



Synchro flange



Clamping flange

- To 40,000 steps by 10,000 pulses
- Short circuit proof and overload protected
- Max. pulse frequency 300 kHz
- RS 422
- Push-pull complementary
- Encoder self tests/ Alarm output
- EMC class IV as per IEC 801
- Synchro-, square- or clamping flange
- Protection class up to IP 67
- Option: Explosion proof version

## Number of pulses

RI 58-O

1 / 2 / 3 / 5 / 10 / 20 / 25 / 29 / 30 / 35 / 50 / 60 / 70 / 80 / 100 / 120 / 125 / 128 / 150 / 180 / 200 / 226 / 250 / 256 / 280 / 300 / 314 / 360 / 375 / 400 / 460 / 480 / 500 / 512 / 600 / 625 / 635 / 720 / 750 / 889 / 900 / 1,000 / 1,024 / 1,125 / 1,250 / 1,270 / 1,500 / 1,600 / 1,800 / 1,885 / 1,979 / 2,000 / 2,048 / 2,500 / 3,000 / 3,600 / 3,925 / 3,958 / 4,000 / 4,096 / 5,000 / 5,400 / 6,000 / 6,875 / 7,854 / 8,192 / 9,000 / 10,000

Other numbers of pulses available on request

RI 58-T

as above, but only for the range from 5 to 2,500 pulses

Other numbers of pulses available on request

## Technical data

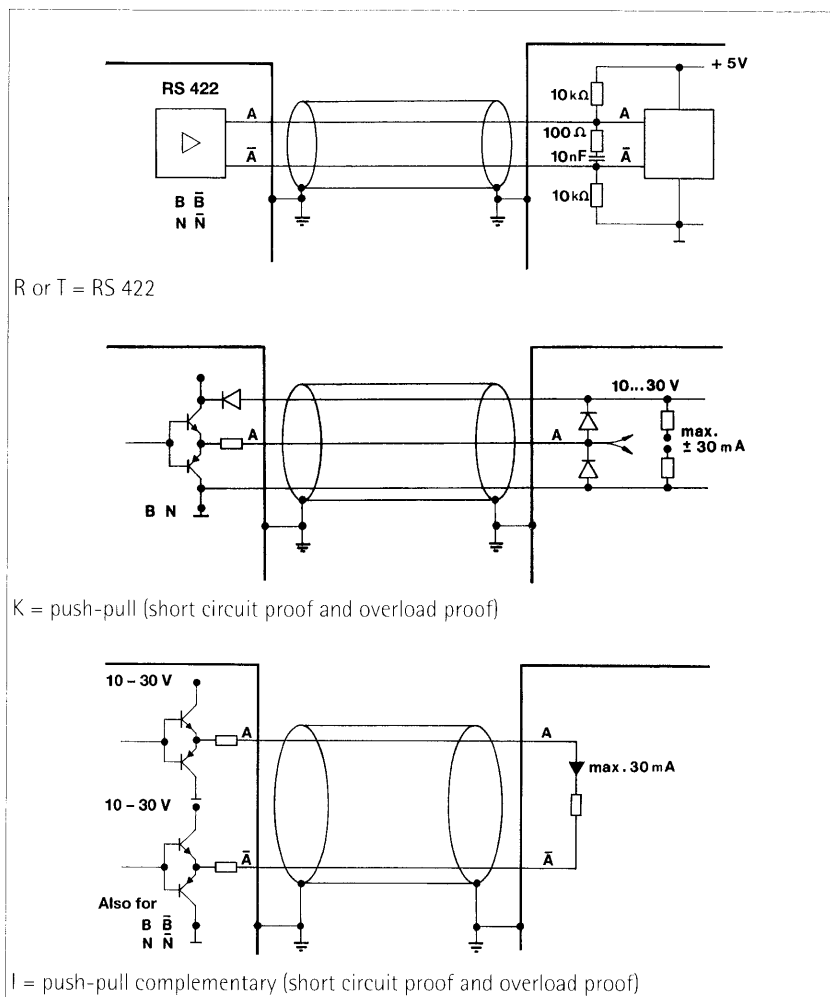
mechanical

|                                       |                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Shaft diameter                        | 6 mm/6.35 mm ( $\frac{1}{4}$ inch)/7 mm / 12 mm/10 mm/9.52 mm ( $\frac{3}{8}$ inch)                                                                                                                                                                                                                                                                        |
| Absolute max. shaft load radial/axial | <div> <div> <div>Ø 12 mm</div> <div>180/140 N (39/30 lbs)</div> </div> <div> <div>Ø 7...10 mm</div> <div>160/107 N (35/24 lbs)</div> </div> <div> <div>Ø 6 mm/6.35 mm</div> <div>110/60 N (24/13 lbs)</div> </div> </div>                                                                                                                                  |
| Absolute maximum speed                | 10,000 RPM                                                                                                                                                                                                                                                                                                                                                 |
| Torque                                | ≤ 1 Ncm (IP 65)                                                                                                                                                                                                                                                                                                                                            |
| Moment of inertia                     | synchro flange 14 gcm <sup>2</sup> approx.<br>clamping flange 20 gcm <sup>2</sup> approx.                                                                                                                                                                                                                                                                  |
| Protection class (DIN 40050)          | IP 50, IP 65, IP 67*                                                                                                                                                                                                                                                                                                                                       |
| General design                        | as per DIN VDE 0160                                                                                                                                                                                                                                                                                                                                        |
| Operating temperature                 | RI 58-O: -10 ... +70 °C; RI 58-T: -10 ... +100 °C                                                                                                                                                                                                                                                                                                          |
| Storage temperature                   | RI 58-O: -25 ... +85 °C; RI 58-T: -25 ... +100 °C                                                                                                                                                                                                                                                                                                          |
| Vibration performance (IEC 68-2-6)    | 100 m/s <sup>2</sup> (10 ... 2,000 Hz)                                                                                                                                                                                                                                                                                                                     |
| Shock resistance (IEC 68-2-27)        | 1,000 m/s <sup>2</sup> (3 ms)                                                                                                                                                                                                                                                                                                                              |
| Type of connection, axial or radial   | 1.5 m cable** or connector                                                                                                                                                                                                                                                                                                                                 |
| Housing                               | aluminium Ø 58 mm                                                                                                                                                                                                                                                                                                                                          |
| Flange                                | S = synchro flange, K = clamping flange,<br>G, Q = square flange, M = synchro clamping flange                                                                                                                                                                                                                                                              |
| Weight                                | 360 g approx.                                                                                                                                                                                                                                                                                                                                              |
| Bearing life                          | <div>1 x 10<sup>10</sup> revolutions (typ.) at 35 % of full rated shaft load</div> <div>1 x 10<sup>9</sup> revolutions (typ.) at 75 % of full rated shaft load</div> <div>1 x 10<sup>8</sup> revolutions (typ.) at 100 % of full rated shaft load</div> <div>For example 30,000 h at 6,000 RPM with<br/>a 13 lb radial load (10 mm or 9.52 mm shaft)</div> |

\*Other specifications possible on request

\*\*other lengths of cable available on request

## Output circuit



| Code letter      | R, T                 | K                        | I                        |
|------------------|----------------------|--------------------------|--------------------------|
| Output           | RS 422               | push-pull                | push-pull complementary  |
| H                | $\geq 2.5 \text{ V}$ | $\geq U_B - 3 \text{ V}$ | $\geq U_B - 3 \text{ V}$ |
| L                | $\leq 0.5 \text{ V}$ | $\leq 2 \text{ V}$       | $\leq 2 \text{ V}$       |
| Output load max. | $\pm 20 \text{ mA}$  | $\pm 30 \text{ mA}$      | $\pm 30 \text{ mA}$      |
| Alarm output     | O.C. NPN 10 mA       | O.C. NPN 10 mA           | O.C. NPN 10 mA           |

### Cable lengths\* (depending on voltage and frequency) (at 25 °C) Push-pull

|       | RS 422         | Push-pull                                             | complementary                                         |
|-------|----------------|-------------------------------------------------------|-------------------------------------------------------|
| 10 m  | 5 VDC, 300 kHz | 12 VDC, 200 kHz<br>24 VDC, 200 kHz<br>30 VDC, 200 kHz | 12 VDC, 200 kHz<br>24 VDC, 200 kHz<br>30 VDC, 200 kHz |
| 50 m  | 5 VDC, 300 kHz | 12 VDC, 200 kHz<br>24 VDC, 200 kHz<br>30 VDC, 100 kHz | 12 VDC, 200 kHz<br>24 VDC, 50 kHz<br>30 VDC, 25 kHz   |
| 100 m | 5 VDC, 300 kHz | 12 VDC, 200 kHz<br>24 VDC, 100 kHz<br>30 VDC, 50 kHz  | 12 VDC, 150 kHz<br>24 VDC, 25 kHz<br>30 VDC, 12 kHz   |

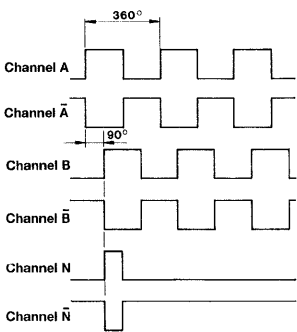
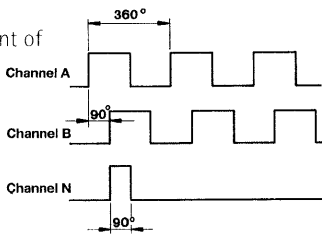
\* with respect to Hengstler' own cables

# Type RI 58

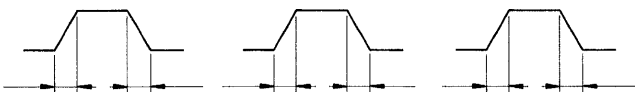
## Technical data electrical

|                      |                     |                                  |                                          |
|----------------------|---------------------|----------------------------------|------------------------------------------|
| Output <sup>1)</sup> | RS 422<br>(TTL)     | Push-pull <sup>2)</sup>          | Push-pull<br>complementary <sup>2)</sup> |
| Supply voltage       | 5 VDC/10 ... 30 VDC | 10 ... 30 VDC                    | 10 ... 30 VDC                            |
| Power consumption    | 40 mA (5 VDC)       | 30 mA (24 VDC)<br>60 mA (10 VDC) | 30 mA (24 VDC)<br>60 mA (10 VDC)         |
| Max. pulse frequency | 300 kHz             | 200 kHz                          | 200 kHz                                  |
| Output signals       | Push-pull           |                                  | RS 422 + push-pull<br>complementary      |

shaft turning  
clockwise  
seen from front of  
encoder



Delay times  
at 1.5 m cable



$\leq 100 \text{ ns}$   $\leq 100 \text{ ns}$      $\leq 250 \text{ ns}$   $\leq 250 \text{ ns}$      $\leq 250 \text{ ns}$   $\leq 250 \text{ ns}$

|                                 |                           |                           |                           |
|---------------------------------|---------------------------|---------------------------|---------------------------|
| Pulse shape                     |                           |                           |                           |
| Pulse duty factor               | 1 : 1                     | 1 : 1                     | 1 : 1                     |
| Pulse width error <sup>3)</sup> | $\pm 25^\circ$ electrical | $\pm 25^\circ$ electrical | $\pm 25^\circ$ electrical |

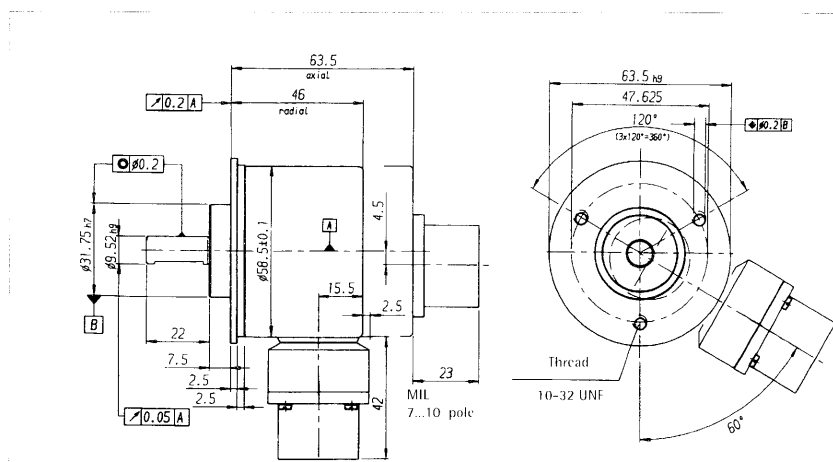
<sup>1)</sup> RI 58-T only with RS 422, 5 VDC  
<sup>2)</sup> short circuit and overload proof over the whole temperature range.  
<sup>3)</sup> distance from A to B is at least 0.45  $\mu\text{s}$



# Type RI 58

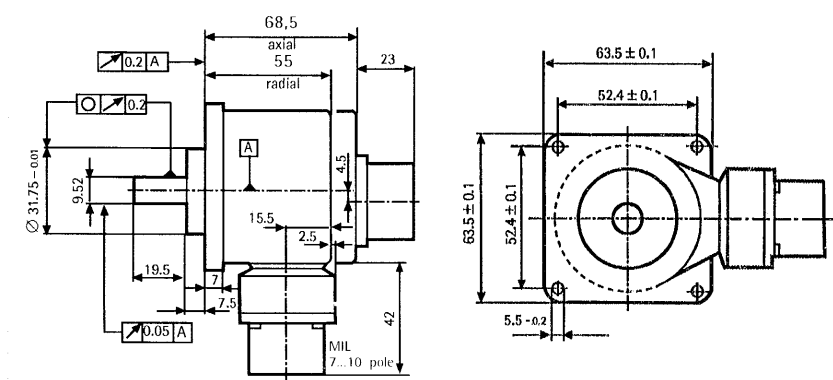
## Dimensioned drawing

Synchro clamping flange, 63.5 mm



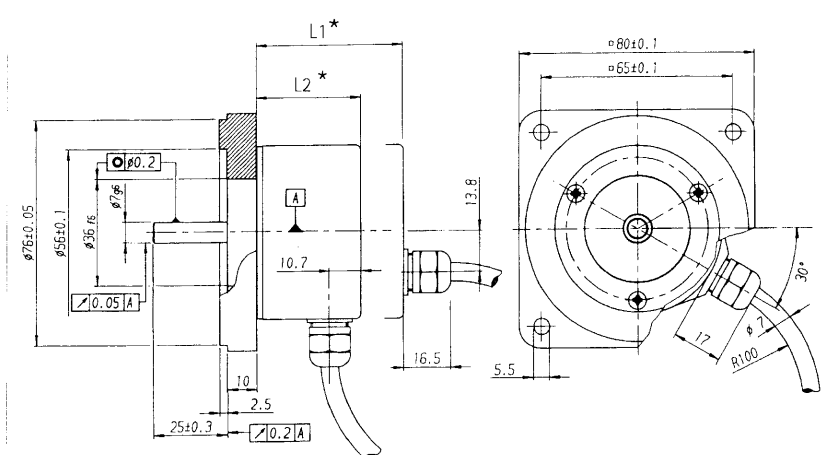
Dimensions in mm

Square flange, 63.5 x 63.5 mm



Dimensions in mm

Square flange, 80 x 80 mm



Dimensions in mm; \* L1, L2 see clamping flange

## Type RI 58

### Connection diagram Cable

| PVC-cable<br>(A, B)  | TPE-cable<br>(E, F)          | Output circuit                |                      |                         |
|----------------------|------------------------------|-------------------------------|----------------------|-------------------------|
| Colour               | Colour                       | RS 422<br>(R, T)              | Push-pull<br>(K)     | Push-pull<br>compl. (I) |
| red                  | brown/green                  | 5/10...30 VDC =               | 10...30 VDC =        | 10...30 VDC =           |
| yellow/red           | blue                         | Sense V <sub>CC</sub>         | Alarm <sup>4)</sup>  | Sense V <sub>CC</sub>   |
| white                | brown                        | Channel A                     | Channel A            | Channel A               |
| white/brown          | green                        | Channel $\bar{A}$             |                      | Channel $\bar{A}$       |
| green                | grau                         | Channel B                     | Channel B            | Channel B               |
| green/brown          | pink                         | Channel $\bar{B}$             |                      | Channel $\bar{B}$       |
| yellow               | red                          | Channel N                     | Channel N            | Channel N               |
| yellow/brown         | black                        | Channel $\bar{N}$             |                      | Channel $\bar{N}$       |
| black                | white/green                  | GND                           | GND                  | GND                     |
| yellow/black         | violet (white) <sup>1)</sup> | Alarm/Sense GND <sup>2)</sup> | Alarm <sup>4)</sup>  | Alarm                   |
| Screen <sup>3)</sup> | Screen <sup>3)</sup>         | Screen <sup>3)</sup>          | Screen <sup>3)</sup> | Screen <sup>3)</sup>    |

<sup>1)</sup> white for RS 422 + Sense (T) <sup>2)</sup> depending on ordering code

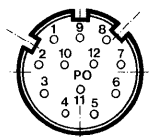
<sup>3)</sup> connected to housing

<sup>4)</sup> for PVC-cable either yellow/red or yellow/black; for TPE-cable only violet

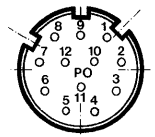
### Connector 12 pole (CONIN)

| Pin | RS 422 +<br>Sense (T) | RS 422 +<br>Alarm (R) | Push-pull<br>(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.*                 | N.C.*                 | N.C.*            | N.C.*                          |
| 10  | GND                   | GND                   | GND              | GND                            |
| 11  | Sense GND             | N.C.                  | N.C.             | N.C.                           |
| 12  | 5 VDC = $\pm 10\%$    | 5/10...30 VDC =       | 10...30 VDC =    | 10...30 VDC =                  |

\* Screen for cable with CONIN connector



Pin assignment  
connector  
counter  
clockwise (ccw)



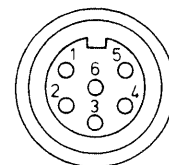
connector  
clockwise (cw)

### Connector 10 pole (MIL)

| Pin  | RS 422/Push-pull complementary<br>Euro-pinout<br>(connection codes O and K) | Push-pull<br>(O and K) | RS 422/Push-pull complementary<br>US-pinout<br>(R and T) |
|------|-----------------------------------------------------------------------------|------------------------|----------------------------------------------------------|
| 1/A  | Channel A                                                                   | Channel A              | Channel A                                                |
| 2/B  | Channel B                                                                   | Channel B              | Channel B                                                |
| 3/C  | Channel N                                                                   | Channel N              | Channel N                                                |
| 4/D  | 5/10...30 VDC =                                                             | 5/10...30 VDC =        | 5/10...30 VDC =                                          |
| 5/E  | Alarm                                                                       | Alarm                  | Alarm                                                    |
| 6/F  | GND                                                                         | GND                    | GND                                                      |
| 7/G  | Channel $\bar{A}$                                                           | Screen                 | Screen                                                   |
| 8/H  | Channel $\bar{B}$                                                           | N.C.                   | Channel $\bar{A}$                                        |
| 9/I  | Channel $\bar{N}$                                                           | N.C.                   | Channel $\bar{B}$                                        |
| 10/J | Screen                                                                      | Screen                 | Channel $\bar{N}$                                        |

### Connector 6 pole (BINDER)

| Push-pull     | Pin |
|---------------|-----|
| 10 ... 30 VDC | 1   |
| Channel A     | 2   |
| Channel N     | 3   |
| Channel B     | 4   |
| Alarm         | 5   |
| GND           | 6   |



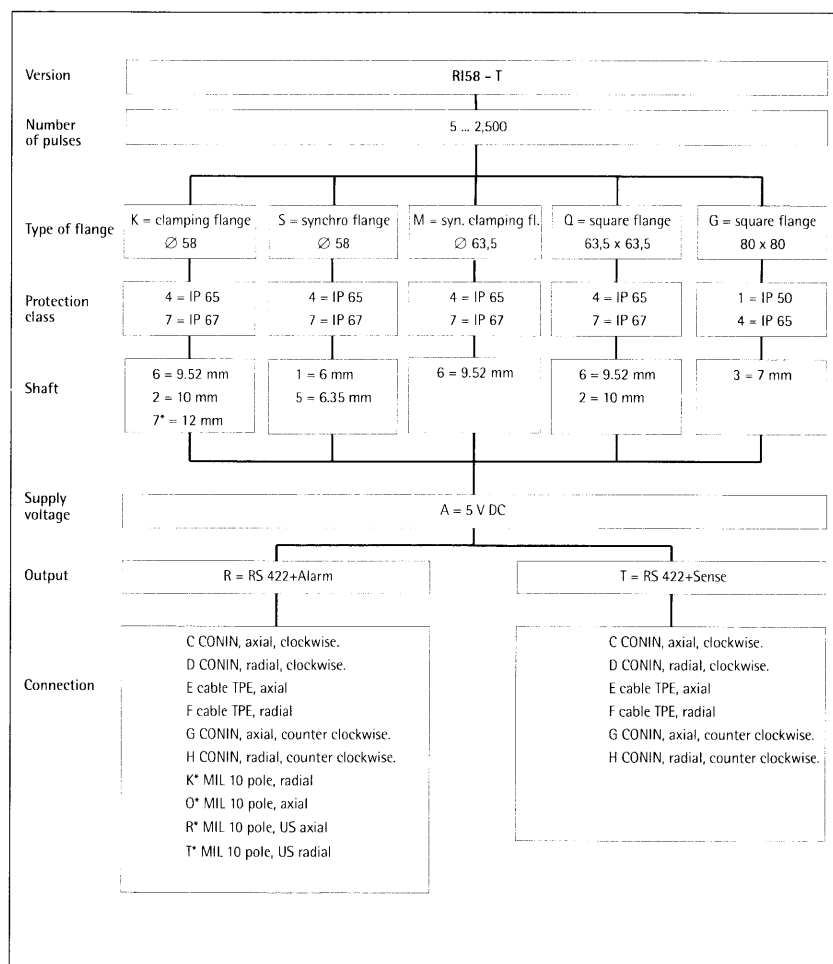
## Connector 6/7 pole (MIL)

|     |             |               |
|-----|-------------|---------------|
|     | MIL 6 pole  | MIL 7 pole    |
| Pin | Push-pull   | Push-pull     |
| 1/A | 10...30 VDC | Channel A     |
| 2/B | Channel A   | Channel B     |
| 3/C | Channel B   | Channel N     |
| 4/D | Channel N   | 10...30 VDC = |
| 5/E | GND         | Alarm         |
| 6/F | Screen      | GND           |
| 7/G | -           | Screen        |

## Connector 8 pole (KPT 12-8P)

|     |                         |
|-----|-------------------------|
|     | RS 422 (R),             |
| Pin | Push-pull complementary |
| 1/A | Channel B               |
| 2/B | Channel B               |
| 3/C | Channel A               |
| 4/D | Channel A               |
| 5/E | + U <sub>B</sub>        |
| 6/F | GND                     |
| 7/G | Channel N               |
| 8/H | Channel N               |

## Standard versions RI 58-T (high temperature)



\*not for IP 67  
Other versions on request

# Type RI 58

## Standard versions RI 58-O

|                  |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                              |                              |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Version          | RI58 - 0                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                              |                              |
| Number of pulses | 1 ... 10,000                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                              |                              |
| Type of flange   | K = clamping flange<br>∅ 58                                                                                                                                                        | S = synchro flange<br>∅ 58                                                                                                                                                                                                                                                                                                                  | M = syn. clamping fl.<br>∅ 63.5                                                                                                                                                                                                                                                                                                             | Q = square flange<br>63.5 x 63.5                                                                                                                                                                                                                                                                                                                                                             | G = square flange<br>80 x 80 |
| Protection class | 4 = IP 65<br>7 = IP 67                                                                                                                                                             | 4 = IP 65<br>7 = IP 67                                                                                                                                                                                                                                                                                                                      | 4 = IP 65<br>7 = IP 67                                                                                                                                                                                                                                                                                                                      | 4 = IP 65<br>7 = IP 67                                                                                                                                                                                                                                                                                                                                                                       | 1 = IP 50<br>4 = IP 65       |
| Shaft            | 6 = 9.52 mm<br>2 = 10 mm<br>7* = 12 mm                                                                                                                                             | 1 = 6 mm<br>5 = 6.35 mm                                                                                                                                                                                                                                                                                                                     | 6 = 9.52 mm                                                                                                                                                                                                                                                                                                                                 | 6 = 9.52 mm<br>2 = 10 mm                                                                                                                                                                                                                                                                                                                                                                     | 3 = 7 mm                     |
| Supply voltage   | A = 5 V DC                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                             | E = 10 ... 30 V DC                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                              |                              |
| Output           | T = RS 422+Sense                                                                                                                                                                   | R = RS 422+Alarm                                                                                                                                                                                                                                                                                                                            | I = push-pull<br>complementary                                                                                                                                                                                                                                                                                                              | R = RS 422+Alarm                                                                                                                                                                                                                                                                                                                                                                             | K = push-pull                |
| Connection       | A cable PVC, axial<br>B cable PVC, radial<br>C CONIN, axial, cw<br>D CONIN, radial, cw<br>E cable IPE, axial<br>F cable IPE, radial<br>G CONIN, axial, ccw<br>H CONIN, radial, ccw | A cable PVC, axial<br>B cable PVC, radial<br>C CONIN, axial, cw<br>D CONIN, radial, cw<br>E cable IPE, axial<br>F cable IPE, radial<br>G CONIN, axial, ccw<br>H CONIN, radial, ccw<br>K* MII 10 pole, radial<br>O* MII 10 pole, axial<br>R* MII 10 pole, US axial<br>I* MII 10 pole, US radial<br>1 KPI 12-BP, axial<br>2 KPI 12-BP, radial | A cable PVC, axial<br>B cable PVC, radial<br>C CONIN, axial, cw<br>D CONIN, radial, cw<br>E cable IPE, axial<br>F cable IPE, radial<br>G CONIN, axial, ccw<br>H CONIN, radial, ccw<br>K* MII 10 pole, radial<br>O* MII 10 pole, axial<br>R* MII 10 pole, US axial<br>I* MII 10 pole, US radial<br>1 KPI 12-BP, axial<br>2 KPI 12-BP, radial | A cable PVC, axial<br>B cable PVC, radial<br>C CONIN, axial, cw<br>D CONIN, radial, cw<br>E cable IPE, axial<br>F cable IPE, radial<br>G CONIN, axial, ccw<br>H CONIN, radial, ccw<br>J BINDER 6 pole, radial<br>N BINDER 6 pole, axial<br>K* MII 10 pole, radial<br>O* MII 10 pole, axial<br>I* MII 7 pole, radial<br>P* MII 7 pole, axial<br>M* MII 6 pole, axial<br>Q* MII 6 pole, radial |                              |

\* not for IP 67

Other versions and explosion-proof on request

## Accessories

Clamping eccentric  
(set of three)

Ordering code 0 070 655

Diaphragm coupling  
hole 6/6 mm

Ordering code 1 076 013

hole 10/10 mm

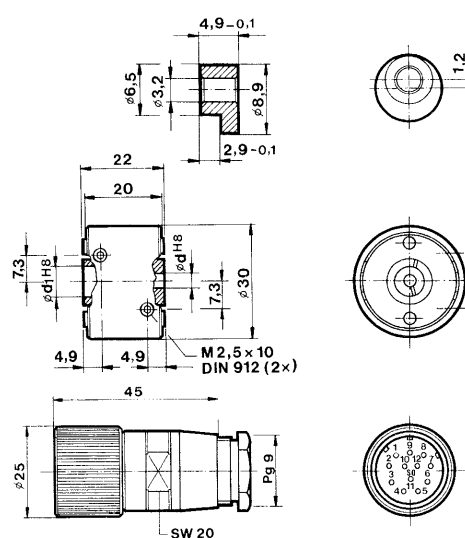
Ordering code 1 076 014

Cable plug connector  
for connector (CONIN),  
clockwise

Ordering code 3 539 202

for connector (CONIN),  
counter clockwise

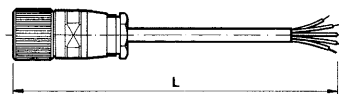
Ordering code 3 539 229



# Type RI 58

## Accessories

Extension cables  
(TPE)



12-pin plug (socket) on one end

clockwise

counter clockwise

**Ordering code**

**Ordering code**

L= 3 m

**1 522 348**

**1 522 394**

L= 5 m

**1 522 349**

**1 522 395**

L= 10 m

**1 522 350**

**1 522 396**

TPE-cable (not made up with connectors) **3 280 112 + length**

For more detailed specifications and other accessories see "Accessories".

## Ordering data

| O standard                 | Supply          | Type of flange              | Shaft diameter |
|----------------------------|-----------------|-----------------------------|----------------|
| T high temperature voltage | A 5 VDC         | S synchro flange            | 1 6 mm         |
|                            | E 10 ... 30 VDC | K clamping flange           | 2 10 mm        |
|                            |                 | G square flange 80 x 80     | 3 7 mm         |
|                            |                 | Q square flange 63.5 x 63.5 | 5 6.35 mm      |
|                            |                 | M synchro clamping flange   | 6 9.52 mm      |
|                            |                 |                             | 7 12 mm        |

| Number of pulses     | Protection class | Output                           | Type of connection                       |
|----------------------|------------------|----------------------------------|------------------------------------------|
| RI58-O: 1 ... 10,000 | 1 IP 50          | T RS 422 + Sense                 | A PVC-cable axial                        |
| RI58-T: 5 ... 2,500  | 4 IP 65          | K push-pull, short circuit proof | B PVC-cable radial                       |
|                      | 7 IP 67          | I push-pull complementary        | C CONIN*, axial clockwise                |
|                      |                  | R RS 422+Alarm                   | D CONIN*, radial clockwise               |
|                      |                  |                                  | E TPE-cable axial                        |
|                      |                  |                                  | F TPE-cable radial                       |
|                      |                  |                                  | G CONIN*, axial counter clockwise        |
|                      |                  |                                  | H CONIN*, radial counter clockwise       |
|                      |                  |                                  | J BINDER 6 pole, radial                  |
|                      |                  |                                  | N BINDER 6 pole, axial                   |
|                      |                  |                                  | O MIL MS*, 10 pole, axial <sup>1)</sup>  |
|                      |                  |                                  | K MIL MS*, 10 pole, radial <sup>1)</sup> |
|                      |                  |                                  | L MIL 7 pole, radial                     |
|                      |                  |                                  | P MIL 7 pole, axial                      |
|                      |                  |                                  | M MIL 6 pole, axial                      |
|                      |                  |                                  | Q MIL 6 pole, radial                     |
|                      |                  |                                  | R MIL 10 pole, US axial <sup>2)</sup>    |
|                      |                  |                                  | T MIL 10 pole, US radial <sup>2)</sup>   |
|                      |                  |                                  | 1 KPT 12-8P, axial                       |
|                      |                  |                                  | 2 KPT 12-8P, radial                      |

|                               |                                          |
|-------------------------------|------------------------------------------|
| <sup>1)</sup> European pinout | <sup>*</sup> encoder connector with pins |
| <sup>2)</sup> U.S. pinout     |                                          |