

domestic and industrial automation



Latest products

Products catalogue

2

0

1

8

NEW PRODUCTS 2018

| | | page |
|--|---------------------|------|
| Sequential controller, pulse-time, 4-channel | PCS-534 | 1 |
| Pulse and operating time counter | SimplyMAX P05 | 2 |
| F&Wave (multifunction controllers) | FW-...-P | 3 |
| Touch wall-mounted remote control transmitter | FW-GS-W / FW-GS-B | 5 |
| Motion sensor (PIR) | DR-03 | 6 |
| Motion sensor (PIR) | DR-09 | 6 |
| Microwave motion sensor | DRM-07 | 7 |
| Microwave motion sensor | DRM-08 | 7 |
| Bistable pulse relay for Ø60 flush-mounted box | BIS-412P | 8 |
| Registration system and network parameters | MeternetLITE | 9 |
| LED stair lights | LS-... | 10 |
| Reserve switching controller | SZR-278 | 12 |
| Reserve switching controller | SZR-279 | 13 |
| FLC programmable controller: CPU | FLC18E 8DI-8R | 14 |
| 12W pulse power supplies | ZI-15, ZI-16, ZI-17 | 15 |
| Pulse power supply for flush-mounted box | ZI-20-12P | 15 |
| Three-phase current transformers | TP-... | 16 |

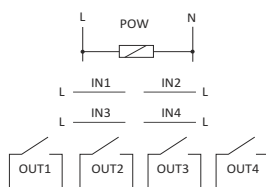
TIME CONTROLLERS

PCS-534

Sequential controller pulse-time, 4-channel

PURPOSE

The PCS-534 controller is designed for automation systems in which it is necessary to simultaneously control a group of receivers in a fixed ON/OFF combination forced by successive pulses fed manually or automatically to a control input or in accordance with the time intervals between successive switchings.



| | |
|------------------------------|------------------------------------|
| power supply | 160÷260V AC/DC |
| output load current | 8 A |
| contact | 4×NO |
| input voltage tolerance | 160÷260 V AC/DC |
| time settings t1, t2, t3, t4 | 1s÷99h59min59s |
| time setting accuracy | 1s |
| number of cycle repetitions | 1÷999999 |
| communication port | in an infinite loop |
| power consumption | miniUSB |
| terminal | 1.3 W |
| tightening torque | 2.5mm ² screw terminals |
| working temperature | 0,4 Nm |
| dimensions | -20÷50°C |
| mounting | 5 modules (87,5mm) |
| ingress protection | on TH-35 rail |
| | IP20 |

FUNCTIONING

The sequential relay has 4 separate outputs OUT1-4 and 4 independent signal inputs IN1-4. The closed/open contact setup is set sequentially in accordance with the preset program. Switching the contacts into the next state occurs after the next impulse at the control input or automatically, in accordance to the time schedule.

The sequence of contacts, time schedule and operating options are set using the PC configuration program. Connection to the controller via a USB cable.

Operating modes:

Pulse – programmed contact sequences are executed after successive pulses of the IN1 control input. The first pulse switches from sequence 0 to sequence 1 and next ones after next pulses. After the last sequence has been executed, the relay executes the program from sequence 0 or 1 for the autostart option;

Time – contact switching is carried out automatically according to the time schedule. The pulse at input IN1 switches from sequence 0 to sequence 1 and continues to switch automatically after the set time. After the last sequence has been executed, the relay returns to sequence 0 and waits for the control pulse at input IN1 or continues the program from sequence 1 (autostart option).

Sequence 0 – contact output status (0000) after switching-on the power supply (permanent option, not changed by the user).

Additional options:

Autostart – automatic start option. In pulse mode, it is an automatic transition to sequence 1 after switching on the power supply. In time mode, it is an automatic start of work according to the time schedule.

Functions of inputs:

IN1 – "start":

- pulse: impulse injection switches the contacts to the next state.
- temporary: impulse delivery triggers the time schedule.

IN2 – "pause"

- pulse: blocks switching to the next sequence despite subsequent pulses on IN1.
- time: stop the countdown time to switch to the next state.

IN3 – "continuation"

- pulse: restores the reaction to IN1 input pulses.
- time: continuation of the countdown in the stopped sequence.

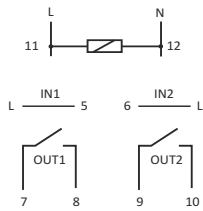
IN4 – "reset"

- pulse: immediate stop of the program being executed and return to sequence 0 and waiting for restarting. In the autostart option, the program runs from sequence 1.
- time: immediate stop of the program being executed and return to sequence 0 and waiting for the start signal on IN1. In the autostart option, the program runs from sequence 1.

GSM REMOTE CONTROL

SIMply MAX P05 PULSE AND OPERATING TIME COUNTER + SWITCH ON/OFF/ALARM

The MAX P05 relay with built-in GSM communicator is used as a pulse or operating time counter with the ability of remote management of the connected device via a mobile phone. It performs simple functions of notifying about exceeding the threshold values of pulses or operating time and allows user to control the connected additional device on the ON/OFF basis. User phone numbers, counting options, alarms and other features are set using the PC configuration program. Connected to the relay via a USB cable.



| | |
|-------------------------------|-------------------------------------|
| power supply | 230 V AC |
| inputs | |
| number | 2 |
| voltage tolerance | 160÷260V AC |
| minimum length of input pulse | 1s |
| relay outputs | |
| number | 2 |
| type | 2×NO |
| nominal voltage | 230V AC |
| maximum load current (AC-1) | 8A |
| ports | SIM, miniUSB |
| power consumption | |
| standby | 1,3W |
| during GSM communication | 3W |
| working temperature | -10÷50°C |
| terminal | 4.0 mm ² screw terminals |
| tightening torque | 0.5 Nm |
| dimensions | 3 modules (52.5mm) |
| mounting | on TH-35 rail |
| ingress protection | IP20 |

| | |
|--------------------|---------------|
| GSM antenna | |
| SMA connector | |
| antenna dimensions | 20×100m |
| length | 2.5m |
| mounting | adhesive tape |

FEATURES

1. System

- * access password for SMS input commands;
- * output status memory;
- * readout of the current value of pulses and operating time;
- * ADMIN administrator function – restoring factory settings and unblocking access in case of a forgotten access password.

2. Counting pulses/operating time

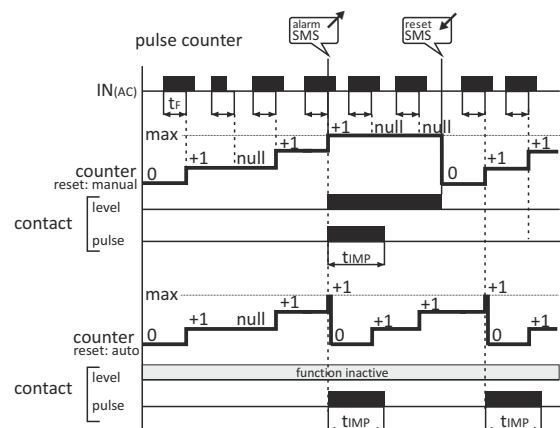
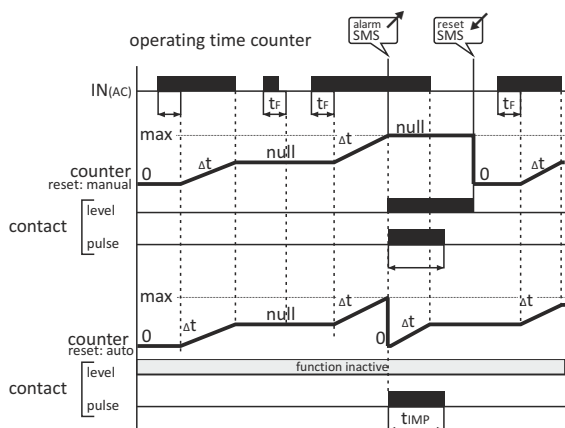
- * individual operating mode for each input: pulse counter/operating time counter
- * counting 160÷260 V AC high voltage signals;
- * time filters for input signals;
- * SMS alerts for set thresholds of pulses and operating time for up to 5 phone numbers.

3. Output OUT

- * output control – two separate operating modes: SMS/ALARM:
 - SMS:
 - output controlled directly via SMS commands;
 - redefinition of the output name, for example OUT1 = PUMP;
 - ON/OFF control and time switching-on of the output;
 - ALARM:
 - contact assigned to temperature alarms - threshold crossing enforces contact actions: ON/pulse;
 - ON option: contact activated above the alarm threshold, the contact opens after a drop below hysteresis;
 - pulse option: contact activated temporarily for the set number of seconds after exceeding the threshold;
 - on/pulse options set separately for the minimum and maximum alarms

6. Input IN

- * redefinition of the input name, for example IN1 = NAPAD;
- * selection of the SMS triggering option:
 - ON – signal appears;
 - OFF – signal loss;
 - ON/OFF – appearance and loss of the signal;
- * notifications of input activation are sent to 5 telephone numbers.



RADIO CONTROL SYSTEM

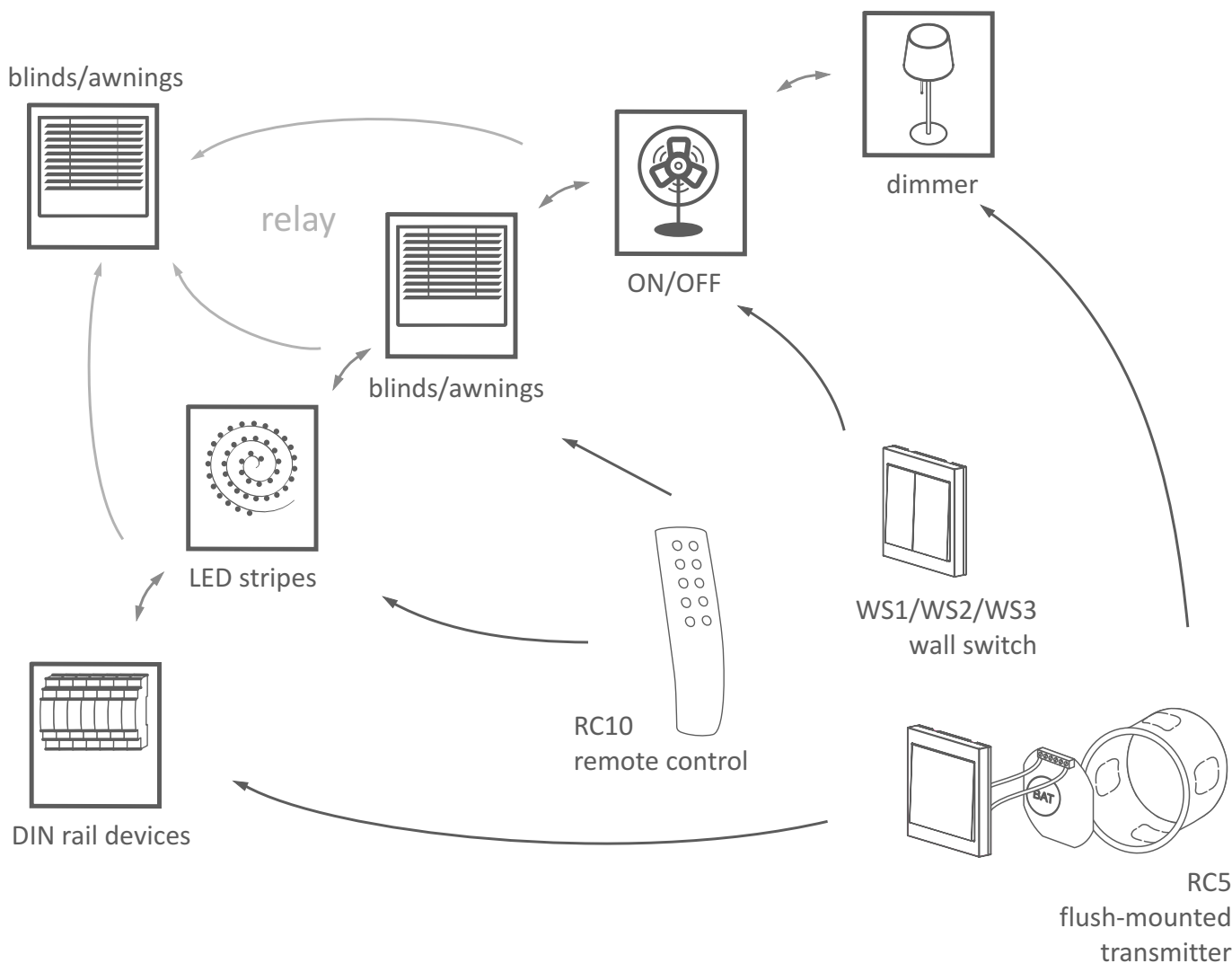
F&Wave

PURPOSE

The F&Wave wireless radio control is intended for direct control of electrical devices in homes and apartments. The system consists of dedicated transmitters and receivers. You can associate multiple transmitters with a single receiver and a single transmitter with multiple receivers.

SYSTEM FUNCTIONS

- * Control different receivers in one system: single and dual relay, dimmer 230 V, dimmer LED, roller blinds controller;
- * Receivers designed for mounting it under plaster in Ø60 flush-mounted box or on a DIN rail;
- * Transmitters in the form of 4- and 10-button remote controls or for mounting under plaster in Ø60 flush-mounted box;
- * The ability to control from up to 8 transmitters;
- * Retransmission of commands from the transmitter - the ability to increase the range of the remote control;
- * Range of up to 100 meters in open space without any interfering factors. In building conditions and in the presence of interference sources (power lines, transmitters, etc.) the actual range may be smaller. The range can be improved by direct retransmission of modules located in mutual coverage area.



BISTABLE RELAYS ON/OFF

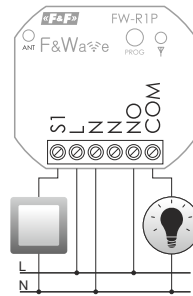
The group of bistable relays is used for direct control of the connected receiver on an on/off basis. Pressing the wall switch connected directly to the relay (local control) or paired radio transmitter button (remote control: remote, battery wall switch or flush transmitter) changes the contact position to the opposite one.

Central control is also available, which means switching on or off the group of relays associated with one central button of selected transmitters.

FW-R1P-P single multifunction relay



- * 1-channel multifunction relay:
 - bistable (ON/OFF)
 - monostable (pulse)
 - time (from 1 s to 48 h)
 - always ON
 - always OFF
- * each button/transmitter (local and remote) can perform a different function
- * controller can be linked with 32 transmitters
- * separated output contact

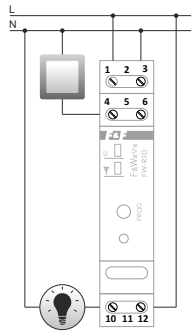


| | |
|-----------------------|------------------------------------|
| power supply | 85±265V AC/DC |
| control | triggered with L or N level |
| control pulse current | <1mA |
| power consumption | |
| on | 0.6W |
| standby | 0.25W |
| output load (AC-1) | 8A/250V |
| radio frequency | 868 MHz |
| working temperature | -25÷50°C |
| terminal | 2.5mm ² screw terminals |
| tightening torque | 0.4Nm |
| mounting | Ø60 flush-mounted box |
| dimensions | 43×48×20mm |
| ingress protection | IP20 |

FW-R1D-P single multifunction relay



- * 1-channel multifunction relay:
 - bistable (ON/OFF)
 - monostable (pulse)
 - time (from 1 s to 48 h)
 - always ON
 - always OFF
- * each button/transmitter (local and remote) can perform a different function
- * controller can be linked with 32 transmitters
- * separated output contact

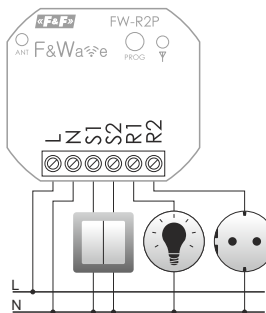


| | |
|-----------------------|------------------------------------|
| power supply | 85±265V AC/DC |
| control | triggered with L or N level |
| control pulse current | <1mA |
| power consumption | |
| on | 0.6W |
| standby | 0.25W |
| output load (AC-1) | 16A/250V |
| radio frequency | 868 MHz |
| working temperature | -25÷50°C |
| terminal | 2.5mm ² screw terminals |
| tightening torque | 0.4Nm |
| mounting | on TH-35 rail |
| dimensions | 1 module (18mm) |
| ingress protection | IP20 |

FW-R2P-P double multifunction relay



- * 2-channel multifunction relay:
 - bistable (ON/OFF)
 - monostable (pulse)
 - time (from 1 s to 48 h)
 - always ON
 - always OFF
- * each button/transmitter (local and remote) can perform a different function
- * controller can be linked with 32 transmitters

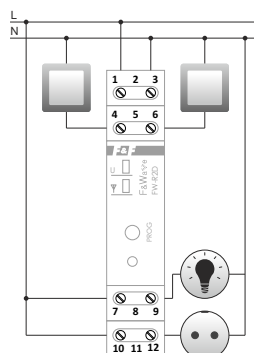


| | |
|-----------------------|------------------------------------|
| power supply | 85±265V AC/DC |
| control | triggered with L or N level |
| control pulse current | <1mA |
| power consumption | |
| on (2 relays) | 1W |
| standby | 0.25W |
| output load (AC-1) | 2×8A/250V |
| radio frequency | 868 MHz |
| working temperature | -25÷50°C |
| terminal | 2.5mm ² screw terminals |
| tightening torque | 0.4Nm |
| mounting | Ø60 flush-mounted box |
| dimensions | 43×48×20mm |
| ingress protection | IP20 |

FW-R2D-P double multifunction relay



- * 2-channel multifunction relay:
 - bistable (ON/OFF)
 - monostable (pulse)
 - time (from 1 s to 48 h)
 - always ON
 - always OFF
- * each button/transmitter (local and remote) can perform a different function
- * controller can be linked with 32 transmitters
- * 2 independent output contacts



| | |
|-----------------------|------------------------------------|
| power supply | 85±265V AC/DC |
| control | triggered with L or N level |
| control pulse current | <1mA |
| power consumption | |
| on (2 relays) | 1W |
| standby | 0.25W |
| output load (AC-1) | 2×16A/250V |
| radio frequency | 868 MHz |
| working temperature | -25÷50°C |
| terminal | 2.5mm ² screw terminals |
| tightening torque | 0.4Nm |
| mounting | on TH-35 rail |
| dimensions | 1 module (18mm) |
| ingress protection | IP20 |

ROLLER-BLIND CONTROLLERS

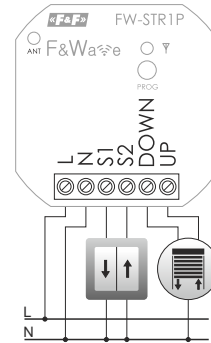
The group of roller-blind receivers is used for direct control of connected roller-blind drives in the "up/down/stop" function. Pressing a wall switch connected directly to the relay (local control) or a paired radio transmitter button (remote control: remote, battery wall switch or flush-mounted transmitter) forces the roller-blind to move in the selected direction. Pressing the button again while the roller-blind is in motion stops it in the current position.

There is also an option of central control, which means the ability to lower or raise a group of controllers associated with one central button of selected transmitters.

FW-STR1P-P 230V AC multifunction roller-blind controller



- * 230V drive controller
- * local and remote control:
 - 1-button
 - 2-buttons
 - 2-buttons central
- * lock function, preventing power from being applied to both motor windings
- * each button/transmitter (local and remote) can perform a different function
- * controller can be linked with 32 transmitters

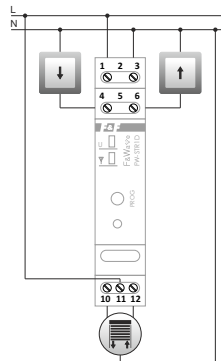


| | |
|---------------------|------------------------------------|
| power supply | 85÷265V AC/DC |
| control | triggered with L or N level |
| power consumption | |
| on | 1W |
| standby | 0.25W |
| output load | |
| AC-1 | 3A |
| AC-3 | 0.6A |
| radio frequency | 868 MHz |
| working temperature | -25÷50°C |
| terminal | 2.5mm ² screw terminals |
| tightening torque | 0.4Nm |
| mounting | Ø60 flush-mounted box |
| dimensions | 43×48×25mm |
| ingress protection | IP20 |

FW-STR1D-P 230V AC multifunction roller-blind controller



- * 230V drive controller
- * local and remote control:
 - 1-button
 - 2-buttons
 - 2-buttons central
- * lock function, preventing power from being applied to both motor windings
- * each button/transmitter (local and remote) can perform a different function
- * controller can be linked with 32 transmitters



| | |
|---------------------|------------------------------------|
| power supply | 85÷265V AC/DC |
| control | triggered with L or N level |
| power consumption | |
| on | 1W |
| standby | 0.25W |
| output load | |
| AC-1 | 8A |
| AC-3 | 1.5A |
| radio frequency | 868 MHz |
| working temperature | -25÷50°C |
| terminal | 2.5mm ² screw terminals |
| tightening torque | 0.4Nm |
| mounting | on TH-35 rail |
| dimensions | 1 module (18mm) |
| ingress protection | IP20 |

Touch wall-mounted remote control transmitter for Ø60 flush-mounted box

FW-GS-W-24 / FW-GS-W-230 white

FW-GS-B-24 / FW-GS-B-230 black

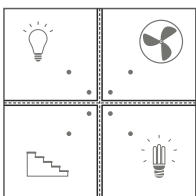
Remote control transmitter, designed to cooperate with all receivers of the F&Wave system.

Front panel made of glass. It operates on a contactless and touch basis. 230 V AC or 24 V DC local power supply. The transmitter has 4 touch zones, which are intended to local control SWITCH and central control ON/OFF (switches on/off and/or raises/lowers the paired receivers). Features of inputs are assigned in accordance with the selected operating program.



| Input | S1 | S2 | S3 | S4 |
|-------|--------|--------|--------|--------|
| Mode | | | | |
| A | SWITCH | SWITCH | SWITCH | SWITCH |
| B | ON | SWITCH | SWITCH | SWITCH |
| C | SWITCH | OFF | SWITCH | SWITCH |
| D | ON | OFF | SWITCH | SWITCH |

| | |
|---------------------------|------------------------------------|
| power supply | |
| FW-GS-W-24 / FW-GS-B-24 | 9÷30V AC/DC |
| FW-GS-W-230 / FW-GS-B-230 | 80÷265V AC/DC |
| power consumption | |
| on | 0.6W |
| standby | 0.25W |
| radio frequency | 868 MHz |
| working temperature | -25÷50°C |
| terminal | 2.5mm ² screw terminals |
| mounting | Ø60 flush-mounted box |
| dimensions | 81×81×12mm |
| ingress protection | IP20 |

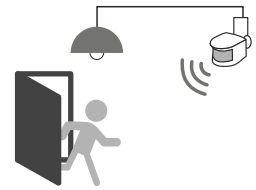


At the customer's special request, it is possible to make pictograms describing the touch zones according to their intended purpose.

MOTION SENSORS

PURPOSE

Motion sensors are used for automatic, time switching of lighting in the event of a person or other object appearing in such places as: corridors, courtyards, approaches and driveways, garages, etc. Using motion sensors for automatic switching of lighting makes it more convenient and cheaper to use.



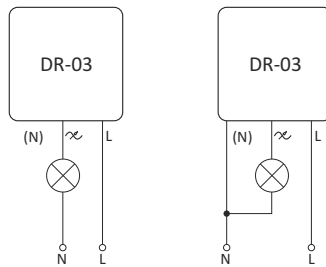
PIR (infrared)

FUNCTIONING

The sensor detects sources of infrared radiation. It analyzes such parameters as: the size of the object, the amount of emitted heat and the speed of movement between sectors of detection. Movement in the detection field automatically switches on the lighting for the time set by the user. After this time, the lighting will be switched off automatically. The motion sensor is equipped with an automatic dusk to dawn light control, preventing the controlled lighting from switching on during the day.

DR sensors can operate inside and outside in places where they are not exposed to direct rain or snow and where there is no risk of splashing the sensor housing and its electrical connection points with water or other liquid.

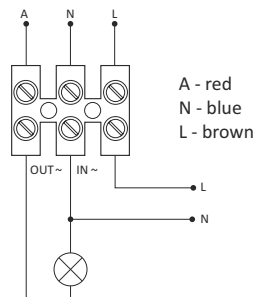
DR-03 WHITE



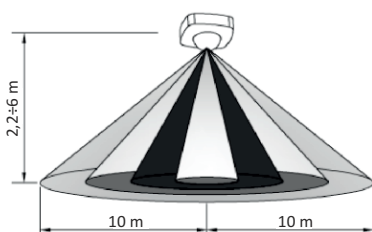
The DR-03 sensor can operate in 2-wire and 3-wire installations.

| | |
|-------------------------------------|---|
| power supply | 230 V AC |
| maximum load current (AC-1) | 3 A |
| twilight activation threshold | 3±2000 lx |
| motion detection | 0.6÷1.5 m/s |
| off time | 10s(±3s)÷7min.(±2min.) |
| vertical detection field | 160° |
| maximum detection distance (T<24°C) | 9m |
| sensor mounting height | 1.0÷1.8m |
| power consumption | 0.5W |
| terminal | 1.5mm ² screw terminals |
| tightening torque | 0.3 Nm |
| working temperature | -10÷40°C |
| dimensions | |
| external | 80×80×62mm |
| groove | ∅60mm, depth= 32mm |
| mounting hole | ∅60mm |
| screw spacing | 58mm |
| mounting | surface mounting or in ∅60 flush-mounted box |
| ingress protection | IP20 |

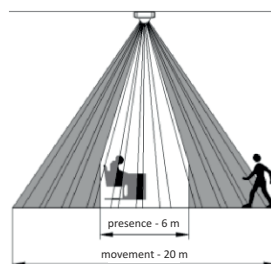
DR-09 ceiling



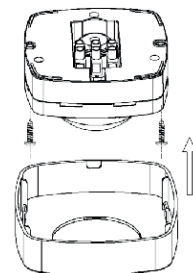
| | |
|-------------------------------------|------------------------------------|
| power supply | 230 V AC |
| maximum load current (AC-1) | 10 A |
| twilight activation threshold | 3±2000 lx |
| motion detection | 0,6÷1.5 m/s |
| off time | 3s÷9min.(±2min.) |
| vertical detection field | 360° |
| maximum detection distance (T<24°C) | 20m |
| sensor mounting height | h=2.2÷6.0m |
| power consumption | 0.5W |
| terminal | 1.5mm ² screw terminals |
| working temperature | -20÷40°C |
| dimensions | 102×102mm, h= 55mm |
| mounting | surface mounting |
| ingress protection | IP20 |



Detection field

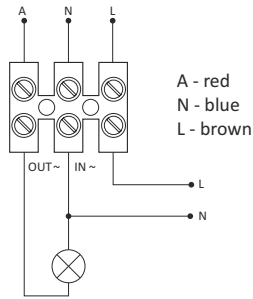


Direction of movement in the detection field



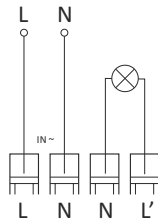
Mounting

DRM-07

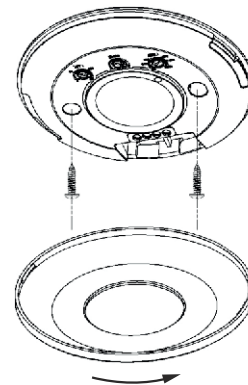
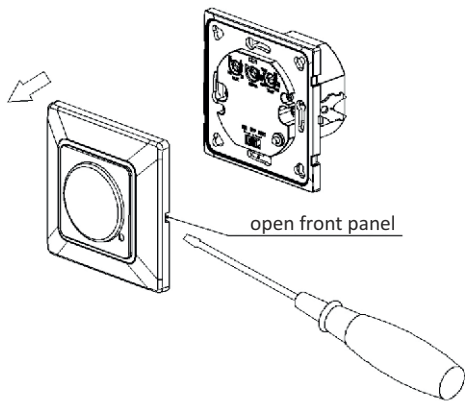


| | |
|--|------------------------------------|
| power supply | 230V AC |
| maximum load current (AC-1) | 6A |
| frequency of microwave radiation | 5.8GHz |
| power of radiation | <0,2mW |
| motion detection | 0.6÷1.5m/s |
| detection field | 180° |
| detection radius - adjustable (for h=1±1.8m) | 5÷50m |
| activation threshold - adjustable | 3÷2000lx |
| receiver activation time - adjustable | 10±3s÷12±1min. |
| activation delay | <1s |
| power consumption | 0.9W |
| terminal | 1.0mm ² screw terminals |
| working temperature | -25÷50°C |
| dimensions | |
| external | 80×80×48mm |
| groove | ∅=55mm, h=33mm |
| mounting hole | ∅60mm |
| screw spacing | 58mm |
| mounting | in ∅60 flush-mounted box |
| ingress protection | IP20 |

DRM-08



| | |
|---------------------------------------|------------------------------------|
| power supply | 230 V AC |
| maximum load current (AC-1) | 10A |
| frequency of microwave radiation | 5.8GHz |
| power of radiation | <10mW |
| motion detection | 0.6÷1.5m/s |
| detection field | 360° |
| detection radius - adjustable | 1÷8m |
| activation threshold - adjustable | 3÷2000lx |
| receiver activation time - adjustable | 10±3s÷12±1min. |
| activation delay | <1s |
| power consumption | 0.9W |
| terminal | 1.0mm ² screw terminals |
| working temperature | -25÷50°C |
| dimensions | ∅115; h=24mm |
| mounting | surface mounting |
| ingress protection | IP20 |



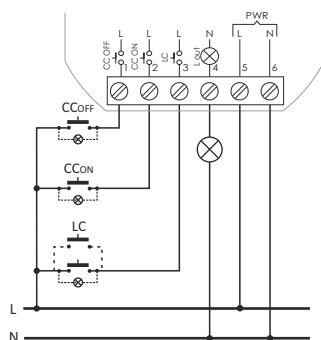
ELECTRONIC BISTABLE PULSE RELAYS

GROUP (HOTEL) with control inputs „SWITCHING EVERYTHING ON” and „SWITCHING EVERYTHING OFF”

PURPOSE

The relays are designed for group operation. A single relay allows you to switch on and off the controlled receiver after each current pulse caused by pressing the momentary (bell) button of the local control. The group system allows you to switch off or on all receivers connected to individual relays using the central control buttons.

BIS-412P for Ø60 flush-mounted box



| | |
|----------------------------|------------------------------------|
| power supply | 165±265V AC |
| contact | 1×NO |
| load current max (AC-1) | 16 A |
| control pulse current | <1 mA |
| maximum current of control | |
| buttons backlight | 5mA |
| activation delay | 0.1÷0.2s |
| power indication | green LED |
| power consumption | |
| standby | 0.15W |
| ON | 0.7W |
| working temperature | -15÷50°C |
| terminal | 2.5mm ² screw terminals |
| tightening torque | 0.4Nm |
| dimensions | Ø54 (48×43mm), h=25mm |
| mounting | flush-mounted box Ø60 |
| ingress protection | IP20 |

WARNING!

- i - a variant with a contact adapted for receivers with a large starting current, such as: LED lamps, ESL fluorescent lamps, electronic transformers, discharge lamps, etc.
 - M - a variant of relays with "memory" of the contact position, so that after switching on the power supply, the state of the relay that was in the moment of switching off the power will be restored.
- Relays powered by 230 V can cooperate with backlit buttons.

FUNCTIONING

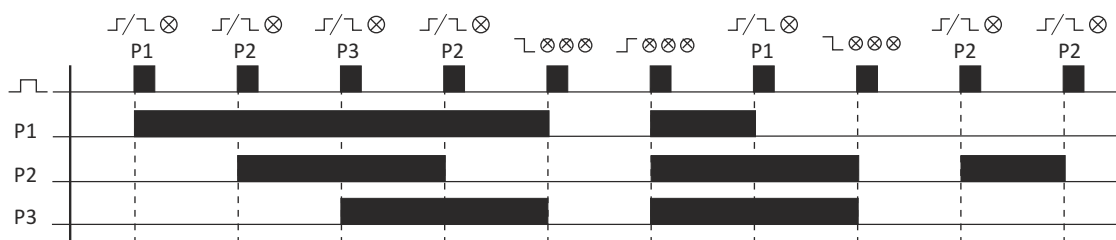
Local control

The receiver is switched on after the current pulse caused by pressing one, any momentary button from the local control group. The relay contact will switch on. After the next impulse, the contact will switch off.

Central control

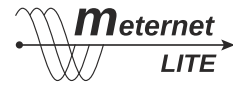
SWITCH EVERYTHING OFF - after the current pulse caused by pressing the momentary button, all receivers individually controlled by relays will be switched off (regardless of their state - switched off or on).

SWITCH EVERYTHING ON - after the current pulse caused by pressing the momentary push-button, all receivers individually controlled by relays will be switched on (regardless of their state - switched off or on).



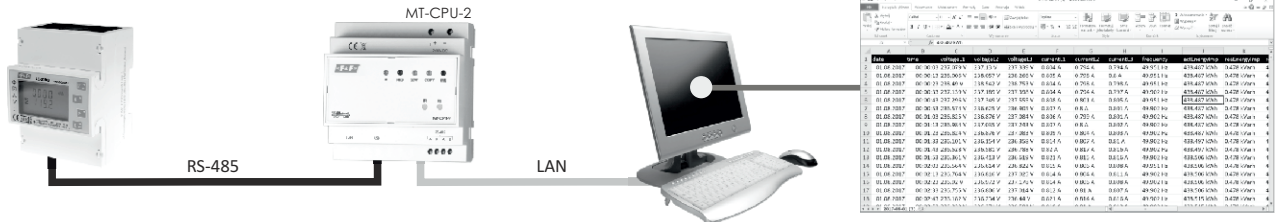
REMOTE READING AND REGISTRATION SYSTEM

MeternetLITE



PURPOSE

The MeternetLITE program is used for remote reading and recording of the indication values of a single F&F measuring device. The program along with the database is installed on a special server MT-CPU-2, which works in the local network. The software user interface is a web application (website). The program can be accessed via any web browser. The archive is available in the form of .csv files (opened for example in Excel).



The MT-CPU-2 server is the central unit of the system. The server is a LAN network device. It can be accessed from LAN via any web browser. It communicates with the selected measuring device via the built-in port and the RS-485 wired bus. In the case of a LAN with a router and a public IP address, it is possible to read and import data via the Internet.

The server send queries to the measurement device and records the results to the internal memory in accordance with the designated interval. Registration is started automatically after each server startup and after making changes to the readout configuration and saving them. Every hour the data from the internal memory is added to the current archive file. Archive files are created separately for each day. Files can be imported to a computer as .csv files. The data can be freely shaped according to the program functions of Excel or other database program. In the absence of physical computer network communication with the server, it is possible to copy registration files to external flash memory (pendrive).

| Nazwa | Wartosc |
|----------------------|---------------------|
| Cieplo | 2017-08-01 15:05:00 |
| Napięcie L1 [V] | 218.71 V |
| Napięcie L2 [V] | 218.793 V |
| Napięcie L3 [V] | 218.997 V |
| Fazc L1 [A] | 0.716 A |
| Fazc L2 [A] | 0.709 A |
| Fazc L3 [A] | 0.776 A |
| Moc Ciepłota L1 [kW] | 0.0 KW |
| Moc Ciepłota L2 [kW] | 0.0 KW |
| Moc Ciepłota L3 [kW] | 0.0 KW |
| Moc Bioma L1 [Watt] | 0.0 W |
| Moc Bioma L2 [Watt] | 0.0 W |

| Nazwa | Rozmiar | Opisany zapis | Policz | Konaj |
|----------------|---------|---------------------|--------|-------|
| 2017-08-01.csv | 1378 KB | 2017-08-01 15:08:10 | ▲ | ■ |
| 2017-07-31.csv | 5383 KB | 2017-07-31 23:59:50 | ▲ | ■ |
| 2017-07-30.csv | 4237 KB | 2017-07-30 23:59:50 | ▲ | ■ |
| 2017-07-29.csv | 4728 KB | 2017-07-29 23:59:50 | ▲ | ■ |
| 2017-07-28.csv | 5429 KB | 2017-07-28 23:59:50 | ▲ | ■ |
| 2017-07-27.csv | 2688 KB | 2017-07-27 16:59:50 | ▲ | ■ |
| 2017-07-26.csv | 7362 KB | 2017-07-26 23:59:50 | ▲ | ■ |
| 2017-07-25.csv | 5563 KB | 2017-07-25 23:59:50 | ▲ | ■ |

Ustawienia

Obsługa

Sort

Czas

Hasła

Ustawienia odczytów

Uzyczenie

LEDMOCT

Cykl

Minutami

Minuty

00-2 minut

Zapisz

MEASURING DEVICES

The system works with the following devices:

- LE-01MP 1-phase 100A
- LE-01MR 1-phase 100A
- LE-03MP 3-phase 60A
- LE-01MQ 1-phase 100A 2-way
- LE-03MQ 3-phase 100A 2-way
- LE-03MQ-CT 3-phase 5A transformer; 2-way

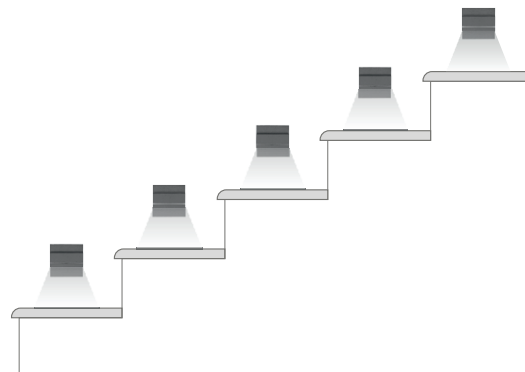
LED STAR LIGHTS

PURPOSE

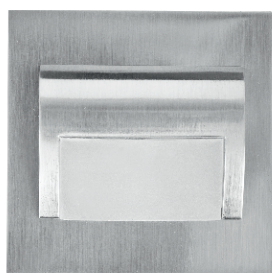
LED stair lights are parts of functional and decorative lighting in such places as: stairs, corridors, public buildings, etc. The use of LED stair lights makes lighting more convenient and cheaper to use.

FUNCTIONING

LED stair lights are equipped with a dimming feature - changing the supply voltage changes the brightness of the lighting. Combined with dedicated control automation, including AS-225 stair sequential controller or selected F&Wave radio control units you can adjust the brightness as well as achieve a smooth lightening and dimming effect.



INGA with dimming feature



satin



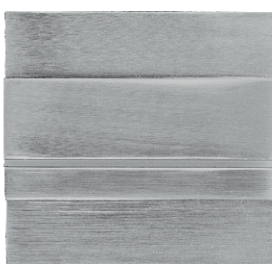
white



anthracite

| | |
|------------------------------|-----------------------|
| power supply | 12 V DC |
| power consumption | 1.2 W |
| color temperature | |
| warm | 3000 K |
| cold | 6000 K |
| luminous flux | 100 lm |
| number of switchings | >40.000 |
| time of illumination to 100% | <0.5s |
| working temperature | 0÷40°C |
| dimensions | |
| external | 74×74×12mm |
| feather | Ø60mm, depth >40mm |
| mounting hole | Ø60mm |
| screw spacing | 58mm |
| mounting | Ø60 flush-mounted box |
| ingress protection | IP20 |

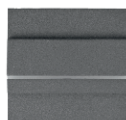
LINA with dimming feature



satin



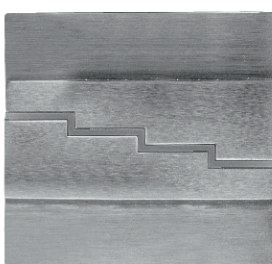
white



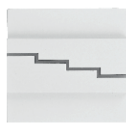
anthracite

| | |
|------------------------------|-----------------------|
| power supply | 12 V DC |
| power consumption | 1.2 W |
| color temperature | |
| warm | 3000 K |
| cold | 6000 K |
| luminous flux | 100 lm |
| number of switchings | >40.000 |
| time of illumination to 100% | <0.5s |
| working temperature | 0÷40°C |
| dimensions | |
| external | 85×75×6mm |
| feather | Ø60mm, depth >40mm |
| mounting hole | Ø60mm |
| screw spacing | 58mm |
| mounting | Ø60 flush-mounted box |
| ingress protection | IP20 |

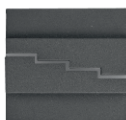
MAYA with dimming feature



satin



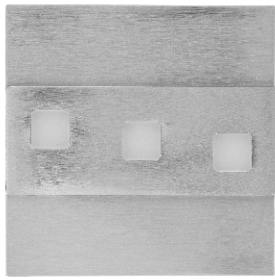
white



anthracite

| | |
|------------------------------|-----------------------|
| power supply | 12 V DC |
| power consumption | 1.2 W |
| color temperature | |
| warm | 3000 K |
| cold | 6000 K |
| luminous flux | 100 lm |
| number of switchings | >40.000 |
| time of illumination to 100% | <0.5s |
| working temperature | 0÷40°C |
| dimensions | |
| external | 85×75×6mm |
| feather | Ø60mm, depth >40mm |
| mounting hole | Ø60mm |
| screw spacing | 58mm |
| mounting | Ø60 flush-mounted box |
| ingress protection | IP20 |

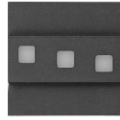
VIKA with dimming feature



satin



white



anthracite

| | |
|------------------------------|-----------------------|
| power supply | 12 V DC |
| power consumption | 1.2 W |
| color temperature | |
| warm | 3000 K |
| cold | 6000 K |
| luminous flux | 100 lm |
| number of switchings | >40.000 |
| time of illumination to 100% | <0.5s |
| working temperature | 0÷40°C |
| dimensions | |
| external | 75×75×4mm |
| feather | Ø60mm, depth >40mm |
| mounting hole | Ø60mm |
| screw spacing | 58mm |
| mounting | Ø60 flush-mounted box |
| ingress protection | IP20 |

Product symbols overview

| Product name | Inga | | | | | | Lina | | | | | | Maya | | | | | | Vika | | | | | |
|-------------------|-------|------|-------|------|------------|------|-------|------|-------|------|------------|------|-------|------|-------|------|------------|------|-------|------|-------|------|------------|------|
| | satin | | white | | anthracite | | satin | | white | | anthracite | | satin | | white | | anthracite | | satin | | white | | anthracite | |
| Color temperature | cold | warm | cold | warm | cold | warm | cold | warm | cold | warm | cold | warm | cold | warm | cold | warm | cold | warm | cold | warm | cold | warm | cold | warm |
| LS-ISC | ◆ | | | | | | | | | | | | | | | | | | | | | | | |
| LS-ISW | | ◆ | | | | | | | | | | | | | | | | | | | | | | |
| LS-IWC | | | ◆ | | | | | | | | | | | | | | | | | | | | | |
| LS-IWW | | | | ◆ | | | | | | | | | | | | | | | | | | | | |
| LS-IAC | | | | | ◆ | | | | | | | | | | | | | | | | | | | |
| LS-IAW | | | | | | ◆ | | | | | | | | | | | | | | | | | | |
| LS-LSC | | | | | | | ◆ | | | | | | | | | | | | | | | | | |
| LS-LSW | | | | | | | | ◆ | | | | | | | | | | | | | | | | |
| LS-LWC | | | | | | | | | ◆ | | | | | | | | | | | | | | | |
| LS-LWW | | | | | | | | | | ◆ | | | | | | | | | | | | | | |
| LS-LAC | | | | | | | | | | | ◆ | | | | | | | | | | | | | |
| LS-LAW | | | | | | | | | | | | ◆ | | | | | | | | | | | | |
| LS-MSC | | | | | | | | | | | | | ◆ | | | | | | | | | | | |
| LS-MSW | | | | | | | | | | | | | | ◆ | | | | | | | | | | |
| LS-MWC | | | | | | | | | | | | | | | ◆ | | | | | | | | | |
| LS-MWW | | | | | | | | | | | | | | | | ◆ | | | | | | | | |
| LS-MAC | | | | | | | | | | | | | | | | | ◆ | | | | | | | |
| LS-MAW | | | | | | | | | | | | | | | | | | ◆ | | | | | | |
| LS-VSC | | | | | | | | | | | | | | | | | | | ◆ | | | | | |
| LS-VSW | | | | | | | | | | | | | | | | | | | | ◆ | | | | |
| LS-VWC | | | | | | | | | | | | | | | | | | | | | ◆ | | | |
| LS-VWW | | | | | | | | | | | | | | | | | | | | | | ◆ | | |
| LS-VAC | | | | | | | | | | | | | | | | | | | | | | | ◆ | |
| LS-VAW | | | | | | | | | | | | | | | | | | | | | | | | ◆ |

Legend (example markings):

LS-ISC: LS - staircase lamp, I - Inga (product name), S - satyna (casing color), C - cold (color temperature)

LS-VAW: LS - staircase lamp, V - Vika (product name), A - anthracite (casing color), W - warm (color temperature)

cold color temperature (cold) => approx. 6000 K,

warm color temperature (warm) => approx. 3000 K

AUTOMATIC TRANSFER SWITCHING EQUIPMENT

PURPOSE

Automatic transfer switching equipment is used to control the work performance and accuracy of power lines and automatic switching power supply facility sources in the event of power line parameters decrease or total loss of voltage on the line.

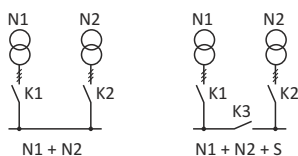
SZR-278

The SZR-278 is designed for automatic switching of power sources operating in the N1 + N2 or N1 + N2 + S configuration.



| | |
|-----------------------------------|------------------------------------|
| controlled lines | 3×400V+N |
| supply voltage | 24÷264V AC |
| maximum voltage | 450V AC |
| frequency | 45÷55Hz |
| number of controlled lines | 2 |
| number of relay outputs | 4×NO/NC |
| maximum coil current of contactor | 2A |
| lower voltage threshold | 150÷210V AC |
| upper voltage threshold | 270V AC |
| lower switch off time | 1÷15s |
| upper switch off time | 0.3s |
| line switching time | 0.1÷5s |
| voltage asymmetry | 80V |
| switch-off time at voltage drop | 0.1s |
| power consumption | 4W |
| working temperature | -25÷50°C |
| terminal | 2.5mm ² screw terminals |
| tightening torque | 0.4Nm |
| dimensions | 6 modules (105mm) |
| mounting | on TH-35 rail |
| ingress protection | IP20 |

OPERATING MODES

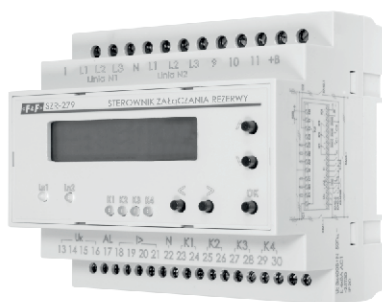


FEATURES OF THE CONTROLLER

- * Phase presence control;
- * Phase sequence control;
- * Phase asymmetry control;
- * Monitoring of the minimum and maximum phase voltage;
- * Control of contactors or switches with motor drive;
- * Monitoring of contactors condition;
- * Monitoring of the operation of circuit breakers;
- * Can operate from an external power source;
- * Operation in voltage range from 24 to 450 V;
- * Can be used in 1-phase circuits;
- * Automatic switching of reserve power in accordance with the specified algorithm;
- * Protection of receivers from voltage above 400 V;
- * Setting the operation time of the reserve switching system after switching off and restoring the main power supply;
- * Manual control of actuators;
- * Indication of the presence and correctness of input voltages;
- * Status indicators (on/off/failure) of actuators;
- * Software block against simultaneous switching on contactors;

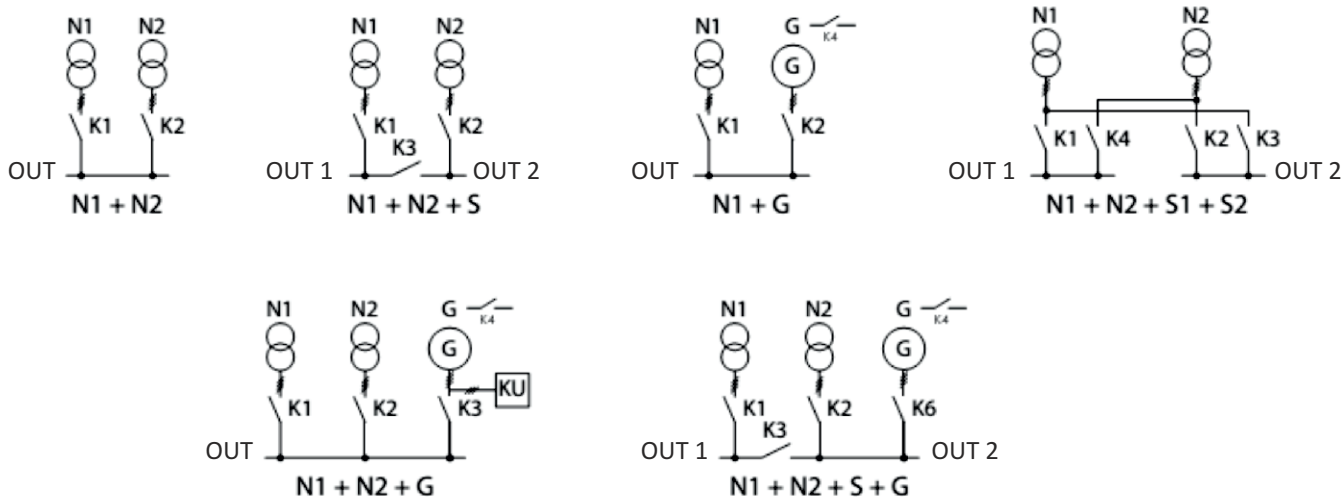
SZR-279

The SZR-279 reserve switching controller is designed for automatic switching of power sources in system of one or two power supply lines with the additional feature of controlling an emergency generator.



| | |
|-----------------------------------|------------------------------------|
| controlled lines | 3×400V+N |
| supply voltage | 24÷264V AC |
| maximum voltage | 450V AC |
| frequency | 45÷55Hz |
| number of controlled lines | 2 |
| number of relay outputs | 4×NO/NC, 1×NO |
| maximum coil current of contactor | 2A |
| lower voltage threshold | 150÷210V AC |
| upper voltage threshold | 230÷300V AC |
| lower switch off time | 2÷30s |
| upper switch off time | 0.3÷10s |
| line switching time | 0.3÷30s |
| voltage asymmetry | 20÷100V |
| generator start-up time | 5÷100s |
| generator shutdown time | 10÷200s |
| switch-off time at voltage drop | 4s |
| power consumption | 6W |
| working temperature | -25÷50°C |
| terminal | 2.5mm ² screw terminals |
| tightening torque | 0.4Nm |
| dimensions | 6 modules (105mm) |
| mounting | on TH-35 rail |
| ingress protection | IP20 |

OPERATING MODES



FEATURES OF THE CONTROLLER

- * Phase presence control;
- * Phase sequence control;
- * Phase asymmetry control;
- * Monitoring of the minimum and maximum phase voltage;
- * Control of contactors or switches with motor drive;
- * Monitoring of contactors condition;
- * Monitoring of the operation of circuit breakers;
- * Generator start signal;
- * ALARM output;
- * Controller settings locked with a PIN code;
- * Can operate from an external power source;
- * Operation in voltage range from 24 to 450 V;
- * Can be used in 1-phase circuits;
- * Automatic switching of reserve power in accordance with the specified algorithm;
- * Protection of receivers from voltage above 400 V;
- * Setting the operation time of the reserve switching system after switching off and restoring the main power supply;
- * Manual control of actuators;
- * Indication of the presence and correctness of input voltages;
- * Status indicators (on/off/failure) of actuators;
- * Indication of operating modes;
- * Software block against simultaneous switching on contactors;
- * Separated signaling and alarm outputs;
- * Monitoring of the backup line from the generator.

FLC PROGRAMMABLE CONTROLLERS

PURPOSE

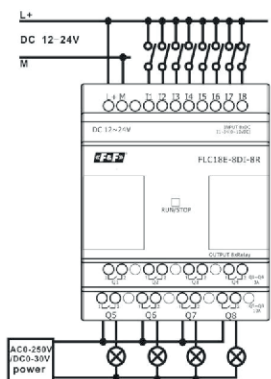
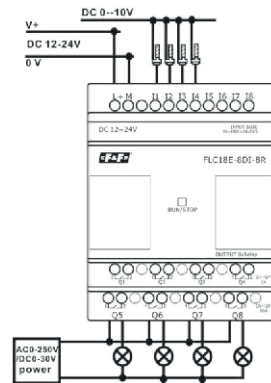
FLC is a universal, programmable logic controller, which can control the elements of domestic and industrial electrical installation (for example lighting control, roller blind control, watering the garden, control of simple machines). With the built-in user panel it does not require combining with costly external panels, while at the same time providing a user with a preview and configuration of the control system parameters. The controller is equipped with advanced communication interfaces and allows for easy connection to professional visualization stations (using the Modbus protocol).



HARDWARE RESOURCES TABLE

| Model | FLC12 8DI-4R | FLC18 12DI-6R | FLC18 E-8DI-8TN | FLC18 E4AI-I | FLC18 E3-PT-100 | FLC18 E-RS485 | FLC18 E-2AQ-VI |
|----------------------|-------------------------|---------------------------------|------------------------|------------------|-----------------|---------------|---|
| Type | CPU | | | Expansion module | | | |
| Power supply | 12÷24V DC | | | | | | |
| Digital inputs | 8 | 12 | 8 | - | - | RS-485 | - |
| Analog inputs | 4 | 6 | 4 | 4 | 4 | - | - |
| Analog inputs type | voltage (0÷10 V DC) | | current (0/4÷20 mA) | | PT-100 | - | - |
| Digital outputs | 4 | 6 | 8 | - | - | - | - |
| Digital outputs type | relay (10A/250 V AC) | transistor (PNP, 3A/60 V DC) | - | - | - | - | - |
| Analog outputs | - | - | - | - | - | - | 2 |
| Analog outputs type | - | - | - | - | - | - | voltage (0÷10 V DC) or current (0/4÷20 mA) |
| Fast meter | 4 | - | - | - | - | - | - |
| PWM | - | YES | - | - | - | - | - |
| RTC | YES | - | - | - | - | - | - |
| LCD | YES | - | - | - | - | - | - |

FLC18E 8DI-8R EXPANSION MODULE OF ANALOG-DIGITAL INPUTS/OUTPUTS



| | |
|--|-------------------------------------|
| power supply | 12÷24 V DC |
| resistance to temporary power failure | 5 ms |
| starting current | 250 mA |
| power | 3.5÷4 W |
| inputs | |
| total number of inputs | 8 (I1÷I8) |
| number of digital inputs | 8 (I1÷I8) |
| number of analog inputs | 4 (I1÷I4) (0÷10 V DC) |
| input voltage range | 0÷28.8 V DC |
| input type | resistive |
| isolation between input and power supply | resistance |
| isolation between inputs | no |
| I1÷I4 analog inputs | |
| measuring range | 0÷10 V DC |
| maximum input voltage | 28.8 V DC |
| input impedance | 34÷72 kΩ |
| resolution | 9 Bit |
| voltage accuracy at 25°C | 30 mV |
| voltage accuracy at 55°C | 60 mV |
| outputs | |
| number of outputs | 8 (Q1÷Q8) |
| output type | PNP transistor |
| continuous current, resistive load | 300 mA |
| continuous current, inductive load | 2 A |
| operating voltage (AC) | 250 V |
| operating voltage (DC) | 48 V |
| acceptable power load | 300 W |
| electrical life, resistive load | 10 ⁵ cycles |
| mechanical durability | 10 ⁷ cycles |
| switching speed (mechanical) | 10 Hz |
| short-circuit protection or surge protection | none |
| other parameters | |
| cooperation with the CPU modules | YES |
| working temperature | -25÷50°C |
| dimensions | 71.5×90×58 mm |
| weight | 300 g |
| terminal | 2.5 mm ² screw terminals |
| tightening torque | 0.4 Nm |
| ingress protection | IP20 |

ELECTRIC SUPPLIERS AND TRANSFORMERS

ZI-15, ZI-16, ZI-17, ZI-20, ZI-21 12W PULSE



| Type | Output voltage | Current |
|-------|----------------|---------|
| ZI-15 | 15V DC | 0.8A |
| ZI-16 | 13.5V DC | 0.9A |
| ZI-17 | 14.5V DC | 0.8A |
| ZI-20 | 12V DC | 1.0A |
| ZI-21 | 24V DC | 0.5A |

| | |
|---------------------|---|
| input voltage | 100÷264V AC |
| output power | 12W |
| current limit | I _{max} =110% I _{out} |
| working temperature | -10÷40°C |
| terminal | 2.5mm ² screw terminals |
| tightening torque | 0.4 Nm |
| dimensions | 1 module (18mm) |
| weight | 80g |
| mounting | on TH-35 rail |
| ingress protection | IP20 |

ZI 10-12P / ZI 20-12P PULSE POWER SUPPLY FOR FLUSH-MOUNTED BOX



| Type | Power | Current |
|-----------|-------|---------|
| ZI-10-12P | 10W | 0.85A |
| ZI-20-12P | 20W | 1.7A |

| | |
|--|------------------------------------|
| input voltage | 185÷265V AC |
| output voltage | 12V DC |
| efficiency | 82% |
| starting current | 4A/20ms |
| leakage current | 1mA |
| accuracy of output voltage stabilization | 3% |
| overload | 140÷160% I _{out} /10s |
| thermal protection threshold | 70÷80°C |
| working temperature | -20÷35°C |
| terminal | 2.5mm ² screw terminals |
| tightening torque | 0.4 Nm |
| dimensions | Ø54 (48×43mm), h=25mm |
| mounting | Ø60 flush-mounted box |
| ingress protection | IP20 |

PROTECTION

- * Overload – in the case of overload or short circuit, the output voltage is automatically disconnected. The power supply cyclically attempts to switch on the power supply and when the cause of the protection ceases, the rated supply voltage is restored;
- * Thermal – cuts off the output voltage. When the temperature drops to a safe value, the output voltage will be restored.

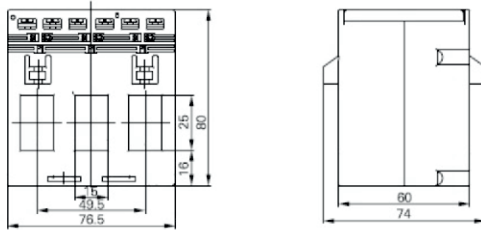
CURRENT TRANSFORMERS

THREE-PHASE

PURPOSE

The 3-phase current transformer (3 in 1) is used for indirect measurements of three-phase currents. Its design allows for mounting directly on the outputs of the power switches (ABB series Isomax, Merlin Gerlin series NS and similar), saving installation time and place in the switchgear.

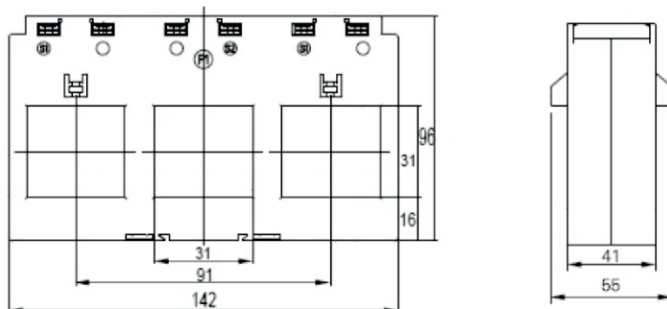
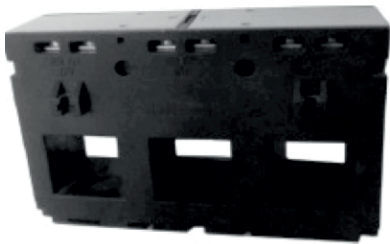
TP-100 / TP-150 / TP-200



| | |
|--------------------------------------|-------------------------------------|
| norm number | IEC 60044-1 |
| nominal secondary current Is | 5A |
| rated voltage | 720V AC |
| insulation breakdown voltage | 3kV/1min. |
| frequency | 50/60Hz |
| safety factor | <5 |
| thermal short-circuit current (Ith) | 60×In |
| dynamic short-circuit-current (Idyn) | 2,55×Ith |
| working temperature | -5÷40°C |
| S1/S2 terminal | 4.0 mm ² screw terminals |
| tightening torque | 0.5 Nm |
| mounting | DIN rail/switchboard/wire |
| position | vertical/horizontal |
| ingress protection | IP20 |

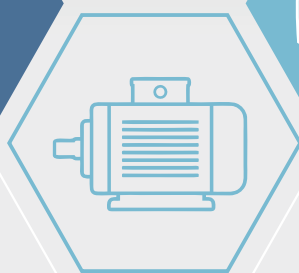
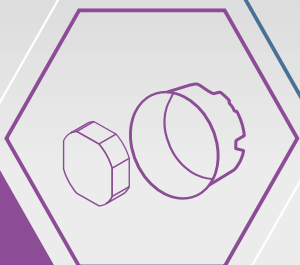
| Type | Transformer Ip/Is | Class | Power [VA] | Dimensions of P1/P2 holes [mm] | Dimensions W×H×D [mm] | Weight [kg] |
|--------|-------------------|-------|------------|--------------------------------|-----------------------|-------------|
| TP-100 | 100/5 | 1.0 | 1.5 | 15×21 | 76.5×74×80 | 0.452 |
| TP-150 | 150/5 | 1.0 | 2.5 | 15×21 | 76.5×74×80 | 0.452 |
| TP-200 | 200/5 | 1.0 | 2.5 | 15×21 | 76.5×74×80 | 0.452 |

TP-400 / TP-600



| | |
|--------------------------------------|-------------------------------------|
| norm number | IEC 60044-1 |
| nominal secondary current Is | 5A |
| rated voltage | 720V AC |
| insulation breakdown voltage | 3kV/1min. |
| frequency | 50/60Hz |
| safety factor | <5 |
| thermal short-circuit current (Ith) | 60×In |
| dynamic short-circuit-current (Idyn) | 2,55×Ith |
| working temperature | -5÷40°C |
| S1/S2 terminal | 4.0 mm ² screw terminals |
| mounting | DIN rail/switchboard/wire |
| position | vertical/horizontal |
| ingress protection | IP20 |

| Typ | Transformer Ip/Is | Class | Power [VA] | Dimensions of P1/P2 holes [mm] | Dimensions W×H×D [mm] | Weight [kg] |
|--------|-------------------|-------|------------|--------------------------------|-----------------------|-------------|
| TP-400 | 400/5 | 1.0 | 3,75 | 31×31 | 142×55×96 | 0,570 |
| TP-600 | 600/5 | 1.0 | 3,75 | 31×31 | 142×55×96 | 0,570 |



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