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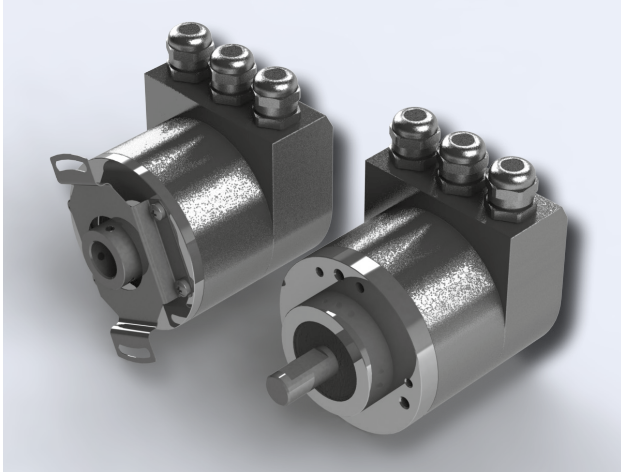


# Series BC 58

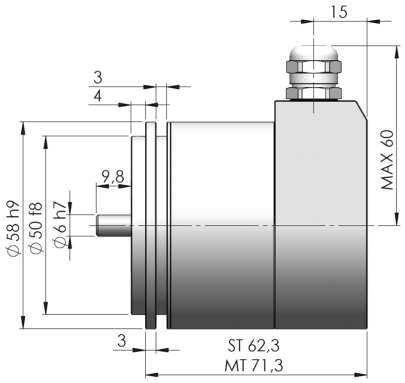
- Absolute single- and multiturn rotary-encoder with solid shaft or blind hollow shaft
- Housing diameter 58 mm, compact design and high degree of protection up to IP67
- Maximum resolution singleturn 17 Bit
- Maximum resolution multiturn 25 Bit
- For highest industrial requirements
- Available interfaces: Parallel, SSI, ProfibusDP, Interbus K2 and K3, DeviceNet, CAN, CANopen
- Accessories from page 78

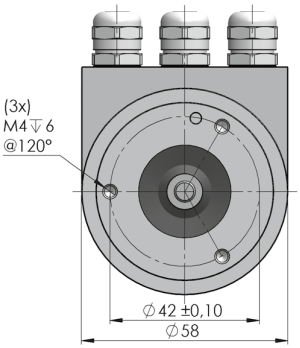
## Mechanical specifications

| | |
|---|---|
| Shaft diameter | 6 mm (synchro flange)<br>10 mm (clamping flange)<br>10/12 mm (blind hollow shaft) |
| Shaft load | axial 40 N, radial 60 N (10, 12 mm shaft) |
| Speed | Continuous operation 10.000 $min^{-1}$ |
| Torque | < 0.5 Ncm |
| Moment of inertia | ca. 3,8 x $10^{-6}$ $kgm^2$ |
| Protection class | Shaft input IP 64 or IP 67, housing IP 67 |
| General design | according to DIN EN 61010, protection class III,<br>degree of contamination 2,<br>overvoltage category II |
| Operating temperature | - 40 ... 100 ° C |
| Storage temperature | - 40 ... 85 ° C |
| Vibration resistance | DIN EN 60068-2-6, 100 $m/s^2$ (10 ... 2.000 Hz) |
| Shock resistance | DIN EN 60068-2-27, 1.000 $m/s^2$ (6 ms) |
| Connection | axial or radial |
| Flange | S = Synchro flange<br>K= Clamping flange<br>F = Blind hollow shaft |
| Starting torque | < 0,01 Nm |
| Mass | Singleturn approx 350 g, Multiturn approx 400 g |

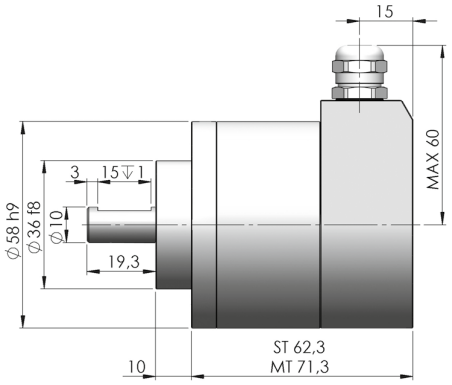
## Mechanical dimensions

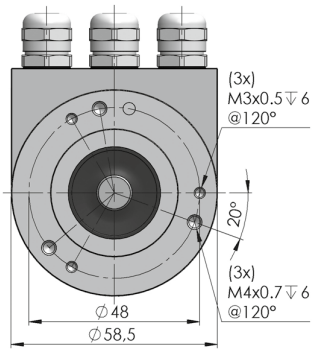
Synchro flange („S")



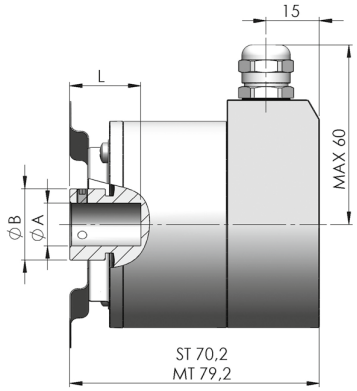



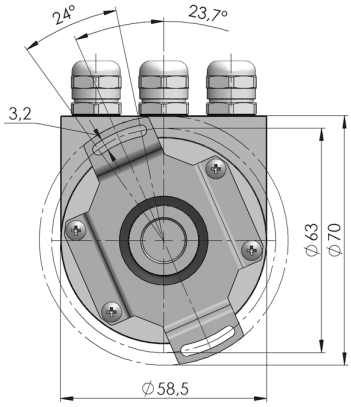

Clamping flange („K")



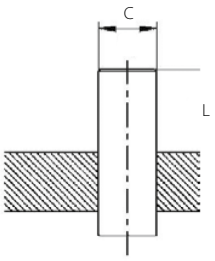




Blind hollow shaft („F")




| | | |
|---|---|---|
| Hollow shafts Ø A | $10^{+0,012}$ mm | $12^{+0,012}$ mm |
| Connecting shafts Ø C | $10_{g7}$ mm | $12_{g7}$ mm |
| Clamping ring Ø B | 18 mm | 20 mm |
| L min. | 15 mm | 18 mm |
| L max. | 20 mm | 20 mm |
| Shaft code | „2" | „7" |



## BC 58 with parallel interface - Singleturn with cable

| Colour (PVC) | 10 Bit | 12 Bit | 13 Bit | 14 Bit |
|---|---|---|---|---|
| gray/pink | N.C. | N.C. | N.C. | S0 (LSB) |
| brown/yellow | N.C. | N.C. | S0 (LSB) | S1 |
| brown/gray | N.C. | S0 (LSB) | S1 | S2 |
| red/blue | N.C. | S1 | S2 | S3 |
| purple | S0 (LSB) | S2 | S3 | S4 |
| white/brown | S1 | S3 | S4 | S5 |
| white/green | S2 | S4 | S5 | S6 |
| white/yellow | S3 | S5 | S6 | S7 |
| white/gray | S4 | S6 | S7 | S8 |
| white/pink | S5 | S7 | S8 | S9 |
| white/blue | S6 | S8 | S9 | S10 |
| white/red | S7 | S9 | S10 | S11 |
| white/black | S8 | S10 | S11 | S12 |
| brown/green | S9 (MSB) | S11 (MSB) Tristate | S12 (MSB) | S13 (MSB) |
| yellow | Tristate S0…S9 | S0… S11 Latch | Tristate S0…S1 | Tristate S0…S13 |
| pink | Latch (only binary) | Latch (only binary) | Latch (only binary) | Latch (only binary) |
| green | Direction | Direction | Direction | Direction |
| black | 0 V | 0 V | 0 V | 0 V |
| red | 5 V/10..30 V DC | 5 V/10..30 V DC | 5 V/10..30 V DC | 5 V/10..30 V DC |
| brown | Alarm | Alarm | Alarm | Alarm |

## BC 58 with parallel interface - Singleturn with flange receptacle, 17-pol.

| Pin | 10 Bit | 12 Bit | 13 Bit | 14 Bit |
|---|---|---|---|---|
| 1 | S0 (LSB) | S0 | S12 (MSB | S13 (MSB) |
| 2 | S1 | S1 | S11 | S12 |
| 3 | S2 | S2 | S10 | S11 |
| 4 | S3 | S3 | S9 | S10 |
| 5 | S4 | S4 | S8 | S9 |
| 6 | S5 | S5 | S7 | S8 |
| 7 | S6 | S6 | S6 | S7 |
| 8 | S7 | S7 | S5 | S6 |
| 9 | S8 | S8 | S4 | S5 |
| 10 | S9 (MSB) | S9 | S3 | S4 |
| 11 | N.C. | S10 | S2 | S3 |
| 12 | Tristate S0..S9 | S11 (MSB) Latsch | S1 | S2 |
| 13 | Latsch (only binary) | Latsch (only binary) | S0 (LSB) | S1 |
| 14 | Direction | Direction | Direction | S0 (LSB) |
| 15 | 0 V | 0 V | 0 V | 0 V |
| 16 | 5 V/10..30 V DC | 5 V/10..30 V DC | 5 V/10..30 V DC | 5 V/10..30 V DC) |
| 17 | Alarm | Alarm | Alarm | Alarm |

## BC 58 with parallel interface - Multiturn (PVC cable)

| Colour | Configuration | Colour | Configuration | Colour | Configuration |
|---|---|---|---|---|---|
| brown | S 0 | yellow/brown | S 11 | gray/green | M 10 2) |
| green | S 1 | white/gray | M 0 | yellow/gray | M 11 2) |
| yellow | S 2 | gray/brown | M 1 | pink/green | Alarm |
| gray | S 3 | white/pink | M 2 | yellow/pink | Direction |
| pink | S 4 | pink/brown | M 3 | green/blue | Latch |
| purple | S 5 | white/blue | M 4 1) | yellow/blue | Tristate |
| gray/pink | S 6 | brown/blue | M 5 1) | red (0.5 mm²) | 10 ... 30 V DC |
| red/blue | S 7 | white/red | M 6 1) | white (0.5 mm²) | 10 ... 30 V DC |
| white/green | S 8 | brown/red | M 7 1) | blue (0.5 mm²) | 0 V |
| brown/green | S 9 | white/black | M 8 2) | black (0.5 mm²) | 0 V |
| white/yellow | S 10 | brown/black | M 9 2) | | |

1) N.C. with resolution 16-bit
2) N.C. with resolution 16- or 20-bit

## Electrical specifications

| | |
|---|---|
| Supply voltage | 10-30 V |
| Intrinsic current consumption | ST 200 mA/MT 300 mA |
| Interface | Parallel |
| Output code | Binary, Gray, Gray excess |
| Resolution singleturn | 10-14-bit, depending on variant, 12-bit in MT design<br>Gray excess: 360, 720 steps |
| Resolution multiturn | 12-bit |
| Linearity | +/- ½ LSB |
| Output current | 30 mA per bit Short-circuit-proof |
| Control inputs | Latch, Direction, Tristate by ST; Tristate by MT |
| Connection | Cable or flange receptacle, Conin 17-pol.<br>Axial or radial, Sub D 37-pol. |

## Order reference

BC 58 – [ ] – E – [ . ] – [ ] – [ ]

**Resolution**
0010 = 10 bit ST
0012 = 12 bit ST
0013 = 13 bit ST
0014 = 14 bit ST
0360 = 360 steps ST
0720 = 720 steps ST
0412 = 4 bit MT + 12 bit ST
0812 = 8 bit MT + 12 bit ST
1212 = 12 bit MT + 12 bit ST

**Supply**
E = DC 10-30 V

**Flange**
S.41 = Synchro
S.71 = Synchro
K.42 = Clamp
K.72 = Clamp
F.42 = Spring sheet*
F.47 = Spring sheet*
* blind hollow shaft with spring sheet

**Protection class**
IP 64
IP 67
IP 64
IP 67
IP 64
IP 67

**Shaft**
6 mm
6 mm
10 mm
10 mm
10 mm*
12 mm*

**Interface**
PB = Parallel Binary
PG = Parallel gray

**Connection**
A = Cable axial
B = Cable radial
U = M23-Connector (Conin), 17 pol. axial, ccw
V = M23-Connector (Conin), 17 pol. radial, ccw
W = M23-Connector (Conin), 17 pol. axial, cw
Y = M23-Connector (Conin), 17 pol. radial, cw
A-A1-F = 0,1 m Cable, Sub-D-Connector, 37 pol. axial
B-A1-F = 0,1 m Cable, Sub-D-Connector, 37 pol. radial

## BC 58 with SSI interface

### Synchronous serial transmission (SSI) for absolute rotary encoders

The SSI interface can be used for multiturn encoders with gray code or binary code. Furthermore, special bits (alarm signal, parity) can be attached to the data bits of the 24-bit encoder.

The SSI interface supports single and multiple transfers. For multiple transfer (the stored value is read out several times in succession), a fixed number of cycles per revolution must be observed (25 to 26 cycles for multiturn).

For multiple transfer, the distance between the clock brush must be below 10 µs and for single transfer, it must be greater than 30 µs. After the output of the last bit (alarm or parity), the data output for approx. 20 µs is set to logic „0", then to logic „1". Then current encoder data can be read out again.

### Recommended data transfer rate for SSI

The maximum data transfer rate depends on the cable length.

| Cable length | Baud rate |
|---|---|
| < 50 m | < 400 KHz |
| < 100 m | < 300 KHz |
| < 200 m | < 200 KHz |
| < 400 m | < 100 Khz |

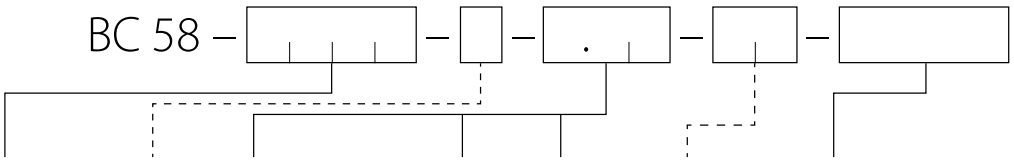
### Pin configuration SSI interface

| Cable | Flange receptacle | Signal |
|---|---|---|
| brown (0.5 $mm^2$) | 1 | 0 V (supply voltage) |
| pink | 2 | Data |
| yellow | 3 | Cycle |
| | 4 | N.C. |
| blue | 5 | $\overline{\text{Direction}}$ |
| | 6 | N.C. |
| | 7 | N.C. |
| white (0.5 $mm^2$) | 8 | 10 ... 30 V DC |
| | 9 | N.C. |
| gray | 10 | $\overline{\text{Data}}$ |
| green | 11 | $\overline{\text{Cycle}}$ |
| black | 12 | 0 V- Signal output |

## BC 58 with SSI interface

| Electrical | |
|---|---|
| Supply voltage | 5 V or 10-30 V |
| Intrinsic current consumption | Singleturn 50 mA/Multiturn 100 mA |
| Interface | Standard SSI |
| Output code | Binary or gray |
| Resolution singleturn | 10-17-bit, depending on variant, max. 13-bit in MT<br>Gray excess: 360, 720 steps |
| Absolute accuracy | +/- 35 ´´ |
| Repeat accuracy | +/- 7 ´´ |
| Status LED | Green = ok; Red = Alarm |
| Control inputs | Direction |
| Parametrisable | Resolution, code type, direction of rotation, warning, alarm |
| Reset button | Lockable per parametrisation |
| Connection | Cable or flange receptacle Conin axial or radial |

## Order reference




| Resolution | Supply | Flange | Protection class | Shaft | Interface | Connection |
|---|---|---|---|---|---|---|
| 0010 = 10-bit ST | A = 5 V | S.41 = Synchro | IP 64 | 6 mm | SB = SSI Binary | A = Cable axial |
| 0012 = 12-bit ST | E = 10-30 V | S.71 = Synchro | IP 67 | 6 mm | SG = SSI Gray | B = Cable radial |
| 0013 = 13-bit ST | | K.42 = Clamp | IP 64 | 10 mm | | C = Connector 12 pol. axial, cwl |
| 0014 = 14-bit ST | | K.72 = Clamp | IP 67 | 10 mm | | D = Connector 12 pol. radial, cw |
| 0017 = 17-bit ST | | F.42 = Spring sheet* | IP 64 | 10 mm hollow sh.* | | G = M23-Connector (Conin), 12 pol. axial, ccw |
| 1212 = 12 MT+12 S | | F.47 = Spring sheet* | IP 64 | 12 mm hollow sh.* | | H = M23-Connector (Conin), 12 pol. radial, ccw |
| 1213 = 12 MT+13 S | | * blind hollow shaft with spring sheet | | | | |

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Series BC 58

## BC 58 with Profibus DP interface

| Electrical | |
|---|---|
| Supply voltage | 11-30 V DC |
| Intrinsic current consumption | Singleturn 220 mA/Multiturn 250 mA |
| Interface | Profibus-DP, Encoder Profile |
| Certified | PNO |
| Programmable | According to class 2: Resolution, Preset*, Direction |
| Output code | Binary |
| Baud rate | 9.6 K Baud - 12 M Baud |
| Resolution singleturn | 10 - 14-bit, depending on variant |
| Resolution multiturn | 12-bit |
| Integrated special function | Speed, acceleration, operating time |
| Connection | Bus cover with 2 connectors, bus cover with 3-fold PG gland |
| **Mechanical** | |
| perating temperature | - 40° C to + 85° C |
| Mass, approx. | Singleturn 350 g/Multiturn 400 g |

* Preset only via bus, no button

## Order reference

BC 58 – [ ] – [E] – [ . ] – [D P] – [ ]

| Resolution | Supply | Flange | Protection class | Shaft | Interface | Connection |
|---|---|---|---|---|---|---|
| 0010 = 10-bit ST<br>0012 = 12-bit ST<br>0013 = 13-bit ST<br>0014 = 14-bit ST<br>1212 = 12 MT+12 S<br>1213 = 12 MT+13 S<br>1214 = 12 MT+14 S | E = 10-30 V | S.41 = Synchro<br>S.71 = Synchro<br>K.42 = Clamp<br>K.72 = Clamp<br>F.42 = Spring sheet*<br>F.47 = Spring sheet*<br>* blind hollow shaft with spring sheet | IP 64<br>IP 67<br>IP 64<br>IP 67<br>IP 64<br>IP 64 | 6 mm<br>6 mm<br>10 mm<br>10 mm<br>10 mm hollow sh.*<br>12 mm hollow sh.* | DP = Profibus DP | I = buscover with 2 x M23-connector (Conin) 12pol. radial, cw<br>R = buscover with 3 x M12-connector<br>Z = buscover with 3 x cable gand |

Absolute Rotary Encoder

## BC 58 with Interbus interface

| Electrical | |
|---|---|
| Supply voltage | 11-30 V DC |
| Intrinsic current consumption | Singleturn 220 mA/Multiturn 250 mA |
| Interface | Interbus, ENCOM Profile K 3 (parametrisable), K 2 |
| DÜ Format | Supi address 0123, Byte no. 3210 |
| Programmable | Direction, scaling factor, preset, offset |
| Output code | 32-bit binary |
| Baud rate | 500 KBaud according to ENCOM |
| Resolution singleturn | Singleturn 10 - 17-bit, depending on variant, 12-bit in MT design |
| Resolution multiturn | 12-bit |
| ID code k 3 | 37H (055 decimal) |
| Connection | Bus cover with 2 connectors, bus cover with 3-fold PG gland |
| **Mechanical** | |
| Operating temperature | - 40° C to + 85° C |
| Mass, approx. | Singleturn 350 g/Multiturn 400 g |

## Order reference

BC 58 – [ ] – [E] – [ . ] – [ ] – [ ]

Resolution
0010 = 10-bit ST
0012 = 12-bit ST
1212 = 12 Bit MT+12 Bit ST

Supply
E = 10-30 V

Flange
S.41 = Synchro
S.71 = Synchro
K.42 = Clamp
K.72 = Clamp
F.42 = Spring sheet*
F.47 = Spring sheet*
* blind hollow shaft with spring sheet

Protection class
IP 64
IP 67
IP 64
IP 67
IP 64
IP 64

Shaft
6 mm
6 mm
10 mm
10 mm
10 mm hollow sh.*
12 mm hollow sh.*

Interface
I2 = Interbus K 2
I3 = Interbus K 3

Connection
I = buscover with 2 x M23-connector(Conin) 12pol. radial, cw
Z = buscover with 3 x cable gand

## BC 58 with DeviceNet interface

| Electrical | |
|---|---|
| Supply voltage | 11-30 V DC |
| Intrinsic current consumption | Singleturn 220 mA/Multiturn 250 mA |
| Interface | CAN-Highspeed according to ISO/DIS 11898, CAN specifications 2.0 B |
| Certified | PNO |
| Programmable | According to class 2: Resolution, Preset*, Direction |
| Output code | Binary |
| Baud rate | Adjustable 125, 250, 500 KBaud |
| Resolution singleturn | 10 - 14-bit, depending on variant, 12-bit in MT design |
| Resolution multiturn | 12-bit |
| Transfer mode | Polling mode (only upon request),<br>Change of State (automatic with value change),<br>Cyclical with adjustable cycle timer |
| Connection | Bus cover with 2 connectors, bus cover with 3-fold PG gland |
| **Mechanical** | |
| Operating temperature | - 40° C to + 85° C |
| Mass, approx. | Singleturn 350 g/Multiturn 400 g |

* Preset only via bus, no button

## Order reference

BC 58 – [ ] – [E] – [ . ] – [VD] – [ ]

| Resolution | Supply | Flange | Protection class | Shaft | Interface | Connection |
|---|---|---|---|---|---|---|
| 0010 = 10-bit ST | E = DC 10-30 V | S.41 = Synchro | IP 64 | 6 mm | VD = DeviceNet | S = buscover with 1 x M12-v, 5pole , radial |
| 0012 = 12-bit ST | | S.71 = Synchro | IP 67 | 6 mm | | Z = buscover with 2 x cable gand |
| 0013 = 13-bit ST | | K.42 = Clamp | IP 64 | 10 mm | | |
| 0014 = 14-bit ST | | K.72 = Clamp | IP 67 | 10 mm | | |
| 1212 = 12 MT+12-bit ST | | F.42 = Spring sheet* | IP 64 | 10 mm hollow sh.* | | |
| 1213 = 12 MT+13-bit ST | | F.47 = Spring sheet* | IP 64 | 12 mm hollow sh.* | | |
| 1214 = 12 MT+14-bit ST | | * blind hollow shaft with spring sheet | | | | |

## BC 58 with CANopen/CAN Layer 2 interface

| Electrical | |
|---|---|
| Supply voltage | 11-30 V DC |
| Intrinsic current consumption | Singleturn 220 mA/Multiturn 250 mA |
| Interface | CAN-Highspeed according to ISO/DIS 11898, Basic and Full CAN<br>CAN specifications 2.0 B (11 and 29-bit identifier) |
| Profile | Profile CANopen according to Profile DSP 406, with additional functions |
| Programmable | CANopen: Direction, resolution, preset, offset,<br>Limit values: CAN L2: Direction, limit values, binary |
| Output code | 32-bit binary |
| Baud rate | Adjustable 10 to 1.000 KBaud |
| Base identifier | Adjustable via DIP switch |
| Integrated special function | Speed, acceleration/rotary axle, limit values only CANopen |
| Resolution singleturn | Singleturn 10 - 14-bit, depending on variant, 12-bit in MT design |
| Resolution multiturn | 12-bit |
| Transfer mode | Polling mode (only upon request), Change of State (automatically with value change), cyclical with adjustable cycle timer |
| Connection | Bus cover with 2 connectors, bus cover with 3-fold PG gland |
| **Mechanical** | |
| Operating temperature | - 40° C to + 85° C |
| Mass, approx. | Singleturn 350 g/Multiturn 400 g |

## Order reference

BC 58 – ☐☐☐☐ – E – ☐☐. – ☐☐ – ☐

| Resolution | Supply | Flange | Protection class | Shaft | Interface | Connection |
|---|---|---|---|---|---|---|
| 0010 = 10-bit ST | E = 10-30 V | S.41 = Synchro | IP 64 | 6 mm | OL = CANopen | A = cable axial |
| 0012 = 12-bit ST | | S.71 = Synchro | IP 67 | 6 mm | CL = CAN L2 | B = cable radial |
| 0013 = 13-bit ST | | K.42 = Clamp | IP 64 | 10 mm | | C = M23-connector, 12 pole axial, cw |
| 0014 = 14-bit ST | | K.72 = Clamp | IP 67 | 10 mm | | D = M23-connector, 12 pole radial, cw |
| 0017 = 17-bit ST | | F.42 = Spring sheet* | IP 64 | 10 mm hollow sh.* | | G = M23-connector, 12 pole axial, ccw |
| 1212 = 12 MT+12-bit ST | | F.47 = Spring sheet* | IP 64 | 12 mm hollow sh.* | | H = M23-connector, 12 poe. radial, ccw |
| 1213 = 12 MT+13-bit ST | | * blind hollow shaft | | | | I = buscover with 2 x M23-connector, |
| 1214 = 12 MT+14-bit ST | | with spring sheet | | | | 9 pole radial, cw |
| | | | | | | Z = buscover with 3 x cable gand |