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                  |
| <b>c</b> <i>Output circuit / power supply</i><br>2 = push-pull (with inverted signal) / 5 ... 18 V DC<br><b>4 = push-pull (with inverted signal) / 8 ... 30 V DC</b><br>3 = push-pull (without inverted signal) / 8 ... 30 V DC<br>6 = RS422 (with inverted signal) / 5 V DC<br>5 = RS422 (with inverted signal) / 8 ... 30 V DC |                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                  |

| Mounting accessory for shaft encoders      |                                                                        | Order no.                   |
|--------------------------------------------|------------------------------------------------------------------------|-----------------------------|
| <b>Coupling</b>                            | bellows coupling ø 15 mm [0.59"] for shaft 6 mm [0.24"]                | <b>8.0000.1202.0606</b>     |
| Connection technology                      |                                                                        | Order no.                   |
| <b>Cordset, pre-assembled</b>              | M12 female connector with coupling nut, 8-pin<br>2 m [6.56"] PVC cable | <b>05.00.6041.8211.002M</b> |
| <b>Connector, self-assembly (straight)</b> | M12 female connector with coupling nut, 8-pin                          | <b>05.CMB 8181-0</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                                          |                                                               |                                                 |                                                |  |
|---------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------|------------------------------------------------|--|
| Mechanical characteristics                              |                                                               |                                                 |                                                |  |
| <b>Maximum speed</b>                                    | shaft version                                                 | 12000 min <sup>-1</sup>                         |                                                |  |
|                                                         | hollow shaft version                                          | 6000 min <sup>-1</sup>                          |                                                |  |
| <b>Mass moment of inertia</b>                           |                                                               | approx. 0.2 x 10 <sup>-6</sup> kgm <sup>2</sup> |                                                |  |
| <b>Starting torque</b>                                  | - at 20°C [68°F]                                              | < 0.05 Nm                                       |                                                |  |
| <b>Shaft load capacity</b>                              | radial                                                        | 40 N                                            |                                                |  |
|                                                         | axial                                                         | 20 N                                            |                                                |  |
| <b>Weight</b>                                           |                                                               | approx. 0.08 kg [2.82 oz]                       |                                                |  |
| <b>Protection</b>                                       | acc. to EN 60529                                              |                                                 |                                                |  |
|                                                         | housing side                                                  | IP65                                            |                                                |  |
|                                                         | flange side                                                   | IP50 (IP64 on request)                          |                                                |  |
| <b>Working temperature range</b>                        |                                                               | -20°C ... +85°C [-4°F ... +185°F]               |                                                |  |
| <b>Materials</b>                                        | shaft                                                         | stainless steel                                 |                                                |  |
|                                                         | hollow shaft                                                  | brass                                           |                                                |  |
|                                                         | housing                                                       | aluminum                                        |                                                |  |
|                                                         | cable                                                         | PVC                                             |                                                |  |
| <b>Shock resistance</b>                                 | acc. to EN 60068-2-27                                         | 1000 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           |                                                |  |
| Electrical characteristics                              |                                                               |                                                 |                                                |  |
| <b>Output circuit</b>                                   | <b>RS422</b>                                                  | <b>Push-pull <sup>1)</sup></b><br>(7272 comp.)  | <b>Push-pull <sup>1)</sup></b><br>(7272 comp.) |  |
| <b>Power supply</b>                                     | 5 V DC (±5 %) or 8 ... 30 V DC                                | 5 ... 18 V DC                                   | 8 ... 30 V DC                                  |  |
| <b>Power consumption with inverted signal (no load)</b> | typ. 40 mA / max. 90 mA                                       | max. 40 mA                                      | max. 40 mA                                     |  |
| <b>Permissible load / channel</b>                       | max. +/- 20 mA                                                | max. +/- 20 mA                                  | max. +/- 20 mA                                 |  |
| <b>Pulse frequency</b>                                  | max. 300 kHz                                                  | max. 200 kHz                                    | max. 200 kHz                                   |  |
| <b>Signal level</b>                                     | HIGH min. 2.5 V<br>LOW max. 0.5 V                             | min. +V - 2.5 V<br>max. 0.5 V                   | min. +V - 3.0 V<br>max. 0.5 V                  |  |
| <b>Rising edge time t<sub>r</sub></b>                   | max. 200 ns                                                   | max. 1 µs                                       | max. 1 µs                                      |  |
| <b>Falling edge time t<sub>f</sub></b>                  | max. 200 ns                                                   | max. 1 µs                                       | max. 1 µs                                      |  |
| <b>Short circuit proof outputs <sup>2)</sup></b>        | yes                                                           | yes                                             | yes                                            |  |
| <b>Reverse polarity protection of the power supply</b>  | yes                                                           | yes                                             | yes                                            |  |
| <b>UL approval</b>                                      | file 224618                                                   |                                                 |                                                |  |
| <b>CE compliant</b>                                     | acc. to EMC guideline 2014/30/EU<br>RoHS guideline 2011/65/EU |                                                 |                                                |  |

1) Max. recommended cable length 30 m [98.43'].  
2) If power supply correctly applied.

# Incremental encoders

|                        |                                           |                          |
|------------------------|-------------------------------------------|--------------------------|
| <b>Compact optical</b> | <b>3610 / 3620 (shaft / hollow shaft)</b> | <b>Push-pull / RS422</b> |
|------------------------|-------------------------------------------|--------------------------|

## Terminal assignment

| Output circuit                 | Type of connection | Cable (isolate unused wires individually before initial start-up) |     |    |    |           |    |           |    |
|--------------------------------|--------------------|-------------------------------------------------------------------|-----|----|----|-----------|----|-----------|----|
| 2, 4, 5, 6<br>with inv. signal | 1, 2, A, B, E      | Signal:                                                           | 0 V | +V | A  | $\bar{A}$ | B  | $\bar{B}$ | 0  |
|                                |                    | Core color:                                                       | WH  | BN | GN | YE        | GY | PK        | BU |
| 3<br>without inv. signal       | 1, 2, A, B, E      | Signal:                                                           | 0 V | +V | A  | $\bar{A}$ | B  | $\bar{B}$ | 0  |
|                                |                    | Core color:                                                       | WH  | BN | GN | -         | YE | -         | GY |
| 2, 4, 5, 6<br>with inv. signal | 3, 4               | M12 connector, 8-pin                                              |     |    |    |           |    |           |    |
|                                |                    | Signal:                                                           | 0 V | +V | A  | $\bar{A}$ | B  | $\bar{B}$ | 0  |
| 3<br>without inv. signal       | 3, 4               | M12 connector, 8-pin                                              |     |    |    |           |    |           |    |
|                                |                    | Signal:                                                           | 0 V | +V | A  | $\bar{A}$ | B  | $\bar{B}$ | 0  |
| 2, 4, 5, 6<br>with inv. signal | 3, 4               | Pin:                                                              | 1   | 2  | 3  | 4         | 5  | 6         | 7  |
|                                |                    | Pin:                                                              | 1   | 2  | 3  | -         | 5  | -         | 7  |

+V: Encoder power supply +V DC  
 0 V: Encoder power supply ground GND (0 V)  
 A,  $\bar{A}$ : Incremental output channel A  
 B,  $\bar{B}$ : Incremental output channel B  
 0,  $\bar{0}$ : Reference signal

Top view of mating side, male contact base



M12 connector, 8-pin

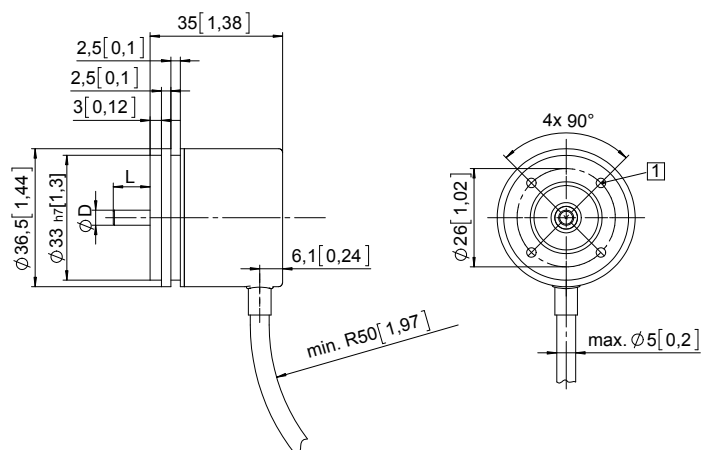
## Dimensions shaft version

Dimensions in mm [inch]

### Synchro flange, ø 36.5 [1.44] Flange type 2

- 1 4 x M3, 5 [0.20] deep

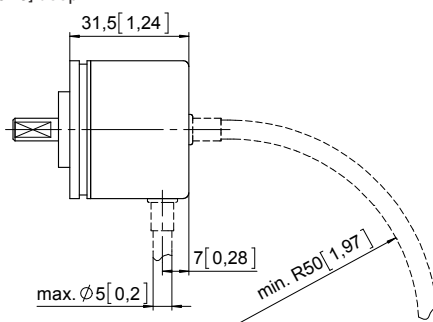
| D        | Fit | L           |
|----------|-----|-------------|
| 4 [0.16] | f7  | 10 [0.39]   |
| 5 [0.20] | f7  | 10 [0.39]   |
| 6 [0.24] | f7  | 12.5 [0.49] |
| 1/4"     | f7  | 12.5 [0.49] |



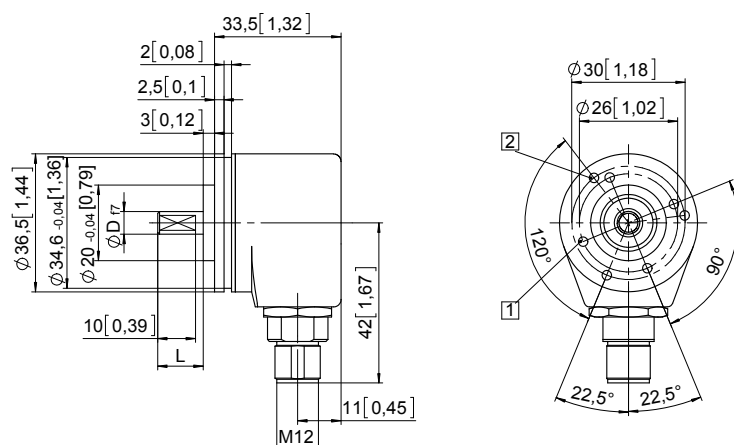
### Clamping flange, ø 36.5 [1.44] Flange type 3

#### Flange type 3

- 1 4 x M3, 5 [0.20] deep  
2 3 x M3, 5 [0.20] deep



| D        | Fit | L           |
|----------|-----|-------------|
| 4 [0.16] | f7  | 10 [0.39]   |
| 5 [0.20] | f7  | 10 [0.39]   |
| 6 [0.24] | f7  | 12.5 [0.49] |
| 1/4"     | f7  | 12.5 [0.49] |



# Incremental encoders

## Compact optical

## 3610 / 3620 (shaft / hollow shaft)

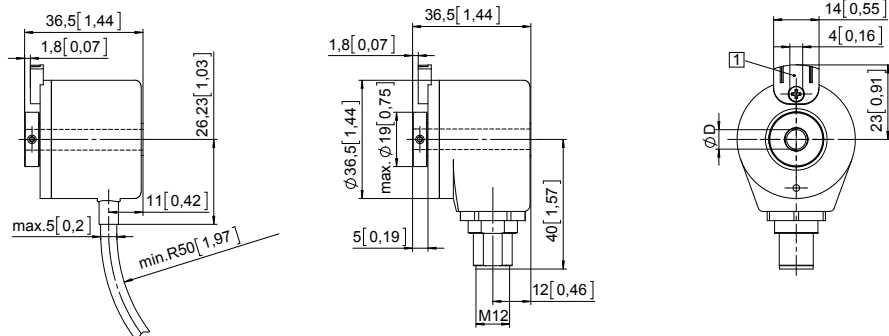
## Push-pull / RS422

### Dimensions hollow shaft version

Dimensions in mm [inch]

#### Flange with spring element, short Flange type 1

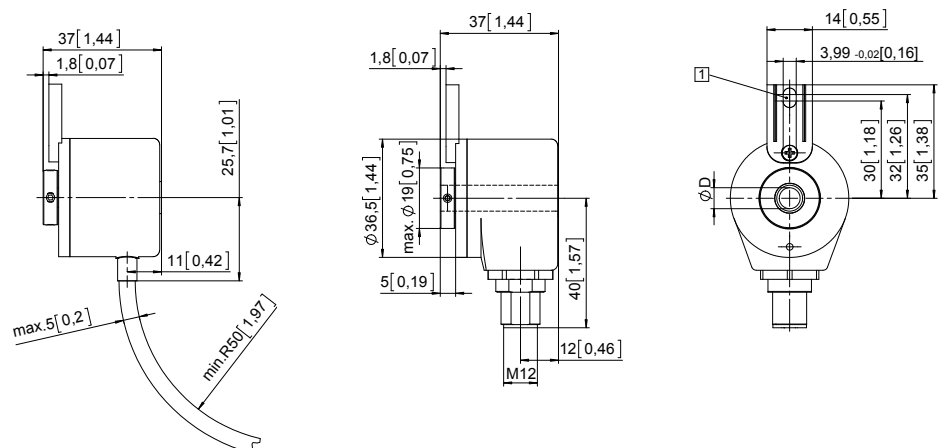
- 1 Slot spring element,  
recommendation:  
cylindrical pin DIN 7,  $\varnothing$  4 [0.16]



| D        | Fit |
|----------|-----|
| 6 [0.24] | H7  |
| 8 [0.32] | H7  |
| 1/4"     | H7  |

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

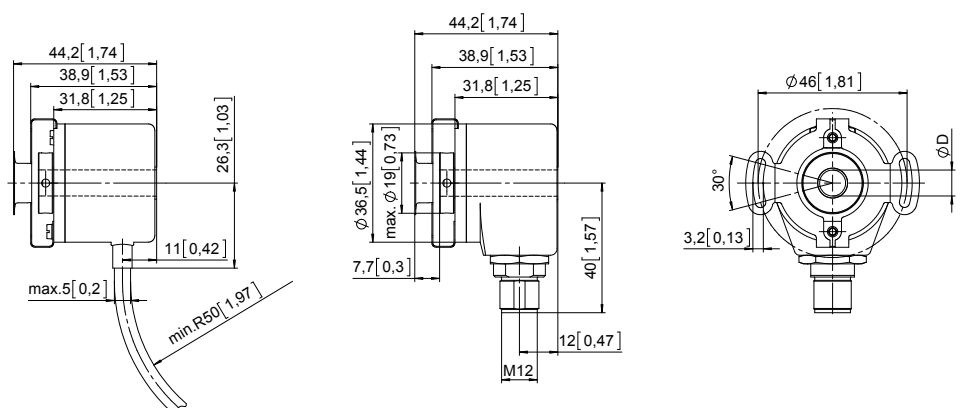
- 1 Slot spring element,  
recommendation:  
cylindrical pin DIN 7,  $\varnothing$  4 [0.16]



| D        | Fit |
|----------|-----|
| 6 [0.24] | H7  |
| 8 [0.32] | H7  |
| 1/4"     | H7  |

#### Flange with stator coupling, $\varnothing$ 46 [1.81]

#### Flange type 5



| D        | Fit |
|----------|-----|
| 6 [0.24] | H7  |
| 8 [0.32] | H7  |
| 1/4"     | H7  |