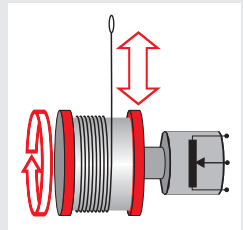![MICRO-EPSILON logo]

**MICRO-EPSILON**

# More Precision.

**wireSENSOR**
Draw wire sensors / CET / String pots

# wireSENSOR
## Series P200

**Robust sensor design**
**Long range sensor - up to 50,000 mm**
**Various digital interfaces**

The P200 series are specially designed for industrial applications in elevator engineering, crane systems and high bay warehouses. The rugged housing and solid, high quality components guarantee high operational reliability and a long service life even in difficult industrial environments.

*Model P200*
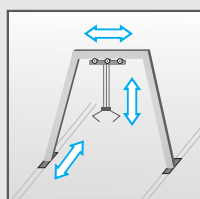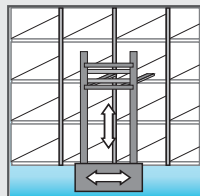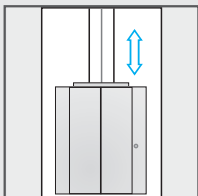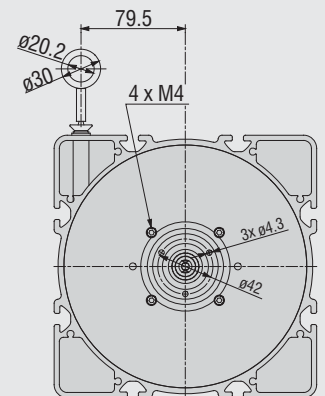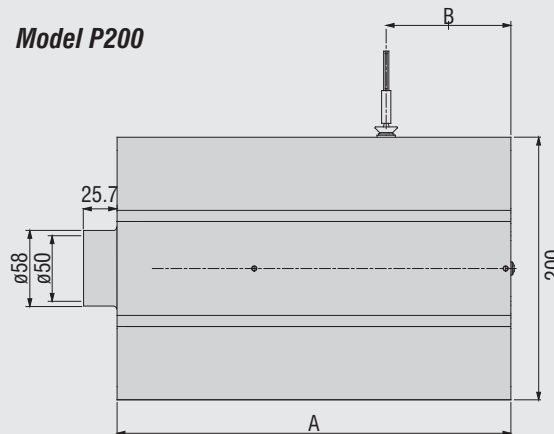
*Model P200-HTL/TTL*
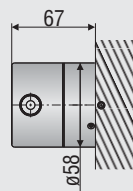
*Model P200-SSI*

*Model P200-CO/PB*

| Measuring range | A | B |
|---|---|---|
| 30000 | 268 | 75 |
| 40000 | 300 | 95 |
| 50000 | 333.5 | 95 |

Dimensions in mm, not to scale. Please ask for detailed reference drawings.

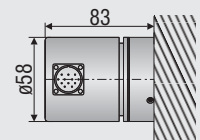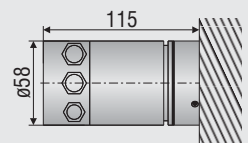| Model | WDS-30000-P200 | WDS-40000-P200 | WDS-50000-P200 |
|---|---|---|---|
| Measuring range | 30000 mm | 40000 mm | 50000 mm |
| Output | HTL, TTL, SSI, PB, CO | | |
| Travel per encoder revolution | 500 mm | | |
| Linearity ± 0.01 % FSO | 3 mm | 4 mm | 5 mm |
| Resolution HTL, TTL | 0.167 mm (6 pulses/mm) | | |
| Resolution SSI, PB, CO | 0.061 mm | | |
| Temperature range | -20 ... +80 °C | | |
| Sensor element | incremental-/absolute encoder | | |
| Material | housing: aluminum | | |
| Material | draw wire: coated polyamid stainless steel (ø 0.8 mm) | | |
| Wire mounting | eyelet | | |
| Sensor mounting | slot nuts | | |
| Wire acceleration | 2 g | | |
| Wire retraction force (min) | 12 N | 11 N | 11 N |
| Wire extension force (max) | 22 N | 22 N | 24 N |
| Protection class | IP 65 | | |
| Electrical connection output HTL, TTL | integral cable, radial, 1 m long | | |
| Electrical connection output SSI | connector, radial, 12-pin | | |
| Electrical connection output PB, CO | bus cover | | |
| Weight | appr. 10 kg | appr. 11 kg | appr. 12 kg |

FSO = Full Scale Output

Specifications for digital outputs page 32 and continuing.

**Article description**

WDS- *30000* - P200 - *SR* - *SSI*

**Output option** TTL
HTL
SSI
CO: CANopen
PB: Profibus DP

**Connection** SR (only SSI): radial plug (incl. female connector)
CR (only HTL, TTL): integral cable, radial, 1m
BH (only CAN, PB)

**Model** P200

**Measuring range** in mm

# wireSENSOR
# Accessories and mounting

**WE-x-M4, WE-x-Clip** Wire extension x=length

**TR1-WDS** Pulley wheel, adjustable

**TR3-WDS** Pulley wheel, fixed

**GK1-WDS** Attachment head for M4

**MH1-WDS** Magnetic holder for wire mounting

**MH2-WDS** Magnetic holder for sensor mounting
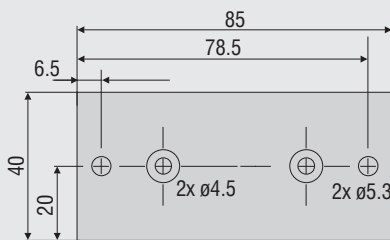
**MT-60-WDS** Mounting clamp for WDS-P60

**FC8** Female connector for WDS, 8-pin

**FC8/90** Female connector 90° for WDS, 8-pin

**PC 3/8** Sensor cable, length 3 m

**PS 2010** Power supply (chassis mounting 35 x 7.5 mm); input 120/230 VAC; output 24 VDC / 2.5 A; L/B/H 120 x 20 x 40 mm

**WDS-MP60** Mounting plate for P60 sensors

**Application example with accessories**

**MT-60-WDS** mounting clips

**MH1-WDS** magnetic holder

measuring range

**WE-x-Clip** wire extension

**TR3-WDS** pulley wheel, fix

**TR1-WDS** pulley wheel, adjustable

85
78.5
6.5
40
20
2x ø4.5
2x ø5.3

**Mounting plate WDS-MP60**
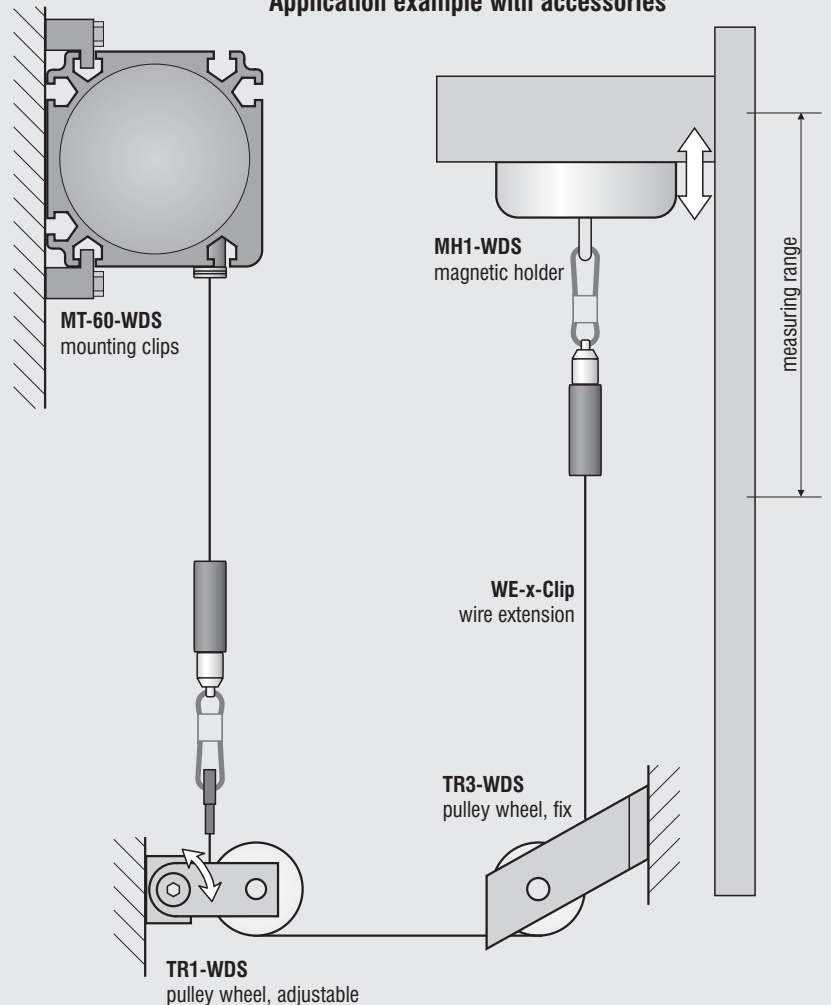
## Installation information:

Wire attachment: The free return of the measurement wire is not permissible and it is essential that this is avoided during installation.

## Wire exit angle:

When mounting a draw-wire displacement sensor, a straight wire exit (±3° tolerance) must be taken into account. If this tolerance is exceeded, increased material wear on the wire and at the wire aperture must be expected.

**wire aperture 0° (±3° tolerance)**
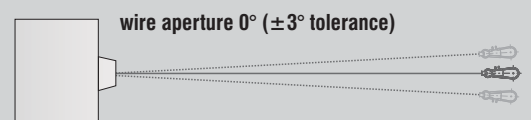
# wireSENSOR
# Absolute encoder output specifications: SSI

## Contact description

| | |
|---|---|
| 1 UB | Encoder power supply connection. |
| 2 GND | Encoder ground connection. The voltage drawn to GND is UB. |
| 3 Pulse + | Positive SSI pulse input. Pulse + forms a current loop with pulse -. A current of approx. 7 mA in direction of Pulse + input generates a logical 1 in positive logic. |
| 4 Data + | Positive, serial data output of the differential line driver. A High level at the output corresponds to logical 1 in positive logic. |
| 5 ZERO | Zero setting input for setting a zero point at any desired point within the entire resolution. The zeroing process is triggered by a High pulse (pulse duration ≥100 ms) and must take place after the rotating direction selection (UP/DOWN). For maximum interference immunity, the input must be connected to GND after zeroing. |
| 6 Data - | Negative, serial data output of the differential line driver. A High level at the output corresponds to logical 0 in positive logic. |
| 7 Pulse - | Negative SSI pulse input. Pulse - forms a current loop with pulse +. A current of approx. 7 mA in direction of Pulse - input generates a logical 0 in positive logic. |
| 8 / 10 $\overline{\text{DATAVALID}}$ $\overline{\text{DATAVALID}}$ $\overline{\text{MT}}$ | Diagnosis outputs $\overline{\text{DV}}$ and $\overline{\text{DV}}$ $\overline{\text{MT}}$ Jumps in data word, e.g. due to defective LED or photoreceiver, are displayed via the $\overline{\text{DV}}$ output. In addition, the power supply of the multiturn sensor unit is monitored and the $\overline{\text{DV}}$ $\overline{\text{MT}}$ output is set when a specified voltage level is dropped below. Both outputs are Low-active, i.e. are switched through to GND in the case of an error. |
| UP/DOWN | UP/DOWN counting direction input. When not connected, this input is on High. UP/$\overline{\text{DOWN}}$-High means increasing output data with a clockwise shaft rotating direction when looking at the flange. UP/$\overline{\text{DOWN}}$-Low means increasing values with a counter-clockwise shaft rotating direction when looking at the flange. |
| 11 / 12 | Not in use |

## Pin assignment

| Pin | Cable color | Assignment |
|---|---|---|
| 1 | brown | UB |
| 2 | black | GND |
| 3 | blue | Pulse + |
| 4 | beige | Data + |
| 5 | green | ZERO |
| 6 | yellow | Data - |
| 7 | violet | Pulse - |
| 8 | brown/yellow | $\overline{\text{DATAVALID}}$ |
| 9 | pink | UP/DOWN |
| 10 | black/yellow | $\overline{\text{DATAVALID}}$ $\overline{\text{MT}}$ |
| 11 | - | - |
| 12 | - | - |
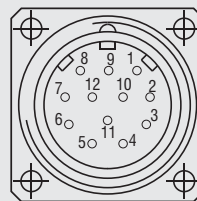
Please use leads twisted in pairs for extension cables.

## Inputs

Control signals UP/DOWN and Zero

| | |
|---|---|
| Level High | > 0.7 UB |
| Level Low | < 0.3 UB |
| Connection: | UP/DOWN input with 10 kohms to UB, zeroing input with 10 kohms to GND. |

SSI pulse

Optocoupler inputs for electrical isolation

## Outputs

| | |
|---|---|
| SSI data | RS485 driver |
| Diagnostic outputs | |
| Push-pull outputs are short-circuit-proof | |
| Level High | > UB -3.5 V (with I = -20 mA) |
| Level Low | < 0.5 V (with I = 20 mA) |

# wireSENSOR
## Absolute encoder output specifications: CANopen

### CANopen features

| | |
|---|---|
| Bus protocol | CANopen |
| Device profile | CANopen - CiA DSP 406, V 3.0 |
| CANopen Features | Device Class 2, CAN 2.0B |
| Operating modes | Polling Mode (asynch, via SDO) |
| (with SDO progr.) | Cyclic Mode (asynch-cyclic) The encoder cyclically sends the current process actual value without a request by a master. The cycle time can be parameterized for values between 1 and 65535 ms. Synch Mode (synch-cyclic) The encoder sends the current actual process value after receiving a synch telegram sent by a master. The synch counter in the encoder can be parameterized so that the position value is not sent until after a defined number of synch telegrams. |
| | Acyclic Mode (synch-acyclic) |
| Preset value | With the "Preset" parameter the encoder can be set to a desired actual process value that corresponds to the defined axis position of the system. The offset value between the encoder zero point and the mechanical zero point of the system is saved in the encoder. |
| Rotating direction | With the operating parameter the rotating direction in which the output code is to increase or decrease can be parameterized. Scaling The steps per revolution and the total revolution can be parameterized. |
| Diagnosis | The encoder supports the following error messages: |
| | - Position and parameter error |
| | - Lithium cell voltage at lower limit (Multiturn) |
| Default setting | 50 kbit/s, node number 0 |
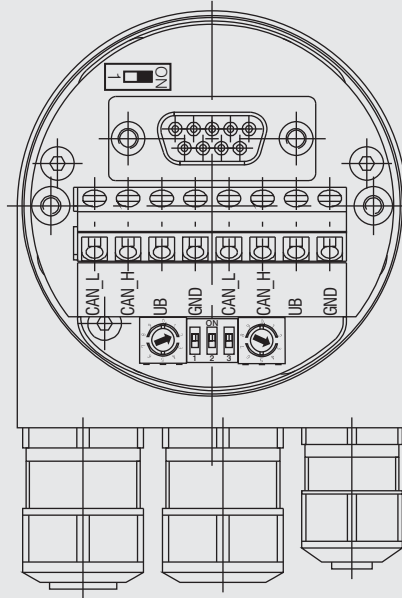


**Setting of terminating Resistor for CANopen**



ON = Last user
OFF = User X

### Setting CANopen baud rate

| Baud rate | Setting Dip Switch | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| 10 kBit/s | OFF | OFF | OFF |
| 20 kBit/s | OFF | OFF | ON |
| 50 kBit/s | OFF | ON | OFF |
| 125 kBit/s | OFF | ON | ON |
| 250 kBit/s | ON | OFF | OFF |
| 500 kBit/s | ON | OFF | ON |
| 800 kBit/s | ON | ON | OFF |
| 1 MBit/s | ON | ON | ON |

### Contact description CANopen

| | |
|---|---|
| CAN_L | CAN Bus Signal (dominant Low) |
| CAN_H | CAN Bus Signal (dominant High) |
| UB | Supply voltage 10...30 VDC |
| GND | Ground contact for UB |
| | (Terminals with the same designation are internally interconnected) |

### Settings of user address for CANopen

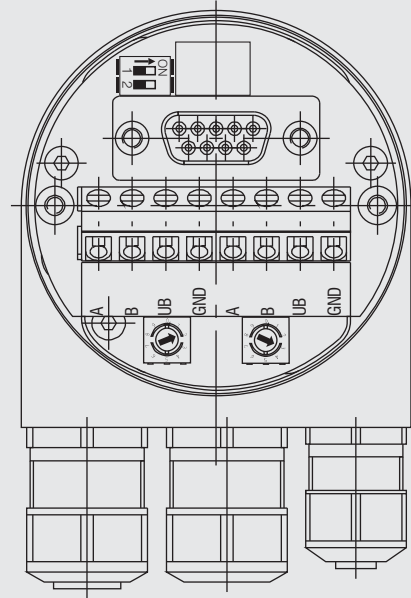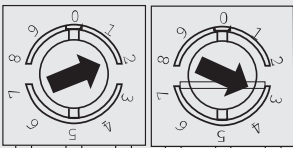Address can be set with rotary switch. Example: User address 23
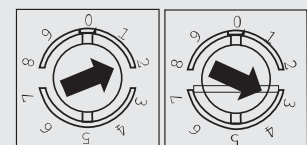
# wireSENSOR
## Absolute encoder output specifications: Profibus

### Profibus-DP features

| | |
|---|---|
| Bus protocol | Profibus-DP |
| Profibus features | Device Class 1 and 2 |
| Data exch. functions | Input: Position value |
| | Additional parameterized speed signal (readout of the current rotary speed) |
| | Output: Preset value |
| Preset value | With the "Preset" parameter the encoder can be set to a desired actual value that corresponds to the defined axis position of the system. |
| Parameter functions | Rotating direction: With the operating parameter the rotating direction for which the output code is to increase or decrease can be parameterized. |
| Scaling: | The steps per revolution and the total revolution can be parameterized. |
| Diagnosis | The encoder supports the following error messages: |
| | - Position error |
| | - Lithium cell voltage at lower limit (Multiturn) |
| Default setting | User address 00 |



**Settings of terminating resistors for Profibus-DP**

ON = last user
OFF = user X

### Settings of user address for Profibus-DP

Address can be set with rotary switch. Example: User address 23



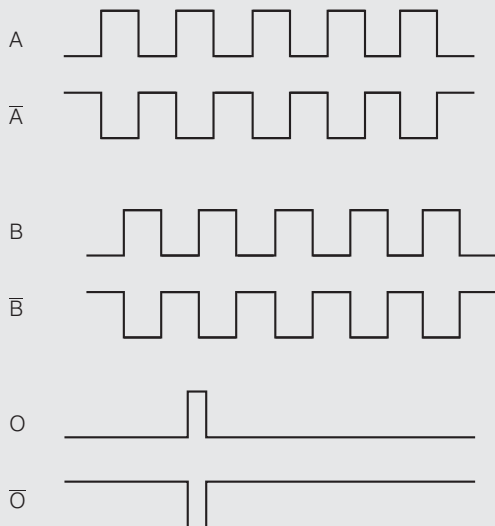### Contact description Profibus-DP

| | |
|---|---|
| A | A negative serial data line |
| B | Positive serial data line |
| UB | Supply voltage 10...30 VDC |
| GND | Ground contact for UB |

(Terminals with the same designation are internally interconnected)

# wireSENSOR
## Output specifications Incremental-encoder

### Signal output

A

$\overline{A}$

B

$\overline{B}$

O

$\overline{O}$

### Pin assignment TTL, HTL

| Pin | Cable color | Assignment |
|---|---|---|
| 1 | pink | B inv. |
| 2 | blue | UB Sense |
| 3 | red | N (reference pulse) |
| 4 | black | N inv. (reference pulse inv.) |
| 5 | brown | A |
| 6 | green | A inv. |
| 7 | - | - |
| 8 | grey | B |
| 9 | - | - |
| 10 | white/green | GND |
| 11 | white | GND Sense |
| 12 | brown/green | UB |
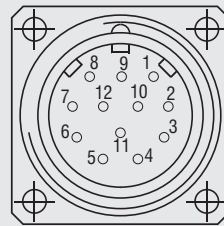
Pin 2 and Pin 12 are internally connected as well as Pin 11 and 10.

For cable length >10 m twisted pair wires are required.

| Output TTL | Linedriver (5 VDC) |
|---|---|
| Level High | $\geq$ 2.5 V (with I = -20 mA) |
| Level Low | $\leq$ 0.5 V (with I = 20 mA) |
| Load High | $\leq$ 20 mA |
| Output | A, $\overline{A}$, B, $\overline{B}$, O |

| Output HTL | Push-pull (10 ... 30 VDC) |
|---|---|
| Level High | $\geq$ UB -3 V (with I = -20 mA) |
| Level Low | $\leq$ 1.5 V (with I = 20 mA) |
| Load | $\leq$ 40 mA |
| Output | A, $\overline{A}$, B, $\overline{B}$, O |

| Output E | Push-pull (5 VDC) |
|---|---|
| Level High | UB -2.5 V |
| Level Low | $\leq$ 0.5 V |
| Load | $\leq$ 50 mA |
| Output | A, B, O |

| Output E830 | Push-pull (8 ... 30 VDC) |
|---|---|
| Level High | UB -3 V |
| Level Low | $\leq$ 2.5 V |
| Load | $\leq$ 50 mA |
| Output | A, B, O |

### Connection assignment E, E830

| Pin | Cable color | Assignment |
|---|---|---|
| - | white | 0V |
| - | brown | +UB |
| - | green | A |
| - | - | $\overline{A}$ |
| - | yellow | B |
| - | - | $\overline{B}$ |
| - | grey | 0 |

# More Precision.

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