PCM-07/U TIME RELAY

INSTRUCTION MANUAL

Zakład Mechaniki i Elektroniki
ZAMEL sp.j.
J.W. Dzida, K. Łodzińska

ul. Zielona 27, 43-200 Pszczyna, Poland
Tel. +48 (32) 210 46 65, Fax +48 (32) 210 80 04
www.zamelcet.com, e-mail: marketing@zamel.pl

DESCRIPTION

The multifunctional digital time relay PCM-07/U has a time function in automation and control systems. It is equipped with 25 independent operating modes released by power supply voltage or an external impulse command on S terminal (coming from L or N line). It has a really wide time adjustment range from 0,1 sec. to 99 h 59 min. 59,9 sec. And it has permanent switch on / switch off functions by means of IN input. The mode change is possible without waiting for the current cycle to be finished.

FEATURES

- 25 operating modes (external release or from power supply voltage),
- double-modular casing with a security cover,
- S input (start) and an additional IN control input (permanent switch on / switch off),
- time measure accuracy,
- wide time adjustment range,
- permanent switch on or switch off function,
- voltage relay output – two change over contacts of max 16 A capacity,
- LCD display backlight,
- double-modular casing,
- TH-35 DIN rail installation.

CAUTION

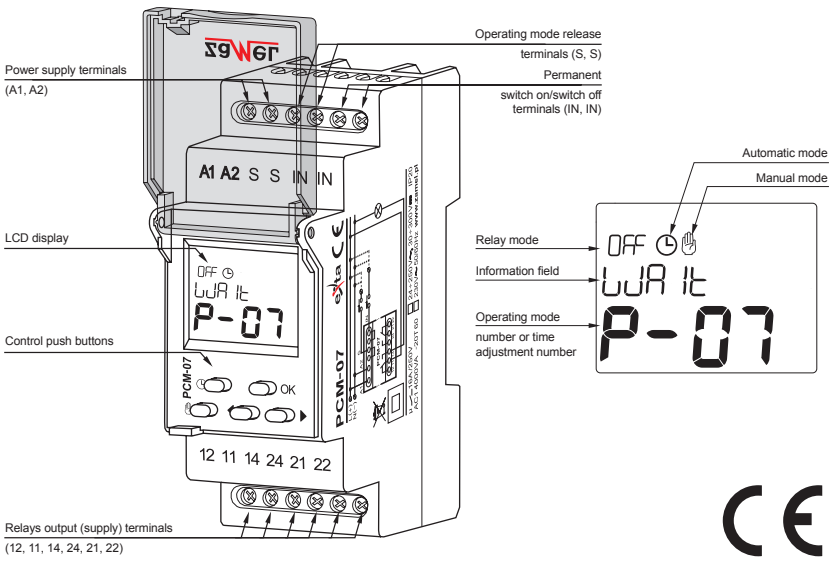
The device is designed for single-phase installation and must be installed in accordance with standards valid in a particular country. The device should be connected according to the details included in this operating manual. Installation, connection and control should be carried out by a qualified electrician staff, who act in accordance with the service manual and the device functions. Disassembling of the device is equal with a loss of guarantee and can cause electric shock. Before installation make sure the connection cables are not under voltage. The cruciform head screwdriver 3,5 mm should be used to instal the device. Improper transport, storage, and use of the device influence its wrong functioning.
It is not advisable to instal the device in the following cases: if any device part is missing or the device is damaged or deformed. In case of improper functioning of the device contact the producer.

The symbol means selective collecting of electrical and electronical equipment. It is forbidden to put the used equipment together with other waste

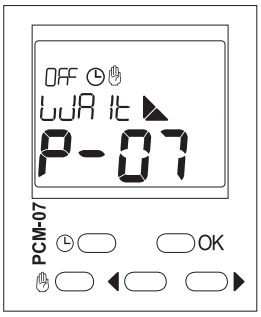
TECHNICAL DATA

PCM-07/U	
Power supply terminals:	A1, A2
Input rated voltage:	24÷250 V AC, 30÷300 V DC
Nominal frequency:	50 / 60 Hz
Rated power consumption:	2 W / 14 VA
Operating mode release terminals:	S, S
Permanent switch on/switch off terminals:	IN, IN
Number of operating modes:	25
Operating modes:	manual, automatic
Time adjustment range t:	0,1 sec ÷ 99 h 59 min 59,9 sec
Time adjustment accuracy:	0,1 s
LCD display backlight:	amber
Time measure accuracy:	max. ±3 s / 24 h with 25 °C
Hold up programme time:	10 years
Receiver input (supply) terminals:	11, 12, 14, 21, 22, 24
Output relay parameters:	2 NO/NC 16 A 250 V AC1 4000 VA
Number of terminal clamps:	12
Section of connecting cables:	0,2 ÷ 2,50 mm^2
Ambient temperature range:	-20 ÷ +60 °C
Operating position:	freely
Mounting:	rail TH 35 (PN-EN 60715)
Protection degree:	IP20 (PN-EN 60529)
Protection level:	II
Overvoltage category:	II
Pollution degree:	2
Dimensions:	double-modular (35 mm) 90x35x66 mm
Weight:	0,130 kg
Reference standards:	PN-EN 60730-1; PN-EN 60730-2-7 PN-EN 61000-4-2,3,4,5,6,11

APPEARANCE



DESCRIPTION



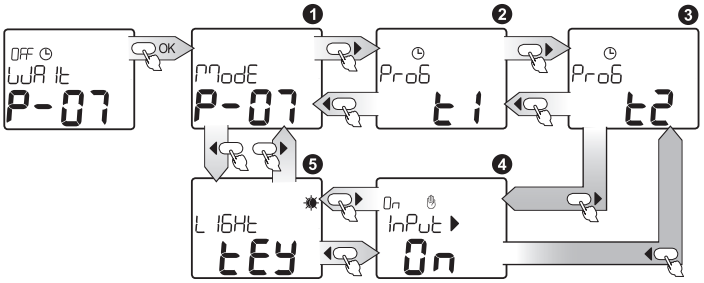
Displayed elements and messages description

On OFF - relay mode
- automatic mode
- manual mode
▲ - external input S
▶ - external input IN
☀ - backlight
Prog - t1 and t2 time adjustment
mode - operating mode adjustment
L IGHt - backlight level adjustment
inPut - permanent switch on / switch off input
WAIt - waiting for releasing signal
End - operating mode end
On OFF - switch on/switch off

Push button description

	• main window – automatic mode entry
	• main window – manual mode entry or relay mode change if the clock is already in the manual mode
OK	• main window – main menu entry • different windows - submenu entry or adjusted value confirmation
◀ ▶	• menu windows/options change or decreasing/increasing the adjusted value

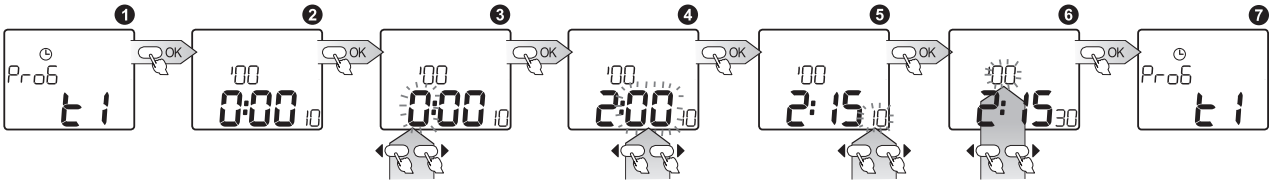
MAIN MENU



Choose OK to enter menu; use cursor ◀ ▶ to choose options.

	Function	Description
❶	mode	OPERATING MODE ADJUSTMENT
❷	Prog t1	T1 TIME ADJUSTMENT
❸	Prog t2	T2 TIME ADJUSTMENT
❹	inPut ▶	EXTERNAL INPUT ADJUSTMENT
❺	L IGHt ☀	BACKLIGHT LEVEL ADJUSTMENT

T1 AND T2 TIME ADJUSTMENT

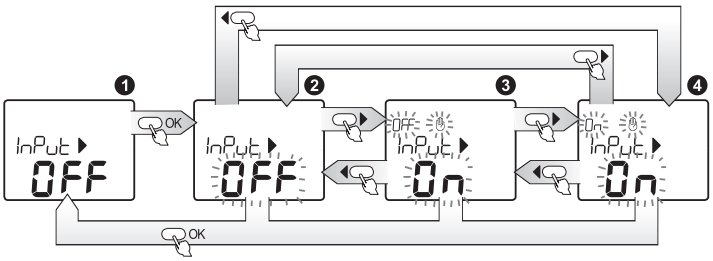


❶ Prog t1-t1 time preview and adjustment; press OK to enter;
❷ t1 adjusted time preview window, press OK to enter;
❸ HOUR - use cursor ◀ ▶ to choose the required number of hours; adjustment range from 0 to 99; press OK to confirm;
❹ MINUTE - use cursor ◀ ▶ to choose the required number of minutes; adjustment range from 0 to 59; press OK to confirm;
❺ SECOND - use cursor ◀ ▶ to choose the required number of seconds; adjustment range from 0 to 59; press OK to confirm;
❻ DECIMAL POINT OF A SECOND - use cursor ◀ ▶ to choose the required value; adjustment range from 0 to 90; press OK to confirm;
❼ To confirm all the adjustments press OK; confirming the command allows to enter the time adjustment window.
The system is equipped with protection against 0h0m0s0ss - 0,1 sec is the minimum time.

t2 time adjustment in Prog t2 menu - similarly to Prog t1 menu.

There is an escape possibility from every submenu window one level higher in every moment of programming by pressing ◷ or ✋ without saving the adjusments.

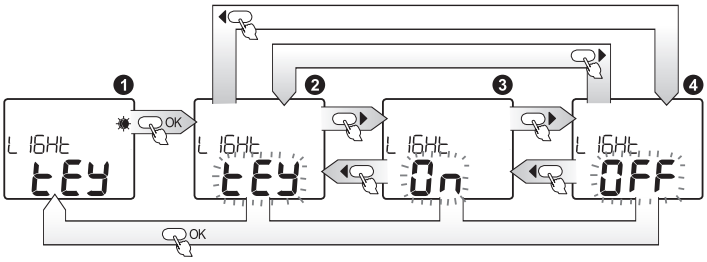
EXTERNAL INPUT ADJUSTMENT



❶ inPut ▶ - system mode adjustment suitable for the moment of releasing external input IN; the system operates in this mode as long as there is a releasing signal on external input IN; press OK to enter; use cursors ◀ ▶ to choose a suitable mode for the external input, where:
❷ OFF - external input function is switched off;
❸ ✋ OFF - manual mode with a relay constantly switched off;
❹ ✋ On - manual mode with a relay constantly switched on;
Use cursors ◀ ▶ to change options; press Ok button to confirm choices.
After the signal in releasing input IN disappears, the previous operating mode (time measure) will be finished.

There is an escape possibility from every submenu window one level higher in every moment of programming by pressing ◷ or ✋ without saving the adjusments.

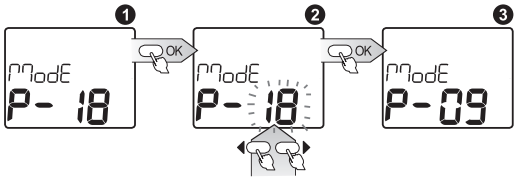
BACKLIGHT LEVEL ADJUSTMENT



❶ L IGHt ☀ - backlight level adjustment; press OK to enter;
❷ tEY - the backlight switches on after pressing any of the buttons, and it will be switched off automatically after 20 seconds from the last press;
❸ On - the backlight will be switched on as long as the system is connected to power supply voltage;
❹ OFF - the backlight will be switched off.
Use cursors ◀ ▶ to change options; press OK to confirm your choices.

There is an escape possibility from every submenu window one level higher in every moment of programming by pressing ◷ or ✋ without saving the adjusments.

OPERATING MODE ADJUSTMENT



❶ mode - operating mode adjustment will be activated in the moment of releasing external input S; press OK to enter;
❷ Use cursors ◀ ▶ to choose the right mode; the modes are numbered in the range from P-01 to P-25, press OK to confirm your choice;
❸ Confirming the command allows to enter the operating mode adjustment window.

There is an escape possibility from every submenu window one level higher in every moment of programming by pressing ◷ or ✋ without saving the adjusments.

Power supply voltage release:

for t 1

P-01 

SWITCH ON DELAY - after the supply voltage has been applied the preset time t measure starts. After the time is over the relay switches on (pos. 11-14). The next switch on mode appears after power supply voltage reset.

P-02 

SWITCH OFF DELAY - after the supply voltage has been applied, the relay switches on immediately (pos.11-14), and the preset time t is measured. After the preset time is measured, the relay is switched off (pos.11-12). The next switch on interval appears after power supply voltage reset.

P-03 

FLASHER STARTING WITH OFF – (Starting from the switch off position). After the supply voltage has been applied, the preset time t is measured. After the time is over, the relay switches on (pos. 11-14). Again with the preset time t interval, the relay is switched off (pos.11-12) and switched on (pos. 11-14). The next switch on interval appears after power supply voltage reset.

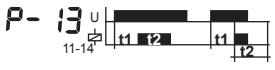
P-04 

FLASHER STARTING WITH ON – (Starting from the switch on position). After the supply voltage has been applied, the relay is immidiatelly switched on (pos. 11-14) and the preset time t is measured. After the time t is over, the relay switches off (pos. 11-12). Again with the preset time t interval the relay is switched on (pos. 11-14) and switched off (pos. 11-12). The next switch on interval appears after power supply voltage reset.

P-05 

IMPULSE GENERATOR DELAY 0,5 sec. - After the supply voltage has been applied the preset time t measure starts. After the time t is over the relay switches on (pos. 11-14) for 0,5 second, and switches off (pos. 11-12). The next switch on interval appears after power supply voltage reset.

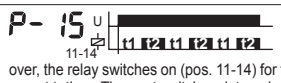
for t 1 and t 2

P-13 

SWITCH ON DELAY - after the supply voltage has been applied the t_1 time measure starts. After the time is over the relay switches on (pos. 11-14) for t_2 time. The next switch on interval appears after power supply voltage reset.

P-14 

SWITCH OFF DELAY - after the supply voltage has been applied, the output relay switches on immediately (pos.11-14), and the preset time t_1 is measured. After the preset time is measured, the relay is switched off (pos.11-12) for the preset t_2 time and its another switch on mode. The next switch on interval appears after power supply voltage reset.

P-15 

FLASHER STARTING WITH OFF – (Starting from the switch off position). After the supply voltage has been applied, the preset time t_1 is measured. After the time is over, the relay switches on (pos. 11-14) for the preset t_2 time and again switches off (pos.11-12) for the preset t_1 time. The next switch on interval appears after power supply voltage reset.

P-16 

FLASHER STARTING WITH OFF – (Starting from the switch on position). After the supply voltage has been applied, the output relay switches on immediately (pos.11-14) for the preset time t_1. After the time is over, the relay is swtches off (pos.11-12) for the preset t_2 time and its another switch on mode for t_1 time. The next switch on interval appears after power supply voltage reset.

P-17 

PERMANENT SWITCH ON MODE - After the supply voltage has been applied the relay is switched on permanently. When choosing this mode t_1 and t_2 time adjustments do not matter.

P-18 

PERMANENT SWITCH OFF MODE - After the supply voltage has been applied the relay is switched off permanently. When choosing this mode t_1 and t_2 time adjustments do not matter.

External signal S release:

for t 1

P-06 

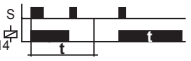
TIME IMPULSE RELEASED BY RISING EDGE – after the impulse release has been applied to the power-supply system (rising edge) it switches on the relay (pos. 11-14) and starts to measure the preset time. After the time t is over the relay is switched off (pos. 11-12). Impulse time duration is not important here.

P-07 

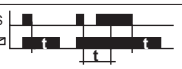
TIME IMPULSE RELEASED BY FALLING EDGE – power-supply system switches on the relay after impulse release fades (falling edge) (pos.11-14) and time measurement starts. After the time t is over the relay is switched off (pos. 11-12). The following impulse release fades during time measurement does not cause time measure from the beginning (non- retriggerable).

P-08 

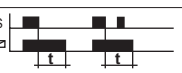
SWITCH ON/OFF DELAY – after the impulse release has been applied to the power-supply system (rising edge),it lets the relay be switched off (pos.11-12) and at the same time starts the preset time t measurement. After the time is over the relay is switched on (pos.11-14). After the impulse release fade is detected (falling edge), again the system starts the preset time measurement. When it is over the relay is switched off (pos. 11-12). In case the impulse duration time is shorter than the preset time t, the relay is switched on only for the time t.

P-09 

BISTABLE RELAY WITH TIME LIMIT – after the impulse release has been applied to the power-supply system (rising edge), it switches on the relay (pos.11-14) and starts to measure the preset time t. The relay is switched off during the next impulse release (rising edge) or after time t is over in case there was no such impulse occurence. Impulse time duration is not important for system operating.

P-10 

TIME IMPULSE RELEASED BY RISING EDGE WITH SWITCH OFF DELAY (retriggerable) - after the impulse release has been applied to the power-supply system (rising edge) it switches on the relay (pos.11-14). After the impulse release fade is detected (rising edge), the system starts the preset time t measurement and when the time is over the relay is switched off (pos. 11-12). The following impulse release fade during time measurement causes time measure from the beginning (retriggerable).

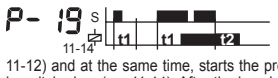
P-11 

TIME IMPULSE RELEASED BY RISING EDGE WITH SWITCH OFF DELAY (non-retriggerable) - after the impulse release has been applied to he power-supply system (rising edge) it switches on the relay (pos.11-14). After the impulse release fade is detected (falling modulated voltage), the system starts the preset time t measurement and when the time is over the relay is switched off (pos. 11-12).

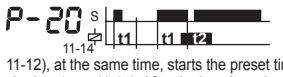
P-12 

SWITCH ON DELAY RELEASED BY IMPULSE - after the impulse release has been applied to the power-supply system (rising edge) it keeps the relay in a switched off position (pos.11-12) and simultaneously starts the preset time t measurement. After the time t is over the relay is switched on (pos. 11-14). The relay is switched on as long as there is a power supply voltage on, the next release impulses do not affect operation of the relay.

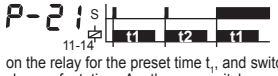
for t 1 and t 2

P-19 

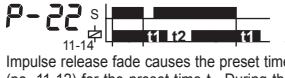
SWITCH ON/OFF DELAY- (retriggerable) – after the impulse release has been applied to the power-supply system (rising edge), it lets the relay be switched off (pos. 11-12) and at the same time, starts the preset time t_1 measurement. After the time is over the relay is switched on (po. 11-14). After the impulse release fade is detected (falling modulated voltage), the system starts preset t_2 time measuremnt and after it is over the relay is switched off (po. 11-12). In case the impulse release duration is shorter than the preset time t_1, the relay is not switched on. Applying the impluse release during the preset t_2 time measurement does not cause switching off the relay but it starts time measurement after the impulse fade (falling modulated voltage).

P-20 

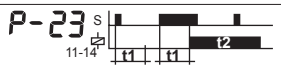
SWITCH ON/OFF DELAY- (non-retriggerable) – after the impulse release has been applied to the power-supply system (rising edge), it lets the relay be switched off (pos. 11-12), at the same time, starts the preset time t_1 measurement. After the time is over the relay is switched on (pos. 11-14). After the impulse release fade is detected (falling modulated voltage), the system starts preset time t_2 measuremnt and after it is over the relay is switched off (po. 11-12).The release input state can change during the time t_2 measurement and does not affect functioning of the system In case the impulse release duration is shorter than the preset time t_1, the relay is not switched on.

P-21 

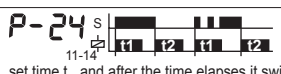
IMPULSE GENERATION WITH AN ALTERNATE TIME DURATION - after the impulse release has been applied to the power-supply system (growing value), it switches on the relay for the preset time t_1, and switches it off. The next impulse release causes the relay switches on for t_2 time. Another one switches on the relay for t_1 time, etc. The impulse release time duration does not influence the relay switching on time.

P-22 

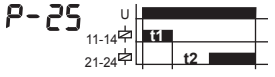
SWITCH OFF DELAY RELEASED BY FALLING EDGE - after the impulse release has been applied to the power-supply system, it switches on the relay (pos. 11-14). Impulse release fade causes the preset time t_1 measurement, after it is over the relay is switched off (po. 11-12) for the preset time t_2. During the t_2 time the system is resistant to signals release. After the t_2 time is over the relay is switched on again in the moment of applying impulse release (growing value).

P-23 

TIME IMPULSE RELEASED BY IMPULSE WITH SPECIFIC TIME DURATION - after the impulse release has been applied and lasts continuously for the preset time t_1, it switches on the relay (pos.11-14) for time t_2. If the release impulse is shorter than the preset time t_1, the relay is not switched on - during switching on the relay the releasing impulses are ignored.

P-24 

IMPULSE RELEASED BY FALLING EDGE - after the impulse release has been applied to the power-supply system (rising edge), it switches on the relay for the preset time t_1, and after the time elapses it switches off the relay. The impulse release fade (falling edge) switches on the relay (pos. 11-14) for the preset time t_2, and after the time elapses it switches it off. During switching on the relay the rising edge and the falling edge are ignored.

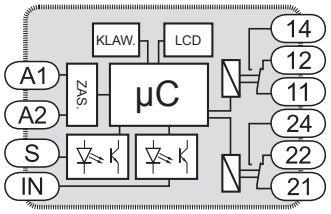
P-25 

STAR-DELTA SWITCH - after the supply voltage has been applied the relay 1 is switched on (pos. 11-14) for the preset time t_1. After the time is over the relay is switched off and the preset time t_2 is measured. After time t_2 is over the relay 2 is switched on permanently (pos. 21-24).

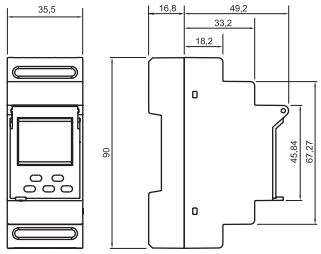
MOUNTING

1. Disconnect power supply by the phase fuse, the circuit-breaker or the switch- disconnector combined to the proper circuit.
2. Check if there is no voltage on connection cables by means of a special measure equipment.
3. Install the PCM-07/U on the TH-35 DIN rail in the switchboard.
4. Connect the cables with the terminals in accordance with the installing diagram.
5. Switch on the power supply from the mains.

INNER DIAGRAM



DIMENSIONS



PRODUCT FAMILY

The time relay PCM-07 belongs to PCM relay group

PCX-xx(/x)

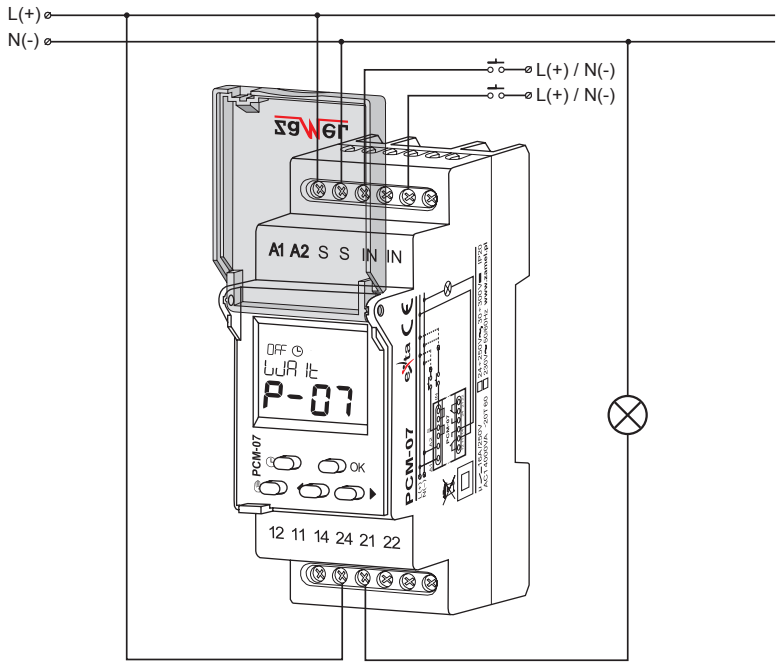
Voltage type:
24V - 24 V AC/DC
U - 12÷240 V AC/DC: *available for PCM-01, PCM-02, PCM-03, PCM-06*
U - 24÷250 V AC; 30÷300 V DC: available for *PCM-07*

Device type:
01 - 1 operating mode – switch on delay
02 - 1 operating mode – switch off delay
03 - 1 operating mode – cyclic change over
04 - 8 (PCP-04) or 10 (PCM-04) operating modes
06 - 2 operating modes - switch on/ switch off delay
07 - 25 operating modes, digital, two ranges of time operation
10 - 10 operating modes, two ranges of time operation

Casing type:
M - modular version (TH 35 DIN rail)
P - flush junction box Ø60 version

Device symbol

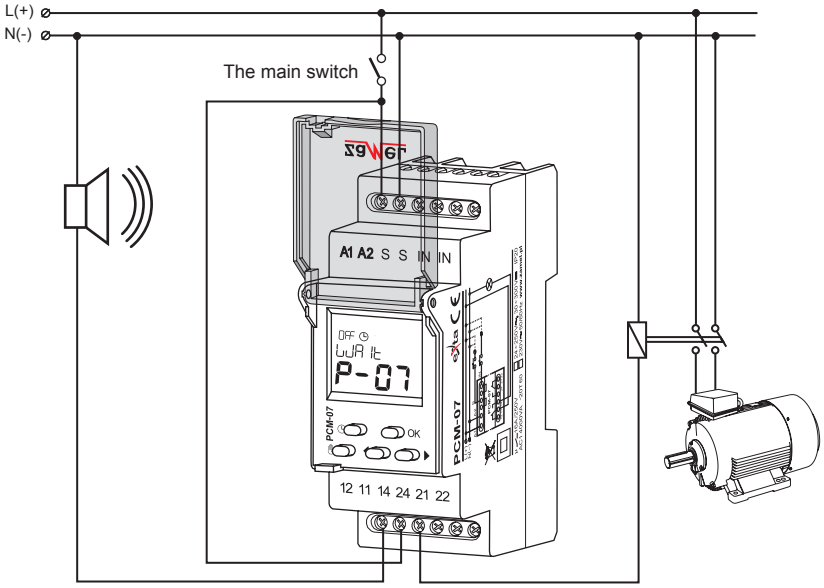
CONNECTION



RELAY CAPACITY

2000 W
1000 W
500 W
750 W

APPLICATION



The acoustic signal system of starting the machine (engine).
Operating mode adjusted to P-01.

WARRANTY CARD

There is 24 months guarantee on the product

Salesman stamp and signature, date of sale

1. ZMIE ZAMEL SP. J. assures 24 months guarantee for the product.
2. The manufacturer's guarantee does not cover any of the following actions:
   a) mechanical damage during transport, loading / unloading or under other circumstances,
   b) damage caused by incorrect product mounting or misuse,
   c) damage caused by unauthorised modifications made by the PURCHASER or any third parties to the product or any other devices needed for the product functioning,
   d) damage caused by Act of God or any other incidents independent of the manufacturer.
3. The PURCHASER shall lay any claims in writing to the dealer or ZMIE ZAMEL SP. J.
4. ZMIE ZAMEL SP. J. is liable for processing any claim according to current Polish legislation.
5. ZMIE ZAMEL SP. J. shall process the claim at its own discretion: product repair, replacement or money return.
6. The manufacturer's guarantee is valid in the Republic of Poland.
7. The PURCHASER's statutory rights in any applicable legislation whether against the retailer arising from the purchase contract or otherwise are not affected by this warranty.