NOVATEK ELECTRO
ISO 9001

TIME DELAY RELAY REV-114N

Operating Manual

The quality management system of development and production complies with the requirements of ISO 9001:2015

Dear Customer,
Company thanks you for purchasing our products.
You will be able to use properly the product after carefully studying the Operating Manual. Keep the Manual throughout the service life of the product.

APPLICATION

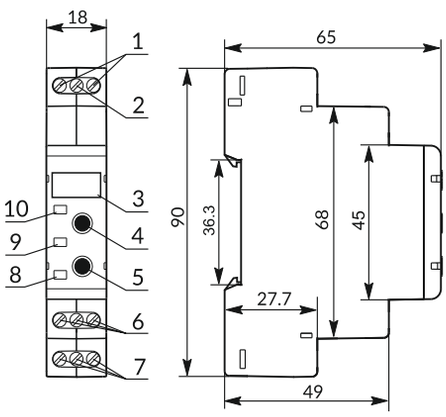
Time delay relays REV-114N (hereinafter referred to as the product, REV-114N) is a microprocessor device designed to switch on and off the load at intervals set by the User.

REV-114N can be powered from a standard 20-265 V 50 Hz alternating voltage network or from a 20-75 V constant voltage source.

REV-114N is equipped with control buttons and a digital display designed for adjustment and visual check of timing.

REV-114N can be operated by seventeen operation algorithms:

- on-delay;
- time delay when energizing;
- periodic with on-delay;
- periodic with time delay when energizing;
- pulse generator;
- on-delay with external start;
- off delay with external start;
- pulse I with external start;
- pulse II with external start;
- on/off delay with external start;
- pitch of the load relay (during each control contact closing);
- periodic with external start and on-delay;
- periodic with external start and time delay when energizing;
- pulse generator with external start;
- start stop;
- always ON;
- always OFF.



1 – input contacts 20-265V **N**, **L**;
2 – input control contact **S**;
3 – digital indicator display;
4 – button (UP) ;
5 – button (DOWN);
6 – output contacts of load relay (**NO2**, **C2**, **NC2**);
7 – output contacts of load relay (**NO1**, **C1**, **NC1**);
8 – LED indicator of setup mode **prg**;
9 – LED indicator of load relay ;
10 – LED indicator of power **On**.

Figure 1

OPERATION CONDITIONS

The **product is designed** for operation in the following conditions:
– Ambient temperature: from minus 30 to +45°C;
– Atmospheric pressure: from 84 to 106.7 kPa;
– Relative air humidity (at temperature of +25°C): 30 ... 80 %.

When moving from a cold to a warm location or, conversely, the details of the product can cause condensation that can cause undesired operation. In this case, before connecting the product to the mains keep it within two hours of operating conditions.

The product **is not intended** for operation in the following conditions:
– Significant vibration and shocks;
– High humidity;
– Aggressive environment with content in the air of acids, alkalis, etc., as well as severe contaminations (grease, oil, dust, etc.).

TERMS AND ABBREVIATIONS

It periodically flashes – the indicator short-time enabling.
It periodically is off – the indicator short-time disabling.

MAINTENANCE

Maintenance of the product must be performed by qualified service personnel.

Recommended frequency of maintenance is every six months.

Maintenance procedure:

1) Check the connection reliability of the wires, if necessary, clamp with the force at 0.4 N*m;

2) Visually check the integrity of the housing, in case of detection of cracks and damages to remove the product from service and send for repair;

3) If necessary, wipe with cloth the front panel and the product housing.

Do not use abrasives and solvents for cleaning.

SAFETY PRECAUTIONS

It is strictly forbidden to carry out mounting works and maintenance without disconnecting the product from the mains.
– to open and repair the product independently;
– to operate the product with mechanical damages of the case.

It is not allowed water penetration on terminals and internal elements of the product.

During operation and maintenance the regulatory document requirements must be met, namely:
Regulations for Operation of Consumer Electrical Installations;
Safety Rules for Operation of Consumer Electrical Installations;
Occupational Safety in Operation of Electrical Installations.

TRANSPORTATION AND STORAGE

The product in the original package is permitted to be transported and stored at the temperature from minus 45 to +60 °C and relative humidity of no more than 80 %.

SERVICE LIFE AND MANUFACTURER WARRANTY

The lifetime of the product is 10 years. Upon expiration of the service life, contact the manufacturer.

Shelf life is 3 years.

Warranty period of the product operation is 5 years from the date of sale.

During the warranty period of operation (in the case of failure of the product) the manufacturer is responsible for free repair of the product.

Attention! If the product was operated in violation of the requirements of this OPERATING MANUAL, the buyer forfeits the right to warranty service.

Warranty service is performed at the place of purchase or by the manufacturer of the product.

Post-warranty service of the product is performed by the manufacturer at current rates.

Before sending for repair, the product should be packed in the original or other packing excluding mechanical damage.

ACCEPTANCE CERTIFICATE

REV-114N has been manufactured and accepted in accordance with the requirements of current technical documentation and classified as fit for operation.

Head of QCD _____

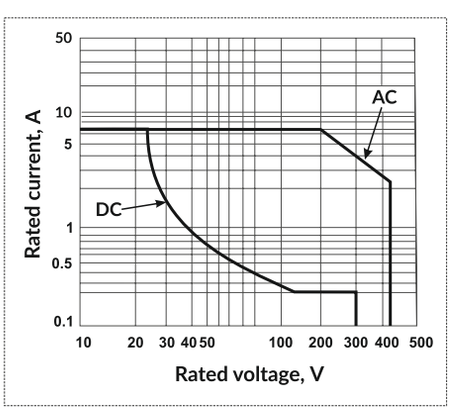
Date of manufacture _____

Seal

BASIC SPECIFICATIONS

Operating supply voltage	AC 20 – 265 V; DC 20-75 V
Frequency of supply mains	45 - 62 Hz
Permissible harmonic configuration (unsinusoidality) of power supply voltage	EN 50160
Readiness time when energizing	≤ 0.4 s
Accuracy of time setting holding	≤ 0.05 % ± 10ms
Number of operation algorithms	17
Adjustment range of time	from 0.1 s to 10 days
Timing adjustment	Buttons on the front panel
Digit display of remaining time	Available
Service of the product	Switchgear and control gear
Rated operating condition	Continuous
Type and quantity of contacts (switching)	2
Climatic design version	NF 3.1
Protection rating of case	IP 40
Protection rating of terminal box	IP 20
Commutation lifetime of output contacts: - under load of 6 A - under load of 1 A	 ≥ 100 000 times ≥ 1 000 000 times
Power consumption (under load)	≤ 1.5 W
Permissible contamination level	II
Overvoltage category	II
Electric shock protection class	II
Rated insulation voltage	450 W
Rated impulse withstand voltage	2.5 kV
Wire cross-section for connection to terminals	0.5 - 2 mm²
Tightening torque of terminal screws	0.4 N*m
Weight	≤ 0.15 kg
Overall dimensions, HxBxL	90x18x65 mm
The product meets the requirements of the following: EN 60947-1; EN 60947-6-2; EN 55011; EN 61000-4-2	
Product installation (mounting) is on standard 35mm DIN rail	
The product remains functional at any position in space	
Case material is self-extinguishing plastic	
Harmful substances in amounts exceeding maximum permissible concentrations are not available	

The product output contacts characteristics



REV-114N CONNECTION

⚠ PRODUCT TERMINALS AND INTERNAL COMPONENTS ARE UNDER POTENTIALLY LETHAL VOLTAGE.

The product is not designed for load commutation in case of short circuits. An automatic AC circuit breaker, class B, with rating of not more than 6 A, should be connected in the power supply circuit of the load.

To improve performance of the product it is recommended to install the fuse or the analogue in the power supply circuit of REV-114N for 1 A current.

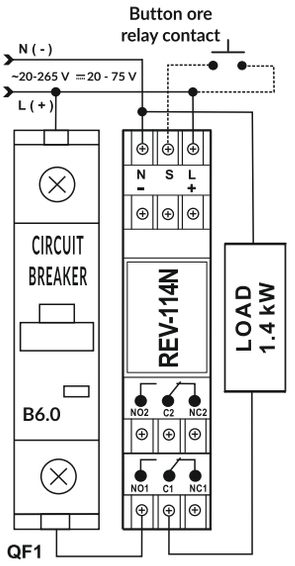
All connections must be performed when the product is deenergized.

It is not allowed to leave exposed portions of wire protruding beyond the terminal block.

To ensure the reliability of electrical connections you should use flexible (stranded) wires with insulation for voltage of no less than 450 V, the ends of which it is necessary to be striped of insulation for 5±0.5 mm and tightened with bootlaces.

Recommended cable cross section is no less than 1.0 mm^2. Wires fastening should exclude mechanical damage, twisting and abrasion of the wire insulation.

Connect the product in accordance with the diagram given in Fig.2.



QF1– Circuit breaker max 6 A

Figure 2

ADJUSTMENT OF THE PRODUCT

Energize the product. On the front panel of the product, press and hold simultaneously the buttons ⬆ and ⬇ , after 3 s the indicator **prg** (Fig.1 it.8) is on and the display shows the first parameter of main menu (Pr9), release the buttons.

Figure 3 shows the diagram for the configuration of the product.

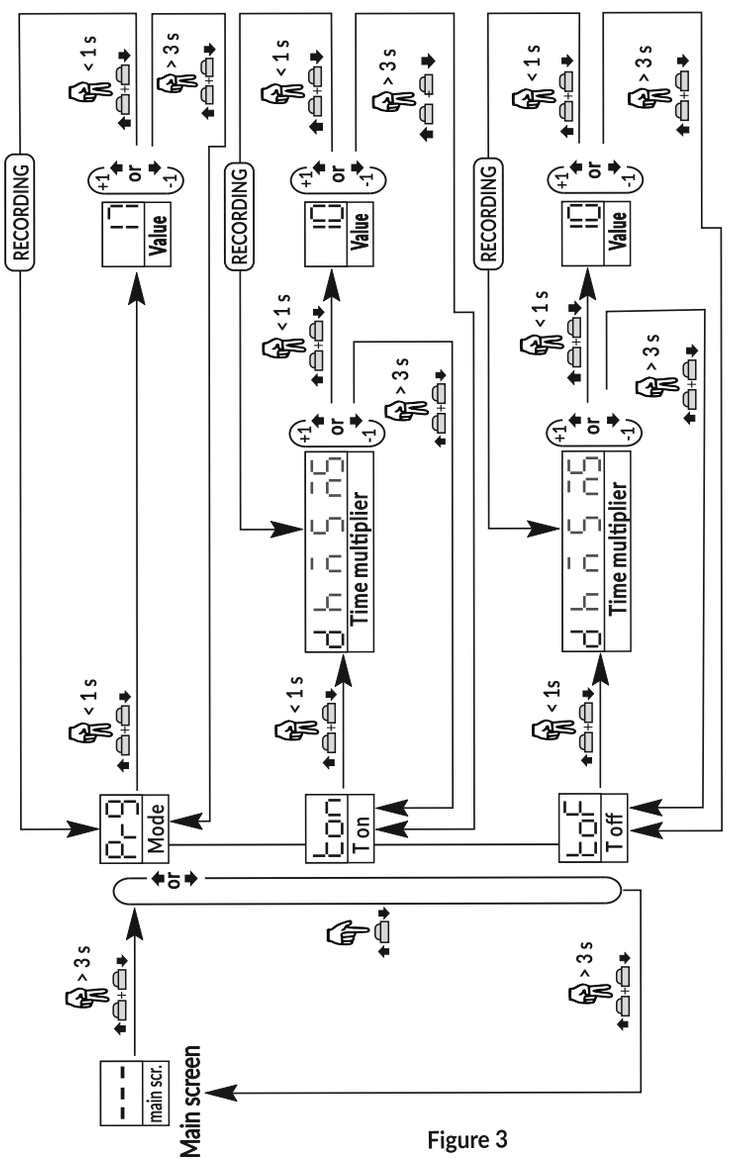


Figure 3

The configuration of the product is performed in the following order:

- Adjustment of operation mode (Pr9);
- Adjustment of timing (ton and toF).

To exit the main menu, press and hold for more than 3 seconds the buttons ↑ + ↓. In this case the indicator **prg** will off and the display shows the remaining time before switching on (off) the load relay.

If within 30 s neither button is pressed, the product will automatically exit from programming mode.

Adjustment of the product operation mode

Using the buttons ↑ or ↓ select the main menu item Pr9 (the product operation mode), confirm the selection by one time pressing of the buttons ↑ +↓. In this case the display will flash the current operation mode in the form of a decimal number.

Using the buttons ↑ or ↓ select the required operation mode (list of the operation modes for REV-114N is given in "REV-114N operation modes").

Press the buttons ↑ + ↓ one time to save the selected mode and return to the main menu. Figure 3 shows the complete programming diagram for the product.

Adjustment of timing

Using the buttons ↑ or ↓ select the main menu item ton (on-time of the load relay), confirm the selection by one time pressing of the buttons ↑ +↓. In this case, the display shows the submenu to select one of the units of time:

- d - days (from 0 to 10);
- h - hours (from 0 to 23);
- n - minutes (from 0 to 59);
- S - seconds (from 0 to 59);
- nS - hundreds of milliseconds (from 0 to 9).

Using the buttons ↑ or ↓ select the required unit of time, confirm the selection by one time pressing of the buttons ↑ + ↓ .

In this case the display will flash the current value of the selected time product.

Using the buttons ↑ or ↓ set the required value.

Press the buttons ↑ + ↓ one time to save the set value and return to the previous menu. After setting all of the time units, press and hold the buttons ↑ + ↓ more than 3 seconds to exit to the main menu.

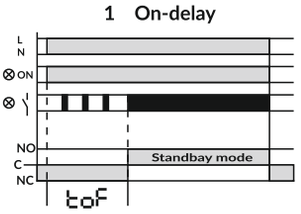
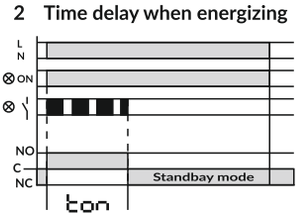
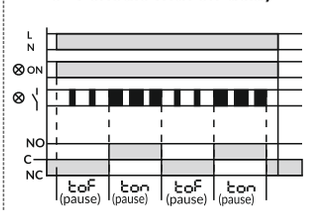
Total on-time of the load relay ton consists of the sum of the values of each time unit:

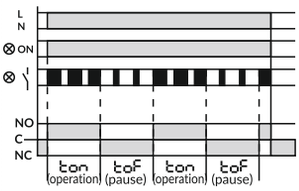
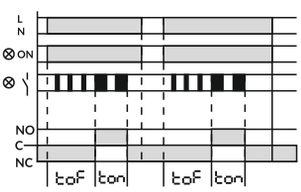
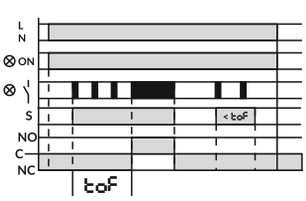
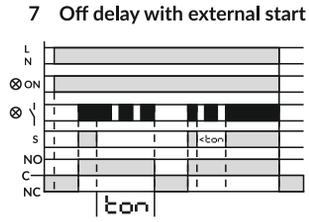
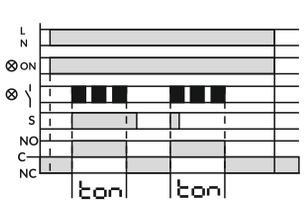
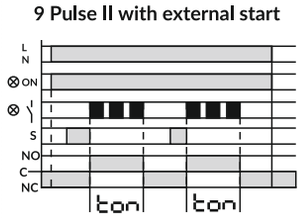
ton = d + h + n + S + nS

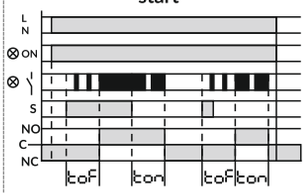
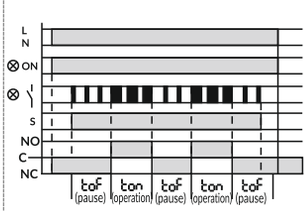
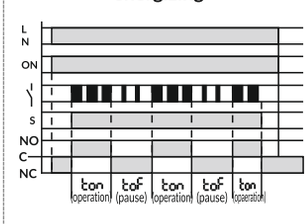
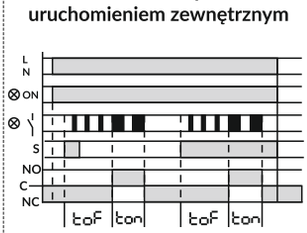
Adjustment of the main menu item toF (off-time of the load relay) is similar.

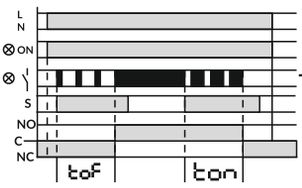
REV-114N OPERATION MODES

ATTENTION! In the operation modes described below, contacts C mean C1, C2, contacts NO - NO1, NO2.

Mode name	Description
1 On-delay 	After energizing, the indicator **On** is on and the set delay time occurs toF . During the delay time the indicator ⁄ periodically flashes. At the end of the delay time the load relay contacts **C** and **NO** are closed, the indicator ⁄ is on and the product goes into standby mode until power-off
2 Time delay when energizing 	After energizing, the indicator **On** is on, contacts of the load relay **C** and **NO** are closed, the indicator ⁄ is on and the set delay time occurs ton . During the delay time the indicator ⁄ periodically is off. At the end of the delay time the load relay contacts are open, the indicator ⁄ is off and the product goes into standby mode until power-off
3 Periodic with on-delay 	After energizing, the indicator **On** is on and the set delay time occurs toF . During the delay time the indicator ⁄ periodically flashes. At the end of the delay time the load relay contacts **C** and **NO** are closed for set time ton and the indicator ⁄ is on. During the delay time the indicator ⁄ periodically is off. At the end of the delay time the load relay contacts are open, and the product starts fulfillment of algorithm from the beginning

Mode name	Description
4 Periodic with time delay when energizing 	After energizing, the indicator **On** is on, contacts of the load relay **C** and **NO** are closed, the indicator ⁄ is on and the set delay time occurs ton . During the delay time the indicator ⁄ periodically is off. At the end of the delay time the load relay contacts are open for set time toF and the indicator ⁄ is off. During the delay time the indicator ⁄ periodically flashes. At the end of the delay time the product starts fulfillment of algorithm from the beginning
5 Pulse generator 	After energizing, the indicator **On** is on and the set delay time occurs toF . During the delay time the indicator ⁄ periodically flashes. At the end of the delay time the load relay contacts **C** and **NO** are closed, and the set delay time occurs ton . During the delay time the indicator ⁄ periodically is off. At the end of the delay time the load relay contacts **C** and **NO** are open, the indicator ⁄ is off and the product goes into standby mode until power-off
6 On-delay with external start 	After energizing, the indicator **On** is on and the product goes into standby mode, in this case the load relay contacts **C** and **NO** are open, and the indicator ⁄ is off. When control signal **S** occurs, there is the set time delay toF . During the delay time the indicator ⁄ periodically flashes. At the end of the delay time the load relay contacts **C** and **NO** are closed, the indicator is on and the product goes into standby mode. When there is no the control signal **S**, the load relay contacts **C** and **NO** are open, the indicator ⁄ is off and the product goes into standby mode
7 Off delay with external start 	After energizing, the indicator **On** is on and the product goes into standby mode, in this case the load relay contacts **C** and **NO** are open, and the indicator ⁄ is off. When control signal **S** occurs, the load relay contacts **C** and **NO** are closed, the indicator ⁄ is on and the product goes into standby mode. When there is no the control signal **S**, there is the set time delay ton . During the delay time the indicator ⁄ periodically is off. At the end of the delay time the load relay contacts **C** and **NO** are open, the indicator ⁄ is off and the product goes into standby mode. In case of repeated occurrence of the control signal **S**, the algorithm fulfillment is repeated
8 Pulse I with external start 	After energizing, the indicator **On** is on and the product goes into standby mode, in this case the load relay contacts **C** and **NO** are open, and the indicator ⁄ is off. When control signal **S** occurs, the load relay contacts **C** and **NO** are closed, the indicator ⁄ is on and there is the set time delay ton. During the delay time the indicator ⁄ periodically is off. At the end of the delay time the load relay contacts are open, the indicator ⁄ is off and the product goes into standby mode. In case of absence and repeated occurrence of the control signal **S**, the algorithm fulfillment is repeated
9 Pulse II with external start 	After energizing, the indicator **On** is on and the product goes into standby mode, in this case the load relay contacts **C** and **NO** are open, and the indicator ⁄ is off. When control signal **S** occurs, the product remains in standby mode. When there is no the control signal **S**, the load relay contacts **C** and **NO** are closed, the indicator ⁄ is on and there is the set time delay ton. During the delay time the indicator ⁄ periodically is off. At the end of the delay time the load relay contacts are open, the indicator ⁄ is off and the product goes into standby mode. When control signal **S** occurs, the algorithm fulfillment is repeated

Mode name	Description
10 On/off delay with external start 	After energizing, the indicator **On** is on and the product goes into standby mode, in this case the load relay contacts **C** and **NO** are open, and the indicator is off. When control signal S occurs, there is the set time delay toF . During the delay time the indicator periodically flashes. At the end of the delay time the load relay contacts are closed, the indicator is on and the product goes into standby mode. When there is no the control signal **S**, there is the set time delay ton . During the delay time the indicator periodically is off. At the end of the delay time the load relay contacts are open, the indicator is off and the product goes into standby mode. In case of repeated occurrence of the control signal **S**, the algorithm fulfillment is repeated
11 Pitch of the load relay 	After energizing, the indicator **On** is on and the product goes into standby mode, in this case the load relay contacts **C** and **NO** are open, and the indicator is off. When control signal **S** occurs, the load relay contacts **C** and **NO** and the indicator change its state to the opposite, then the product goes into standby mode. When there is no the control signal **S**, the product continues to be in standby mode. In case of repeated occurrence of the control signal **S**, the algorithm fulfillment is repeated
12 Periodic with external start and on-delay 	After energizing, the indicator **On** is on and the product goes into standby mode, in this case the load relay contacts **C** and **NO** are open, and the indicator is off. When control signal **S** occurs, there is the set time delay toF . During the delay time the indicator periodically flashes. At the end of the delay time the load relay contacts **C** and **NO** are closed for set time ton and the indicator is on. During the delay time the indicator periodically is off. At the end of the delay time the load relay contacts **C** and **NO** are open, and the product starts the algorithm fulfillment from the beginning. When there is no the control signal **S**, the algorithm fulfillment is stopped, the load relay contacts **C** and **NO** are open and the product goes into the standby mode
13 Periodic with external start and time delay when energizing 	After energizing, the indicator **On** is on and the product goes into the standby mode, in this case the load relay contacts **C** and **NO** are open, and the indicator is off. When control signal **S**, the load relay contacts **C** and **NO** are closed for set time ton . During the delay time the indicator periodically is off. At the end of the delay time the load relay contacts **C** and **NO** are open for set time toF and the indicator is off. During the delay time the indicator eriodically flashes. At the end of the delay time the article starts the algorithm fulfillment from the beginning. When there is no the control signal **S**, the algorithm fulfillment is stopped, the load relay contacts **C** and **NO** are open and the product goes into the standby mode
14 Generator impulsów z uruchomieniem zewnętrznym 	After energizing, the indicator **On** is on and the product goes into the standby mode, in this case the load relay contacts **C** and **NO** are open, and the indicator is off. When control signal **S** occurs, there is the set time delay toF . During the delay time the indicator periodically flashes. At the end of the delay time the load relay contacts **C** and **NO** are closed for the set time ton and the indicator is on. During the delay time the indicator periodically is off. At the end of the delay time the load relay contacts are open, and the product goes into the standby mode
15 Start-stop	After energizing, the indicator **On** is on and the product goes into the standby mode, in this case the load relay contacts **C** and **NO** are open, and the indicator is off.

Mode name	Description
	When control signal **S** occurs, there is the set time delay toF . During the delay time the indicator periodically flashes. At the end of the delay time the load relay contacts **C** and **NO** are closed, the indicator is on. In case of repeated occurrence of the control signal **S**, there is the set time delay ton. During the delay time the indicator periodically is off. At the end of the delay time the load relay contacts **C** and **NO** are open, the indicator is off and the product goes into the standby mode
16 Always ON	After energizing, the indicator **On** is on, the load relay contacts **C** and **NO** are closed, the indicator is on and the product goes into the standby mode until power-off
17 Always OFF	After energizing, the indicator **On** is on, the load relay contacts **C** and **NO** remain open, and the indicator is off. The product goes into the standby mode until power-off

USE OF THE PRODUCT

After the power supply the indicator **On** (Fig.1 it.10) is on and the product begins to operate according to the User-selected mode (see “REV-114N operation modes”), displaying the remaining time to turn on (off) the load relay.

Example of displaying the time:

- 10d - 10 days;
- 23h - 23 hours;
- 59n - 59 minutes;
- 59S - 59 seconds;
- 9nS - 900 milliseconds;
- --- - time account is completed.

The time is displayed by the maximum value of time unit (not equal to zero) in the order presented above.

The enabled load relay status corresponds to the closed condition of the contacts **NO1**-**C1** (**NO2**-**C2**) and the open condition of the contacts **NC1**-**C1** (**NC2**-**C2**).

The disabled load relay status corresponds to the open condition of the contacts **NO1**-**C1** (**NO2**-**C2**) and the closed condition of the contacts **NC1**-**C1** (**NC2**-**C2**).

Periodic flashing of light indicates the time delay after which the load relay will on.

Periodic disabling of light indicates the time delay after which the load relay will off.

Note *– when energizing the product there is a small pause (no more than 300 ms) before the product starts to operate according to the set operation mode.*

RESET TO FACTORY SETTINGS

Supply voltage to REV-114N by pressing the ▲ + ▼ buttons simultaneously. he display will show the caption rAU, then release the buttons.

Switch off the power supply. The factory settings are reset.

CLAIMS DATA

You are kindly requested, in case of the device return and transfer it to the warranty (post-warranty) service please indicate detailed reason for the return in the field of the claims data.

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_____

_____

_____

_____

For all questions, please contact the manufacturer:
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Odessa, 65007, Ukraine.
Tel.: +38 (048)738-00-28,
Tel./fax: +38 (0482) 34-36-73.
www.novatek-electro.com

Date of sale _____