

A36 PHOTOELECTRIC ROTARY ENCODER

(A36-A, A36-AV, A36-F)



The encoder A36 is similar to the "Heidenhain" ROD 1000 (Minirod) type encoders in electrical parameters, mounting and overall dimensions.

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The photoelectric rotary encoder **A36** is used to establish an informational link between the key components of machines, industrial robots, comparators and DCC, NC or Digital Readout units. It gives information about the value and direction of the motion components. The encoder is used in automatic control, on-line gauging, in process monitoring systems, etc.

The encoder consists of three parts: mechanical, optical and electronic.

The mechanical part supports the rotation of the grating disc, fixes optical and electronic parts.

The optical part includes the light source, photosensitive diodes and grating elements.

The electronic part is made on the base of a specialized microchip.

The case of the encoder is fixed to an object by means of screws. The shaft of the encoder is connected with an object shaft by virtue of a compensating coupling.

The encoder has three versions by its output signals:

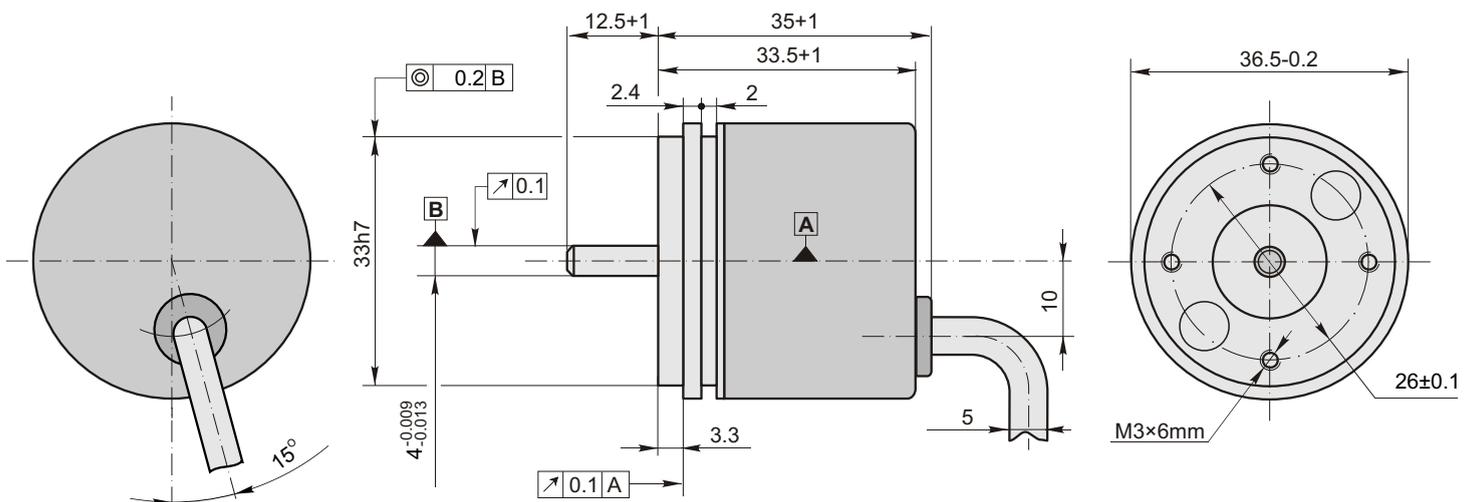
A36-A - sinusoidal signals, with amplitude approx. $11 \mu\text{App}$;

A36-AV - sinusoidal signals, with amplitude approx. 1 Vpp ;

A36-F - square-wave signals TTL or HTL.

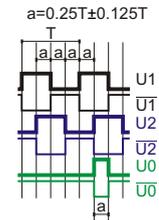
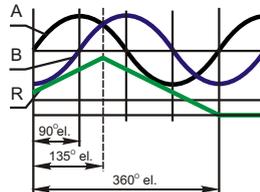
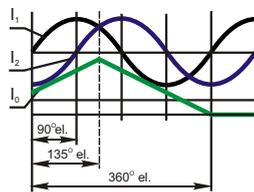
Mechanical Data

| | | | |
|-------------------------------|------------------------------|---------------------------------------|------------------------------------|
| Line number: | | Starting torque at 20°C | $\leq 0.1 \text{ Ncm}$ |
| - preferable | 100 200 250 | Moment of inertia of rotor | $< 2 \text{ gcm}^2$ |
| | 360 500 1000 | Protection (IEC 529) | IP64 |
| | 1024 1500 2000 | Maximum weight without cable | 0.07 kg |
| | 2500 3600 | Operating temperature | $-10...+70 \text{ }^\circ\text{C}$ |
| - possible | 60 256 300 | Storage temperature | $-30...+80 \text{ }^\circ\text{C}$ |
| | 400 512 600 | Maximum humidity | |
| | 720 800 900 | (without condensation of moisture) | 98 % |
| | 1200 | Permissible vibration (55 to 2000 Hz) | $\leq 100 \text{ m/s}^2$ |
| Maximum shaft speed | 10000 rpm | Permissible shock (11 ms) | $\leq 300 \text{ m/s}^2$ |
| Maximum shaft load: | | | |
| - axial | 5 N | | |
| - radial (at shaft end) | 10 N | | |
| Accuracy (T-period of signal) | $\pm 0.1 \text{ T arc. sec}$ | | |



Electrical Data

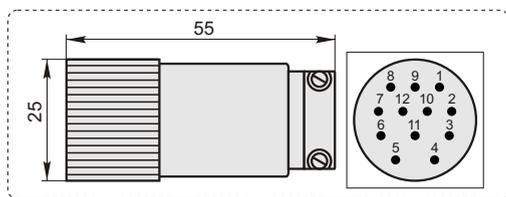
| Version | A36-A $\sim 11 \mu\text{A}_{pp}$ | A36-AV $\sim 1 \text{V}_{pp}$ | A36-F \square TTL; \square HTL |
|---|--|---|---|
| Power supply (U_p) | +5 V $\pm 5\%$ | +5 V $\pm 5\%$ | +5 V $\pm 5\%$; +(10 to 30) V |
| Maximum consumed current (without load) | 80 mA | 120 mA | 120 mA |
| Light source | LED | LED | LED |
| Incremental signals | Two sinusoidal I_1 and I_2 . Amplitude at 1 k load: - $I_1 = 7-16 \mu\text{A}$ - $I_2 = 7-16 \mu\text{A}$ | Two sinusoidal A and B. Amplitude at 120 load: - A = 0.6-1.2 V - B = 0.6-1.2 V | Square-wave $U1$, $U2$ and their inverted $\overline{U1}$, $\overline{U2}$. Signal levels at 20 mA load current: - low ("0" logic) $\leq 0.5 \text{V}$ at $U_p = +5 \text{V}$ - low ("0" logic) $\leq 1.5 \text{V}$ at $U_p = 10 \text{ to } 30 \text{V}$ - high ("1" logic) $\geq 2.4 \text{V}$ at $U_p = +5 \text{V}$ - high ("1" logic) $\geq (U_p - 2) \text{V}$ at $U_p = 10 \text{ to } 30 \text{V}$ |
| Reference signal | One quasi-triangle I_0 peak per revolution. Signal magnitude at 1 k load: - $I_0 = 2-8 \mu\text{A}$ (usable component) | One quasi-triangle R per revolution. Signal magnitude at 120 load: - R = 0.2-0.8 V (usable component) | One square-wave $U0$ and its inverted $\overline{U0}$ per revolution. Signal levels at 20 mA load current: - low ("0" logic) $\leq 0.5 \text{V}$ at $U_p = +5 \text{V}$ - low ("0" logic) $\leq 1.5 \text{V}$ at $U_p = 10 \text{ to } 30 \text{V}$ - high ("1" logic) $\geq 2.4 \text{V}$ at $U_p = +5 \text{V}$ - high ("1" logic) $\geq (U_p - 2) \text{V}$ at $U_p = 10 \text{ to } 30 \text{V}$ |
| Maximum operating frequency | (-3 dB) $\geq 160 \text{ kHz}$ | (-3 dB) $\geq 160 \text{ kHz}$ | 160 kHz |
| Direction of signals | I_2 lags I_1 with clockwise rotation (viewed from shaft side) | B lags A with clockwise rotation (viewed from shaft side) | $U2$ lags $U1$ with clockwise rotation (viewed from shaft side) |
| Maximum rising and falling time | | | $< 0.5 \mu\text{s}$ |
| Standard cable length | 1 m, without connector | 1 m, without connector | 1 m, without connector |
| Cable diameter | 5 mm | 5 mm | 5 mm |
| Maximum cable length | 5 m | 15 m | 30 m |



Accessories

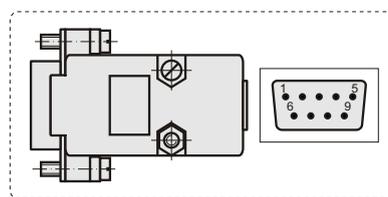
C12

12-pin round connector for A36-AV and A36-F

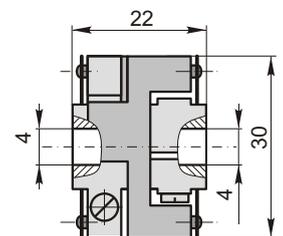


D9

9-pin flat connector for all version of A36



SC30 Coupling



Order form

A36 - X - XXXXX - XXX - XX/X - X

Version by output signals:
A, AV or F

Line number:
100...
3600

Power supply:
05V - +5V
30V - 10 to 30V*
*only for A36-F with HTL output signals

Cable length:
01 - 1m
02 - 2m
03 - 3m
... ..

Type of connector:
W - without connector
D9 - flat, 9 pins
C12 - round, 12 pins

Coupling:
0 - without coupling
1 - with coupling

