MAGNETIC SENSORS FOR CYLINDERS

General

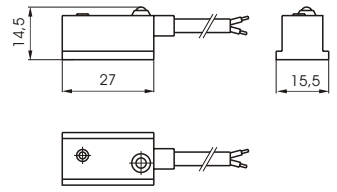
The limit switches, or magnetic sensors, have to be mounted on cylinders with magnetic piston. These, when hit by the magnetic field generated by the piston as it approaches, close the circuit sending an electrical signal by relè solenoid valve control, etc. or converse with the controlling electronic system situaded on the machine. There are available magnetic sensor with ampulla Reed type and with Hall effect. The sensors are attached to the cylinder by a proper clamp and have a Led insertion indicator.
The magnetic sensors with ampulla are made in 3 versions:
- U (universal) functioning with continuous or alternate current, protected by varistor Led indicator.
- U/1(universal) functioning with continuous or alternate current, with contact Reed only to avoid 3 volt tension drop caused by led.
- D.C. for functioning with continuous current only, utilized for switching heavy loads since the contact Reed become the pilot of a semi-conductor power circuit.

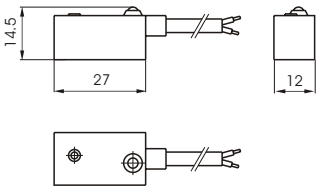
Note: The magnetic sensors are according to the Directive **EMC 89/336/CEE** and following amendments.

Instruction on how to use the sensors properly

Particular attention should be paid not to exceed the wide operating limits showed in the specification table.
Besides the sensor has never to be connected to the mains if a load has not been yet connected in series. These are the only cares that, if not followed, may cause damages to the sensor.
Furthermore it has to be considered that, while loading, the current absorbed by the sensor might be 50% higher that the rated one. Therefore, specially while using alternate current (AC) there is the need to observe the appropriate safety margins.
In the case of direct current (DC) sensors (see code numbers 1500.DC and 1600.DC), the polarity of the connection has to be observed: the brown cable must be connected to the plus (+) and the blue one to the minus (-).
Attention has also to be paid to the orientation of the connector, cause by inverting the connection the circuit will be not damaged, but the sensors will remain switched, the load connected and the led turned off.
Due to the particular structure of the switching circuit of these sensors, which is made of semiconductors, there are no particular contra-indications related to its use: the supported load may therefore be indifferently of inductive, capacitive or resistive type, and similarly the length of the connecting wire is not of importance.
On the contrary, in case of use universal (U) sensors with direct current (DC), attention has to be paid to the length of the cable, which has to be no longer than 10m.
Besides, there are some other external factors to be taken into consideration, such as proximity of powered cable, magnetic fields produced by electric motors, mass of iron too close to the sensor, and so on: these factors have to be therefore carefully avoided, being able to influence the sensors and accordingly to cause irregularity of operation.

Sensors with 2 m. cable (REED type)





for cylinders and microcylinders

for rodless cylinders

Ordering code		
Cylinders and microcylinders	**1500.A.C.**	sensor for alternating current with led
	1500.D.C.	sensor for continuous current with led
	1500.U	universal sensor with led
	1500.U/1	universal sensor without led (REED ampulla only)
Rodless cylinders	**1600.A.C.**	sensor for alternating current with led
	1600.D.C.	sensor for continuous current with led
	1600.U	universal sensor with led
	1600.U/1	universal sensor without led (REED ampulla only)

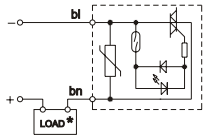
Technical characteristics

	a.c.	d.c.	U		U/1	
			a.c.	d.c.	a.c.	d.c.
Maximum permanent current	1,5A	1,2A	0,5A		0,3A	
Maximum current (pulses of 0,5 sec.)	6A	1,5A	1A		0,8A	
Voltage range	12 ÷ 250V	12 ÷ 30V	3 ÷ 250V	12 ÷ 48V	0 ÷ 250V	0 ÷ 48V
Maximum permanent power	375VA	32W	20VA	15W	10VA	8W
Working temperature	-20°C ÷ 50°C	-20° C ÷ 70°C				
Maximum voltage drop	< 3V	2V	< 3V		0V	
Cable section	2x0,35 mm²					
Degree of protection	IP 65					
Connecting time	2 ms					
Disconnecting time	1 ms					
Average working period	10^7 cicles					
Repetition of intervention point	± 0,1 mm					
Type of contact	N. O.					

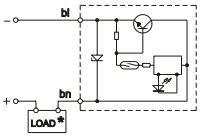
*** Connection can be done either to negative or positive pole.**

Diagrams and connections

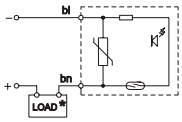
Type - a.c.



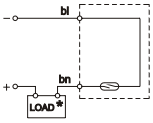
Type - d.c.



Type - U



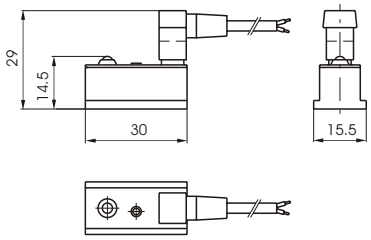
Type U/1



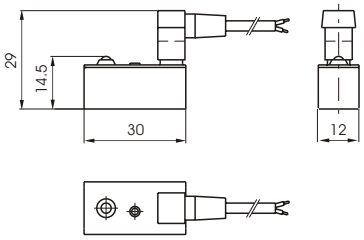
These sensors can be used on cylinders series:

1200	for microcylinders with threaded end covers, with clamps code	1260.Ø.F	
	for microcylind. "MIR" with rolled end covers, with clamps code	1280.Ø.F	from Ø16 to Ø32
	for microcylind. "MIR-INOX" with rolled end covers, with clamps code	1280.Ø.FX	from Ø16 to Ø32
1306 - 1307 - 1308	brackets code	1306.A	from Ø32 to Ø63
		1306.B	from Ø80 to Ø125
		1306.C	from Ø160 to Ø200
1319 - 1320	brackets code	1320.A	for cylinders Ø32 and Ø40
		1320.B	for cylinders Ø50 and Ø63
		1320.C	for cylinders Ø80 and Ø100
		1320.D	for cylinders Ø125
		1320.E	for cylinders Ø160
		1320.F	for cylinders Ø200
1380 - 1381 - 1382	directly on groove		
1500	directly on groove		
1600	brackets code	1600.A	

Sensors with connector (REED type)



for cylinders and microcylinders



for rodless cylinders

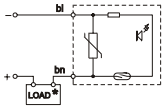
Ordering code

Cylinders and Microcylinders	**RS.UA**	universal sensor with led normally open N.O.
	RS.UANO	universal sensor with led normally open N.O, according to standard IEC 947
	RS.UA/1	universal sensor without led N.O. (REED ampulla only)
	RS.UA/1L	universal sensor with led normally open N.O., for series assembly (3 wires)
	RS.UC	universal sensor with led normally closed N.C.
	RS.DC	sensor for continuous current with led normally open N.O.
	RS.DCNO	sensor for continuous current with led normally open N.O., according to standard IEC 947
	RS.UAC1	universal sensor with led N.O. with connector and 2,5 m. Cable
	RS.UAC1/1	universal sensor without led N.O. with connector and 2,5 m. cable (REED ampulla only)
	RS.UACH1/1L**	universal sensor with led N.O. with connector and 2,5 m. cable, for series mounting (3 wires)
	RS.UCC1	universal sensor with led N.C. with connector and 2,5 m. Cable
Rodless cylinders	**SRS.UA**	universal sensor with led N.O.
	SRS.UA/1	universal sensor without led N.O.
	SRS.UA/1L	universal sensor with led N.O., for series assembly (3 wires)
	SRS.UC	universal sensor with led normally closed N.C.
	SRS.DC	sensor for continuous current with led normally closed N.C.
	SRS.UAC1	universal sensor with led N.O. with connector and 2,5 m. Cable
	SRS.UAC1/1	universal sensor without led N.O. with connector and 2,5 m. cable (REED ampulla only)
	SRS.UACH1/1L**	universal sensor with led N.O. with connector and 2,5 m. cable, for series assembly (3 wires)
	SRS.UCC1	universal sensor with led N.C. with connector and 2,5 m. cable
	SRS.DCC1	sensor for continuous current with led normally closed N.O., with connector and 2,5 m. Cable
Cylinders and Microcylinders Rodless cylinders	**C1**	connector with 2,5 m. cable
	C2	connector with 5 m. cable
	C3	connector with 10 m. cable
	C1NO	connector with 2,5 m. cable, according to standard IEC 947
	C2NO	connector with 5 m. cable, according to standard IEC 947
	C3NO	connector with 10 m. cable, according to standard IEC 947

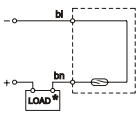
****Use only connector for sensors HALL effect (see page 8.5)**

Diagrams and connections

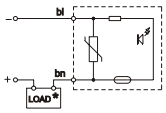
Type - UA



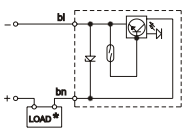
Type UA/1



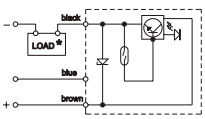
Type - UC



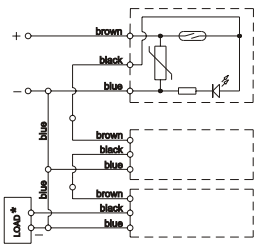
Type - d.c.



Type - DCNO



Type - UA/1L



Technical characteristics

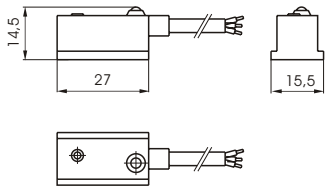
	d.c.	U				U/1L		U/1	
		a.c.		d.c.		a.c.	d.c.	a.c.	d.c.
Type of contact	N.O.	N.O.	N.C.	N.O.	N.C.	N.O.		N.O.	
Maximum permanent current	1,2A	0,5A	0,3A	0,5A	0,3A	0,5A		0,5A	
Maximum current (pulses of 0,5 sec.)	1,5A	1A	0,8A	1A	0,8A	1A		1A	
Voltage range	12 ÷ 30V	3 ÷ 250V	3 ÷ 110V	12 ÷ 48V		24V		0 ÷ 250V	0 ÷ 48V
Maximum permanent power	32W	20VA	10VA	15W	8W	20VA	15W	10VA	8W
Working temperature	-20° C ÷ 70°C								
Maximum voltage drop	2V	<3V				0V			
Cable section	2x0,35 mm²					3x0,35 mm²		2x0,35 mm²	
Degree of protection	IP 65								
Connecting time	2 ms								
Disconnecting time	1 ms								
Average working period	10 ⁷cicles								
Repetition of intervention point	± 0,1 mm								

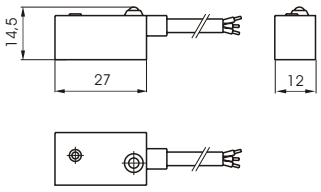
*** Connection can be done either to negative or positive pole.**

These sensors can be used on cylinders series:

1200	for microcylinders with threaded end covers, with clamps code	1260.Ø.F	
	for microcylind. "MIR" with rolled end covers, with clamps code	1280.Ø.F	from Ø16 to Ø32
	for microcylind. "MIR-INOX" with rolled end covers, with clamps code	1280.Ø.FX	from Ø16 to Ø32
1306 - 1307 - 1308	brackets code	1306.A	from Ø32 to Ø63
		1306.B	from Ø80 to Ø125
		1306.C	from Ø160 to Ø200
1319 - 1320	brackets code	1320.A	for cylinders Ø32 and Ø40
		1320.B	for cylinders Ø50 and Ø63
		1320.C	for cylinders Ø80 and Ø100
		1320.D	for cylinders Ø125
		1320.E	for cylinders Ø160
		1320.F	for cylinders Ø200
1380 - 1381 - 1382	directly on groove		
1500	directly on groove		
1600	brackets code	1600.A	

Sensors with 3 m. cable (HALL effect)





for cylinders and microcylinders

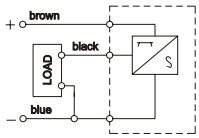
for rodless cylinders

Ordering code		
Cylinders and microcylinders	**1500.HAP**	PNP sensor Hall effect with led, normally open N.O.
	1500.HAN	NPN sensor Hall effect with led, normally open N.O.
	1500.HCP	PNP sensor Hall effect with led, normally closed N.C.
	1500.HCN	NPN sensor Hall effect with led, normally closed N.C.
Rodless cylinders	**1600.HAP**	PNP sensor Hall effect with led, normally open N.O.
	1600.HAN	NPN sensor Hall effect with led, normally open N.O.
	1600.HCP	PNP sensor Hall effect with led, normally closed N.C.
	1600.HCN	NPN sensor Hall effect with led, normally closed N.C.

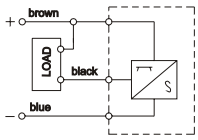
Technical characteristics

Maximum permanent current	0,5A
Voltage range	10 ÷ 30V DC
Power (inductive load)	10W
Maximum voltage drop	2 V
Working temperature	-20° C ÷ 70°C
Cable section	3x0,25 mm²
Degree of protection	IP 65
Connecting time	0,8 µs
Disconnecting time	0,3 µs
Average working period	10^9 cicles
Repetition of intervention point	± 0,1 mm
Type of contact	N. O. o N.C.

Diagrams and connections



PNP

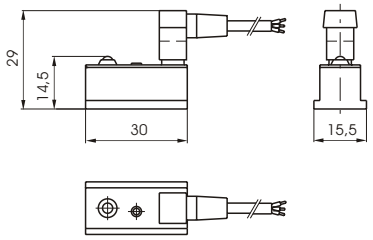


NPN

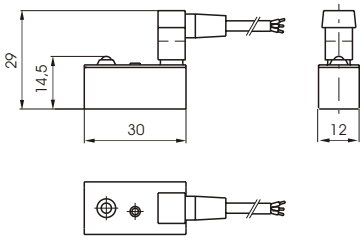
These sensors can be used on cylinders series:

1200	for microcylinders with threaded end covers, with clamps code	1260.Ø.F	
	for microcylind. "MIR" with rolled end covers, with clamps code	1280.Ø.F	from Ø16 to Ø32
	for microcylind. "MIR-INOX" with rolled end covers, with clamps code	1280.Ø.FX	from Ø16 to Ø32
1306 - 1307 - 1308	brackets code	1306.A	from Ø32 to Ø63
		1306.B	from Ø80 to Ø125
		1306.C	from Ø160 to Ø200
1319 - 1320	brackets code	1320.A	for cylinders Ø32 and Ø40
		1320.B	for cylinders Ø50 and Ø63
		1320.C	for cylinders Ø80 and Ø100
		1320.D	for cylinders Ø125
		1320.E	for cylinders Ø160
		1320.F	for cylinders Ø200
1380 - 1381 - 1382	directly on groove		
1500	directly on groove		
1600	brackets code	1600.A	

Sensor with connector (Hall effect)



for cylinders and microcylinders



for rodless cylinders

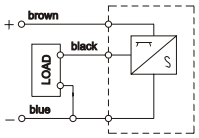
Ordering code

Cylinders and microcylinders	**HS.PA**	PNP sensor Hall effect with led, normally open N.O.
	HS.NA	NPN sensor Hall effect with led, normally open N.O.
	HS.PAC1	PNP sensor Hall effect N.O. with led, with connector and 2,5 m. cable
	HS.NAC1	NPN sensor Hall effect N.O. with led, with connector and 2,5 m. cable
Rodless cylinders	**SHS.PA**	PNP sensor Hall effect with led, normally open N.O.
	SHS.NA	NPN sensor Hall effect with led, normally open N.O.
	SHS.PAC1	PNP sensor Hall effect N.O. with led, with connector and 2,5 m. cable
	SHS.NAC1	NPN sensor Hall effect N.O. with led, with connector and 2,5 m. cable
	CH1	connector with 2,5 m. cable (3 wires)
	CH2	connector with 5 m. cable (3 wires)

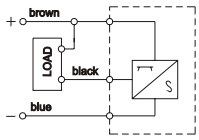
Technical characteristic

Maximum permanent current	0,25A
Voltage range	6 ÷ 30V DC
Power (inductive load)	6W
Maximum Voltage drop	2 V
Working temperature	-20° C ÷ 70°C
Cable section	3x0,25 mm²
Degree of protection	IP 65
Connecting time	0,8 µs
Disconnecting time	0,3 µs
Average working period	10^9 cicles
Repetition of intervention point	± 0,1 mm
Contact normally open	N. O.

Diagrams and connections



PNP



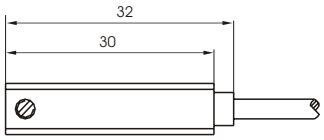
NPN

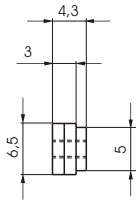
These sensors can be used on cylinders series:

1200	for microcylinders with threaded end covers, with clamps code	1260.Ø.F	
	for microcylind. "MIR" with rolled end covers, with clamps code	1280.Ø.F	from Ø16 to Ø32
	for microcylind. "MIR-INOX" with rolled end covers, with clamps code	1280.Ø.FX	from Ø16 to Ø32
1306 - 1307 - 1308	brackets code	1306.A	from Ø32 to Ø63
		1306.B	from Ø80 to Ø125
		1306.C	from Ø160 to Ø200
1319 - 1320	brackets code	1320.A	for cylinders Ø32 and Ø40
		1320.B	for cylinders Ø50 and Ø63
		1320.C	for cylinders Ø80 and Ø100
		1320.D	for cylinders Ø125
		1320.E	for cylinders Ø160
		1320.F	for cylinders Ø200
1380 - 1381 - 1382	directly on groove		
1500	directly on groove		
1600	brackets code	1600.A	

Sensor c/w 2.5 m. cable

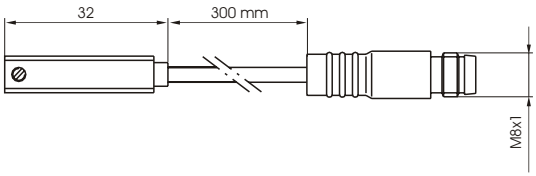
Weight gr. 27





Sensor c/w M8 connector (300 mm cable)

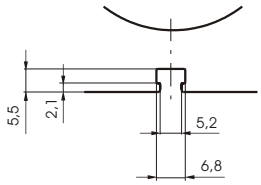
Weight gr. 15



Ordering codes

1580.U	Reed bulb sensor with led and 2.5 m cable
1580.UAP	Reed bulb sensor with led and 2.5 m cable (3 wires)
1580.HAP	PNP sensor Hall effect with led and 2.5 m cable
MRS.U	Reed bulb sensor with led and connector
MRS.UAP	Reed bulb sensor with led and connector (3 wires)
MHS.P	PNP sensor Hall effect with led and connector
MC1	M8 in line connector with 2.5 m cable (2 wires)
MC2	M8 in line connector with 5 m cable (2 wires)
MCH1	M8 in line connector with 2.5 m cable (3 wires)
MCH2	M8 in line connector with 5 m cable (3 wires)

Slot detail



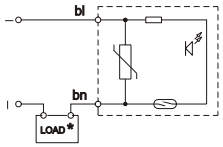
Normal standard "PNEUMAX" sensors suitable for large slot are available for cylinders from Ø 32 to Ø 100 (see catalogue 4 section 8).

Technical characteristics

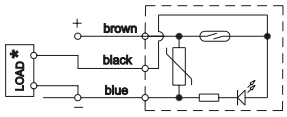
	1580.U	1580.UAP	MRS.U	MRS.UAP	1580.HAP	MHS.P
Type of contact	N.O.					
Maximum current (pulses of 0,5 sec.)	0,2A			0,2A		
Maximum permanent current	0,2A			0,2A		
Maximum permanent power	6VA			4W		
Voltage range A. C.	3 ÷ 30V	24V	3 ÷ 30V	/		
Voltage range D. C.	3 ÷ 30V	24V	3 ÷ 30V	12÷30V		
Working temperature			-20° C ÷ 70°C			
Maximum voltage drop	<3V	0V	<3V	0V	<3V	
Cable section	2x0,14	3x0,14	2x0,14	3x0,14		
Degree of protection	IP 65					
Connecting time	0,5 ms			0,8 µs		
Disconnecting time	0,1 ms			0,3 µs		
Average working period	10^7			10^9		
Repetition of intervention point	± 0,1					

NOTE : pay attention to the connected loads which should not exceed the recommendation

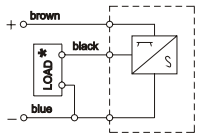
Diagrams and connections



with Reed bulb



with Reed bulb (3 wires)



Hall effect

These sensors can be used on cylinders series:

1200	Microcylinders "MIR" with rolled end covers, with clamps code	1280.Ø.FS
	Microcylinders "MIR-INOX" with rolled end covers, with clamps code	1280.Ø.FSX
1380-1381-1382	with sensor adapter, from Ø 32 to Ø 100.	1380.01F
1500	Short stroke compact cylinders with sensor adapter code	1580.01F
	Europe compact cylinders - directly on groove from Ø 12 to Ø 25	
	Europe compact cylinders - directly on groove or with sensor adapter from Ø 32 to Ø 50	1580.01F
	Europe compact cylinders - with sensor adapter - from Ø 63 to Ø 100	1580.01F