

## TECHNICAL DATASHEET

### Incremental Encoder RI 58-D / RI 58TD



Clamping shaft



Blind shaft

- Direct mounting without coupling
- Flexible hollow shaft design up to diameter 14 mm
- Through hollow shaft or as end shaft (blind shaft)
- Easy installation by means of clamping shaft or blind shaft
- Short overall length of 33 mm
- Fixing of flange by means of a stator coupling or set screw
- Various shaft versions
- Applications: actuators, motors
- Operating temperature up to 100 °C (RI 58TD)



#### NUMBER OF PULSES

RI 58-D

1 / 2 / 3 / 4 / 5 / 10 / 20 / 25 / 30 / 35 / 40 / 45 / 50 / 60 / 64 / 70 / 72 / 80 / **100** / 125 / 128 / 144 / 150 / 180 / 200 / **250** / 256 / 300 / 314 / 350 / 360 / 375 / 400 / 460 / 480 / **500** / 512 / 600 / 625 / 720 / 900 / **1000** / **1024** / **1250** / 1500 / 1600 / 1800 / 2000 / 2048 / **2500** / 3000 / 3480 / **3600** / 4000 / **4096** / **5000**

Other number of pulses on request

Preferably available versions are printed in bold type.

#### NUMBER OF PULSES

RI 58TD

4 / 5 / 10 / 20 / 25 / 30 / 35 / 40 / 45 / 50 / 60 / 64 / 70 / 72 / 80 / **100** / 125 / 128 / 144 / 150 / 180 / 200 / **250** / 256 / 300 / 314 / 350 / 360 / 375 / 400 / 460 / 480 / **500** / 512 / 600 / 625 / 720 / 900 / **1000** / **1024** / **1250** / 1500 / 1600 / 1800 / 2000 / 2048 / **2500**

Other number of pulses on request

Preferably available versions are printed in bold type.

#### TECHNICAL DATA mechanical

|                                            |                                                                                                            |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Housing diameter                           | 58 mm                                                                                                      |
| Shaft diameter <sup>1</sup>                | 10 mm / 12 mm (Through hollow shaft)<br>10 mm / 12 mm / 14 mm (Hubshaft)                                   |
| Flange<br>(Mounting of housing)            | Synchro flange                                                                                             |
| Mounting of shaft                          | RI 58-D: Front clamping ring, Center bolt<br>RI 58TD: Front clamping ring, Rear clamping ring, Center bolt |
| Protection class shaft input<br>(EN 60529) | IP64                                                                                                       |
| Protection class housing<br>(EN 60529)     | Through hollow shaft - D: IP64<br>Hubshaft - E,F: IP65                                                     |
| Shaft tolerance                            | Ø 10 mm, tolerance g8 (-0.005 ... -0.027 mm), Ø 12/ 14 mm, tolerance g8 (-0.006 ... -0.033 mm)             |

## TECHNICAL DATASHEET

### Incremental Encoder RI 58-D / RI 58TD

#### TECHNICAL DATA mechanical (continued)

|                                            |                                                                                                                                                                                                                                 |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Max. speed                                 | Hub shaft - E,F: max. 6000 rpm<br>Through hollow shaft - D: max. 4000 rpm                                                                                                                                                       |
| Starting torque typ.                       | ≤ 1 Ncm (Hub shaft - E,F)<br>≤ 2 Ncm (Through hollow shaft - D)                                                                                                                                                                 |
| Moment of inertia                          | approx. 35 gcm <sup>2</sup> (Hub shaft with clamping ring front - F)<br>approx. 20 gcm <sup>2</sup> (Hub shaft, mounting with set screw - E)<br>approx. 60 gcm <sup>2</sup> (Through hollow shaft with clamping ring front - D) |
| Vibration resistance<br>(DIN EN 60068-2-6) | 10 g = 100 m/s <sup>2</sup> (10 ... 2000 Hz)                                                                                                                                                                                    |
| Shock resistance<br>(DIN EN 60068-2-27)    | 100 g = 1000 m/s <sup>2</sup> (6 ms)                                                                                                                                                                                            |
| Operating temperature                      | RI 58-D: -10 °C ... +70 °C<br>RI 58TD: -25 °C ... +100 °C                                                                                                                                                                       |
| Storage temperature                        | -25 °C ... +85 °C                                                                                                                                                                                                               |
| Material housing                           | Aluminum                                                                                                                                                                                                                        |
| Weight                                     | approx. 170 g with hubshaft (E,F), approx. 190 g with through hollow shaft (D)                                                                                                                                                  |
| Connection <sup>2</sup>                    | Cable, axial or radial<br>M23 connector (Conin), radial                                                                                                                                                                         |

<sup>1</sup> Other shaft diameters on request

<sup>2</sup> Standard cable length: 1.5 m cable, other cable length on request (only RI 58TD)

#### TECHNICAL DATA electrical

|                             |                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General design              | as per DIN VDE 0160, protection class III, contamination level 2, overvoltage class II                                                                                                                                                                                                                                                                 |
| Supply voltage <sup>1</sup> | RS422 + Sense (T): DC 5 V ±10 %<br>RS422 + Alarm (R): ± 10% DC 5 V or DC 10 - 30 V<br>Push-pull (K), Push-pull antivalent (I): DC 10-30 V                                                                                                                                                                                                              |
| Current w/o load typ.       | 40 mA (DC 5 V), 60 mA (DC 10 V), 30 mA (DC 24 V)                                                                                                                                                                                                                                                                                                       |
| Max. pulse frequency        | RS422: 300 kHz<br>Push-pull: 200 kHz                                                                                                                                                                                                                                                                                                                   |
| Standard output versions    | RS422 + Alarm (R): A, B, N, $\overline{A}$ , $\overline{B}$ , $\overline{N}$ , $\overline{Alarm}$<br>RS422 + Sense (T): A, B, N, $\overline{A}$ , $\overline{B}$ , $\overline{N}$ , Sense<br>Push-pull (K): A, B, N, $\overline{Alarm}$<br>Push-pull complementary (I): A, B, N, $\overline{A}$ , $\overline{B}$ , $\overline{N}$ , $\overline{Alarm}$ |
| Pulse width error           | ± max. 25° electrical                                                                                                                                                                                                                                                                                                                                  |
| Number of pulses            | 1 ... 5000                                                                                                                                                                                                                                                                                                                                             |
| Alarm output                | NPN-O.C., max. 5 mA                                                                                                                                                                                                                                                                                                                                    |
| Pulse shape                 | Square wave                                                                                                                                                                                                                                                                                                                                            |
| Pulse duty factor           | 1:1                                                                                                                                                                                                                                                                                                                                                    |

<sup>1</sup> With push-pull (K): pole protection



## TECHNICAL DATASHEET

### Incremental Encoder RI 58-D / RI 58TD

#### ELECTRICAL CONNECTIONS

##### Cable TPE

| Cable<br>TPE<br>Colour      | Output circuit            |                           |                           |                                   |
|-----------------------------|---------------------------|---------------------------|---------------------------|-----------------------------------|
|                             | RS422<br>+ Sense (T)      | RS422<br>+ Alarm (R)      | push-pull (K)             | push-pull<br>complementary<br>(I) |
| brown                       | Channel A                 | Channel A                 | Channel A                 | Channel A                         |
| green                       | Channel $\bar{A}$         | Channel $\bar{A}$         |                           | Channel $\bar{A}$                 |
| grey                        | Channel B                 | Channel B                 | Channel B                 | Channel B                         |
| pink                        | Channel $\bar{B}$         | Channel $\bar{B}$         |                           | Channel $\bar{B}$                 |
| red                         | Channel N                 | Channel N                 | Channel N                 | Channel N                         |
| black                       | Channel $\bar{N}$         | Channel $\bar{N}$         |                           | Channel $\bar{N}$                 |
| violet (white) <sup>1</sup> | Sense GND                 | Alarm                     | Alarm                     | Alarm                             |
| blue                        | Sense V <sub>CC</sub>     | Sense V <sub>CC</sub>     |                           | Sense V <sub>CC</sub>             |
| brown/green                 | DC 5 V                    | DC 5 / 10 - 30 V          | DC 10 - 30 V              | DC 10 - 30 V                      |
| white/green                 | GND                       | GND                       | GND                       | GND                               |
| Cable screen <sup>2</sup>   | Cable screen <sup>2</sup> | Cable screen <sup>2</sup> | Cable screen <sup>2</sup> | Cable screen <sup>2</sup>         |

<sup>1</sup> white with RS422 + Sense (T)

<sup>2</sup> connected with encoder housing

#### ELECTRICAL CONNECTIONS

##### M23 connector (Conin), 12 pole

| Pin | RS422<br>+ Sense (T)  | RS422<br>+ Alarm (R)  | push-pull (K)     | push-pull<br>complementary (I) |
|-----|-----------------------|-----------------------|-------------------|--------------------------------|
| 1   | Channel $\bar{B}$     | Channel $\bar{B}$     | N.C.              | Channel $\bar{B}$              |
| 2   | Sense V <sub>CC</sub> | Sense V <sub>CC</sub> | N.C.              | Sense V <sub>CC</sub>          |
| 3   | Channel N             | Channel N             | Channel N         | Channel N                      |
| 4   | Channel $\bar{N}$     | Channel $\bar{N}$     | N.C.              | Channel $\bar{N}$              |
| 5   | Channel A             | Channel A             | Channel A         | Channel A                      |
| 6   | Channel $\bar{A}$     | Channel $\bar{A}$     | N.C.              | Channel $\bar{A}$              |
| 7   | N.C.                  | Alarm                 | Alarm             | Alarm                          |
| 8   | Channel B             | Channel B             | Channel B         | Channel B                      |
| 9   | N.C. <sup>1</sup>     | N.C. <sup>1</sup>     | N.C. <sup>1</sup> | N.C. <sup>1</sup>              |
| 10  | GND                   | GND                   | GND               | GND                            |
| 11  | Sense GND             | N.C.                  | N.C.              | N.C.                           |
| 12  | DC 5 V                | DC 5/10 - 30 V        | DC 10 - 30 V      | DC 10 - 30 V                   |

<sup>1</sup> screen for cable with CONIN connector

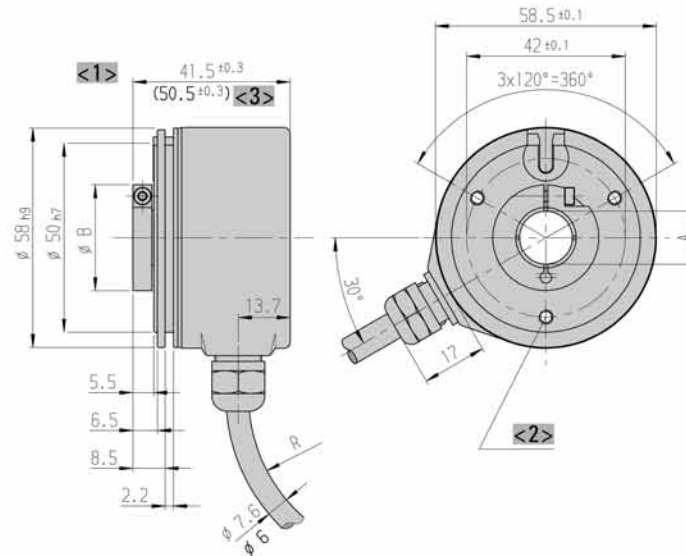
|                     |                                                                                                                                                                                       |      |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Data sheet created  | © Hengstler GmbH, Umlandstr. 49, D-78554 Aldingen/ Germany                                                                                                                            | Page |
| 2010-07-14 09:45:35 | ☎ +49 74 24 - 89 0    Fax +49 74 24 - 89 500<br>E-mail: <a href="mailto:info@hengstler.com">info@hengstler.com</a> Internet: <a href="http://www.hengstler.com">www.hengstler.com</a> | 5    |

## TECHNICAL DATASHEET

### Incremental Encoder RI 58-D / RI 58TD

#### DIMENSIONED DRAWINGS (continued)

##### Mounting D: Through hollow shaft with clamping ring front



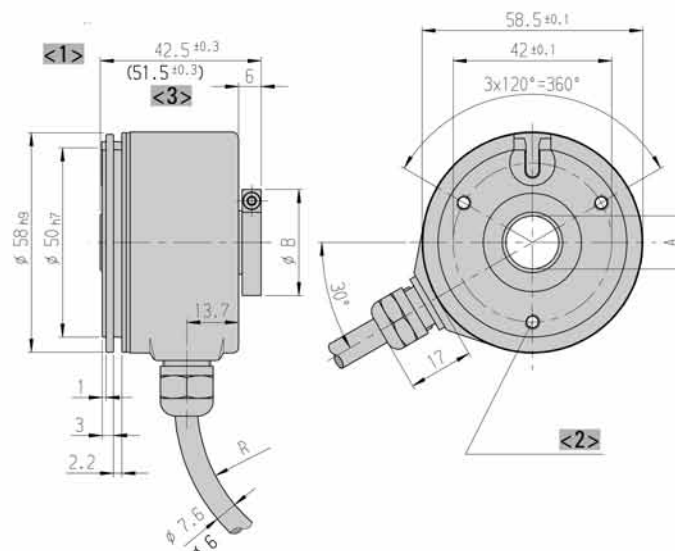
| Dim. | Hollow shaft Ø   |                  | Unit |
|------|------------------|------------------|------|
| A    | 10 <sup>H7</sup> | 12 <sup>H7</sup> | mm   |
| A*   | 10 <sup>g8</sup> | 12 <sup>g8</sup> | mm   |
| B    | 26               | 28               | mm   |

A\* = diameter of connection shaft

- <1> View turned 60°
  - <2> mounting thread M4x5
  - <3> value in brackets with version DC 10 - 30 V, RS422
- Cable bending radius R for flexible installation ≥ 100 mm  
Cable bending radius R for fixed installation ≥ 40 mm

Dimensions in mm

##### Mounting H optional: Through hollow shaft with clamping ring rear on request



| Dim. | Hollow shaft Ø   |                  | Unit |
|------|------------------|------------------|------|
| A    | 10 <sup>H7</sup> | 12 <sup>H7</sup> | mm   |
| A*   | 10 <sup>g8</sup> | 12 <sup>g8</sup> | mm   |
| B    | 26               | 28               | mm   |

A\* = diameter of connection shaft

- <1> View turned 60°
  - <2> mounting thread M4x5
  - <3> value in brackets with version DC 10 - 30 V, RS422
- Cable bending radius R for flexible installation ≥ 100 mm  
Cable bending radius R for fixed installation ≥ 40 mm

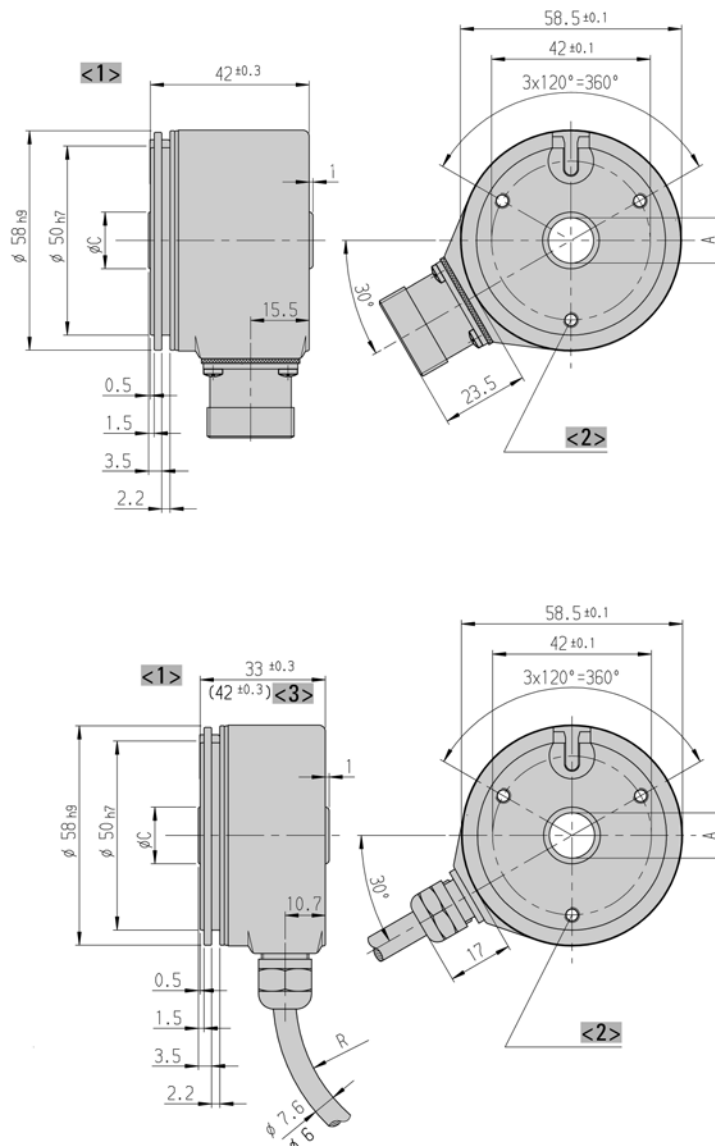
Dimensions in mm

## TECHNICAL DATASHEET

### Incremental Encoder RI 58-D / RI 58TD

#### DIMENSIONED DRAWINGS (continued)

##### Mounting E: Hubshaft. mounting with center screw



| Dim. | Hollow shaft Ø   |                  |                  | Unit |
|------|------------------|------------------|------------------|------|
| A    | 10 <sup>H7</sup> | 12 <sup>H7</sup> | 14 <sup>H7</sup> | mm   |
| A*   | 10 <sub>g8</sub> | 12 <sub>g8</sub> | 14 <sub>g8</sub> | mm   |
| C    | 15               | 15               | 17               | mm   |
| T    | 18±0.5           | 18±0.5           | 18±0.5           | mm   |

A\* = diameter of connection shaft  
T = length of custom shaft in encoder

- <1> View turned 60°  
 <2> mounting thread M4x5  
 <3> value in brackets with version DC 10 - 30 V, RS422  
 Cable bending radius R for flexible installation  $\geq 100$  mm  
 Cable bending radius R for fixed installation  $\geq 40$  mm

Dimensions in mm

## TECHNICAL DATASHEET

### Incremental Encoder RI 58-D / RI 58TD

#### ORDERING INFORMATION

| Type                           | Number of pulses         | Supply voltage <sup>1,2</sup>            | Flange, Protection, Shaft <sup>3,4,5</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Output                                                                                                   | Connection                                                                                                                                                              |
|--------------------------------|--------------------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>       | <input type="checkbox"/> | <input type="checkbox"/>                 | <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <input type="checkbox"/>                                                                                 | <input type="checkbox"/>                                                                                                                                                |
| <b>RI58-D</b><br><b>RI58TD</b> | <b>1 ... 5000</b>        | <b>A</b> DC 5 V<br><b>E</b> DC 10 - 30 V | <b>D.32</b> Through hollow shaft with clamping ring front, IP64, 10 mm<br><b>D.37</b> Through hollow shaft with clamping ring front, IP64, 12 mm<br><b>E.42</b> Hubshaft, mounting with set screw, IP64, 10 mm<br><b>E.47</b> Hubshaft, mounting with set screw, IP64, 12 mm<br><b>E.49</b> Hubshaft, mounting with set screw, IP64, 14 mm<br><b>F.42</b> Hubshaft, mounting with clamping ring front, IP64, 10 mm<br><b>F.47</b> Hubshaft, mounting with clamping ring front, IP64, 12 mm<br><b>F.49</b> Hubshaft, mounting with clamping ring front, IP64, 14 mm | <b>R</b> RS422 +Alarm<br><b>T</b> RS422 +Sense<br><b>K</b> Push-pull<br><b>I</b> Push-pull complementary | <b>B</b> PVC cable, radial<br><b>F</b> TPE cable, radial<br><b>D</b> M23 connector (Conin), 12 pole, radial, cw<br><b>H</b> M23 connector (Conin), 12 pole, radial, ccw |

<sup>1</sup> DC 5 V: only with output "T", "R" available

<sup>2</sup> DC 10 - 30 V: only with output "K", "I", "R" available

<sup>3</sup> Mounting (flange) code "D" only with connection code "B", "F" (cable)

<sup>4</sup> Mounting (flange) code "E", "F" only with connection code "D", "H" (M23 connector)

<sup>5</sup> IP67 on cover with connector only if IP67 mating connector mounted properly.

#### ORDERING INFORMATION

##### Selection of cable length

Versions with cable outlet (connection A, B, E or F) are available with various lengths of cable. To order your desired cable length, please add the respective code to the end of your ordering code. For variants with connector on cable end please add cable length code in between. Further cable lengths on request.

| Code         | Cable length |
|--------------|--------------|
| without code | 1.5 m        |
| -D0          | 3 m          |
| -F0          | 5 m          |
| -K0          | 10 m         |
| -P0          | 15 m         |
| -U0          | 20 m         |
| -V0          | 25 m         |

Example:

Cable 3 m length: ... B - D0

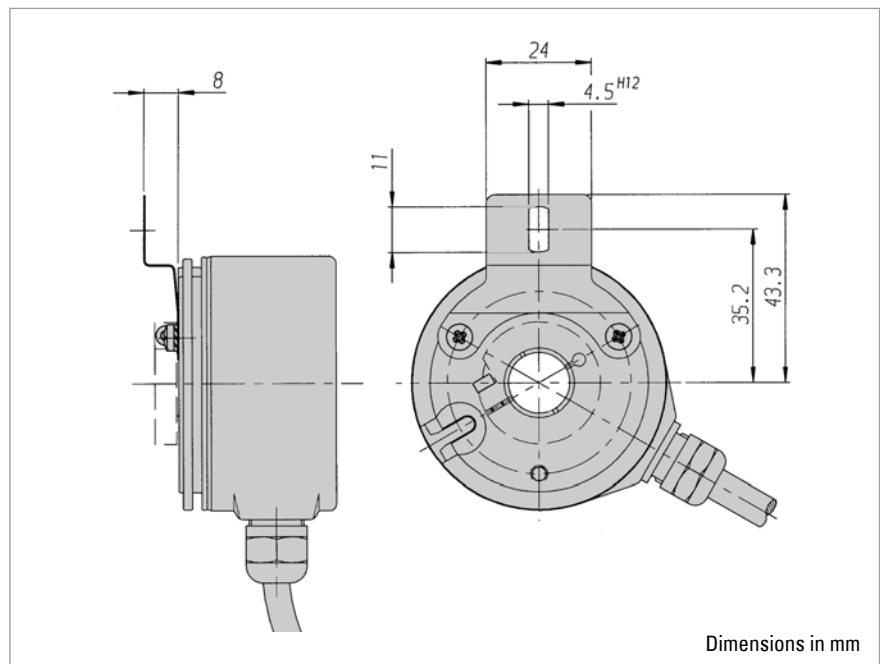
Cable mit 3 m length and M23 connector, cw: ... B - D0 - I

## TECHNICAL DATASHEET

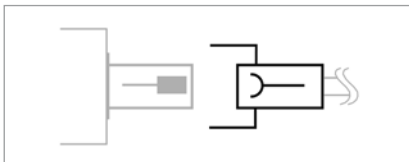
### Incremental Encoder RI 58-D / RI 58TD Accessories

#### ACCESSORIES

Hubshaft with tether as stator coupling,  
ordering code 1 531 162

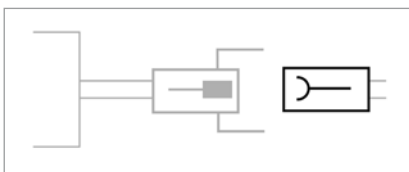


#### CONNECTORS



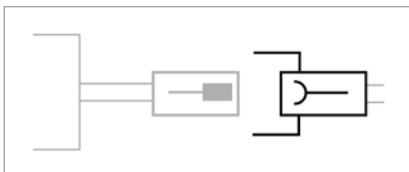
| Connector (socket) matching with encoder connector                      | Ordering code |
|-------------------------------------------------------------------------|---------------|
| M16 (Binder), 6 pole, bent, IP40, mating connector for connection J/N   | 3 539 209     |
| M16 (Binder), 6 pole, gerade, IP67, mating connector for connection J/N | 3 539 472     |
| M23 (Conin), 12 pole, PG9, cw, mating connector for connection C/D/-I   | 3 539 202     |

#### CONNECTORS



| Coupling (socket) matching with encoder cable with connector                        | Ordering code |
|-------------------------------------------------------------------------------------|---------------|
| M23 (Conin), 12 pole, cw, mating connector for connection -C (cable plug 3 539 186) | 3 539 187     |
| M23 (VDW), 12 pole, cw, mating connector for connection -B (cable plug 3 539 252)   | 3 539 304     |

#### CONNECTORS



| Connector (socket) matching with encoder cable with connector                      | Ordering code |
|------------------------------------------------------------------------------------|---------------|
| M23 (Conin), 12 pole, ccw, mating connector for connection G/H/-D/-H               | 3 539 229     |
| M23 (VDW), 12 pole, ccw, mating connector for connection -E (cable plug 3 539 274) | 3 539 305     |

# TECHNICAL DATASHEET

## Incremental Encoder RI 58-D / RI 58TD Accessories

### CONNECTING CABLES



| Connecting cables with plug (socket) on one end                                       | Ordering code |
|---------------------------------------------------------------------------------------|---------------|
| M16 (Binder), 6 pole, PVC cable, mating connector for connection J/N, 3 m             | 1 522 405     |
| M16 (Binder), 6 pole, PVC cable, mating connector for connection J/N, 5 m             | 1 522 404     |
| M16 (Binder), 6 pole, PVC cable, mating connector for connection J/N, 10 m            | 1 522 340     |
| M16 (Binder), 6 pole, PVC cable, mating connector for connection J/N, 15 m            | 1 522 833     |
| M16 (Binder), 6 pole, PVC cable, mating connector for connection J/N, 50 m            | 1 522 836     |
| M23 (Conin), 12 pole, TPE cable, cw, mating connector for connection C/D/-I, 3 m      | 1 522 348     |
| M23 (Conin), 12 pole, TPE cable, cw, mating connector for connection C/D/-I, 5 m      | 1 522 349     |
| M23 (Conin), 12 pole, TPE cable, cw, mating connector for connection C/D/-I, 10 m     | 1 522 350     |
| M23 (Conin), 12 pole, TPE cable, cw, mating connector for connection C/D/-I, 15 m     | 1 522 454     |
| M23 (Conin), 12 pole, TPE cable, cw, mating connector for connection C/D/-I, 20 m     | 1 522 456     |
| M23 (Conin), 12 pole, TPE cable, cw, mating connector for connection C/D/-I, 25 m     | 1 522 457     |
| M23 (Conin), 12 pole, TPE cable, cw, mating connector for connection C/D/-I, 30 m     | 1 522 464     |
| M23 (Conin), 12 pole, TPE cable, cw, mating connector for connection C/D/-I, 40 m     | 1 522 643     |
| M23 (Conin), 12 pole, TPE cable, cw, mating connector for connection C/D/-I, 50 m     | 1 522 793     |
| M23 (Conin), 12 pole, TPE cable, ccw, mating connector for connection G/H/-D/-H, 3 m  | 1 522 394     |
| M23 (Conin), 12 pole, TPE cable, ccw, mating connector for connection G/H/-D/-H, 5 m  | 1 522 395     |
| M23 (Conin), 12 pole, TPE cable, ccw, mating connector for connection G/H/-D/-H, 10 m | 1 522 396     |
| M23 (Conin), 12 pole, TPE cable, ccw, mating connector for connection G/H/-D/-H, 15 m | 1 522 447     |
| M23 (Conin), 12 pole, TPE cable, ccw, mating connector for connection G/H/-D/-H, 20 m | 1 522 461     |
| M23 (Conin), 12 pole, TPE cable, ccw, mating connector for connection G/H/-D/-H, 25 m | 1 522 462     |
| M23 (Conin), 12 pole, TPE cable, ccw, mating connector for connection G/H/-D/-H, 30 m | 1 522 463     |
| M23 (Conin), 12 pole, TPE cable, ccw, mating connector for connection G/H/-D/-H, 40 m | 1 522 463     |

### CONNECTING CABLES

| Cable not made up with connectors | Ordering code      |
|-----------------------------------|--------------------|
| PVC cable, 10-core + screen       | 3 280 114 + length |
| PVC cable, 6-core + screen        | 3 280 113 + length |
| TPE cable, 12-core + screen       | 3 280 112 + length |