



Reed contact rod **iKMA263**

for path measurements
in hydraulic cylinders
by means of magnetically
operated contacts

- Path measurements from 100 mm to 2,000 mm
- any fitting position
- Contact spacing 2 mm or 4 mm
- largely unaffected by external influences
- maintenance free as contacts are operated by magnets
- Type of protection: IP 65 according to EN 60529/IEC 529; EEx ia I intrinsically safe according to Directive 94/9/EC (ATEX)



*Installing the reed contact rod
into a ranging arm lifting cylinder*

Function and design

Path measurements are conducted on the basis of the magnet switch principle with inert gas contacts being strung together over the complete measuring length. The distance between the contacts which is the measure for the resolution is 2 mm or 4 mm. The individual contacts act on a combination of resistors.

The path over the measuring length is determined by means of a permanent magnet. The latter passes along the reed contacts and the respective contact activated provides a resistance value which will be evaluated to determine the position. A current or voltage output is available for the analog signal. Without additional connection the resistance value can be used direct for evaluation.

The chain of resistors with the reed contacts and the evaluation circuit is embedded in cast resin and housed in a rugged pipe made of stainless steel. This arrangement ensures adequate safety with respect to explosion protection and mechanical damage. The cable leading out of the potting compound largely resists acids and alkaline solutions. In order to enable the user to adapt to the conditions of application the output cable can be provided with free conductor ends or a Lumberg connector.

The permanent magnet comes in the shape of an annular magnet. The magnet segments are housed in a brass enclosure and are also embedded in cast resin compound.

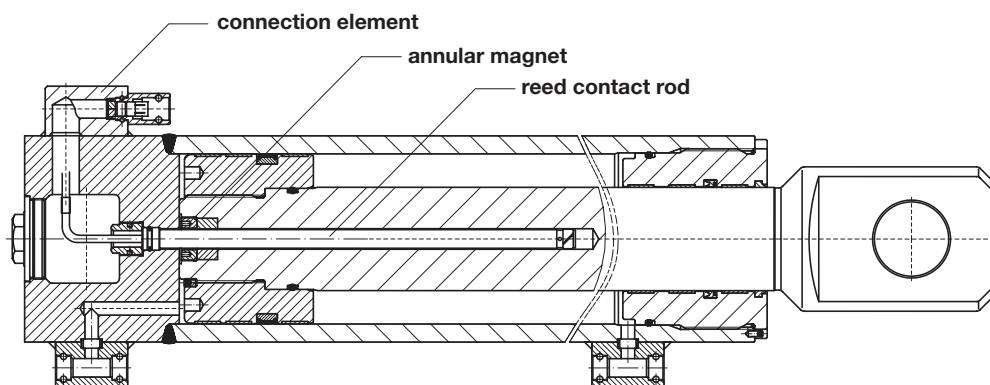
Application

The reed contact rod iKMA263 and the annular magnet M31 have been especially designed for installation into a lifting cylinder. The figure below shows the reed contact rod being installed into the cylinder and forming the locally unchanging measuring instrument.

The annular magnet is fastened to the piston rod. Thus, the path length analogous to the stroke is measured as the piston moves.

The reed contact rod is available for a stroke range between 100 mm and 2,000 mm.

The connection of the output cable can be made by the user individually. The type with the free conductor ends has the connection to the evaluation unit made via a connection box attached to the cylinder. For the type using Lumberg connectors a special connection element is available which is shown in the illustration below and a dimensioned drawing. The output of the reed contact rod is directed towards the Lumberg socket while a rugged hose is connected to the evaluation unit via the SKK24 socket.



Technical data

Measuring length (stroke)	100 mm - 2.000 mm; different lengths upon inquiry	
Contact spacing	2 mm und 4 mm	
Fitting length		
with current or voltage output	with 2 mm spacing:	measuring length +190 mm
	with 4 mm spacing:	measuring length +150 mm
without connection *)		measuring length +130 mm
Fitting position	any	
Reproducibility	± 0,2 mm	
Input voltage	$V_{nom} = 12 \text{ V DC}$; $V_{max} = 13,5 \text{ V DC}$	
Analog output signal	0,5 V - 4,5 V 1,0 V - 10,0 V 2,0 V - 10,0 V 4,0 mA - 20,0 mA other values upon inquiry without connection *)	
Operating life	> 10^9 measurement cycles	
Temperature range	-20°C to 60°C	
Type of connection	free conductor ends or Lumberg connector	
Type of protection	IP 65 acc. to EN 60529/IEC 529; I M2 EEx ia I acc. to Directive 94/9/EC	
Certificate number	BVS 03 ATEX E 320	

*) without connection the ohmic resistance of the respective measurement chain is present at the output

Type code and ordering information

Type iKMA263*167Z**/**/*

Cable length, standard: free conductor ends - 2 m, Lumberg connector - 200 mm, other cable lengths upon inquiry

Contact spacing: 2 mm or 4 mm

Measuring length (stroke)

Analog signal range

Output signal: U = voltage, I = current, 9 = without connection

Cable output: L = free conductor ends, S = Lumberg connector

Typical example

iKMA263L167ZU1,0-10,0/12004/02m

02m ➤ output cable: 2 m

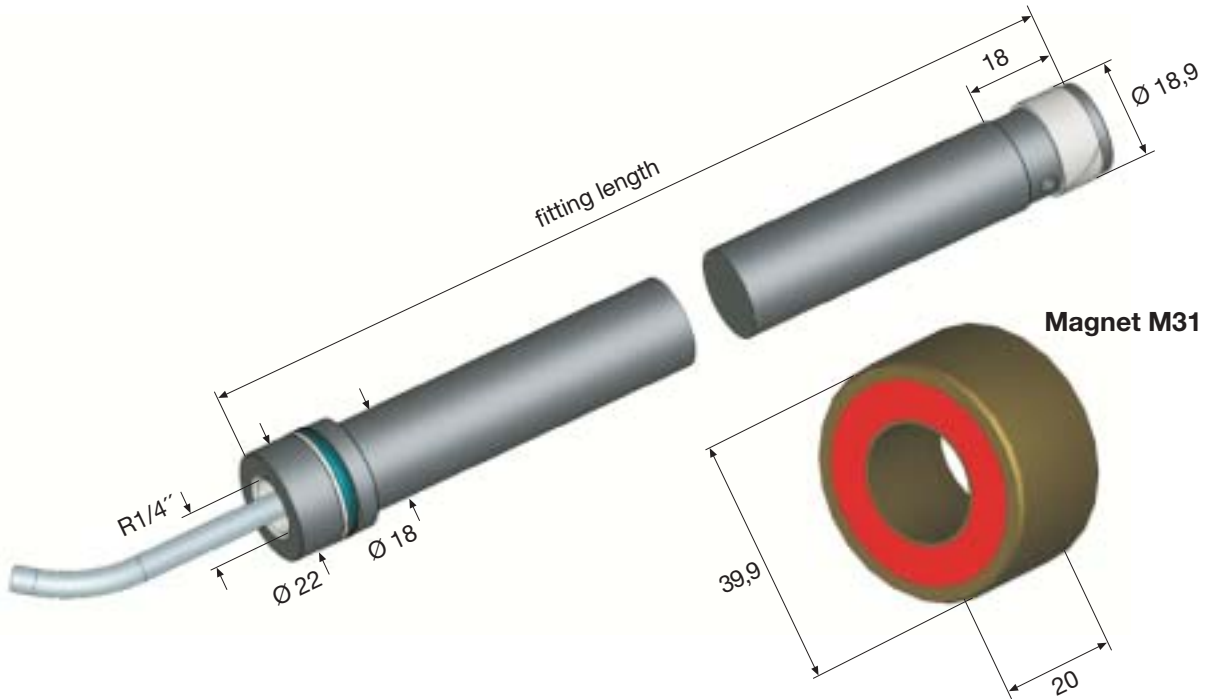
4 ➤ contact spacing: 4 mm

1200 ➤ measuring length (stroke)

1,0-10,0 ➤ analog voltage range

U ➤ voltage signal

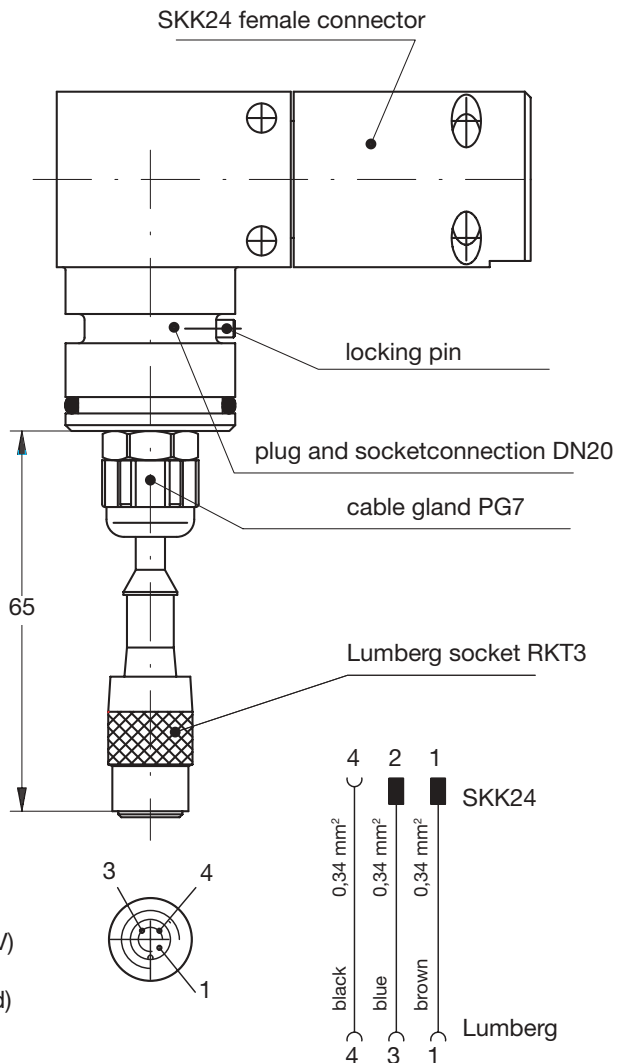
L ➤ output cable with free conductor ends

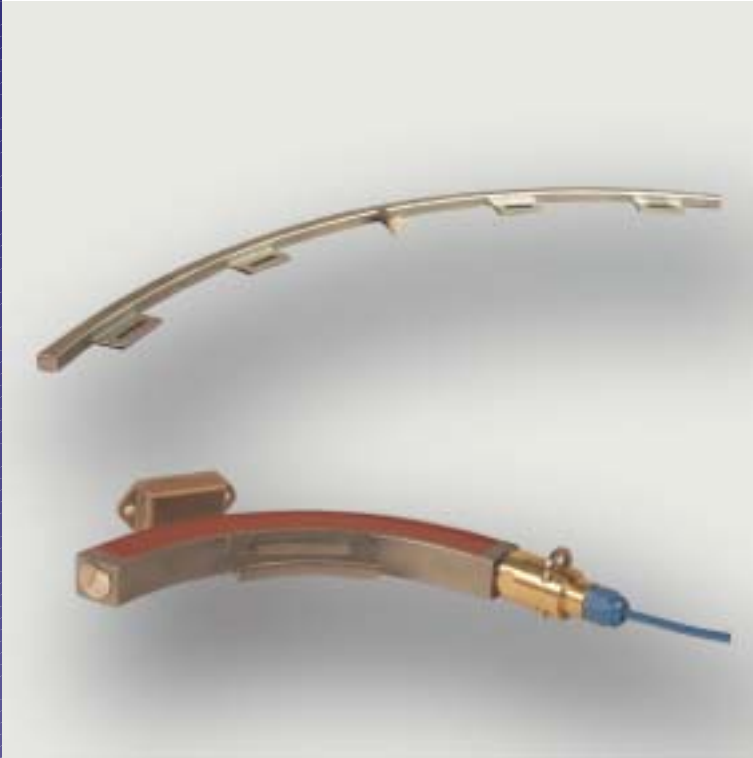


free conductor ends

Input voltage	black
Output signal	brown
Ground	white

plug-in elbow



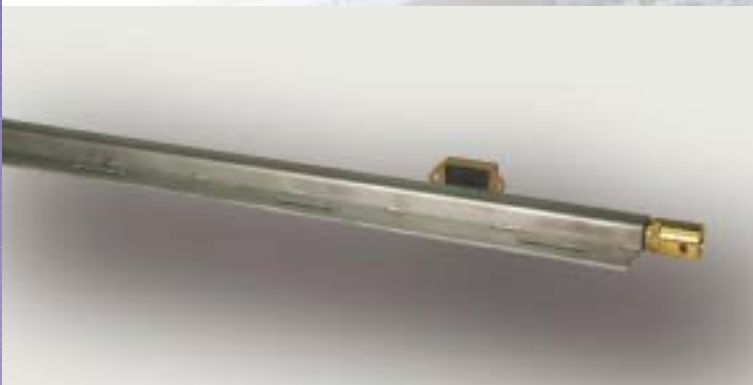


Reed contact rod **iKMA...** Channel section rod

for path measurements
by means of magnetically
operated contacts

bent-type rod

- Path measurement: bent-type rod $r = 170$ mm up to 1,000 mm; straight-type rod up to 2,500 mm
- any fitting position
- Contact spacing: 2 mm or 4 mm for the straight type, approx. 3 mm for the bent type
- largely unaffected by external influences
- maintenance free as contacts are operated by magnets
- Type of protection: IP 65 according to EN 60529/IEC 529; EEx ia I intrinsically safe according to Directive 94/9/EC (ATEX)



straight-type rod

Function and design

Path measurements are conducted on the basis of the magnet switch principle with inert gas contacts being strung together over the complete measuring length. The distance between the contacts is the measure for the resolution; it is 2 mm or 4 mm for the straight-type and approx. 3 mm for the bent-type rod. The individual contacts act on a combination of resistors.

The path over the measuring length is determined by means of a permanent magnet. The latter passes along the reed contacts and the respective contact activated provides a resistance value which will be evaluated to determine the position. A current or voltage output is available for the analog signal. Without additional connection the resistance value can be used direct for evaluation.

The chain of resistors with the reed contacts and the evaluation circuit is embedded in cast resin and housed in a rugged channel section bar made of stainless steel. This arrangement ensures adequate safety with respect to explosion protection and mechanical damage.

The connection led out of the cast resin leads to an SKK24 connector which forms an integral unit with the reed contact rod.

For path measurements a series M8 to M10 permanent magnet can be used. The permanent magnet preferably used is type M10.

Application

The design has been made such that the reed contact rods can be easily integrated into new or retrofit installations. Thus, the reed contact rods are e.g. installed in a roadheader for monitoring the movements of a cutting arm. While the vertical deflection is measured using model 263 (see information sheet iKMA263) installed in the lifting cylinder, the horizontal deflection is measured by means of the bent-type rod.

As standard, the reed contact rods of the bent type are available up to a radius of 1,000 mm with the arc length of a circular sector of 90° and of the straight-type up to a length of 2,500 mm. If different sizes are required an inquiry should be sent.

The electrical connection of the reed contact rod with the evaluation unit is provided via the female connector with the rugged SKK24 hose line.

Technical data

Measuring length straight type	100 mm - 2.500 mm; different length upon requiry
bent type	arc length acc. to requirements, radius of circular sector $r = 170$ mm to 1.000 mm, different sizes upon requiry
Contact spacing straight type	2 mm and 4 mm
bent type	approx. 3 mm
Fitting position	any
Reproducibility	$\pm 0,2$ mm
Input voltage	$V_{nom} = 12$ V DC; $V_{max} = 13,5$ V DC
Analog output signal	0,5 V - 4,5 V 1,0 V - 10,0 V 2,0 V - 10,0 V 4,0 mA - 20,0 mA other values upon requiry without connection *)
Operating life	$> 10^9$ measurement cycles
Temperature range	-20°C to 60°C
Type of connection	SKK24 connector
Type of protection	IP 65 acc. to EN 60529/IEC 529; I M2 EEx ia I acc. to Directive 94/9/EC (ATEX)
Certificate number	BVS 03 ATEX E 320

*) without connection the ohmic resistance of the respective measurement chain is present at the output

Type code and ordering information

Type iKMA***S167Z**/**

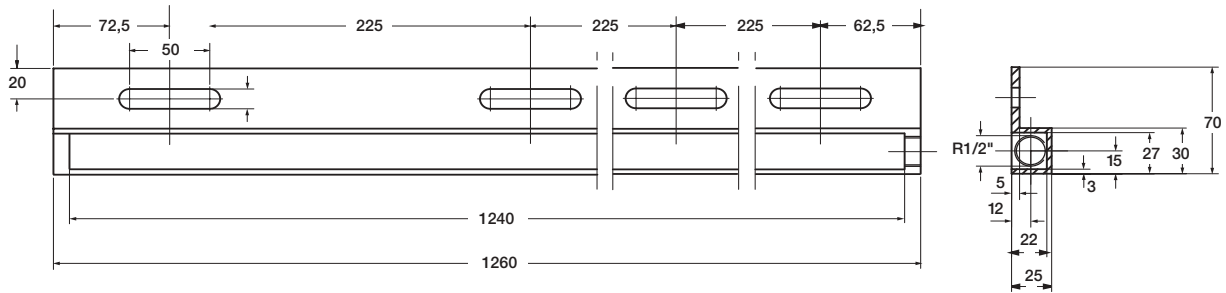
***	Contact spacing: 2 mm oder 4 mm, NA for bent-type rod
167	Measuring length or radius
Z	Analog signal range
**	Output signal: U = voltage, I = current, 9 = without connection
**	SKK24 connector
/**	Serial number for device specification

Typical example

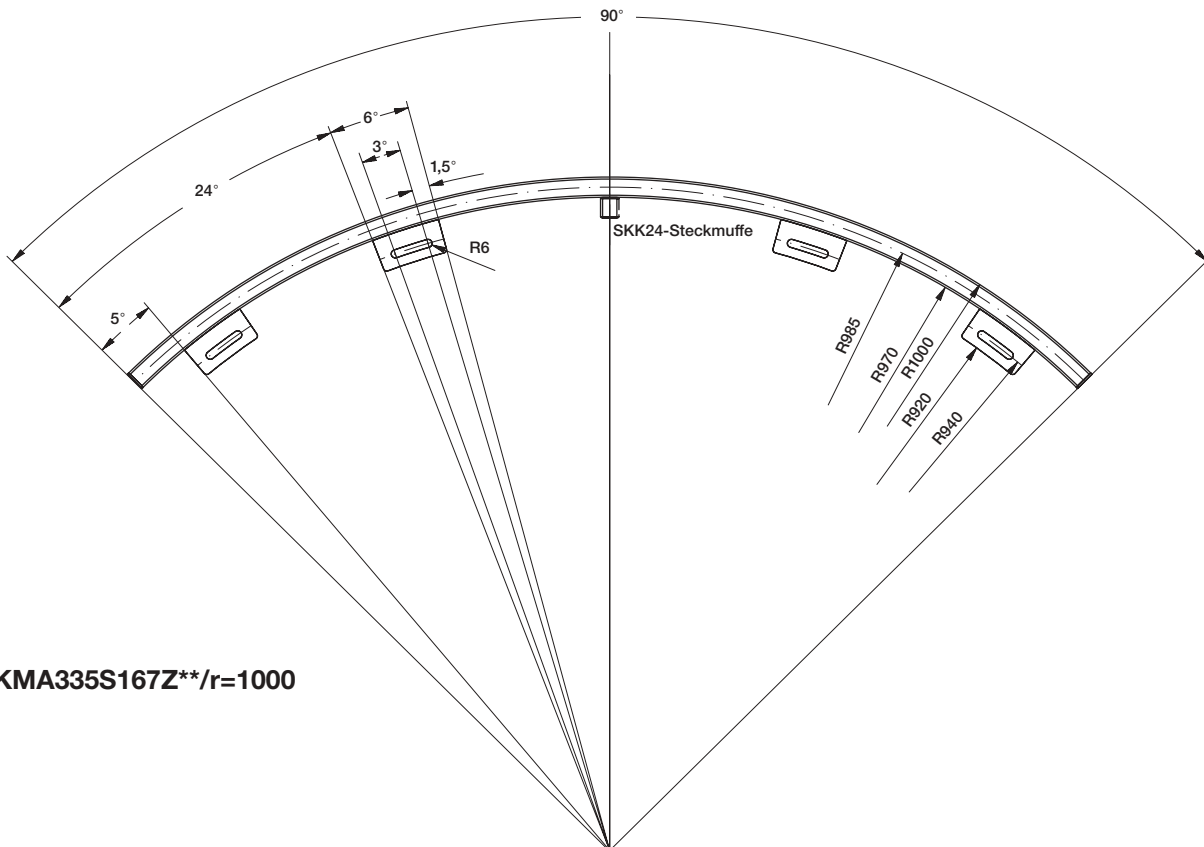
iKMA335S167ZI4,0-20,0/r = 1000

335	r = 1000	➤ radius of circular sector
S	4,0-20,0	➤ analog current range
I	I	➤ current signal
S	S	➤ SKK24 female connector

Typical examples



iKMA393S167Z/1100***



iKMA335S167Z/r=1000**