

Proximity Switches RS (Reed Switch)

General

Pneumatic systems can often be combined with electric control circuits. The position of the piston in the cylinder can then be sensed by means of a proximity switch which delivers signals to the control system. The ORIGA type RS proximity switch is a non-contacting, electric sensor integrated with the cylinder. No external cams or other mechanical actuating devices are necessary. The cylinder, incorporating the required number of switches, is a complete unit which is ready for installation.

Operation

The type RS proximity switch consists of a reed switch which is actuated by a permanent magnet in the piston. The snap action of the contacts on closure ensures distinct and reliable operation.

Design

The reed switch is encapsulated and is enclosed in an aluminium case, to which the connecting cables are securely clamped. The design is very sturdy and the reed switches used can withstand high mechanical and electrical loads. The proximity switch consists of an encapsulated reed switch and an associated mounting. The proximity switches can therefore be very easily adjusted to operate at the required point along the piston stroke. All parts of the proximity switch are made of corrosion resistant materials.

Accuracy

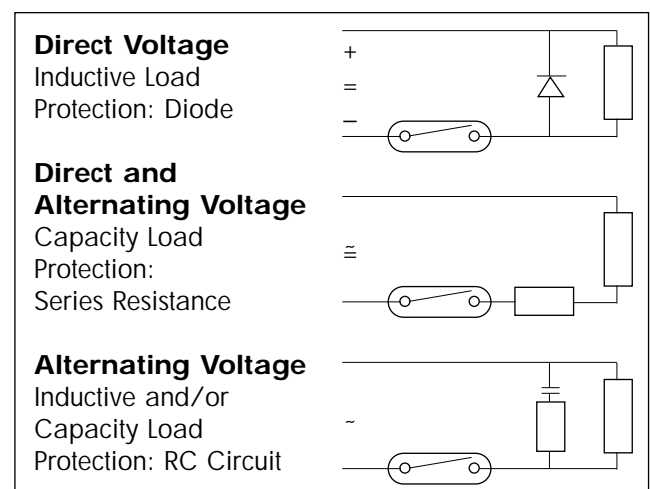
The accuracy of a control system is dependent on the repeatability, hysteresis and dynamic error of the components. The repeatability of the reed switches used for the ORIGA proximity switches is excellent - .0004 in. In practice, the repeatability of a control system is determined by other components, such as by the variations in the operating points of associated relays and valves. The variations in the operating points of relays, valves and sensors are additive. Hysteresis is the directional dependence of the operating point, i.e. the switch is actuated at a slightly different piston position when the piston is moving in one direction than it is when the piston is moving in the opposite direction. An inherent feature of the reed switch is that the distance between these operating points is large. If an identical operating point is required, regardless of the direction of travel, two proximity switches - one on each side of the cylinder - can be used. These switches

can then be connected across logic circuits which will select the appropriate switch when the piston is moving to the right or to the left. Positional deviations in the positioning of the piston, for instance, will occur when the piston speed, its load or the compressed air supply pressure is varied (dynamic error).

Electrical Useful Life

The electrical useful life of the reed switch is determined by a number of factors, such as the breaking load, type of load and the type of electric power. The reed switches used have a high nominal rating of 35 watts ($\varnothing 10:10$ Watt). The electrical useful life is normally $3 - 6 \times 10^6$ switching operations at 35 Watt ($\varnothing 10:10$ Watt). At a lower load, the useful life is extremely high (more than 100×10^6 switching operations). The transients occurring in switching inductive loads (relay coils, solenoid valves, contactors) should be suppressed by means of diodes, RC circuits or varistors (voltage-dependent resistors). A diode connected in parallel with the load offers an inexpensive and reliable method of spark-suppression, although this can only be used on D.C. RC circuits and varistors can be used for A.C. and D.C., but these are more expensive and must be carefully matched to the circuit. Note that all types of spark-suppression devices across solenoid valves and relays cause some measure of drop-out delay. In the case of resistive loading with high inrush current (such as incandescent lamps), a protective resistor should be fitted in series with the load. Protective resistors should also be used when the cables are very long and the voltage is in excess of 100 V.

For the above reasons, a universal instrument (ohmmeter) or LEDs should be used for adjustment and checking of ORIGA proximity switches.

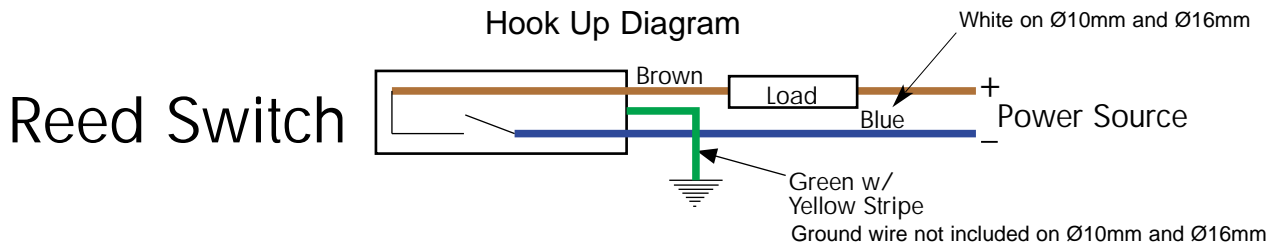


Technical Data

Proximity Switch RS

Manufacturer	ORIGA
Type	RS
Switching Configuration	Normally Open
Maximum Contact Rating	35 Watts (Ø 10mm = 10 Watts)
Maximum Voltage	250 Volts AC/DC
Maximum Starting Current	1.5 Amps (Ø 10mm = .5 Amps)
Hysteresis (integral)	Approx. 8mm
Temperature Range	-20° F to +175° F
Enclosure Class	IP 65
Housing Material	Anodized Aluminum

obsolete - please contact customer service at Hoerbiger-Origa

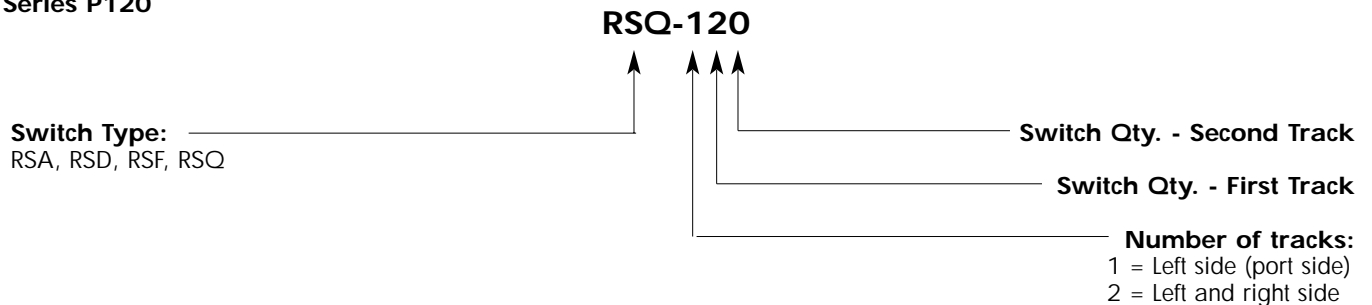


Reed Switches (RS) - Series 2000 (ref. page 4.1/5)

Designation		Bore Sizes					
		10mm	16mm	25mm	32mm	40mm	50mm
Type RS (without LED)	Part Number	3047	1723	2676-0201/5	2676-0301/5	2676-0301/5	2676-0501/5
5 Meter Cable							
Type RS (with LED)	Part Number	N/A	N/A	N/A	2690-0301/5	2690-0301/5	2690-0501/5
5 Meter Cable							
Sensor Clamp w/Set Screw	Part Number	N/A	1271	2689-0201	N/A	N/A	N/A

Ordering Procedure - Reed Switches (RS) - Series P120 (ref. page 4.1/7)

Series P120



Proximity Switches IS (Hall Effect Switch with LED)

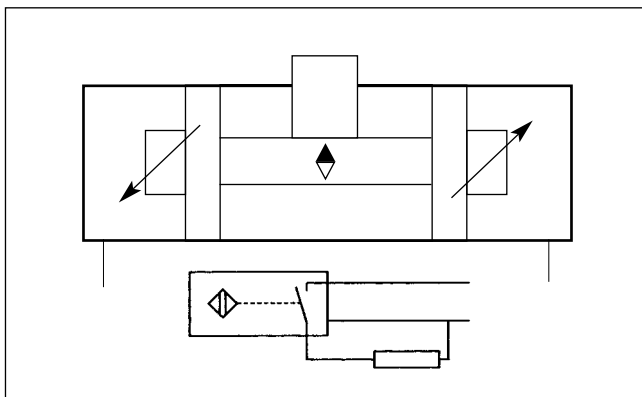
General

Pneumatic systems can often be combined with electric control circuits. The position of the piston in the cylinder can then be sensed by means of a proximity switch which delivers signals to the control system.

The ORIGA Type IS proximity switch is a non-contacting electric sensor integrated with the cylinder. No external cams or other mechanical actuating devices are necessary. The cylinder, incorporating the required number of switches, is a complete unit which is ready for installation.

Operation

The basic principle of the hall effect sensing element is a high frequency oscillator circuit which is influenced by the magnetic field of the piston. With a defined magnetic field density the bounce free output signal is supplied via a flip-flop and an output stage and is indicated by the LED. The output signal can be processed into a control signal and is particularly suitable for signal input in programmable controllers.



Advantages

Full electrical operation—no moving parts—wear free. Bounce-free signal output. Unaffected by shaking and vibration. High switching frequency. Built-in LED. Short circuit protected switching output with integral protective circuit. Low switching hysteresis.

Design

The IS switch is enclosed in an aluminium case to which the connecting cables are securely clamped. The proximity switch and its associated mounting

clamp is mounted in the grooves along the cylinder. The proximity switches can therefore very easily be adjusted to operate at the required point along the piston stroke. All parts of the proximity switch are made of corrosion resistant materials.

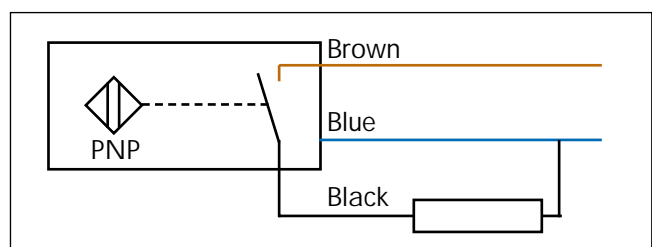
Accuracy

The accuracy of a control system is dependent on the repeatability, hysteresis and dynamic error of the components. The repeatability of the hall effect switches used for the ORIGA IS proximity switches is excellent - .0004 in. In practice the repeatability of a control system is determined by other components such as by the variations in the operating points or relays and valves and sensors are additive. Hysteresis is the directional dependency of the operating point i.e. the switch is actuated at slightly different piston position when the piston is moving in one direction than it is when the piston is moving in the opposite direction. With hall effect switches the difference between those operating points is very small. If an identical operating point is required, regardless of the direction of travel, two proximity switches (one on each side of the cylinder) can be used. These switches can then be connected across logic circuits which will select the appropriate switch when the piston is moving to the right or the left. Positional deviations in the positioning of the piston, for instance, will occur when the piston speed, its load or the compressed air supply pressure is varied (dynamic error).

Electrical Service Life

Because of the fully electronic mode of operation the electrical service life is theoretically unlimited. The IS sensor has integrated protection against inductive voltage peaks and is short circuit protected. Electrical protective circuits are not required.

Connection Diagram



Technical Data

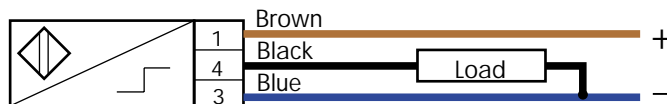
Proximity Switch (Hall Effect)

Manufacturer	ORIGA
Type	IS
Switching Configuration	Normally Open
Output Type	PNP
Maximum Continuous Current	200 mA
Maximum Voltage	10 - 30 Volt DC
Switch Indicator	LED
Maximum Closing Frequency	1 kHz (approx.)
Maximum Starting Current	1.5 Amps (Ø 10mm = .5 Amps)
Hysteresis (mounted)	Approx. .8mm
Temperature Range	-20° F to +175° F
Enclosure Class	IP 67
Housing Material	Anodized Aluminum
Connection Cable	3 X .25mm ²

Note: Connection leads are polarity protected.
Protection against inductive voltage peaks.
Short circuit protected.

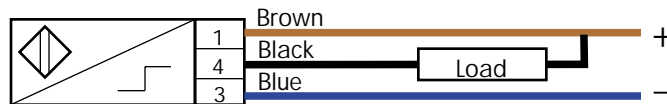
Hall Effect

Hook Up Diagram



PNP (Sourcing)

Hall Effect



NPN (Sinking)

Inductive Switches (IS) - Series 2000/PowerGuide

Designation		Bore Sizes					
		10mm	16mm	25mm	32mm	40mm	50mm
Type IS PNP (with LED)	Part Number	3049	1724	0223*	0223-0301*	0223-0301	0223-0501
5 Meter Cable							
Type IS NPN (with LED)	Part Number	3753	3754	3755*	3755-0301*	3755-0301	3755-0501
5 Meter Cable							
Sensor Clamp w/Set Screw	Part Number	N/A	1271	2689-0201*	2689-0301	2689-0301	2689-0501

*Note: For 32mm PowerGuide cylinders use 25mm sensors and clamp.

Proximity Switch Series 2000 cylinders

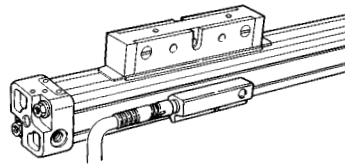
For non-contact sensing of piston position on Origa rodless cylinders.

Type IS (Hall Effect Switch)

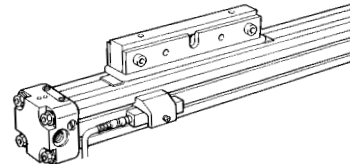
Available for Ø 10mm, 16mm and 50mm

- Proximity switch with cable connection for sensing end or intermediate positions.
- LED indicator
- Cable length 16 ft.

Ø10mm



Ø16mm - 50mm

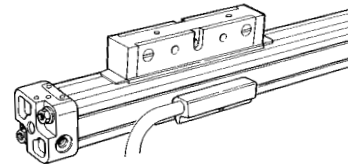


Type RS (Reed Switch)

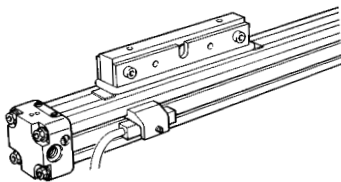
Available for Ø 10mm, 16mm, 25mm, 32mm, 40mm and 50mm

- Proximity switch with cable connection for sensing end or intermediate positions.
- Cable length 16 ft.

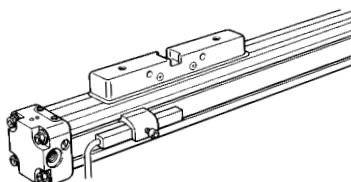
Ø10mm



Ø16mm



Ø25mm



Ø32mm - 50mm

Advantages of Proximity Switches (RS and IS)

Simple Installation

The proximity switch is clamped in the required position simply by means of the clamp attachment. The sensor and clamp fit anywhere along the barrel grooves as illustrated in the above drawing.

Compact

The proximity switches are mounted directly to the side of the barrel and require minimal additional space - compact in design, the overall length of the cylinder does not change.

Safe in Operation

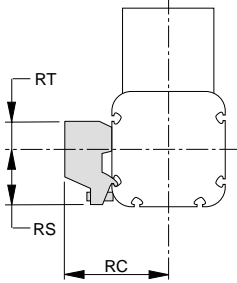
The proximity switch encapsulated in the aluminum housing has IP 65 (RS) and IP 67 (IS) protection and therefore can be used under adverse environmental conditions.

Cost Effective

Eliminates the need for cam and switch mountings. Maintenance free, no wearing parts.

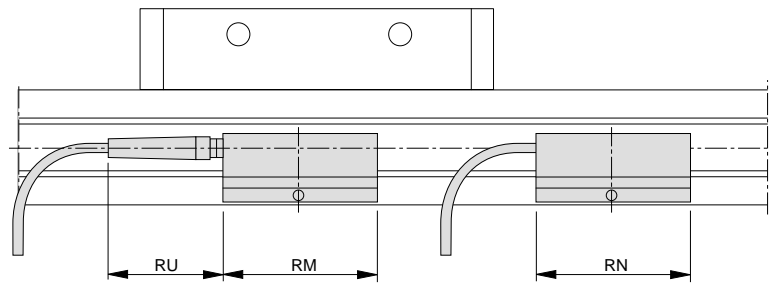
Dimensions

Ø10mm

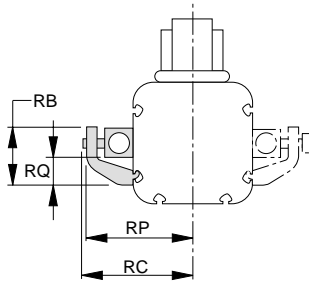


Ø10mm (IS)

Ø10mm (RS)

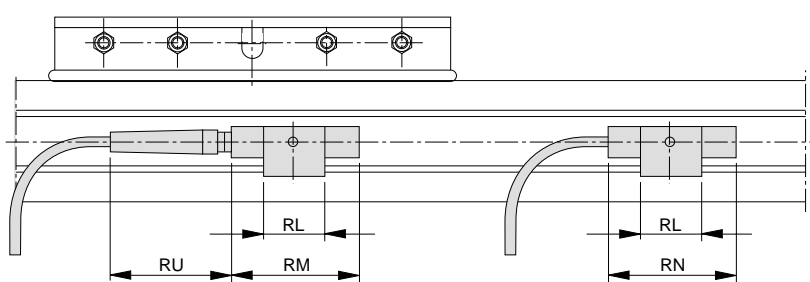


Ø16mm

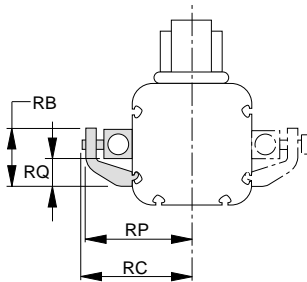


Ø16mm (IS)

Ø16mm (RS)

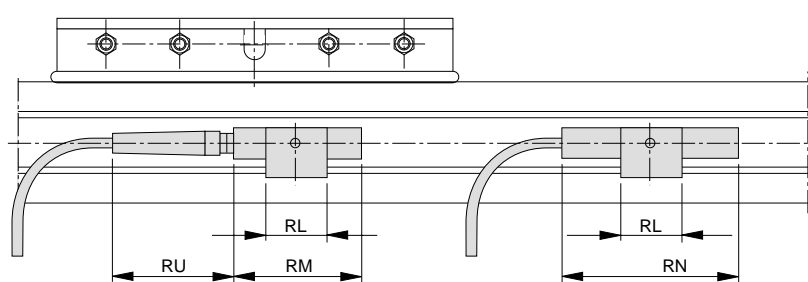


Ø25mm - Ø50mm



Ø25mm - Ø50mm (IS)

Ø25mm (RS only)



Ø32mm - 50mm

(RS version only)

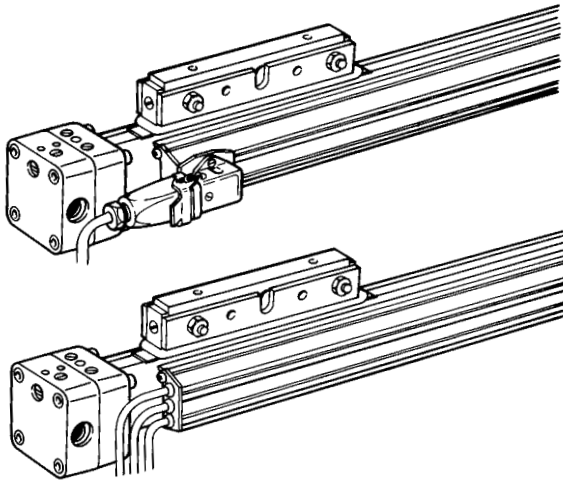
Cyl. Ø	RB	RC	RL	RM	RN	RP	RQ	RS	RT	RU
10	---	.67	---	1.38	1.38	---	---	.35	.20	1.38
16	.67	1.10	.79	1.38	1.57	1.06	.43	---	---	1.38
25	.79	1.46	.79	1.38	3.15	1.32	.43	---	---	1.38
32	.98	1.72	.79	1.38	3.15	1.58	.22	.43	---	1.38
40	.98	1.91	.79	1.38	3.15	1.77	.22	.43	---	1.38
50	1.26	2.17	.79	1.38	3.15	2.03	.22	.43	---	1.38

Proximity Switch Series P120 cylinders

For non-contact sensing of piston position on Origa rodless cylinders. Note: Series P120 cylinders ordered without Reed Switches are supplied with non-magnetic pistons.

Available for use on Series P120 cylinders.

Ø 40mm, 63mm and 80mm - Switches can be mounted on both sides of cylinder upon request.

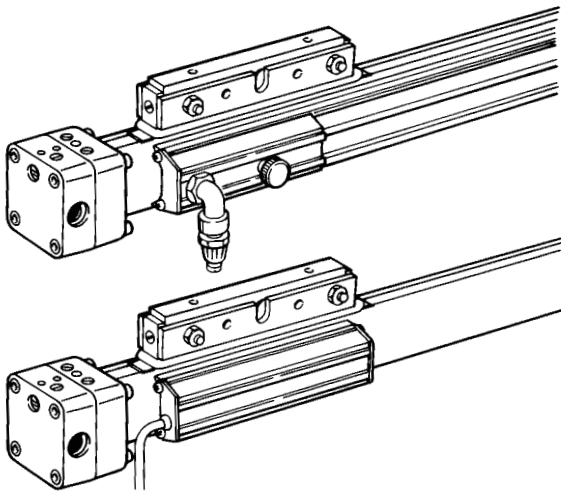


RSA: with RS (Reed Switch) ISA: with IS (Inductive Switch)

- Proximity switch connected across multi-pole connector.
- Operating points freely adjustable along the entire piston stroke length.

RSD: with RS (Reed Switch) ISD: with IS (Inductive Switch)

- Proximity switch with permanently connected cable.
- Operating points freely adjustable along the entire piston stroke length.



RSQ: with RS (Reed Switch) ISQ: with IS (Inductive Switch)

- Proximity switch with permanently connected cable protected by flexible conduit.
- Quick, adjustable settings along the entire piston stroke length.

RSF: with RS (Reed Switch) ISF: with IS (Inductive Switch)

- Proximity switch with permanently connected cable designed to serve as a fixed limit switch.

Advantages of Proximity Switches (RS and IS) Simple Installation

The proximity switch track is permanently fixed to the side of the cylinder barrel. The switch assemblies are installed within the track at the desired positions.

Safe in Operation

The proximity switch encapsulated in the aluminum housing has IP 65 (RS) and IP 67 (IS) protection and therefore can be used under adverse conditions.

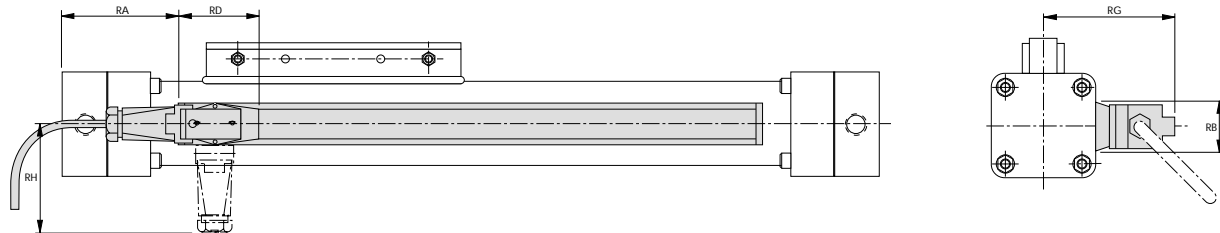
Compact

With the switches mounted directly to the side of the barrel minimal additional space is required in terms of cylinder width. The overall length of the cylinder does not change.

Cost Effective

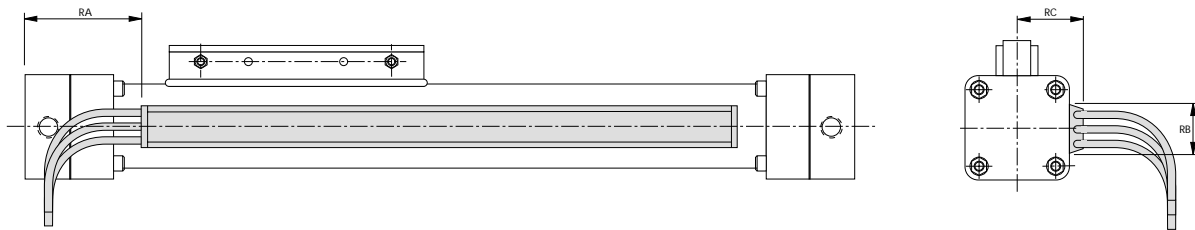
Eliminates the need for cam and switch mountings. Maintenance free, no wearing parts.

Type RSA/ISA



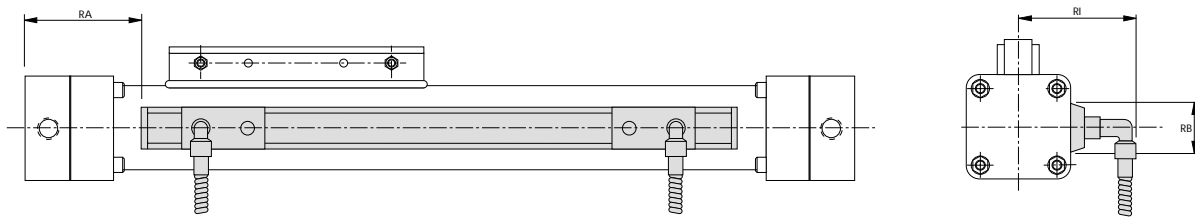
- A maximum of 6 proximity switches can be connected to each plug connection.
- The plug connection consists of a socket and plug ready for wiring.
- The plug connection is delivered assembled onto the end of the track.
- The plug connection can be mounted in 4 different directions.

Type RSD/ISD



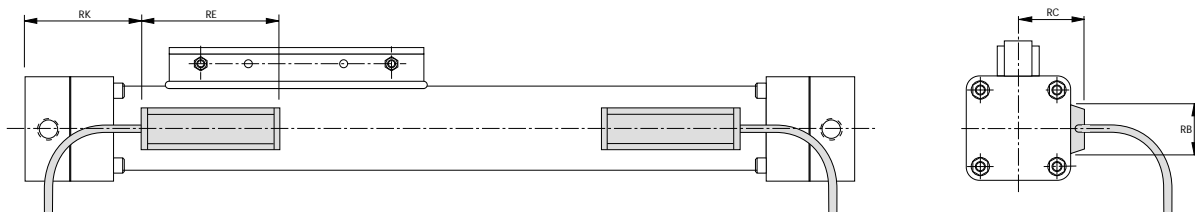
- A maximum of 6 proximity switches per switch track with cable outlet optional, 3 x left and 3 x right.
- Cable length 5 meters

Type RSQ/ISQ



- For quick adjustment of switches.
- Optional number of switches.
- Cable length 5 meters with protective conduit.

Type RSF/ISF



- End of stroke sensing
- Cable length 5 meters

Cyl. Ø	RA (S/)	RA (L/)	RK (S/)	RK (L/)	RB	RC	RD	RE	RG	RH	RI
40	3.35	7.28	3.46	7.40	1.69	1.93	2.05	4.53	4.06	3.54	3.07
63	4.13	10.04	5.83	11.73	1.69	2.52	2.05	4.53	4.65	3.54	3.66
80	4.92	10.83	7.40	13.31	1.69	2.99	2.05	4.53	5.12	3.54	4.13