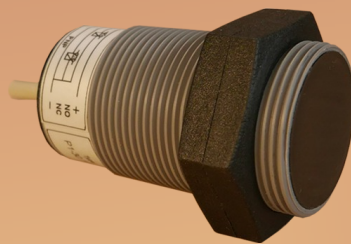


"ESA Control" Ltd

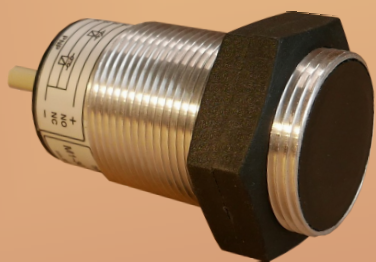


ALTERNATING CURRENT

INDUCTIVE

PROXIMITY SENSORS

2-wire, AC / U0



Bulgaria
5300 Gabrovo
3, Stancionna str.
Tel./fax: +359 66 860543
E-mail: office@esa-control.com
Site: <http://www.esa-control.com>

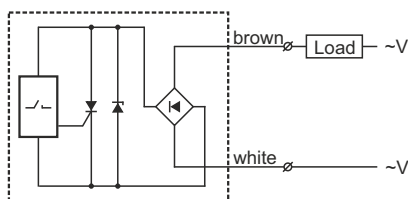
Purpose and areas of application

The presented inductive proximity sensors serve to commutate 2-wire alternating current electric circuits. They act on the basis of induction - if a metal piece is brought to the active surface, the output switches over - the electric circuit opens or shuts. Lack of physical contact between object and inductive proximity sensors ensures their high reliability and long-lasting exploitation. They are used for automatic transfer lines, metalworking machines, textile, wood working, packaging and other machines. They find place in solving automation problems, especially in conditions of: high quantity of dust, moisture, lubricants and oils, under vibrations and prolonged regime of working.

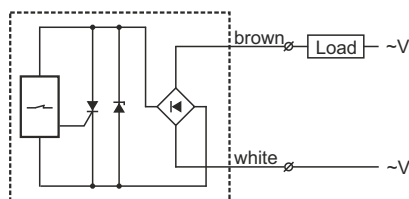
Technical parameters

Operating voltage, U_s	12...250 Vac / 40...60 Hz
Load current, I_{out}	5...300 mA (5...500mA)
Residual voltage, U_{res1}	4.0 Vac & 15...500 mA
Residual voltage, U_{res2}	5.5 Vac & 5...15 mA
Current consumption, I_s	1 mA
Operating temperature range, T_{amb}	-25°...+70°C
Degree of protection of the sensors	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Joining - cable "LIYY" (grey)	2x0.5 mm ² , L=2 m, PVC
Protection when switching on without load	NO
Protection against reverse connection	YES

Electrical schematics



Scheme 71 (NO - normally open)



Scheme 72 (NC - normally closed)

Output characteristic /residual voltage/

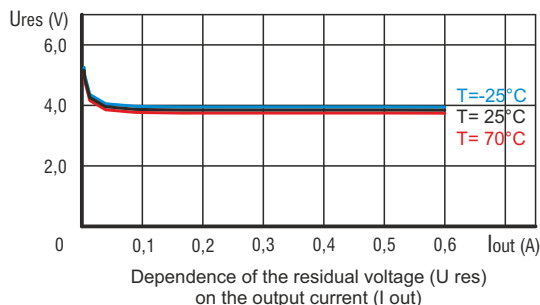




fig.1

Operating principle

The presented inductive proximity sensor M12 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

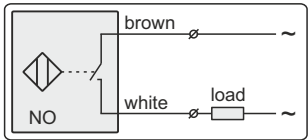
Technical parameters

Nominal sensing distance, <i>Sn</i>	3.5 mm ±4%
Measuring plate steel, <i>St 37</i>	12x12x1 mm
Hysteresis, <i>h</i>	5...12%
Operating voltage, <i>Us</i>	12...250 Vac / 40...60 Hz
Load current, <i>Iout</i>	5...300 mA
Residual voltage, <i>Ures1</i>	4.0 Vac & 15...300 mA
Residual voltage, <i>Ures2</i>	5.5 Vac & 5...15 mA
Current consumption (max), <i>Is</i>	1 mA
Switching frequency (max), <i>fo</i>	25 Hz
Operating temperature range, <i>Tamb</i>	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm², L=2 m, PVC, grey
Overall dimensions	M12x1, L=56 mm
Housing material	CuZn (Ni plated)

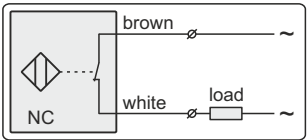
Type parameters

Type	Output function	Scheme of connection
M1-12.71.U0	NO	71
M1-12.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72



fig.1

Operating principle

The presented inductive proximity sensor M12 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

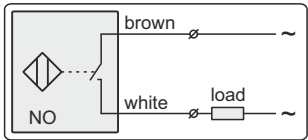
Technical parameters

Nominal sensing distance, <i>Sn</i>	5.0 mm ±4%
Measuring plate steel, <i>St 37</i>	12x12x1 mm
Hysteresis, <i>h</i>	5...12%
Operating voltage, <i>Us</i>	12...250 Vac / 40...60 Hz
Load current, <i>Iout</i>	5...300 mA
Residual voltage, <i>Ures1</i>	4.0 Vac & 15...300 mA
Residual voltage, <i>Ures2</i>	5.5 Vac & 5...15 mA
Current consumption (max), <i>Is</i>	1 mA
Switching frequency (max), <i>fo</i>	25 Hz
Operating temperature range, <i>Tamb</i>	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm², L=2 m, PVC, grey
Overall dimensions	M12x1, L=56 mm
Housing material	PVC

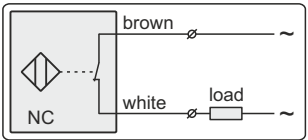
Type parameters

Type	Output function	Scheme of connection
P1-12.71.U0	NO	71
P1-12.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72

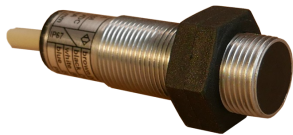


fig.1

Operating principle

The presented inductive proximity sensor M14 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

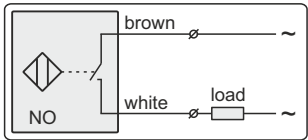
Technical parameters

Nominal sensing distance, <i>Sn</i>	3.5 mm ±4%
Measuring plate steel, <i>St 37</i>	14x14x1 mm
Hysteresis, <i>h</i>	5...12%
Operating voltage, <i>Us</i>	12...250 Vac / 40...60 Hz
Load current, <i>Iout</i>	5...300 mA
Residual voltage, <i>Ures1</i>	4.0 Vac & 15...300 mA
Residual voltage, <i>Ures2</i>	5.5 Vac & 5...15 mA
Current consumption (max), <i>Is</i>	1 mA
Switching frequency (max), <i>fo</i>	25 Hz
Operating temperature range, <i>Tamb</i>	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm², L=2 m, PVC, grey
Overall dimensions	M14x1, L=56 mm
Housing material	CuZn (Ni plated)

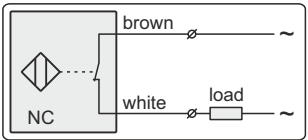
Type parameters

Type	Output function	Scheme of connection
M1-14.71.U0	NO	71
M1-14.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72



fig.1

Operating principle

The presented inductive proximity sensor M14 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

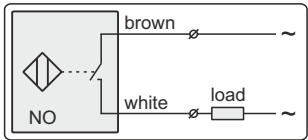
Technical parameters

Nominal sensing distance, S_n	5.5 mm $\pm 4\%$
Measuring plate steel, $St\ 37$	14x14x1 mm
Hysteresis, h	5...12%
Operating voltage, U_s	12...250 Vac / 40...60 Hz
Load current, I_{out}	5...300 mA
Residual voltage, U_{res1}	4.0 Vac & 15...300 mA
Residual voltage, U_{res2}	5.5 Vac & 5...15 mA
Current consumption (max), I_s	1 mA
Switching frequency (max), f_o	25 Hz
Operating temperature range, T_{amb}	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm ² , L=2 m, PVC, grey
Overall dimensions	M14x1, L=56 mm
Housing material	PVC

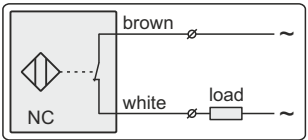
Type parameters

Type	Output function	Scheme of connection
P1-14.71.U0	NO	71
P1-14.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72

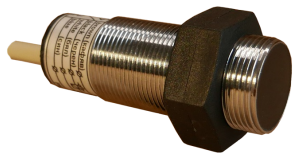


fig.1

Operating principle

The presented inductive proximity sensor M18 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

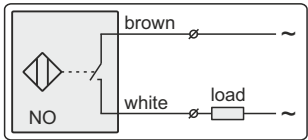
Technical parameters

Nominal sensing distance, <i>Sn</i>	5.0 mm ±4%
Measuring plate steel, <i>St 37</i>	18x18x1 mm
Hysteresis, <i>h</i>	5...12%
Operating voltage, <i>Us</i>	12...250 Vac / 40...60 Hz
Load current, <i>Iout</i>	5...500 mA
Residual voltage, <i>Ures1</i>	4.0 Vac & 15...500 mA
Residual voltage, <i>Ures2</i>	5.5 Vac & 5...15 mA
Current consumption (max), <i>Is</i>	1 mA
Switching frequency (max), <i>fo</i>	25 Hz
Operating temperature range, <i>Tamb</i>	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm ² , L=2 m, PVC, grey
Overall dimensions	M18x1, L=59 mm
Housing material	CuZn (Ni plated)

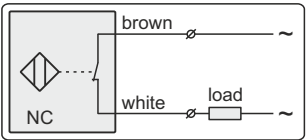
Type parameters

Type	Output function	Scheme of connection
M1-18.71.U0	NO	71
M1-18.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72



fig.1

Operating principle

The presented inductive proximity sensor M18 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

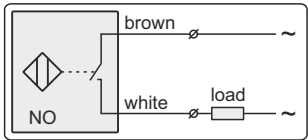
Technical parameters

Nominal sensing distance, S_n	8.0 mm $\pm 4\%$
Measuring plate steel, $St\ 37$	18x18x1 mm
Hysteresis, h	5...12%
Operating voltage, U_s	12...250 Vac / 40...60 Hz
Load current, I_{out}	5...500 mA
Residual voltage, U_{res1}	4.0 Vac & 15...500 mA
Residual voltage, U_{res2}	5.5 Vac & 5...15 mA
Current consumption (max), I_s	1 mA
Switching frequency (max), f_o	25 Hz
Operating temperature range, T_{amb}	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm ² , L=2 m, PVC, grey
Overall dimensions	M18x1, L=59 mm
Housing material	PVC

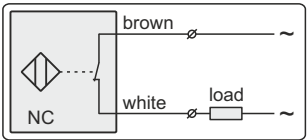
Type parameters

Type	Output function	Scheme of connection
P1-18.71.U0	NO	71
P1-18.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72

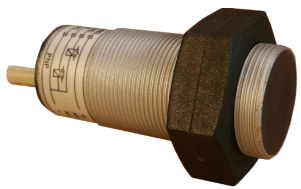


fig.1

Operating principle

The presented inductive proximity sensor M22 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

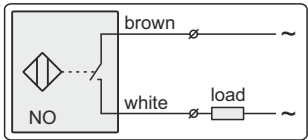
Technical parameters

Nominal sensing distance, S_n	6.5 mm $\pm 4\%$
Measuring plate steel, $St\ 37$	22x22x1 mm
Hysteresis, h	5...12%
Operating voltage, U_s	12...250 Vac / 40...60 Hz
Load current, I_{out}	5...500 mA
Residual voltage, U_{res1}	4.0 Vac & 15...500 mA
Residual voltage, U_{res2}	5.5 Vac & 5...15 mA
Current consumption (max), I_s	1 mA
Switching frequency (max), f_o	25 Hz
Operating temperature range, T_{amb}	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm ² , L=2 m, PVC, grey
Overall dimensions	M22x1, L=59 mm
Housing material	CuZn (Ni plated)

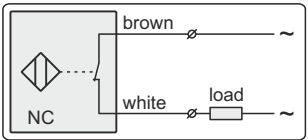
Type parameters

Type	Output function	Scheme of connection
M1-22.71.U0	NO	71
M1-22.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72

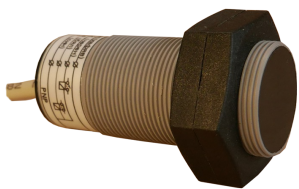


fig.1

Operating principle

The presented inductive proximity sensor M22 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

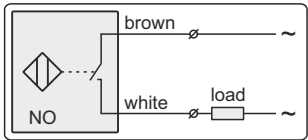
Technical parameters

Nominal sensing distance, S_n	10.0 mm $\pm 4\%$
Measuring plate steel, $St\ 37$	22x22x1 mm
Hysteresis, h	5...12%
Operating voltage, U_s	12...250 Vac / 40...60 Hz
Load current, I_{out}	5...500 mA
Residual voltage, U_{res1}	4.0 Vac & 15...500 mA
Residual voltage, U_{res2}	5.5 Vac & 5...15 mA
Current consumption (max), I_s	1 mA
Switching frequency (max), f_o	25 Hz
Operating temperature range, T_{amb}	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm ² , L=2 m, PVC, grey
Overall dimensions	M22x1, L=59 mm
Housing material	PVC

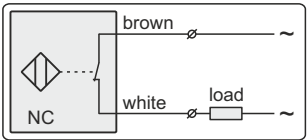
Type parameters

Type	Output function	Scheme of connection
P1-22.71.U0	NO	71
P1-22.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72

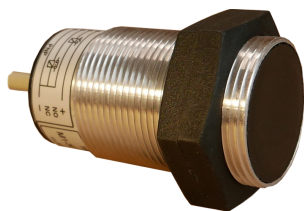


fig.1

Operating principle

The presented inductive proximity sensor M30 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

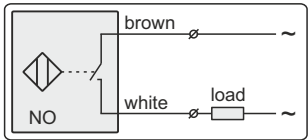
Technical parameters

Nominal sensing distance, S_n	9.5 mm $\pm 4\%$
Measuring plate steel, $St\ 37$	30x30x1 mm
Hysteresis, h	5...12%
Operating voltage, U_s	12...250 Vac / 40...60 Hz
Load current, I_{out}	5...500 mA
Residual voltage, U_{res1}	4.0 Vac & 15...500 mA
Residual voltage, U_{res2}	5.5 Vac & 5...15 mA
Current consumption (max), I_s	1 mA
Switching frequency (max), f_o	25 Hz
Operating temperature range, T_{amb}	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm ² , L=2 m, PVC, grey
Overall dimensions	M30x1.5, L=61 mm
Housing material	Al (Aluminum)

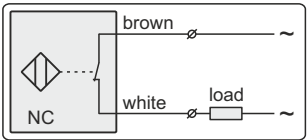
Type parameters

Type	Output function	Scheme of connection
M1-30.71.U0	NO	71
M1-30.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72

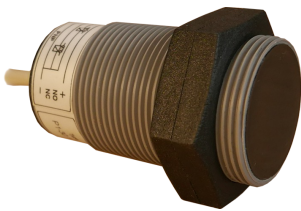


fig.1

Operating principle

The presented inductive proximity sensor M30 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

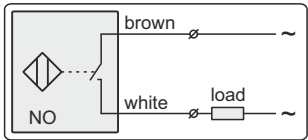
Technical parameters

Nominal sensing distance, S_n	14.0 mm $\pm 4\%$
Measuring plate steel, $St\ 37$	30x30x1 mm
Hysteresis, h	5...12%
Operating voltage, U_s	12...250 Vac / 40...60 Hz
Load current, I_{out}	5...500 mA
Residual voltage, U_{res1}	4.0 Vac & 15...500 mA
Residual voltage, U_{res2}	5.5 Vac & 5...15 mA
Current consumption (max), I_s	1 mA
Switching frequency (max), f_o	25 Hz
Operating temperature range, T_{amb}	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm ² , L=2 m, PVC, grey
Overall dimensions	M30x1.5, L=61 mm
Housing material	PVC

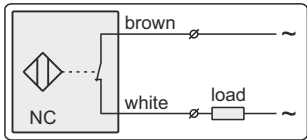
Type parameters

Type	Output function	Scheme of connection
P1-30.71.U0	NO	71
P1-30.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72

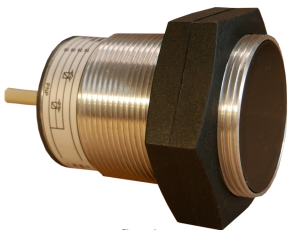


fig.1

Operating principle

The presented inductive proximity sensor M40 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

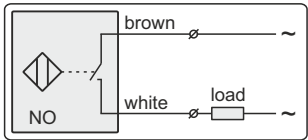
Technical parameters

Nominal sensing distance, S_n	14.0 mm $\pm 4\%$
Measuring plate steel, $St\ 37$	40x40x1 mm
Hysteresis, h	5...12%
Operating voltage, U_s	12...250 Vac / 40...60 Hz
Load current, I_{out}	5...500 mA
Residual voltage, U_{res1}	4.0 Vac & 15...500 mA
Residual voltage, U_{res2}	5.5 Vac & 5...15 mA
Current consumption (max), I_s	1 mA
Switching frequency (max), f_o	25 Hz
Operating temperature range, T_{amb}	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm ² , L=2 m, PVC, grey
Overall dimensions	M40x1.5, L=55 mm
Housing material	Al (Aluminum)

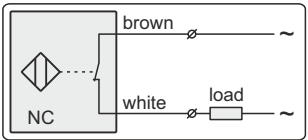
Type parameters

Type	Output function	Scheme of connection
M1-40.71.U0	NO	71
M1-40.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72

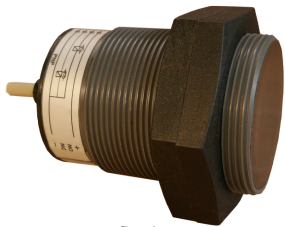


fig.1

Operating principle

The presented inductive proximity sensor M40 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

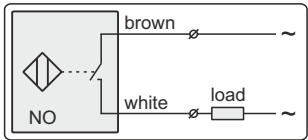
Technical parameters

Nominal sensing distance, S_n	24.0 mm $\pm 4\%$
Measuring plate steel, $St\ 37$	40x40x1 mm
Hysteresis, h	5...12%
Operating voltage, U_s	12...250 Vac / 40...60 Hz
Load current, I_{out}	5...500 mA
Residual voltage, U_{res1}	4.0 Vac & 15...500 mA
Residual voltage, U_{res2}	5.5 Vac & 5...15 mA
Current consumption (max), I_s	1 mA
Switching frequency (max), f_o	25 Hz
Operating temperature range, T_{amb}	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm ² , L=2 m, PVC, grey
Overall dimensions	M40x1.5, L=55 mm
Housing material	PVC

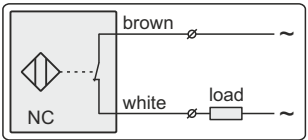
Type parameters

Type	Output function	Scheme of connection
P1-40.71.U0	NO	71
P1-40.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72

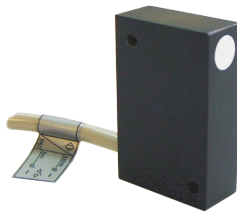


fig.1

Operating principle

The presented inductive proximity sensor P3-40 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

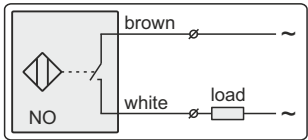
Technical parameters

Nominal sensing distance, <i>Sn</i>	4.0 mm ±4%
Measuring plate steel, <i>St 37</i>	12x12x1 mm
Hysteresis, <i>h</i>	5...12%
Operating voltage, <i>Us</i>	12...250 Vac / 40...60 Hz
Load current, <i>Iout</i>	5...300 mA
Residual voltage, <i>Ures1</i>	4.0 Vac & 15...300 mA
Residual voltage, <i>Ures2</i>	5.5 Vac & 5...15 mA
Current consumption (max), <i>Is</i>	1 mA
Switching frequency (max), <i>fo</i>	25 Hz
Operating temperature range, <i>Tamb</i>	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm², L=2 m, PVC, grey
Overall dimensions	26x12x40 mm
Housing material	PVC

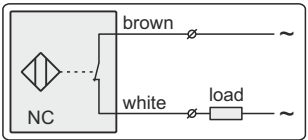
Type parameters

Type	Output function	Scheme of connection
P3-40.71.U0	NO	71
P3-40.72.U0	NC	72

Schemes of connection



Scheme 71



Scheme 72



fig.1

Operating principle

The presented inductive proximity sensor P3-60 serves to switch 2-wire alternating current circuits. Its output is switched when passing metal objects in front of its active part. 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.

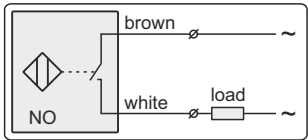
Technical parameters

Nominal sensing distance, S_n	12.5 mm $\pm 4\%$
Measuring plate steel, $St\ 37$	30x30x1 mm
Hysteresis, h	5...12%
Operating voltage, U_s	12...250 Vac / 40...60 Hz
Load current, I_{out}	5...500 mA
Residual voltage, U_{res1}	4.0 Vac & 15...500 mA
Residual voltage, U_{res2}	5.5 Vac & 5...15 mA
Current consumption (max), I_s	1 mA
Switching frequency (max), f_o	25 Hz
Operating temperature range, T_{amb}	-25°...+70° C
Degree of protection	IP67 (IEC144)
Output element	Thyristor
Light output indicator	LED
Protection when switching on without load	NO
Protection against reverse connection	YES
Joining - cable "LIYY"	2x0.5 mm ² , L=2 m, PVC, grey
Overall dimensions	60x30x15 mm
Housing material	PA6 (Polyamide)

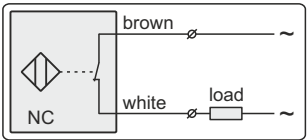
Type parameters

Type	Output function	Scheme of connection
P3-60.71.U0	NO	71
P3-60.72.U0	NC	72

Schemes of connection

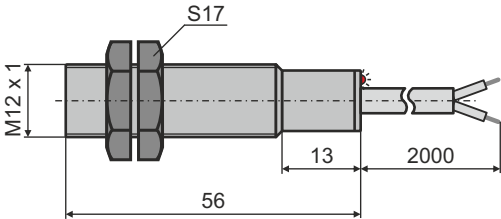


Scheme 71

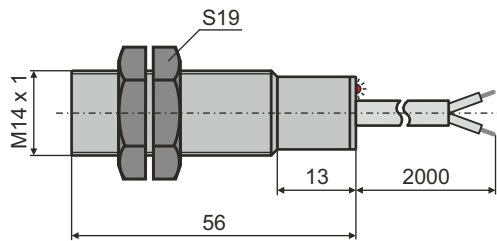


Scheme 72

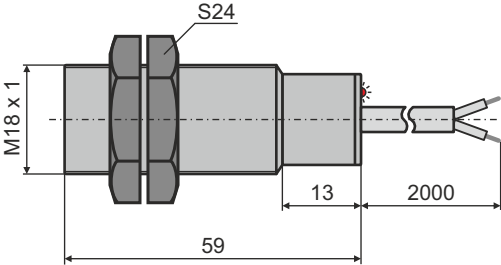
M12



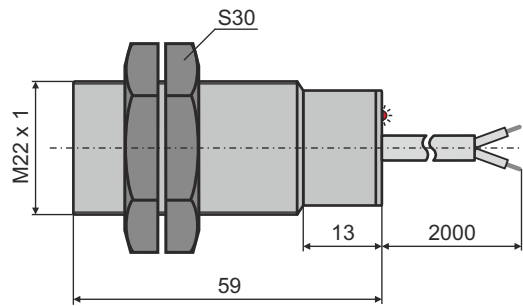
M14



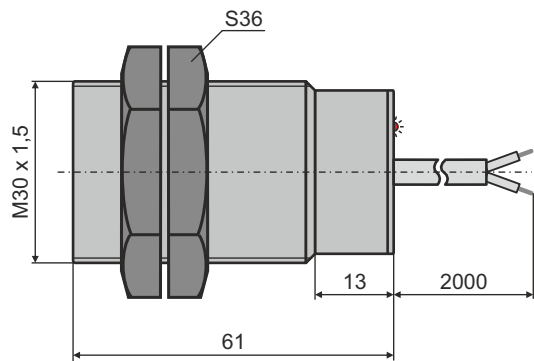
M18



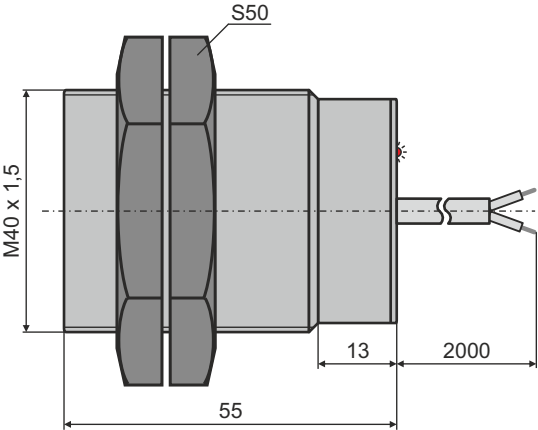
M22



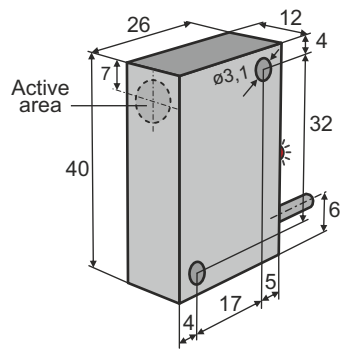
M30



M40



P3-40



P3-60

