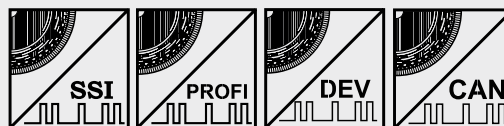


# POSIWIRE® WS19KT Absolute Encoder Output



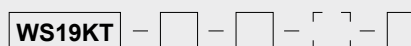
## Robust Sensor with heavy duty encoder

- Protection class IP64
- Measurement range 0 ... 2000 mm to 0 ... 15000 mm
- Absolute encoder output



| Specifications   | Outputs  | See order code   |  |
|------------------|--|--|--|
|                  | Resolution for 12 bit per revolution (4096 steps/revolution) | WS19KT-2000<br>WS19KT-3000<br>WS19KT-5000<br>WS19KT-8000<br>WS19KT-15000 | Resolution<br>0.04 mm<br>0.063 mm<br>0.10 mm<br>0.162 mm<br>0.146 mm |
| Linearity        | ±0.05% f.s.; ±0.01% f.s. as option                           |  |  |
| Sensing device   | Absolute encoder   |  |  |
| Material         | Aluminum and stainless steel; cable: stainless steel         |  |  |
| Protection class | IP64   |  |  |
| Connection       | Depend on the encoder type: connector or bus cover           |  |  |
| Weight           | See table page 28  |  |  |
| EMC, temperature | Refer to output specification                                |  |  |

## Order code WS19KT



### Model name

### Measurement range (in mm)

2000 / 3000 / 5000 / 8000 / 15000

### Outputs

- HSSI = Absolute encoder with synchronous serial output (SSI)
- HPROF = Absolute encoder with Profibus interface
- HINT = Absolute encoder with Interbus interface
- HDEV = Absolute encoder with DeviceNet interface
- HCAN = Absolute encoder with CAN interface
- HCANOP = Absolute encoder with CANopen interface

### Linearity (option)

L01 = ±0.01% f.s.

### Cable fixing

- M4 = M4 cable fixing
- SB0 = Cable clip

## Order code mating connector

SSI: **CONN-CONIN-12F-G**

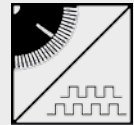
**Order example: WS19KT - 3000 - HSSI - M4**

# POSIWIRE® WS19KT Incremental Encoder Output



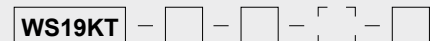
## Robust Sensor with heavy duty encoder

- Protection class IP64
- Measurement range 0 ... 2000 mm to 0 ... 15000 mm
- Incremental encoder output



| Specifications   | Outputs  | Incremental output TTL or HTL compatible |              |
|------------------|--|--|--------------|
|                  | Resolution for 12 bit per revolution (4096 steps/revolution) |  | WS19KT-2000  |
|                  |  | WS19KT-3000                              | 15.75 pulses |
|                  |  | WS19KT-5000                              | 10 pulses    |
|                  |  | WS19KT-8000                              | 6.13 pulses  |
|                  |  | WS19KT-15000                             | 6.83 pulses  |
| Linearity        | ±0.05% f.s.; ±0.01% f.s. as option                           |  |              |
| Sensing device   | Incremental encoder  |  |              |
| Material         | Aluminum and stainless steel; cable: stainless steel         |  |              |
| Protection class | IP64   |  |              |
| Connection       | Male 12 pin socket   |  |              |
| Weight           | See table page 28  |  |              |
| EMC, temperature | Refer to output specification                                |  |              |

## Order code WS19KT



### Model name

### Measurement range (in mm)

2000 (smaller measurement ranges included) / 3000 / 5000 / 8000 / 15000

### Outputs

LD5VC = Incremental encoder TTL compatible

PP24VC = Incremental encoder HTL compatible

### Linearity (option)

L01 = ±0.01% f.s.

### Cable fixing

M4 = M4 cable fixing

SB0 = Cable clip

## Order code mating connector

**CONN-CONIN-12F-G**

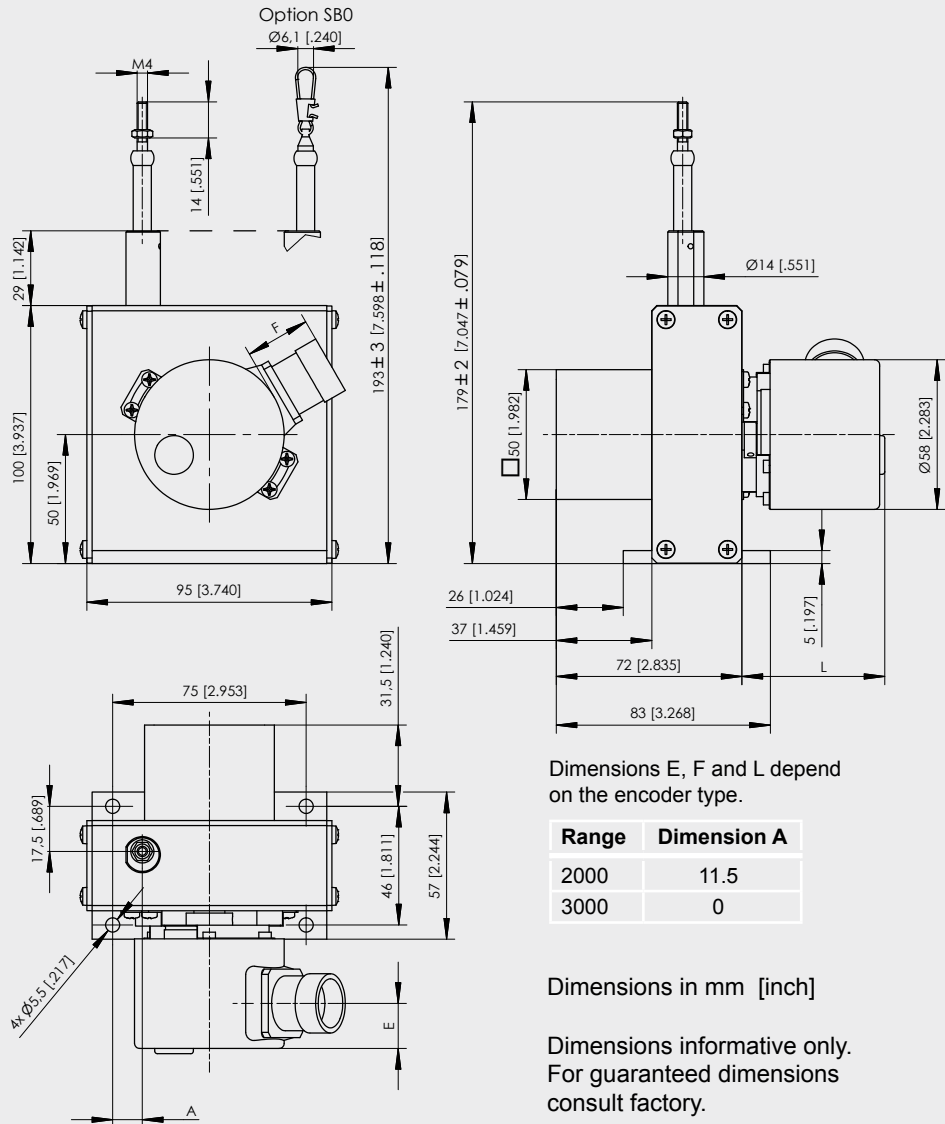
Order example: **WS19KT - 5000 - LD5VC - M4**

**POSIWIRE®**  
**WS19KT**  
**Absolute or Incremental Encoder Output**



| Cable forces,<br>typical at 20 °C | Range | Weight (approx.) | Max. pull-out force | Min. pull-in force |
|-----------------------------------|-------|------------------|---------------------|--------------------|
|                                   | [mm]  | [kg]             | [N]                 | [N]                |
|                                   | 2000  | 1.3              | 11.0                | 6.0                |
|                                   | 3000  | 1.6              | 8.1                 | 4.9                |
|                                   | 5000  | 3.0              | 12.0                | 9.0                |
|                                   | 8000  | 5.6              | 10.5                | 6.8                |
|                                   | 15000 | 6.1              | 16.5                | 9.1                |

**Outline drawing**  
**WS19KT-2000 / 3000**

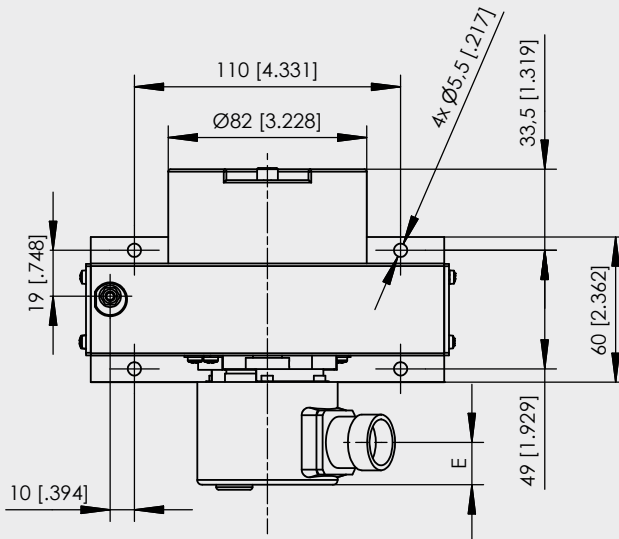
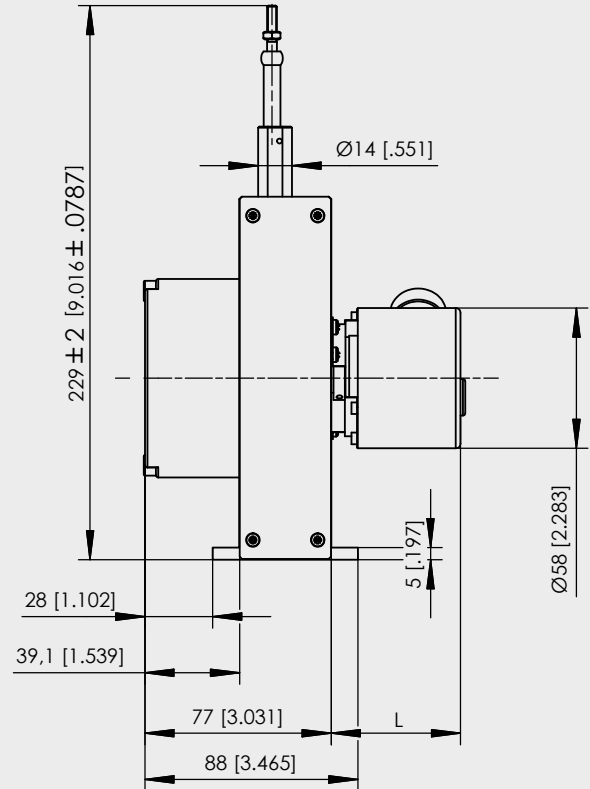
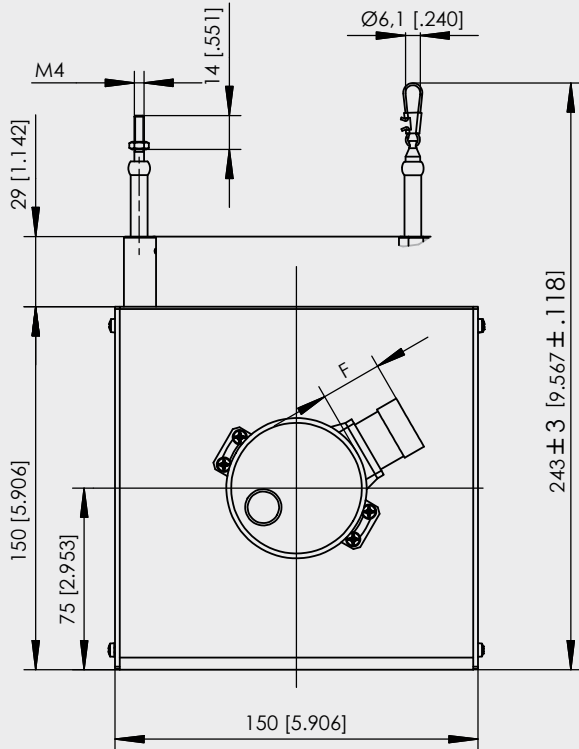


**POSIWIRE®**  
**WS19KT**  
**Absolute or Incremental Encoder Output**



Outline drawing  
 WS19KT-5000

Option SB0



Dimensions E, F and L depend on the encoder type.

Dimensions in mm [inch]

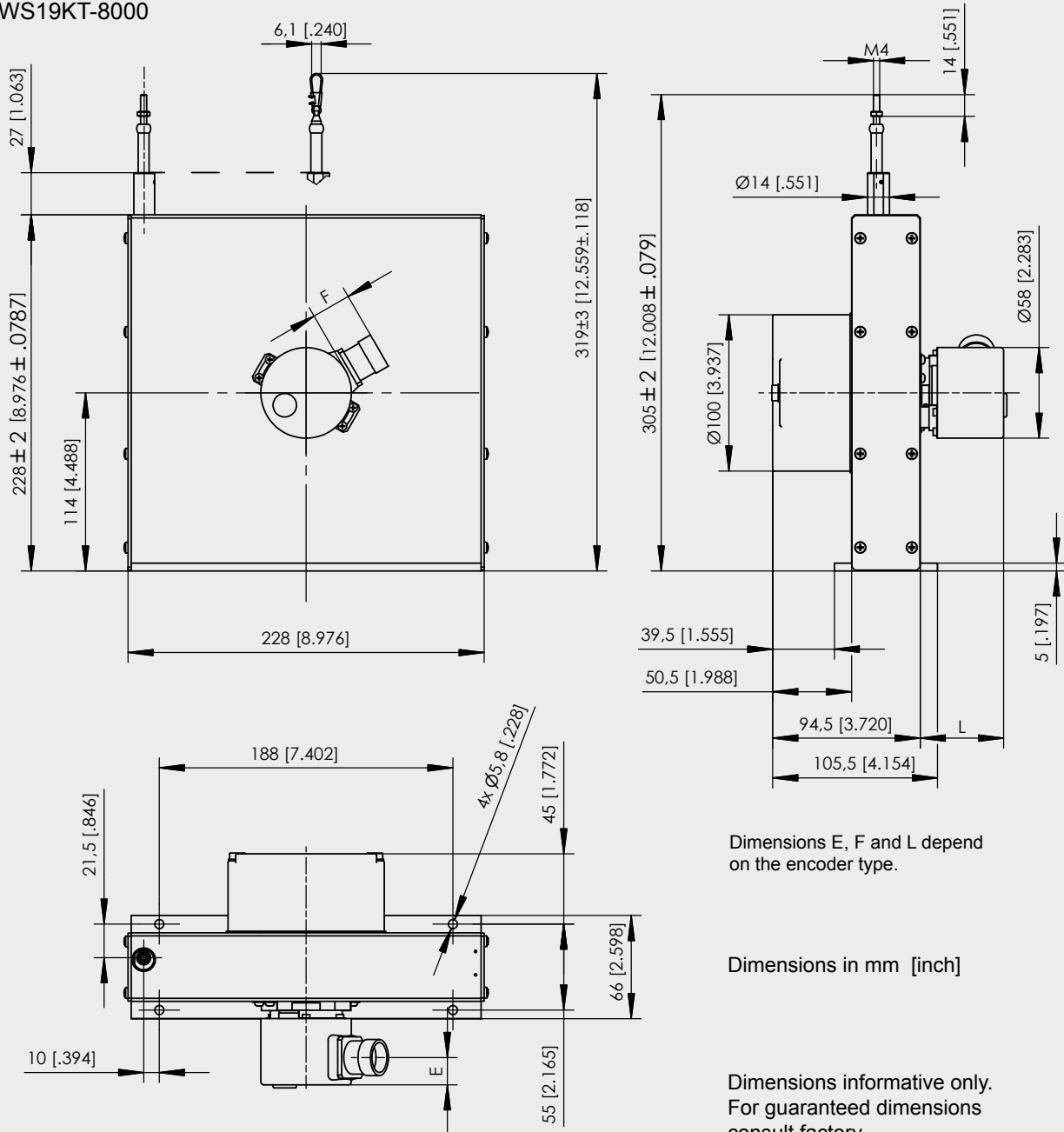
Dimensions informative only.  
 For guaranteed dimensions consult factory.

**POSIWIRE®**  
**WS19KT**  
**Absolute or Incremental Encoder Output**



**Outline drawing**  
**WS19KT-8000**

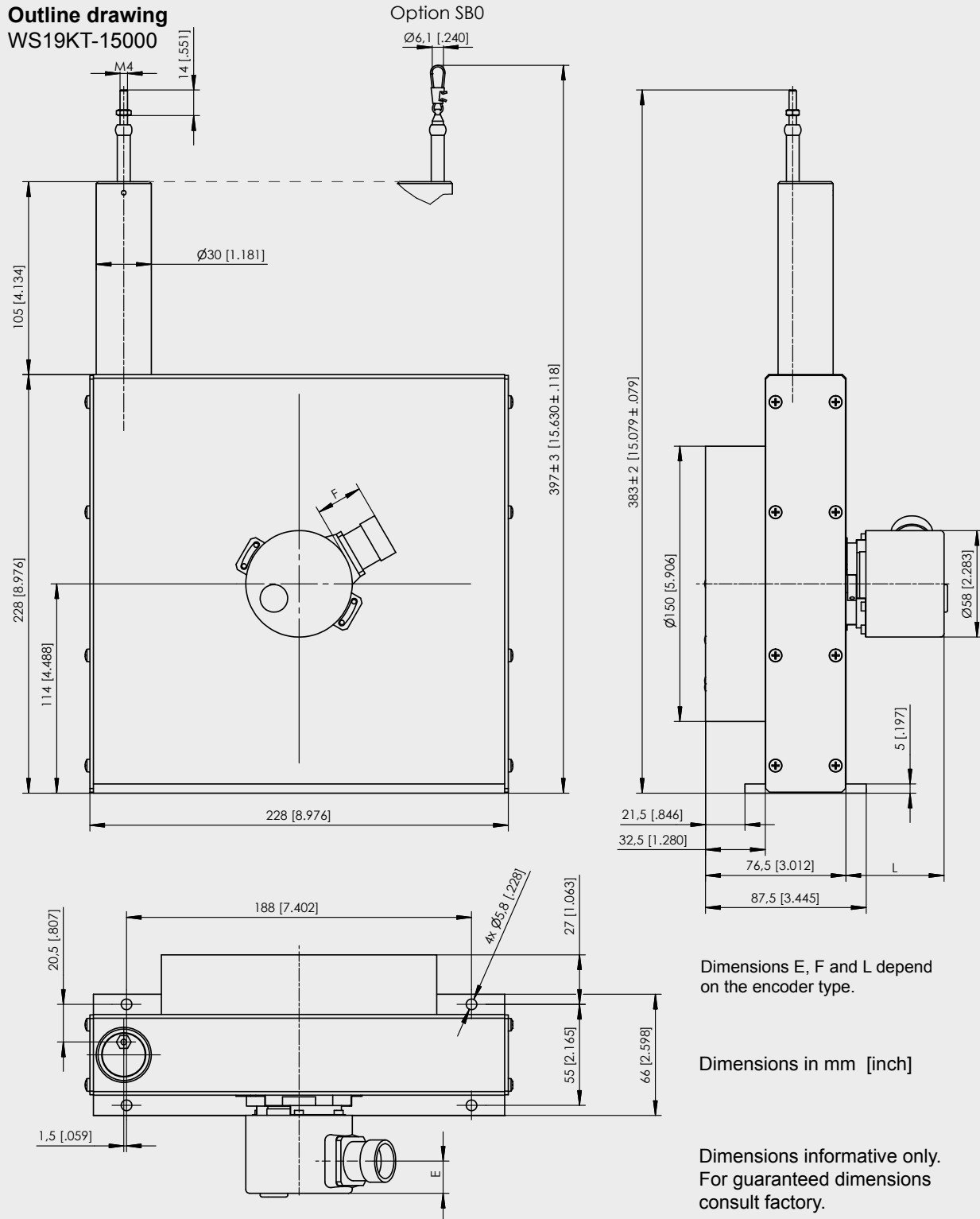
Option SB0



**POSIWIRE®**  
**WS19KT**  
**Absolute or Incremental Encoder Output**




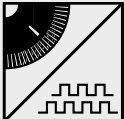
**Outline drawing**  
**WS19KT-15000**



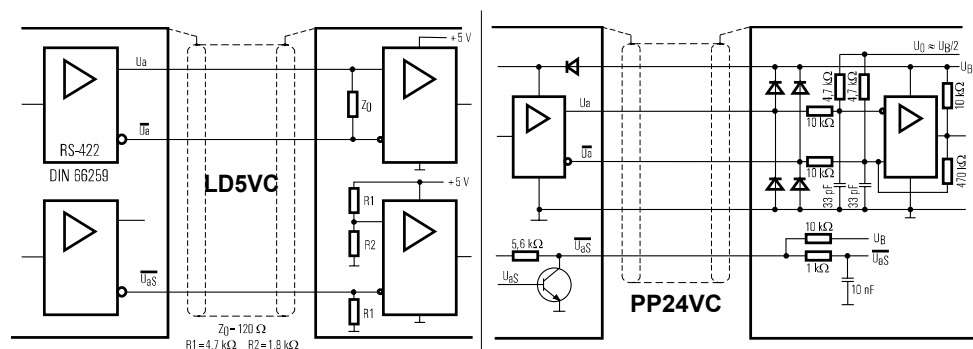
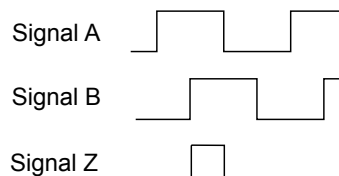
# POSIWIRE® LD5VC and PP24VC Incremental Output



|  |                               |  |
|--|-------------------------------|--|
| <b>Signal conditioner<br/>LD5VC<br/>Incremental</b><br><br> | Interface                     | Line driver RS422                                    |
|  | Excitation voltage            | 5 V DC $\pm 10\%$                                    |
|  | Excitation current            | 150 mA max. w/o load                                 |
|  | Output frequency              | 300 kHz max.   |
|  | Output current                | 20 mA per channel                                    |
|  | Signal level                  |  |
|  | Ud High at Id=20 mA           | $\geq 2.5$ V   |
|  | Ud Low at Id=20 mA            | $\leq 0.5$ V   |
|  | Transition time positive edge | <100 ns  |
|  | Transition time negative edge | <100 ns  |
|  | Stability (temperature)       | $\pm 20 \times 10^{-6}$ / °C f.s. (sensor mechanism) |
|  | Operation temperature         | -20 ... +85 °C                                       |
|  | Protection                    | Short circuit, overvoltage                           |
| EMC  | According to EN 61326:2006    |  |

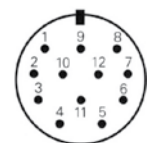
|   |                               |  |
|---|-------------------------------|--|
| <b>Signal conditioner<br/>PP24VC<br/>Incremental</b><br><br> | Interface                     | Push-pull line driver (24 V-HTL)                     |
|   | Excitation voltage            | 10 ... 30 V DC                                       |
|   | Excitation current            | 150 mA max. w/o load                                 |
|   | Output frequency              | 300 kHz max.   |
|   | Output current                | 100 mA per channel                                   |
|   | Signal level                  |  |
|   | Ud High at Id=20 mA, Ub=24 V  | $\geq 21$ V  |
|   | Ud Low at Id=20 mA, Ub=24 V   | $\leq 2.8$ V   |
|   | Transition time positive edge | <200 ns  |
|   | Transition time negative edge | <200 ns  |
|   | Stability (temperature)       | $\pm 20 \times 10^{-6}$ / °C f.s. (sensor mechanism) |
|   | Operating temperature         | -20 ... +85 °C                                       |
|   | Protection                    | Reverse polarity, short circuit, overvoltage         |
| EMC   | According to EN 61326:2006    |  |

## Output signals



| Signal name                           | CONN-CONIN-12F, connector pin no. |
|---------------------------------------|-----------------------------------|
| Excitation +                          | 12                                |
| Excitation GND (0 V)                  | 10                                |
| Signal A                              | 5                                 |
| Signal $\bar{A}$                      | 6                                 |
| Signal B (A + 90°)                    | 8                                 |
| Signal B                              | 1                                 |
| Signal Z (reference pulse)            | 3                                 |
| Signal $\bar{Z}$                      | 4                                 |
| Fault detection signal $\bar{U}_{as}$ | 7                                 |
| Shield                                | Housing                           |

View to sensor connector




CONN-CONIN-12F

# POSIWIRE®

## HSSI

### Absolute SSI Encoder



|   |                       |                                       |
|---|-----------------------|---------------------------------------|
| <b>Signal conditioner</b><br><b>HSSI</b><br>Absolute encoder<br>synchronous serial<br> | Excitation voltage    | 10 ... 30 V DC                        |
|   | Excitation current    | 100 mA                                |
|   | Interface             | Standard SSI                          |
|   | Lines / drivers       | Clock and data / RS422                |
|   | Code                  | Gray                                  |
|   | Resolution            | 12 + 12 Bit                           |
|   | 3 dB cutoff frequency | 500 kHz                               |
|   | Control input         | $\overline{\text{Direction}}$         |
|   | Preset key            | Zero adjustment with optical response |
|   | Alarm output          | Alarm bit (SSI option), warning bit   |
|   | Status LED            | Green = OK, red = alarm               |
|   | Connection            | Cable or 12 pin male socket           |

|                    |                   |                  |    |     |     |     |     |     |     |     |     |     |     |     |
|--------------------|-------------------|------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>Data format</b> | <b>Resolution</b> | <b>Clock</b>     |    |     |     |     |     |     |     |     |     |     |     |     |
|                    |                   | T1               | T2 | T3  | ... | T12 | T13 | ... | T21 | T22 | T23 | T24 | T25 | T26 |
|                    |                   | <b>Data bits</b> |    |     |     |     |     |     |     |     |     |     |     |     |
| 24 bit             | M11               | M10              | M9 | ... | M0  | S11 | ... | S3  | S2  | S1  | S0  | 0   |     |     |

Mx = multiturn bits, Sx = singleturn bits

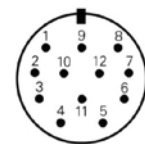
|                          |                     |                  |  |
|--------------------------|---------------------|------------------|--|
| <b>Transmission rate</b> | <b>Cable length</b> | <b>Baud rate</b> | <b>Note:</b><br>Extension of the cable length will reduce the maximum transmission rate. |
|                          | < 50 m              | < 400 kHz        |  |
|                          | < 100 m             | < 300 kHz        |  |
|                          | < 200 m             | < 200 kHz        |  |
|                          | < 400 m             | < 100 kHz        |  |

|                      |                                 |              |                          |
|----------------------|---------------------------------|--------------|--------------------------|
| <b>Signal wiring</b> | <b>Signal name</b>              | <b>Color</b> | <b>Connector pin no.</b> |
|                      | Excitation +                    | White        | 8                        |
|                      | Excitation GND (0 V)            | Brown        | 1                        |
|                      | CLOCK                           | Yellow       | 3                        |
|                      | $\overline{\text{CLOCK}}$       | Green        | 11                       |
|                      | DATA                            | Pink         | 2                        |
|                      | $\overline{\text{DATA}}$        | Grey         | 10                       |
|                      | $\overline{\text{Direction}}$ * | Blue         | 5                        |
|                      | 0 V Signal output               | Black        | 12                       |

\* Excitation + = cw increasing code, 0 V = cw decreasing code

### Connection

View to sensor  
connector



CONN-CONIN-12F



# POSIWIRE®

## HPROF

### Absolute Profibus Encoder



#### Interface HPROF

Absolute encoder  
Profibus



|                              |   |
|------------------------------|---|
| Excitation voltage           | 10 ... 30 V DC  |
| Excitation current           | 250 mA  |
| Interface                    | RS485   |
| Protocol                     | Profibus DP with encoder profile C2                   |
| Resolution                   | 12 (10 ... 14) + 12 bit                               |
| Output code                  | Binary  |
| Baud rate                    | Automatically selected between 9,6 kBaud and 12 MBaud |
| Programmability              | Resolution, preset, direction                         |
| Integrated special functions | Velocity, acceleration, operating time                |
| Bus terminating resistor     | Selectable via DIP switch                             |
| Connection                   | Bus cover with T manifold                             |
| EMC                          | EN 61326: class A                                     |

#### Signal wiring

| Signal name        | Cable terminal no. (bus cover) |
|--------------------|--------------------------------|
| U <sub>B</sub> in  | 1                              |
| 0V in              | 2                              |
| U <sub>B</sub> out | 3                              |
| 0V out             | 4                              |
| B in               | 5                              |
| A in               | 6                              |
| B out              | 7                              |
| A out              | 8                              |

# POSIWIRE®

## HINT

### Absolute Interbus Encoder




|  |                    |   |
|--|--------------------|---|
| <b>Interface HINT</b><br>Absolute encoder<br>Interbus<br> | Excitation voltage | 10 ... 30 V DC                                |
|  | Excitation current | 250 mA  |
|  | Interface          | Interbus, ENCOM profile K3 (configurable), K2 |
|  | Output code        | 32 Bit binary                                 |
|  | Baud rate          | 500 kBaud                                     |
|  | Data refresh       | Every 600 µs                                  |
|  | Resolution         | 12 (10 ... 14) + 12 bit                       |
|  | Programmability    | Direction, preset, offset, resolution         |
|  | Connection         | Bus cover with T manifold                     |
|  | EMC                | EN 50081-2, EN 50082-2                        |

|                                      |                                    |   |   |   |   |   |
|--------------------------------------|------------------------------------|---|---|---|---|---|
| <b>Data format</b><br>Interbus K2/K3 |                                    | Differential signals (RS485)<br>ENCOM profile K3, K2, 32 Bit, binary process data |   |   |   |   |
|                                      | DT-Format                          | Supi address  | 0 | 1 | 2 | 3 |
|                                      | (according to the Phoenix company) | Byte No.  | 3 | 2 | 1 | 0 |
|                                      | ID code K2                         | 36 H (= 54 dec.)  |   |   |   |   |
|                                      | ID code K3                         | 37 H (= 55 dec.)  |   |   |   |   |

| Signal wiring | Signal name      | Cable terminal no. (bus cover) |
|---------------|------------------|--------------------------------|
|               |                  | U <sub>B</sub> +               |
|               | GND              | 2                              |
|               | DI1              | 3                              |
|               | $\overline{DI1}$ | 4                              |
|               | DO1              | 5                              |
|               | $\overline{DO1}$ | 6                              |
|               | DO2              | 7                              |
|               | $\overline{DO2}$ | 8                              |
|               | DI2              | 9                              |
|               | $\overline{DI2}$ | 10                             |
|               | RBST             | 11                             |
|               | GND              | 12                             |

**POSIWIRE®**  
**HDEV**  
**Absolute DeviceNet Encoder**



|   |                          |   |
|---|--------------------------|---|
| <b>Interface HDEV</b><br>Absolute encoder<br>DeviceNet<br> | Excitation voltage       | 10 ... 30 V DC  |
|   | Excitation current       | 250 mA  |
|   | Interface                | CAN highspeed according to ISO/DIS 11898<br>CAN specification 2.0 A (11 bit identifier) |
|   | Protocol                 | DeviceNet according rev. 2.0, programmable encoder                                      |
|   | Resolution               | 12 (10 ... 14) + 12 bit   |
|   | Output code              | Binary  |
|   | MAC-ID                   | Selectable via DIP switch   |
|   | Date refresh             | Every 5 ms  |
|   | Baud rate                | Selectable via DIP switch: 125 kBaud, 250 kBaud, 500 kBaud                              |
|   | Programmability          | Resolution, preset, direction   |
|   | Bus terminating resistor | Selectable via DIP switch   |
|   | Connection               | Bus cover with T manifold   |
|   | EMC                      | EN 50081-2, EN 50082-2  |
| <b>Recommended transmission</b>   | Characteristic impedance | 135 ... 165 Ω (3 ... 20 MHz)  |
|   | Operating capacity       | < 30 pF   |
|   | Loop resistance          | < 110 Ω/km  |
|   | Wire diameter            | > 0.63 mm   |
|   | Wire width               | > 0.34 mm <sup>2</sup>  |
| <b>Transmission rate</b>  | <b>Segment length</b>    | <b>Kbit/s</b>   |
|   | 500 m                    | 125   |
|   | 250 m                    | 250   |
|   | 100 m                    | 500   |
| <b>Signal wiring</b>  | <b>Signal name</b>       | <b>Cable terminal no. (bus cover)</b>   |
|   | U <sub>b</sub> in        | 1   |
|   | 0V in                    | 2   |
|   | CAN-L                    | 3   |
|   | CAN-H                    | 4   |
|   | Drain                    | 5   |
|   | Drain                    | 6   |
|   | CAN-H                    | 7   |
| CAN-L   | 8                        |   |

**POSIWIRE®**  
**HCAN/HCANOP**  
**Absolute CAN / CANopen Encoder**



**Interface**  
**HCAN/HCANOP**  
 Absolute encoder  
 CANopen/CAN Layer 2



|                              |   |
|------------------------------|---|
| Excitation voltage           | 10 ... 30 V DC  |
| Excitation current           | 250 mA  |
| Interface                    | CAN highspeed according to ISO/DIS 11898  |
| Protocol                     | CANopen according DS301 with encoder profile DSP406, programmable encoder according class C2  |
| Resolution                   | 12 (10 ... 14) + 12 bit   |
| Output code                  | Binary  |
| Data refresh                 | Every millisecond (selectable), on request  |
| Baud rate                    | Selectable 10 up to 1000 kbit/s   |
| Base identifier              | Selectable via DIP switch   |
| Programmability              | CANopen: direction, resolution, preset, offset<br>CAN L2: direction, limit values             |
| Integrated special functions | CANopen: velocity, acceleration, rotary axis, limit values<br>CAN L2: direction, limit values |
| Connection                   | Bus cover with T manifold   |
| EMC                          | EN 50081-2, EN 50082-2  |

**Signal wiring**

| Signal name            | Cable terminal no. (bus cover) |
|------------------------|--------------------------------|
| U <sub>B</sub> in      | 1                              |
| 0V in                  | 2                              |
| CAN in – (dominant L)  | 3                              |
| CAN in + (dominant H)  | 4                              |
| CAN GND in             | 5                              |
| CAN GND out            | 6                              |
| CAN out + (dominant H) | 7                              |
| CAN out – (dominant L) | 8                              |
| 0V out                 | 9                              |
| U <sub>B</sub> out     | 10                             |