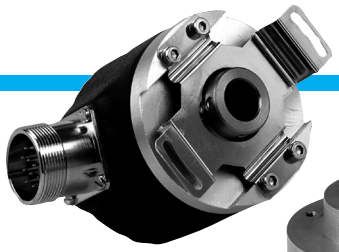
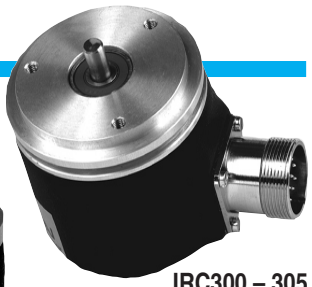
Incremental rotary encoders IRC300 – 325

IRC30x – external diameter of the shaft ∅ 6 mm
IRC31x – external diameter of the shaft ∅ 10 mm
IRC32x – internal diameter of the shaft ∅ 12 mm

The incremental rotary encoders IRC with a LED as the light source in the standard industrial version converts rotary motion to electrical signals by the photoelectronic scanning of rasters onto two glass elements [stator and rotor]. Electrical signals provide information of bilateral position of two mechanical parts, angle turn or rotary motion. Common use of the IRC encoders is in connection with display units or numerical control systems on machine tools or robots. They are excellent for application in other equipment where measuring accuracy and reliability are required.



IRC320 – 325



IRC300 – 305

IRC310 – 315

Technical data

Rotation	10000 min.$^{-1}$
Angular acceleration	40000 rad.s^{-2}
Moment of inertia of mechanical parts	20 g.cm^{-2} ±10 %
Shaft loads IRC – axial 300-305/310-325	20/40 N max.
– radial 300-305/310-325	50/60 N max.
Type of protection	IP65
Weight max.	0,35 kg

Type identification

IRC3 x x / xxxx xx x

SUBSTANDARD (example)
- **P** – Pinion Ø 5 mm or 8 mm sticked to the shaft
- **M** – Frost resistant -25° to +60°C
- **D** – Optical indication of zero impulse by LED (KB, PB)

OUTLET
- **PA** – Cable 1 m axial
- **PB** – Cable 1 m radial
- **KA** – Connector CONTACT 20.10.10.AA axial
- **KB** – Connector CONTACT 20.10.10.AA radial
- **KKA** – Cable 1 m with connector CONTACT 20.10.50.AC axial or eq.
- **KKB** – Cable 1 m with connector CONTACT 20.10.50.AC radial

NUMBER OF IMPULSES PER ROTATION
100, 200, 250, 360, 500, 512, 1000, 1024, 1250, 1500, 2048, 2500, 3600, 4096, 5000 and 6000 with one zero impulse per rotation.

OUTLETS IDENTIFICATION

	Supply voltage	Outlet
0	+10 ÷ +30 V	push/pull
1	+ 10 ÷ +30 V	OC NPN
2	+10 ÷ +30 V	OC PNP
3	+ 5 V	OC NPN
4	+ 5 V	OC PNP
5	+ 5 V	line driver

DIAMETER OF SHAFTS
- **0** – external diameter of the shaft 6 mm
- **1** – external diameter of the shaft 10 mm
- **2** – internal diameter of the shaft 12 mm

TYPE OF ENCODER
- **3** – IRC3xx with a LED as the light source

Elektrical data	IRC 3x0	IRC 3x1	IRC 3x2	IRC 3x3	IRC 3x4	IRC 3x5
Suply voltage U_N [V]	10-30	10-30	10-30	5±5%	5±5%	5±5%
Suply voltage OC U_O [V]	–	5-30	U_N	5-30	U_N	–
Suply curent max. I_N [mA]	50/30V	50/30V	50/30V	100	100	100
Output frekvency max. F_O [kHz]	150	100	100	100	100	200
Output max. I_O [mA]	±25	25	-25	25	-25	±20
Output signals level						
U_{OH} [V] U_N=30V, I_{ON}=10mA	U_N-3	–	>U_N-1	–	>U_N-1	>2.5
U_{OL} [V] U_N=U_O=30V, I_{OL}=-10mA	<1,2	<1	–	<1	–	<0,4
I_{OH} [µA] U_N=U_O=30V	–	<-6	–	<-6	–	–
I_{OL} [µA] U_N=U_O=30V	–	–	<6	–	<6	–
Lenght cable max. [m]	100	20	20	20	20	50

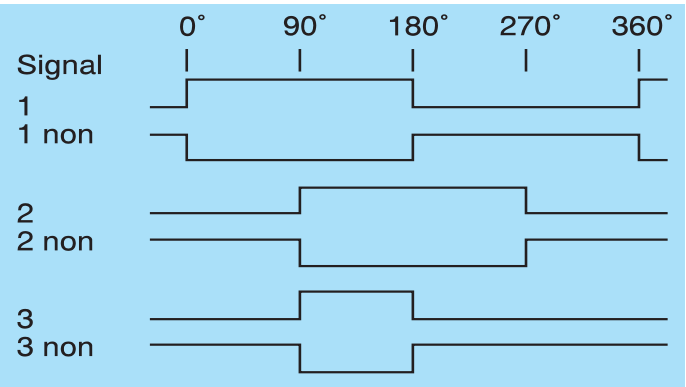
Working conditions

Vibration according to FCČSN345791		10 g_n (10 ÷ 2000 Hz)
Shock		50 g_n (100 ms)
Operating temperature	– standard	0° ÷ +60°C
	– model M	-25° ÷ +60°C
Humidity	– relative	95 % max.
	– absolute	40 g.m^{-3} max.

Atmosphere without aggressive substances.

Output signals IRC300 – 325

2 basic signals (1,2) moved by 90° electric, 1 zero impulse (3) and their negation. For frequecies higher than 100kHz zero pulse is not quaranteed.



Assembly

Encoders are fixed into the equipment by 3 screws M4. Position of the shaft is determined by fitted diameter 50h7. Encoders IRC310-315 are fixed into the equipment by 3 screws M3. Position of the shaft is deter-

continued on next page

Description of connection elements IRC300 ÷ 325

Pin Connector	Colour of outlet cable	Significance IRC3x0 – 3x2	IRC3x3 – 3x5
1	Grey	Signal 2 non	
2	Rose	Sensor +10 ÷ +30 V	Sensor +5 V
3	Blue	Signal 3	
4	Violet	Signal 3 non	
5	Yellow	Signal 1	
6	White	Signal 1 non	
7	—	NC	
8	Green	Signal 2	
9	Shield	Shield	
10	Black	GND	
11	Brown	Sensor 0 V	
12	Red	U_n +10 ÷ +30 V	V_{cc} +5 V

Note: Function Sensor is used with a supply resource enabling balancing the decrease of voltage on the cable as the feedback. If Sensor function is not used we recommend to connect PIN 2 to PIN 12 and PIN 10 to PIN 11.

Assembly – continued from previous page

mined by fitted diameter 36f8. Encoders IRC320-325 are installed on the shaft of the appropriate equipment and tightened with 2 imbus screws M4. Afterwards the encoder is turned to the required position and 4 screws M3 are tightened with stationary couplings. The connection has to be constructed so as to avoid exceeding the maximum radial or axial shaft load permited. It is necessary to keep alignment connection. It is recommended to use suitable homokinetic diaphragm couplings [see Accessories catalogue list].

Considering that sensitive electrostatic parts have been used we recommend to connect encoders without a power supply and to strictly follow the rules for work with electrostatic sensitive equipment.
When temperature is less then –5°C cable must be fixed.

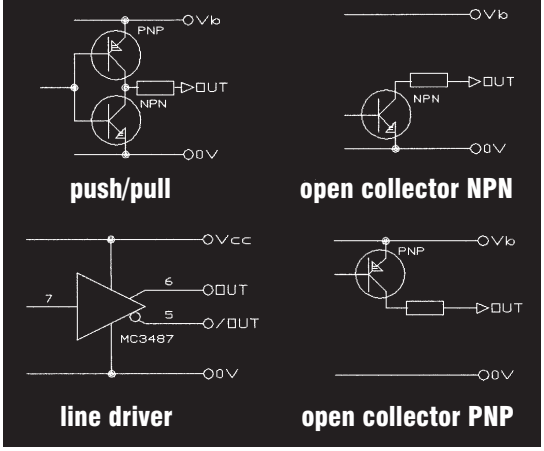
How to order?

Please indicate encoder type, number of impulses per rotation, outlet, number of pieces, delivery term and other non-standard features.Connecting cable and homokinetic diaphragm couplings can be ordered as well [see Accessories catalogue list].

Example

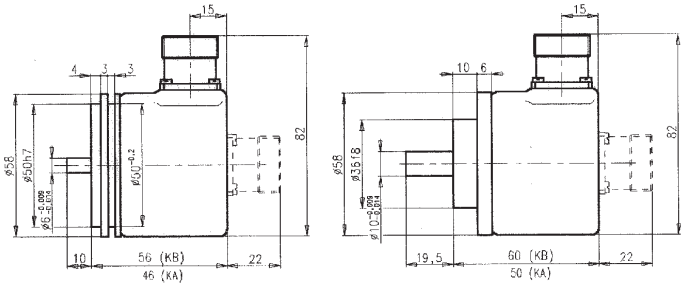
20 pcs IRC 300/1250KB. Delivery term – four weeks Connecting cable and homokinetic diaphragm couplings can be ordered as well [see Accessories catalogue list].

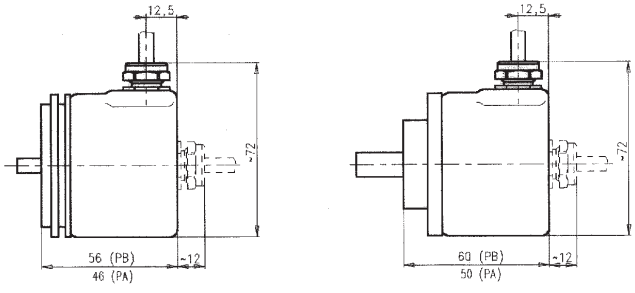
Scheme of output circuit (for one signall)

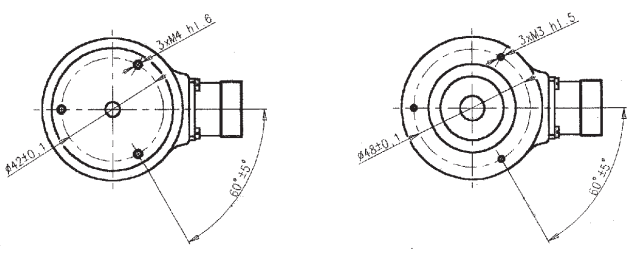


Dimensioned drawing

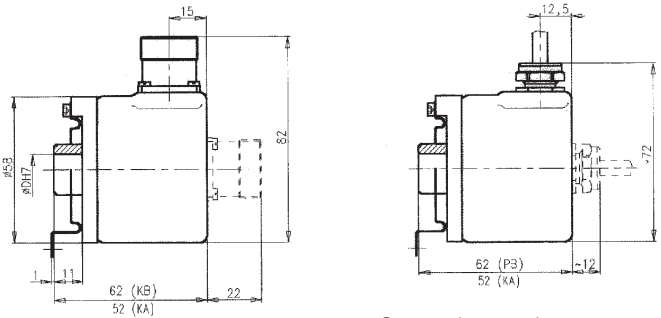
IRC300 - 305 IRC310 - 315







IRC320 - 325



Connection requirements