



## Series SA

### General

The limit switches, or magnetic sensors, must 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 to relay, solenoid valve or converse with the controlling electronic system of the machine. There are both ampulla Reed and Hall effect magnetic sensor available. The sensors are attached to the cylinder by a proper clamp, slot or adapter and may have an activation LED indicator.

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 in order not to exceed the wide operating limits shown in the next pages. Besides, the 2 wires sensors have 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. Besides, please consider that, while loading, the current absorbed by the sensors might be 50% higher than the rated one.

In case of direct current (DC) feeding, the polarity of the connection must be observed: the brown cable must be connected to the plus (+) and the blue one to the minus (-).

For all sensors, particular attention has to be paid to external factors (like, for example, nearby live cables, electromagnetic fields generated by electric motors, nearby metallic bodies, etc.) since they can affect the magnetic field generated by the magnet inside the piston and therefore causing malfunctions.

Electrical cable length must be kept below 10 meters in order to guarantee proper functioning.

If needed, 10 meters cable length can be exceeded; Pneumax suggests the use of an inductor or resistor in series to the load in order to reduce the capacitive behavior of the cable.

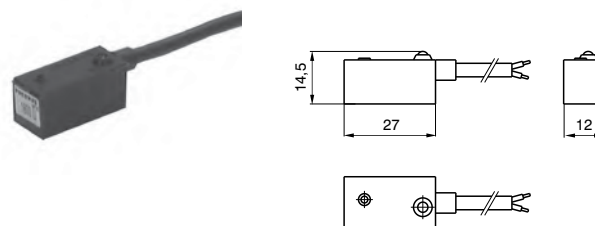
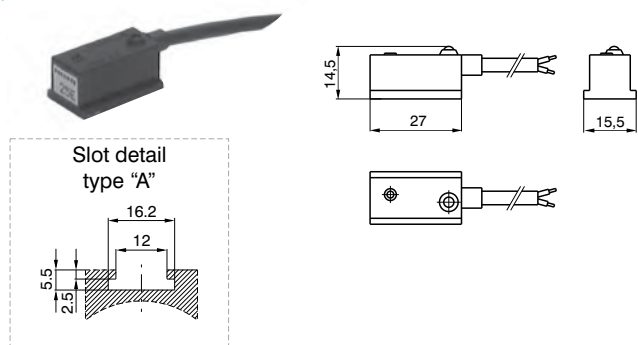
In this case, the customer is responsible for the selection of the inductor or resistor value. Pneumax assume no responsibility in case of malfunction.

When using a two wire Reed type sensor always ensure that the correct load is applied in series on any of the two wires.

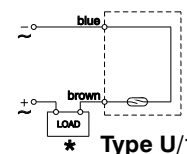
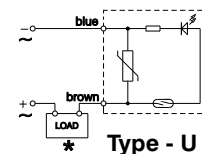
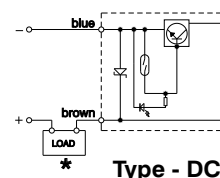
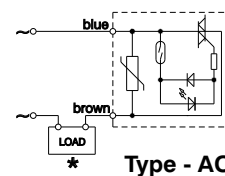
When using a sensor fitted with the SNAP connector pay attention to the orientation of the connector (see fig. page 6.6) because by inverting the connection the circuit will not be damaged, but the LED will not turn on. In case two or more sensors need to be connected in series, pay attention to the voltage drop generated (around 3V for each sensor), and, in case, use the version designed for in series connection.

Hall effect sensors are longer lasting if compared to the Reed version since they do not include any moving mechanical part.

## Sensors with 2 wires cable (PUR Ø4,2 mm 2x0,34 mm<sup>2</sup>)



## Diagrams and connections



## Ordering code

Cylinders and microbore cylinders	<b>1500.AC</b>	sensor for alternating current with led
	<b>1500.DC</b>	sensor for continuous current with led
	<b>1500. U</b>	universal sensor with led
	<b>1500.U/1</b>	universal sensor without led (REED ampulla only)
Rodless cylinders	<b>1600.AC</b>	sensor for alternating current with led
	<b>1600.DC</b>	sensor for continuous current with led
	<b>1600.U</b>	universal sensor with led
	<b>1600.U/1</b>	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 - 230V	12 - 30V	3 - 230V	12 - 48V	0 - 230V	0 - 48V
Maximum permanent power	375VA	32W	20VA	15W	10VA	8W
Working temperature	-20° C - 70°C					
Maximum voltage drop	3V max	2V max	3V max		0V	
Cable section	2x0,34 mm <sup>2</sup> Ø4,2 mm PUR					
Degree of protection	IP 65					
Connecting time	2 ms					
Disconnecting time	1 ms					
Average working period	10 <sup>7</sup> cycles					
Repetition of intervention point	± 0,1 mm					
Type of contact	N.O.					

★The load (LOAD) can be connected either to negative or positive pole.

These sensors can be used on cylinders series:

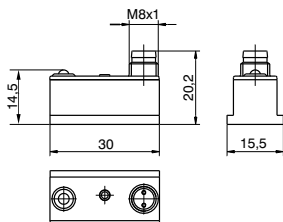
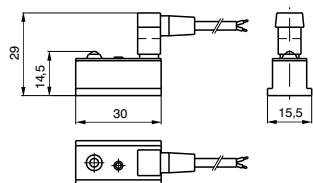
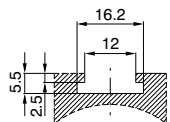
SERIES	DESCRIPTION	MOUNTED
<b>1200</b>	for microbore with threaded end covers and "TECNO-MIR" microbore	with clamps code 1260.Ø.F
	for microbore "MIR" with rolled end covers, cylinders from Ø16 to Ø32	with clamps code 1280.Ø.F
	for microbore "MIR-INOX" with rolled end covers	with clamps code 1280.Ø.FX
<b>1306 - 1307 - 1308</b>	for cylinders from Ø32 to Ø63	with brackets code 1306.A
	for cylinders from Ø80 to Ø125	with brackets code 1306.B
	for cylinders from Ø160 to Ø200	with brackets code 1306.C
<b>1315</b>	for cylinders Ø250 and Ø320 (ISO)	with brackets code 1306.D
	for cylinders Ø32 and Ø40	with brackets code 1320.A
	for cylinders Ø50 and Ø63	with brackets code 1320.B
<b>1319 - 1320</b>	for cylinders Ø80 and Ø100	with brackets code 1320.C
	for cylinders Ø125	with brackets code 1320.D
	for cylinders Ø160	with brackets code 1320.E
	for cylinders Ø200	with brackets code 1320.F
	for cylinders ECOLIGHT Ø32 and Ø40	with brackets code 1390.A
<b>1390 - 1391</b>	for cylinders ECOLIGHT Ø50 and Ø63	with brackets code 1390.B
	for cylinders ECOLIGHT Ø80 and Ø100	with brackets code 1390.C
	for cylinders ECOLIGHT Ø125 - Ø200	with brackets code 1390.D
	Compact cylinders "Europe" (from Ø32)	directly on groove
<b>1500</b>	Rodless cylinders	with brackets code 1600.A

### 2 pin sensor for SNAP connector

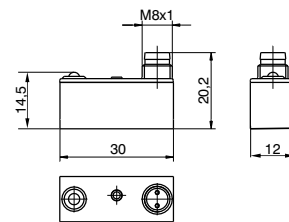
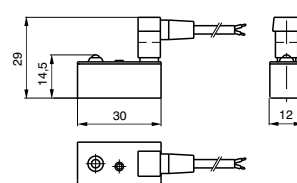


for cylinders and microbore

Slot detail type "A"



for rodless cylinders



### Ordering code

Cylinders and microbore	<b>RS.DC</b>	sensor for continuous current with led normally open N.O.
	<b>RS.UA</b>	universal sensor with led normally open N.O.
	<b>RS.UC</b>	universal sensor with led normally closed N.C.
	<b>RS.UA/1</b>	universal sensor without led N.O. (REED ampulla only)
Rodless cylinders	<b>SRS.DC</b>	sensor for continuous current with led normally open N.O.
	<b>SRS.UA</b>	universal sensor with led N.O.
	<b>SRS.UC</b>	universal sensor with led normally closed N.C.
	<b>SRS.UA/1</b>	universal sensor without led N.O.
Cable	<b>C1</b>	connector with 2.5 m. cable 2 wires (PVC Ø3,5 mm 2x 0,25mm <sup>2</sup> )
	<b>C2</b>	connector with 5 m. cable 2 wires (PVC Ø3,5 mm 2x 0,25mm <sup>2</sup> )
	<b>C3</b>	connector with 10 m. cable 2 wires (PVC Ø3,5 mm 2x 0,25mm <sup>2</sup> )

### 2 pin sensor for SNAP connector + C1 cable 2 wires (PVC Ø3.5 mm 2x0.25 mm<sup>2</sup>)

Cylinders and microbore	<b>RS.DCC1</b>	sensor for DC current N.O. with LED and 2.5 m. cable
	<b>RS.UAC1</b>	universal sensor with led N.O. with connector and 2.5 m. cable
	<b>RS.UCC1</b>	universal sensor with led N.C. with connector and 2.5 m. cable
	<b>RS.UAC1/1</b>	universal sensor without led N.O. with connector and 2.5 m. cable (REED ampulla only)
Rodless cylinders	<b>SRS.DCC1</b>	sensor for continuous current with led normally closed N.O. with connector and 2.5 m. cable
	<b>SRS.UAC1</b>	universal sensor with led N.O. with connector and 2.5 m. cable
	<b>SRS.UCC1</b>	universal sensor with led N.C. with connector and 2.5 m. cable
	<b>SRS.UAC1/1</b>	universal sensor without led N.O. with connector and 2.5 m. cable (REED ampulla only)

### 2 pin sensor with M8 connettor

Cylinders and microbore	<b>RS8.DC</b>	sensor for DC current N.O. with LED and M8 plug
	<b>RS8.UA</b>	universal sensor N.O. with LED and M8 plug
	<b>RS8.UC</b>	universal sensor N.C. with LED and M8 plug
Rodless cylinders	<b>SRS8.DC</b>	sensor for DC current N.O. with LED and M8 plug
	<b>SRS8.UA</b>	universal sensor N.O. with LED and M8 plug
	<b>SRS8.UC</b>	universal sensor N.C. with LED and M8 plug
Cable	<b>MCH1</b>	cable 3 wires l=2.5m with M8 connector three wires (PUR Ø2.6 mm 3x 0.15 mm <sup>2</sup> )
	<b>MCH2</b>	cable 3 wires l=5m with M8 connector three wires (PUR Ø2.6 mm 3x 0.15 mm <sup>2</sup> )
	<b>MCH3</b>	cable 3 wires l=10m with M8 connector three wires (PUR Ø2.6 mm 3x 0.15 mm <sup>2</sup> )



### 3 pin sensor for SNAP connector with 2 wires according to IEC 947 norms

Cylinders and microbore	<b>RS.DCNO</b>	sensor for continuous current with led normally open N.O., according to standard IEC 947
	<b>RS.UANO</b>	universal sensor with led normally open N.O., according to standard IEC 947
Cable	<b>C1NO</b>	connector with 2.5 m. cable, according to standard IEC 947 (PVC Ø3.5 mm 2x0.25 mm <sup>2</sup> )
	<b>C2NO</b>	connector with 5 m. cable, according to standard IEC 947 (PVC Ø3.5 mm 2x0.25 mm <sup>2</sup> )
	<b>C3NO</b>	connector with 10 m. cable, according to standard IEC 947 (PVC Ø3.5 mm 2x0.25 mm <sup>2</sup> )

### 3 pin sensors for in series assembling with SNAP connector

Cylinders and microbore Rodless cylinders	<b>RS.UA/1L</b>	universal sensor with led normally open N.O., for series assembly (3 wires)
	<b>SRS.UA/1L</b>	universal sensor with led N.O., for series assembly (3 wires)
Cable	<b>CH1</b>	connector with 2.5 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm <sup>2</sup> )
	<b>CH2</b>	connector with 5 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm <sup>2</sup> )
	<b>CH3</b>	connector with 10 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm <sup>2</sup> )

### 3 pin sensors for in series assembling with SNAP conn. + CH1 cable 3 wires (PVC ø3.5mm 3x0.25 mm<sup>2</sup>)

Cylinders and microbore	<b>RS.UACH1/1L</b>	universal sensor with led N.O. with connector and 2.5 m. cable, for series mounting (3 wires)
Rodless cylinders	<b>SRS.UACH1/1L</b>	universal sensor with led N.O. with connector and 2.5 m. cable, for series assembly (3 wires)

### 3 pin sensors for in series assembling with M8 connector

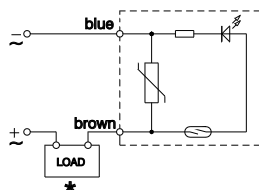
Cylinders and microbore Rodless cylinders	<b>RS8.UA/1L</b>	universal sensor N.O. with LED for in series assembling (3wires) and M8 plug
	<b>SRS8.UA/1L</b>	universal sensor N.O. with LED for in series assembling (3wires) and M8 plug
Cable	<b>MCH1</b>	M8 connector with 2.5 m. cable 3 wires (PUR Ø2.6 mm 3x 0.15 mm <sup>2</sup> )
	<b>MCH2</b>	M8 connector with 5 m. cable 3 wires (PUR Ø2.6 mm 3x 0.15 mm <sup>2</sup> )
	<b>MCH3</b>	M8 connector with 10 m. cable 3 wires (PUR Ø2.6 mm 3x 0.15 mm <sup>2</sup> )

For sensors according to IEC 947 Standard		For 3 wires SNAP & M8 sensors		For 2 wires SNAP sensors	
Connection 2 wires 3 PIN		Connection 3 wires 3 PIN		Connection 2 wires 2 PIN	
<b>SNAP code connectors</b>	<b>M8 code connectors</b>	<b>SNAP code connectors</b>	<b>M8 code connectors</b>	<b>SNAP code connectors</b>	
C1NO Ø 3.5 mm	MC1 Ø 2.6 mm	CH1 Ø 3.5 mm	MCH1 Ø 2.6 mm	C1 Ø 3.5 mm	
C2NO PVC	MC2 PUR	CH2 PVC	MCH2 PUR	C2 PVC	
C3NO 2x 0.25 mm <sup>2</sup>	MC3 2x 0.15 mm <sup>2</sup>	CH3 3x 0.25 mm <sup>2</sup>	MCH3 3x 0.15 mm <sup>2</sup>	C3 2x 0.25 mm <sup>2</sup>	

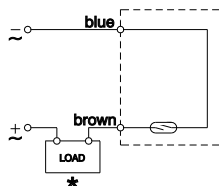
Technical characteristics	DC	UA				UA/1L		UA/1	
		a.c.		d.c.		a.c.	d.c.	a.c.	d.c.
Type of contact	N.O.	N.O.	N.C.	N.O.	N.C.	N.O.		N.O.	
Maximum permanent current	1.2A	0.5A	0.3A	0.5A	0.3A	0.5A		0.5A	
Maximum current (pulses of 0.5 sec.)	1.5A	1A	0.8A	1A	0.8A	1A		1A	
Voltage range	12 - 30V	3 - 250V	3 - 110V	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			
Cables number	2					3		2	
Degree of protection	IP65								
Connecting time	2 ms								
Disconnecting time	1 ms								
Average working period	10 <sup>7</sup> cycles								
Repetition of intervention point	±0.1 mm								

## Diagrams and connections

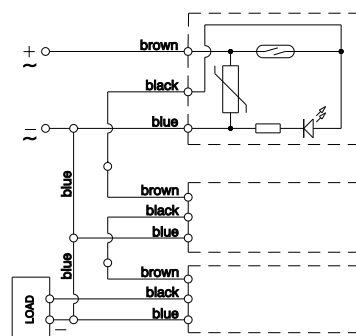
**Type - UA**



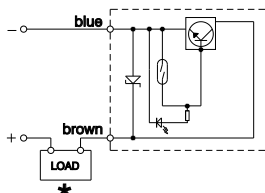
**Type UA/1**



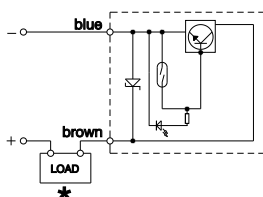
**Type - UA/1L**



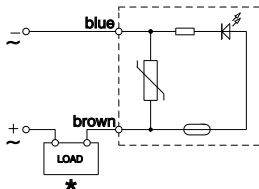
**Type - DC**



**Type - DCNO**



**Type - UC**

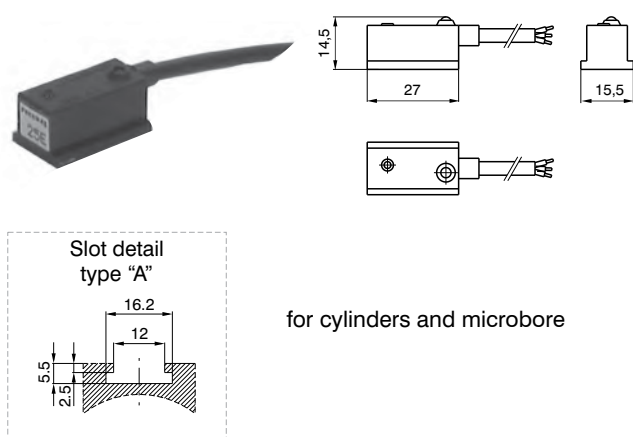


★The load (LOAD) can be connected either to negative or positive pole.

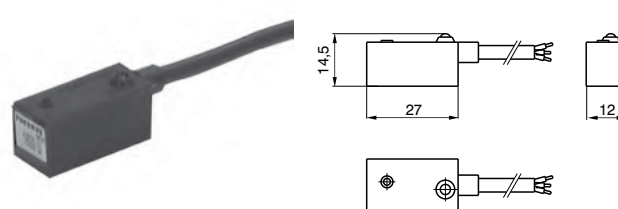
These sensors can be used on cylinders series:

SERIES	DESCRIPTION	MOUNTED
<b>1200</b>	for microbore with threaded end covers and "TECNO-MIR" microbore for microbore "MIR" with rolled end covers, cylinders from Ø16 to Ø32 for microbore "MIR-INOX" with rolled end covers	with clamps code 1260.Ø.F with clamps code 1280.Ø.F with clamps code 1280.Ø.FX
<b>1306 - 1307 - 1308</b>	for cylinders from Ø32 to Ø63 for cylinders from Ø80 to Ø125 for cylinders from Ø160 to Ø200	with brackets code 1306.A with brackets code 1306.B with brackets code 1306.C
<b>1315</b>	for cylinders Ø250 and Ø320 (ISO)	with brackets code 1306.D
<b>1319 - 1320</b>	for cylinders Ø32 and Ø40 for cylinders Ø50 and Ø63 for cylinders Ø80 and Ø100 for cylinders Ø125 for cylinders Ø160 for cylinders Ø200	with brackets code 1320.A with brackets code 1320.B with brackets code 1320.C with brackets code 1320.D with brackets code 1320.E with brackets code 1320.F
<b>1390 - 1391</b>	for cylinders ECOLIGHT Ø32 and Ø40 for cylinders ECOLIGHT Ø50 and Ø63 for cylinders ECOLIGHT Ø80 and Ø100 for cylinders ECOLIGHT Ø125 - Ø200	with brackets code 1390.A with brackets code 1390.B with brackets code 1390.C with brackets code 1390.D
<b>1500</b>	Compact cylinders "Europe" (from Ø32)	directly on groove
<b>1605</b>	Rodless cylinders	with brackets code 1600.A

► **Sensors with 3 wires cable PUR  $\varnothing$  4.2 mm 3x0.34mm<sup>2</sup>)**



for cylinders and microbore



for rodless cylinders

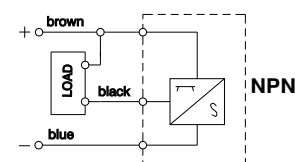
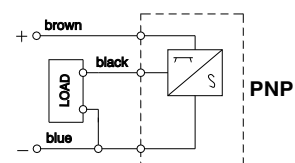
### Ordering code

Cylinders and microbore	<b>1500.HAP</b>	PNP sensor Hall effect with led, normally open N.O.
	<b>1500.HAN</b>	NPN sensor Hall effect with led, normally open N.O.
Rodless cylinders	<b>1600.HAP</b>	PNP sensor Hall effect with led, normally open N.O.
	<b>1600.HAN</b>	NPN sensor Hall effect with led, normally open N.O.

### Technical characteristics

Maximum permanent current	0.5A
Voltage range	10 - 30V DC
Power (inductive load)	10W
Maximum voltage drop	2V
Working temperature	-20°C - 70°C
Cable section	PUR 4.2mm 3x0.34 mm <sup>2</sup>
Degree of protection	IP 65
Connecting time	0.8 $\mu$ s
Disconnecting time	0.3 $\mu$ s
Average working period	10 <sup>9</sup> cycles
Repetition of intervention point	$\pm$ 0.1 mm
Type of contact	N.O.

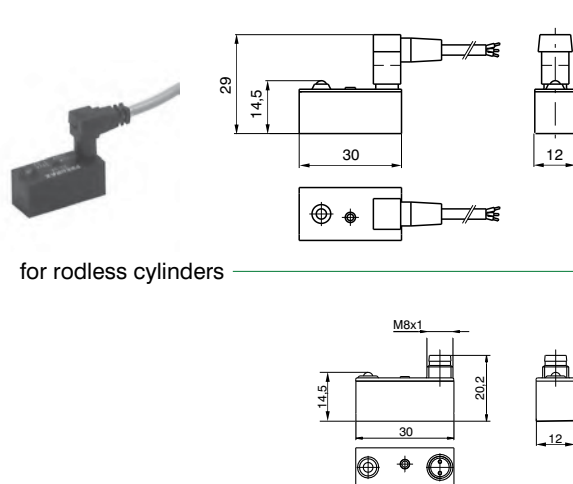
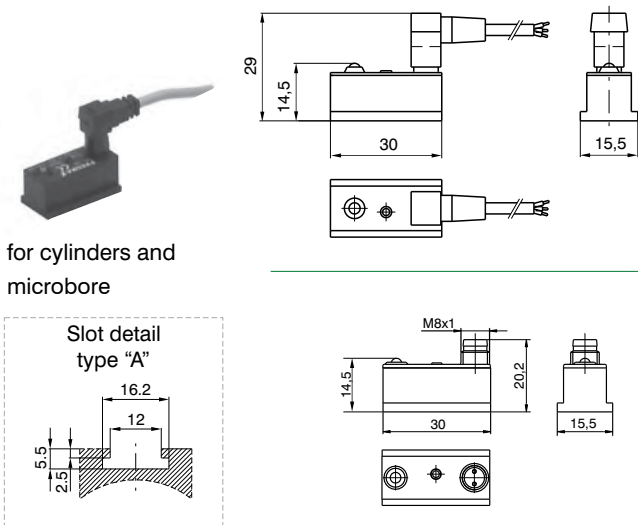
### Diagrams and connections



### These sensors can be used on cylinders series:

SERIES	DESCRIPTION	MOUNTED
<b>1200</b>	for microbore with threaded end covers and "TECNO-MIR" microbore	with clamps code 1260.Ø.F
	for microbore "MIR" with rolled end covers, cylinders from Ø16 to Ø32	with clamps code 1280.Ø.F
	for microbore "MIR-INOX" with rolled end covers	with clamps code 1280.Ø.FX
<b>1306 - 1307 - 1308</b>	for cylinders from Ø32 to Ø63	with brackets code 1306.A
	for cylinders from Ø80 to Ø125	with brackets code 1306.B
<b>1315</b>	for cylinders from Ø160 to Ø200	with brackets code 1306.C
	for cylinders Ø250 and Ø320 (ISO)	with brackets code 1306.D
<b>1319 - 1320</b>	for cylinders Ø32 and Ø40	with brackets code 1320.A
	for cylinders Ø50 and Ø63	with brackets code 1320.B
	for cylinders Ø80 and Ø100	with brackets code 1320.C
	for cylinders Ø125	with brackets code 1320.D
	for cylinders Ø160	with brackets code 1320.E
	for cylinders Ø200	with brackets code 1320.F
	for cylinders ECOLIGHT Ø32 and Ø40	with brackets code 1390.A
<b>1390 - 1391</b>	for cylinders ECOLIGHT Ø50 and Ø63	with brackets code 1390.B
	for cylinders ECOLIGHT Ø80 and Ø100	with brackets code 1390.C
	for cylinders ECOLIGHT Ø125 - Ø200	with brackets code 1390.D
<b>1500</b>	Compact cylinders "Europe" (from Ø32)	directly on groove
<b>1605</b>	Rodless cylinders	with brackets code 1600.A

### 3 PIN sensor for SNAP connector



### Ordering code

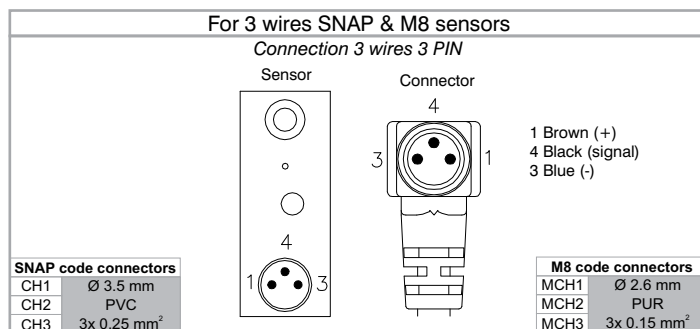
Cylinders and microcylinders	<b>HS.PA</b>	PNP sensor Hall effect with led, normally open N.O.
Rodless cylinders	<b>SHS.PA</b>	PNP sensor Hall effect with led, normally open N.O.
Cable	<b>CH1</b>	connector with 2.5 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm <sup>2</sup> )
	<b>CH2</b>	connector with 5 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm <sup>2</sup> )
	<b>CH3</b>	connector with 10 m. cable 3 wires (PVC Ø3.5 mm 3x0.25 mm <sup>2</sup> )

### 3 PIN sensor for SNAP connector + CH1 cable 3 wires (PVC ø3.5 mm 3x0.25 mm<sup>2</sup>)

Cylinders and microbore	<b>HS.PAC1</b>	PNP sensor Hall effect N.O. with led, with connector and 2.5 m. cable
Rodless cylinders	<b>SHS.PAC1</b>	PNP sensor Hall effect N.O. with led, with connector and 2.5 m. cable

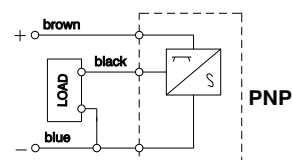
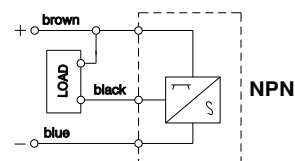
### 3 PIN sensor for M8 connector

Cylinders and microbore	<b>HS8.NA</b>	NPN Hall effect sensor N.O. with LED and M8 plug
	<b>HS8.PA</b>	PNP Hall effect sensor N.O. with LED and M8 plug
Rodless cylinders	<b>SHS8.NA</b>	NPN Hall effect sensor N.O. with LED and M8 plug
	<b>SHS8.PA</b>	PNP Hall effect sensor N.O. with LED and M8 plug
Cable	<b>MCH1</b>	M8 connector with cable 2.5 m. 3 wires (PUR Ø2.6 mm 3x0.15mm <sup>2</sup> )
	<b>MCH2</b>	M8 connector with cable 5 m. 3 wires (PUR Ø2.6 mm 3x0.15mm <sup>2</sup> )
	<b>MCH3</b>	M8 connector with cable 10 m. 3 wires (PUR Ø2.6 mm 3x0.15mm <sup>2</sup> )



**Technical characteristic**

Maximum permanent current	0,25A
Voltage range	6 - 30V DC
Power (inductive load)	6W
Maximum Voltage drop	2V
Working temperature	-20°C - 70°C
Cables number	3
Degree of protection	IP 65
Connecting time	0,8 ms
Disconnecting time	0,3 ms
Average working period	10 <sup>8</sup> cycles
Repetition of intervention point	± 0,1 mm
Contact normally open	N.O.

**Diagrams and connections**

These sensors can be used on cylinders series:

SERIES	DESCRIPTION	MOUNTED
<b>1200</b>	for microbore with threaded end covers and "TECNO-MIR" microbore for microbore "MIR" with rolled end covers, cylinders from Ø16 to Ø32 for microbore "MIR-INOX" with rolled end covers	with clamps code 1260.Ø.F with clamps code 1280.Ø.F with clamps code 1280.Ø.FX
<b>1306 - 1307 - 1308</b>	for cylinders from Ø32 to Ø63 for cylinders from Ø80 to Ø125 for cylinders from Ø160 to Ø200	with brackets code 1306.A with brackets code 1306.B with brackets code 1306.C
<b>1315</b>	for cylinders Ø250 and Ø320 (ISO) for cylinders Ø32 and Ø40 for cylinders Ø50 and Ø63 for cylinders Ø80 and Ø100 for cylinders Ø125 for cylinders Ø160 for cylinders Ø200	with brackets code 1306.D with brackets code 1320.A with brackets code 1320.B with brackets code 1320.C with brackets code 1320.D with brackets code 1320.E with brackets code 1320.F
<b>1319 - 1320</b>	for cylinders ECOLIGHT Ø32 and Ø40 for cylinders ECOLIGHT Ø50 and Ø63 for cylinders ECOLIGHT Ø80 and Ø100 for cylinders ECOLIGHT Ø125 - Ø200	with brackets code 1390.A with brackets code 1390.B with brackets code 1390.C with brackets code 1390.D
<b>1390 - 1391</b>		
<b>1500</b>	Compact cylinders "Europe" (from Ø32)	directly on groove
<b>1605</b>	Rodless cylinders	with brackets code 1600.A

3

PNEUMATIC ACTUATION