



*ul. Konstantynowska 79/81, 95-200 Pabianice
POLAND*

*The << F & F >> company
was established in 1992
based on a commercial and service company
active in the electronic sector.
The previous marketing and technical experience
(mainly in terms of electronics and electrical engineering)
enabled its owners to become a successful producer
able to offer a wide range of electronic control devices
for both household and industrial applications.
Nowadays, the F&F brand has been widely known in Poland.
The company delivers its products to customers in
Russia, Ukraine, Belarus, Lithuania,
Slovakia, Hungary, Germany
and the United States.*

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CERTYFIKAT Nr B/12/482/04
uprawiający do oznaczania wyrobów znakami bezpieczeństwa

Nazwa i adres posiadacza
certyfikatu: **F & F FILIPOWSKI Spółka Jawna**
ul. Konstantynowska 79/81
95-200 Pabianice

Nazwa i adres producenta: **F & F FILIPOWSKI Spółka Jawna**
ul. Konstantynowska 79/81
95-200 Pabianice

Nazwa wyrobu: Łączniki zmierzchowe

Typ (odmiany): AZH, AZH-106, AZH-C, AZH-S, AZH-S PLUS,
AWZ, AWZ-30, AZ-B, AZ-B PLUS, AZ-112, AZ-112 PLUS.

Podstawowe parametry: znamionowe napięcie: AC 230 V, 50 Hz;
znamionowy prąd: 10 A - AZH, AZH-C;
16 A - AZH-106, AWZ, AZH-S, AZH-S PLUS,
AZ-B, AZ-B PLUS, AZ-112, AZ-112 PLUS;
30 A - AWZ-30;
stopień ochrony obudowy: IP40, IP65;
wyposażenie: sonda zewnętrzna hermetyczna PLUS.

Symbol klasyfikacyjny: SWW: 1131-2 PKWU: 31.20.27-80.80

Wyrób spełnia wymagania
bezpieczeństwa zawarte w: PN-EN 60669-1:2002 +A1:2003, EN 60669-1:1999 +A1:2002
PN-EN 60669-2-1:2002, EN 60669-2-1:2000 +A2:2001

Nr sprawozdania: TA 4.57

Model certyfikacji: MODEL 5 ISO

Prawo do oznaczania w okresie od 2004-04-30 do 2009-04-29
dotyczy wyłącznie egzemplarzy wyrobów posiadających identyczne właściwości (parametry),
jak przedstawiciele do badań waży (wzory) i odpowiadających wymaganiom określonym powyżej.
Prawa i obowiązki obu stron wynikające z niniejszego certyfikatu określone odrębnie umową.

Wzrostek certyfikatu nr B/12/451/2000
Warszawa, dnia 2004-04-30

PCA
AC 012

We declare
that the conformity of our products
with the requirements
of the
CE and B
labelling procedures
has been confirmed with tests
carried out
by
**Biuro Badawcze ds. Jakości
SEP Warszawa**
within the scope
of the
Low Voltage Directive
by a
laboratory in Lublin
and
in terms
of the Electromagnetic Compatibility Directive
by
**Instytut Elektrotechniki Politechniki
Wrocławskiej**

All concerned parties
may receive
the copies of conformity
certificates CE
and
B-label security certificates
concerning our products
via mail or fax.
Printable versions of these documents
may also be found
in our
internet site
www.fif.com.pl

DEKLARACJA ZGODNOŚCI WE
Nr 006/04

Niżej podpisany, reprezentujący niżej wymienionego producenta

Producent: <<F&F>> Filipowski s. j.
Regon 470625813
NIP 731-000-53-14

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niniejszym deklaruje, że wyrób
Identyfikacja wyrobu:
Automatyczne przełączniki faz
Typy: PF-431, PF-441, PF-451

jest zgodny z postanowieniami następującej dyrektywy (dyrektyw) WE
(łącznie ze wszystkimi jej zmianami i uzupełnieniami)

Nr dyrektywy (dokumentu)	Tytuł
LVD 73/23/EWG	Dyrektywa niskonapięciowa
EMC 89/338/EWG	Dyrektywa dotycząca kompatybilności elektromagnetycznej

i że zastosowano normy i/lub dokumentację techniczną wymienione na rewersie deklaracji.
Ostatnie dwie cyfry roku, w którym naniesiono oznaczenie CE: **05**

Pabianice	29.03.2004	 FILIPOWSKI Spółka Jawna ul. Konstantynowska 79/81 95-200 Pabianice, tel/fax 042 215 2883 Regon 470625813, NIP 731-000-53-14	Sławomir Grzegorzewski Dyrektor techniczny
miejsce i data			

pieczęć firmowa nazwisko i funkcja sygnatariusza

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1. LIGHT DEPENDENT RELAYS

PURPOSE

Light dependent relay serves to switch-ON the lighting of streets, squares, shop windows, neon lamps etc, at twilight and to switch-OFF afore mentioned lighting at dawn.

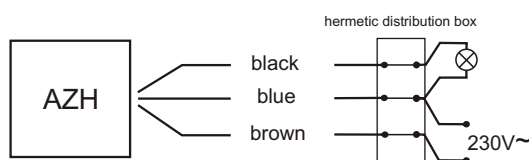
FUNCTIONING

The relay should be situated at place with permanent access to day light, which, due to its changes of intensity, will cause switching ON and OFF the lighting. The exact time of switching the lighting can be set by potentiometer by the user. Turn in the direction of "half moon" will delay switching-ON, turning in the direction of "sun" will advance switching-ON. The relay is equipped with a delay system, which delays switching ON and OFF the lighting, thus eliminating the influence of accidental disturbances like thunder lightings on the relay functioning.

WITH INTERNAL LIGHT DEPENDENT SENSOR

AZH

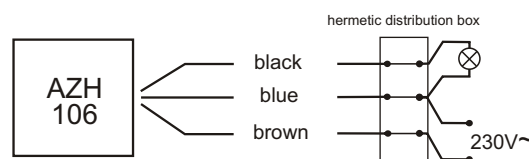
10A. Hermetic.



supply	230V AC
current load	<10A
switching threshold (setting range)	2÷1000Lx
switching threshold (factory setting)	ok. 7Lx
hysteresis	ok. 15Lx
switching ON delay	1÷15sec
switching OFF delay	10÷30sec
power consumption	0,56W
connection cable	cable 3×0,75mm ² ; l=0,8m
working temperature	-25÷50°C
dimensions	50×67×26mm
fixing	two screws to substrate
protection level	IP65

AZH-106

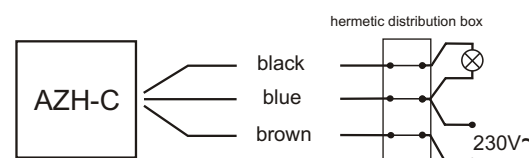
16A. Hermetic.



supply	230V AC
current load	<16A
switching threshold (setting range)	2÷1000Lx
switching threshold (factory setting)	ok. 7Lx
hysteresis	ok. 15Lx
switching ON delay	1÷15sec
switching OFF delay	10÷30sec
power consumption	0,56W
connection cable	cable 3×1mm ² ; l=0,8m
working temperature	-25÷50°C
dimensions	50×67×26mm
fixing	two screws to substrate
protection level	IP65

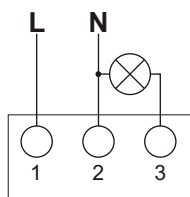
AZH-C

10A. Miniature. Hermetic.



supply	230V AC
current load	<10A
switching threshold (setting range)	2÷1000Lx
switching threshold (factory setting)	ok. 7Lx
hysteresis	ok. 15Lx
switching ON delay	1÷15sec
switching OFF delay	10÷30sec
power consumption	0,56W
connection cable	cable 3×0,75mm ² ; l=0,5m
working temperature	-25÷50°C
dimensions	81×33×25mm
fixing	two screws to substrate
protection level	IP65

AWZ 16A. Hermetic. With internal connection.
AWZ-30 30A. Hermetic. With internal connection.

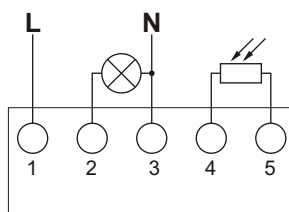


Light dependent relay in box with special sealing flange, fastened to the substrate by two screws, closed by a cover with silicongasket and tightened by 4 screws.

supply	230V AC
current load	<16A
switching threshold (setting range)	2÷1000Lx
switching threshold (factory setting)	ok. 7Lx
hysteresis	ok. 15Lx
switching ON delay	1÷15sec
switching OFF delay	10÷30sec
power consumption	0,8W
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	60×85×35mm
fixing	two screws to substrate
protection level	IP65

WITH EXTERNAL HERMETIC PROBE

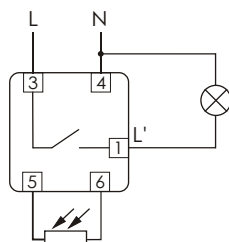
AZH-S / AZH-S PLUS



External hermetic probe Ø10 or PLUS (see item 1/9) including with automatic twilight sensor.

supply	230V AC
current load	<16A
switching threshold (setting range)	2÷1000Lx
switching threshold (factory setting)	ok. 7Lx
hysteresis	ok. 15Lx
switching ON delay	1÷15sec
switching OFF delay	10÷30sec
power consumption	0,56W
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	50×67×26mm
fixing	two screws to substrate

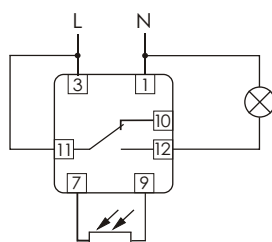
AZ-B / AZ-B PLUS



External hermetic probe Ø10 or PLUS (see item 1/9) including with automatic twilight sensor.

supply	AZ-B / AZ-B PLUS 230V AC
	AZ-B UNI / AZ-B PLUS UNI 12÷264V AC/DC
current load	<16A
switching threshold (setting range)	2÷1000Lx
switching threshold (factory setting)	ok. 7Lx
hysteresis	ok. 15Lx
switching ON delay	1÷15sec
switching OFF delay	10÷30sec
power consumption	0,56W
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

AZ-112 / AZ-112 PLUS



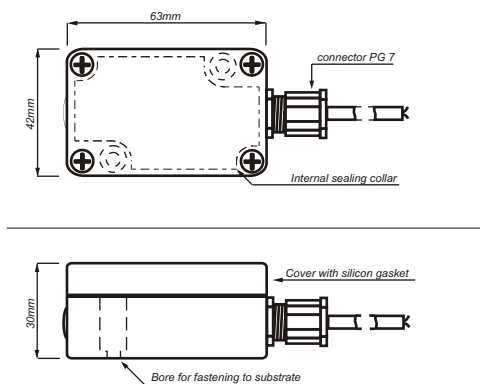
External hermetic probe Ø10 or PLUS (see item 1/9) including with automatic twilight sensor.

supply	230V AC
contact	1N/O
current load	<16A
switching threshold (setting range)	2÷1000Lx
switching threshold (factory setting)	ok. 7Lx
hysteresis	ok. 15Lx
switching ON delay	1÷15sec
switching OFF delay	10÷30sec
power consumption	0,8W
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	1 module (18mm)
fixing	on rail TH-35

Hermetic external probe

PLUS

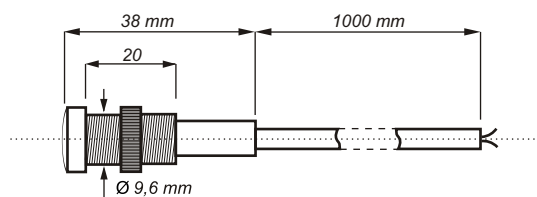
Applied in sets: AZH-S PLUS, AZ-B PLUS, AZ-112 PLUS.
Available separately.



Optical sensor in convenient low dimensioned casing, to be connected by connector PG7 with round cable $\varnothing_{\max} 7$ mm, (for ex. $2 \times 0,5 \text{ mm}^2$) of length acc to necessity, Box with special sealing flange, fastened to the substrate by two screws, closed by a cover with silicon gasket and tightened by 4 screws.

Ø10

Applied in sets: AZH-S, AZ-B, AZ-112.
Available separately.



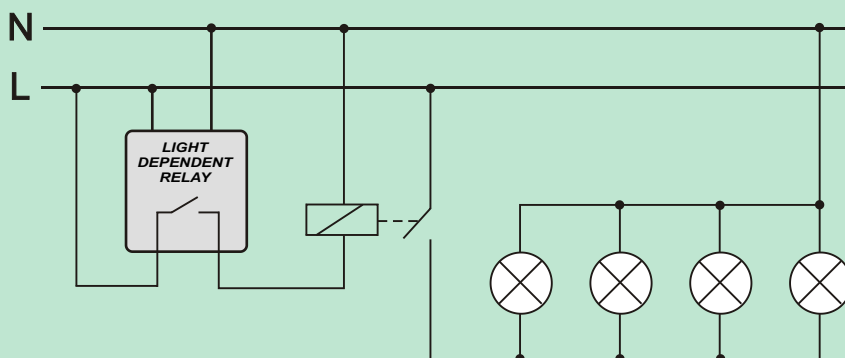
Little, easy to mount light dependent sensor with 1 meter cable with possibility to extend (connection of leads should be made in hermetic distribution box or at a place free from atmospheric influence).

ATTENTION!

The external probe should be situated at place with permanent access to day light, which, due to its changes of intensity, will cause switching ON and OFF the lighting.

When length of connecting cable of external probe exceeds 10m it should not be laid in vicinity of a parallel conductor under mains voltage, or conducting great currents. In any case always connect correctly phase and neutral leads to the light dependent relay.

PRACTICAL SOLUTIONS



Control system for contactor-actuating receivers of total power consumption exceeding the maximum allowable load of a photo-sensitive switch.

ATTENTION!

Automatic twilight sensors for other voltages than specified in the technical data table are also available on special request (24V, 48V, and 110V AC/DC and other).

2. STAIRCASE TIMERS

PURPOSE

Staircase timer serves to keep switched-ON lighting of staircase, corridor, or any other object for the set time and to switch-OFF this lighting automatically, upon elapse of this set time.

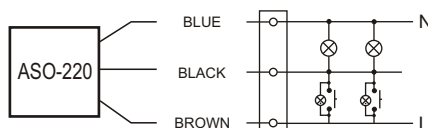
FUNCTIONING

Turned ON staircase timer supports the lighting during set time by potentiometer (from 0,5min. to 10min.). After passage of set time timer will switch OFF the lighting automatically. After switching OFF the lighting there is possibility to switch it ON again.

STANDART TYPE

ASO-220 / ASO-24

10A. With cable connection.

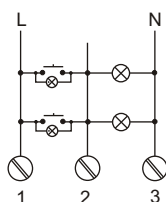


supply ASO-220	230V AC
ASO-24	24V AC/DC
current load	<10A
switching OFF delay (to set)	0,5÷10m
switching ON delay	<1sec
power consumption	0,56W
connection	cable 3×0,75mm ² ; l=0,45m
working temperature	-25÷50°C
dimensions	50×67×26mm
fixing	two screws to substrate

ASO-220 is adapted to co-operate with pushbuttons equipped with neon lamp.

ASO-201 / ASO-204

16A. With screw terminals.

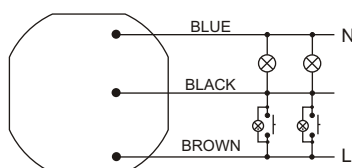


supply ASO-201	230V AC
ASO-204	24V AC/DC
current load	<16A
switching OFF delay (to set)	0,5÷10m
switching ON delay	<1sec
power consumption	0,56W
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	50×67×26mm
fixing	two screws to substrate

ASO-201 is adapted to co-operate with pushbuttons equipped with neon lamp.

ASO-205

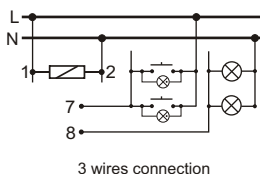
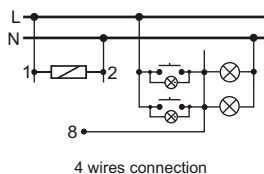
10A. To under plaster box.



supply	230V AC
current load	<10A
switching OFF delay (to set)	0,5÷10m
switching ON delay	<1sec
power consumption	0,4W
connection	wires 3×1mm ² ; l=10cm
working temperature	-25÷50°C
dimensions	Ø55, h=13mm
fixing	to under plaster box Ø60

ASO-205 is adapted to co-operate with pushbuttons equipped with neon lamp.

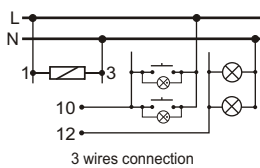
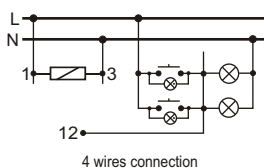
AS-B220 / AS-B24



supply AS-B 220	230V AC
AS-B24	24V AC/DC
current load	<16A
switching OFF delay (to set)	0,5+10m
switching ON delay	<1sec
power consumption	1,2W
connection	screw terminals 2,5mm ²
working temperature	-25+50°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

AS-B 220 is adapted to co-operate with pushbuttons equipped with neon lamp.

AS-212 / AS-214



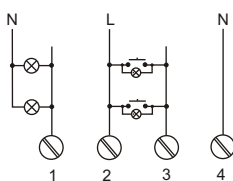
supply AS-212	230V AC
AS-214	24V AC/DC
current load	<16A
switching OFF delay (to set)	0,5+10m
switching ON delay	<1sec
power consumption	0,56W
connection	screw terminals 2,5mm ²
working temperature	-25+50°C
dimensions	1 module (18mm)
fixing	on rail TH-35

AS-212 is adapted to co-operate with pushbuttons equipped with neon lamp.

WITH ADDITIONAL FUNCTION OF COUNTER-BLOCKADE

Function of counter blockade does not allow to keep the light-ON in case of staircase switch blocking (after blocking the pushbutton, for example by match, the timer will count the set time and switch OFF the lighting). Next switching ON can be after removing the blockade.

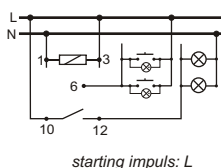
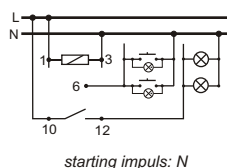
ASO-202 / ASO-203



supply ASO-202	230V AC
ASO-203	24V AC/DC
current load	<16A
switching OFF delay (to set)	0,5+10m
switching ON delay	<1sec
power consumption	0,56W
connection	screw terminals 2,5mm ²
working temperature	-25+50°C
dimensions	50×67×26mm
fixing	two screws to substrate

ASO-202 is adapted to co-operate with pushbuttons equipped with neon lamp.

AS-223 / AS-224



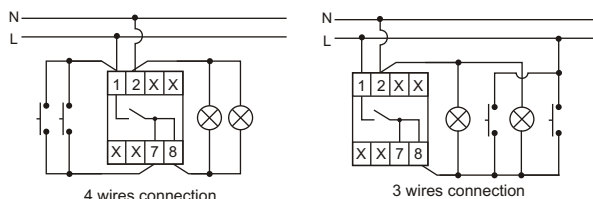
supply AS-223	230V AC
AS-224	24V AC/DC
current load	<16A
switching OFF delay (to set)	0,5+10m
switching ON delay	<1sec
power consumption	0,56W
connection	screw terminals 2,5mm ²
working temperature	-25+50°C
dimensions	1 module (18mm)
fixing	on rail TH-35

AS-223 is adapted to co-operate with pushbuttons equipped with neon lamp.

WITH FUNCTION OF SIGNALISATION OF LIGHTING SWITCHING-OFF.

AS-221T

Turned ON staircase timer supports the lighting during set time by potentiometer (from 0,5min. to 10min.) and upon elapse of this set time a reduction by half of lighting brightness follows for about 30 seconds, after that OFF follows (thus an occurrence of a sudden darkness is avoided, enabling safe approach to the switch). After switching OFF the lighting there is possibility to switch it ON again.



supply	230V AC
current load	<10A
switching OFF delay (to set)	0,5÷10m
switching ON delay	<1sec
time of reduced brightness	~30sec
power consumption	0,8W
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

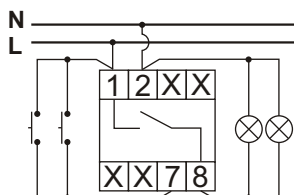
ATTENTION!

The AS-221T is not compatible with glow-discharge tubes, compact fluorescent lamps and other lighting devices including electric starters.

AS-222T

WITH COUNTER BLOCKADE

Turned ON staircase timer supports the lighting during set time by potentiometer (from 0,5min. to 10min.) and upon elapse of this set time a reduction by half of lighting brightness follows for about 30 seconds, after that OFF follows (thus an occurrence of a sudden darkness is avoided, enabling safe approach to the switch). Function of counter blockade does not allow to keep the light-ON in case of staircase switch blocking (after blocking the pushbutton, for example by match, the timer will count the set time and switch OFF the lighting). Next switching ON can be after removing the blockade.



supply	230V AC
current load	<10A
switching OFF delay (to set)	0,5÷10m
switching ON delay	<1sec
time of reduced brightness	~30sec
power consumption	0,8W
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

ATTENTION!

The AS-222T is not compatible with glow-discharge tubes, compact fluorescent lamps and other lighting devices including electric starters.

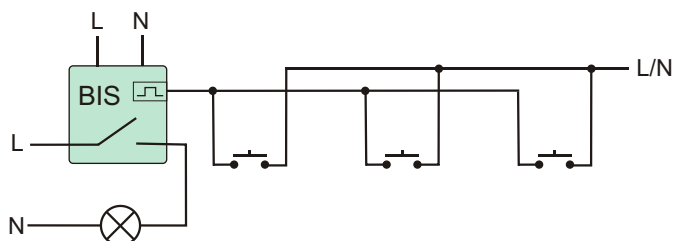
ATTENTION!

Automatic staircase switches for other voltages than specified in the technical data table are also available on special request (12V, 48V, and 110V AC/DC and other). The offer does not include the AS-221T and AS-222T models.

3. ELECTRONIC BI-STABLE PULSE RELAYS

PURPOSE

Electronic bi-stable pulse relays enables the user to actuate lighting or other devices from various locations by means of control buttons in parallel connection.



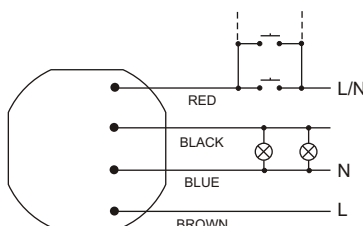
SWITCH ON - SWITCH OFF TYPE

FUNCTIONING

The receiver is actuated by means of a current pulse triggered by pushing any bell push connected to the relay. The receiver is deactivated by another pulse or after a preset time.

The relay does not "memorize" the position of the relay contact, i.e. in case of supply voltage decay and the subsequent return of supply voltage, the relay contact will be set in the off position. Such a solution prevents the automatic actuation of the receivers controlled that might occur without proper supervision after a long-lasting decay of supply voltage.

BIS-402

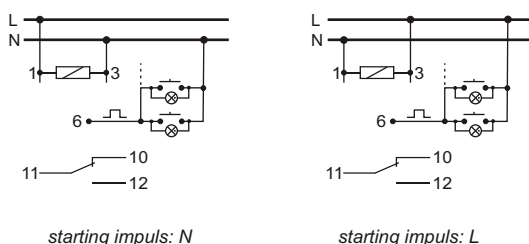


supply	230V AC
current load	<10A
controlling current	0,5÷1mA
activation delay	0,1÷0,2sec
power consumption	0,4W
connection	wires 4×1mm ² ; l=10cm
working temperature	-25÷50°C
dimensions	Ø55, h=13mm
fixing	to under plaster box Ø60

ATTENTION!

The BIS-402 is not compatible with bell pushes equipped with fluorescent lamps.

BIS-411



supply	230V AC
current load	<10A
controlling current	0,5÷1mA
activation delay	0,1÷0,2sec
sygnalling of supply	green LED
sygnalling of activation	red LED
power consumption	0,8W
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	1 module (18mm)
fixing	on rail TH-35

ATTENTION!

The BIS-411 is compatible with bell pushes equipped with fluorescent lamps.

WITH TIMING SWITCH

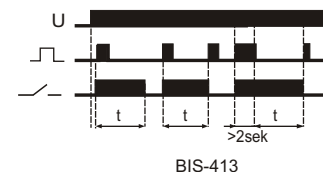
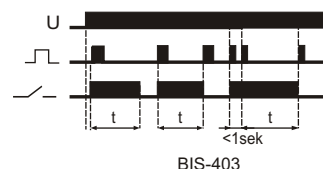
FUNCTIONING

The receiver is actuated by means of a current pulse triggered by pushing any bell push connected to the relay. The receiver is deactivated by another pulse or after a preset time.

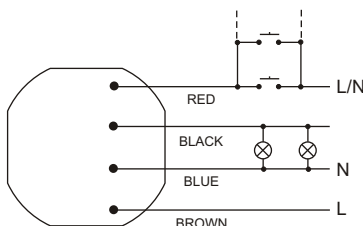
BIS-403: Pressing the control button twice in time to 1 sec., that will effect the activate lighting permanently until the next pulse which will turn off the relay. [In this software version of the relay available while stocks last]

BIS-413: Press and hold the control button longer then 2 sec, that will effect the activate lighting permanently until the next pulse which will turn off the relay.

The relay does not "memorize" the position of the relay contact, i.e. in case of supply voltage decay and the subsequent return of supply voltage, the relay contact will be set in the off position. Such a solution prevents the automatic actuation of the receivers controlled that might occur without proper supervision after a long-lasting decay of supply voltage.



BIS-403

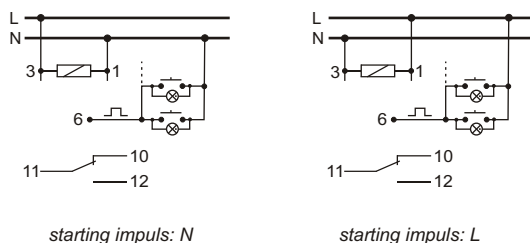


supply	230V AC
current load	<10A
controlling current	0,5±1mA
activation delay	0,1+0,2sec
switching OFF delay (to set)	1+12min
power consumption	0,4W
connection	wires 4×1mm ² ; l=10cm
working temperature	-25+50°C
dimensions	Ø55, h=13mm
fixing	to under plaster box Ø60

ATTENTION!

The BIS-403 is not compatible with bell pushes equipped with fluorescent lamps.

BIS-413

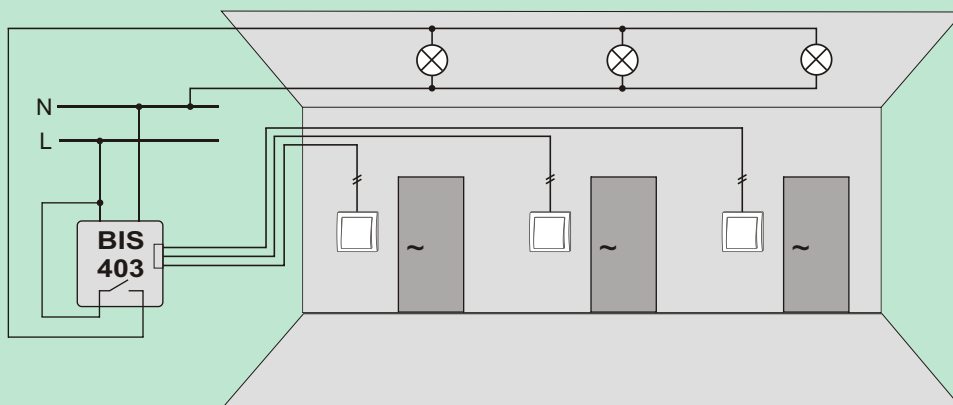


supply	230V AC
current load	<10A
controlling current	0,5±1mA
activation delay	0,1+0,2sec
switching OFF delay (to set)	1+12min
sygnalling of supply	green LED
sygnalling of activation	red LED
power consumption	0,8W
connection	screw terminals 2,5mm ²
working temperature	-25+50°C
dimensions	1 module (18mm)
fixing	on rail TH-35

ATTENTION!

The BIS-413 is not compatible with bell pushes equipped with fluorescent lamps.

PRACTICAL SOLUTIONS



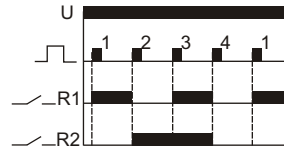
Example of control system for three-point hall lighting.

SEQUENCE-TYPE FUNCTIONING

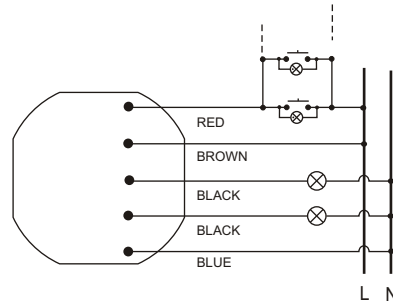
Switching the relay into another cycle phase is made by another current pulse triggered by pressing any bell push connected to the relay.

The relay does not “memorize” the position of the relay contact, i.e. in case of supply voltage decay and the subsequent return of supply voltage, the relay contact will be set in the off position. Such a solution prevents the automatic actuation of the receivers controlled that might occur without proper supervision after a long-lasting decay of supply voltage.

PULSE	STATE OF FUNCTIONING
1	ACTIVATED ONLY SECTION R1
2	ACTIVATED ONLY SECTION R2
3	ACTIVATED SECTION R1 AND R2
4	DEACTIVATED SECTION R1 AND R2



BIS-404

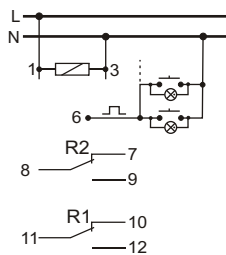


supply	230V AC
contacts	2×1N/O
current load	2×(<5A)
controlling current	0,5±1mA
activation delay	0,1±0,2sec
power consumption	0,56W
connection	wires 5×1mm ² ; l=10cm
working temperature	-25÷50°C
dimensions	Ø55, h=13mm
fixing	to under plaster box Ø60

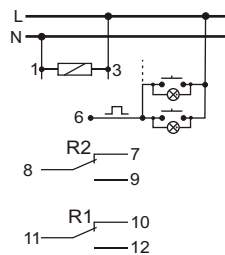
ATTENTION!

The BIS-404 is not compatible with bell pushes equipped with fluorescent lamps.

BIS-414



starting impuls: N



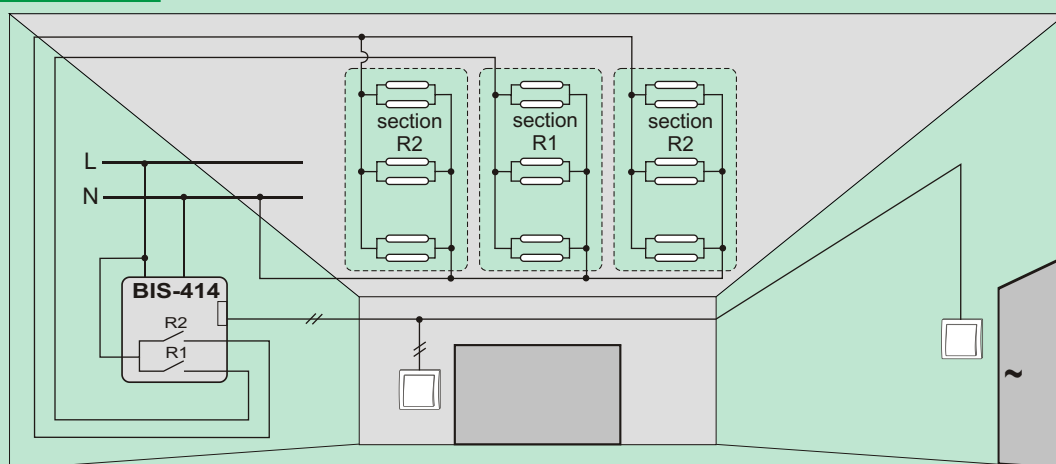
starting impuls: L

supply	230V AC
contacts	2×1N/O
current load	2×(<10A)
controlling current	0,5±1mA
activation delay	0,1±0,2sec
switching OFF delay (to set)	1±12min
signalling of supply	green LED
signalling of activation	2×yellow LED
power consumption	0,8W
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	1 module (17,5mm)
fixing	on rail TH-35

ATTENTION!

The BIS-414 is not compatible with bell pushes equipped with fluorescent lamps.

PRACTICAL SOLUTIONS



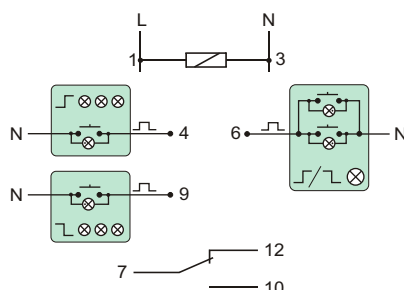
Example of lighting system which allows control of light intensity by actuating one of the sections R1 and R2 from any location in the room.

GROUP-TYPE (HOTEL-TYPE)

BIS-412 WITH CONTROLLING INPUTS 'ACTIVATE ALL' AND 'DEACTIVATE ALL'

FUNCTIONING

BIS-412 electronic bi-stable pulse relay is designed for operation in a group configuration. A single relay enables the activation and deactivation of the receiver controlled after each current pulse triggered by pushing a local control momentary push-button (bell-push). The group configuration enables the deactivation or activation of all receivers connected to individual relays by means of the central control push-buttons



supply BIS-412 230V	230V AC
BIS-412 24V	24V AC/DC
current load	<16A
controlling current	0,5÷1mA
activation delay	0,1÷0,2sec
signalling of supply	green LED
signalling of activation	red LED
power consumption	0,8W
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	1 module (18mm)
fixing	on rail TH-35

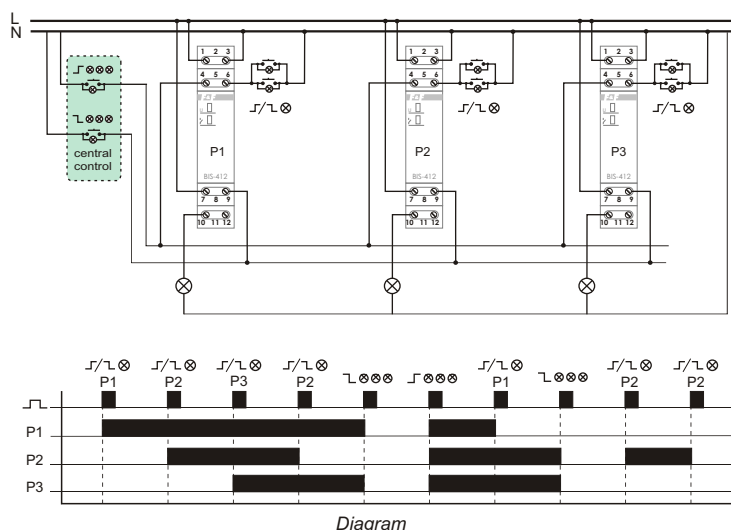
Local control

The receiver is activated after a current pulse that is triggered by pushing one optional momentary push-button $\text{J/L} \otimes$ belonging to the local control group. The contact of the relay is switched to the 7-10 position. After a next current pulse, the receiver will be deactivated (the contact of the relay returns to the 7-12 position).

Central control

DEACTIVATE ALL - after a current pulse triggered by pushing the $\text{L} \otimes \otimes \otimes$ momentary push-button, all receivers will be deactivated (regardless of their status, i.e. deactivation or activation) that are controlled separately by individual relays. The contact in each relay will be switched to the 7-12 position.

ACTIVATE ALL - after a current pulse triggered by pushing the $\text{J} \otimes \otimes \otimes$ momentary push-button, all receivers will be activated (regardless of their status, i.e. deactivation or activation) that are controlled separately by individual relays. The contact in each relay will be switched to the 7-10 position.

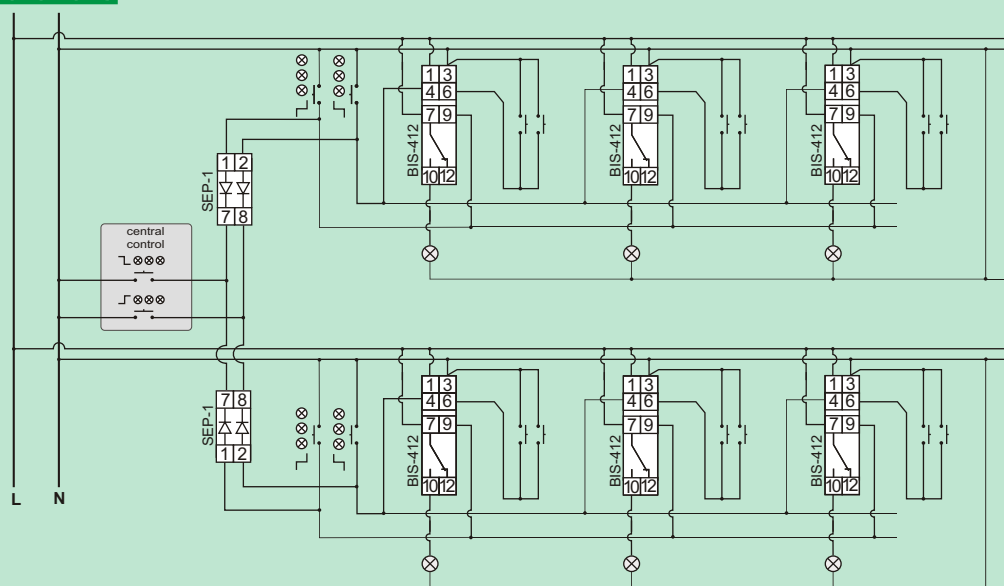


Diagram

ATTENTION!

The BIS-412 230V is compatible with bell pushes equipped with fluorescent lamps.

PRACTICAL SOLUTIONS



Example of division into subgroups using SEP-01 incoming signal separators (see chapter 23)

4.

LIGHT DIMMERS

PURPOSE

the dimmer is used for switching on and off incandescent and halogen lamps and offers the option of light intensity adjustment by means of any impulse switch (buzzer). **Suitable for incandescent and halogen lamps** (including those powered with electronic or transformer-based feeders adapted to dimmers).

FUNCTIONING

Lighting is turned on by a current pulse sent after pressing an impulse switch (buzzer) connected to a relay. Another impulse switches the lighting off. Pressing and holding the switch for more than 1 second allows the user to adjust light intensity (continuous loop adjustments in the following sequence: BRIGHTER→DARKER→BRIGHTER).

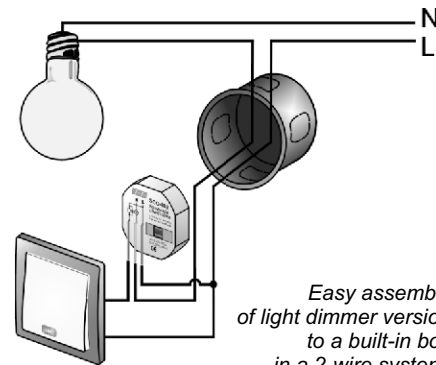
Light intensity may be controlled by means of numerous switches in a parallel connection, distributed in several locations within a room.

SCO are adapted to co-operate with pushbuttons equipped with neon lamp.

ATTENTION!

There may be working irregularities with certain electronic feeders (e.g. flickering may appear). Therefore, some feeder types require light bulbs or halogens of total power up to 50% of the feeder's nominal.

Tests are recommended before final assembly and commission.

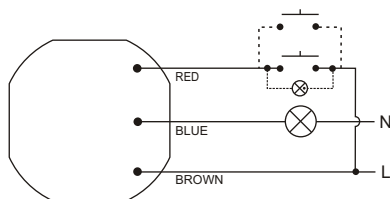


Easy assembly of light dimmer version to a built-in box in a 2-wire system.

NO "STORAGE" OF LIGHT INTENSITY SETTINGS ENABLED.

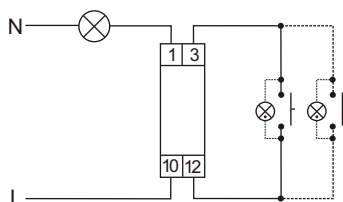
The lighting returns to its maximum intensity after each activation.

SCO-801 350W



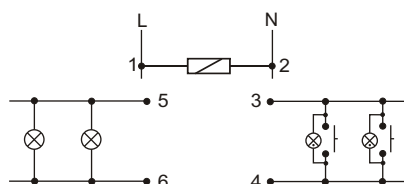
supply	230V AC
current load	<1,5A
maximum power of light bulbs connected	350 W
current pulse duration	<1sec
power consumption	0,1W
working temperature	-25+50°C
connection	wires 3×1mm ² , l=10cm
dimensions	Ø55, h=13mm
fixing	to under plaster box Ø60mm
overcurrent protection	WTA 5×20 fuse link 2A

SCO-811 350W



supply	230V AC
current load	<1,5A
maximum power of light bulbs connected	350 W
current pulse duration	<1sec
power consumption	0,1W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	1 module (18mm)
fixing	on rail TH-35
overcurrent protection	WTA 5×20 fuse link 2A

SCO-813 1000W



supply	230V AC
current load	<4,5A
maximum power of light bulbs connected	1000 W
current pulse duration	<1sec
power consumption	0,3W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	3 modules (52,5mm)
fixing	on rail TH-35
overcurrent protection	WTA 5×20 fuse link 6,3A

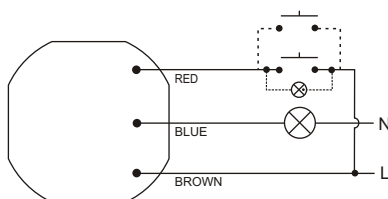
ATTENTION!

"SOFT START" - pressing and holding the switch for more than 1 second on switch-on allows gradual increase of the intensity from "zero level" (in a DARKER→BRIGHTER sequence).

A FUNCTION OF LIGHT INTENSITY SETTING “STORAGE” ALLOWED.

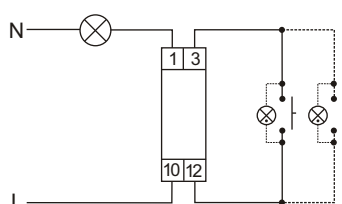
The lighting returns to the preset intensity after each activation.

SCO-802 350W



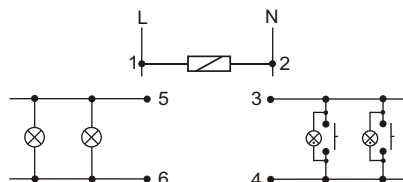
supply	230V AC
current load	<1.5A
maximum power of light bulbs connected	350 W
current pulse duration	<1sec
power consumption	0,1W
working temperature	-25+50°C
connection	wires 3x1mm ² , l=10cm
dimensions	Ø55, h=13mm
fixing	to under plaster box Ø60mm
overcurrent protection	WTA 5x20 fuse link 2A

SCO-812 350W



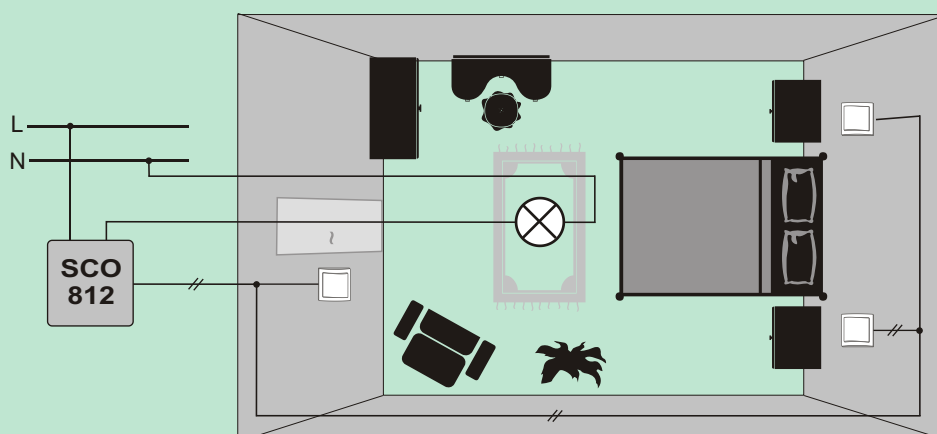
supply	230V AC
current load	<1.5A
maximum power of light bulbs connected	350 W
current pulse duration	<1sec
power consumption	0,1W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	1 module (18mm)
fixing	on rail TH-35
overcurrent protection	WTA 5x20 fuse link 2A

SCO-814 1000W



supply	230V AC
current load	<4,5A
maximum power of light bulbs connected	1000 W
current pulse duration	<1sec
power consumption	0,3W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	3 modules (52,5mm)
fixing	on rail TH-35
overcurrent protection	WTA 5x20 fuse link 6,3A

PRACTICAL SOLUTIONS



Example of lighting control system from three locations within a room.

5. INFRARED MOTION SENSOR SWITCH

INFRARED

PURPOSE

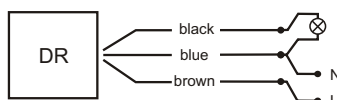
Motion sensors are used for automatic attached temporary lighting in the event of a person or other object in such areas as hallways, courtyards, approach and access roads, garages, etc. The use of motion sensors to automatically accompany the lighting makes use of the lighting is more convenient and cheaper in operation.

FUNCTIONING

The sensor detects infrared radiation source. It's analysing parameters as the size of the object, the amount of heat emitted, and the speed of movement between the various sectors of detection. Detector head is moving in two dimensions, which allows for precise setting of the matched field detection to the individual requirements of the user. Movement detection in the box will automatically attach to the lighting time set by the user. After that time, the lighting is switched off automatically. Motion sensor is equipped with an automatic control include preventing crepuscular lighting during the day. The state detector and a willingness to attach lighting is activated only after dusk. The timing of activation of the sensor can be adjusted by the user potencjometrem.

DR-05 W WHITE

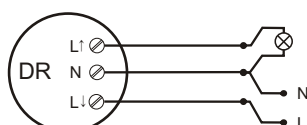
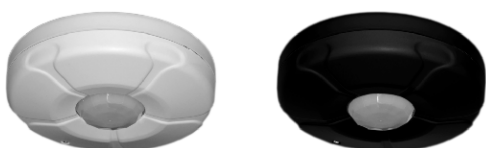
DR-05 B BLACK



supply	230V AC
current load	<5A
ambient light	3÷2000Lx
detection motion speed	0,6÷1,5m/sek
time-delay	8sek±3sek ÷ 10min±2min
detection range - horizontal	140°÷180°
detection range - vertical	0°÷45°
detection distance (for <24°C)	12m
installation height	0,5÷3,5m
power consumption	0,45W
connection	screw terminals 1,5mm²
working temperature	-20÷40°C
dimensions	75×87×185mm
fixing	two screws to substrate
protection level	IP40

DR-06 W WHITE

DR-06 B BLACK



supply	230V AC
current load	<7A
ambient light	3÷2000Lx
detection motion speed	0,6÷1,5m/sek
time-delay	10sek±5sek ÷ 4min±1min
detection range - horizontal	360°
detection distance (for h=3m, T<24°C)	r=5m
installation height	h=2,5÷3m
power consumption	0,45W
connection	screw terminals 1,5mm²
working temperature	-20÷40°C
dimensions	Ø=110mm, h=35mm
fixing	two screws to substrate
protection level	IP20

MICROWAVE

PURPOSE

Microwave motion detector is used for automatic, temporary lighting attach if a person or another object appears in detector's range in places such as hallways, courtyards, approaches and driveways, garages, etc.

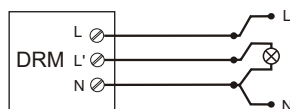
Microwave sensor allows for motion detection by wooden boards, plasterboard panels, glass and plastics.

FUNCTIONING

DRM sensor emits and bounces high-frequency 5.8GHz electromagnetic waves . The sensor detects changes in the reflected waves caused by movement of the object in the area of detection. The sensor detects movement of an object to and from the sensor. Movement in the range of detection will automatically attach the lighting for time set by the user. After this time the lights will be turned off automatically. The motion sensor is equipped with Light dependant relay able to attaching lighting during the day. Detection status and stand-by to attach lights are activated only after dusk. Sensor activation time might be adjust by the user. In addition, there is a possibility of adjustment of the detection area in range 3-10m (for h = 2.5 m) and the receiver actuation time adjustment to 8sek-12min. The inclusion of the receiver is signaled by a shining green LED. Sensor can work indoors. The sensor allows for motion detection by wooden boards, plasterboard panels, glass and plastics. Temperature changes do not affect on motion detection

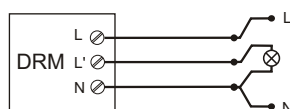
The power of microwave radiation is relatively low and is completely safe for humans and animals. Its value is less than 10mW. By comparison, microwaves and cell phones radiate about 1000mW of power (100 times harder).

DRM-01



supply	230VAC
current load	<5A
frequency of the microwaves radiation	5,8GHz
power radiation	<10mW
detection range	360°
detection ray - adjustable (for h=2,5m)	1+10m
activation treshold - adjustable	2+2000Lx
receiver's activation time - adjustable	8sec+12min
activation delay	1sec
power consumption	0,9W
connection	screw terminals 1mm ²
working temperature	-25+50°C
dimensions	46×93×42mm
fixed	two screws to the substrate
protection level	IP20

DRM-01



supply	230VAC
current load	<5A
frequency of the microwaves radiation	5,8GHz
power radiation	<10mW
detection range	360°
detection ray - adjustable (for h=2,5m)	1+10m
activation treshold - adjustable	2+2000Lx
receiver's activation time - adjustable	8sec+12min
activation delay	1sec
power consumption	0,9W
connection	screw terminals 1mm ²
working temperature	-25+50°C
dimensions	Ø103 h=42mm
fixed	two screws to the substrate
protection level	IP40

DRM-03 PLAFOND WITH HIDDEN SENSOR



supply	230VAC
type of light bulb	E27 max. 60W
frequency of the microwaves radiation	5,8GHz
power radiation	<10mW
detection range	360°
detection - adjustable	1+8m
activation treshold - adjustable	2+2000Lx
receiver's activation time - adjustable	5sec+15min
activation delay	1sec
power consumption of sensor	0,9W
connection	screw terminals 1,5mm ²
working temperature	-25+50°C
dimensions	Ø285 h=110mm
fixed	three screws to the substrate
lampshade	milk-white glass

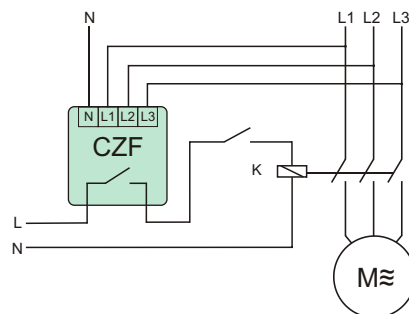
6.

PHASE CONTROL RELAYS

6.1 THREE-PHASE MONITORS

PURPOSE

Three phase monitors serve to protect the three-phase electric motors supplied from three-phase mains, against phase collapse in at least one phase or against phase-to-phase voltage asymmetry, threatening to damage the motor.

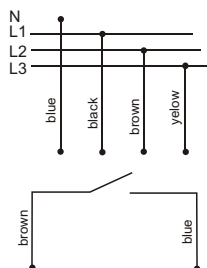


WITH FIXED ACTUATION THRESHHOLD VOLTAGE ASYMMETRY

FUNCTIONING

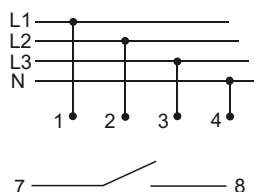
Phase collapse in at least one phase or voltage unbalance between phases above fixed actuation threshold causes switching-OFF the motor. The motor switching-OFF occurs with delay, which prevents any accidental motor disconnecting at temporary voltage drop. The re-connection will occur automatically at voltage increase of 5V above activation voltage (i.e. of value of voltage hysteresis). At occurrence of these disturbances, it is not possible to set a motor in motion.

CZF



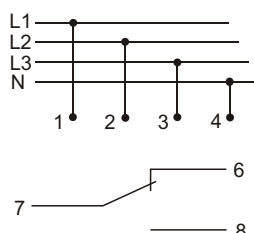
supply	3x400/230V+N
contact	1N/O
current load	<10A
sygnalling of supply	LED in each phase circuit
activation voltage asymmetry	45V ~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	4x1mm ² , 2x0,75mm ² ; l=0,5m
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	50x67x26 mm
fixing	two screws to the base

CZF-B



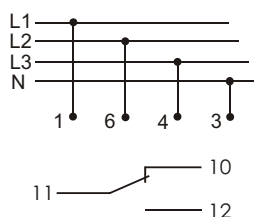
supply	3x400/230V+N
contact	1N/O
current load	<10A
sygnalling of supply	LED in each phase circuit
activation voltage asymmetry	45V ~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+50°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

CZF-BS



supply	3x400/230V+N
contact	1C/O
current load	<10A
sygnalling of supply	LED in each phase circuit
activation voltage asymmetry	45V ~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

CZF-310



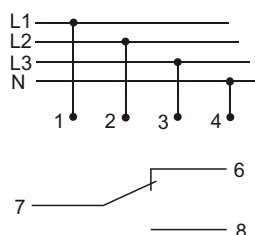
supply	3x400/230V+N
contact	1C/O
current load	<10A
signalling of supply	LED in each phase circuit
activation voltage asymmetry	45V ~
activation voltage	185V ~
hysteresis	5V ~
switching-OFF delay	4sec
power consumption	0,56W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	1 module (18mm)
fixing	on rail TH-35

AND ADJUSTABLE ACTUATION THRESHHOLD AT VOLTAGE ASYMMETRY

FUNCTIONING

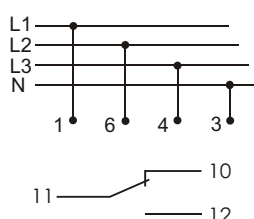
Phase collapse in at least one phase or voltage unbalance between phases above set value causes switching-OFF the motor. The motor switching-OFF occurs with 4 sec delay, which prevents any accidental motor disconnecting at temporary voltage drop. The re-connection will occur automatically at voltage increase of 5V above activation voltage (i.e. of value of voltage hysteresis). At occurrence of these disturbances, it is not possible to set a motor in motion.

CZF-BR



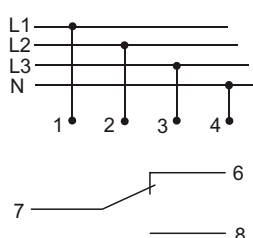
supply	3x400/230V+N
contact	1C/O
current load	<10A
signalling of supply	LED in each phase circuit
activation voltage asymmetry	40+80V ~
hysteresis	5V ~
switching-OFF delay	4sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+50°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

CZF-311



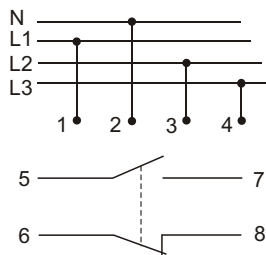
supply	3x400/230V+N
contact	1C/O
current load	<10A
signalling of supply	LED in each phase circuit
activation voltage asymmetry	40+80V ~
activation voltage	175+190V ~
hysteresis	5V ~
switching-OFF delay	4sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	1 module (18mm)
fixing	on rail TH-35

CZF-BT WITH ADJUSTABLE ACTUATION TIME 0,5+15sek



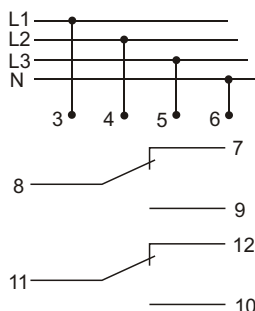
supply	3x400/230V+N
contact	1C/O
current load	<10A
signalling of supply	LED in each phase circuit
activation voltage asymmetry	40+80V ~
hysteresis	5V ~
switching-OFF delay	0,5+15sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+50°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

CZF-312 MONITOR WITHOUT ACTION DELAY 0,3SEC.



supply	3x400/230V+N
contact	1N/O, 1N/C
current load	2x(<5A)
signalling of supply	LED in each phase circuit
activation voltage asymmetry	40+55V~
activation voltage	175+190V~
hysteresis	5V~
switching-OFF delay	0,2sec
power consumption	1,2W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	1 module (18mm)
fixing	on rail TH-35

CZF-331 WITH TWO SEPARATED CONTACTS 2C/O.

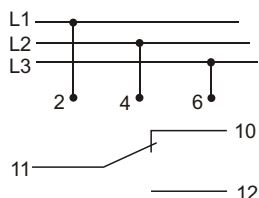


supply	3x230/400V+N
contact	2C/O
current load	2x[<8A]
signalling of supply	LED in each phase circuit
activation voltage asymmetry	40+80V~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,2W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	3 modules (52,5mm)
fixing	on rail TH-35

CZF-333

**WITHOUT NEUTRAL LEAD.
PREVENTS AGAINST SYMMETRICAL AND ASYMETRICAL VOLTAGE DROP.**

In case the voltage asymmetry above set value between phases causes the switching-OFF the motor. The switching-OFF the motor also occurs in case of phase-to-phase voltage drop below 320V. The motor switching-OFF occurs with 4 sec delay, which prevents any accidental motor disconnecting at temporary voltage drop. The re-connection will occur automatically at voltage increase of 5V above activation voltage (i.e. of value of voltage hysteresis). At occurrence of these disturbances, it is not possible to set a motor in motion.



supply	3x400V
contact	1C/O
current load	<10A
signalling of supply	3xLED
activation voltage asymmetry	20+50V~
activation voltage	<320V~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	3 modules (52,5mm)
fixing	on rail TH-35

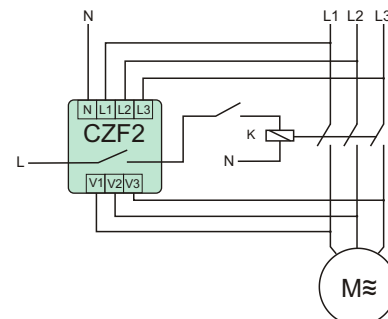
6.2 THREE-PHASE MONITORS WITH CHECKING STATE OF CONTACTOR CONTACTS

PURPOSE

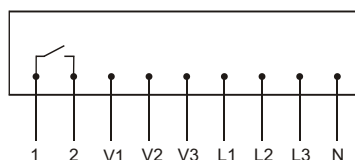
Three phase monitor serves to protect the three-phase electric motors supplied from three-phase mains, against phase collapse in at least one phase or against phase-to-phase voltage asymmetry or against damage of contacts threatening to damage the motor.

FUNCTIONING

Phase collapse in at least one, optional phase or voltage unbalance between phase fixed actuation threshold causes switching-OFF the motor. The motor switching-OFF occurs with 4 sec delay, which prevents any accidental motor disconnecting at temporary voltage drop. The re-connection will occur automatically at voltage increase of 5V above activation voltage (i.e. of value of voltage hysteresis). At occurrence of these disturbances, it is not possible to set a motor in motion. Shining of red diode LED along with simultaneous disconnecting the apparatus permanently, indicates contactor contacts damage. Reactivation of the apparatus is possible (after contact repair), after disconnecting from supply all three phases (fuses) and then, after switching-ON anew.

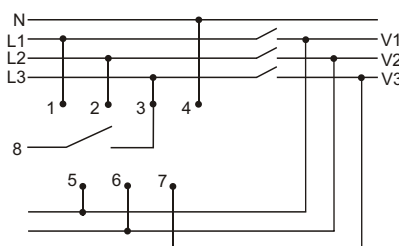


CZF2



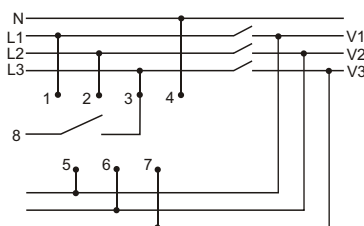
supply	3x400/230V+N
contact	1N/O
current load	<10A
signalling of supply	2xLED
activation voltage asymmetry	45V ~
activation voltage	185V~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	95x60x25 mm
fixing	two screws to the base

CZF2-B CONTACT CONNECTED TO POWER SUPPLY VOLTAGE.



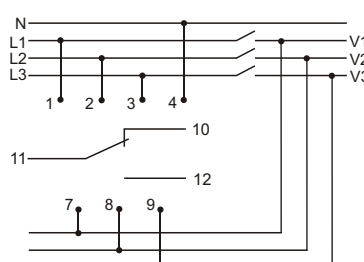
supply	3x400/230V+N
contact	1N/O
current load	<10A
signalling of supply	2xLED
activation voltage asymmetry	55V ~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+50°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

CZF2-BR CONTACT CONNECTED TO POWER SUPPLY VOLTAGE.



supply	3x400/230V+N
contact	1N/O
current load	<10A
signalling of supply	2xLED
activation voltage asymmetry	40+55V~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

CZF-332 WITH SEPARATED CONTACT.

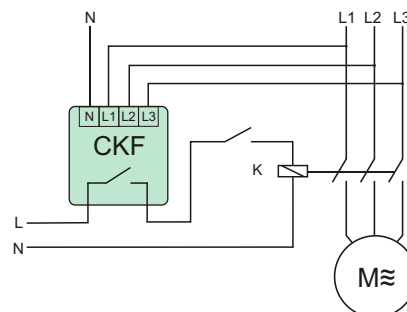


supply	3x400/230V+N
contact	1C/O
current load	<10A
signalling of supply	2xLED
activation voltage asymmetry	40+55V~
activation voltage	175+190V~
hysteresis	5V~
switching-OFF delay	3+5sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	3 modules (52,5mm)
fixing	on rail TH-35

6.3 THREE-PHASE ASYMMETRY AND SEQUENCE MONITORS

PURPOSE

Three phase and sequence monitor is designed to protect three phase electric motors against voltage drop in at least one phase or voltage asymmetry between phases, which could damage the motor, with additional protection of motor rotation direction in case of phase change before the monitor.

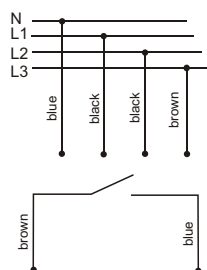


WITH FIXED ACTUATION THRESHHOLD VOLTAGE ASYMMETRY

FUNCTIONING

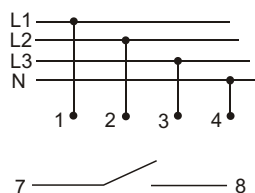
Voltage collapse in any phase or voltage asymmetry between phases above fixed actuation threshold causes switching-OFF the motor. The motor switching-OFF occurs after delay of 4 sec, which prevents accidental motor switching-OFF caused by instantaneous voltage drop. Switching the motor ON anew occurs automatically when the voltage increases of 5V~ above activation voltage (i.e. about value of voltage hysteresis). At occurrence of these disturbances, it is not possible to set motor in motion. In case of change of phase sequence, before the monitor, which causes change of motor rotation direction (in relation to that primarily set) is signaled by shining red diode LED along with impossibility of switching-on the motor. The re-connection is possible after the return to correct phase sequence.

CKF



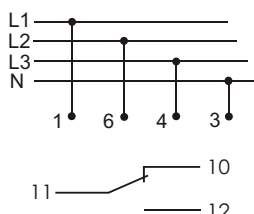
supply	3x400/230V+N
current load	<10A
signalling of supply	2xLED
activation voltage asymmetry	45V ~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	4x1mm ² , 2x0,75mm ² ; l=0,5m
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	50x67x26 mm
fixing	two screws to the base

CKF-B



supply	3x400/230V+N
current load	<10A
signalling of supply	2xLED
activation voltage asymmetry	55V ~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+50°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

CKF-316



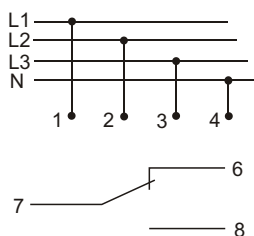
supply	3x400/230V+N
current load	<10A
signalling of supply	2xLED
activation voltage asymmetry	55V ~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	1 module (18mm)
fixing	on rail TH-35

AND ADJUSTABLE ACTUATION THRESHHOLD VOLTAGE ASYMMETRY

FUNCTIONING

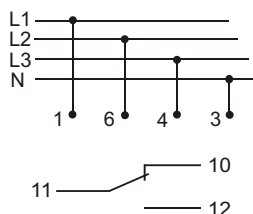
Voltage collapse in any phase or voltage asymmetry between phases above set value causes switching-OFF the motor. The motor switching-OFF occurs after delay of 4 sec, which prevents accidental motor switching-OFF caused by instantaneous voltage drop. Switching the motor ON anew occurs automatically when the voltage increases about 5V~ above activation voltage. At occurrence of these disturbances, it is not possible to set a motor in motion. In case of change of phase sequence, before the monitor, which causes change of motor rotation direction (in relation to that primarily set) along with impossibility of switching-ON the motor. The rswitching-ON is possible after the return to correct phase sequence.

CKF-BR



supply	3x400/230V+N
current load	<10A
contact	1 C/O
sygnalling of supplay	2xLED
activation voltage asymmetry	40+80V~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	terminal screws 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+50°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

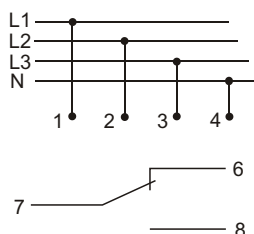
CKF-317



supply	3x400/230V+N
current load	<10A
contact	1 C/O
sygnalling of supplay	2xLED
activation voltage asymmetry	40+80V~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	0,56W
connection	terminal screws 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	1 module (18mm)
fixing	on rail TH-35

CKF-BT

WITH ADJUSTABLE ACTUATION TIME 0,5÷15sek



supply	3x400/230V+N
contact	1C/O
current load	<10A
sygnalling of supplay	LED in each phase circuit
activation voltage asymmetry	40+80V~
hysteresis	5V~
switching-OFF delay	0,5÷15sec
power consumption	1,6W
connection	screw terminals 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+50°C
dimensions	2 modules (35mm)
fixing	on rail TH-35

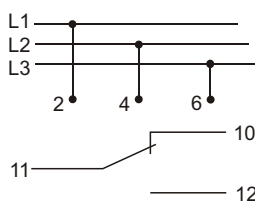
CKF-337

WITHOUT NEUTRAL LEAD.

PREVENTS AGAINST SYMMETRICAL AND ASYMETRICAL VOLTAGE DROP.

In case of voltage asymmetry above set value between phases causes the switching-OFF the motor. The switching-OFF the motor also occurs in case of phase-to-phase voltage drop below 320V. The motor switching-OFF occurs with 4 sec delay, which prevents any accidental motor disconnecting at temporary voltage drop. The re-connection will occur automatically at voltage increase of 5V above activation voltage (i.e. of value of voltage hysteresis). At occurrence of these disturbances, it is not possible to put a motor to motion.

Change of phase sequence, before the monitor, which causes change of motor rotation direction (in relation to that primarily set) along with impossibility of switching-ON the motor.



supply	3x400V
contact	1 C/O
current load	<10A
sygnalling of supplay	4xLED
activation voltage asymmetry	20+50V~
activation voltage	<320V~
hysteresis	5V~
switching-OFF delay	4sec
power consumption	1,6W
connection	terminal screws 2,5mm ²
durability	10 ⁵ of switching
working temperature	-25+40°C
dimensions	3 modules (52,5mm)
fixing	on rail TH-35

7.

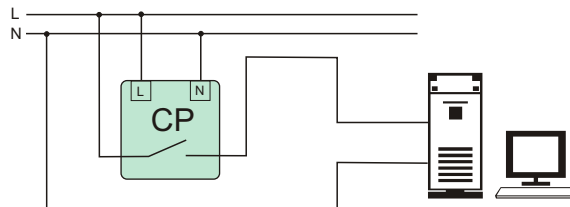
VOLTAGE RELAYS

PURPOSE

Voltage relays serves to voltage control in single or three phase mains and to protect receiver against the effects of voltage collapse or increase beyond set values.

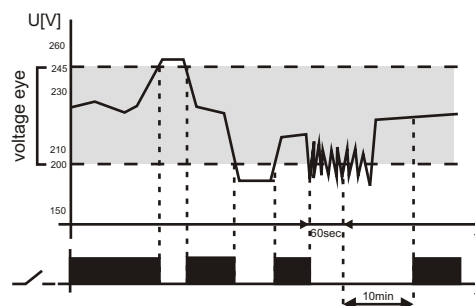
ATTENTION!

All types of CP can be supplied with a voltage up to 450V~. This ensures the effective protection of the receiver even in case of a voltage increase beyond allowable standards. Also, in case of supply polarity exchange or when "zero" is switched off (for three-phase types) the relay will not be destroyed ("burned").



FUNCTIONING

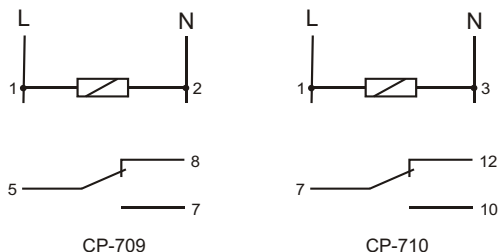
Lower voltage value (U1) and upper voltage value (U2) are set by means of potentiometers. It is so-called eye of voltage, in limits of which can occur changes of phases voltages that do not cause activation of relay. Change of phase voltage on one of phases above or below set voltage thresholds will cause activation of relay. Reactivation follows automatically return of correct voltage value.



ONE-PHASE TYPE

CP-709 WITHOUT TIME-BLOCKADE

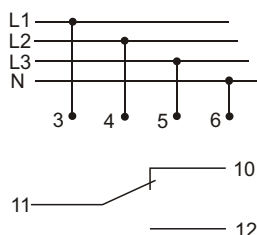
CP-710 WITH TIME-BLOCKADE



Supply	50+450V AC
current load	<16A
Contacts	1 C/O
signalling of supply	4xLED
Voltage Value	
lower U1	150+210V
upper U2	230+260V
hysteresis	
for U1	5V
for U2	5V
activation lag delay functions	
for U1	1,5sec
For U2	0,1sec
Recovery time	
for U1	1,5sec
for U2	1,5sec
power consumption	0,8W
Connection	screw terminals 2,5mm ²
working temperature	-25+50°C
Dimension	1 module (18mm)
fixing	on rail TH-35

THREE-PHASES TYPE

CP-730 WITH TIME-BLOCKADE



Supply	3x(50+450V)+N
current load	<10A
Contacts	1 C/O
signalling of supply	4xLED
Voltage Value	
lower U1	150+210V
upper U2	230+260V
hysteresis	
for U1	5V
for U2	5V
activation lag delay functions	
for U1	1,5sec
For U2	0,1sec
Recovery time	
for U1	1,5sec
for U2	1,5sec
power consumption	0,8W
Connection	screw terminals 2,5mm ²
working temperature	-25+50°C
Dimension	3 modules (52,5mm)
fixing	on rail TH-35

ATTENTION!

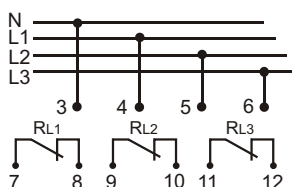
Because of unstable voltage in mains and frequent changes of supply voltage beyond the set thresholds of "eye of voltage" (at least 10 times per 1minute), relay blocks itself for 10 minutes. This prevents against too frequent, cyclic switching-ON and OFF of the connected receiver.

UNDER VOLTAGE

CP-733 Contatas3×1N/C

FUNCTIONING

A voltage relay is used to control voltage in a 3-phase network and secure a receiver against voltage drops below a preset value. Voltage decay in a phase or its drop below a preset activation threshold results in the shortage of the relay contact for this phase. The contact will be automatically released after the voltage in the phase is reinstated or its increase is 5V over the preset threshold (i.e. the voltage hysteresis value).

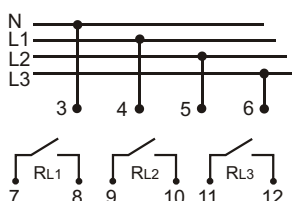


Supply	3×(50÷4 50V)+N
Current load	3×(<8A)
contact	separated 3×1N/C
signalling of supply	3×LED
Switching delay	170÷210V
Hysteresis	5V
operation time	0,5sek
Power supply return	1,5sek
Power consumption	0,8W
terminal	screw terminals 2,5mm ²
Working temperature	-25÷50°C
durability	10 ⁵ of switching
Dimensions	3 modules (52,5mm)
Fixing	on rail TH-35

CP-734 Contacts 3×1N/O

FUNCTIONING

A voltage relay is used to control voltage in a 3-phase network and secure a receiver against voltage drops below a preset value. Voltage decay in a phase or its drop below a preset activation threshold results in the opened of the relay contact for this phase. The contact will be automatically released after the voltage in the phase is reinstated or its increase is 5V over the preset threshold (i.e. the voltage hysteresis value).



Supply	3×(50÷4 50V)+N
Current load	3×(<8A)
contact	separated 3×1N/O
signalling of supply	3×LED
Switching delay	170÷210V
Hysteresis	5V
operation time	0,5sek
Power supply return	1,5sek
Power consumption	0,8W
terminal	screw terminals 2,5mm ²
Working temperature	-25÷50°C
durability	10 ⁵ of switching
Dimensions	3 modules (52,5mm)
Fixing	on rail TH-35

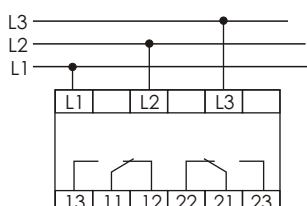
CP-500 POWER SUPPLY 3×500V. WITHOUT NEUTRAL

PROTECTING FEATURES

- PROTECTION AGAINST PHASE COLLAPSE
- PROTECTION AGAINST OF PHASE CHANGE ORDER
- PROTECTION AGAINST PHASE ASYMMETRY
- PROTECTION AGAINST CROSSING OVER VOLTAGE 580V
- PROTECTION AGAINST DECLINE BELOW VOLTAGE 420V

FUNCTIONING

With the correct network voltage contacts remain closed. Operation of any security opens the sensor's contacts. Closure of the contacts will automatically after return the correct network parameters.



supply	3×500V
current load	2×[<8A]
contact	separated 2P
status indication	6×LED
activation asymmetry - adjustable	5÷80V
activation time- adjustable	1÷10sec
time to return	1,5sek
threshold voltage activation	
upper	580V
lower	420V
return voltage hysteresis	5V
power consumption	0,7W
protection level	IP20
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	4 modules (70mm)
weigh	250g
fixing	on rail TH-35

8.

AUTOMATIC PHASE SWITCHES

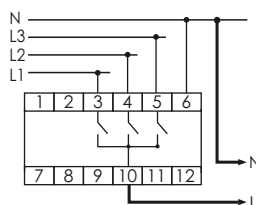
PURPOSE

Automatic phase switches serve to maintain continuity of power supply to single-phase receivers in the event of power phase decay or a drop in its parameters below standard values.

PF-431 WITH "PRIORITY" PHASE

FUNCTIONING

Three-phase voltage (3x230V+N) is supplied to the input of the switch. Single-phase voltage (230V AC), i.e. the phase voltage of one of the phases, is supplied to the output of the switch. The electronic system of the switch controls voltage values of the phases supplied in such a way as to ensure that output voltage is not lower than 195V. The phase that has correct parameters is directed to the output of the switch. The L1 phase is the priority phase, i.e. if its parameters are correct, this phase will be always switched to the output. If the voltage parameters of the L1 phase are not correct or if voltage decay occurs in this phase, the electronic system will switch the L2 phase to the output (provided that its parameters are correct). In case of a simultaneous lack of correct voltages in the L1 and L2 phases, the L3 phase will be switched to the output. When the correct supply voltage returns to the L1 phase, the electronic system will switch this phase to the output.

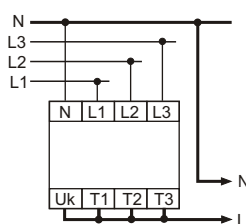


supply	3x400+N
output	230V AC
current load	<16A
activation threshold	
for L1 and L2 (lower / upper)	<195V / >250V
for L3 (lower / upper)	<190V / >250V
hysteresis	5V
working temperature	-25+50°C
switching time	0,5+0,8sec
power supply indicator	3xgreen LED
connection	terminal screws 2,5mm ²
dimensions	3 modules (52,5mm)
terminal	on rail TH-35

PF-441 WITH "PRIORITY" PHASE. FOR CO-OPERATING WITH CONTACTORS

FUNCTIONING

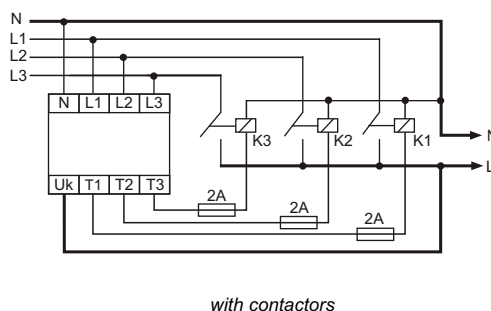
The directly connected switch is used for supplying the single-phase circuit whose current-load does not exceed 16A. For the circuits that have a current-load higher that 16A, a configuration is used that consists of a switch and three contactors that have a properly selected current-carrying capacity. Three-phase voltage (3x230V+N) is supplied to the input of the switch (L1, L2, L3, N). Single-phase voltage (230V AC), i.e. the phase voltage of one of the phases, is directed to the output of the switch (T1, T2, T3). The electronic system of the switch controls voltage values of the phases supplied. The phase that has correct parameters is switched to the output of the switch. The L1 phase is the priority phase, i.e. if its parameters are correct, this phase will be always switched to the output. If the voltage parameters of the L1 phase are not correct or if voltage decay occurs in this phase, the electronic system will switch the L2 phase to the output (provided that its parameters are correct). In case of a simultaneous lack of correct voltages in the L1 and L2 phases, the L3 phase will be switched to the output. When the correct supply voltage returns to the L1 phase, the electronic system will switch this phase to the output. The switch-over time (required for voltage to occur at the output) after the decay of a currently activated phase is from 0.5 to 0.8 sec. (during this time the receivers are not supplied). Uk input is used for controlling the voltages activated. The system enables the activation of only one phase. In this way the simultaneous switching of voltages of two phases to the output is prevented. Such simultaneous switching of voltages might lead to a phase-to-phase fault. Also, the defect of the contactor (for example, a break in the coil circuit, suspending or burning out of the working contactor) will cause the switching of the receiver to another phase despite the fact that the voltage in a given phase is correct. If the contacts of the contactor are permanently closed, the system will not switch to another contactor despite the fact that the voltage in this phase is incorrect. After the activation of supply voltage (at least one phase), the system examines the correctness of voltages supplied for 2 seconds and only after that time the system switches the phase to the output.



without contactors

supply	3x400+N
output	230V AC
current load	
without contactors	<16A
with contactors up to max. capacity of the contacts	
activation threshold	
lower	<195V
upper	>250V
hysteresis	5V
working temperature	-25+50°C
switching time	0,5+0,8sec
power supply indicator	green LED
signalization of phase selection	3 x yellow LED
connection	
for L1, L2, L3, N pin	terminal screws 2,5mm ²
for T1, T2, T3, Uk pin	terminal screws 1,5mm ²
dimensions	4 modules (70mm)
fixing	on rail TH-35

System with connectors is applied with receiver current exceeding 16A.



with connectors

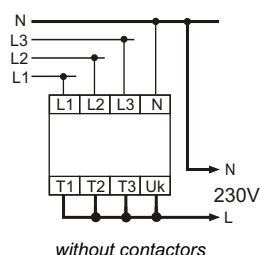
PF-451 WITH "PRIORITY" PHASE

FOR CO-OPERATING WITH CONTACTORS.

WITH ADJUSTABLE LOWER (170÷210V) AND UPPER (230÷260V) ACTUATION THRESHOLD

FUNCTIONING

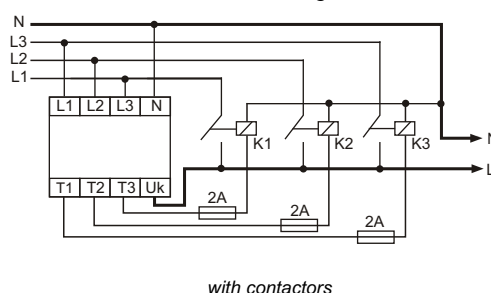
The directly connected switch is used for supplying the single-phase circuit whose current-load does not exceed 16A. For the circuits that have a current-load higher than 16A, a configuration is used that consists of a switch and three contactors that have a properly selected current-carrying capacity. Three-phase voltage (3x230V+N) is supplied to the input of the switch (L1, L2, L3, N). Single-phase voltage (230V AC), i.e. the phase voltage of one of the phases, is directed to the output of the switch (T1, T2, T3). The electronic system of the switch controls voltage values of the phases supplied. The phase that has correct parameters is switched to the output of the switch. Phase switching sequence is not specified the phase that has the best parameters is always switched to the output. Switching to another phase that has correct parameters occurs only after a drop in values of parameters of the currently used phase. The switch-over time (required for voltage to occur at the output) after the decay of a currently activated phase is from 0.5 to 0.8 sec. (during this time the receivers are not supplied). Uk input is used for controlling the voltages activated. The system enables the activation of only one phase. In this way the simultaneous switching of voltages of two phases to the output is prevented. Such simultaneous switching of voltages might lead to a phase-to-phase fault. Also, the defect of the contactor (for example, a break in the coil circuit, suspending or burning out of the working contactor) will cause the switching of the receiver to another phase despite the fact that the voltage in a given phase is correct. If the contacts of the contactor are permanently closed, the system will not switch to another contactor despite the fact that the voltage in this phase is incorrect. After the activation of supply voltage (at least one phase), the system examines the correctness of voltages supplied for 2 seconds and only after that time the system switches the phase to the output. The switch provides the option of adjusting a lower voltage threshold (150V to 210V) and an upper voltage threshold (230V to 260V) at which switching-over occurs.



without contactors

supply	3x400+N
output	230V AC
current load	
without contactors	<16A
with contactors	up to max. capacity of the contacts
activation threshold	
lower	170÷210V
upper	230÷260V
hysteresis	5V
working temperature	-25÷50°C
switching time	0,5÷0,8sec
power supply indicator	green LED
signalization of phase selection	3 x yellow LED
connection	terminal screws 2,5mm ²
dimensions	5 modules (88mm)
fixing	on rail TH-35

System with connectors is applied with receiver current exceeding 16A.



with connectors

9.

TIMING RELAYS

PURPOSE

Timing relays are devised to time the control of industrial and domestic automatic control engineering systems (e.g. ventilation, heating, lighting, signalling, etc.).

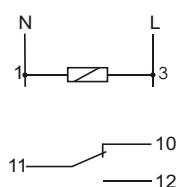
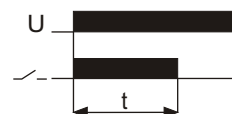
Operation mode: **LAGGED DEACTIVATION**

PCA-512

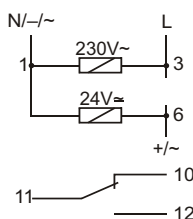
PCA-514

FUNCTIONING

Until the relay is activated, the contact remains in the 11-10 position. After the power voltage is supplied, contact is shifted to position 11-12 and the countdown of the preset value t is commenced. After the preset time t has been counted down, contact returns to position 11-10. The working sequence of the relay may be repeated after turning the power supply off and on.



PCA-512



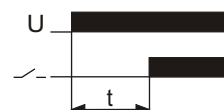
PCA-514

supply	PCA-512 230V	230V AC
	PCA-512 24V	24V AC/DC
	PCA-512 UNI	12+264V AC/DC
	PCA-514 DUO	230V AC / 24V AC/DC
current load		<10A
contacts		1 C/O
operation time		0,1sec+24day
activation lag		<50msec
power supply indicator		green LED
operation mode indicator		red LED
power consumption		0,8W
working temperature		-25+50°C
connection		screw terminals 2,5mm ²
dimensions		1 module (18mm)
fixing		on rail TH-35

Operation mode: **LAGGED ACTIVATION**

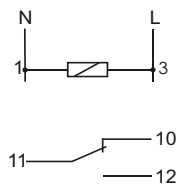
FUNCTIONING

After the power voltage is supplied, the contact remains in position 11-10 and the timing of the preset value t is commenced. After the preset time t has been counted down, the contact is shifted to position 11-12. The working sequence of the relay may be repeated after turning the power supply off and on.

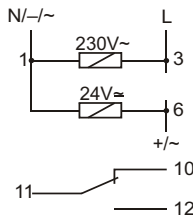


PCR-513

PCR-515



PCR-513

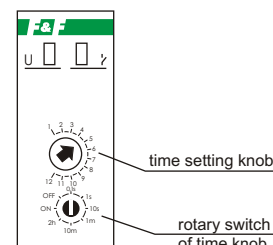


PCR-515

supply	PCR-513 230V	230V AC
	PCR-513 24V	24V AC/DC
	PCR-513 UNI	12+264V AC/DC
	PCR-515 DUO	230V AC / 24V AC/DC
current load		<10A
contacts		1 C/O
operation time		0,1sec+24day
power supply indicator		green LED
operation mode indicator		red LED
power consumption		0,8W
working temperature		-25+50°C
connection		screw terminals 2,5mm ²
dimensions		1 module (18mm)
fixing		on rail TH-35

ATTENTION!

- *Setting the time range knob regulator in the:
ON - position with power supply activated results in the permanent closure of the contact.
OFF - position (power supply activated) causes the contact to be permanently closed.
- *With the power supply on, the system does not respond to time range setting modifications.
- *The newly set time range is active after the power supply has been turned off and on.
- *With the power supply on, it is possible to regulate the preset time freely within the selected time range.



MULTI-FUNCTION; MULTI-RANGE FUNCTIONING

Operation mode:

*LAGGED ACTIVATION (IR)

After the power voltage is supplied, the contact remains in position 11-10 (and 8-7 for PCU-510) and the timing of the preset value t is commenced. After the preset time t has been counted down, the contact is shifted to position 11-12 (and 8-9 for PCU-510). The working sequence of the relay may be repeated after turning the power supply off and on.

*LAGGED DEACTIVATION (IA)

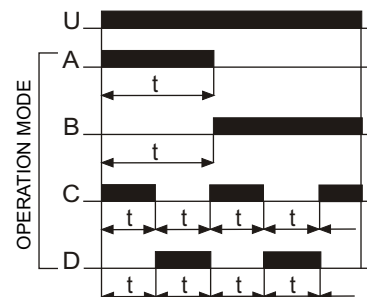
Until the relay is activated, the contact remains in the 11-10 (and 8-7 for PCU-510) position. After the power voltage is supplied, contact is shifted to position 11-12 (and 8-9 for PCU-510) and the countdown of the preset value t is commenced. After the preset time t has been counted down, contact returns to position 11-10 (and 8-7 for PCU-510). The working sequence of the relay may be repeated after turning the power supply off and on.

*LAGGED ACTIVATION - CYCLIC (CR)

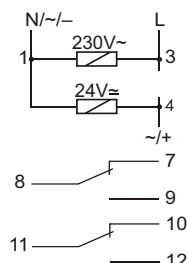
The LA operational mode is triggered in equal interruption/work cycles according to the preset time values.

*LAGGED DEACTIVATION - CYCLIC (CA)

The LD operational mode is triggered in equal interruption/work cycles according to the preset time values.

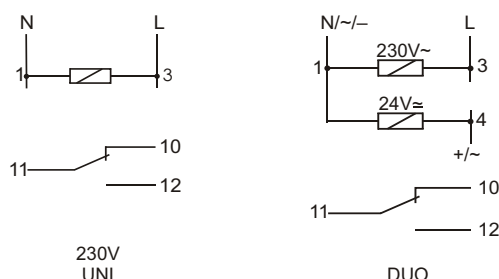


PCU-510



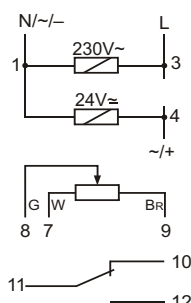
supply PCU-510 DUO	230V AC / 24V AC/DC
current load	2x(<5A)
contacts	2 C/O
operation time	0,1sec+24day
activation lag delay functions	<50msec
power supply indicator	green LED
operation mode indicator	red LED
power consumption	0,8W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	1 module (18mm)
fixing	on rail TH-35

PCU-511



supply PCU-511 230V	230V AC
PCU-511 DUO	230V AC / 24V AC/DC
PCU-511 UNI	12+264V AC/DC
current load	<10A
contacts	2 C/O
operation time	0,1sec+24day
activation lag delay functions	<50msec
power supply indicator	green LED
operation mode indicator	red LED
power consumption	0,8W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	1 module (18mm)
fixing	on rail TH-35

PCU-518 WITH EXTERNAL TIME SETTING KNOB



supply PCU-518 DUO	230V AC / 24V AC/DC
current load	<8A
contacts	1 C/O
operation time	0,1sec+24day
activation lag delay functions	<50msec
power supply indicator	green LED
operation mode indicator	red LED
power consumption	0,8W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	1 module (18mm)
fixing	on rail TH-35
dimensions of knob	63x42x30mm
connection	cabl 3x0,34mm ² ; l=70cm
fixing hole	Ø10

ATTENTION!

*Setting the time range knob regulator in the:

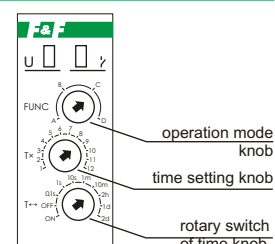
ON - position with power supply activated results in the permanent closure of the contact.

OFF - position (power supply activated) causes the contact to be permanently closed.

*With the power supply on, the system does not respond to time range setting modifications.

*The newly set time range is active after the power supply has been turned off and on.

*With the power supply on, it is possible to regulate the preset time freely within the selected time range.



PCU-520

SETTING OF TWO INDEPENDENT TIME VALUES T1 AND T2 (work time and interruption time).

Made for 230V AC or 24V AC/DC (special order for 12V, 48V, 110V AC/DC)

FUNCTIONING

Operation mode:

*LAGGED ACTIVATION (IR)

Until the relay is activated, the contact remains in the 1-5 and 2-8 position. After the power voltage is supplied (the green "U" LED lights up), the contact is shifted to 1-6 and 2-7 position and the countdown of the preset value t is commenced (the red LED lights up). After the preset time t has been counted down, the contact returns to position 1-5 and 2-8. The working sequence of the relay may be repeated after turning the power supply off and on.

*LAGGED DEACTIVATION (IA)

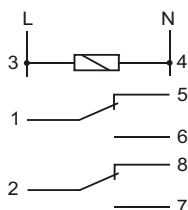
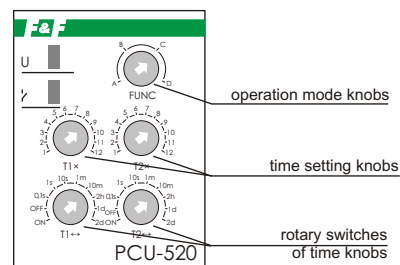
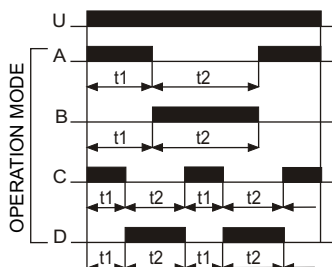
Until the relay is activated, the contact remains in the 1-5 and 2-8 position. After the power voltage is supplied (the green "U" LED lights up), the contact is shifted to position 1-6 and 2-7 and the countdown of the preset value t is commenced (the red LED lights up). The working sequence of the relay may be repeated after turning the power voltage off and on.

*LAGGED ACTIVATION - CYCLIC (CR)

The LA operational mode is triggered in equal interruption/work cycles according to preset time values.

*LAGGED DEACTIVATION - CYCLIC (CA)

The LD operational mode is triggered in equal interruption/work cycles according to preset time values.



supply	230V AC
	24V AC/DC
current load	2x(<8A)
contacts	2 C/O
operation time	0,1sec+24day
activation lag delay functions	<50msec
power supply indicator	green LED
operation mode indicator	red LED
power consumption	1,2W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	2 modules (35mm)
fixing	on rail TH-35

ATTENTION!

*Setting the time range knob regulator in the:

ON - position with power supply activated results in the permanent closure of the contact in position 1-6 and 2-7.

OFF - position (power supply activated) causes the contact to be permanently closed in the 1-5 and 2-7 position.

*With the power supply on, the system does not respond to time range setting modifications.

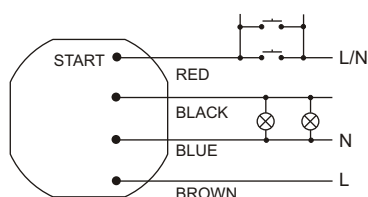
*The newly set time range is active after the power supply has been turned off and on.

*With the power supply on, it is possible to regulate the preset time freely within the selected time range.

MULTI-FUNCTION; MULTI-RANGE

PCS-506 8 FUNCTION

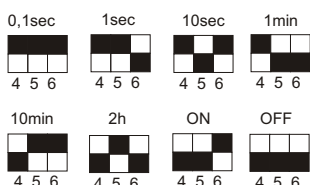
with START control input



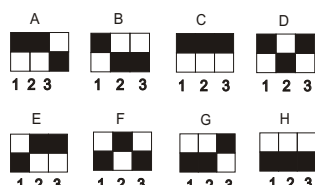
Setting of operation mode and time range

The required time range and the operation mode of the relay is selected by choosing the proper combination of the switches (black field in the diagram stands for the switch position).

TIME RANGE



OPERATION MODE



Setting the wheel regulator in the:

***ON** position with power supply activated causes the contact to be permanently closed.

***OFF** position with power supply activated causes the contact to be permanently opened.

***With the power supply on, the system does not respond to time range setting modifications.**

***The newly set time range is active after the power supply has been turned off and on.**

***With the power supply on, it is possible to regulate the preset time freely within the selected time range.**

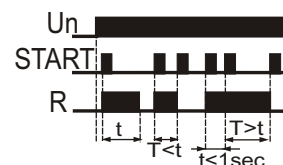
supply	230V AC
current load	<10A
contacts	1 N/O
operation time	0,1sec+24h
activation lag delay function	<50msec
power supply indicator	green LED
operation mode indicator	red LED
power consumption	0,8W
working temperature	-25+50°C
connection	4×1mm ² ; l=10cm
dimensions	Ø55, h=13mm
fixing	to under plaster box Ø60

Ⓐ



Presence simulator. When the START signal is being applied, the system turns the relay on and off at random for a period of 20sec. up to 20 min. The sequence in question is initiated by activation of the relay. After the START signal is discontinued, the system turns the relay off. The device does not respond to time range settings.

Ⓑ



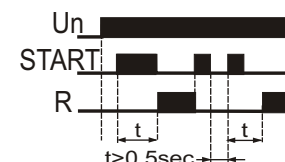
Bistable relay with step automatic module. A single pressing of the START button results in activating the relay for the preset time. A further START impulse generated during the countdown will deactivate the relay. Two START impulses applied within a time shorter than 1sec. will result in the permanent activation of the relay. The following impulse turns the relay off.

Ⓒ



Generator with a pulse duty factor of 50% which initiates its working sequence from the moment of activation. It is active as long as START voltage is applied. Once the START signal is disconnected, the connection is broken and the device is deactivated.

Ⓓ



Lagged activation of the relay with the START signal. When the relay is active, another START impulse will turn it off. The following START impulse causes a repetition of the time countdown sequence and activation of the relay. The interval between the trailing edge of the reset signal and the leading edge of the START signal, which re-initiates the countdown sequence, should be at least 0,5 sec.

Ⓔ



Generation of a single impulse of t time by the START signal trailing edge. During preset time countdown, the system does not respond to START impulses.

Ⓕ



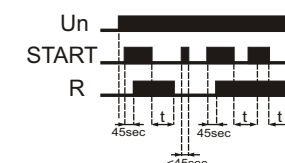
Generation of a single impulse of t time by the START signal trailing edge. During preset time countdown, the system does not respond to START impulses.

Ⓖ



Lag in deactivation with support function enabled. The leading edge of the START signal results in relay activation, whereas the trailing edge of the same signal triggers the time countdown. The supply of the START signal during countdown results in an extension of the cycle by another t time value along the trailing edge.

Ⓕ



Deactivation and activation lags with support function enabled. If the START voltage is supplied for less than 45sec., it is ignored by the system, however if it is longer, the relay is activated after the 45sec. and the preset time value is counted down with the trailing edge of the START signal. If another START impulse is applied during the countdown, then the trailing edge of this signal will result in the repeated countdown sequence (e.g. for ventilation purposes: short activation of the lighting does not turn the fan on, but if the lighting is activated for longer than the 45sec., the fan will start).

PCU-516 10-FUNCTION

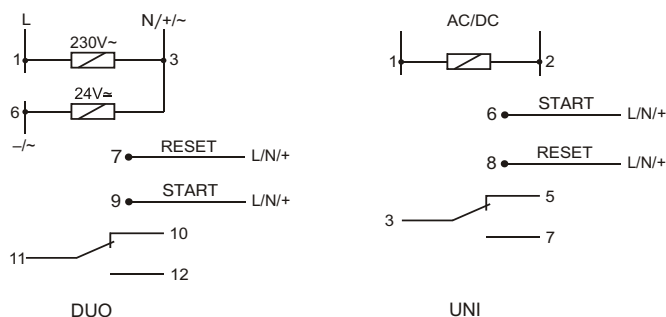
with START i RESET control inputs



DUO

UNI

If the RESET voltage is applied during the execution of:
 *A, B, C, D, F functions the 'selected operation' mode is restarted
 *F, G, H, I functions the relay returns to the initial condition and awaits the START signal;
 *K function the relay's contact is closed permanently in the 3-7 position.



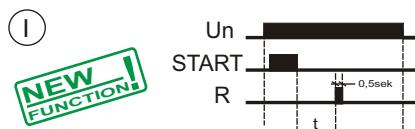
supply	PCS-516 DUO	230V AC / 24V AC/DC
	PCS-516 UNI	12÷264V AC/DC
current load		<10A
contacts		1 C/O
operation time		0,1sec+24day
activation lag delay function		<50msec
power supply indicator		green LED
operation mode indicator		red LED
power consumption		0,8W
working temperature		-25÷50°C
connection		screw terminals 2,5mm ²
dimensions		1 module (18mm)
fixing		on rail TH-35

ATTENTION!

*Setting the time range knob regulator in the:
 ON - position with power supply activated results in the permanent closure of the contact in position 3-7 (UNI) and 11-12 (DUO).
 OFF - position (power supply activated) causes the contact to be permanently closed in the position 3-5 (UNI) and 11-10 (DUO).
 *With the power supply on, the system does not respond to the modification of time range and operation mode.
 *The newly set time range and operation mode values are active after the power supply is turned off and on or after the RESET voltage is supplied.
 *With the power supply on, it is possible to regulate the preset time freely within the selected time range.
 *If the function is changed into F, G, H, I, or K, one with the power supply on, and the START voltage is supplied, the system will carry out the previous function and then reset (switch into the newly selected function). A further instance of the START voltage supply will result in executing the new function.

ATTENTION!

NEW FUNCTION FOR PCS-516 DUO



Generation of a single impulse 0,5sec. by the START signal trailing edge.



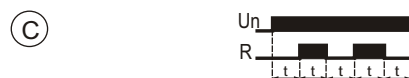
LAGGED ACTIVATION

After the power voltage is supplied, the contact remains in position 3-5 and the timing of the preset value t is commenced. After the preset time t has been counted down, the contact is shifted to position 3-7. The working sequence of the relay may be repeated after turning the power supply off and on.



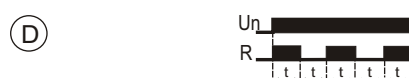
LAGGED DEACTIVATION

Until the relay is activated, the contact remains in the 3-5 position. After the power voltage is supplied, the contact is shifted to position 3-7 and the countdown of the preset value t is commenced. The working sequence of the relay may be repeated after turning the power voltage off and on.



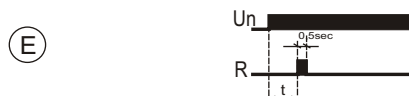
LAGGED ACTIVATION - CYCLIC

The LA operational mode is triggered in equal interruption/work cycles according to preset time values.

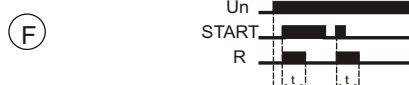


LAGGED DEACTIVATION - CYCLIC

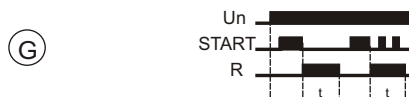
The LD operational mode is triggered in equal interruption/work cycles according to preset time values.



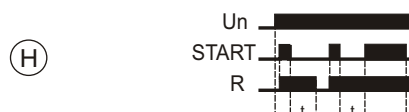
0,5sec. impulse generation after preset time t



Generation of a single impulse of t time by the START signal leading edge. During preset time countdown, the system does not respond to START impulses.



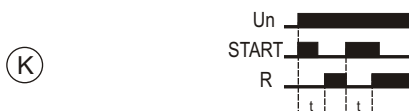
Generation of a single impulse of t time by the START signal trailing edge. During preset time countdown, the system does not respond to START impulses.



Lag in deactivation with support function enabled. The leading edge of the START signal results in relay activation, whereas the trailing edge of the same signal triggers the time countdown. The supply of the START signal during countdown results in an extension of the cycle by another t time value along the trailing edge.



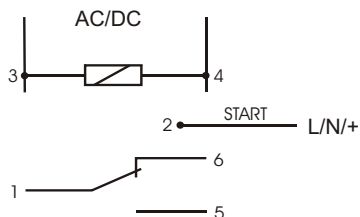
Deactivation and activation lags with support function enabled. If the START voltage is supplied for less than 45sec., it is ignored by the system, however if it is longer, the relay is activated after the 45sec and the preset time value is counted down with the trailing edge of the START signal. If another START impulse is applied during the countdown, then the trailing edge of this signal will result in the repeated countdown sequence (e.g. for ventilation purposes: short activation of the lighting does not turn the fan on, but if the lighting is activated for longer than the 45sec, the fan will start).



Turning off the relay for a specified period of time along the leading edge of the START signal. During the preset time countdown the system does not respond to START signals.

PCS-517 18-FUNCTION

with START control input



ATTENTION!

Wide range of time adjustment positions (0.25 sec. - 99 hrs 59mins 59secs) enables the user to preset an extremely accurate contact actuation time, e.g. 2hrs - 13mins - 27secs.

Supply	24÷264V AC/DC
Current load	<16A
contats	separated 1C/O
Control pulse current	<1mA
Operation time	0.25sec+99h59min59sec±100
activation lag delay function	500msec
Power consumption	1.5W
Working temperature	-20÷50°C
Terminal	screw terminals 2.5mm ²
Dimensions	2 modules (35mm)
Fixing	on rail TH-35

P00 IDLE MODE

P01



After supply voltage has been applied, the contact remains in 1-6 position and countdown of the preset delay time t is commenced. After this time is counted down, the contact is switched to position 1-5 (actuation). The next run of the relay's working sequence is operable when the supply voltage is reinstated after cut-off.

P02



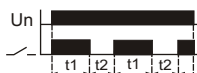
Until the supply voltage is applied, the contact remains in 1-6 position. Once the voltage is applied, the contact is switched to position 1-5 (actuation) and countdown of the preset delay time t is commenced. The next run of the relay's working sequence is operable when the supply voltage is reinstated after cut-off.

P03



Delayed actuation work mode is realised in cycles with the following preset time interruptions: t_1 interruption and t_2 work (actuation).

P04



Delayed deactivation work mode is realised in cycles with the following preset time interruptions: t_1 actuation and t_2 interruption.

P05



After supply voltage has been applied, the contact remains in position 1-6 and countdown of the preset delay time t is commenced. After this time is counted down, the contact is switched to position 1-5 (actuation) for time t_2 . The next run of the relay's working sequence is operable when the supply voltage is reinstated after cut-off.

P06



Once the START signal is applied, the contact is switched to position 1-5 (actuation). After the signal's decay, the contact is held in the position for the preset time t . When time t is counted down, the contact does not respond to the next pulses of the START signal.

P07



Once the START signal is applied, the contact is switched to position 1-5 (actuation). After the signal's decay, the contact is held in the position for the preset time t . Another application of the START signal during countdown time t results in the countdown interruption, with the contact still actuated (pos. 1-5). Another decay of the START signal triggers off time t countdown and the contact support in that position.

P08



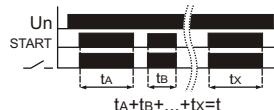
Contact actuation (pos. 1-5) for time t by the leading edge of the START signal.

P09



Delay time t_1 (pos. 1-6) is triggered off by the leading edge of the START signal. After the t_1 time has been counted down, the contact is actuated (pos. 1-6) for the t_2 time.

P10



Contact actuation (pos. 1-5) during the countdown of time t from value set as "zero" only during the application of the START signal. The signal's decay stops the countdown. Another application of the START signal results in the continuation of the countdown for the remaining time t . The decay of the supply voltage results in the remaining time t being reset. After the supply voltage and START signal are reinstated, the countdown of time t from the preset value will be restarted.

P11



Contact actuation (pos. 1-5) for time t with the trailing edge of the START signal. When time t is counted down, the contact does not respond to the next pulses of the START signal.

P12



Contact actuation (pos. 1-5) for time t with the trailing edge of the START signal. Another application of the START signal, as well as its decay during time t countdown triggers off the countdown from the beginning.

P13



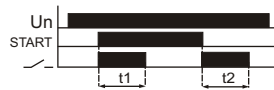
Contact actuation (pos. 1-5) for time t by the leading edge of the START signal. Another application of the START signal during time t countdown results in the countdown's interruption and the contact's deactivation (pos. 1-6).

P14



Contact actuation (pos. 1-5) for time t by the leading edge of the START signal. Another application of the START signal during time t countdown triggers off the countdown from the beginning.

P15



Contact actuation (pos. 1-5) for t_1 time by the leading edge of the START signal and another actuation for time t_2 with the trailing edge of the START signal.

P16



Contact actuation (pos. 1-5) for time t_1 by the leading edge of the START signal. When time t is counted down, the contact does not respond to the next pulses of the START signal.

P17



Delayed contact actuation after the lapse of time t , with the countdown triggered off by the leading edge of the START signal. Another application of the signal deactivates the contact (pos. 1-6) for time t . A further application of the START signal during time t countdown triggers off the countdown from the beginning.

P18



Delayed contact actuation after the lapse of time t , with the countdown triggered off by the leading edge of the START signal. When time t is counted down, the contact does not respond to the next pulses of the START signal. The contact is deactivated (pos. 1-6) on the decay of the supply voltage. The next run of the relay's working sequence is operable after the supply voltage is cut off and reinstated.

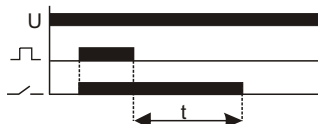
LAGGED-PULSE TIME RELAYS

PURPOSE

Lagged-pulse time relays are devised to support the power supply of the controlled receiver for a specified period of time after decay of the control voltage, e.g. in bathroom ventilation systems in which the upkeep of the fan operation (activated along with the lighting) is required for a specified period of time after turning off the accompanying lighting.

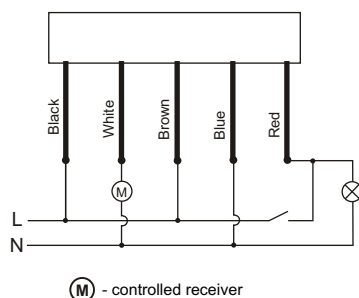
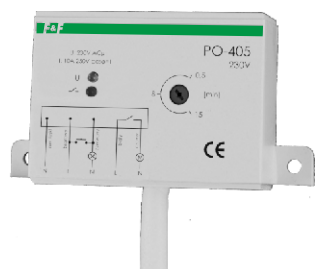
FUNCTIONING

The application of control voltage *S* to the relay causes its activation and the resulting supply of voltage *R* to the controlled receiver. After decay of the control voltage, the operation of the receiving device is kept for the support time *t* (preset with the potentiometer). After the *t* time has been counted down, the controlled receiver is turned off automatically. If control voltage *S* is re-supplied before the lapse of the preset time, the relay will repeat its operational sequence.



PO-405

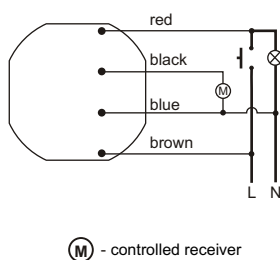
With cable connection.



supply PO-405 230V	230V AC
PO-405 24V	24V AC/DC
current load	<10A
contacts	1 N/O
operation time	1+15min
power supply indicator	green LED
operation mode indicator	red LED
power consumption	0,56W
working temperature	-25+50°C
connection	5×0,5mm ² ; l=0,5m
dimensions	70×50×25mm
fixing	two screws to substrate

PO-406

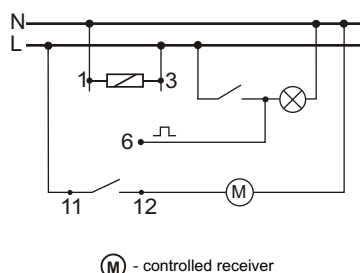
To under plaster box.



supply	230V AC
current load	<10A
contacts	1 N/O
operation time	1+15min
power consumption	0,56W
working temperature	-25+50°C
connection	wires 4×1mm ² ; l=10cm
dimensions	Ø55, h=13mm
fixing	to under plaster box Ø60

PO-415

On rail TH-35



supply PO-415 230V	230V AC
PO-415 24V	24V AC/DC
current load	<10A
contacts	1 C/O
operation time	1+15min
power supply indicator	green LED
operation mode indicator	red LED
power consumption	0,56W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	1 module (17,5mm)
fixing	on rail TH-35

10.

TIME CONTROLLERS

STP-541 PROGRAMMABLE CONTROLLER (LEFT/RIGHT activation mode)

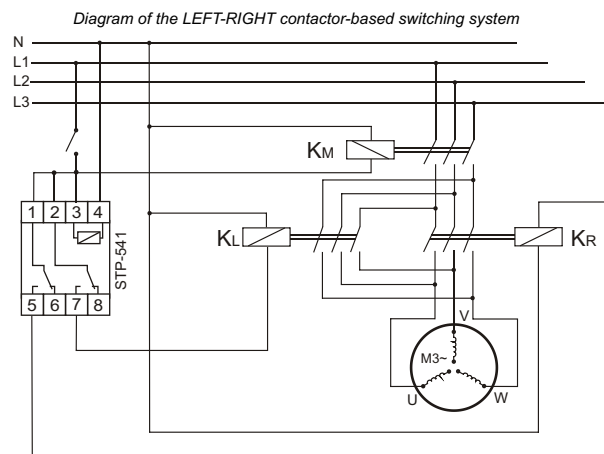
With four time settings available and a programmable number of repetitions or infinite work sequence in the "loop mode"

PURPOSE

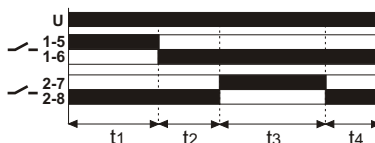
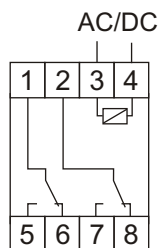
The controller is used for technological process control in industrial automatic-control device systems which require temporal, cyclic and alternate activation of receivers with appropriate intervals between successive switchings.

FUNCTIONING

The controller works in compliance with a four-time sequence program and a preset number of cycles. A cycle is a sequence of four successive contact states.



KM - main contactor
KR - "RIGHT" contactor
KL - "LEFT" contactor



supply	24+264V AC/DC
current load	2x(<16A)
contacts	2x1N/C
time settings t1, t2, t3, t4 -	1sec+ 99h 59min 59sec
time setting accuracy	1 sec
number of cycle repetitions	1 + 999999
	or infinite in the "loop mode"
power consumption	1.5W
working temperature	-20+50°C
connection	screw terminals 2.5mm ²
dimensions	2 modules (35mm)
fixing	on rail TH-35

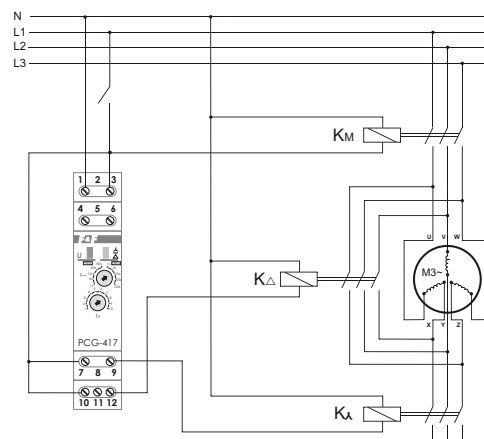
PCG-417 STAR-DELTA SWITCH

To control the STAR-DELTA contactor connection system.

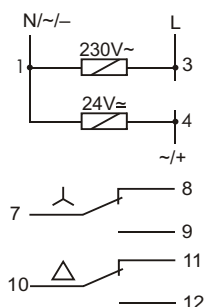
FUNCTIONING

The PCG-417 relay is equipped with a special system of two electromagnetic relays which removes the risk of activating two connectors simultaneously, with each relay controlling a given connector. Once the system is switched from STAR to DELTA, one relay disconnects the "star" connector (a forced interval takes place). The other then activates the "delta" connector.

After the power supply is turned on, the contact 7-9 is closed and remains in this position for the preset start-up time t1. After the lapse of t1, contact 7-9 opens and both contacts remain open for the time t2. After the lapse of t2, the contact 10-12 is closed and remains in this position until the power voltage is disconnected.



KM - main contactor
KΔ - contactor "DELTA"
KΔ - contactor "STAR"

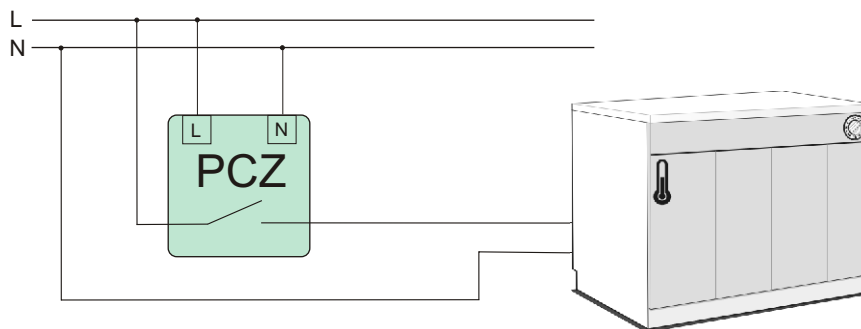


supply	230V AC / 24V AC/DC
current load	2x(<8A)
contact	2x1C/O
start-up time Δ	1+1000sec
switching time Δ	75msec / 150msec
power consumption	0.8W
power supply indicator	green LED
action indicator	red LED
working temperature	-25+50°C
connection	screw terminals 2.5mm ²
dimensions	1 module (18mm)
fixing	on rail TH-35

11. PROGRAMMABLE CONTROL TIMERS

PURPOSE

Programmable control timers are used to control the work time of devices included into industrial or household automatic systems in compliance with individual time schedule planned by the user.



ATTENTION!

Daylight Saving Time - automatic change function! (Concerns all types)

Time change from winter to summer occurs automatically at 2 a.m. On the last sunday of March by adding one hour to the current time.

Time change from summer to winter occurs automatically at 3 a.m. on the last sunday of October by taking away one hour from the current time.

ATTENTION! It is possibilities to switch-OFF of automatic change function.

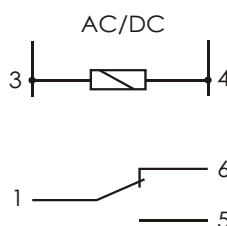
WEEKLY CYCLES TYPE

FUNCTIONING

The timer activates and deactivates a given device at preset hours in the following cycles: 24-hour, weekly, working day (Mon-Fri) or weekend (Sat, Sun).

PCZ-521

One-way type. 250 of program memory sectors.

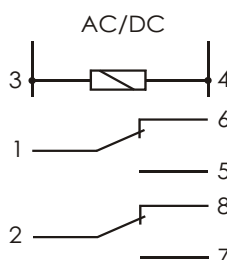


supply	24÷264V AC/DC
current load	<16A
contacts	1C/O
display maintenance time	non
timer maintenance time	6 years
indication accuracy item	1sec
time deviation	±1sec/24h
schedule time accuracy item	1min
no. of program memory sectors	250
	(125 entry pairs: ON/OFF)
power consumption	1.5W
working temperature	-25÷50°C
connection	screw terminals 2,5mm ²
dimensions	2 modules (35mm)
fixing	on rail TH-35

PCZ-522

Two-way type. 2×250 of program memory sectors.

With two independent separately programmable ways.



supply	24÷264V AC/DC
current load	2×(<16A)
contacts	2×1C/O
display maintenance time	non
timer maintenance time	6 years
indication accuracy item	1sec
time deviation	±1sec/24h
schedule time accuracy item	1min
no. of program memory sectors	2×250
	(2×125 entry pairs: ON/OFF)
power consumption	1.5W
working temperature	-25÷50°C
connection	screw terminals 2,5mm ²
dimensions	2 modules (35mm)
fixing	on rail TH-35

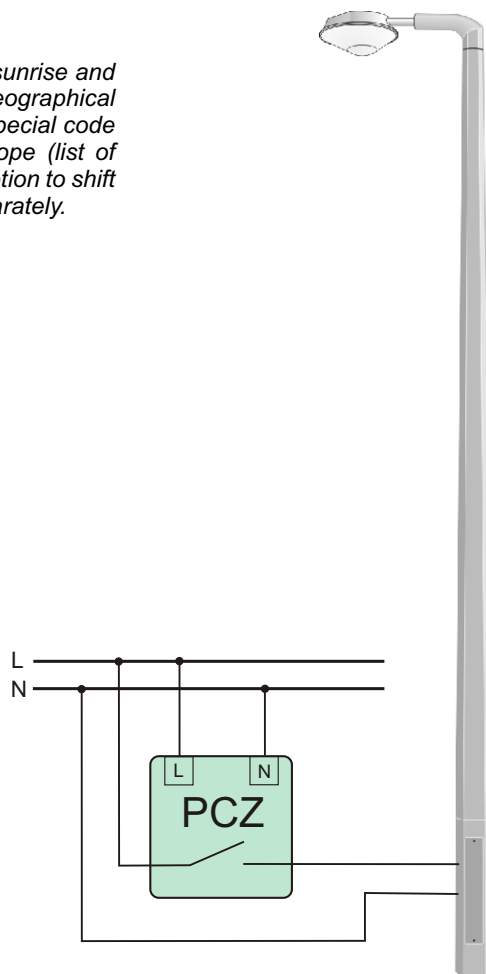
ASTRONOMICAL TYPE

FUNCTIONING

The astronomical timer activates and deactivates a device at certain hour, i.e. at sunrise and sunset. Should more settings that are precise be required for locations of different geographical co-ordinates, there is an option to set a given longitude and latitude or select a special code which entails automatic setting of these co-ordinates for a given place in Europe (list of locations and their codes may be found in the manual). Furthermore, there is an option to shift the preset activation/deactivation time for ± 99 min. for sunrise and sunset times separately.

Code	City	°N	°E	City	Country
1	Praga	50 08	14 25	Prague	CZECHY
2	Pilzno	49 47	13 22	Plzen	
3	Budejovice	48 58	14 29	Ceske Budejovice	
4	Brno	49 10	16 37	Brno	
5	Olomouc	49 35	17 15	Olomouc	
6	Ostrava	49 51	18 19	Ostrava	
7	Hradec Kralove	50 13	15 49	Hradec Kralove	
8	Bratislava	48 08	17 05	Bratislava	SLOVACIA
9	Zylina	49 13	18 44	Zilina	
10	Banska Bystrica	48 44	19 08	Banska Bystrica	
11	Poprad	49 03	20 17	Poprad	
12	Koszyce	48 43	21 15	Kosice	WĘGRY
13	Budapeszt	47 30	19 04	Budapest	
14	Debrecen	47 33	21 37	Debrecen	
15	Szeged	46 15	20 08	Szeged	
16	Szombathely	47 13	16 37	Szombathely	
17	Gyor	47 40	17 38	Gyor	LITWA
18	Wilno	54 42	25 17	Vilnius	
19	Kowno	54 54	23 53	Kaunas	
20	Klaipeda	55 41	21 08	Klaipeda	
21	Poniewież	55 43	24 21	Panevezys	
22	Szawle	55 56	23 18	Siauliai	

...



ATTENTION!

Daylight Saving Time - automatic change function! (Concerns all types)

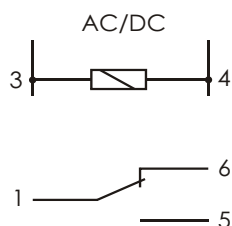
Time change from winter to summer occurs automatically at 2 a.m. On the last sunday of March by adding one hour to the current time.

Time change from summer to winter occurs automatically at 3 a.m. on the last sunday of October by taking away one hour from the current time.

ATTENTION! It is possibilities to switch-OFF of automatic change function.

PCZ-524

One-way type.

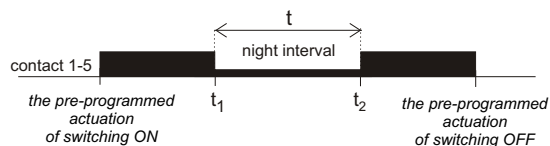


supply	24÷264V AC/DC
current load	<16A
contacts	1C/O
display maintenance time	non
timer maintenance time	6 years
indication accuracy item	1sec
time deviation	±1sec/24h
schedule time accuracy item	1min
activation/deactivation time correction	±0÷99min
schedule correction accuracy item	1min
power consumption	1,5W
working temperature	-25÷50°C
connection	screw terminals 2,5mm²
dimensions	2 modules (35mm)
fixing	on rail TH-35

with programmeable night interval (PCZ-525.2, PCZ-526.2)

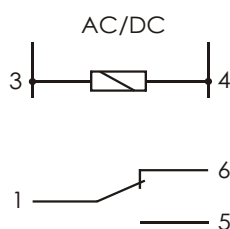
FUNCTIONING

Like PCZ-524.2. Another feature enables the user to set the so-called night interval between the pre-programmed actuation times, i.e. turning off the controlled receiver for a given period t (e.g. from 11 p.m. (t_1) to 04.00 a.m. (t_2)).



PCZ-525

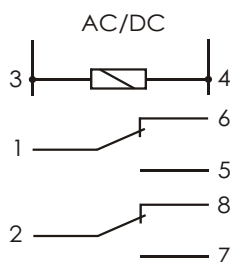
One-way type.



supply	24÷264V AC/DC
current load	<16A
contacts	1C/O
display maintenance time	non
timer maintenance time	6 years
schedule maintenance time	1sec
battery recharge time	±1sec/24h
indication accuracy item	1min
time deviation	±0÷99min
schedule time accuracy item	1min
activation/deactivation time correction	00:00÷24:00
schedule correction accuracy item	1.5W
interval time setting range	-25÷50°C
power consumption	screw terminals 2,5mm ²
working temperature	2 modules (35mm)
connection	on rail TH-35
dimensions	
fixing	

PCZ-526

Two-way type



supply	24÷264V AC/DC
current load	<16A
contacts	2x1C/O
display maintenance time	non
timer maintenance time	6 years
schedule maintenance time	1sec
battery recharge time	±1sec/24h
indication accuracy item	1min
time deviation	±0÷99min
schedule time accuracy item	1min
activation/deactivation time correction	±0÷99min
schedule correction accuracy item	1min
interval time setting range	00:00÷24:00
power consumption	1.5W
working temperature	-25÷50°C
connection	screw terminals 2,5mm ²
dimensions	2 modules (35mm)
fixing	on rail TH-35

12. PROGRAMMABLE LOGIC CONTROLLER PLC

MAX Logic H series

PURPOSE

H Series drivers are designed to solve large-scale task management of technological processes and data exchange. Are used in home automation and industrial low and medium level of technological advancement. Made in a compact case designed for mounting directly on a flat surface (wall, table) as well as switchboards (35mm rail).



H01



H02



H03



H04

H01 Basic version

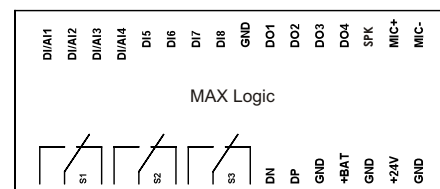
H02 With GSM communicator

H03 with front panel (LCD screen + keyboard)

H04 With GSM communicator, front panel (LCD screen + keyboard), GUI

supply	9+24V DC
digital inputs	4
analog/digital inputs	4
digital outputs	4
relay outputs N/C	3x<5A
ports	SD, microUSB, SIM, RS485
communication port	MODBUS RTU
working temperature	-10+50°C
power consumption	1W
connection	screw terminals 1,5mm ²
dimensions	110x79x40mm
fixing	to the base or on the rail TH-35

Short description of H04 series. Pozostałe sterowniki są uboższymi wariacjami H04. Więcej informacji na www.plcmax.pl

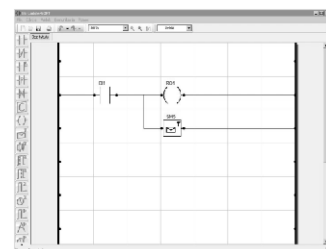


PURPOSE

H04-type controller has a built GSM communicator. It is designed to solve large-scale task management of technological processes and exchange data via the mobile phone GSM 900/1800 networks in voice mode (using DTMF function) and SMS.

MAX Logic H04 is one of the few drivers to enable connection and use it without the elements of programming. Using menu configurator, anyone can utilize who does not want to know the language and the complicated procedures of PLC programming.

With universal design, and service created for the driver programming language ForthLogic (modification FORTH) and the program "ladder" MAX-LadderSOFT driver is not only used in home automation as control working conditions and remote control devices, but also as an element of control and supervision of industrial automation equipment small and medium level of technological advancement.



MAX-LadderSOFT

FUNCTIONS

WORKING MODES - determines the status of implementation of logical functions of the controller:

- Work in CONFIGURATION mode is compatible with a given algorithm in the configuration menu.
- Work in FORTH mode is consistent with the logic defined by the applications in ForthLogic or the "ladder" MAX-LadderSOFT.
- Work in mixed mode to work mode driver setting of SETUP mode FORTH for the at least one relay output or digital. It is the separation of the work out of the CONFIGURATION mode. Control of the output is then determined using in ForthLogic application.

- work in dialog mode is a special kind of work with the controller allows to work directly with the forth-system using Microsoft

Hyperterminal through which a user communicates with the driver (MAX-PC connection USB cable). Such a program is called terminal window where the user via the computer keyboard can make speech and language ForthLogic orders system and the forth-system directly analyzes and executes them, giving back about the correctness of performance or failure.

REMOTE CONTROL AND COMMUNICATIONS - remote control allows easy and clear way to manage and monitor outputs operating status of devices connected to the driver's input using a mobile phone:

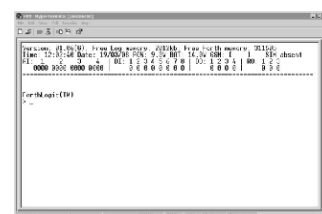
Operator MENU VOICE - (play audio files type. Wav files) allows remote control mode with a standard voice call functions using DTMF (choice of options by pressing the desired button, the phone keypad).

SMS COMMANDS - (input SMS) is a standard and defined command language ForthLogic, which are directly implemented by the driver.

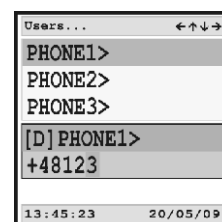
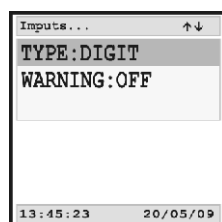
NOTICE - the function of instant information, voice or text message sent to the phone user to change the status of digital or analog.

USER INTERFACE - consists of a graphical color screen, LED display, keyboard and audio signal generator, which together with graphical-text configuration menus allow you to create logical functions work with low complexity. The controller has an application menu, voice activated from the configuration menu (there is also the possibility to program your own menus using voice ForthLogic programming language). All these elements create a modern and dynamic way to communicate with the user.

CONFIGURATION MENU - graphical-text menu enables you to set driver functions, configure the type of inputs, outputs, set of functions, given phone numbers for that are to be sent notification, establish a lockout, given the parameters for the implementation of specific tasks and system parameters



HyperTerminal



ACCESS BLOCKING - ability to set passwords against unauthorized interference in the work of the driver. Password is working at the entrance to the configuration menu and the remote control by a voice menu or SMS.

RECORDER - record changes in the operation of the controller (date, time, change in inputs and outputs, a GSM, etc). Registration data are saved in the driver's internal memory or SD card.

STATUS EC / OUTPUT - display the status of inputs and outputs allowing the optical signal of the driver work - informs about firmware version, available memory and power supply voltage parameters.

SYSTEM CLOCK- allows you to associate certain events with a particular logical time and date.

MODBUS RTU - a communications protocol allowing the communication device via serial port RS-485.

MICROPHONE - microphone elektretowego. Allows you to listen "live" during a voice call.

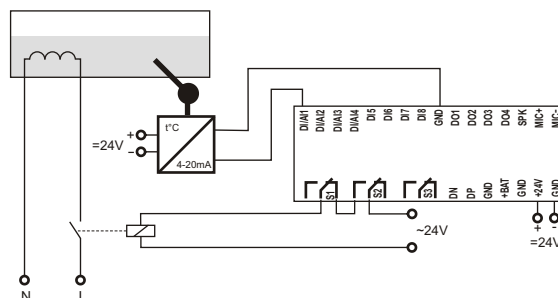
Speaker - output audio channel. Allows to deduce *.wav files to an external speaker.

POWER SOURCE - Built-in battery charger emergency power supply (reserve).

Example settings for temperature control with remote control.

Functions set by using the configuration menu.

Enclose the system remotely via SMS or a voice menu, setting the contact S2 in the active position. In the case of lower temperature from the set S1 is attached heating relay. After crossing the temperatures above the specified threshold contact S1 disconnects heater. After a decline in the temperature of the heater hysteresis value will be re-attached.



Configuration:

Menu Inputs → DI/AI 1 → TYP: I (4-20mA)

Menu Inputs → DI/AI 1 → CALL: OFF

Menu Inputs → DI/AI 1 → UNIT: ST

Menu Inputs → DI/AI 1 → SCALE> [Set the temperature sensor in accordance with its specifications (as given by the sensor manufacturer), eg. 5+35]

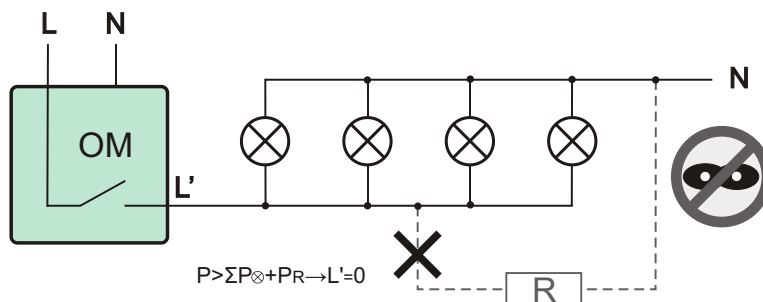
Menu Inputs → DI/AI 1 → TRESHOLD+HIST> [set the temperature threshold and hysteresis of return, such as threshold 22; hysteresis 2]

Menu Output → RO 1 → WORK: DI/AI 1

13. POWER CONSUMPTION LIMITERS

PURPOSE

Power consumption limiters are devised for the automatic disconnection of power from the circuit of single-phase wiring systems once the rated power consumption of the receivers incorporated into the system is exceeded.



FUNCTIONING

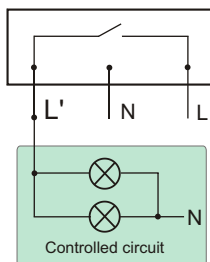
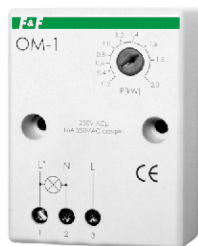
The limiter enables the user to supply power to the circuit if the total consumed power applied to the receivers constituting the system is lower than the preset value on the limiter's scale. Once the rated power consumption threshold in the controlled circuit is exceeded, the element is automatically disconnected from the power source. The supply is reinstated automatically once the preset time lapses. If the value of power consumption remains over the rated input, the power supply to the circuit is cut off again.

ATTENTION!

The power consumption limiter has been equipped with a delayed activation circuit (1.5÷2sec) which prevents disconnection of the power supply in the event of momentary power consumption surges over the rated level.

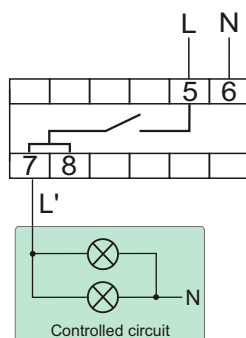
OM-1 POWER SUPPLY RETURN: 30SEC.

OM-2 ADJUSTABLE POWER SUPPLY RETURN: 4÷150SEC.



supply	180÷240V AC
current load	<16A
power limit	200÷2000 VA
activation lag	1,5÷2sec
power supply return	
OM-1 (factory setting)	30sec
OM-2 (to set)	4÷150sec
power consumption	0,8W
working temperature	-25÷50°C
connection	screw terminals 2,5mm ²
dimensions	26×50×67mm
fixing	two screws to substrate

OM-631

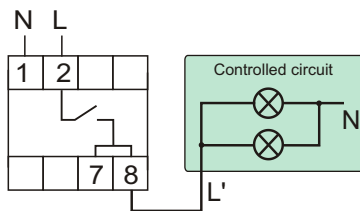


supply	180÷240V AC
current load	<16A
power limit	200÷2000 VA
activation lag	1,5÷2sec
power supply return	30sec
power consumption	0,8W
working temperature	-25÷50°C
connection	screw terminals 2,5mm ²
dimensions	3 modules (52,5mm)
fixing	on rail TH-35

FOR CIRCUITS WITH CONVERTERS

OM-632

Limiter adapted for the protection of circuits with converters, e.g. fluorescent lamps, transformers.

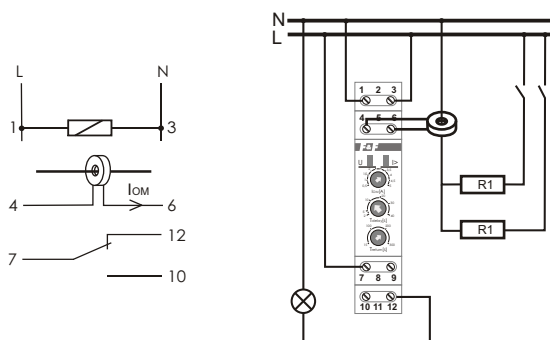
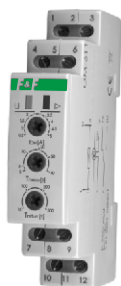


supply	180+240V AC
contact	1O
current load for $\cos\phi=1$	<16A
for $\cos\phi \neq 1$	<4A
power limit	200+1000 VA
activation lag	1,5+2sec
power supply return	10+100sec
power consumption	0,8W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	2 modules (35mm)
fixing	on rail TH-35

TO WORK WITH A CURRENT TRANSFORMER

OM-611

The relay is adapted to cooperate with current transformer whose primary circuit is connected to the circuit to be measured, and output terminals for measuring the OM, which allows for control circuits of any load and the actual setting of the relay activation threshold higher than 5A (I_{OM}). Range of measured current dependence on the transmission transformer for example, from 5A to 50A with the transmission ratio of 10:1 for the transformer 50/5A.



supply	180+240V AC
contact	1C/O
current load	<10A
actuation threshold adjustable	0,5+5 A
actuation delay adjustable	2+40sec
power supply recovery hysteresis	2%
power supply recovery time adjustable	15+300sec
power consumption	0,8W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	1 module (18mm)
fixing	on rail TH-35

WITH STAIRCASE TIMER

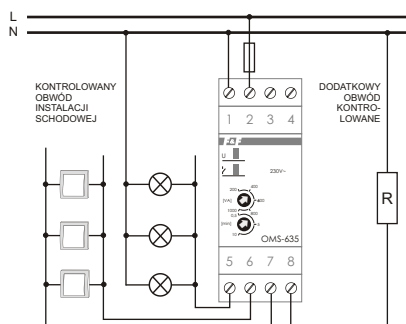
OMS-635

PURPOSE

The OMS-635 power consumption limiter allows the user to maintain lighting in halls, staircases or other places active for a specified time when it will then turn off automatically. The user may also preset the automatic disconnection of power supply to a single-phase wiring system if the rated power input to the receivers in a given circuit is exceeded.

FUNCTIONING

Once activated by means of a release button (bell push), the limiter keeps the lighting active for a specified period of time preset by the potentiometer. After the lapse of this period, the device turns off the lighting automatically. The lights may then be turned on again. The limiter allows the user to supply power to the circuit if the total consumed power of all the receivers incorporated into the system is lower than the value set on the limiter's scale. Once the rated threshold of power consumption in the controlled circuit is exceeded, the supply to this element is disconnected and returned automatically after 30sec. If the value of power consumed continues to exceed the rated level, the supply is disconnected again.



supply	180+240V AC
current load	<10A
power limit	200+1000VA
switching off delay (to set)	0,5+10min
activation lag	1,5+2sec
power supply return	30sec
work time setting range	0,5+10min
power consumption	0,8W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions	3 modules (52,5mm)
fixing	on rail TH-35

14.

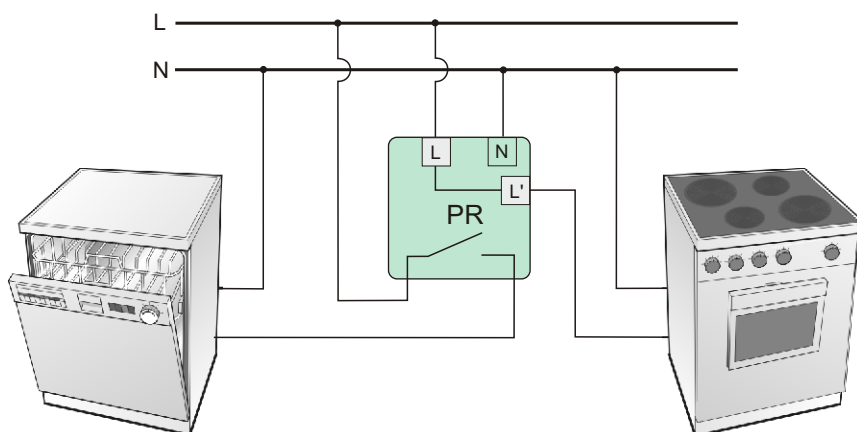
PRIORITY RELAYS

PURPOSE

Priority relays are designed to control the value of current drawn by electric receivers and their control units in cases where their simultaneous work could result in circuit overload or current overload protection activation.

FUNCTIONING

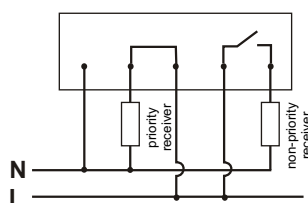
The potentiometer sets the value of drawn current (from 2A to 15A; for PR-615: from 4A to 30A) in the priority circuit, above which the receiver cuts off the non-primary circuit. A drop in current consumption in the priority circuit below the set threshold value will result in an automatic activation of the non-priority circuit. In cases where the priority receiver is already activated, the priority relay will prevent the activation of the non-priority receiver.



ATTENTION!

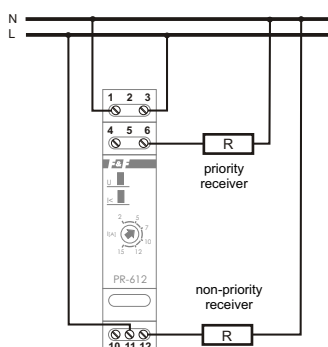
Circuits equipped with master relays require over-current security devices with increased actuation time, in order to prevent them operating before actuation of the relay.

PR-602 SETTING RANGE: 2÷15A



supply	230V AC
non-priority receivers current	<16A
	or higher with the use of a contactor
priority receivers current	<15A
contact	1 N/O
activation threshold	2÷15 A (priority circuit)
recovery hysteresis	10%
cut off delay	0,1sec
plug in delay	0,1sec
power consumption	0,4 W
dimensions	50×67×26 mm
terminal	screws terminal 2,5mm ²
fixing	2 screws to substrate

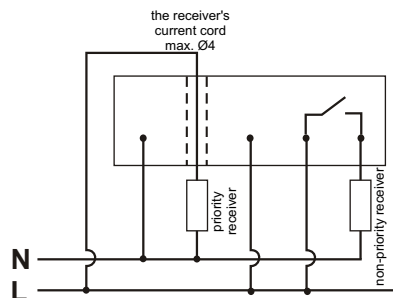
PR-612 SETTING RANGE: 2÷15A



supply	230V AC
non-priority receivers current	<16A
	or higher with the use of a contactor
priority receivers current	<15A
contact	1 C/O
activation threshold	2÷15 A (priority circuit)
recovery hysteresis	10%
cut off delay	0,1sec
plug in delay	0,1sec
power consumption	0,4 W
terminal	screw terminals 2,5mm ²
dimensions	1 module (18mm)
fixing	on rail TH-35

WITH THE RECEIVER'S CURRENT CORD SECTION (GALVANIC SEPARATED FROM THE MEASUREMENT SYSTEM)

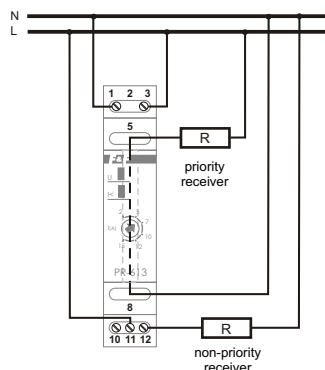
PR-603 SETTING RANGE: 2÷15A



supply	230V AC
non-priority receivers current	<16A
priority receiver current	or higher with use of contactor limited by the cross-section of the reciver cable (max Ø=4 mm)
contact	1 N/O
activation treshold	2÷15A (priority circuit)
recovery hysteresis	10%
cut off delay	0,1sec
plug In delay	0,1sec
working temperature	-25÷50°C
power consumption	0,4W
connection	screw terminals 2,5mm²
dimensions	26×50×67mm
fixing	two screws to substrate

PR-613 SETTING RANGE: 2÷15A

PR-615 SETTING RANGE: 4÷30A



supply	230V AC
non-priority receivers current	<16A
priority receiver current	or higher with use of contactor limited by the cross-section of the reciver cable (max Ø=4 mm)
contact	1 N/O
activation treshold PR-613	2÷15A (priority circuit)
PR-614	4÷30A (priority circuit)
recovery hysteresis	10%
cut off delay	0,1sec
plug in delay	0,1sec
working temperature	-25÷50°C
power consumption	0,4W
connection	screw terminals 2,5mm²
dimensions	1 modules (18mm)
fixing	on rail TH-35

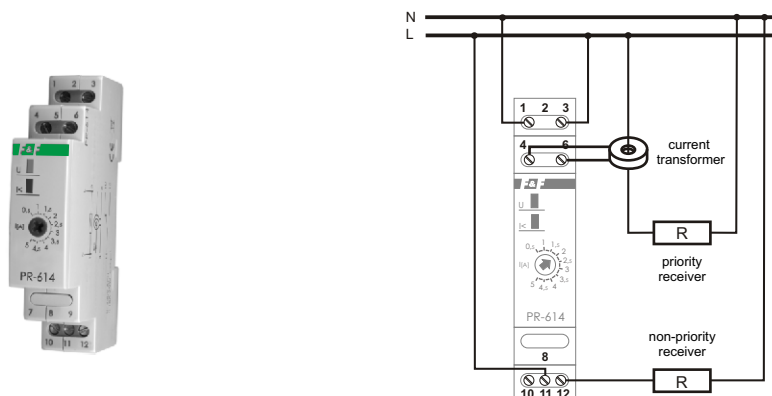
Priority receiver current can be higher than 15A. It is only restricted by the receiver's current cord section (galvanic separated from the measurement system) revved through the relay's throughway channel.

TO CO-OPERATION WITH A CURRENT TRANSFORMER

PR-614

The relay is designed to work with the current transformer with secondary current 5A. Transformer primary circuit is included in the priority receiver circuit, and secondary to the measurement relay terminals.

Example: For the receiver a priority for a maximum load of 140A we use the parameters of current transformer 150/5A. Torque is 30 at setting values on a scale equal to 2A relay will work with the actual value of current equal to 60A (2A×30=60A).



supply	230V AC
non-priority receivers current	<16A
priority receiver current	or higher with use of contactor or increased with the use of current transformer
contact	1 C/O
activation treshold	2÷15A (priority circuit)
recovery hysteresis	10%
cut off delay	0,1sec
plug in delay	0,1sec
working temperature	-25÷50°C
power consumption	0,4W
connection	screw terminals 2,5mm²
dimensions	1 modules (18mm)
fixing	on rail TH-35

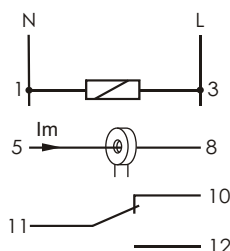
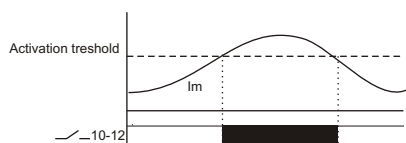
15. CURRENT RELAYS

PURPOSE

Current relays are used to control the flow of current in the circuit measured with the function switch contact in case of exceeding the value of current intensity above set thresholds.

EPP-619 WITH RECEIVER'S CURRENT CORD SECTION. (GALVANIC SEPARATED FROM THE MEASUREMENT SYSTEM)

Adjustable potentiometer value is the measured intensity of the current circuit, above which the contact is closed (pos. 11-12). Intensity of the current decline in value below the set threshold will automatically open contact (item 11-10).

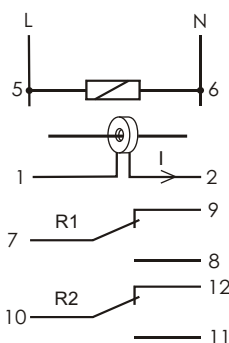


supply	230V AC
contact	separated 1P
current load	<16A
circuit current measured limited cross-section of the cable (max. Ø=4mm)	
current switch - adjustable	0,6÷16A
return hysteresis	10%
actuation time - adjustable	0,5÷10sec
return time	0,5sec
power consumption	0,4Wworking
temperature	-25÷50°C
connection	screw terminal 2,5mm ²
dimensions	1 module (18mm)
fixing	on rail TH-35

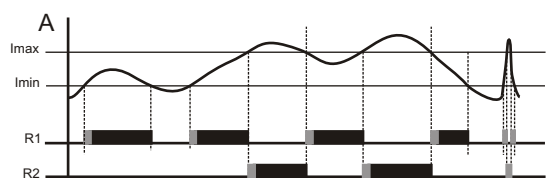
EPP-620 FOUR FUNCTIONS. WITH ADJUSTABLE LOWER AND UPPER ACTUATION THRESHOLD.

FUNCTIONING

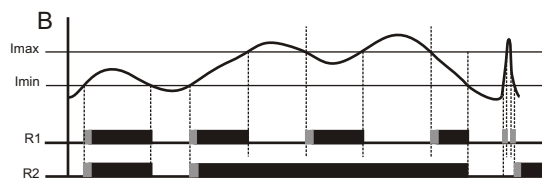
The relay is designed to work with the current transformer with secondary current 5A. Transformer's primary circuit is included in the circuit being measured, and secondary to the terminals of the measuring relay. Potentiometers are set thresholds for current - the lower I_{min} and upper I_{max} . Excess over the measured intensity of the current closes the appropriate contacts in accordance with the desired work function. Contact closure is delayed setting potentiometers T1 (for contact R1) and T2 (for



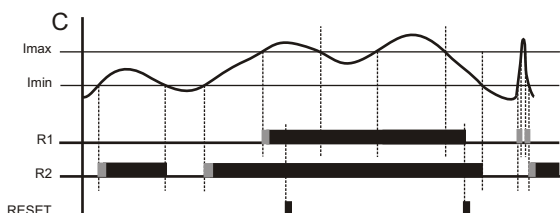
supply	230V AC
contact	2× separowany 1P
current load R1 i R2	<16A
input current measurement 1-2	<5A
current switch - adjustable	I_{min} 0,02÷1A
	I_{max} 0,5÷5A return
hysteresis	10%
actuation time T1 i T2 - adjustable	0÷20sec
return time	0,5sec
power consumption	0,4W
working temperature	-25÷50°C
connection	screw terminals 2,5mm ²
dimensions	3 modules (52,5mm)
fixing	on rail TH-35



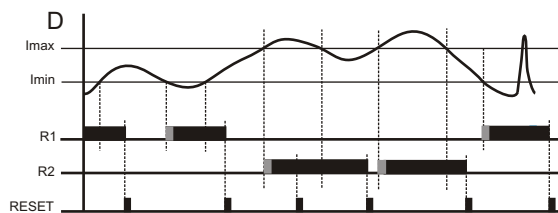
After crossing the I_{min} , contact R1 will close. After crossing the threshold of I_{max} contact R2 will close and R1 contact will be opened.



After crossing the I_{min} contacts R1 and R2 will close. After crossing the threshold of I_{max} R1 contact will open and R2 contact is closed.



After crossing the I_{min} the R2 contact will be closed. After crossing the threshold of I_{max} the R1 contact will be closed. Contact R1 is locked until you press the RESET button. If value exceeding I_{max} , the R1 contact doesn't react to the RESET button.



After crossing the I_{min} the R1 contact will be closed. After crossing the threshold of I_{max} the R2 contact will be and R1 contact is opened. Contact R1 and R2 are locked until you press the RESET button. If a value exceeding I_{max} , the contact R2 doesn't react to RESET.

16.

FUSE MODULES

PURPOSE

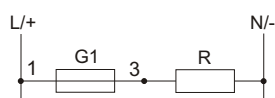
Fuse modules serve as a security device for electric receivers against current increase over the nominal current value for the secured receiver.

FUNCTIONING

Fuse actuation (blowing of fuse link) is signalled by a red LED.

BZ-1

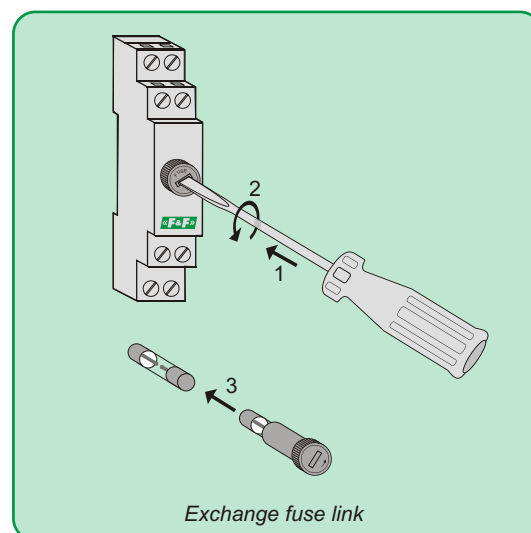
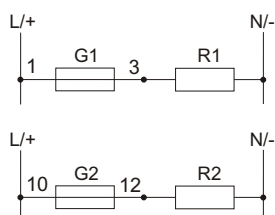
One-socket.



fuse link Ø5×20mm

BZ-2

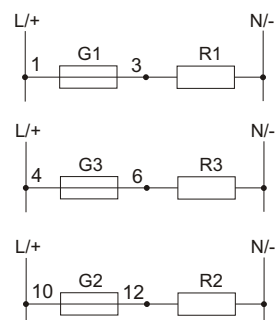
Two-socket.



Exchange fuse link

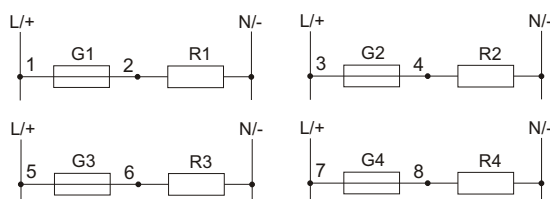
BZ-3

Three-socket.



BZ-4

Four-socket.



fuse	fuse link Ø5×20mm
voltage	250V AC
current	<6,3A
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions BZ-1, BZ-2, BZ-3	1 module (18mm)
BZ-4	2 modules (35mm)
fixing	on rail TH-35

ATTENTION!

With DC power supply, proper polarity of the connection is of importance since otherwise the LED shall not signal the fuse actuation.

17. MICROPROCESSOR-BASED RELAY FOR ELECTRIC ENGINES

EPS

APPLICATION

The EPS is intended as a safety device for 3-phase electric motors. It is extremely efficient for expensive applications where reliability is essential, like for elevators, transporters, hoists, fans, centrifuges, compressors, etc.

FUNCTIONING

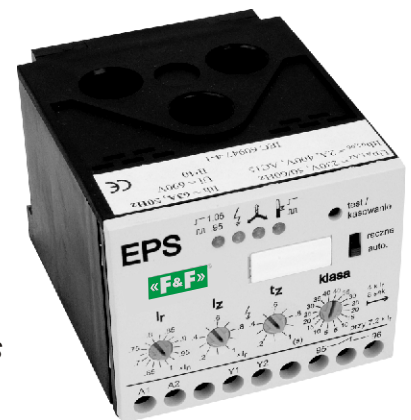
The relay controls loads for all phases. Based on the values preset by the user, as well as the actual current consumed by the motor, the operation of the motor is analysed by the relay's CPU. By comparing the operation of the motor in question with model characteristics stored in the CPU, the device detects all defects very quickly and accurately, and immediately switches off the motor.

SECURITY FEATURES

THERMAL PROTECTION
PROTECTION AGAINST MECHANICAL OVERLOAD
PROTECTION AGAINST FAN STALL
PROTECTION AGAINST FREQUENT RESTARTS
PROTECTION AGAINST PHASE COLLAPSE
PROTECTION AGAINST LOAD UNBALANCE
PROTECTION AGAINST EARTH FAULT

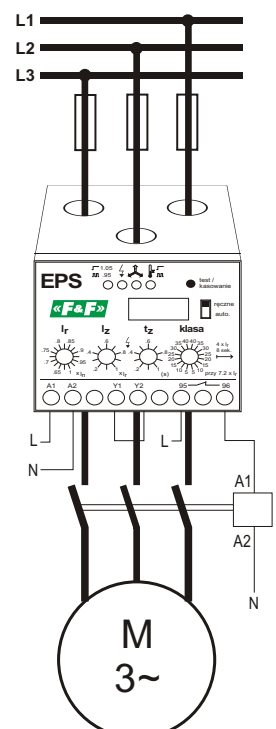
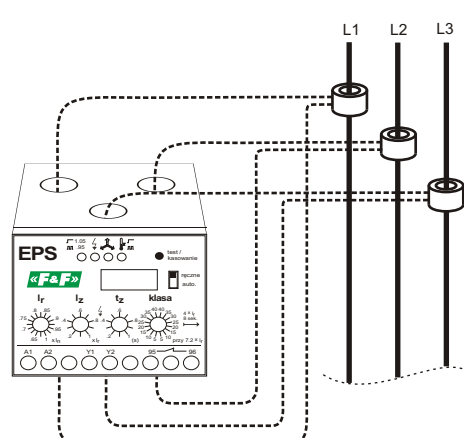
ADDITIONAL FEATURES

INITIAL LIGHT SIGNALLING OF ENGINE OVERLOAD
SELECTIVE SIGNALLING OF TRIP CAUSE
REMOTE RELAY MOTOR CONTROL DIRECTLY FROM INDUSTRIAL CONTROLLERS
MOTOR'S THERMAL MEMORY



The EPS is available in seven current versions: 5 A, 10 A, 16 A, 25 A, 45 A, 63 A, and 100 A. The actual working current set value range for each version is from 62 to 100% of the relay's rated current ($0.625 \div 1 \times I_n$). Therefore, the selection of a proper relay depends on the power of the engine to be protected and its rated current. For engines with power between several hundred watts and 55 kW, the EPS with a proper set current range can be used, whereas more powerful units require the 5A EPS version with additional external current transformers.

EPS VERSION	SETTING RANGE	
5A	3,125÷5A	to cooperatin with current transformer
10A	6,25÷10A	
16A	10÷16A	
25A	15,625÷25A	
40A	25÷40A	
63A	39,375÷63A	
100A	62,5÷100A	



Power supply	230V AC
Main circuits' insulation voltage	690V~
Rated current (I _n)	see label on EPS case
current load of contact	2A AC-15
Effective current unbalance	>30%
Delay at phase decay and unbalance	4sec.
Max. cable diameter	Ø14
Terminal	screw terminals 2,5 mm
Measurements	72×59×88 mm
Weight	385g
Fixing	on rail TH-35

EPS-D

APPLICATION

The EPS-D is intended as a safety device for 3-phase electric motors. It is extremely efficient for expensive applications where reliability is essential, like for pumps, hydrophores, elevators, transporters, hoists, fans, centrifuges, compressors, etc.

FUNCTIONING

The relay controls loads for all phases. Based on the values preset by the user, as well as the actual current consumed by the motor, the operation of the motor is analysed by the relay's CPU. By comparing the operation of the motor in question with model characteristics stored in the CPU, the device detects all defects very quickly and accurately, and immediately switches off the motor.

SECURITY FEATURES

THERMAL PROTECTION
PROTECTION AGAINST IDLE OPERATION AND DRY RUN (undercurrent protection)
PROTECTION AGAINST MECHANICAL OVERLOAD
PROTECTION AGAINST FAN STALL
PROTECTION AGAINST FREQUENT RESTARTS
PROTECTION AGAINST PHASE COLLAPSE
PROTECTION AGAINST PHASE SEQUENCE SWITCH
PROTECTION AGAINST LOAD UNBALANCE
PROTECTION AGAINST EARTH FAULT

OPTIONAL SECURITY FEATURES

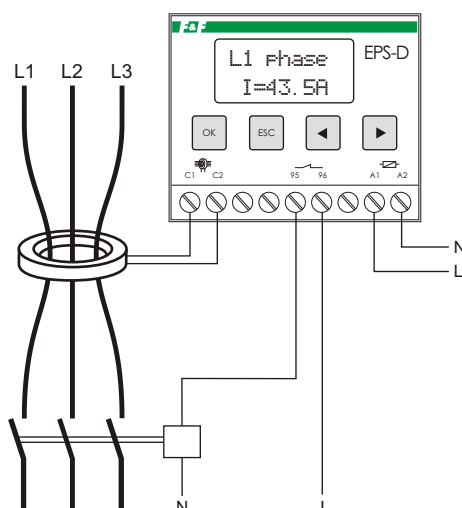
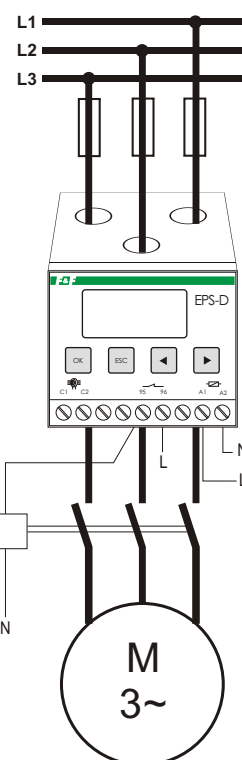
AGAINST SHOCK (an additional Ferranti transformer enables efficient protection within the range of 30 mA 500 mA. Response time: approx. 100 ms).

ADDITIONAL FEATURES

MOTOR LOAD PREVIEW
MESSAGE CONCERNING THE CAUSE OF PROTECTION ACTIVATION
MOTOR'S THERMAL MEMORY

The relay's LCD screen shows an actual current value for a single, selected phase. This is available in absolute (A) or relative (%) values in relation to the set current value I_n . additionally, the device displays the scope of the measured current by means of characters ($I > 105\% I_n$), ($I < 95\% I_n$), ($95\% I_n \leq I \leq 105\% I_n$). The relay measures the real current value up to and including the 7th harmonic. The measurement accuracy is 1%.

VERSION	SETTING RANGE	
20A	0÷20A	to cooperatin with current transformer
100A	20÷100A	



Power supply	230V AC
Main circuits' insulation voltage	690V~
Rated current (I_n)	see label on EPS case
current load of contact	2A AC-15
Effective current unbalance	>30%
Delay at phase decay and unbalance	4sec.
Max. cable diameter	Ø14
Terminal	screw terminals 2,5 mm
Measurements	72×59×88 mm
Weight	385g
Fixing	on rail TH-35

18. ELECTRIC SUPPLIERS AND TRANSFORMERS

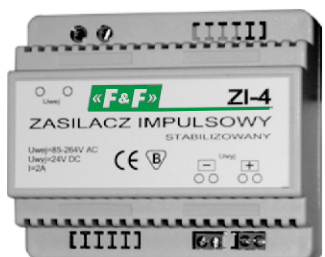
ZS 1÷6 TRANSFORMER-BASED 12W



TYPE	OUTPUT VOLTAGE	OUTPUT CURRENT
ZS-1	5V DC	2A
ZS-2	12V DC	1A
ZS-3	18V DC	0,66A
ZS-4	24V DC	0,5A
ZS-5	15V DC	0,8A
ZS-6	48V DC	0,25A

input voltage	230 V ± 10% AC
output power	12W
current limitation	I max = 110% of output current
working temperature	-10+60°C
current ripple	<3mV RMS
connection	screw terminals 2,5mm ²
dimensions	6 modules (105mm)
weight	550g
fixing	on the TH-35 rail

ZI 1÷6 PULSE 50W



TYPE	OUTPUT VOLTAGE	OUTPUT CURRENT
ZI-1	5V DC	10A
ZI-2	12V DC	4A
ZI-3	18V DC	3A
ZI-4	24V DC	2A
ZI-5	15V DC	3,3A
ZI-6	48V DC	1A

input voltage	85+264V AC
output power	50W
current limitation	I max = 110% of output current
working temperature	-10+60°C
minimum load	0%
keying frequency	70 kHz
connection	screw terminals 2,5mm ²
dimensions	6 modules (105mm)
weight	550g
fixing	on the TH-35 rail

ZI-22-24 PULSE 30W



TYPE	OUTPUT VOLTAGE	OUTPUT CURRENT
ZI-22	12V DC	2,5A
ZI-24	24V DC	1,25A

input voltage	100+264V AC
output power	30W
current limitation	I max = 110% of output current
working temperature	-10+40°C
minimum load	0%
keying frequency	70 kHz
connection	screw terminals 2,5mm ²
dimensions	3 modules (52,5mm)
weight	190g
fixing	on the TH-35 rail

ZT 1÷6 TRANSFORMER-BASED WITH PULSE STABILIZER



TYPE	OUTPUT VOLTAGE	OUTPUT CURRENT
ZT-1	5V DC	3A
ZT-2	12V DC	2A
ZT-4	24V DC	1A

input voltage	180+264V AC
output power	25W
current limitation	I max = 110% of output current
working temperature	-10+40°C
minimum load	0%
keying frequency	52 kHz
connection	screw terminals 2,5mm ²
dimensions	6 modules (105mm)
weight	742g
fixing	on the TH-35 rail

ZI 11÷14 PULSE STABILIZER



TYPE	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT
ZI-11	8+28V AC / 12+37V DC	5V DC	3A
ZI-12	12+28V AC / 16+37V DC	12V DC	3A
ZI-13	18+28V AC / 22+37V DC	18V DC	3A
ZI-14	24+28V AC / 38+27V DC	24V DC	3A

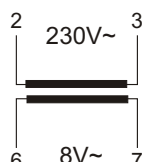
input voltage	10+28V AC
output current	3A
current limitation	I max = 110% of output current
minimum load	0%
working temperature	-10+60°C
connection	screw terminals 2,5mm ²
dimensions	3 modules (52,5mm)
weight	150g
fixing	on the TH-35 rail

MAINS TRANSFORMER

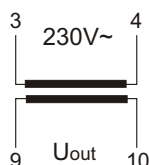
PURPOSE

Application: power supply of electrical and electronic devices which do not require a stable and properly filtered supply voltage, regardless of mains voltage fluctuations.

TR-08



TR-12 TR-24



TYP	OUT SUPPLY.	CURRENT	POWER
TR-08	8V	1A	8VA
TR-12	12V	0,66A	8VA
TR-24	24V	0,5A	12VA

ATTENTION!

The transformer system has an incorporated PTC posistor which offers overcurrent protection.

In order to complete the receiver's safety solutions, it is recommended to include an additional overcurrent protection in series connection (e.g. the BZ-1 safety fuse module) on the secondary side.

Protection class: 1,5A for TR-08; 1A for TR-12; 800mA for TR-08

supply	230V AC
efficiency	85%
working temperature	-10÷45°C
dimensions	TR-08 2 modules (35mm)
	TR-12 3 modules (52,5mm)
	TR-24 3 modules (52,5mm)
weight	TR-08 271g
	TR-12 325g
	TR-24 433g
connection	screw terminals 2,5mm ²
fixing	on rail TH-35

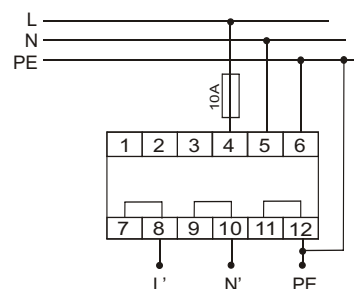
19. OVERVOLTAGE PROTECTOR

type 3 (early D-class) with a triple interference filter

OP-230

PURPOSE

protection of electronic devices, i.e. computers, PLCs, microprocessor systems, etc. against electromagnetic disturbance and overvoltage in the electrical system.



ATTENTION!

The system is to be secured with a fuse of <10 A but only if the capacity of other fuses downstream in relation to the protector exceed 10 A.

standard no	IEC 61643-1:2001
protection class	D
rated voltage	230V
rated current	10A
rated frequency	50Hz
maximum stable working voltage	255V
overvoltage protection level L•Novervoltage	<1,25kV
protection level L(N)•PE	<1,5kV
operating time	<25ns
additional protection	10A gL/gG lub C10A
inductans	1mH na tor
leakage current	0,5mA
capacitance L•N	880nF
capacitance L(N)•PE	2,2nF
electromagnetic interference damping capacity	>85dB
terminal	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	3 modules (52,5mm)
weight	170g
fixing	on rail TH-35

20.

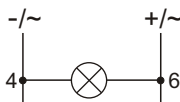
POWER SUPPLY INDICATORS

SIGNAL LAMPS

LK-712 One phase.

PURPOSE

Designed to optically signal the presence of voltage in a electrical circuit.



TYPE	COLOURS OF LED
LK-712 G	1×GREEN
LK-712 Y	1×YELLOW
LK-712 R	1×RED
LK-712 B	1×BLUE

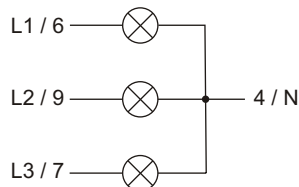
supply (made in one range only)	5+10V AC/DC
	10+30V AC/DC
	30+130V AC/DC
	130+260V AC/DC
voltage indicator	1×LED
power consumption	0,8W
connection	screw terminals 2,5mm ²
working temperature	-25+50°C
dimensions	1 module(18mm)
fixing	on rail TH-35

Order labelling method: LK-712 B 30+130V — supply voltage colour of LED

LK-713 Three phases.

PURPOSE

Designed to optically signal the presence of voltage in the three-phase electrical network.
The presence of voltage in a phase is signalled by the green LED in the circuit of each phase.



TYPE	COLOURS OF LED
LK-713 G	3×green LED
LK-713 Y	3×yellow LED
LK-713 R	3×red LED
LK-713 K	yellow-red-green LEDs

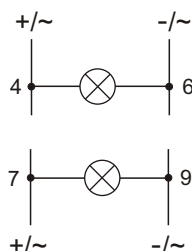
supply	3×230V+N
voltage indicator	3×LED
power consumption	1,1W
connection	screw terminals 2,5mm ²
working temperature	-25+50°C
dimensions	1 module (18mm)
fixing	on rail TH-35

Order labelling method: LK-713 K — colour of LEDs

LK-714 Two ability type.

PURPOSE

Designed to optically signal the ability of recivers, for example: work - break, opened - closed, ect. It has two separated signal circuit: green LED and red LED.



supply (made in one range only)	5+10V AC/DC
	10+30V AC/DC
	30+130V AC/DC
	13+260V AC/DC
indicator	1×LED green
	1×LED red
power consumption	1,6W
connection	screw terminals 2,5mm ²
working temperature	-25+50°C
dimensions	1 module(18mm)
fixing	on rail TH-35

Order labelling method: LK-712 30+130V — supply voltage

VOLTAGE INDICATORS

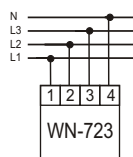
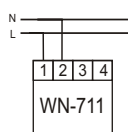
PURPOSE

Voltage indicators are devised to continually measure the value of the voltage in a single-phase or three-phase network.

LED LINE TYPE

WN-711 One phase indicator.

WN-723 Three phase indicator.

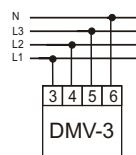
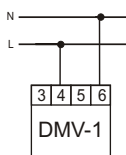


supply	WN-711	230V AC
	WN-723	3×400V+N
voltage indicator	WN-711	11×LED
	WN-723	3×(11×LED)
indication range		205÷245V
scale		5V
indication precision		2,5V
power consumption		0,8W
connection		screw terminals 2,5mm ²
working temperature		-25÷50°C
dimensions	WN-711	1 moduly (17,5mm)
	WN-723	2 moduly (35mm)
fixing		on rail TH-35

DIGITAL

DMV-1 **DMV-1 TrueRMS** One phase indicator.

DMV-3 **DMV-3 TrueRMS** Three phase indicator.



supply		100÷300V AC
frequency		45÷55Hz
indication range		100÷300V
indication precision		
	DMV-1; DMV-3	1%
	DMV-1 True RMS; DMV-3 True RMS	0,5%
display for one phase		3×segment LED 10×6mm
power consumption		4W
connection		screw terminals 2,5mm ²
working temperature		-25÷50°C
dimensions		3 moduly (52,5mm)
fixing		on rail TH-35

* phase voltage measurement

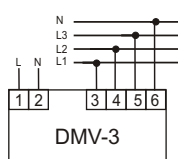
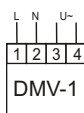
* measuring circuit is also a device supplying circuit

* indicators with True RMS marking, equipped with RMS value converter, give proper voltage value for deflected runs

DIGITAL

DMV-1T One phase indicator.

DMV-3T Three phase indicator.



supply		230V AC
indication range	DMV-1T	12÷600V
	DMV-3T	3×0÷400V
indication precision		1%
display		
	DMV-1T	4×segment LED 14×8mm
	DMV-3T	3×(4×segment LED 14×8mm)
power consumption		3VA
connection		screw terminals 2,5mm ²
working temperature		-5÷50°C
dimensions		
	DMV-1T	72×72×92mm
	DMV-3T	96×96×92mm
fixing hole		
	DMV-1T	66×66mm
	DMV-3T	92×92mm

CURRENT INTENSITY INDICATORS

PURPOSE

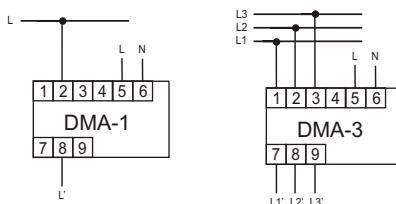
Current intensity indicators are devised to continually measure the value of the current in a circuits of single-phase or thre-phase network.

DIGITAL

DMA-1 **DMA-1 True RMS** One phase indicator.
DMA-3 **DMA-3 True RMS** Three phase indicator.

* independent current measurement for each phase

* indicators with True RMS marking, equipped with RMS value converter, give proper voltage value for deflected runs



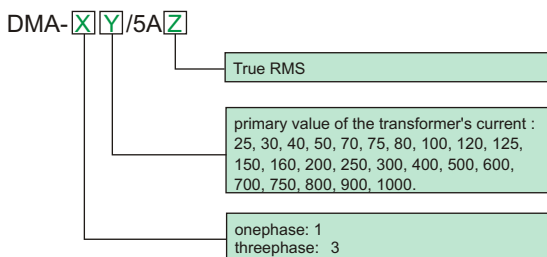
supply	100÷300V AC
frequency	45÷55Hz
max. measured current	20A
max. temporary overloading of current	40A (<1sec)
indication precision	
DMV-1; DMV-3	1%
DMV-1 True RMS; DMV-3 True RMS	0,5%
display for one phase	3×segment LED 10×6mm
power consumption	4W
connection	screw terminals 2,5mm ²
working temperature	-25÷50°C
dimensions	3 moduły (52,5mm)
fixing	on rail TH-35

DMA indicators are intended for current transformers with a rated secondary current of 5A. The current range for these transformers is from 25 to 1000/5A. The primary value of the transformer's current specifies the maximum measured current and the actual current value displayed by the indicator.

The DMA-20A and DMA-3 20A are intended for direct measurements (without transformers applied) within the range of 0÷20A.

Order labelling method:

INDIRECT MEASUREMENT (with transformers applied)

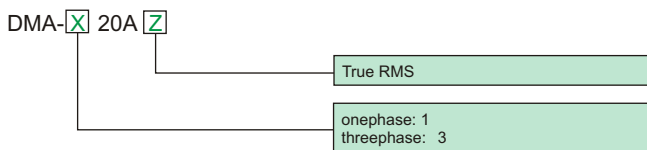


Example:

* DMA-150/5A a one-phase device for 50/5A transformer, measurement range at 0÷50A, no TrueRMS;

* DMA-3150/5 A TrueRMS a three-phase for 3×150/5A transformers, measurement range at 3 ×0÷150A, incl. TrueRMS.

DIRECT MEASUREMENT (without transformers)



Przykład:

* DMA-1 20A - jednofazowy do 20A, zakres mierzony 0÷20A, bez TrueRMS

* DMA-3 20A TrueRMS - trójfazowy do 20A, zakres mierzony 3x0÷20A, z TrueRMS

DMA-1T One phase indicator.

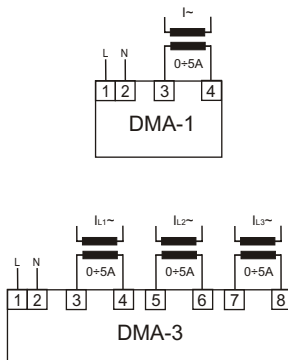
DMA-3T Three phase indicator.

* direct measurement 0÷5A

* indirect measurement using current transformers

* setting indicator to proper current transformer values using three buttons on the indicator's front

* indirect measurement using current transformers in standard current work with 1÷9000/5A range.



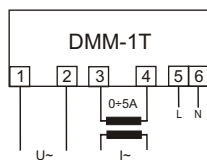
supply	230V AC
max. current of direct measure for single phase	5A
max. current of indirect measure	depended on applied current transformer
possible type of current transformer to conect	1÷9000/5A
indication precision	1%
display	
DMA-1T	4×segment LED 14×8mm
DMA-3T	3×(4×segment LED 14×8mm)
power consumption	3VA
connection	screw terminals 2,5mm ²
working temperature	-5÷50°C
dimensions	
DMA-1T	72×72×92mm
DMA-3T	96×96×92mm
fixing hole	
DMV-1T	66×66mm
DMV-3T	92×92mm

MULTIMETERS

PURPOSE

Multimeters are intended for monitoring parameters of three-phase electrical network.

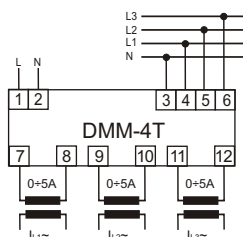
DMM-1T ONE-PHASE TYPE



- * independent current measurement for each phase
- * direct measurement 0÷5A
- * indirect measurement using current transformers in standard current work with 1÷9000/5A range
- * setting indicator to proper current transformer values using three buttons on the indicator's front
- * phase voltage and phase to phase voltage measurement
- * phase frequency measurement

supply	230V AC
max. current of direct measure for single phase	5A
max. current of indirect measure	depended on applied current transformer
possible type of current transformer to connect	1÷9000/5A
measured frequency range	10÷100Hz
measured voltage range	0÷400V
indication precision	1%±1 digit
display	4×segment LED 5×9mm
power consumption	3VA
connection	screw terminals 2,5mm ²
working temperature	-5÷50°C
dimensions	96×96×92mm
fixing hole	92×92mm

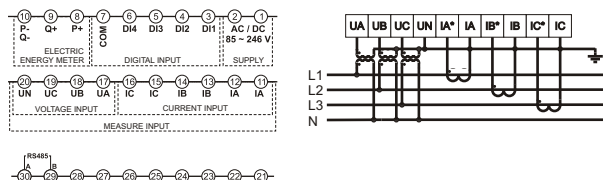
DMM-4T THREE-PHASE TYPE



- * independent current measurement for each phase
- * direct measurement 0÷5A
- * indirect measurement using current transformers in standard current work with 1÷9000/5A range
- * setting indicator to proper current transformer values using three buttons on the indicator's front
- * phase voltage and phase to phase voltage measurement
- * phase frequency measurement
- * selection of indicated voltage and frequency values for a single phase using button on indicator's front

supply	230V AC
max. current of direct measure for single phase	5A
max. current of indirect measure	depended on applied current transformer
possible type of current transformer to connect	1÷9000/5A
measured frequency range	10÷100Hz
measured voltage range	0÷400V
indication precision	1%±1 digit
display	4×segment LED 5×9mm
power consumption	3VA
connection	screw terminals 2,5mm ²
working temperature	-5÷50°C
dimensions	96×96×92mm
fixing hole	92×92mm

DMM-3T THREE-PHASE TYPE



- * direct or indirect (using current transformer) measurement of phase currents.
- * direct or indirect (using current transformer) measurement of phase voltage and phase to phase voltage.
- * frequency measurement
- * active, wattless and apparent power measurement
- * power factor measurement
- * four-quadrant measurement of input and output energy
- * constant or periodical display of one of eight measured values, automatic switching between the displayed values
- * digital inputs
- * OC type pulse output (open collector)
- * communication with peripheral devices using RS485 interface and MODBUS RTU protocol (up to 32 devices)

supply	85÷264V AC/DC
power consumption	<5VA
frequency	45÷65Hz
operation temperature	-10÷50°C
humidity (free of wet and gascorruption)	≤85%
elevation	≤3000m n.p.m.
dimansion	96×96×105mm
fix hole	92×92mm
network	three phase three-wire or four-wire
measuringaccuracy	
voltage/current	±(0,5%FS + 1 digit)
power	±(0,5%FS + 1 digit)
frequency	±0,1Hz
power factor	±0,01
active electric energy	±0,5%
reactive electric energy	±2%
digital output	
ways	4
signal	non current type
electric energy meter	
output mode	two-channel open collector optical pulse output
puls constant - active	10000imp/kWh
- reactive	10000imp/kVARh
communication	
output mode	RS 485
protocol	MODBUS RTU
baud rate	4880bps
connection	screw terminals 2,5mm ²
working temperature	-5÷50°C
dimensions	96×96×92mm
fixing hole	92×92mm

21.

ELECTRIC ENERGY METERS

PURPOSE

LE iare a static (electronic) rated electric energy meters which are to serves as an auxiliary meters to measure the energy consumption in a direct system.

FUNCTIONING

The meter is equipped with a special electronic circuit which generates pulses proportionally to electric energy consumption in a given phase by means of the current flow and voltage applied. The sum of the pulses from t is signalled by blinking of an LED, calculated in phase into the electric energy consumed in the system, and finally its total value is indicated by a mechanical drum counter. For LE-01 and LE-03 the last red digit in the counter indicates 0.1 KWh (100 Wh). 1/10 KWh (100Wh).

ATTENTION!

Meters are equipped with SO+ -SO- pulse outputs. It enables the connection of other pulse device (SO), reading the pulses generated by the meter.

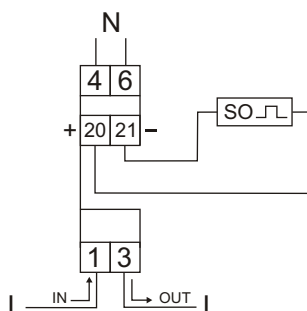
The connection of additional device is not required for the proper operation of a meter.

Meters have the possibility of sealing input and output terminals, preventing the meter by-passing.

SINGLE-PHASE ENERGY METER

LE-01 with a mechanical drum counter

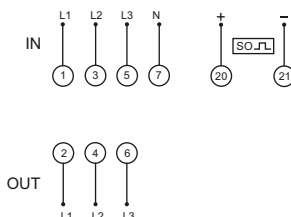
LE-01d with a LCD display



reference voltage	230V AC $\pm 30\%$
basic current	5A
maximum current	45A
minimum current	0,02A
measurement accuracy per IEC61036	class 1
counter's own power consumption	<8VA; <0,4W
drum counter indication range	
LE-01	0+99999.9 kWh
LE-01d	0+99999.99 kWh
constant of a meter (1Wh/pulse)	1000 pulses/kWh
current consumption signal	1×red LED
pulse output SO+ SO-	open collector
connection voltage SO+ SO-	< 27V DC
connection current SO+ SO-	< 27mA
constant SO+ SO- (1Wh/pulse)	1000 pulses/kWh
czas impulsu SO+ SO-	90msek
working temperature LE-01	-20+65°C
LE-01d	-20+50°C
protection level	IP20
connection	6mm ² screw terminals
measurements	1 modules (18 mm)
fixing	on rail TH-35

THREE-PHASE ENERGY METER

LE-02d with a LCD display

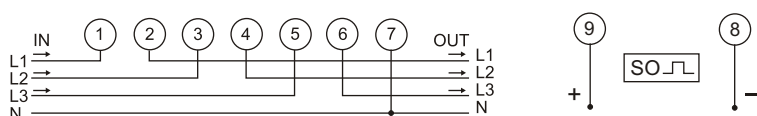


reference voltage	3×230/400V+N
basic current	5 A
maximum current	63A
minimum current	0,04A
measurement accuracy per IEC61036	class 1
counter's own power consumption	<10VA; <2W
drum counter indication range	0+999999.99 kWh
constant of a meter (1,25 Wh/pulse)	800 pulses/kWh
current consumption signal	3×red LEDs
read-out status signal	red LED
pulse output SO+ SO-	open collector
connection voltage SO+ SO-	< 30V DC
connection current SO+ SO-	< 27mA
constant SO+ SO- (1.25 Wh/pulse)	800 pulses/kWh
working temperature	-20+50°C
protection level	IP20
connection	16mm ² screw terminals
measurements	4,5 modules (75 mm)
fixing	on rail TH-35

THREE-PHASE ENERGY METER

LE-03 with a mechanical drum counter

LE-03d with a display LCD

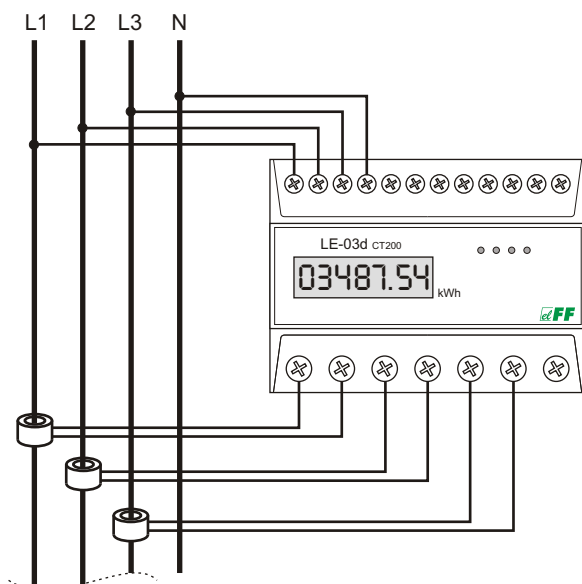
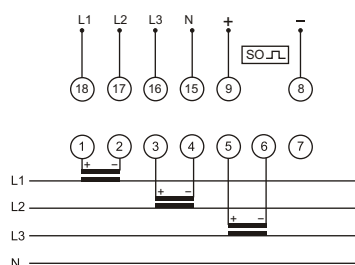


reference voltage	3×230/400V+N
basic current	10 A
maximum current	100A
minimum current	0,04A
measurement accuracy per IEC61036	class 1
counter's own power consumption	<10VA; <2W
drum counter indication range	0+999999,9 kWh
constant of a meter (1,25 Wh/pulse)	800 pulses/kWh
current consumption signal	3×red LEDs
read-out status signal	red LED
pulse output SO+ SO-	open collector
connection voltage SO+ SO-	< 30V DC
connection current SO+ SO-	< 27mA
constant SO+ SO- (1.25 Wh/pulse)	800 pulses/kWh
working temperature	LE-03 -20+65°C LE-03d -20+50°C
protection level	IP20
connection	25mm² screw terminals
measurements	7 modules (122 mm)

THREE-PHASE ENERGY METER TO CO-OPERATION WITH A CURRENT TRANSFORMERS

LE-03d CT200

LE-03d CT400



type of transformer	LE-03d CT200 200/5A LE-03d CT400 400/5A
reference voltage	3×230/400V+N
basic current	3×1,5 A
maximum current	3×5A
minimum current	0,04A
measurement accuracy per IEC61036	class 1
counter's own power consumption	<10VA; <2W
drum counter indication range	0+999999,9 kWh
constant of a meter (0,083Wh/imp)	12000imp/kWh
current consumption signal	3×red LEDs
read-out status signal	red LED
pulse output SO+ SO-	open collector
connection voltage SO+ SO-	< 30V DC
connection current SO+ SO-	< 27mA
constant SO+ SO- (0,083Wh/imp)	12000imp/kWh
working temperature	-20+55°C
protection level	IP20
connection	25mm² screw terminals
measurements	7 modules (122 mm)
fixing	on rail TH-35

These meters are intended for current transformers with a secondary current of 5A. Maximum measured current of the system is specified by the value of the primary current while using the current transformer. In the case of transformers with dedicated operating parameters, the meters display the actual value of the power consumed by the system.

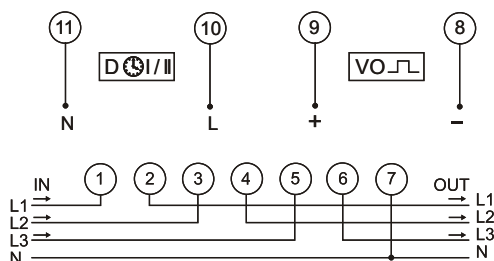
THREE-PHASE ENERGY METER

LE-04d

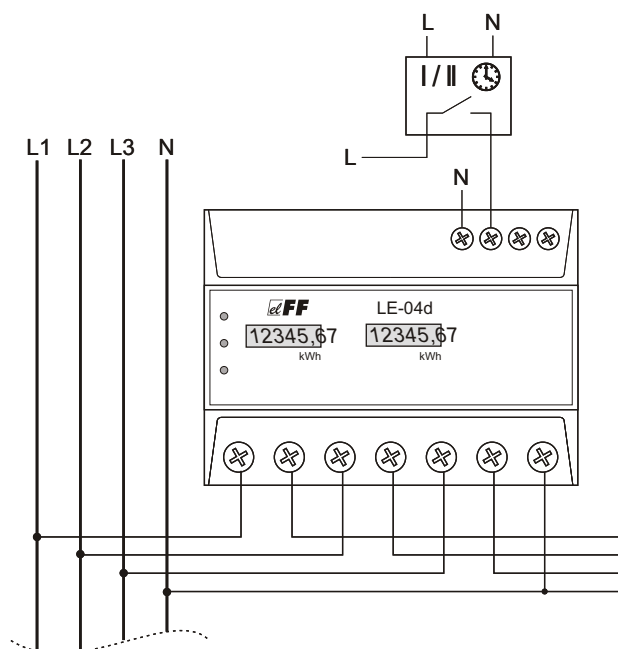
TWO TARIFFS



The counter is equipped to measure the electricity in two tariff system. The values indicated in the power tariffs are separate displays T0 and T1. Switching between the tariffs is fed to the input control voltage meter D (joints 10-11). This can be used for controlling the external clock. Counter T0 read energy input in the absence of voltage control at the entry to the T1 D. Meter read energy input from the control voltage appears at the entrance to the D decay. Operation of the meter is indicated by shine the corresponding LED.



reference voltage	3×230/400V+N
basic current	10A
max current	100A
min current	0,04A
measure precision with IEC61036	class 1
meter's own power consumption	<10VA; <2W
range of display reports T0 i T1	0+99999,99kWh
constant of the meter	(1,25Wh/imp) 800imp/kWh
current consumption signal	4×LED red
meter signal T0 i T1	2×LED red
impulse output VO	open collector
connection voltage VO	<24V DC
connection current SO+ SO-	<30mA
constant VO	(1,25Wh/imp) 800imp/kWh
working temperature	-20÷55°C
protection level	IP20
connection	screw terminals 25mm ²



Pulse output supply system with connected external counting machine

FUNCTIONING

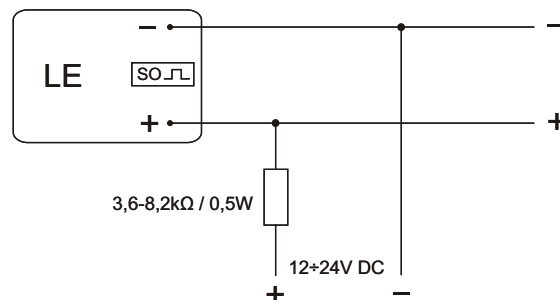
In order to connect to electricity energy meter counting device has to be connected in parallel to the system power supply 12÷24V DC through resistor 3.6 ÷ 8.2 kOhm / 0,5 W current limiting. Maximum load counting circuit is 27mA.

ATTENTION!

Changing the polarization of power can damage the meter pulse output.

ATTENTION!

In the absence of connecting an external counting device is not allowed to connected to the output pulse power system.



PULSE METER

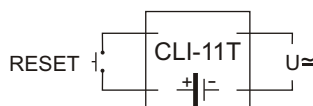
PURPOSE

Pulse meters are intended for counting AC/DC voltage signals, generated by additional peripheral devices in order to determine the number of carried out working cycles in automatics systems, e.g. in order to control the number of press strokes, the number of revolutions of a rotating device, the number of components leaving the production line, etc.

CLI-11T 230V CLI-11T 24V

FUNCTIONING

CLI-11T meter is a one-way meter, enabling the counting of pulses from 0 to 999999 range (six digits). It is equipped with RESET input for the connection of an external button, enabling the resetting of the meter state for any value.

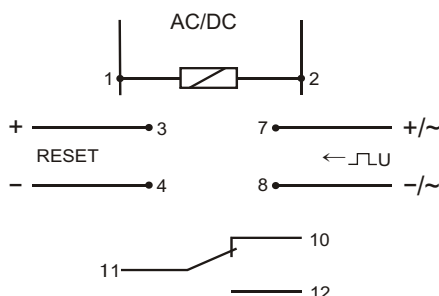
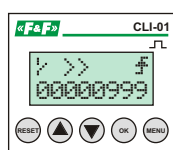


Supply	(non-voltage type) internal battery
Battery life	10 years
T input voltage	
CLI-11T 230V	110÷240V AC/DC
CLI-11T 24V	4÷30V DC
maximum counting frequency	200Hz
RESET input	non-voltage type
display	8 characters / h 6.7mm
precision	1%±1digit
connection	screw terminals 1,5mm ²
working temperature	-5÷50°C
dimensions	96×96×92mm
fixing hole	92×92mm

CLI-01

FUNCTIONING

CLI-01 is a programmable, one-way type electronic meter enabling the counting of external pulses in 0 to 99 999 999 range. Pulses are counted from 0 to value set by the user. After reaching the limiting value, the meter will stop to count. Meter will count from 0 again after reset.



supply	24÷264V AC/DC
T input voltage low state	0÷4V
T input voltage high state	5÷264V
RESET input voltage	24÷264V
maximum frequency for DC signal	5kHz
maximum frequency for AC signal	50Hz
maximum relay load current	8A
power input	1,5W
operating temperature	-20÷50°C
terminal	screw terminal 2,5mm ²
dimensions	3 modules (52,5mm)
assembly	TH-35 bus

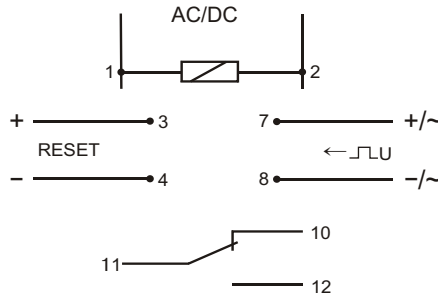
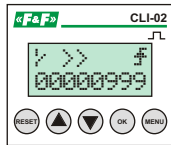
FUNCTIONS

- * control panel, enabling programming and the monitoring of device operation
- * T input, adapted for operation with AC/DC signal, 5 to 264V amplitude and 50 Hz frequency for AC and 5kHz for DC signals
- * possibility to set THRESHOLD parameter (1÷99 999 999 range), specifying the limiting number of pulses counted in a single operation cycle
- * external RESET input
- * relay output signaling the preset meter state (contact 1C/O 8A)
- * local counter, reset using the external reset input or using RESET button
- * total counter for all impulses (loop mode 0 → 99 999 999 → 0 → ... or reset using the meter configuration menu)
- * digital filter, enabling the limiting of maximum frequency of the counted pulses (in order to reduce interferences on meter input)
- * local and total meter state memory after supply failure
- * program menu in three languages: Polish, English or Russian

CLI-02

FUNCTIONING

CLI-02 is a programmable, multifunction electronic meter enabling the counting of external pulses in 0 to 99 999 999 range (or using an internal divider up to 99 999 999 999). Pulses are counted according to an individual program, set by the user. After reaching the limiting value, the meter will configure itself according to individual user's needs.

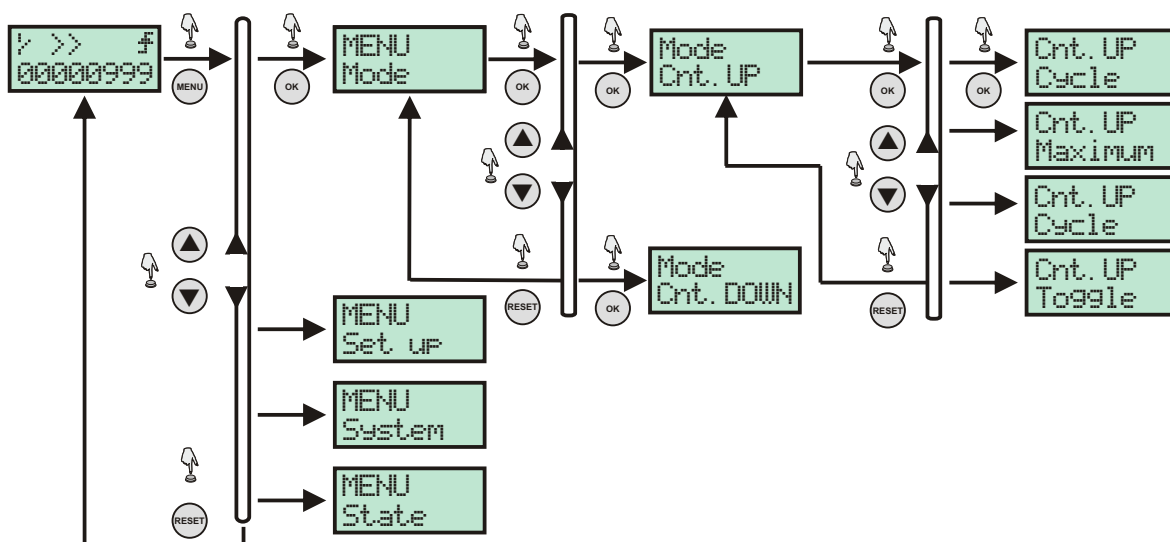


supply	24÷264V AC/DC
T input voltage low state	0÷4V
T input voltage high state	5÷264V
RESET input voltage	24÷264V
maximum frequency for DC signal	5kHz
maximum frequency for AC signal	50Hz
maximum relay load current	8A
power input	1,5W
operating temperature	-20÷50°C
terminal	screw terminal 2,5mm ²
dimensions	3 modules (52,5mm)
assembly	TH-35 bus

FUNCTIONS

- * control panel, enabling programming and the monitoring of device operation
- * T input, adapted for operation with AC/DC signal, 5 to 264V amplitude and 50 Hz frequency for AC and 5kHz for DC signals
- * possibility to set THRESHOLD parameter (1÷99 999 999 range), specifying the limiting number of pulses counted in a single operation cycle
- * 'downward' counting mode to the selected value with zero value signaling (e.g. 9999→0)
- * selection of input pulse edge (leading or trailing) the counter will react to
- * external RESET input
- * possibility of automatic local counter reset (loop mode) with possibility to set selected relay action
- * relay output signaling the preset meter state (contact 1C/O 8A)
- * relay action selection: pulse with set time length; ON OFF or OFF ON state change
- * local counter, reset using the external reset input or using RESET button
- * total counter for all impulses (loop mode 0 → 99 999 999 → 0 → ... or reset using the meter configuration menu)
- * digital filter, enabling the limiting of maximum frequency of the counted pulses (in order to reduce interferences on meter input)
- * local and total meter state memory after supply failure
- * scaling pulse values according to set multiplier or divider
- * limiting access to program menu using PIN code
- * setting display illumination mode
- * program menu in three languages: Polish, English or Russian

Menu (example)



WORKING TIME METERS

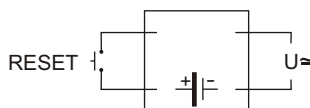
PURPOSE

Working time meters are intended for counting the number of working hours in automatic production processes or the number of device working hours, which, due to safety requirements and operation efficiency have limited overhaul life, i.e. operational capacity that may not be exceeded (e.g. advanced power units, special radioactive lamps, etc.).

CLG-13T with button RESET CLG-14T without button RESET

FUNCTIONING

CLG-13T meter is an electronic, one-way meter, enabling the counting of working hours in 0 to 99999,9 range (five digits + one decimal). It is equipped with RESET input for the connection of external button and RESET button in front (with locking), enabling counter state reset for any value.

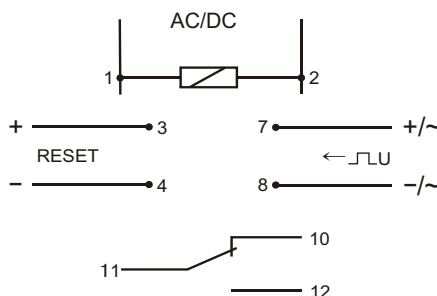
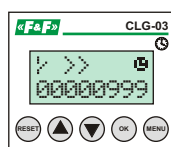


Supply	(non-voltage type) internal battery
Battery life	10 years
T input voltage	
CLI-11T 230V	110÷240V AC/DC
CLI-11T 24V	4÷30V DC
CLG-14T 230V	110÷240V AC/DC
maximum counting frequency	200Hz
RESET input	non-voltage type
display	6 characters / h 6.7mm
precision	1%±1 digit
connection	screw terminals 1,5mm²
working temperature	-5÷50°C
dimensions	96×96×92mm
fixing hole	92×92mm

CLG-03

FUNCTIONING

CLG-03 is a programmable, multi-function electronic meter, enabling the counting of working hours of the connected devices or systems in 1 to 999 999 range, corresponding to 114 years of operation. Working time is counted according to an individual program, set by the user. After reaching the limiting value, the meter will configure itself according to individual user's needs.



zasilanie	24÷264V AC/DC
napięcie wejścia zliczającego	4÷264V
prąd obciążenia przekaźnika	8A
pobór mocy	1,5W
temperatura pracy	-20÷50°C
przylącze	zaciski śrubowe 2,5mm²
wymiary	3 moduły (52,5mm)
montaż	na szynie TH-35

FUNCTIONS

- * control panel, enabling programming and the monitoring of device operation
- * T input for DC signal and AC signal 50 Hz
- * counting time upwards without threshold value
- * 'downward' counting mode to the selected value with zero value signaling (e.g. 9999 → 0)
- * counting working time with high state (constant voltage) at the T input
- * counting working time between two pulses given at the T input
- * counting time upwards to the selected threshold value
- * external RESET input
- * relay output signaling the preset meter state (contact 1C/O 8A)
- * relay action selection: pulse with set time length; ON → OFF or OFF → ON state change
- * local and total meter state memory after supply failure
- * limiting access to program menu using PIN code
- * setting display illumination mode
- * program menu in three languages: Polish, English or Russian

22. FLUID LEVEL CONTROL RELAYS

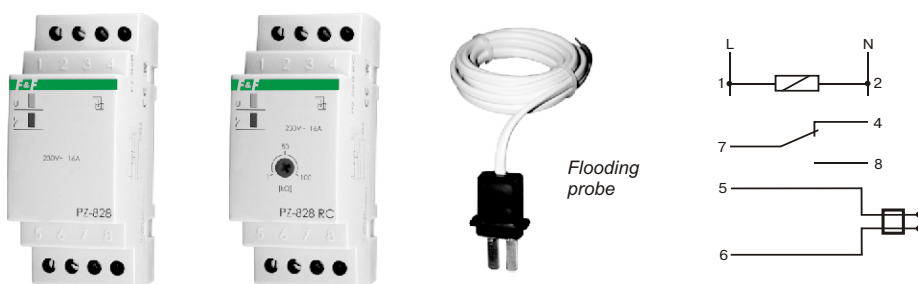
ONE-POSITION

PURPOSE

Fluid level control relays are devised to detect the presence of conductive liquids reaching the level of the sensor.

PZ-828

PZ-828 RC ADJUSTABLE SENSITIVITY



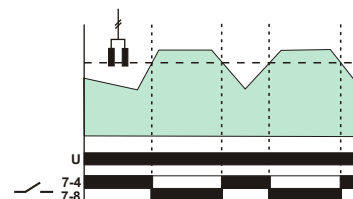
supply	230V AC
current load	<16A
contact	1 C/O
sensitivity	PZ-828 (factory setting) 50KΩ
	PZ-828 RC (adjustable) 4,5+220KΩ
power supply indicator	green LED
working mode indicator	red LED
power consumption	1,1 W
terminal	screw terminals 2,5mm ²
dimensions	2 modules (35 mm)
fixing	on rail TH-35

output 5-6 galvanic separated

flooding probe	electrode
dimension of sensor / length of wire	30×20×5mm/1,5m
length / pitch of electrodes	30mm / 5mm
sensor voltage	<6V~
sensor current	<0,13mA

FUNCTIONING

In dry conditions, the relay's contact remains in the 7-4 position. Once the sensor becomes flooded with liquid, the red LED indicator lights up, and the contact is shifted to the 7-8 position. After the level of the conductive liquid decreases (and the electrodes of the flooding sensor depart), the contact returns to position 7-4.



How to connect the probe

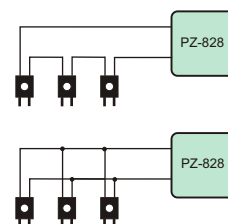
The design of the probe makes it possible to install the probe on a flat horizontal base, for example on the floor in a room where hydro-valves and flow pipes are installed or in a laundry room. Thanks to such a design of the probe, any failure or flooding of a room with a liquid can be quickly detected as well as electric circuits can be simultaneously switched off or the sound or light signalling system (alarm system) can be actuated. The probe cable can be extended to 100m.

A maximum of 10 probes can be connected in parallel connection or in series connection to 5-6 output:

series connection - for a dependant system that controls the level of liquid in many points a simultaneous short-circuit of all sensors connected must occur in order to activate the relay.

parallel connection - for an alternative system that controls the level of liquid in many points - a short-circuit of at least one of the sensors connected must occur.

In case of a series connection, the sensitivity of the sensors is reduced (conductivity is



TWO-POSITION

PURPOSE

Fluid level control relays are devised to detect the presence of conductive liquids reaching the level of the sensor.

PZ-829

PZ-829 RC ADJUSTABLE SENSITIVITY



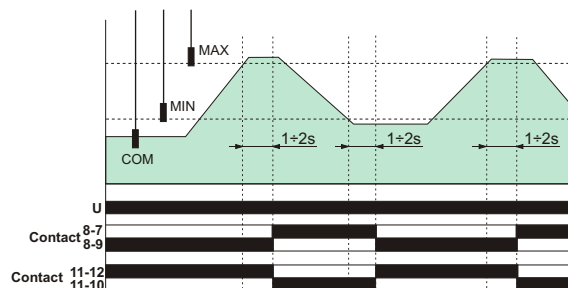
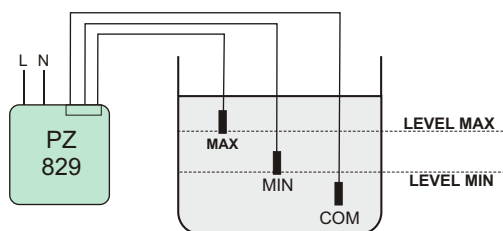
supply	230V AC
current load	2×(<16A)
contact	2×1C/O
sensitivity	PZ-829 (factory setting) 50KΩ
	PZ-829 RC (adjustable) 4,5+220KΩ
contact switching delay	
for level MIN	1+2sec
for level MAX	1+2sec
power supply indicator	green LED
working mode indicator	2×red LED
power consumption	1,1 W
terminal	screw terminals 2,5mm ²
dimensions	3 modules (52,5 mm)
fixing	on rail TH-35

output 4-5-6 galvanic separated

flooding probe	acid-resistant steel electrode in a plastic case with stuffing box
dimension of sensor/length of wire	Ø15/length 9,5cm
sensor voltage	<6V~
sensor current	<0,13mA

FUNCTIONING

After the liquid level decreases to MIN (i.e. electrodes MIN and COM spaced), the RMIN contact is switched to position 11-12, whereas the RMAX contact remains in position 8-9. On the other hand, when the MAX liquid level is reached (MAX and COM electrodes shorted), the relay's RMIN contact will be switched to position 11-10, whereas the RMAX into position 8-7.



ATTENTION!

In order to avoid relay switching, caused by momentary or accidental electrode shorting by liquid flows, the switching system has been equipped with a 1-2 sec. delay unit.

The electrode probe is connected by means of a cable with wire diameter up to 1 mm and maximum length of 100 m.

THREE-POSITION

PZ-831 RC



Flooding probes
4-piece set

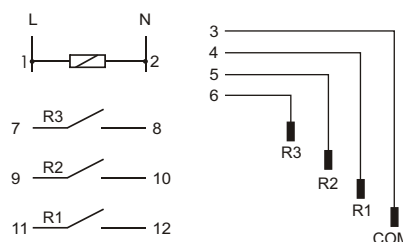
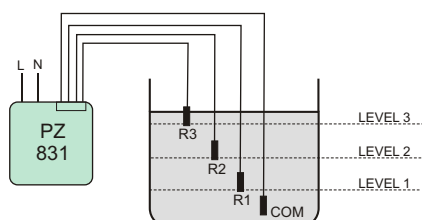
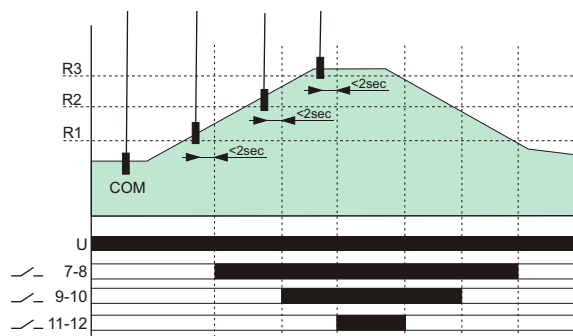
supply	230V AC
current load	3x(<8A)
contact	3x1NO
sensitivity	1+180KΩ
contact switching delay	<2sec
power supply indicator	green LED
working mode indicator	3xred LED
power consumption	1,1 W
terminal	screw terminals 2,5mm ²
dimensions	3 modules (52,5 mm)
fixing	on rail TH-35

output 3-4-5-6 galvanic separated

flooding probe	acid-resistant steel electrode in a plastic case with stuffing box
dimension of sensor/length of wire	Ø15/length 9,5cm
sensor voltage	<6V~
sensor current	<0,13mA

FUNCTIONING

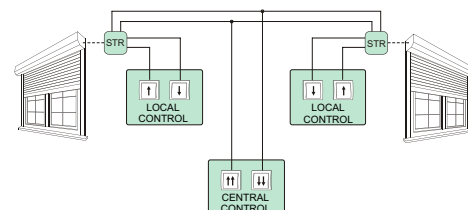
In dry condition (all probes open), all the transformer's contacts are also open. If the base probe COM and the next level probe are closed due to a liquid presence, the contact for a given probe will close, e.g. once the first R1 level probe (the COM base probe and the R1 level probe closed) is submerged, the 11-12 contact will close. The same procedure applies to the R2 and R3 level probes. On the other hand, once the liquid level drops below the probe level (the COM probe and the level probe open), the contact for a given probe will open as well.



23. ROLLER BLIND CONTROLLER

PURPOSE

The roller blind controllers are designed for controlling roller blinds (up and down movement) or other devices (for example, gates) that are driven by a single-phase AC electric motor and operated by means of momentary switches (for example, bell-pushes). The controller can operate as an independent unit (designated for opening/closing one roller blind) as well as the controllers can be combined into groups that enable the central controlling of many roller blinds



FUNCTIONING

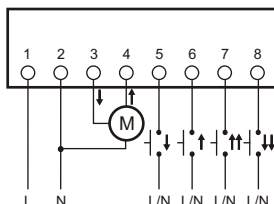
The roller blind motor is activated by the momentary switching of a current pulse (L or N) to one of the control inputs. The motor is activated at a time programmed previously by the user. The activation time programmed enables the complete lifting or lowering of the roller blind. Also, there is a possibility of stopping the rolled blind activated at a level selected by the user (non-complete opening or closing of the roller blind).

DOUBLE-BUTTON TYPE

Local control - a group of push-buttons that controls one roller blind. ↑ - upwards (opening); ↓ - downwards (closing). Pressing the local control push-button activates the movement of the roller blind in a selected direction. If the roller blind is already moving, pressing the local control push-button will stop the roller blind.

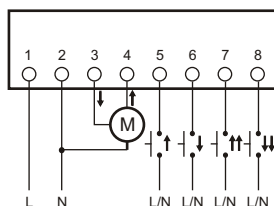
Central control - a common group of push-buttons for many controllers (minimum two controllers) that controls all roller blinds included in the central control system. ↑↑ - all upwards; ↓↓ - all downwards. Pressing the central control push-button activates the movement of the roller blinds in a selected direction. If one of the roller blinds is already moving in the same direction, its movement will be continued. If one of the roller blinds is moving in the opposite direction, this roller blind will be first stopped and then its movement will be activated in the direction in accordance with the command sent to the central input. The central control enables only activating the movement of the roller blinds in a selected direction. The roller blind will be stopped after the programmed movement time or when any of the local control push-buttons is pressed.

STR-1



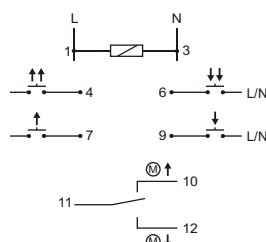
supply	230V AC
current load AC-3	<2A
control pulse current for L/N	<1mA
actuation time - programmable	0sec+10min
indication of power suppl/programming	LED green
power consumption	1W
working temperature	-25+50°C
connection	signal 4×DY 1mm ² , l=10cm
	supplying 4×DY 1,5mm ² , l=10cm
dimensions	Ø55, h=13mm
fixed	to under plaster box Ø60

STR-21



supply STR-21 230V	230V AC
current load AC-3	<2A
control pulse current for L/N	<1mA
power supply indicator	LED green
power consumption	0,8W
working temperature	-25 +50°C
connection	screw terminals 2,5mm ²
dimensions	50×67×26mm
fixing	two screws to the base

STR-421



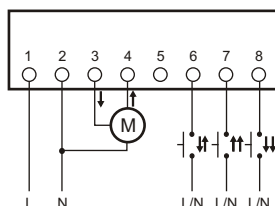
supply STR-421 230V	230V AC
STR-421 24V	24V AC
current load AC-3	<2A
control pulse current for L/N	<1mA
power supply indicator	LED green
operating mode indicator	2×LED red
power consumption	0,8W
working temperature	-25 +50°C
connection	screw terminals 2,5mm ²
dimensions	1 module (18mm)
fixing	on rail TH-35

ONE-BUTTONS

Local control - a group of push-buttons that controls one roller blind. ↑↓-upwards (opening) / downwards (closing). Pressing the local control push-button activates the movement of the roller blind in a direction opposite to the direction of a previously performed movement (after connecting the controller to the power supply, the first movement closes the roller blind). If the roller blind is already moving, pressing the local control push-button will stop the roller blind movement. When the local control push-button is pressed again, the movement of the roller blind in the opposite direction is activated.

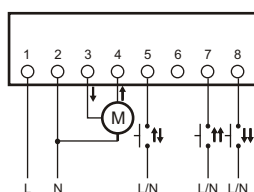
Central control - a common group of push-buttons for many controllers (minimum two controllers) that controls all roller blinds included in the central control system. ↑↑ - all upwards; ↓↓ - all downwards. Pressing the central control push-button activates the movement of the roller blinds in a selected direction. If one of the roller blinds is already moving in the same direction, its movement will be continued. If one of the roller blinds is moving in the opposite direction, this roller blind will be first stopped and then its movement will be activated in the direction in accordance with the command sent to the central input. The central control enables only activating the movement of the roller blinds in a selected direction. The roller blind will be stopped after the programmed movement time or when any of the local control push-buttons is pressed.

STR-2



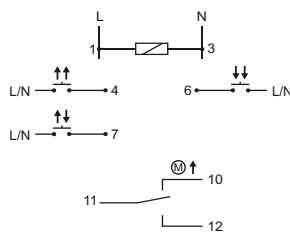
supply	230V AC
current load AC-3	<2A
control pulse current for L/N	<1mA
actuation time - programmable	0sec+10min
indication of power suppl/programming	LED green
power consumption	1W
working temperature	-25+50°C
connection	signal 4×DY 1mm ² , l=10cm
	supplying 4×DY 1,5mm ² , l=10cm
dimensions	Ø55, h=13mm
fixed	to under plaster box Ø60

STR-22



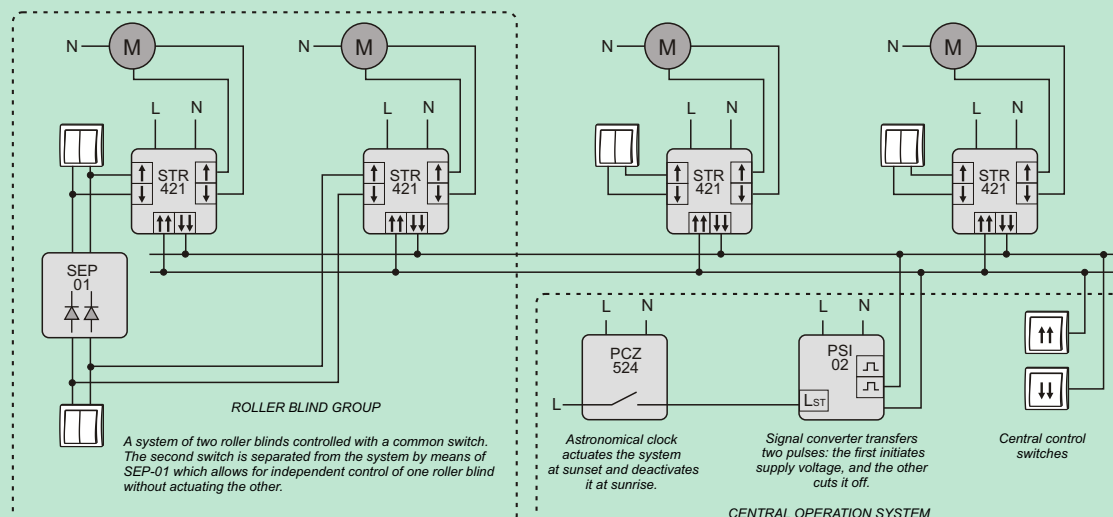
supply	STR-22 230V	230V AC
current load AC-3		<2A
control pulse current for L/N		<1mA
power supply indicator		LED green
power consumption		0,8W
working temperature		-25 +50°C
connection		screw terminals 2,5mm ²
dimensions		50×67×26mm
fixing		two screws to the base

STR-422



supply	STR-422 230V	230V AC
	STR-422 24V	24V AC
current load AC-3		<2A
control pulse current for L/N		<1mA
power supply indicator		LED green
operating mode indicator		2×LED red
power consumption		0,8W
working temperature		-25 +50°C
connection		screw terminals 2,5mm ²
dimensions		1 module (18mm)
fixing		on rail TH-35

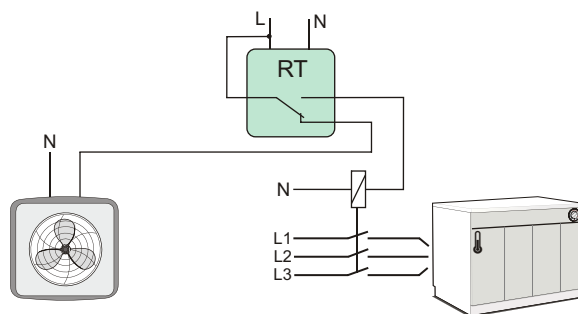
PRACTICAL SOLUTIONS



24. TEMPERATURE REGULATORS

PURPOSE

Temperature regulators may be used for equipment control in anti-freeze systems which prevent the freezing of gutters, the accumulation of ice on stairs, vehicles, etc.



RT-820 temperature setting range: $4\div 30^{\circ}\text{C}$

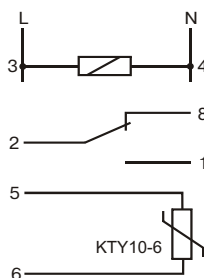
RT-821 emperature setting range: $-4\div 5^{\circ}\text{C}$

RT-822 emperature setting range: $30\div 60^{\circ}\text{C}$

RT-823 emperature setting range: $60\div 95^{\circ}\text{C}$

FUNCTIONING

The power supply to the generator is indicated by the green LED. Until the required ambient temperature is achieved, the contact of the regulator remains in position 2-1 and the heating device is active. Once the set value is achieved, the contact shifts into position 2-8 and the heating or ventilation device is turned off. Any drop in temperature by the hysteresis value will activate the heating device again (contacts 2-1 closed) until the set temperature value is achieved.



supply	230V AC
current load	<16A
contact	1 C/O
temperature setting range	
RT-820	$4\div 30^{\circ}\text{C}$
RT-821	$-4\div 5^{\circ}\text{C}$
RT-822	$30\div 60^{\circ}\text{C}$
RT-823	$60\div 95^{\circ}\text{C}$
hysteresis setting range	$0,5\div 3^{\circ}\text{C}$
temperature sensor	KTY 10-6
length of probe with sensor	2,5m cable
power supply indicator	green LED
operation mode indicator	yellow LED
power consumption	1,1W
terminal	screw terminals 2,5mm ²
dimensions	2 modules (35mm)
fixing	on rail TH-35

PROBE RT for RT-820, RT-821, RT-822

PROBE RT823 for RT-823



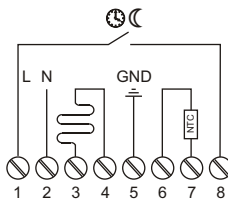
temperature sensor	KTY 10-6
dimansion	Ø5; h=20mm
isolation of sensor	PC
cable	PC 2×0,34mm ² ; l=2,5m



temperature sensor	KTY 10-6
dimansion	Ø8; h=40mm
isolation of sensor	brass muff
cable	heatresist SIHF 2×0,5mm ² ; l=2,5m

FOR HOME APPLICATIONS

RT-824 temperature range: 5÷35°C

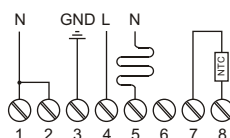
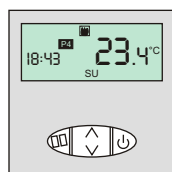


supply	230V AC
current load	<16A
contact	1 NO
temperature setting range	5÷35°C
hysteresis setting range	3°C
set value accuracy	±1°C
temperature sensor	NTC
length of probe with sensor	3m cable
power consumption	0,8W
terminal	screw terminals 1,5mm ²
dimensions	
front	83,5×83,5mm; gt.22mm
back	Ø50; gt.27,5mm
fixing	to under plaster box Ø60mm

FUNCTIONS

- * possibility of programming 1 required temperature
- * the knob located on the front panel enables setting a required temperature
- * the breaker switch located on the front panel enables switching off the power supply of the whole heating system
- * the input for connecting a control clock
- * signalling of the heating system activation
- * 2 temperature sensors: an internal one and an external one
- * 3 operation modes of the regulator: operation with the internal temperature sensor; operation with the external temperature sensor; operation with two temperature sensors
- * in the mode of operation with the internal temperature sensor: in case of the failure of the temperature sensor the regulator will shift to the so-called safe automatic model and will try to maintain the temperature set
- * automatic switching over to the mode of operation with the internal temperature sensor in case of a failure of the external sensor
- * in the mode of operation with two temperature sensors, the external sensor is the limiting one and it does not permit the temperature of 27°C to be exceeded regardless of the temperature set by means of the temperature adjusting knob
- * in the mode of operation with two temperature sensors: if both temperature sensors fail, the regulator will shift to the so-called safe automatic model. Working with interruptions, the regulator will try to maintain the temperature at the level of 80% of the set temperature.

RT-825 temperature range: 5÷60°C



supply	230V AC
current load	<16A
contact	1 NO
temperature setting range	5÷60°C
hysteresis setting range	0÷10°C
set value accuracy	±1°C
temperature sensor	NTC
length of probe with sensor	3m cable
power consumption	0,8W
terminal	screw terminals 1,5mm ²
dimensions	
front	83,5×83,5mm; gt.22mm
back	Ø50; gt.27,5mm
fixing	to under plaster box Ø60mm

FUNCTIONS

- * the control panel enables programming and monitoring the device operation
- * the breaker switch located on the front panel enables switching off the power supply of the whole heating system
- * maintaining a preset temperature in accordance with programmed hours and days of the week
- * possibility of programming 4 intervals of a required temperature per 24 hours
- * 12 program entries: 4 entries concerning the required temperature for working days (Pn-Pt: Monday through Friday); 4 entries concerning the required temperature for Saturday (So: Saturday) and 4 entries concerning the required temperature for Sunday (Nd: Sunday)
- * possibility of a quick, manual correction of the currently maintained temperature
- * adjustable hysteresis
- * 2 temperature sensors: an internal one and an external one
- * 3 operation modes of the regulator: operation with the internal temperature sensor; operation with the external temperature sensor; operation with two temperature sensors
- * in the mode of operation with two temperature sensors, the external sensor is the limiting one with an adjustable temperature within the range of 15÷50°C

PROBE for RT-824, RT-825



temperature sensor	NTC
dimension	Ø7; h=25mm
isolation of sensor	PC muff
cable	PC 2×0,34mm ² ; l=3m

PROGRAMMABLE

PURPOSE

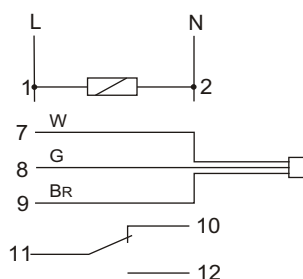
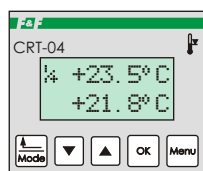
The CRT controllers are multi-function, programmable electronic devices which enable control of heating or cooling devices in order to maintain a stable room temperature, as well as to control ambient and substance temperatures in industrial conditions, with the option of supervising technological processes.

FOR HOME APPLICATIONS

CRT-04 temperature range: 0÷60°C

FUNCTIONING

The operation time and required temperature are achieved according to the individual program set by the user. The CRT controllers are equipped with a calendar and a real time clock which enable switching the controlled device on and off at preset hours within the following cycles: 24-hour, weekly, business-day (Mon. Fri.) or weekend (Sat., Sun.).

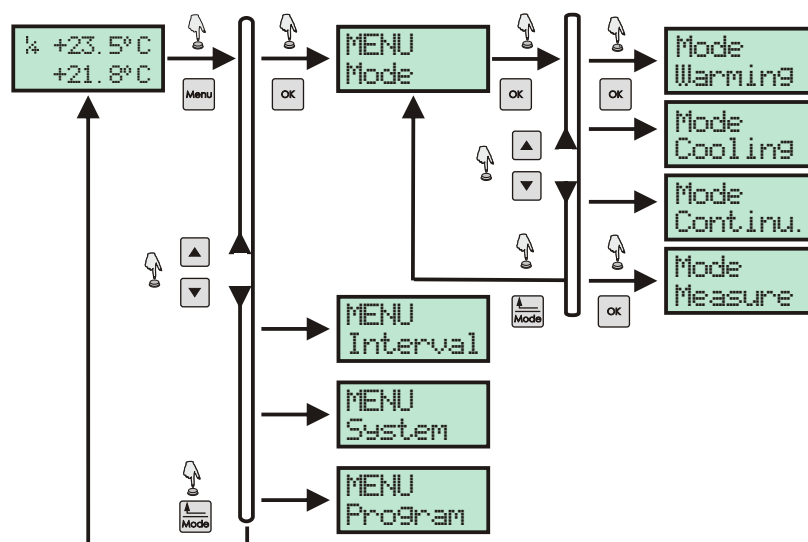


supply	230V AC
current load	<16A
contact	1 C/O
temperature setting range	0÷60°C
hysteresis setting range	0÷10°C
set value accuracy	0,1°C
model correction	±5°C
lagged switching - regulated	1÷15min
type of temperature sensor	RT4
length of probe with sensor	2,5m cable
power consumption	1,5W
terminal	screw terminals 2,5mm ²
dimensions	3 modules (52,5mm)
fixing	on rail TH-35

CONTROLLER'S FEATURES:

- *control panel for programming and monitoring;
- *operation modes: HEATING and COOLING to maintain a preset temperature according to programmed hours and days;
- *CONTINUOUS operating mode to maintain a single preset temperature value while ignoring other program entries;
- *MEASUREMENT operating mode display of an actual temperature value without controlling a connected machine;
- *50 program entries;
- INTERVAL this feature enables the user to program up to 8 required temperature values (3 in the MY1, MY2 and MY3 modes, and an additional 5 in modes called MORNING, WORK, DINNER, DAY, and NIGHT for everyday time windows related to the users' lifestyle;
- *DELAY programmable time of response delay while exceeding limit temperature values;
- *CORRECTION related to the temperature read-out error against the model thermometer;
- *SENSORS visual signalisation of the temperature sensor failure;
- *DST automatic DST time implementation with programmable shift to manual mode;
- *LIGHT selection of display illumination mode.
- *LANGUAGE program menu in three languages: Polish, English or Russian

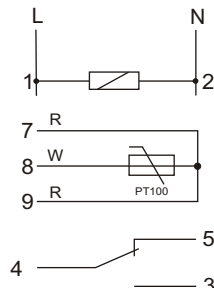
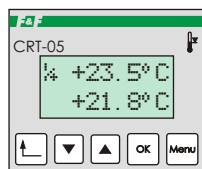
Menu (example)



INDUSTRIAL FUNCTIONING

The controller responds to a selected function on the basis of individual entries concerning parameters like temperature, hysteresis, response delay, and other values preset by the user.

CRT-05 2-FUNCTION temperature range: -100÷400°C

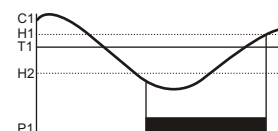


supply	230V AC
current load	<16A
contact	1 C/O
temperature setting range	-100÷400°C
hysteresis setting range	0÷100°C
set value accuracy	1°C
model correction	±20°C
lagged switching - regulated	0÷45min
gradient - regulated	4°C/1sec
type of temperature sensor	PT100
power consumption	1,5W
terminal	screw terminals 2,5mm ²
dimensions	3 modules (52,5mm)
fixing	on rail TH-35

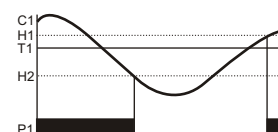
CONTROLLER'S FEATURES:

- *control panel for programming and monitoring;
- *2 operations modes: HEATING and COOLING
- *2 regulated HYSTERESIS values lower and upper limits;
- *AUTOMATIC mode operation with one selected function;
- *MANUAL mode permanent closing or opening of the contact without a temperature measurement.
- *CORRECTION related to the temperature read-out error against the model thermometer;
- *WARNING - visual signalisation of the temperature sensor failure, range exceed and speed rising or falling temperature exceed
- *limiting access to program menu using PIN code
- *LIGHT selection of display illumination mode.
- *LANGUAGE program menu in three languages: Polish, English or Russian

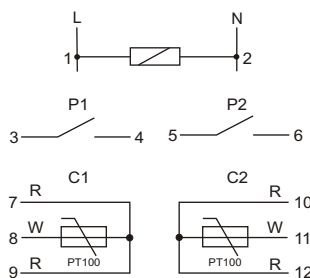
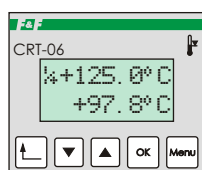
HEATING



COOLING



CRT-06 10-FUNCTION temperature range: -100÷400°C



supply	230V AC
current load	2x(<16A)
contact	1 C/O
temperature setting range	-100÷400°C
hysteresis setting range	0÷100°C
set value accuracy	1°C
model correction	±20°C
lagged switching - adjustable	0÷45min
gradient - regulated	4°C/1sek+6°C/1min
sampling frequency - regulated	1÷120probek/1min
type of temperature sensor	PT100
power consumption	1,5W
terminal	screw terminals 2,5mm ²
dimensions	3 modules (52,5mm)
fixing	on rail TH-35

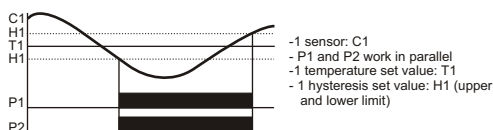
CONTROLLER'S FEATURES:

- *control panel for programming and monitoring;
- *10 operation functions;
- *2 independent temperature sensors;
- *two independent temperature values may be set;
- *2 x 1P contacts applied to the temperature sensors;
- *2 hysteresis set values, one for each sensor;
- *AUTOMATIC mode - operation with one selected function;
- *MANUAL mode permanent closing or opening of the contact without a temperature measurement. Separate temperature drops for the P1 and P2 contacts.
- *memory feature for maximum and minimum temperature values registered, independent for the C1 and C2 sensors;
- *CORRECTION related to the temperature read-out error against the model thermometer;
- *WARNING - visual signalisation of the temperature sensor failure, range exceed and speed rising or falling temperature exceed
- *limiting access to program menu using PIN code
- *LIGHT selection of display illumination mode.
- *LANGUAGE program menu in three languages: Polish, English or Russian

OPERATIONAL FUNCTIONS OF THE CRT-06

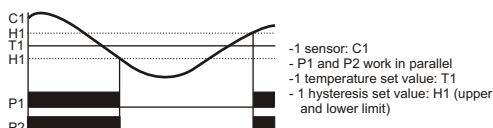
PROG 1

HEATING mode. The P1 and P2 contacts depend on the C1 sensor.



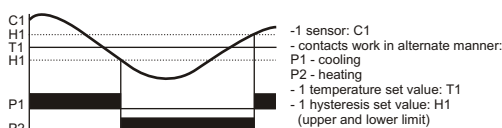
PROG 2

COOLING mode. The P1 and P2 contacts depend on the C1 sensor.



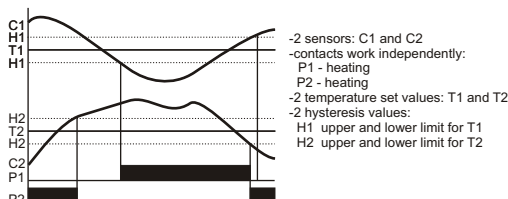
PROG 3

HEATING / COOLING modes. The P1 and P2 contacts depend on the C1 sensor.



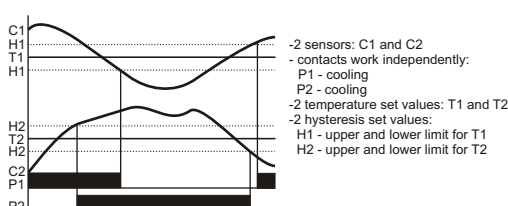
PROG 4

For contacts P1 and P2. The P1 contact dependent on the C1 sensor; the P2 on the C2 sensor.



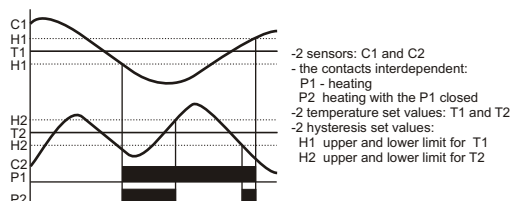
PROG 5

COOLING mode for the P1 and P2 contacts. The P1 contact depends on the C1 sensor; the P2 on the C2 sensor.



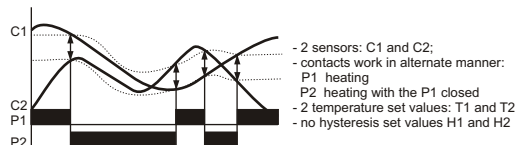
PROG 6

HEATING mode for the contacts P1 and P2. The P1 contact depends on the C1 sensor, and the P2 on the C2 and C1 (activated only with the P1 contact closed).



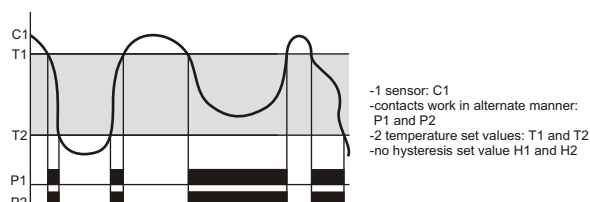
PROG 7

DIFFERENTIAL mode. The P1 contact closed with the temperature difference exceeding the set value. The P2 contact activated in the reversed conditions in comparison to the P1, i.e. with the temperature difference lower than the set value.



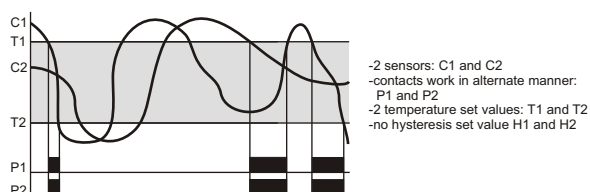
PROG 8

WINDOW mode. The P1 and P2 contacts closed when the C1 sensor temperature is between the preset temperature values of T1 and T2.



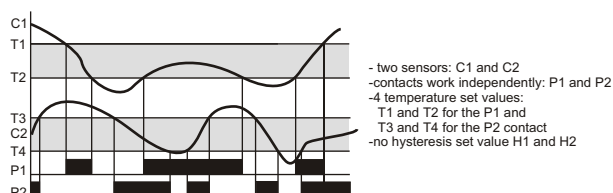
PROG 9

WINDOW mode. The P1 and P2 contacts closed when the C1 and C2 sensors temperature is between the preset temperature values of T1 and T2.



PROG 10

WINDOW mode independent for the P1 and P2 contacts. The P1 contact closed when the C1 sensor temperature is between the preset temperature values of T1 and T2. The P2 contact closed when the C2 sensor temperature is between the preset temperature values of T3 and T4.



PROBE RT4 for CRT-04



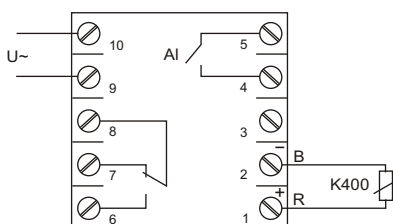
temperature sensor	DS18S20
dimension	Ø5; h=30mm
isolation of sensor	PC
cable	LiYY 3×0,34mm² l=2,5m

PROBE PT100 for CRT-05, CRT-06



temperature sensor	PT100
dimension	Ø4; h=85mm
isolation of sensor	steel muff
cable	PC 3×0,34mm²; l=1,5m
	in metal braid sheath

CRT-15T temperature range: 0÷400°C



supply	100÷240V
current load	<3A
contact	1 C/O
load current for alarm output	<1A
alarm output contact	1 NO
temperature setting range	0÷400°C
PID set value	
proportional section P	0÷100
integrating section I	0÷255
differentiating section D	0÷255
set value accuracy	0.5°C
model correction	±15°C
lagged switching - regulated	0÷45min
gradient - regulated	4°C/1sec
type of temperature sensor	K400
power consumption	1W
terminal	screw terminals 2,5mm ²
dimensions	48×48×86

CONTROLLER'S FEATURES:

- *control panel for programming and monitoring of device operation;
- *PID controller (a proportional-integral-derivative controller);
- *automatic tuning of the PID regulator;
- *ALARM programmable temperature limit to trigger off the alarm feature;
- *preset temperature indications;
- *current temperature indications;
- *1P output contact;
- *additional ALARM output: 1Z contact
- *CORRECTION related to the temperature read-out error against the model thermometer;
- *LOCK settings block.

PROBE for CRT-15T



temperature sensor	K400
dimension	thread M6; h=15mm
isolation of sensor	steel
cable	2×0,34mm ² l=1,0m in steel weave

RESISTANCE (THERMAL) RELAY

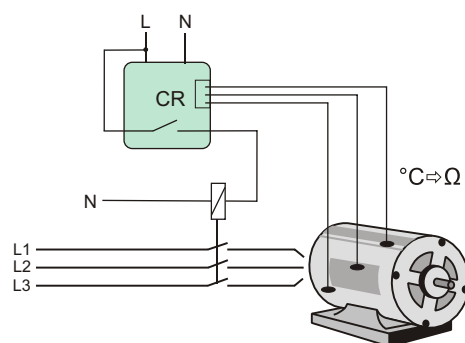
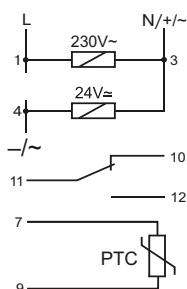
CR-810 TO CO-OPERATION WITH THE PTC THERMISTOR-EQUIPPED TEMPERATURE SENSORS.

PURPOSE

The resistance relay protects electrical equipment against any undesirable temperature increases by means of PTC resistors in serial connection (1-6 pieces).

FUNCTIONING

Correct operation (closed contacts 3-7) is indicated by the green LED (correct power voltage, temperature of the controlled device, working circuit of connected PTC sensors). The increase in temperature of at least one sensor over the rated value results in an increase in its resistance over 3000Ω. The relay is then activated (contacts 3-7 open). The system is activated automatically if the resistance of the PTC sensor loop decreases below the threshold of 1800Ω (drop in temperature of the controlled device). The contact of the executive relay also opens in the event of the resistance dropping to 15Ω (e.g. during a short circuit between cables) or with the power voltage turned off.



supply	230V AC / 24V AC/DC
current load	<16A
contact opening resistance	R>3000Ω, R<70Ω
contact closure resistance	110Ω<R<1800Ω
max resistance of sensor loop when cold	R=1500Ω
power supply / correct conditions indicator	green LED
damage conditions indicator	2×red LED
working temperature	-25÷50°C
terminals	screw terminals 2,5 mm ²
dimensions	1 module (18 mm)
fixing	on rail TH-35

25. CONTROL SYSTEM COMPONENTS

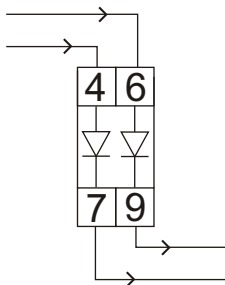
SEP-01 SEPARATOR OF INPUT SIGNAL

PURPOSE

The SEP-01 serve to separating of input signal in automatic arrangement with separated control groups and central control.

FUNCTIONING

Input signal goes in "one way".



current load	<1A 1000V
working temperature	-25+50°C
terminal	screw terminals 2,5mm ²
dimensions	1 module (18mm)
fixing	on rail TH-35

EXAMPLE OF USE: Central control - look chapter 4

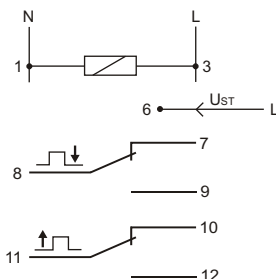
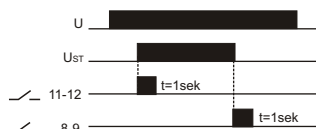
PSI-02 CONTINUOUS - PULSE SIGNAL CONVERTER

PURPOSE

The PSI-02 converter serves to break up a control signal into single pulses required in automatic control systems.

FUNCTIONING

After the application of the control signal to the UST input (leading edge), the converter generates a pulse on output 6 (contact 5-6 closed for 1 second). After the decay of the control signal (trailing edge), the converter sends another pulse on output 8 (contact 7-8 closed for 1 second).



supply	PSI-02 230V	230V AC
	PSI-02 24V	24V AC/DC
current load		<2x8A
contact		separated 2x1N/O
input signal		230V AC
time of input signals		1sec
working temperature		-25+50°C
terminal		screw terminals 2,5mm ²
dimensions		1 module (18mm)
fixing		on rail TH-35

EXAMPLE OF USE: Roller blinds group control system (see chapter 22).

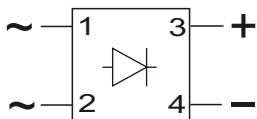
MPG-03 FULL-WAVE BRIDGE RECTIFIER (in GREATZ circuit)

PURPOSE

The MPG-02 changes alternating current into unidirectional direct current.

FUNCTIONING

Proper operation of the rectifier (i.e. presence of voltage on terminals 3-4) is signalled by a green LED.



supply	110+264V AC
	12+48V AC
current load	<2A
signalization of supply	LED green
working temeprature	-25+50°C
terminal	screw terminal 2,5mm ²
dimensions	1 module (17,5mm)
fixing	on rail TH-35

ELECTROMAGNETIC RELAYS

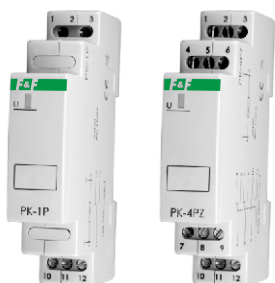
PURPOSE

Electromagnetic relay in single-module casing intended for direct assembly on the TH-35 bus bar.

FUNCTIONING

Application of the power supply voltage to the relay's coil results in a shift of the contact. After the decay of the voltage in question, the contact returns to the initial position.

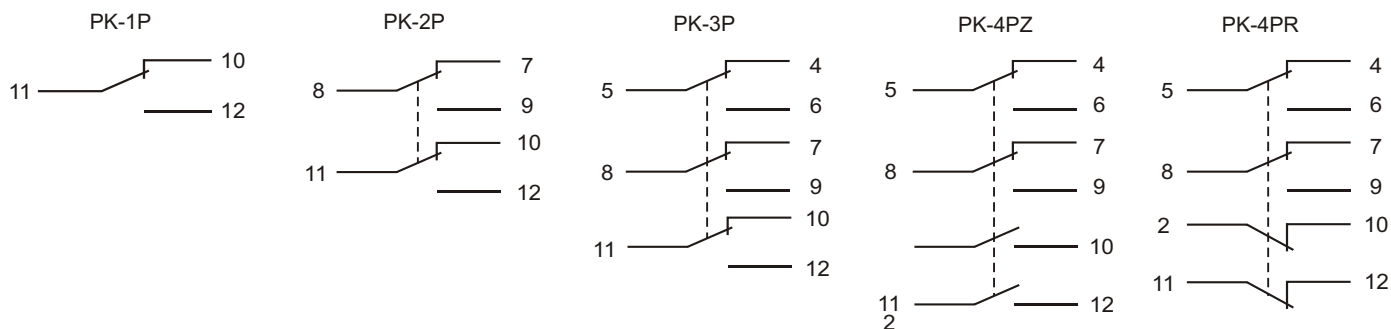
- PK-1P** Contact 1C/O (16A).
PK-2P Contacts 2C/O (2×8A).
PK-3P Contacts 3C/O (3×8A).
PK-4PZ Contacts 2C/O (2×8A) + 2NO (2×8A).
PK-4PR Contacts 2C/O (2×8A) + 2NC (2×8A).



Order labelling method:

PK-2P 48V — supply voltage

appl. standard no.	IEC 61095
power supply	
PK-xP 230V	230V AC
PK-xP 110V	110V AC/DC
PK-xP 48V	48V AC/DC
PK-xP 24V	24V AC/DC
PK-xP 12V	12V AC/DC
connection current	
PK-1P	Ie=16A
PK-2P	Ie=2×8A
PK-3P	Ie=3×8A
PK-4PZ	Ie=4×8A
PK-4PR	Ie=4×8A
connection voltage	Ue=250V
usage category	AC-7a
insulation voltage	400V
voltage surge resistor	contact pair coil, 6 kV
separate current circuits	3.6 kV
contact gap	1.2 kV
pollution level	3
overvoltage capacity	6 kV
safety label	B
protection level	IP20
operating time	max. 40 msec
turn-off time	max. 20 msec
mechanical life	5 x 10 ⁵ cycles
current consumption	25mA
voltage indicator	LED
terminal	screw terminals 2.5 mm ²
working temperature	-25+50°C
dimensions	1 module (18 mm)
fixing	on rail TH-35



Loadability for contats of relays

						ALTERNATING CURRENT			DIRECT CURRENT
						AC-1	AC-3	AC-15	DC-1 24V/230V
	BULBS HALOGEN LIGHTS	INCOMPENSATED FLUORESCENT LIGHTS	COMPENSATED OF FLUORESCENT LIGHTS	FLUORESCENT LIGHTS COMPENSATED IN PARALLEL	ECONOMIC FLUORESCENT LIGHT	non-inductive or low-inductive loads resistive furnace	squirrel-cage motor, switching motors in operation	controlling of alternative electro- magnetic loads	non-inductive or low-inductive, resistive furnaces
5A	600W	300W	300W	200W	240W	1800VA	0,30KW	280VA	5A/0,12A
8A	1100W	550W	550W	350W	300W	2200VA	0,45KW	325VA	8A/0,18A
10A	1500W	650W	650W	500W	350W	2500VA	0,6KW	500VA	10A/0,25A
16A	2300W	1000W	1000W	800W	550W	4200VA	1KW	750VA	16A/0,35A
30A	4000W	1900W	1900W	1500W	1000W	7500VA	1,7KW	1400VA	30A/0,7A

ELECTROMAGNETIC CONTACTORS

PURPOSE

Electromagnetic contactors in module casing intended for direct assembly on the TH-35 bus bar.

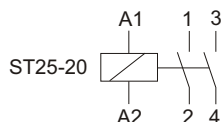
FUNCTIONING

Application of the power supply voltage to the relay's coil results in a shift of the contact. After the decay of the voltage in question, the contact returns to the initial position.

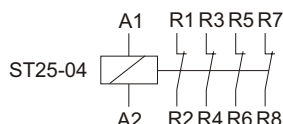
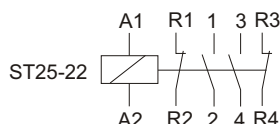
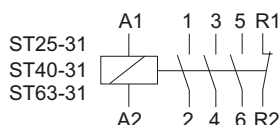
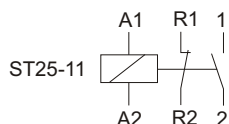
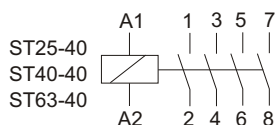
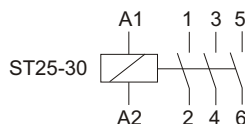
ST-25-

ST-40-

ST-65-



appl. standard no.	IEC 61095
protection level	IP20
working temperature	-25÷50°C
fixing	on rail TH-35

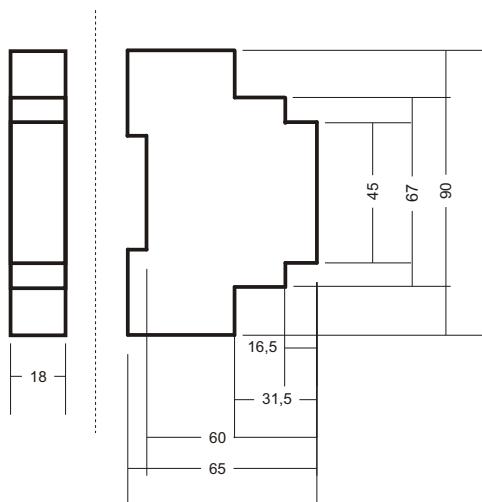


TYPE	CONTACTS	CURRENT	SUPPLY	MODULE	SCREW
ST25-20	2NO	25A	230V AC	1	4mm ²
ST25-20/24	2NO	25A	24V AC	1	4mm ²
ST25-11	1NO+1NC	25A	230V AC	1	4mm ²
ST25-30	3NO	25A	230V AC	2	4mm ²
ST25-31	3NO+1NC	25A	230V AC	2	4mm ²
ST25-31/24	3NO+1NC	25A	24V AC	2	4mm ²
ST25-40	4NO	25A	230V AC	2	4mm ²
ST25-40/24	4NO	25A	230V AC	2	4mm ²
ST25-04	4NC	25A	230V AC	2	4mm ²
ST25-22	2NO+2NC	25A	24V AC	2	4mm ²
ST40-40	4NO	40A	230V AC	3	10mm ²
ST40-40/24	4NO	40A	24V AC	3	10mm ²
ST40-31	3NO+1NC	40A	230V AC	3	10mm ²
ST63-40	4NO	63A	230V AC	3	10mm ²
ST63-40/24	4NO	63A	24V AC	3	10mm ²
ST63-31	3NO+1NC	63A	230V AC	3	10mm ²

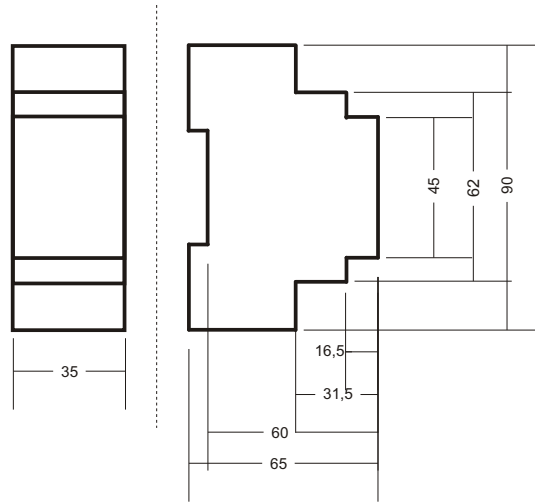
26.

ENCLOSURE DIMENSIONS

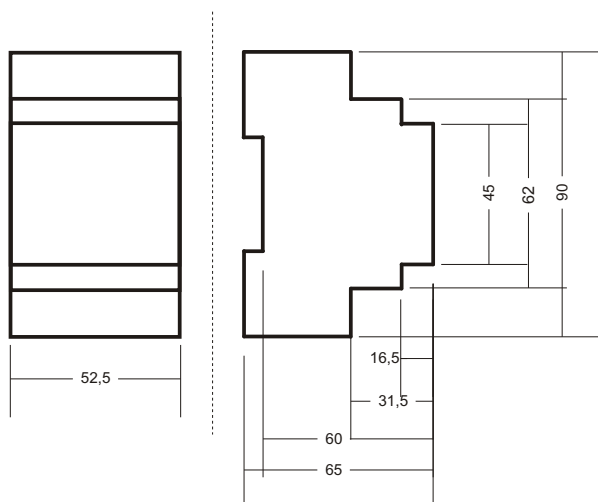
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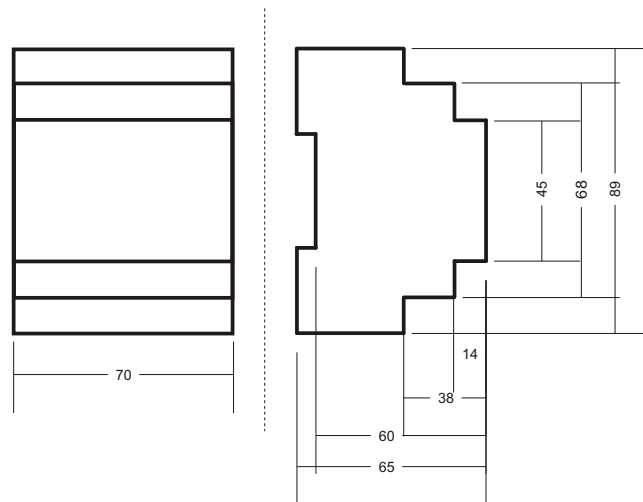
1 modul



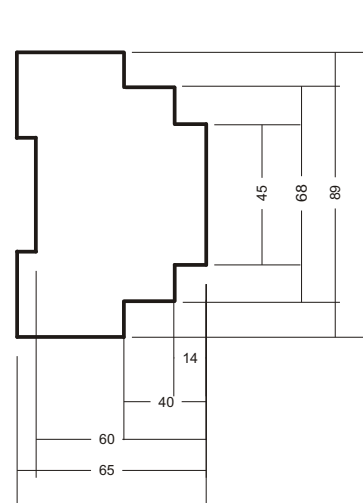
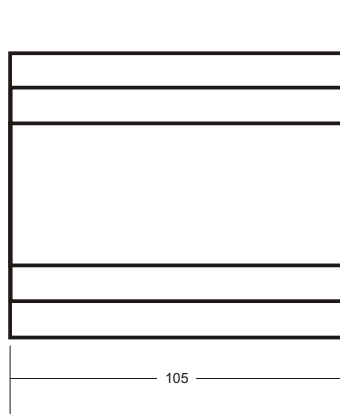
2 modules



3 modules

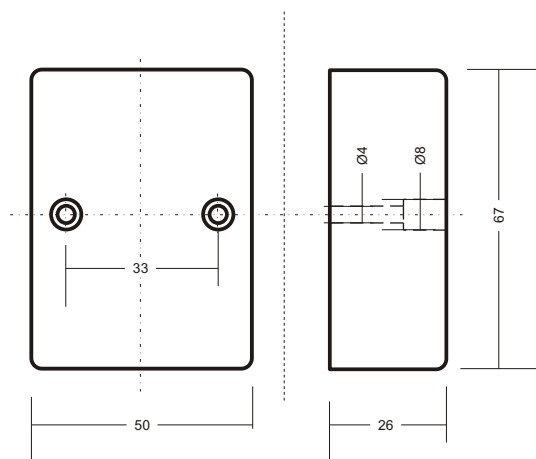


4 modules

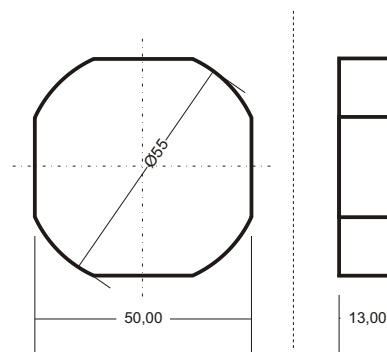


6 modules

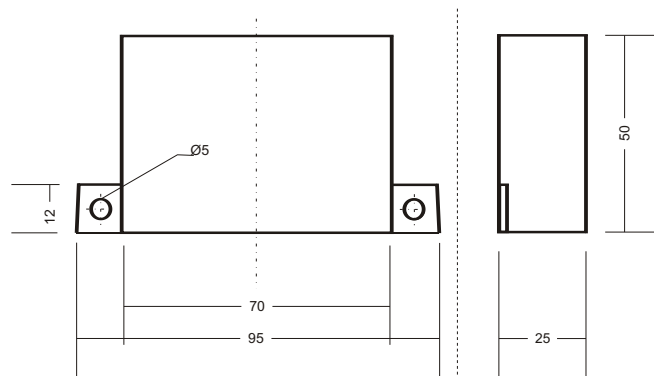
[mm]



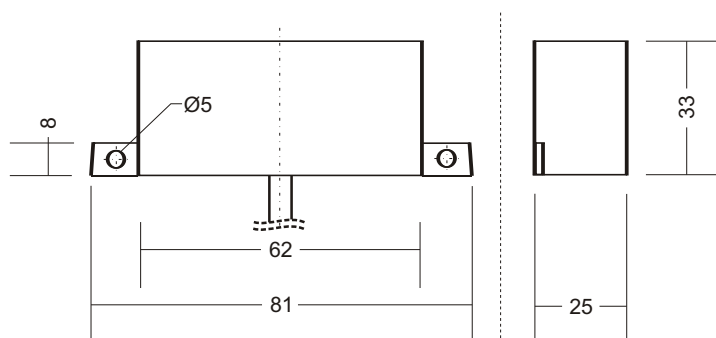
to plater box



to under plaster box



CZF2 PO-405



AZH-C