

Accessories

1 Homokinetic connections

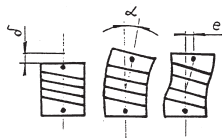
The connectors are used for connection of rotary encoders in a position corresponding to the equipment and they serve for balancing the deviation in axial and radial direction at sufficient torsional rigidity in both directions of rotation. The connectors flexibly balance the imprecision of the assembly and when transmitting the movement they guarantee that the kinematic error of transmission does not exceed the admissible values.

Working conditions:

- The atmosphere of the working environment must not contain aggressive gases
- The temperature of the working environment must not exceed the range of -40°C to +60°C
- Relative humidity of the environment is maximum 95%
- Pulsation does not exceed the acceleration of 3g to 400 Hz

Technical data:

Type	SP	SV
Max. rotations.min ⁻¹	6000	10000
Axial motion of axes δ max. mm	±0,1	±0,3
Angle deviation of axes α max. °	±0,4	±0,5
Radial shifting of axes e max. mm	±0,1	±0,2
Torsional rigidity N.m.rad ⁻¹	30	200



a) SP coupling

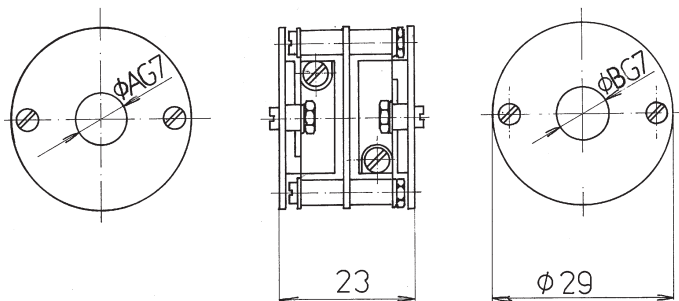
Description: The SP coupling is composed of two aluminium flanges and a flexible part. The flexible part is made of two lamellae and a distance piece.

SP coupling

∅ hole	SP1	SP2	SP3	SP4	SP5	SP6	SP7	SP8	SP9	SP10	SP11	SP12	SP13	SP14	SP15	SP16	SP17
∅ A	8	5	8	8	8	5	5	10	6	4,5	4,5	4,5	4,5	4,5	6	6	7
∅ B	8	5	5	6	10	6	10	10	6	4,5	5	6	8	10	10	7	8

Note: Standard SP1, SP2, SP3, SP4 and SP9, other optional.

Dimension drawing SP



b) SV coupling

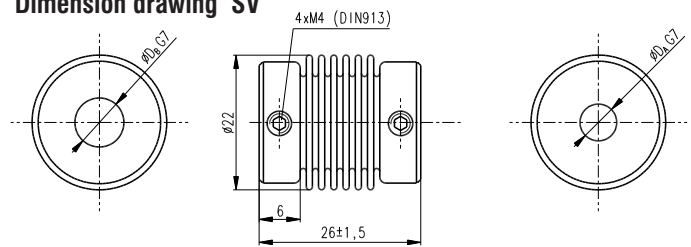
Description: The SV coupling is made from stainless steel and is fixed to the shaft with two screws M4 rotated by 90°.

SV coupling

∅ hole	SV1	SV2	SV3	SV4	SV5	SV6	SV7	SV8	SV9	SV10	SV11	SV12	SV13	SV14	SV15	SV16	SV17
∅ A	8	5	8	8	8	5	5	10	6	4,5	4,5	4,5	4,5	4,5	6	6	7
∅ B	8	5	5	6	10	6	10	10	6	4,5	5	6	8	10	10	7	8

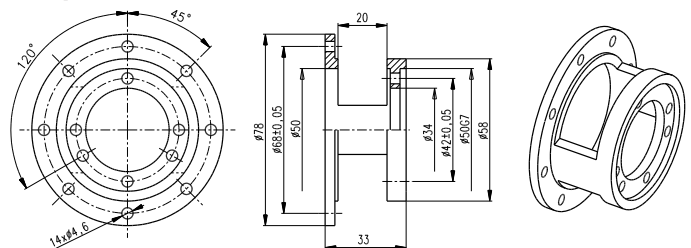
Note: Standard SV1, SV2, SV3, SV4 and SV9, other optional.

Dimension drawing SV

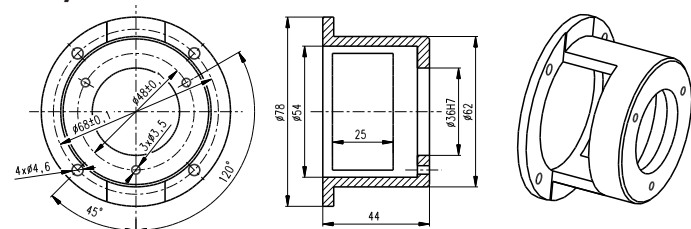


2 Encoders holders

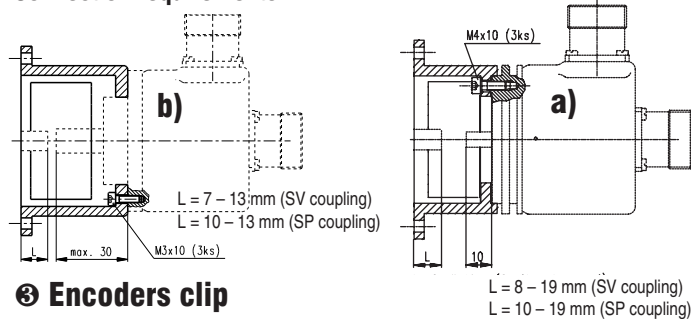
a) IRC300 – 308, ARC308, ARC310 and ARC40x



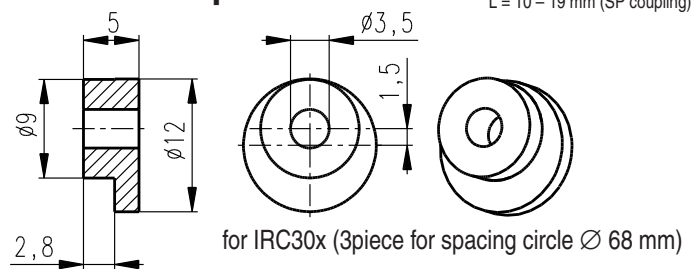
b) IRC310 – 315, IRC317, IRC318 and ARC41x



Connection requirements



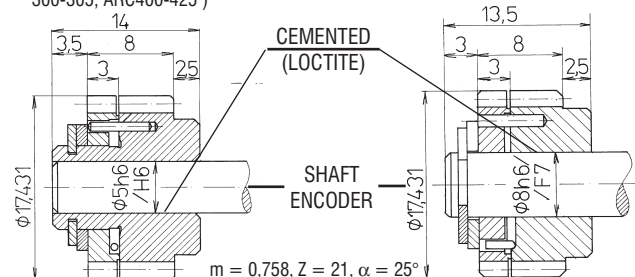
3 Encoders clip



4 Pinion

Pinion IRC5
(IRC120, 121, 122, 202, 205,
300-305, ARC400-425)

Pinion IRC8
(IRC125, IRC310-315, ARC410-415)

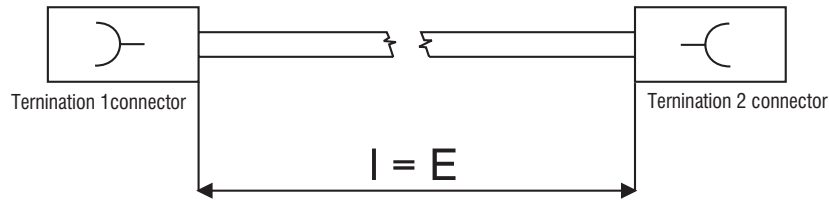


⑤ Extension cable

Cable SYFC 3x2x0,14+4x0,5 (LIY-C-Y 12x0,14) with connector CONTACT20.10.40.AC or VŠ24KPN11G1, optional with one end open.

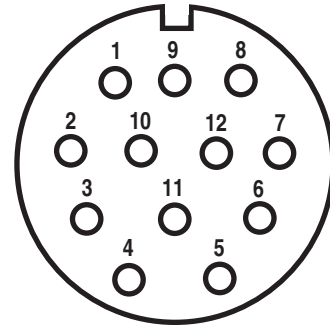
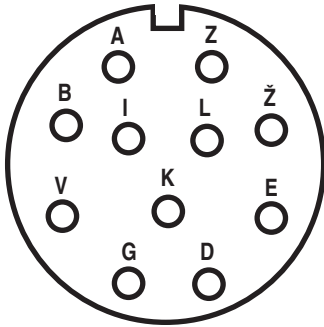
E (m)	2,5	4,5	6	8	10	12	15	17	20	25	35	50
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Other lengths optional...



Connection plug connector VŠ (see back)
Connection cable socket connector VŠ (see front)

Connection plug and cable plug connector CONTACT (see back)
Connection cable socket connector CONTACT (see front)



Connection cable for IRC with connectors CONTACT 20.10.40.AC and VŠ24KPN11.G1 or with one end open

Termination 1 connector CONTACT - pin	1	2	3	4	5	6	7	8	9	10	11	12
Termination 2 connector CONTACT - pin	1	2	3	4	5	6	-	8	9	10	11	12
Termination 2 connector VŠ - pin	D	A	K	I	V	B	-	G	L	E	E	A
Termination 2 one end open colour of cable	gray	pink	blue	violet	yellow	white	-	green	shield	black	brown	red
Significance	signal 2 non	sensor +U _n	signal 3	signal 3 non	signal 1	signal 1 non	NC	signal 2	shield	GND	sensor GND	+U _n

Connection cable for IRC120 to 125 with connectors VŠ24KPN11.G1 or with one end open

Termination 1 connector VŠ - pin	A	B	V	G	D	E	Ž	Z	I	K	L
Termination 2 connector VŠ - pin	A	B	V	G	D	E	Ž	Z	I	K	L
Termination 2 one end open colour of cable	red	white	yellow	green	gray	black	brown	pikk	violet	blue	shield
Significance	suply +5 V	signal 1 non	signal 1	signal 2	signal 2 non	GND	lamp 0 V	lamp +5 V	signal 3 non	signal 3	shield

Connection cable for ARC308 to 310 and ARC4xx/8 or 10bit with connectors CONTACT 20.10.10.AC (LIY-C-Y 12x0,14)

Pin connector	1	2	3	4	5	6	7	8	9	10	11	12
colour of cable	pink	yellow	green	brown	black	violet	white	gray	red-blue	gray-pink	red	blue
Crosscut S (mm ²)	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14
Significance	2 ⁰ + 90°	2 ⁰	2 ¹	2 ²	2 ³	2 ⁴	2 ⁵	2 ⁶	2 ⁷	2 ⁸	+ U _n	GND

LOOKING FOR SOLUTIONS SUBSTANDARD CONFIGURATIONS

Rotary encoders			
Index	Title	Description	Notes
P	Pinion	- pinion cemented onto the shaft \varnothing 5 or 8mm. Also layout with extended shaft possible(H) - possible for IRC120-2, IRC125, IRC20x, IRC30x, IRC31x, ARC4xx	Dimensioned scheme in the catalogue of encoders – section Accessories. Standard distance between pinion and encoder head: 1mm for IRC120-122 3,5 mm for IRC125-126
M	Frost-proof layout	- performed by replacement of some parts -40° to 60°C (IRC20x) -25° to 60°C (IRC3x0, IRC3x5) - choice in climate chamber -25° to 60°C (IRC3x1-IRC3x4, ARC4xx) -35° to 60°C (IRC3x0, IRC3x5)	
D	LED	- control LED installed in the back side of the housing blinks when the encoders passes through the zero point. - possible for IRC202, IRC205, IRC3x2, IRC3x5	Enables to set the zero point in cases when the position on the control system cannot be checked visually during the encoder adjustment.
H	Extended shaft	- the shaft can be extended acc. to customer's requirement. The length is measured from the encoder head. Max. length recommended: 40mm. - possible also for shafts with pinion end - possible for IRC20x, IRC30x, IRC31x, ARC40x, ARC41x	Encoders with extended shaft are not allowed to be exerted by the force set in the catalogue. The radial load declines according to the shaft length. Dimensioned scheme of PH shaft on request.
T	Low friction	- by means of removal of protection covers of the bearings, relubrication with a special oil and decreasing of the prestressing force you can achieve a very smooth operation of the encoder - possible for IRC20x, IRC30x, IRC40x	When the protection covers are removed, the protection level decreases – appropriate for clean plants. Also the radial and axial stress of the shaft decreases (by approx. 60%). A little volume of lubrication oil decreases the revolutions to max. 2000 rev.min-1. The rust protection of the bearings is lower too not suitable for external use.
G	Gufero	- Using gufero with double-sealed bearings covering IP67 is achieved - possible only for IRC30x, IRC125	This modification means the increase of friction moment 10x. Fitting for strong drives. Also the coupling is strongly stressed, especially during the run-up from the static modus.
B	Connector BINDER	- instead of connector CONTACT connector BINDER, type 723-09-0131-80-12 is built in the case	(IRC20x, IRC3xx)
C	Connector CANON on the cover	- instead of connector CONTACT connector CANON 9pin is built in the case - possible for IRC205, IRC3xx	Dimensioned chart and connection table on request
K	Layout PA (PB) with a cable with connector	- output cable of the encoder ended with connector type: CONTACT 20.10.50AC, CONTACT 20.10.40.AC, VS24KPN11.G1, WK18034, CAN9VP - possible for IRC3xx	Connection table on request
L	Infra LED in the illuminator	- in order to achieve better life, the bulb is replaced by infra LED (IRC202, IRC205)	Number of impulses per revolution is limited to 2500
V	Anti-vibration	- securing the measuring disc and large electronic parts by epoxy better resistance and life of the encoder in vibrating environment is achieved	
E	Adjustment of the central shaft diameter	- central diameter can be adjusted acc. to customer's requirement. Allowed extent 30 – 40 f8mm - possible for IRC31x	
W	No outlet condenser	- removal of protection and filter outlet condensers of the line exciter RS422 (IRC3x5, IRC900)	Supports the communication with non-standard external system circuits, but decreases the resistance against VF interferences
F	High frequency	- using special electronic devices the encoders work up to frequency of 700kHz, power consumption under 25mA. (IRC3x5)	At present only for some divisions, more information in the catalogue of encoders
N	Replacement encoders	- by modification of mechanical layout (H+P+lists) mechanical identity with IRC10x, IRC31x is achieved	Layout: N28.5 replacing IRC101, 102, 106, 111 N37 replacing IRC100, 110 For the replacement the reductions flange is required – more information in the catalogue section Replacement encoders

Manual hand wheels			
Index	Title	Description	Notes
F	With front panel	- the encoder is delivered with front panel (IRC53x) or connecting flange (IRC520-525)	performance by the customer possible front panel (IRC53x) 62451416, flange (IRC52x) 62451075+3x clip+3x screw
U	Adjusted output level	- the output is being lifted by means of pull-up resistors 1k5 (IRC535)	Output level does not comply with the TTL level requirements and is set following way: Max. load of output channels +1,6/-4mA Output levels UHI > 2,4 V (-1,4mA), ULO < 0,4V (100mA)
	IRC53x with a small control button	- the shaft is adjusted to \varnothing 6mm. So a small control button from IRC515 can be used (IRC53x)	

Linear measuring gauges			
Index	Title	Description	Notes
D	Stop	- starting position of measurement is always ensured by using a metal stop	
V	Adjusted output level	- mechanically reinforced ruler ensures better resistance against shock impulses	
K	PA layout with cable with connector ending	- output cable of the encoder ended with connector type: CONTACT 20.10.50AC, CONTACT 20.10.40.AC, VS24KPN11.G1, WK18034, CAN9VP	Connecting table on request

Coupling			
Index	Title	Description	Notes
SV-A	SV-A coupling	- wave coupling with extended flange and \varnothing 14mm from one side	
SP-0	SP-0 coupling	- rule coupling with one opposite turned flange	The shaft passing the flange A must pass through its full length.

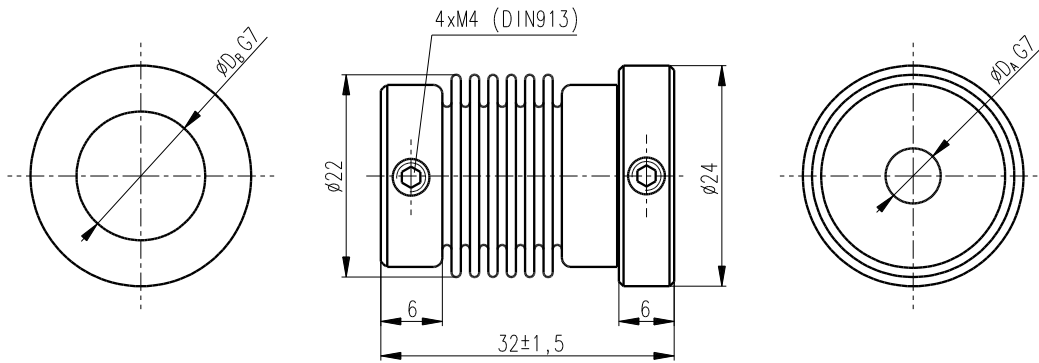
Our interest is to fulfill requirements of our customers, even when standard type series encoder cannot be used. If the requested modification is technically feasible, then index of NON-STANDARD MODIFICATION (see catalogue of encoders) is assigned to such modification.

We want to meet the requirements of our customers, even if it is impossible to use a standard encoder. If the required adjustment is technically possible, it is given an index of NON-STANDARD LAYOUT (see catalogue). The price increase depends on the question, how complicated and extensive the modification was. If you have any questions feel free to contact us, we will do our best to help you find a solution for your problem by designing a suitable encoder or by means of non-standard modifications (see above). In case of larger number of encoders we can help developing special encoders for the respective application.

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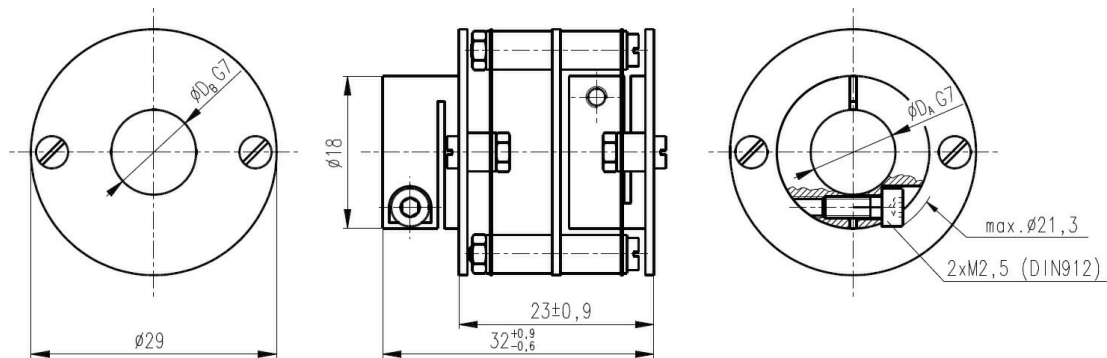
Dimensioned drawing

Coupling SV-A

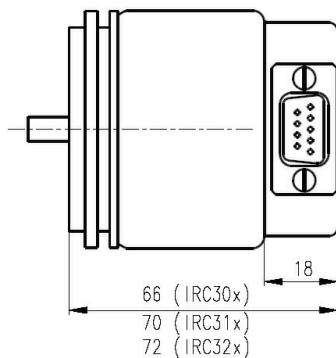


SV-A coupling is combined of diameters 5, 6, 8, 10 and 12 mm. On the side with \varnothing DB the diameter is 14 mm.

Coupling SP-0



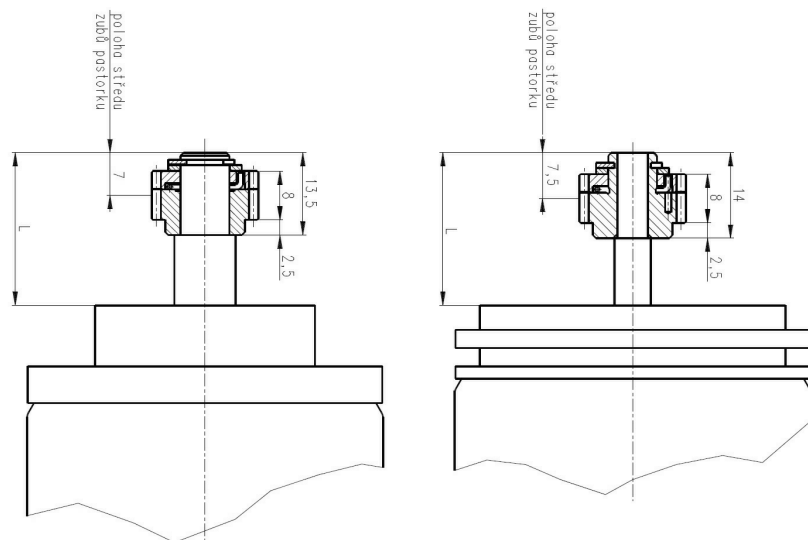
Outlet KC



PIN conector CANON	Significance IRC3xxKC
1	Signal 1
2	Signal 1 non
3	Signal 2
4	Signal 2non
5	U_n
6	Signal 3
7	Signal 3 non
8	GND
9	Shielding

Extended pinion shaft (IRC31x, IRC30x, IRC20x)

Standard shaft lengths delivered:
 L = 15 mm (IRC20x, IRC30x, ARC40x)
 L = 14.5 mm (IRC31x, ARC41x)
 L = 17 mm (IRC125)
 Other length on agreement.



IRC125, IRC31x, ARC41x

IRC30x, ARC40x, IRC20x



LARM

LOOKING FOR SOLUTIONS

Replacement old encoders new encoders

Old type	ENCODER		Adjusting cable reduction	Requirements	Notes	Dimensions drawing
	Replacement encoder					
	General repl. encoder	Direct repl. encoder + reduction flange				
IRC100	IRC304, IRC305 IRC314, IRC315 IRC324, IRC325	IRC314(5) KA (KB) + flange 62451437 fig. 2	Reduction 304/100-101-106	Pin voltage A +5V/120 mA	* impulse number 150 cannot be replaced * there is no replacement encoder for pin voltage A over 5V to 8.5V	<p>Fig. 1</p>
	IRC302, IRC300 IRC312, IRC310 IRC322, IRC320	IRC312(0) KA (KB) + flange 62451437 fig. 2		Pin voltage A +8.5V to 13V/100 mA		
IRC101 IRC106 with bulb voltage 4V	IRC304, IRC305 IRC314, IRC315 IRC324, IRC325	IRC314(5) KA (KB) + flange 62451437 fig. 1	Reduction 304/100-101-106	Pin voltage A +5V/120 mA	* impulse number 400 not available * there is no replacement encoder for pin voltage A over 5V to 8.5V * prior to IRC106 encoder replacement (easy run) contact the manufacturer	
	IRC302, IRC300 IRC312, IRC310 IRC322, IRC320	IRC312(0) KA (KB) + flange 62451437 fig. 1		Pin voltage A +8.5V to 13V/100 mA		
IRC101 with bulb voltage 5V	IRC304, IRC305 IRC314, IRC315 IRC324, IRC325	IRC314(5) KA (KB) + flange 62451437 fig. 1	Reduction 304/101	Pin voltage A +5V/120 mA	* impulse number 400 not available * there is no replacement encoder for pin voltage A over 5V to 8.5V	
	IRC302, IRC300 IRC312, IRC310 IRC322, IRC320	IRC312(0) KA (KB) + flange 62451437 fig. 1		Pin voltage A +8.5V to 13V/100 mA		
IRC102	IRC305 IRC315 IRC325	IRC315 KA (KB) + flange 62451437 fig. 1	Reduction 305/102	Pin voltage A +5V/120 mA	* impulse number 400 not possible	
		IRC135	Not required	Pin voltage A +5V/80 mA Z +5V/160 mA	* run out model Connector and mech. couplings identical with the original type	
IRC107	No replacement encoder				* two different divisions of the measuring disk	
IRC110	IRC303 IRC313 IRC323	IRC313 KA (KB) N37 + flange 62451437 fig. 2	Reduction 303/110	Pin voltage A +5V/120 mA B +5V to 15V/50 mA		
	IRC305 IRC315 IRC325	IRC315 KA (KB) N37 + flange 62451437 fig. 2	Reduction 305/110 In preparation			
IRC111	IRC305 IRC315 IRC325	IRC315 KA (KB) N28.5 + flange 62451437 fig. 1	Reduction 305/111-120-125	Pin voltage A +5V/120 mA	* reduction not needed if the whole connecting cable with end piece 1x CONTACT 20.10.10.AC and 1x VS24KPN11G1 will be replaced (see Accessories) + in VS connector a 47R/0,6W resistor must be soldered to pin Z and Z	
IRC120 IRC125	IRC305 IRC315 IRC325	/	Reduction 305/111-120-125	Pin voltage A +5V/120 mA	* reduction not needed if the whole connecting cable with end piece 1x CONTACT 20.10.10.AC and 1x VS24KPN11G1 will be replaced (see Accessories) + in VS connector a 47R/0,6W resistor must be soldered to pin Z and Z	
IRC121	IRC305 IRC315 IRC325	/	Reduction 305/121 In preparation		* current output	
IRC122	IRC303 IRC313 IRC323	/	Reduction 303/122	Pin voltage A +5V/120 mA B +5V to 15V/30 mA		
	IRC305 IRC315 IRC325	/	Reduction 305/122 In preparation			
IRC124	No replacement encoder				* electrically identical with IRC 3x5, but non-explosive design not possible	
IRC130	No replacement encoder				* push/pull output up to 15V (see IRC3x0), but division of 50 impulses not possible	
IRC200	No replacement encoder				* electrically identical with IRC 305, but there is no design with passing through shaft	
IRC202	IRC302	IRC302	Not required		* electrically and mechanically compatible * impulse number 84, 96, 108, 124, 128, 168, 192, 400, 600, 720 and 900 not possible	
IRC205	IRC305	IRC305	Not required		* electrically and mechanically compatible * impulse number 84, 96, 108, 124, 128, 168, 192, 400, 600, 720 and 900 not possible	

Note: Replacing encoders are divided in two categories: general and direct replacement encoders. **General replacement encoder** complies with electric parameters of the original (old) encoder as for the connection of the cable reduction; the mechanic coupling onto the machine, however, must be adjusted for the new encoder – appropriate in case of machine renewal. Dimension and coupling mechanic measurements of these encoders are usually not compatible with the old encoder. **Direct replacement encoder** – after the replenishment with a reduction flange and cable reduction a “piece for piece” replacement is possible. This is advantageous when servicing the machine, on the other side, this is a non-standard layout (marked N), almost excluding express deliveries. The flange can also be used for a standard encoder IRC 31x, the length and diameter of the output shaft is however different – see figures. As the distance of the connector at the side layout is different, it is always necessary to considerate carefully if you use KB or KA outlet.

Cable reduction adjusts the connection electrically for the connection to the original cable. It shall be connected between the new encoder and its length is always 0.5 m. In frame of the program LOOKING FOR SOLUTIONS we have been working on the preparation of new types of cable reductions. These meet the requirements of service stuff, as their adjusting circuits will be constructed for IRC3x5 encoder – which will lower the necessary range of encoders required when repairing machines. If the assessment system is equipped with a check of power running through a bulb, and this control is indicated, you can either eliminate the protection (by means of software or hardware) or connect the “heating” resistor 8R2 to 10R/3W onto the bulb supply (Z, Z) – this applies especially for lines IRC 10x, IRC 11x). The new couplings as well as encoder holders can be found in our catalogue – section Accessories.

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