ZCM-12, ZCM-12/U TIME PROGRAMMER
WEEK'S, DOUBLE CHANNEL
INSTRUCTION MANUAL

**Zakład Mechaniki i Elektroniki**
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DESCRIPTION

The ZCM-12 control timers are designed for time functions execution in automatics and control systems. The week's programmer controls the output relay in dependence of program settings (day, hour). The device is fitted with some additional functions, among other things the random function that is used for the operating mode changing by means of an external push button. It is possible to mount the device on TH 35 rail and seal it if needed. **In case of power supply malfunction the unit battery sustain enables all settings saving and maintaining.**

CAUTION:
Before installing the device in the switchboard or starting the system operation in order to programme it, the battery security separator should be removed against discharging.
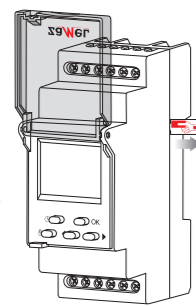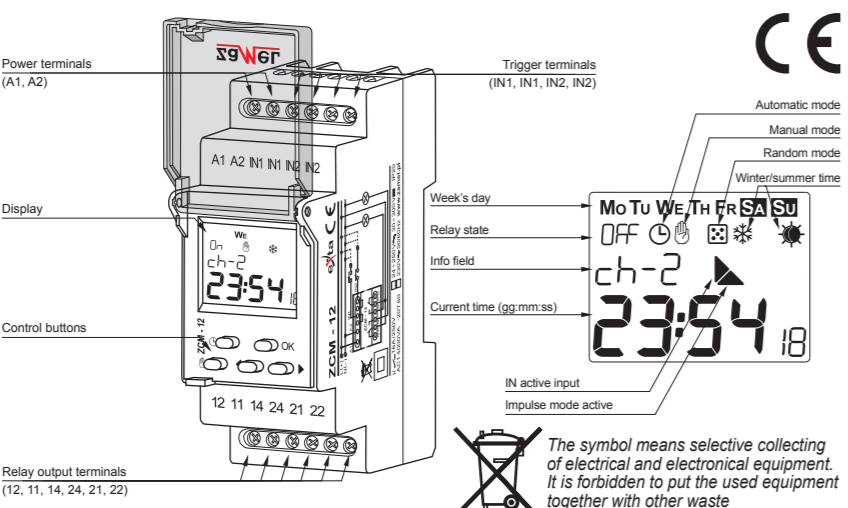
FEATURES

- Week's cycle control in dependence of the current hour,
- Double-module casing with a protection flap,
- Random op mode, additional IN control inputs,
- Double-channel version,
- Many programs,
- LCD display illumination,
- Mounted on TH 35 rail.

⚠ **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.

TECHNICAL DATA

	ZCM-12
Power supply terminals:	A1, A2
Input rated voltage:	ZCM-12: 230 V AC (-15 ÷ +10 %) ZCM-12/U: 24 ÷ 250 V AC, 30 ÷ 300 V DC
Nominal frequency:	50 / 60 Hz
Rated power consumption:	2 W / 14 VA
Number of channels:	2
Program quantity:	400 (100 On/Off pairs per channel)
Program:	daily, week's
Operating modes:	manual, automatic, random, impulse
Change of season summer/ winter:	automatic, manual
Colour of LCD panel lighting:	amber
Input:	2
Accuracy of time measurement:	max ±1 s / 24 h at temp. 25 °C
Time of clock maintenance:	3 years
Time of programme maintenance:	10 years
Clamps of release system:	IN1, IN1, IN2, IN2
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 mm²
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:	0,140 kg
Reference standards:	PN-EN 60730-1; PN-EN 60730-2-7 PN-EN 61000-4-2,3,4,5,6,11

APPEARANCE

Power terminals (A1, A2)
Trigger terminals (IN1, IN1, IN2, IN2)
Automatic mode
Manual mode
Random mode
Winter/summer time
Display
Week's day
Relay state
Info field
Current time (gg:mm:ss)
Control buttons
Relay output terminals (12, 11, 14, 24, 21, 22)
IN active input
Impulse mode active

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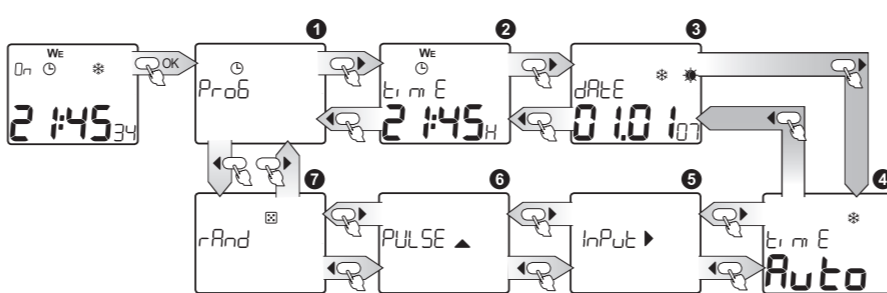
DESCRIPTION
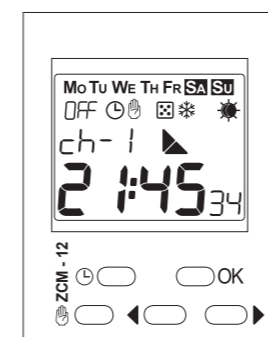
Description of elements and messages displayed

Mo Tu We Th Fr Sa Su - days of week
On OFF - transmitter's status
⏲ - automatic mode
✋ - manual mode
⊠ - random mode
▲ - impulse mode
▶ - external input
❄ - winter time
☀ - summer time
ch-1 ch-2 - channels

dAY - day, YEAR - year
ProG - program setting
tιmE - current time setting and summer/winter time shift
dAtE - current date setting
rAnd - random mode setting
InPut - external input setting
PULSE - impulse mode setting
Auto - automatic, USEr - user
On OFF - on/off

Button description

⏲ • in the main window – the automatic mode enter or relay state changeover, if the timer already in the automatic mode;
• in the main window (3 seconds) – the random mode enter / exit;
• in the random mode – randomizing active/inactive manual toggle;
• the other windows – exit to a higher level without changes saving;

✋ • in the main window – the manual mode enter or the relay state changeover, if the timer already in the manual mode;
• in the random mode – the relay state changeover and randomizing switch-OFF;
• the other windows - exit to a higher level without changes saving;

OK • in the main window – the main menu enter;
• the other windows – a submenu enter or setting acknowledgement;

◀ ▶ • window/option toggle or set value increase/decrease.

MAIN MENU

Menu enter by pressing OK;
menu items scrolling by means of cursors ◀ ▶.

| Function	Description
❶ ProG	PROGRAM SETTING
❷ tιmE ⏲	CURRENT TIME SETTING
❸ dAtE ❄☀	CURRENT DATE SETTING
❹ tιmE ❄	WINTER / SUMMER TIME SETTING
❺ InPut ▶	EXTERNAL INPUT SETTING
❻ PULSE ▲	IMPULSE MODE SETTING
❼ rAnd ⊠	RANDOM MODE SETTING

DATE SETTING
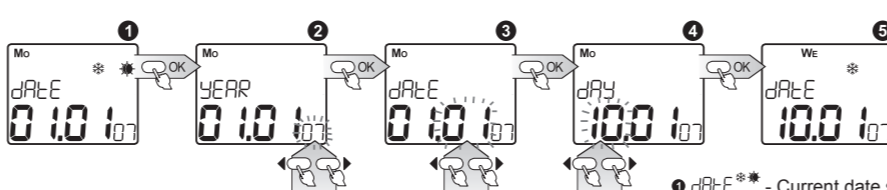
❶ dAtE ❄☀ - Current date setting; entry after pressing OK;
❷ YEAR - choose adequate year with cursors ◀ ▶ confirm with OK, range of years: 2000÷2099;
❸ MONTH - choose month with cursors ◀ ▶ confirm with OK;
❹ DAY - choose day with cursors ◀ ▶ confirm with OK; the system has a protection against introducing incorrect parameter of a day for a given month (it takes into account leap years and it automatically calculates the day of the week on the basis of an arranged date);
❺ Confirmation causes movement to a date setting window and set-up of current summer/ winter time - if the option Auto is arranged.

It is possible to exit every submenu window in any moment without saving settings by pressing the button ⏲ or ✋.

TIME SETTING
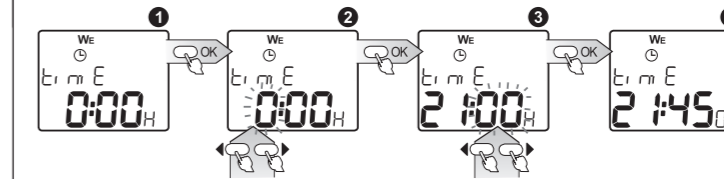
❶ tιmE ⏲ - setting the current clock time; entry after pressing OK;
❷ HOUR- choose adequate hour with cursor ◀ ▶ which you can set in 1-24 H or 1-12 A (AM) and 1-12 P (PM)format; confirm with OK;
❸ MINUTES - choose adequate parameter of minutes with cursors ◀ ▶ confirm with OK;
❹ Confirmation of the parameter of minutes causes simultaneous nullification of the parameter of seconds and movement to the window of time setting.

It is possible to exit every submenu window in any moment without saving settings by pressing the button ⏲ or ✋.

WINTER / SUMMER TIME SETTING
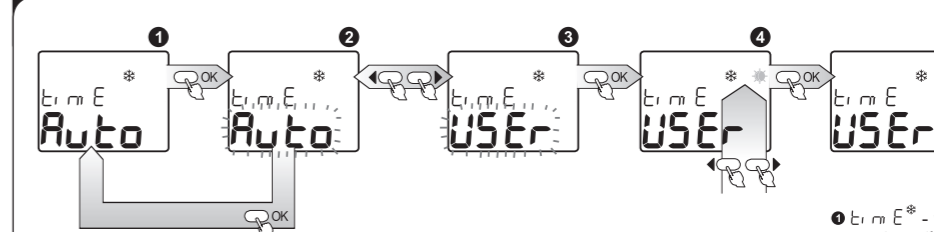
❶ tιmE ❄ - winter/summer time toggle mode selection: Auto - automatic time changing on the last March Sunday, at 2:00 into summer time and on the last October Sunday, at 3:00 into winter time, USEr - winter/summer timer toggle manual, by user; option entering after pressing OK;
❷ MODE SETTING - with ◀ ▶ select Auto or USEr acknowledge with OK; after selecting Auto, winter/summer time will be toggled automatically; after selecting USEr mode you will enter the next window;
❸ With ◀ ▶ select winter/summer, where ❄ is winter time, ☀ - summer time; if the time icon is changed, the timer will correct the current time appropriately; acknowledge by pressing OK;
❹ After time mode selecting winter/summer time change window will be open.

OPERATING MODE CHANGE (AUTOMATIC, MANUAL, RANDOM)
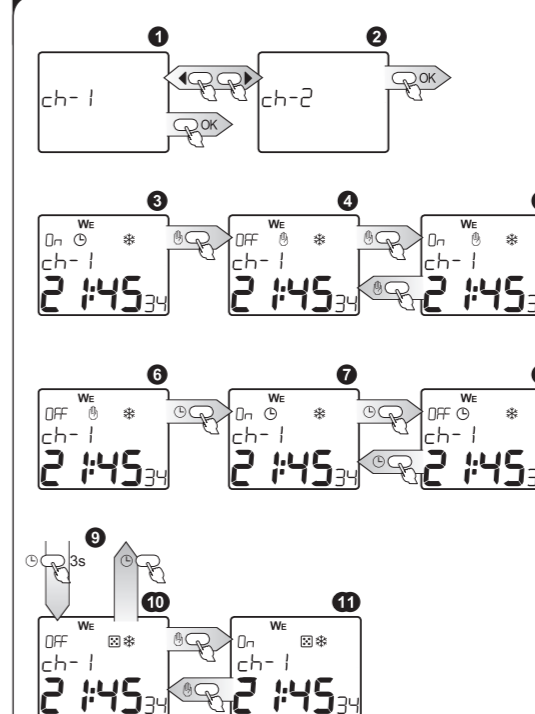
❶ ❷ Before the op mode changing it is necessary, in the main window, to select with the cursors ◀ ▶ channel ch-1 or ch-2.

❸ MANUAL OP MODE TOGGLE - if the main window is open and the timer is in the automatic mode ⏲ pressing the key ✋ will force the unit to toggle into the manual mode and the relay state changeover;
❹ ❺ Successive ✋ key pressing will force the relay state changeover without the op mode changing;

❻ AUTOMATIC MODE TOGGLE – if the main window is open and the timer is in the manual mode ✋ pressing the key ⏲ will force the unit to toggle into the auromatic mode and the relay state changeover;
❼ ❽ Successive ⏲ key pressing will force the relay state changeover without the op mode changing;

❾ RANDOM MODE TOGGLE - in order to enter the random mode it is necessary to press and hold ⏲ key for 3 secs;
❿ ⓫ Pressing the key ✋ forces the relay state changeover; in order to exit the random mode it is necessary to press the key ⏲ ❷.
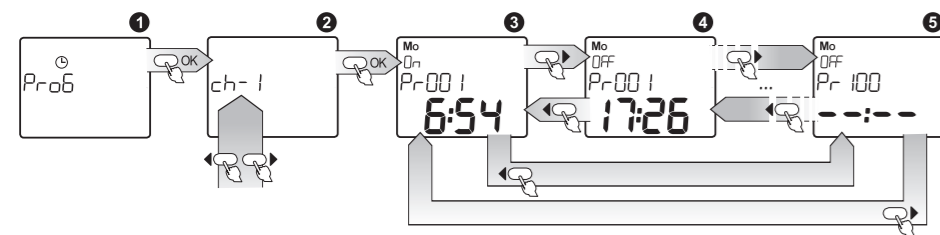
PROGRAM SETTING
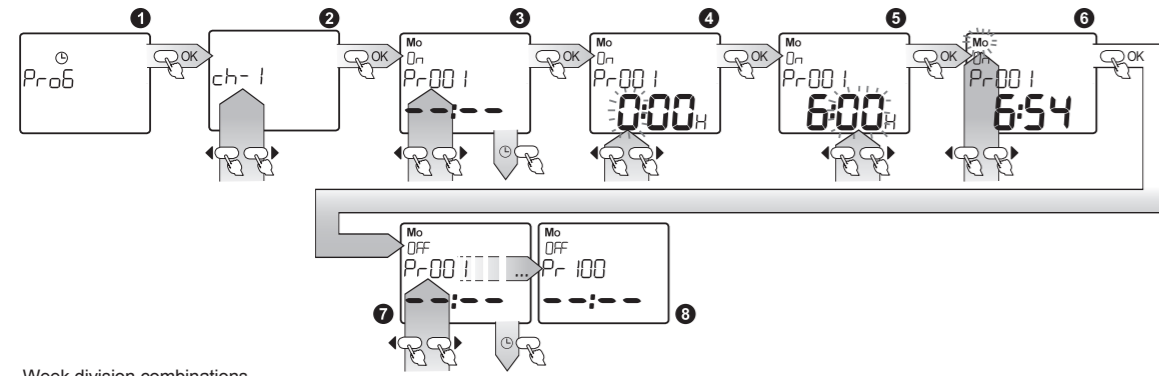
Week division combinations

1	Mo						
2	Tu						
3	We						
4	Th						
5	Fr						
6					Sa		
7						Su	
8	Mo Tu We Th Fr Sa Su						
9	Mo Tu We Th Fr						
10					Sa Su		
11	Mo Tu We Th Fr Sa						
12	Mo We Fr						
13	Tu Th				Sa		
14	Mo Tu We						
15			Th Fr Sa Su				
16	Mo We Fr Su						

❶ Pro6 - ddefining ON-times and OFF-times for the given week's days, for the given programs running in the automatic mode; enter edition by pressing OK; the programs are numbered as (ON / OFF) pair (On / OFF). Maximum number of On / OFF programs is 100 pairs per channel;
❷ With ◀ ▶ cursors select ch-1 or ch-2;
❸ With ◀ ▶ cursors select the program (e.g. Pr-001 On) for its parameters editing and enter edition by pressing OK;
❹ HOUR - with ◀ ▶ cursors select an hour and acknowledge by pressing OK;
❺ MINUTE - with ◀ ▶ cursors select minutes and acknowledge by pressing OK;
❻ WEEK'S DAY - with ◀ ▶ ursors select the week's day when the given program is to be active (there are 16 week division combinations available), acknowledge selection by pressing OK - the program will be saved;
❼ The next saved program will be displayed (e.g. Pr-01 OFF) - press OK to enter edition, in order to select the other program use the cursors ◀ ▶, in order to exit the mode press ⏱ or 🔒;
❽ The last available program is Pr 100 OFF.

PROGRAM VIEWING

❶ PROGRAM VIEWING - viewing settings for the switching programs (On / OFF) i.e. hours, minutes and week's days; enter viewing by pressing OK;
❷ With ◀ ▶ cursors select ch-1 or ch-2;
❸ ❹ In order to scroll programs press successively the cursors ◀ ▶; cursor ▶ increases program number; cursor ◀ decreases program number;
❺ The programs are numbered in the form of (On / OFF), pairs, where each program may be treated independently; there are 400 programs (100 On / OFF pairs per channel).

It is possible to exit every submenu window in any moment without saving settings by pressing the button ⏱ or 🔒.

PROGRAM CANCEL / RESTORE
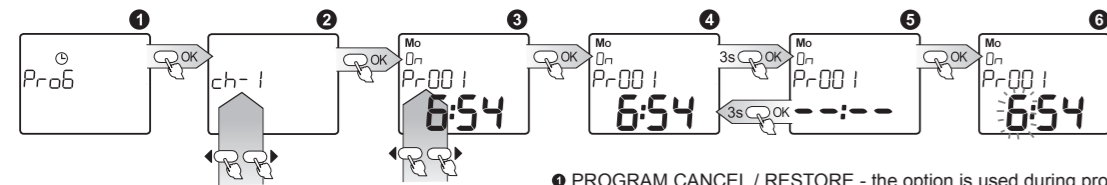
❶ PROGRAM CANCEL / RESTORE - the option is used during program setting and viewing for program cancelling (inactivation) and restoring; enter by pressing OK;
❷ With ◀ ▶ cursors select ch-1 or ch-2;
❸ With ◀ ▶ cursors select the program to be cancelled / restored;
❹ Press and hold OK for 3 seconds – if the program is active, it will be canceled (inactivated) and will not be checked during the timer operating in the automatic mode (however it will be saved in the storage and it will be possible to restore the program); horizontal lines will be displayed;
❺ If the program is cancelled, it will be restored by pressing OK and its edition will be possible ❻, pressing and holding OK for 3 seconds will cause the program restoring without time edition possibility ❼.

EXTERNAL INPUT SETTING
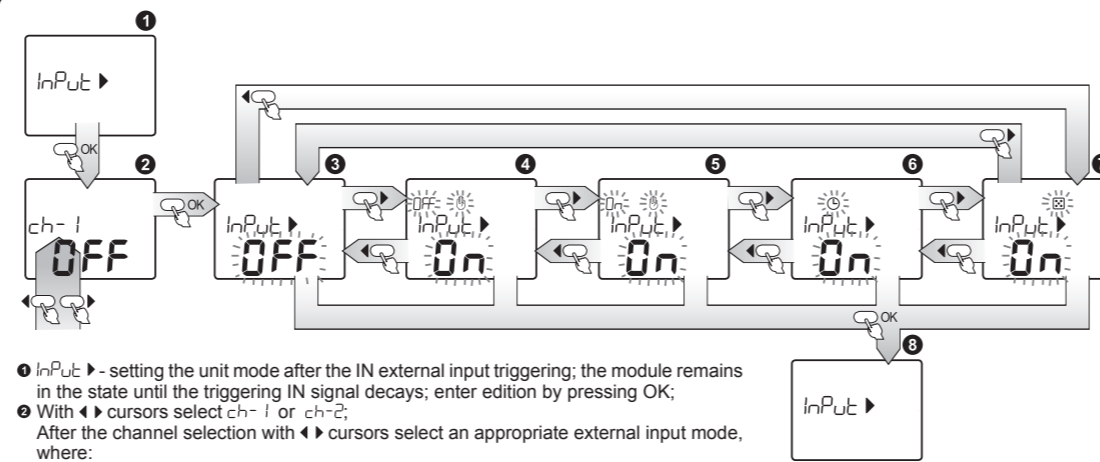
❶ InPut ▶ - setting the unit mode after the IN external input triggering; the module remains in the state until the triggering IN signal decays; enter edition by pressing OK;
❷ With ◀ ▶ cursors select ch-1 or ch-2;
After the channel selection with ◀ ▶ cursors select an appropriate external input mode, where:
❸ OFF - external input function is OFF;
❹ 🔒 OFF - manual mode with the continuous relay OFF-state;
❺ 🔒 On - manual mode with the continuous relay ON-state;
❻ ⏱ - automatic mode, the relay switching ON / OFF according to the set programs;
❼ ⊠ - random mode according to settings from the menu RANDOM MODE SETTING;
❽ Acknowledge the given mode selection by pressing OK; after acknowledgement the external input setting window will be open.

It is possible to exit every submenu window in any moment without saving settings by pressing the button ⏱ or 🔒.

IMPULSE PROGRAM SETTING
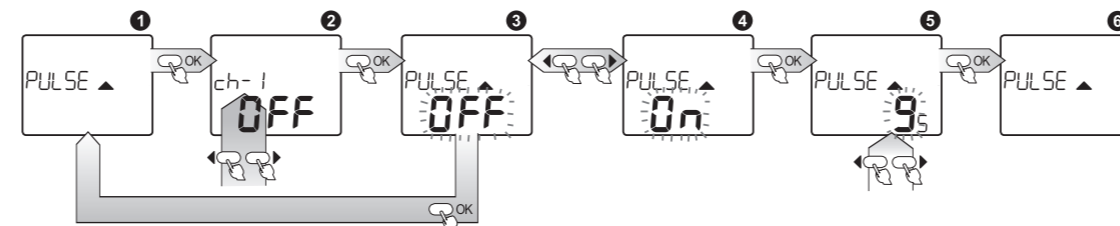
❶ PULSE ▲ - the impulse generating mode and impulse duration time setting; the impulse mode current state is shown in the display (On - ON, OFF - OFF); enter edition by pressing OK;
❷ With ◀ ▶ cursors select ch-1 or ch-2;
❸ ❹ With the cursors ◀ ▶ select one of the following options On - ON or OFF - OFF for the impulse mode; acknowledge selection by pressing OK; in case of the OFF state selecting the impulse mode main window will be open;
❺ After selecting On option with ◀ ▶ cursors select impulse duration time in seconds; acknowledge selection by pressing OK;
❻ After the selection acknowledgement the impulse mode setting window is open. In the impulse mode there are only On programs.

RANDOM MODE SETTING
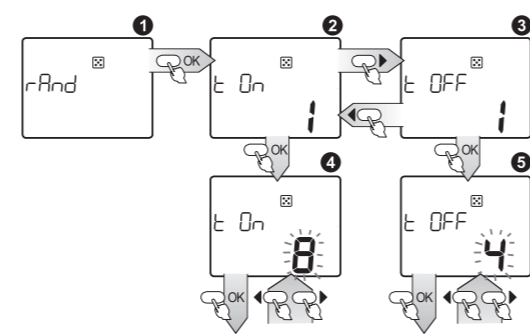
❶ rAnd ⊠ - setting maximum ON and OFF time for the relay in the random mode which is the same for both channels, but switched ON separately; enter the mode by pressing OK; with the cursors ◀ ▶ select demanded window, where:
❷ t On - the relay maximum ON-time setting in minutes - the time will be randomized for the time range between 1 minute and t On minutes;
❸ t OFF - the relay maximum OFF-time setting in minutes - the time will be randomized for the time range between 1 minute and t OFF minutes;

Window ❹: press OK to enter; ❺ with ◀ ▶ cursors set maximum ON-time (in minutes), acknowledge by pressing OK; you will enter window ❷.
Window ❻: press OK to enter; ❼ with ◀ ▶ cursors set maximum OFF-time (in minutes), acknowledge by pressing OK; you will enter window ❸.

It is possible to exit every submenu window in any moment without saving settings by pressing the button ⏱ or 🔒.
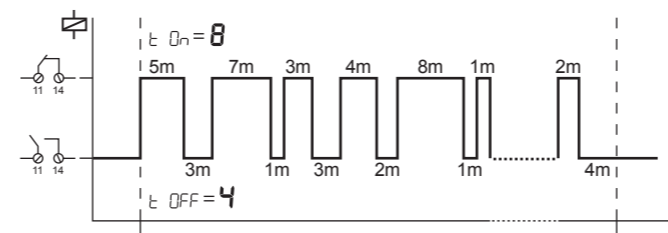

MOUNTING

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 ZCM-12 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
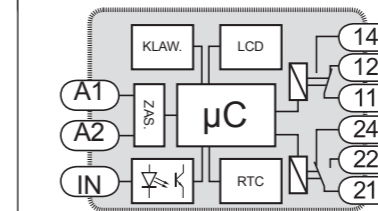
DIMENSIONS
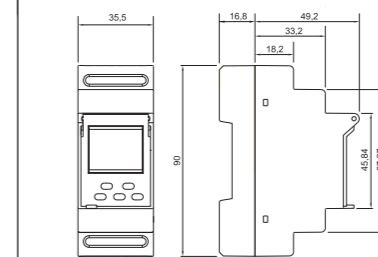
PRODUCT FAMILY

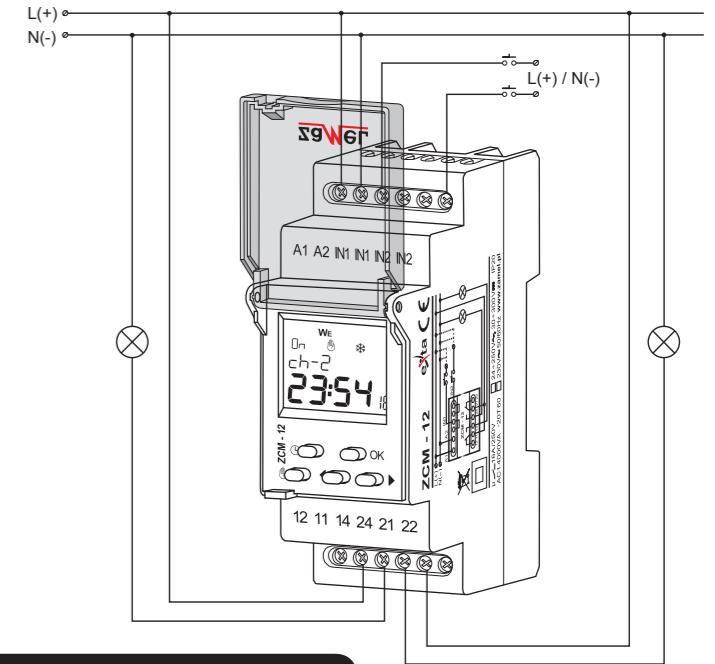ZCM-12 Programmer belongs to ZCM family of products.

ZCM-xx/U

Power supply:	ZCM-xx - 230 V AC
	ZCM-xx/U - 24 ÷ 250 VAC
	30 ÷ 300 V DC
Programmer type:	11 - week (1 channel)
	12 - week (2 channel)
	21 - year
	31 - astronomical
Device type	

WARRANTY CARD

CONNECTION

L(+)
N(-)
A1 A2 IN1 N1 N2
12 11 14 24 21 22

RELAY CAPACITY

☀ 2000 W   ▭ 1000 W
▭ 500 W   ▭ 750 W
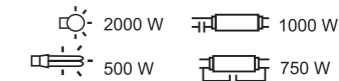
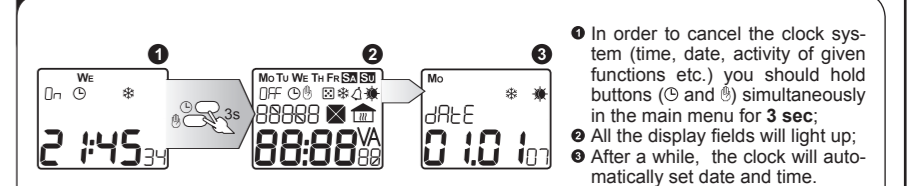## ADVANTAGES

Intelligent calendar - the programmer is fitted with a built-in calendar which fits leap years automatically, disables entering incorrect dates, calculates a week's day on the basis of the current date and fits the summer / winter time change.

General purpose external input - the programmer is fitted with an external input that enables the operating mode change without operating a switchboard, e.g. by means of a remote push button.

Programmable random mode - it is possible to set beginning and ending time, and the day of the random mode activity. Additionally, it is possible to program maximum ON and OFF times in dependence of user's needs.

Additional impulse mode - it is possible to switch the timer into the impulse mode which gives control units new capabilities.

MAIN RESET

❶ In order to cancel the clock system (time, date, activity of given functions etc.) you should hold buttons ⏱ and 🔒 simultaneously in the main menu for **3 sec**;
❷ All the display fields will light up;
❸ After a while, the clock will automatically set date and time.

Attention: In order to restore factory settings, you should additionally hold button OK