

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.).

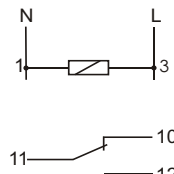
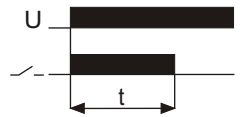
Operation mode: LAGGED DEACTIVATION

PCA-512

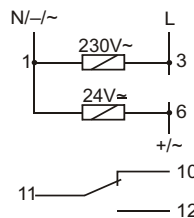
PCA-514

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



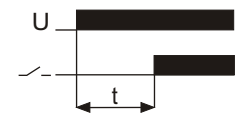
PCA-514

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

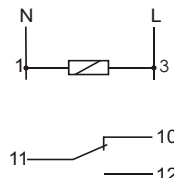
FUNCTIONING

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.

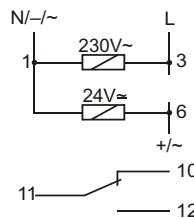


PCR-513

PCR-515



PCR-513

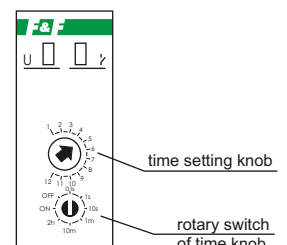


PCR-515

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)**

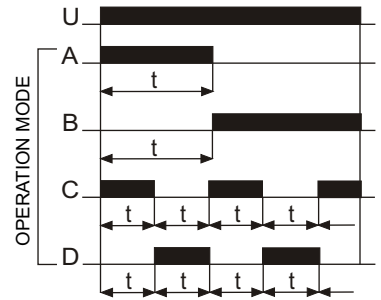
Until the relay is activated, the contact remains in the 11-10 (and 8-7 for PCU-510) position. After the power voltage is supplied, contact is shifted to position 11-12 (and 8-9 for PCU-510) and the countdown of the preset value *t* is commenced. After the preset time *t* has been counted down, contact 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)**

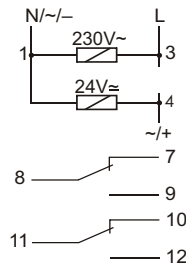
The LA operational mode is triggered in equal interruption/work cycles according to the preset time values.

***LAGGED DEACTIVATION - CYCLIC (CA)**

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

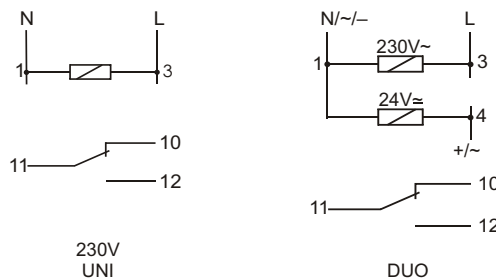


PCU-510



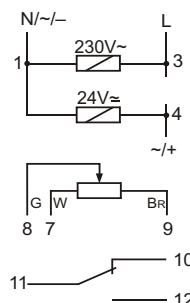
supply PCU-510 DUO	230V AC / 24V AC/DC
current load	2x(<5A)
contacts	2 C/O
operation time	0,1sec+24day
activation lag delay functions	<50msec
power supply indicator	green LED
operation mode indicator	red LED
power consumption	0,8W
working temperature	-25+50°C
connection	screw terminals 2,5mm ²
dimensions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

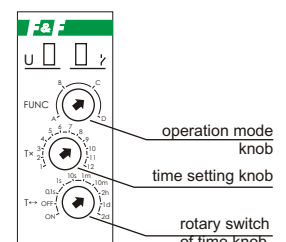
PCU-518 WITH EXTERNAL TIME SETTING KNOB



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	cable 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)**

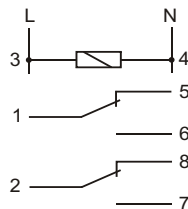
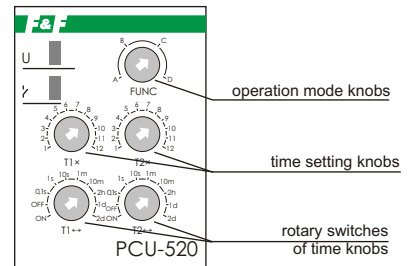
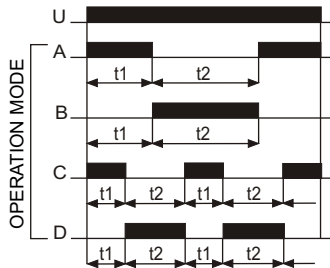
Until the relay is activated, the contact remains in the 1-5 and 2-8 position. After the power voltage is supplied (the green "U" LED lights up), the contact is shifted to position 1-6 and 2-7 and the countdown of the preset value *t* is commenced (the red LED lights up). The working sequence of the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

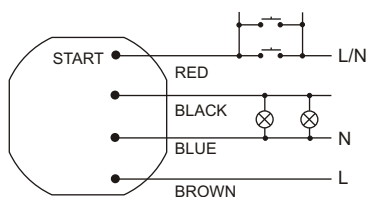
*The newly set time range is active after the power supply has been turned off and on.

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

MULTI-FUNCTION; MULTI-RANGE

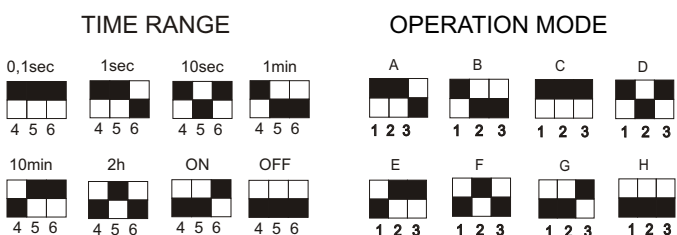
PCS-506 8 FUNCTION

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).



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.*

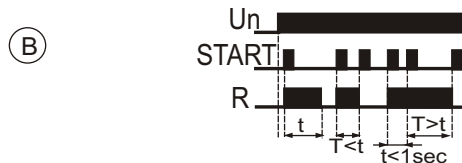
**The newly set time range is active after the power supply has been turned off and on.*

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

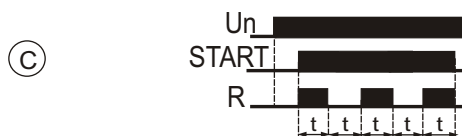
supply	230V AC
current load	<10A
contacts	1 N/O
operation time	0,1sec+24h
activation lag delay function	<50msec
power supply indicator	green LED
operation mode indicator	red LED
power consumption	0,8W
working temperature	-25+50°C
connection	4×1mm ² ; l=10cm
dimensions	Ø55, h=13mm
fixing	to under plaster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



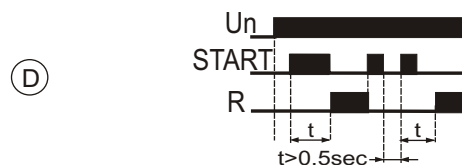
Presence simulator. When the START signal is being applied, the system turns the relay on and off at random for a period of 20sec. up to 20 min. The sequence in question is initiated by activation of the relay. After the START signal is discontinued, the system turns the relay off. The device does not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



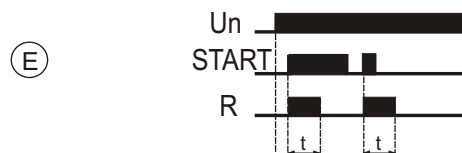
Bistable relay with step automatic module. A single pressing of the START button results in activating the relay for the preset time. A further START impulse generated during the countdown will deactivate the relay. Two START impulses applied within a time shorter than 1sec. will result in the permanent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



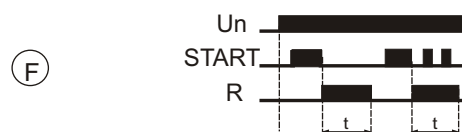
Generator with a pulse duty factor of 50% which initiates its working sequence from the moment of activation. It is active as long as START voltage is applied. Once the START signal is disconnected, the connection is broken and the device is deactivated.



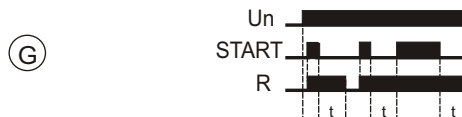
Lagged activation of the relay with the START signal. When the relay is active, another START impulse will turn it off. The following START impulse causes a repetition of the time countdown sequence and activation of the relay. The interval between the trailing edge of the reset signal and the leading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



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.



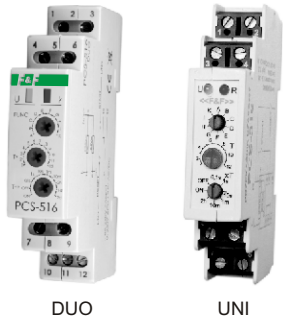
Lag in deactivation with support function enabled. The leading edge of the START signal results in relay activation, whereas the trailing edge of the same signal triggers the time countdown. The supply of the START signal during countdown results in an extension of the cycle by another t time value along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



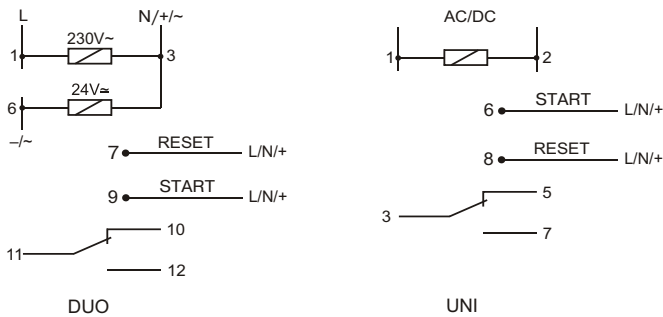
Deactivation and activation lags with support function enabled. If the START voltage is supplied for less than 45sec., it is ignored by the system, however if it is longer, the relay is activated after the 45sec. and the preset time value is counted down with the trailing edge of the START signal. If 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



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.



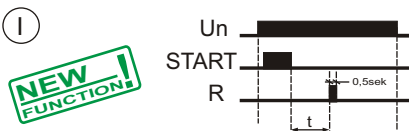
supply	PCS-516 DUO	230V AC / 24V AC/DC
	PCS-516 UNI	12+264V AC/DC
current load		<10A
contacts		1 C/O
operation time		0,1sec+24day
activation lag delay function		<50msec
power supply indicator		green LED
operation mode indicator		red LED
power consumption		0,8W
working temperature		-25+50°C
connection		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.



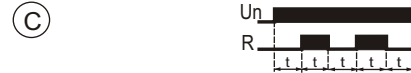
LAGGED ACTIVATION

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.



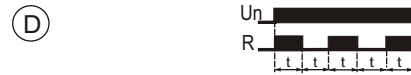
LAGGED DEACTIVATION

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.



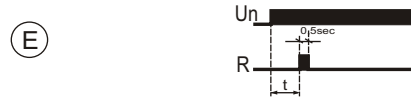
LAGGED ACTIVATION - CYCLIC

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

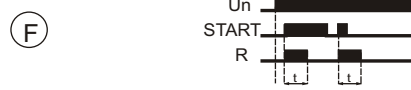


LAGGED DEACTIVATION - CYCLIC

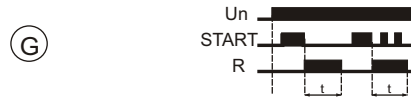
The LD operational mode is triggered in equal interruption/work cycles according to preset time values.



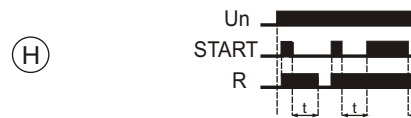
0,5sec. impulse generation after preset time *t*



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.



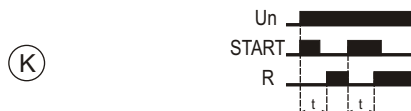
Generation of a single impulse of *t* time by the START signal trailing edge. During preset time countdown, the system does not respond to START impulses.



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.



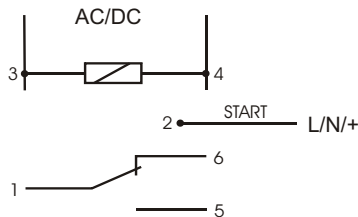
Deactivation and activation lags with support function enabled. If the START voltage is supplied for less than 45sec., it is ignored by the system, however if it is longer, the relay is activated after the 45sec and the preset time value is counted down with the trailing edge of the START signal. If 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
contacts	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



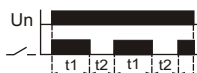
Until the supply voltage is applied, the contact remains in 1-6 position. Once the voltage is applied, the contact is switched to position 1-5 (actuation) and countdown of the preset delay time t is commenced. The next run of the relay's working sequence is operable when the supply voltage is reinstated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



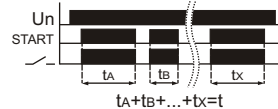
Contact actuation (pos. 1-5) for time t by the leading edge of the START signal.

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.

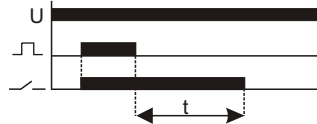
LAGGED-PULSE TIME RELAYS

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.

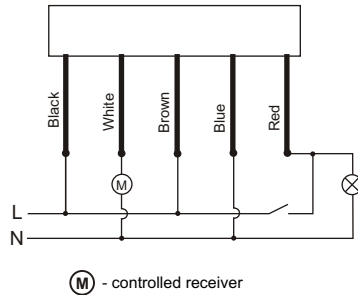
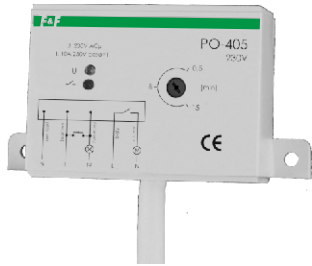
FUNCTIONING

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

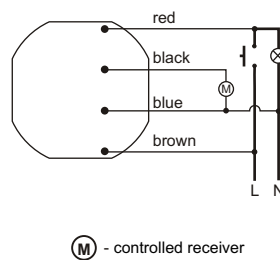
With cable connection.



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

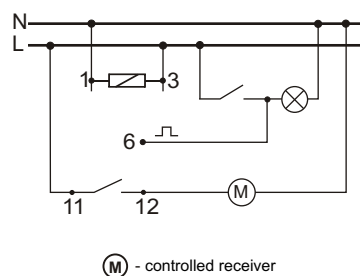
To under plaster box.



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