

# A36

## PHOTOELECTRIC ROTARY ENCODER



Photoelectric rotary encoder A36 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.



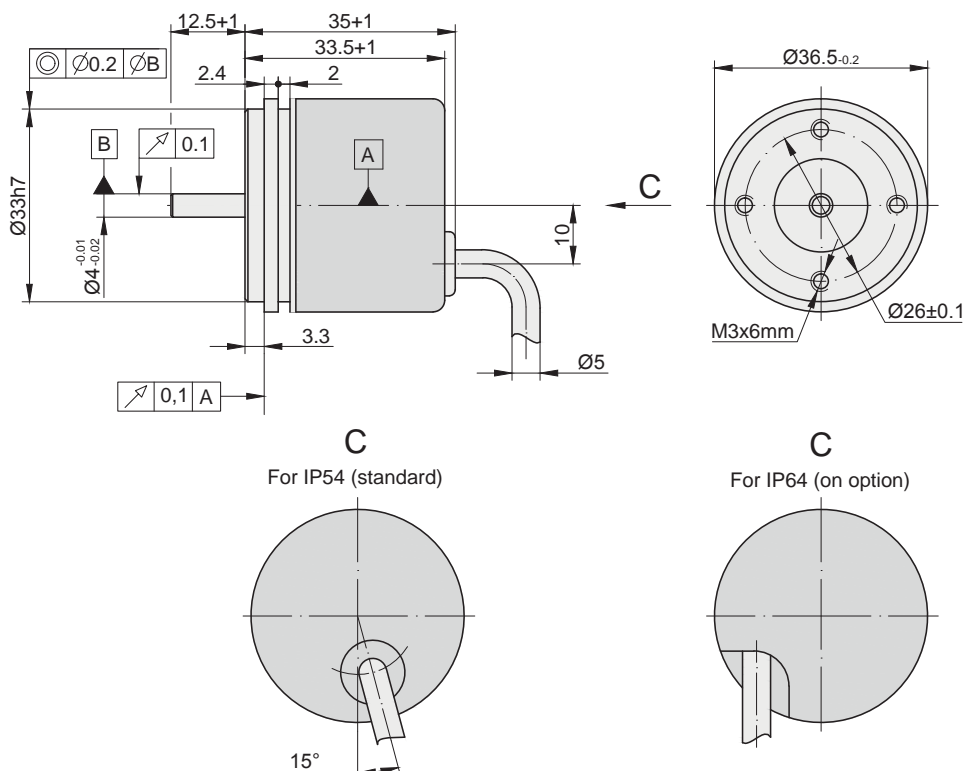
Three versions of output signals are available:

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

- A36-AV - sinusoidal signals, with amplitude approx. 1 Vpp;
- A36-F - square-wave signals TTL or HTL.

### MECHANICAL DATA

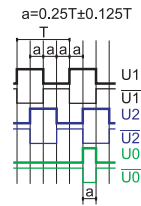
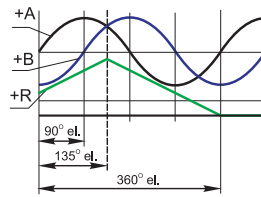
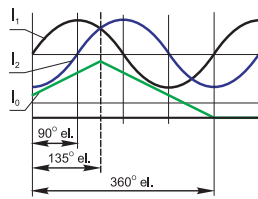
Line number on disc (z)	100; 200; 250; 360; 500; 1000; 1024; 1500; 2000; 2500; 3600	Rotor moment of inertia	< 2 gcm <sup>2</sup>
Number of output pulses per revolution	Z x k, where k=1,2,3,4,5,8,10	Protection (IEC 529)	IP54
Maximum shaft speed	10000 rpm	- for axial cable outlet	IP64
Maximum shaft load:		- for axial cable outlet through gland and for radial cable outlet	
- axial	5N	Maximum weight without cable	0.07 kg
- radial (at shaft end)	10N	Operating temperature	-10...+70 °C
Accuracy		Storage temperature	-30...+80 °C
(T <sub>r</sub> -period of lines on disc in arc. sec)	±0.1T <sub>r</sub> arc. sec	Maximum humidity (non-condensing)	98 %
Starting torque at 20°C	≤ 0.002 Nm	Permissible vibration (55 to 2000 Hz)	≤ 100 m/s <sup>2</sup>
		Permissible shock (11 ms)	≤ 300 m/s <sup>2</sup>



## ELECTRICAL DATA

VERSION	A36-A $\sim$ 11 $\mu$ App	A36-AV $\sim$ 1 $\mu$ App	A36-F $\square$ TTL; $\square$ HTL
Supply voltage	+5 V $\pm$ 5%	+5 V $\pm$ 5%	+5 V $\pm$ 5%; +(10 to 30) V
Max. supply current (without load)	80 mA	120 mA	120 mA
Light source	LED	LED	LED
Incremental signals	Two sinusoidal $I_1$ and $I_2$ Amplitude at 1 k $\Omega$ load: - $I_1$ = 7-16 $\mu$ A - $I_2$ = 7-16 $\mu$ A	Differential sine +A/-A and +B/-B Amplitude at 120 $\Omega$ load: - A = 0.6-1.2 V - B = 0.6-1.2 V	Differential square-wave U1/ $\overline{U1}$ and U2/ $\overline{U2}$ . Signal levels at 20 mA load current: - low (logic "0") $\leq$ 0.5 V at $U_p$ =+5 V - low (logic "0") $\leq$ 1.5 V at $U_p$ =10 to 30 V - high (logic "1") $\geq$ 2.4 V at $U_p$ =+5 V - high (logic "1") $\geq$ ( $U_p$ -2) V at $U_p$ =10 to 30 V
Reference signal	One quasi-triangular $I_0$ peak per revolution. Signal magnitude at 1 k $\Omega$ load: - $I_0$ = 2-8 $\mu$ A (usable component)	One quasi-triangular +R and its complementary -R per revolution. Signals magnitude at 120 $\Omega$ load - R = 0.2-0.8 V (usable component)	One differential square-wave U0/ $\overline{U0}$ per revolution. Signal levels at 20 mA load current: - low (logic "0") < 0.5 V at $U_p$ =+5 V - low (logic "0") < 1.5 V at $U_p$ =10 to 30 V - high (logic "1") > 2.4 V at $U_p$ =+5 V - high (logic "1") > ( $U_p$ -2) V at $U_p$ =10 to 30 V
Maximum operating frequency	(-3 dB) $\geq$ 160 kHz	(-3 dB) $\geq$ 160 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 12-pin round connector	C9 12-pin round connector	C12 12-pin round connector	D9 9-pin flat connector	D15 15-pin flat connector	RS10 10-pin round connector	ONC 10-pin round connector
<b>DIGITAL READOUT DEVICES</b>	CS3000			CS5500			
<b>COUPLING</b>	SC30						
<b>EXTERNAL INTERPOLATOR</b>	NK						

## ORDER FORM

OUTPUT SIGNAL VERSION:	PULSE NUMBER PER REVOLUTION:	(OPTIONAL) LINE NUMBER ON DISC (Z):	SUPPLY VOLTAGE:	CABLE LENGTH AND OUTLET:	CONNECTOR TYPE:	COUPLING:
A AV F	100 ... 36000	100 ... 3600 <small>*only for A36-F</small>	05V - +5V 30V - 10 to 30V*  <small>*only for A36-F with HTL output signals</small>	A01 - 1m (A- axial) A02 - 2m ... R01 - 1m (R- radial) R02 - 2m ...	W - without connector B12 - round, 12 pins C9 - round, 9 pins C12 - round, 12 pins D9 - flat, 9 pins D15 - flat, 15 pins RS10 - round, 10 pins ONC - round, 10 pins	0 - without coupling 1 - with coupling
ORDER EXAMPLES:	1) A36-F-2500-05V-A01/W-0 2) A36-F-36000/3600-05V-A02/C12-1					