



## OFFICIAL DISTRIBUTOR

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ENCODER ROD 280 18000 ROD28018000 SIN/COS 18000 PPR +5V REPLACEMENT  
ID23623

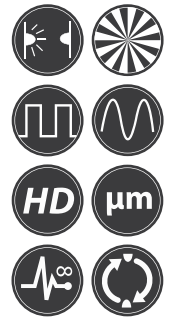


**PRECIZIKA**  
METROLOGY



# A110

## PHOTOELECTRIC ANGLE ENCODER



Photoelectric angle encoder A110 is used to establish an informational link between the key machine components, industrial robots, comparators and DCC, NC or Digital Readout Units. It provides information about the value and direction of motion. The encoder is used in automatic control, on-line gauging, process monitoring systems, etc.

Three versions of output signals are available:

- A110-A - sinusoidal signals, with amplitude approx. 11  $\mu$ App;

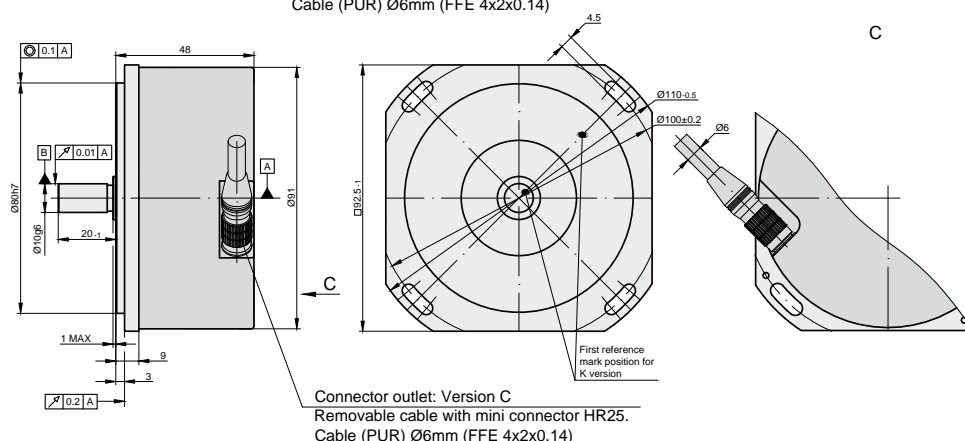
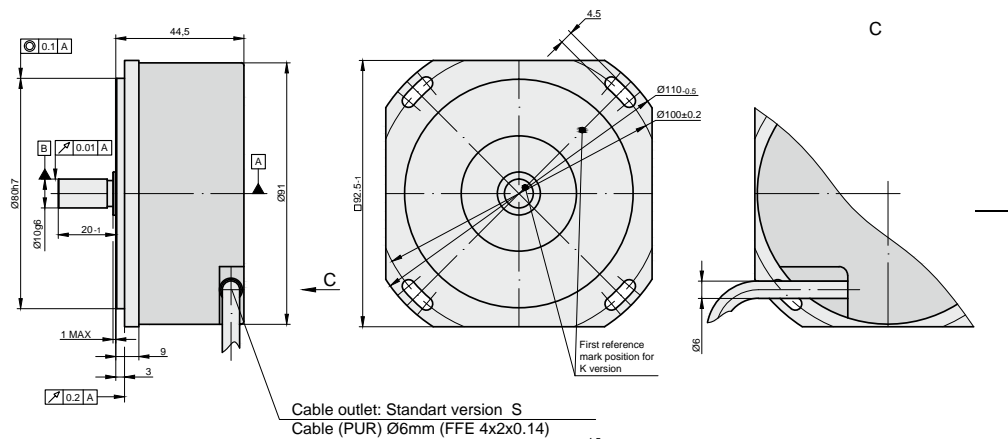
- A110-AV - sinusoidal signals, with amplitude approx. 1 Vpp;
- A110-F - square-wave signals (TTL), with integrated subdividing electronics for interpolation x1, x2, x5, x10, x20, x25, x50 and x100.

The modification with distance-coded reference marks is available.

### MECHANICAL DATA

|   |   |
|---|---|
| Line number on disc (z)                         | 18000   |
| Number of output pulses per revolution for A110 | Z x k, where k = 1, 2, 3, 4, 5, 8, 10, 20, 25, 50, 100. |
| Reference signal:                               |   |
| - standard (S)                                  | one per shaft revolution                                |
| - distance-coded (K)                            | 36 per shaft revolution                                 |
| Maximum shaft speed                             | 5000 rpm  |
| Maximum shaft load:                             |   |
| - axial   | 10 N  |
| - radial (at shaft end)                         | 10 N  |

|                                   |  |
|-----------------------------------|--|
| Accuracy                          | $\pm 7.5; \pm 5.0$ arc. sec            |
| Starting torque at 20°C           | $\leq 0.01$ Nm                         |
| Rotor moment of inertia           | $< 20 \times 10^{-6}$ kgm <sup>2</sup> |
| Protection (IEC 529)              | IP64                                   |
| Maximum weight without cable      | 0.7 kg                                 |
| Operating temperature             | 0...+50 °C                             |
| Storage temperature               | -30...+80°C                            |
| Maximum humidity (non condensing) | 98 %                                   |
| Permissible vibration             | $\leq 100$ m/s <sup>2</sup>            |
| Permissible shock (6 ms)          | $\leq 300$ m/s <sup>2</sup>            |



## ELECTRICAL DATA

| VERSION                            | A110-A $\sim$ 11 $\mu$ App   | A110-AV $\sim$ 1 Vpp  | A110-F $\square$ TTL  |
|------------------------------------|--|---|---|
| Supply voltage ( $U_p$ )           | +5 V $\pm$ 5%  | +5 V $\pm$ 5%   | +5 V $\pm$ 5%;  |
| Max. supply current (without load) | 80 mA  | 120 mA  | 120 mA  |
| Light source                       | LED  | LED   | LED   |
| Incremental signals                | Two sinusoidal $I_1$ and $I_2$<br>Amplitude at 1 k $\Omega$ load:<br>- $I_1 = 7-16 \mu$ A<br>- $I_2 = 7-16 \mu$ A                | Differential sine +A/-A and +B/-B<br>Amplitude at 120 $\Omega$ load:<br>- A = 0.6-1.2 V<br>- B = 0.6-1.2 V                                | Differential square-wave $U1/\overline{U1}$ and $U2/\overline{U2}$ .<br>Signal levels at 20 mA load current:<br>- low (logic "0") $\leq$ 0.5 V<br>- high (logic "1") $\geq$ 2.4 V |
| Reference signal                   | One quasi-triangular $I_0$ peak per revolution. Signal magnitude at 1 k $\Omega$ load:<br>- $I_0 = 2-8 \mu$ A (usable component) | One quasi-triangular +R and its complementary -R per revolution. Signals magnitude at 120 $\Omega$ load<br>- R = 2-8 V (usable component) | One differential square-wave $U0/\overline{U0}$ per revolution. Signal levels at 20 mA load current:<br>- low (logic "0") < 0.5 V<br>- high (logic "1") > 2.4 V                   |
| Maximum operating frequency        | (-3 dB) $\geq$ 160 kHz   | (-3 dB) $\geq$ 180 kHz  | (160 x k) kHz, k-interpolation factor   |
| Direction of signals               | $I_2$ lags $I_1$ for clockwise rotation (viewed from shaft side)   | +B lags +A for clockwise rotation (viewed from shaft side)  | $U2$ lags $U1$ with clockwise rotation (viewed from shaft side)   |
| Maximum rise and fall time         | -  | -   | < 0.5 $\mu$ s   |
| Standard cable length              | 1 m, without connector   | 1 m, without connector  | 1 m, without connector  |
| Maximum cable length               | 5 m  | 25 m  | 25 m  |
| Output signals                     |  |   |   |

Note:

- Maximum working rotation speed (with proper encoder counting) is limited by maximum operating frequency and maximum mechanical rotation speed.
- If cable extension is used, power supply conductor cross-section should not be smaller than 0.5 mm<sup>2</sup>.

## ACCESSORIES

|                                |                               |                             |                               |                            |                              |                                |                               |                                     |
|--------------------------------|-------------------------------|-----------------------------|-------------------------------|----------------------------|------------------------------|--------------------------------|-------------------------------|-------------------------------------|
| <b>CONNECTORS FOR CABLE</b>    | B12<br>12-pin round connector | C9<br>9-pin round connector | C12<br>12-pin round connector | D9<br>9-pin flat connector | D15<br>15-pin flat connector | RS10<br>10-pin round connector | ONC<br>10-pin round connector | HR25<br>8-pins round mini connector |
| <b>DIGITAL READOUT DEVICES</b> | CS3000                        |                             |                               |                            | CS5000                       |                                |                               |                                     |
| <b>COUPLING</b>                | SC70                          |                             |                               |                            |                              |                                |                               |                                     |
| <b>EXTERNAL INTERPOLATOR</b>   | NK                            |                             |                               |                            |                              |                                |                               |                                     |

## ORDER FORM

| OUTPUT SIGNAL VERSION: | PULSE NUMBER PER REVOLUTION:      | REFERENCE SIGNAL:   | ACCURACY GRADE:                                    | CABLE OR CONNECTOR OUTLET:                                     | CABLE LENGTH:                               | CONNECTOR TYPE:  | COUPLING:                                 |
|------------------------|-----------------------------------|---|--|--|---|--|---|
| A<br>AV<br>F           | 1...18000<br>...<br>1...1800000   | S - one per revolution<br>K - 36 per revolution, distance-coded | 50 - $\pm$ 5.0 arc.sec.<br>75 - $\pm$ 7.5 arc.sec. | S - version S (cable outlet)<br>C-version C (connector outlet) | AR01 - 1m<br>AR02 - 2m<br>AR03 - 3m<br>.... | W - without connector<br>B12 - round, 12 pins<br>C9 - round, 9 pins<br>C12 - round, 12 pins<br>D9 - flat, 9 pins<br>D15 - flat, 15 pins<br>RS10 - round, 10 pins<br>ONC - round, 10 pins | 0 - without coupling<br>1 - with coupling |
| ORDER EXAMPLE:         | 1) A110-F-18000-K-50-S-AR02/C12-0 |   |  |  |   |  |   |