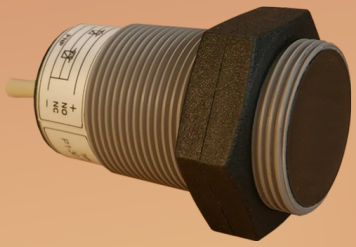
"ESA Control" Ltd

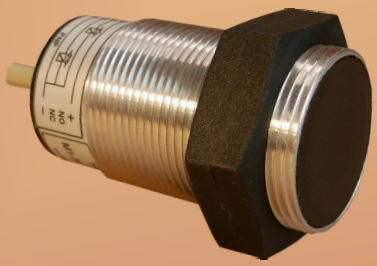


DIRECT CURRENT

INDUCTIVE

PROXIMITY SENSORS

DC, 3- and 4-wire



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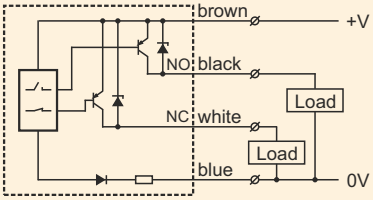
Inductive proximity sensors for direct current /3-wire and 4-wire/

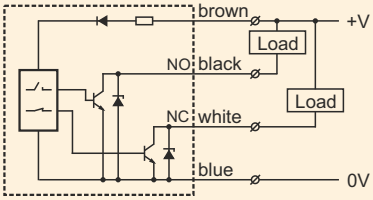
Purpose and areas of application

The presented proximity inductive sensors and switches are used in industrial systems as automation tools for switching 3- and 4-wire direct current circuits. The sensors are activated when metal objects approach their active part. Proximity inductive sensors and switches are moisture and dust resistant. They are used in many areas of human activity to automate production processes in the bottling, textile, packaging and many other industries. The sensors have a long service life due to the non-contact switching of the electrical circuits in which they are included.

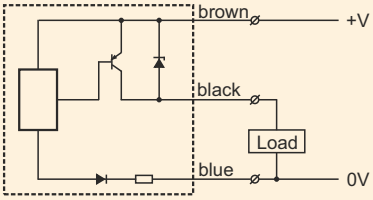
Electrical connection circuit of sensors of the direct current /DC/



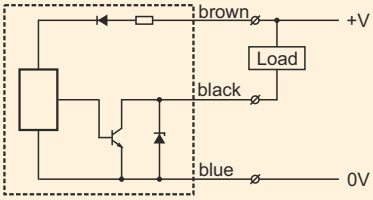
Scheme 10 (PNP / NO+NC)



Scheme 20 (NPN / NO+NC)

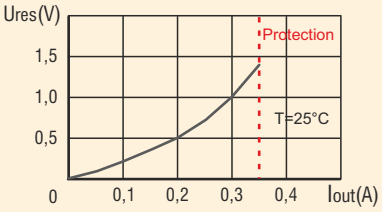


Scheme 11 (PNP / NO)
Scheme 12 (PNP / NC)



Scheme 21 (NPN / NO)
Scheme 22 (NPN / NC)

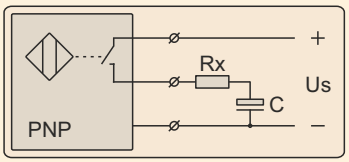
Output characteristic /residual voltage/



Features when working with capacitive load of sensors that have pulse protection against current overload and short circuit

When connecting a capacitive load to the output of the sensors that have pulse protection against short circuit, it is necessary to connected in series a resistor Rx, which limits the current when initially charging the load capacitor C. Rx is added if capacitor C is larger than 100nF.

$$Rx = Us / 0,5 \quad (Rx = 20\Omega \ldots 60\Omega)$$



Ø6,5 inductive proximity sensor for direct current, 3-wire, shielded type

Ø6,5

fig.1

Operating principle

The presented shielded type inductive proximity sensor with a diameter of Ø6.5 mm, serves to switch 3-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

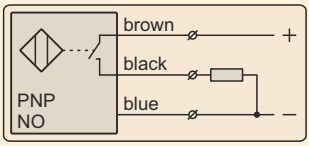
Operating distance, *Sn*	1,7 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	9…36 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	39 Vdc (open drain)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output, *Iprot*	No
Current consumption, *Is*	7 mA
Switching frequency (max), *fo*	1200 Hz (Sn=0,8 mm)
Time of fall and time of rise, *tf / tr*	2 µs / 2 µs
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3x0.25 mm^2, L=2 m, PVC
Overall dimensions	Ø6.5, L=36 mm
Housing - metallic	CuZn (Ni plated)

Features:
Protection from reverse inclusion of the supply voltage.
No protection of the output from overcurrent and short circuit.

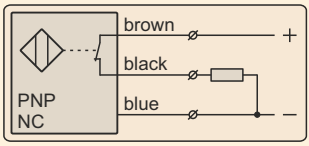
Type parameters

Type	Output function	Scheme of connection
M2-6,5.11	PNP / NO	11
M2-6,5.12	PNP / NC	12
M2-6,5.21	NPN / NO	21
M2-6,5.22	NPN / NC	22

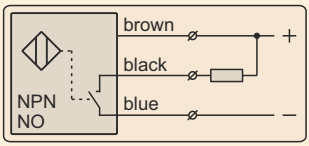
Schemes of connection



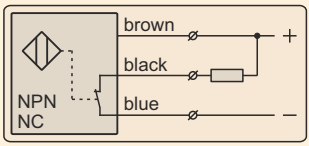
Scheme 11



Scheme 12



Scheme 21



Scheme 22

M8 /short/ inductive proximity sensor for direct current, 3-wire, shielded type

M8/S

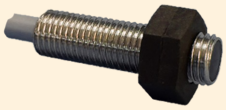


fig.1

Operating principle

The presented shielded type M8/S inductive proximity sensor, serves to switch 3-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

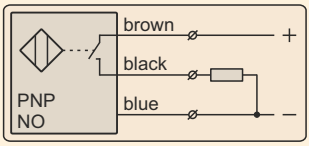
Operating distance, *Sn*	1,7 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	9…36 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	39 Vdc (open drain)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output, *Iprot*	No
Current consumption, *Is*	7 mA
Switching frequency (max), *fo*	1200 Hz (Sn=0,8 mm)
Time of fall and time of rise, *tf / tr*	2 µs / 2 µs
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3x0.25 mm^2, L=2 m, PVC
Overall dimensions	M8x1, L=30 mm
Housing - metallic	CuZn (Ni plated)

Features:
Protection from reverse inclusion of the supply voltage.
No protection of the output from overcurrent and short circuit.

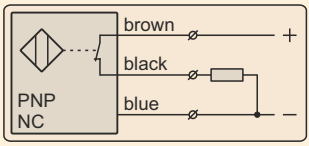
Type parameters

Type	Output function	Scheme of connection
M1-08.11.S	PNP / NO	11
M1-08.12.S	PNP / NC	12
M1-08.21.S	NPN / NO	21
M1-08.22.S	NPN / NC	22

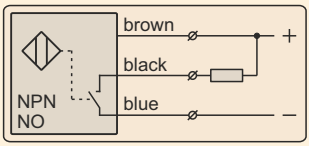
Schemes of connection



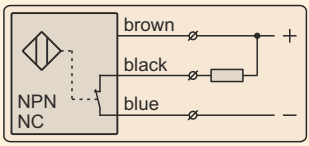
Scheme 11



Scheme 12



Scheme 21



Scheme 22

M8 /short/ inductive proximity sensor for direct current, 3-wire, unshielded type

M8/S

fig.1

Operating principle

The presented unshielded type M8/S inductive proximity sensor, serves to switch 3-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

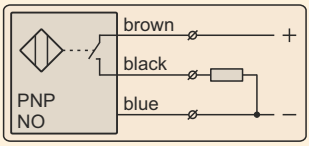
Operating distance, *Sn*	2,5 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	9…36 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	39 Vdc (open drain)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output, *Iprot*	No
Current consumption, *Is*	7 mA
Switching frequency (max), *fo*	1200 Hz (Sn=1,2 mm)
Time of fall and time of rise, *tf / tr*	2 µs / 2 µs
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3x0.25 mm^2, L=2 m, PVC
Overall dimensions	M8x1, L=30 mm
Housing - plastic	PVC

Features:
Protection from reverse inclusion of the supply voltage.
No protection of the output from overcurrent and short circuit.

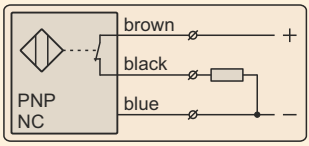
Type parameters

Type	Output function	Scheme of connection
P1-08.11.S	PNP / NO	11
P1-08.12.S	PNP / NC	12
P1-08.21.S	NPN / NO	21
P1-08.22.S	NPN / NC	22

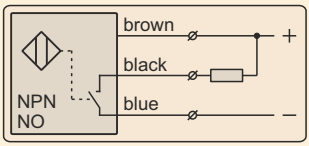
Schemes of connection



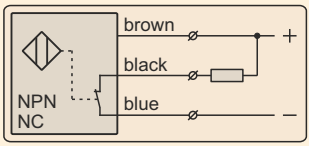
Scheme 11



Scheme 12



Scheme 21



Scheme 22

M8 inductive proximity sensor for direct current, 3-wire, shielded type

M8/K

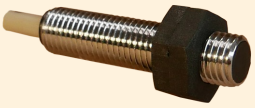


fig.1

Operating principle

The presented shielded type M8/K inductive proximity sensor, serves to switch 3-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

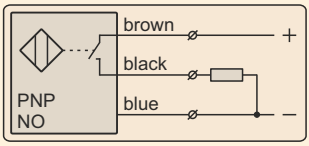
Operating distance, *Sn*	1,7 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	9…36 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	39 Vdc (open drain)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	7 mA
Switching frequency (max), *fo*	1200 Hz (Sn=0,8 mm)
Time of fall and time of rise, *tf / tr*	2 µs / 2 µs
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3x0.25 mm^2, L=2 m, PVC
Overall dimensions	M8x1, L=40 mm
Housing - metallic	CuZn (Ni plated)

Full protection to 40V:
Protection against incorrect connection of the cables, overcurrent and short-circuit at the output.

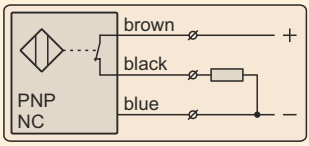
Type parameters

Type	Output function	Scheme of connection
M1-08.11.K	PNP / NO	11
M1-08.12.K	PNP / NC	12
M1-08.21.K	NPN / NO	21
M1-08.22.K	NPN / NC	22

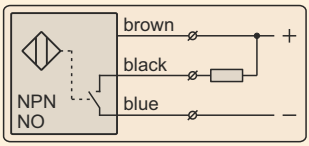
Schemes of connection



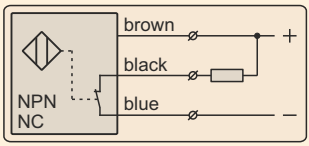
Scheme 11



Scheme 12



Scheme 21



Scheme 22

M8 inductive proximity sensor for direct current, 3-wire, unshielded type

M8/K

fig.1

Operating principle

The presented unshielded type M8/K inductive proximity sensor, serves to switch 3-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

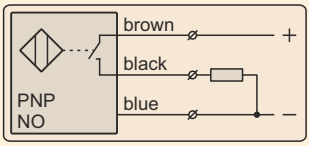
Operating distance, *Sn*	2,5 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	9…36 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	39 Vdc (open drain)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	7 mA
Switching frequency (max), *fo*	1200 Hz (Sn=1,2 mm)
Time of fall and time of rise, *tf / tr*	2 µs / 2 µs
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3x0.25 mm^2, L=2 m, PVC
Overall dimensions	M8x1, L=40 mm
Housing - plastic	PVC

Full protection to 40V:
Protection against incorrect connection of the cables, overcurrent and short-circuit at the output.

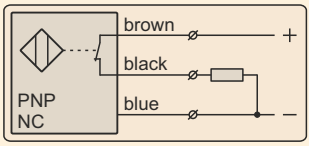
Type parameters

Type	Output function	Scheme of connection
P1-08.11.K	PNP / NO	11
P1-08.12.K	PNP / NC	12
P1-08.21.K	NPN / NO	21
P1-08.22.K	NPN / NC	22

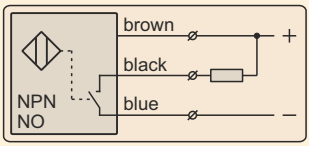
Schemes of connection



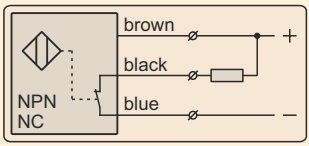
Scheme 11



Scheme 12



Scheme 21



Scheme 22

M12 inductive proximity sensor for direct current, 3-wire and 4-wire, shielded type

M12

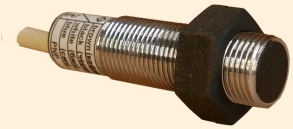


fig.1

Operating principle

The presented shielded type M12 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

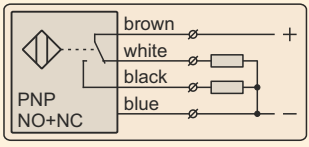
Operating distance, *Sn*	3,5 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	10…30 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	35 Vdc (open collector)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	9 mA
Switching frequency (max), *fo*	1000 Hz (Sn=1,7 mm)
Time of fall and time of rise, *tf / tr*	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	M12x1, L=45 mm
Housing - metallic	CuZn (Ni plated)

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

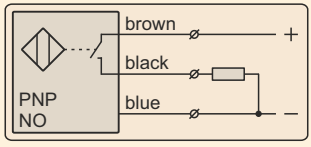
Type parameters

Type	Output function	Scheme of connection
M1-12.10.K	PNP / NO+NC	10
M1-12.11.K	PNP / NO	11
M1-12.12.K	PNP / NC	12
M1-12.20.K	NPN / NO+NC	20
M1-12.21.K	NPN / NO	21
M1-12.22.K	NPN / NC	22

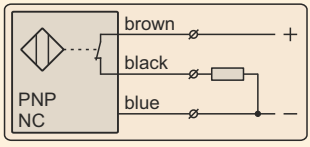
Schemes of connection



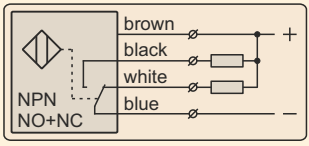
Scheme 10



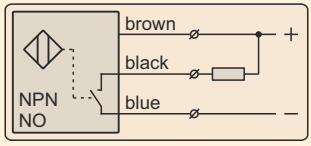
Scheme 11



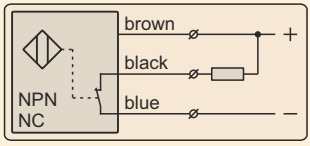
Scheme 12



Scheme 20



Scheme 21



Scheme 22

M12 inductive proximity sensor for direct current, 3-wire and 4-wire, unshielded type

M12

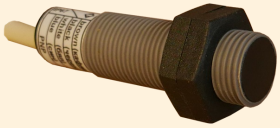


fig.1

Operating principle

The presented unshielded type M12 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

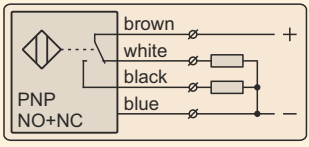
Operating distance, *Sn*	5,0 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	10…30 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	35 Vdc (open collector)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	9 mA
Switching frequency (max), *fo*	800 Hz (Sn=2,5 mm)
Time of fall and time of rise, *tf / tr*	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	M12x1, L=45 mm
Housing - plastic	PVC

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

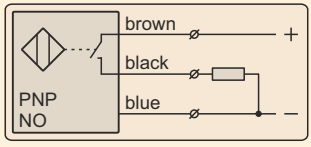
Type parameters

Type	Output function	Scheme of connection
P1-12.10.K	PNP / NO+NC	10
P1-12.11.K	PNP / NO	11
P1-12.12.K	PNP / NC	12
P1-12.20.K	NPN / NO+NC	20
P1-12.21.K	NPN / NO	21
P1-12.22.K	NPN / NC	22

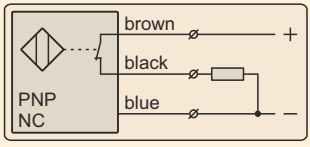
Schemes of connection



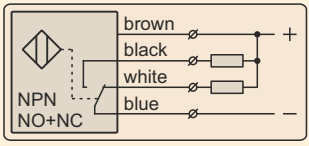
Scheme 10



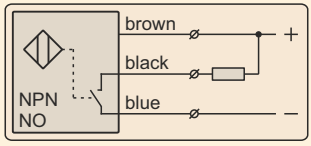
Scheme 11



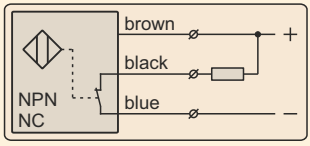
Scheme 12



Scheme 20



Scheme 21



Scheme 22

M14 inductive proximity sensor for direct current, 3-wire and 4-wire, shielded type

M14

fig.1

Operating principle

The presented shielded type M14 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

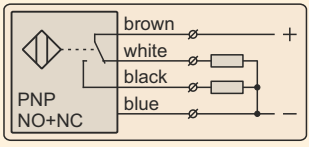
Operating distance, *Sn*	3,5 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	10…30 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	35 Vdc (open collector)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	9 mA
Switching frequency (max), *fo*	800 Hz (Sn=1,8 mm)
Time of fall and time of rise, *tf / tr*	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	M14x1, L=47 mm
Housing - metallic	CuZn (Ni plated)

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

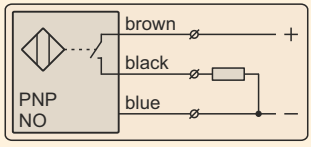
Type parameters

Type	Output function	Scheme of connection
M1-14.10.K	PNP / NO+NC	10
M1-14.11.K	PNP / NO	11
M1-14.12.K	PNP / NC	12
M1-14.20.K	NPN / NO+NC	20
M1-14.21.K	NPN / NO	21
M1-14.22.K	NPN / NC	22

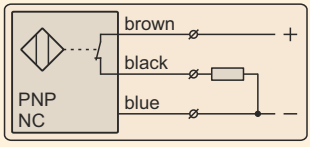
Schemes of connection



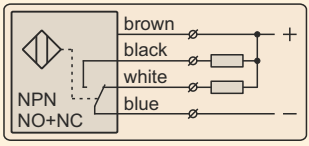
Scheme 10



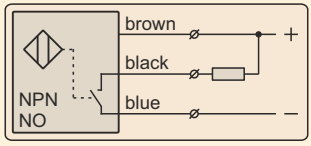
Scheme 11



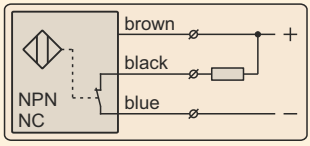
Scheme 12



Scheme 20



Scheme 21



Scheme 22

M14 inductive proximity sensor for direct current, 3-wire and 4-wire, unshielded type

fig.1

Operating principle

The presented unshielded type M14 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

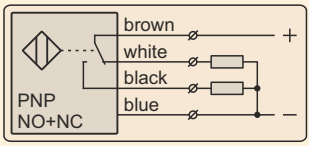
Operating distance, *Sn*	5,5 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	10…30 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	35 Vdc (open collector)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	9 mA
Switching frequency (max), *fo*	600 Hz (Sn=2,8 mm)
Time of fall and time of rise, *tf / tr*	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	M14x1, L=47 mm
Housing - plastic	PVC

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

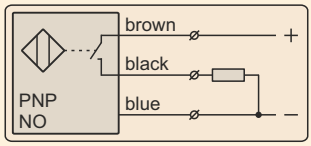
Type parameters

Type	Output function	Scheme of connection
P1-14.10.K	PNP / NO+NC	10
P1-14.11.K	PNP / NO	11
P1-14.12.K	PNP / NC	12
P1-14.20.K	NPN / NO+NC	20
P1-14.21.K	NPN / NO	21
P1-14.22.K	NPN / NC	22

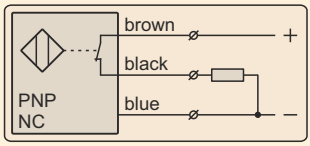
Schemes of connection



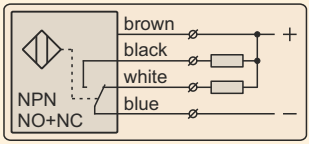
Scheme 10



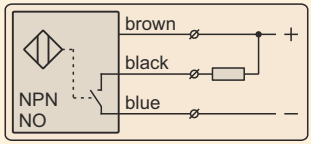
Scheme 11



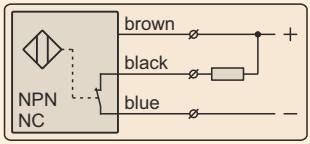
Scheme 12



Scheme 20



Scheme 21



Scheme 22

M18 inductive proximity sensor for direct current, 3-wire and 4-wire, shielded type

M18

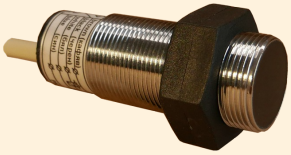


fig.1

Operating principle

The presented shielded type M18 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

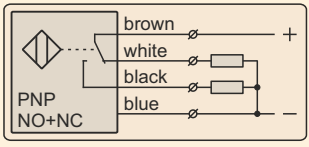
Operating distance, *Sn*	5,0 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	10…30 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	35 Vdc (open collector)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	9 mA
Switching frequency (max), *fo*	600 Hz (Sn=2,5 mm)
Time of fall and time of rise, *tf / tr*	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0,25 mm^2, L=2 m, PVC
Overall dimensions	M18x1, L=49 mm
Housing - metallic	CuZn (Ni plated)

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

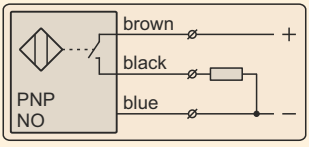
Type parameters

Type	Output function	Scheme of connection
M1-18.10.K	PNP / NO+NC	10
M1-18.11.K	PNP / NO	11
M1-18.12.K	PNP / NC	12
M1-18.20.K	NPN / NO+NC	20
M1-18.21.K	NPN / NO	21
M1-18.22.K	NPN / NC	22

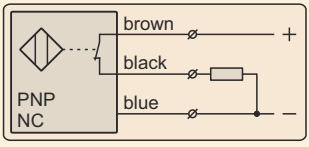
Schemes of connection



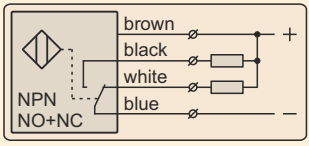
Scheme 10



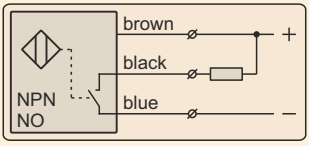
Scheme 11



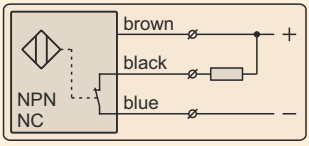
Scheme 12



Scheme 20



Scheme 21



Scheme 22

M18 inductive proximity sensor for direct current, 3-wire and 4-wire, unshielded type

M18

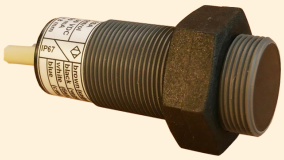


fig.1

Operating principle

The presented unshielded type M18 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

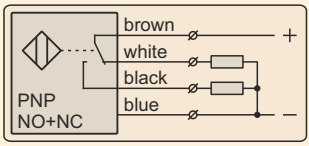
Operating distance, *Sn*	8,0 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	10…30 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	35 Vdc (open collector)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	9 mA
Switching frequency (max), *fo*	400 Hz (Sn=4,0 mm)
Time of fall and time of rise, *tf / tr*	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	M18x1, L=49 mm
Housing - plastic	PVC

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

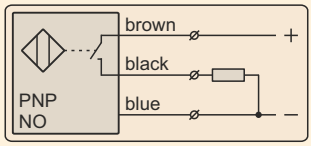
Type parameters

Type	Output function	Scheme of connection
P1-18.10.K	PNP / NO+NC	10
P1-18.11.K	PNP / NO	11
P1-18.12.K	PNP / NC	12
P1-18.20.K	NPN / NO+NC	20
P1-18.21.K	NPN / NO	21
P1-18.22.K	NPN / NC	22

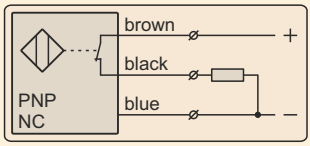
Schemes of connection



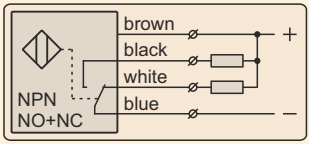
Scheme 10



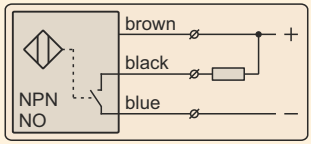
Scheme 11



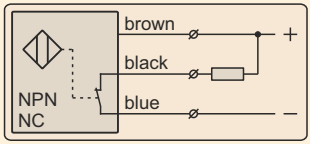
Scheme 12



Scheme 20



Scheme 21



Scheme 22

M22 inductive proximity sensor for direct current, 3-wire and 4-wire, shielded type

M22

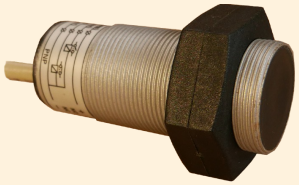


fig.1

Operating principle

The presented shielded type M22 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

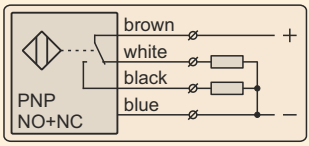
Operating distance, *Sn*	6,5 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	10…30 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	35 Vdc (open collector)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	9 mA
Switching frequency (max), *fo*	400 Hz (Sn=3,3 mm)
Time of fall and time of rise, *tf / tr*	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	M22x1, L=51 mm
Housing - metallic	CuZn (Ni plated)

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

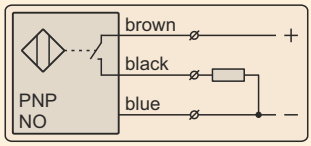
Type parameters

Type	Output function	Scheme of connection
M1-22.10.K	PNP / NO+NC	10
M1-22.11.K	PNP / NO	11
M1-22.12.K	PNP / NC	12
M1-22.20.K	NPN / NO+NC	20
M1-22.21.K	NPN / NO	21
M1-22.22.K	NPN / NC	22

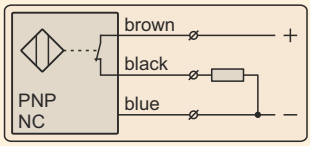
Schemes of connection



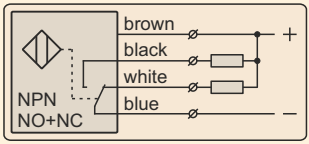
Scheme 10



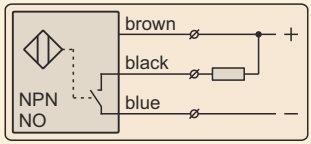
Scheme 11



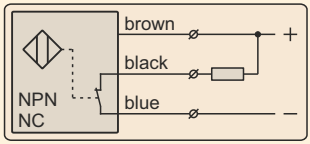
Scheme 12



Scheme 20



Scheme 21



Scheme 22

M22 inductive proximity sensor for direct current, 3-wire and 4-wire, unshielded type

M22

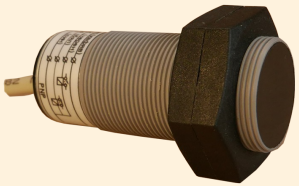


fig.1

Operating principle

The presented unshielded type M22 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

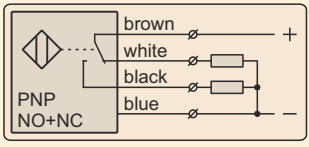
Operating distance, *Sn*	10,0 mm
Hysteresis, *h*	4...15%
Supply voltage, U_s	10…30 Vdc (Ripple ±10 %)
Output voltage (max), U_{out}	35 Vdc (open collector)
Residual voltage, U_{res}	0,8 V (I = 250 mA)
Load current (max), I_{out}	250 mA
Protection of output (scanning), I_{prot}	350 mA (25°C)
Current consumption, I_s	9 mA
Switching frequency (max), f_o	300 Hz (Sn=5,0 mm)
Time of fall and time of rise, t_f / t_r	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	M22x1, L=51 mm
Housing - plastic	PVC

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

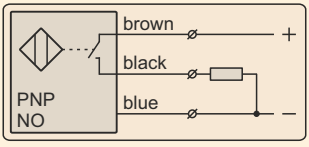
Type parameters

Type	Output function	Scheme of connection
P1-22.10.K	PNP / NO+NC	10
P1-22.11.K	PNP / NO	11
P1-22.12.K	PNP / NC	12
P1-22.20.K	NPN / NO+NC	20
P1-22.21.K	NPN / NO	21
P1-22.22.K	NPN / NC	22

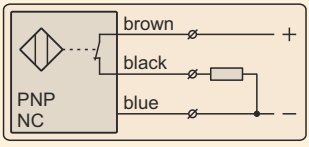
Schemes of connection



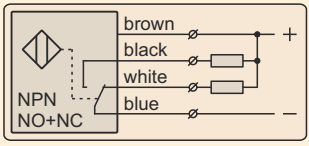
Scheme 10



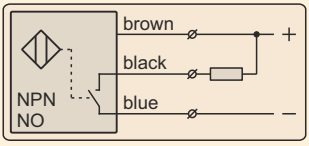
Scheme 11



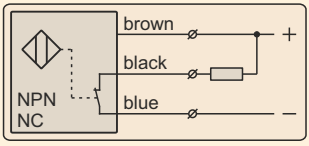
Scheme 12



Scheme 20



Scheme 21



Scheme 22

M30 inductive proximity sensor for direct current, 3-wire and 4-wire, shielded type

M30

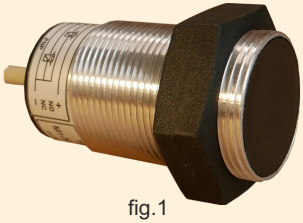


fig.1

Operating principle

The presented shielded type M30 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

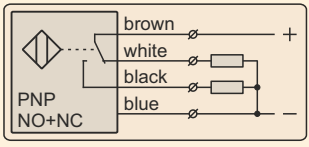
Operating distance, *Sn*	9,5 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	10…30 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	35 Vdc (open collector)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	9 mA
Switching frequency (max), *fo*	300 Hz (Sn=5,0 mm)
Time of fall and time of rise, *tf / tr*	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	M30x1.5, L=53 mm
Housing - metallic	Al (aluminum)

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

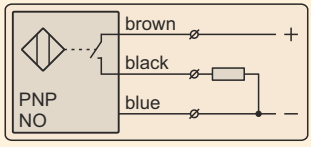
Type parameters

Type	Output function	Scheme of connection
M1-30.10.K	PNP / NO+NC	10
M1-30.11.K	PNP / NO	11
M1-30.12.K	PNP / NC	12
M1-30.20.K	NPN / NO+NC	20
M1-30.21.K	NPN / NO	21
M1-30.22.K	NPN / NC	22

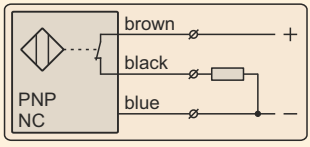
Schemes of connection



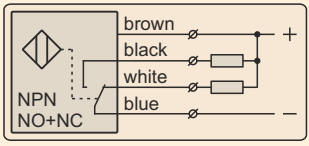
Scheme 10



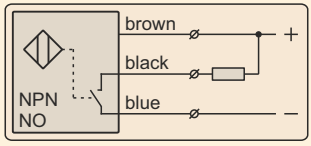
Scheme 11



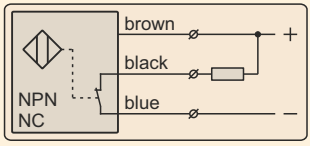
Scheme 12



Scheme 20



Scheme 21



Scheme 22

M30 inductive proximity sensor for direct current, 3-wire and 4-wire, unshielded type

M30

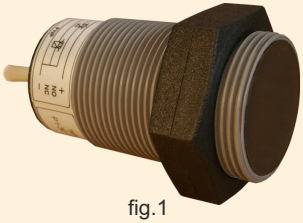


fig.1

Operating principle

The presented unshielded type M30 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

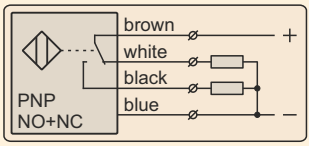
Operating distance, *Sn*	14,0 mm
Hysteresis, *h*	4...15%
Supply voltage, U_s	10…30 Vdc (Ripple ±10 %)
Output voltage (max), U_{out}	35 Vdc (open collector)
Residual voltage, U_{res}	0,8 V (I = 250 mA)
Load current (max), I_{out}	250 mA
Protection of output (scanning), I_{prot}	350 mA (25°C)
Current consumption, I_s	9 mA
Switching frequency (max), f_o	150 Hz (Sn=7,0 mm)
Time of fall and time of rise, t_f / t_r	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	M30x1.5, L=53 mm
Housing - plastic	PVC

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

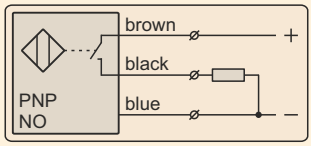
Type parameters

Type	Output function	Scheme of connection
P1-30.10.K	PNP / NO+NC	10
P1-30.11.K	PNP / NO	11
P1-30.12.K	PNP / NC	12
P1-30.20.K	NPN / NO+NC	20
P1-30.21.K	NPN / NO	21
P1-30.22.K	NPN / NC	22

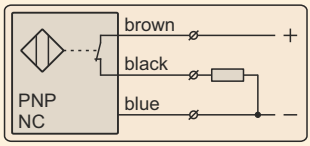
Schemes of connection



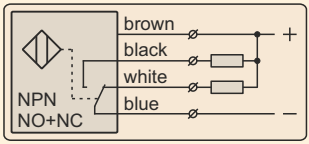
Scheme 10



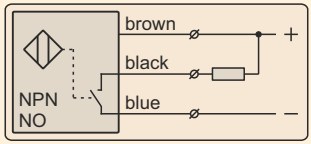
Scheme 11



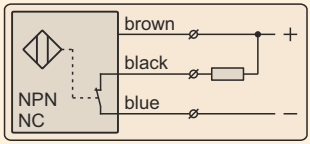
Scheme 12



Scheme 20



Scheme 21



Scheme 22

M40 inductive proximity sensor for direct current, 3-wire and 4-wire, shielded type

M40

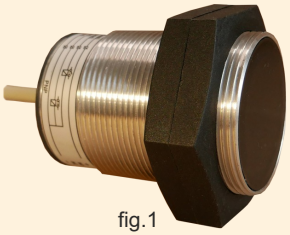


fig.1

Operating principle

The presented shielded type M40 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

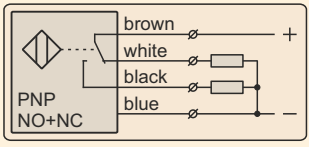
Operating distance, *Sn*	14,0 mm
Hysteresis, *h*	4...15%
Supply voltage, U_s	10…30 Vdc (Ripple ±10 %)
Output voltage (max), U_{out}	35 Vdc (open collector)
Residual voltage, U_{res}	0,8 V (I = 250 mA)
Load current (max), I_{out}	250 mA
Protection of output (scanning), I_{prot}	350 mA (25°C)
Current consumption, I_s	9 mA
Switching frequency (max), f_o	150 Hz (Sn=7,0 mm)
Time of fall and time of rise, t_f / t_r	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, T_{amb}	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	M40x1.5, L=55 mm
Housing - metallic	Al (aluminum)

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

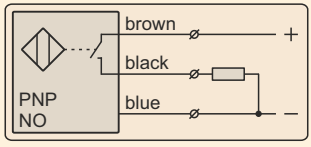
Type parameters

Type	Output function	Scheme of connection
M1-40.10.K	PNP / NO+NC	10
M1-40.11.K	PNP / NO	11
M1-40.12.K	PNP / NC	12
M1-40.20.K	NPN / NO+NC	20
M1-40.21.K	NPN / NO	21
M1-40.22.K	NPN / NC	22

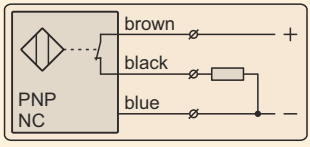
Schemes of connection



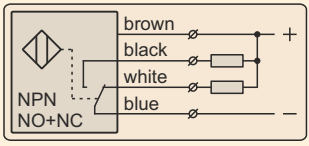
Scheme 10



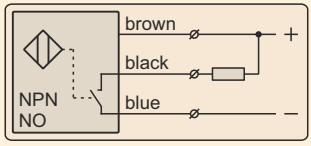
Scheme 11



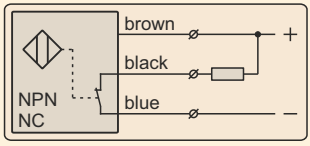
Scheme 12



Scheme 20



Scheme 21



Scheme 22

M40 inductive proximity sensor for direct current, 3-wire and 4-wire, unshielded type

M40

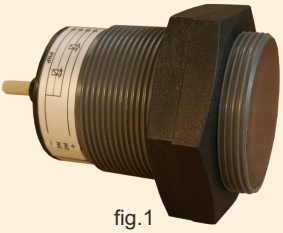


fig.1

Operating principle

The presented unshielded type M40 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

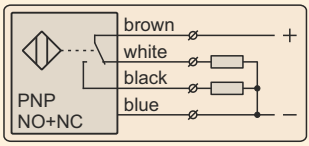
Operating distance, *Sn*	24,0 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	10…30 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	35 Vdc (open collector)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	9 mA
Switching frequency (max), *fo*	100 Hz (Sn=14,0 mm)
Time of fall and time of rise, *tf / tr*	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	M40x1.5, L=55 mm
Housing - plastic	PVC

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

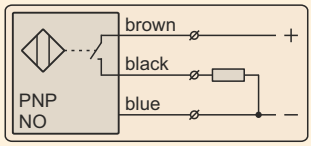
Type parameters

Type	Output function	Scheme of connection
P1-40.10.K	PNP / NO+NC	10
P1-40.11.K	PNP / NO	11
P1-40.12.K	PNP / NC	12
P1-40.20.K	NPN / NO+NC	20
P1-40.21.K	NPN / NO	21
P1-40.22.K	NPN / NC	22

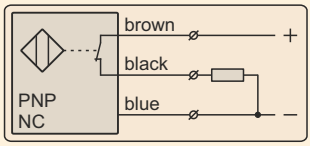
Schemes of connection



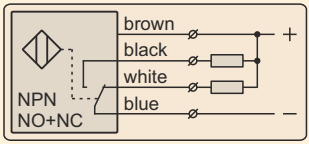
Scheme 10



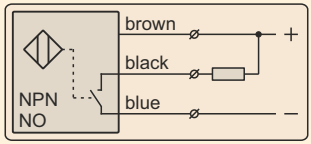
Scheme 11



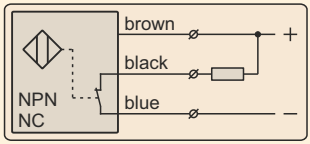
Scheme 12



Scheme 20



Scheme 21



Scheme 22

P3-60 inductive proximity sensor for direct current, 3-wire and 4-wire, unshielded type

P3-60

fig.1

Operating principle

The presented unshielded type P3-60 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

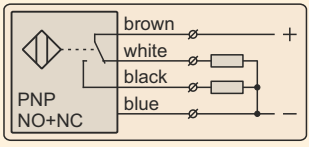
Operating distance, *Sn*	12,5 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	10…30 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	35 Vdc (open collector)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	9 mA
Switching frequency (max), *fo*	100 Hz (Sn=6,5 mm)
Time of fall and time of rise, *tf / tr*	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	60x30x15 mm
Housing - plastic	PA6 (polyamide)

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

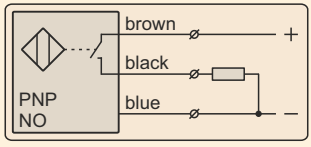
Type parameters

Type	Output function	Scheme of connection
P3-60.10.K	PNP / NO+NC	10
P3-60.11.K	PNP / NO	11
P3-60.12.K	PNP / NC	12
P3-60.20.K	NPN / NO+NC	20
P3-60.21.K	NPN / NO	21
P3-60.22.K	NPN / NC	22

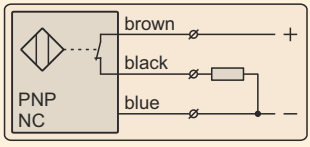
Schemes of connection



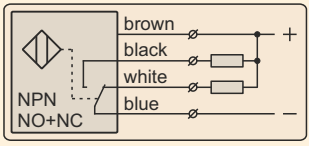
Scheme 10



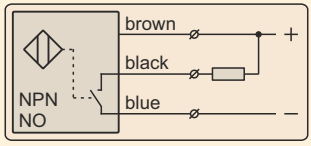
Scheme 11



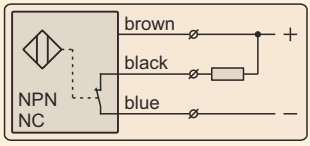
Scheme 12



Scheme 20



Scheme 21



Scheme 22

P4-70 inductive proximity sensors for direct current, 3-wire and 4-wire, unshielded type

P4-70

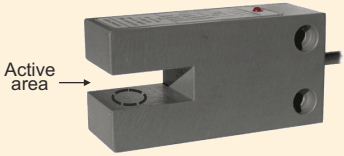


fig.1

Operating principle

The presented unshielded type P4-70 inductive proximity sensor, serves to switch 3- and 4-wire direct current circuits. Its output is activated by approaching of metallic object to him active area. The inductive proximity sensor is resistant to moisture and dust. It has a long service life thanks to the non-contact switching of the electrical circuit in which it is connected.

Technical parameters

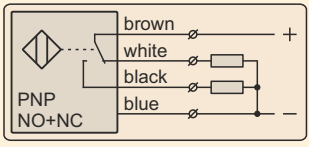
Operating distance, *Sn*	10 mm
Hysteresis, *h*	4...15%
Supply voltage, *Us*	10…30 Vdc (Ripple ±10 %)
Output voltage (max), *Uout*	35 Vdc (open collector)
Residual voltage, *Ures*	0,8 V (I = 250 mA)
Load current (max), *Iout*	250 mA
Protection of output (scanning), *Iprot*	350 mA (25°C)
Current consumption, *Is*	9 mA
Switching frequency (max), *fo*	300 Hz
Time of fall and time of rise, *tf / tr*	0,6/0,2μs PNP; 0,2/0,6μs NPN
Operating temperature range, *Tamb*	-25°…+70° C
Degree of protection	IP67 (IEC144)
Light output indicator	LED
Joining cable	3(4)x0.25 mm^2, L=2 m, PVC
Overall dimensions	70x24x35 mm
Housing - plastic	PVC

Protection from reverse inclusion of the supply voltage.
Protection of the outputs from overcurrent and short circuit.

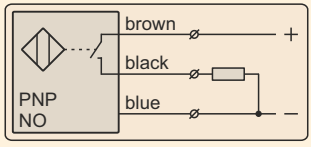
Type parameters

Type	Output function	Scheme of connection
P4-70.10.K	PNP / NO+NC	10
P4-70.11.K	PNP / NO	11
P4-70.12.K	PNP / NC	12
P4-70.20.K	NPN / NO+NC	20
P4-70.21.K	NPN / NO	21
P4-70.22.K	NPN / NC	22

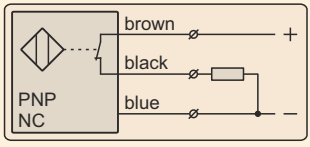
Schemes of connection



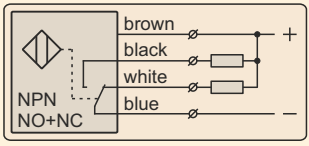
Scheme 10



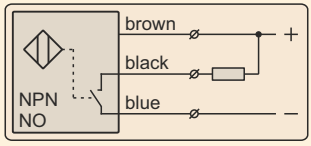
Scheme 11



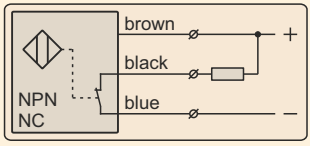
Scheme 12



Scheme 20

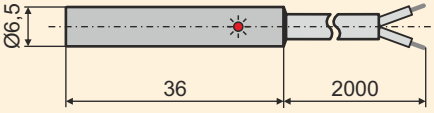


Scheme 21

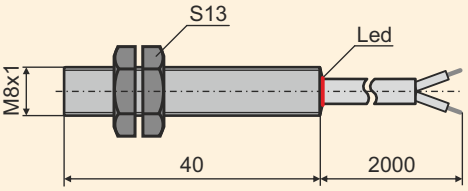


Scheme 22

Ø6,5



M8K



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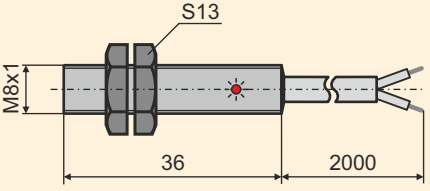

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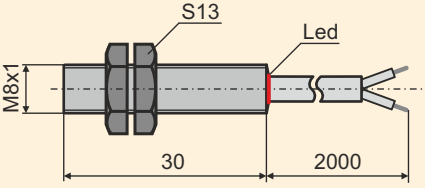

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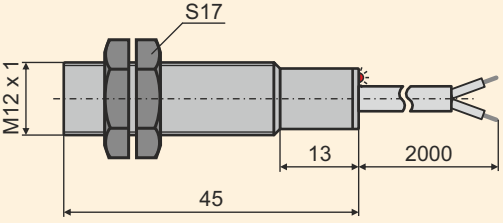

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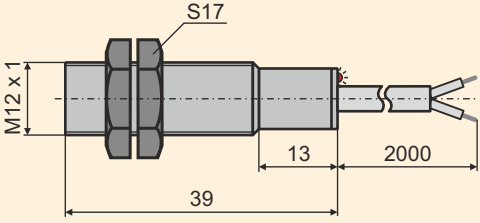

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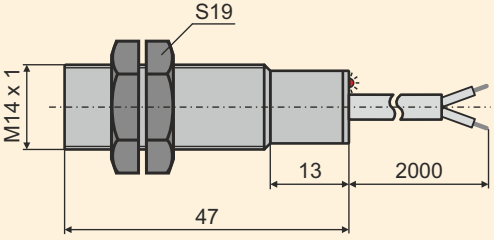

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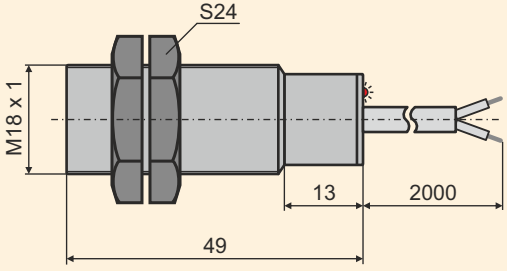

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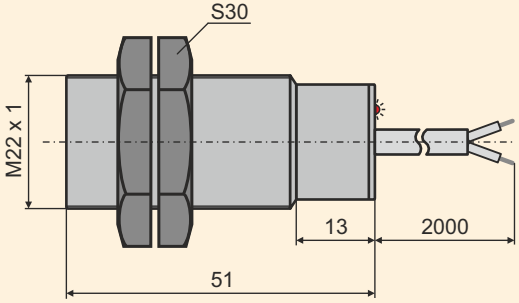

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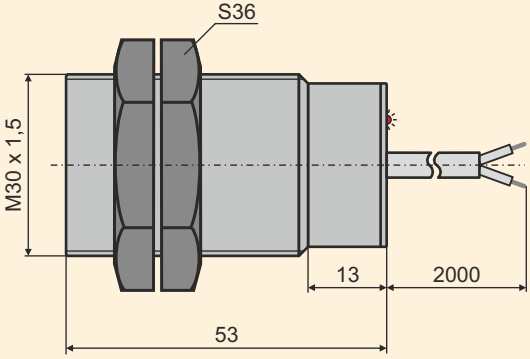

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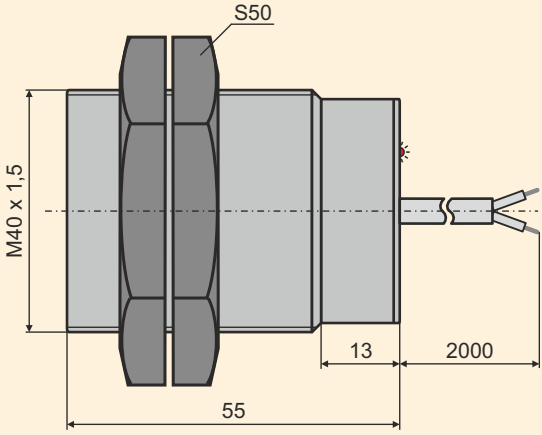
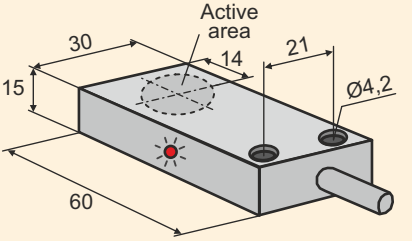


P3-60



P4-70