



TIME DELAY RELAY REV-114, REV-114-24

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 relay REV-114 is used for operation in 230/240V AC networks, relay REV-114.24 - for operation in 8 - 30VDC networks.

Time delay relays REV-114 and REV-114.24 (hereinafter referred to as the product, REV-114; name REV-114.24 is used when the power characteristics differ) is a microprocessor device designed to switch on and off the load at intervals set by the User.

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

REV-114 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 and on-delay;
- 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.

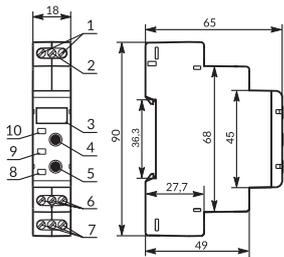


Figure 1

- 1 - Input contacts (for relay REV-114 - N, L; for relay REV-114.24 - "L", "N");
- 2 - input control contact S;
- 3 - digital indicator display;
- 4 - button (UP);
- 5 - button (DOWN);
- 6, 7 - output contacts of load relay (NO, C, NC);
- 8 - LED indicator of setup mode prg;
- 9 - LED indicator of load relay On;
- 10 - LED indicator of power On/Off.

BASIC SPECIFICATIONS

Description	Value	
	REV-114	REV-114.24
Operating supply voltage, V	230/240	24
Frequency of supply mains, Hz	45 - 62	-
Voltage at which service capability is maintained, V	185 - 280	8 - 30
Permissible harmonic configuration (unsinusoidality) of power supply voltage	EN 50160	-
Readiness time when energizing, s, no more than	0.4	-
Accuracy of time setting holding, %, no less than	0.5	-
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	NF3.1	-
Protection rating of case	IP40	-
Protection rating of terminal box	IP20	-
Commutation lifetime of output contacts if cosφ=1: - under load of 6 A, time, no less than - under load of 1 A, time, no less than	100 000 1000 000	-
Power consumption (under load), W, no more than	0.5	0.9
Permissible contamination level	II	-
Overvoltage category	II	-
Electric shock protection class	II	-
Rated insulation voltage, V	450	-
Rated impulse withstand voltage, kV	2.5	-
Wire cross-section for connection to terminals, mm²	0.5 - 2	-
Tightening torque of terminal screws, N*m	0.4	-
Weight, kg, not more	0.15	-
Overall dimensions, H x D x L, mm	90x18x65	-
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.		

Specifications of output contacts of the load relay

cos φ	Max. current at U=250 V, A	Max. switching power, VA	Max. permissible continuous AC voltage, V	Max. current at UDC=28 V, A
1	6	1500	275	3

TERMS AND ABBREVIATIONS

It periodically flashes - the indicator short-time enabling.

It periodically is off - the indicator short-time disabling.

OPERATION CONDITIONS

The product is designed for operation in the following conditions:

- Ambient temperature: from minus 30 to +55°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.).

THE PRODUCT 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 6A, should be connected in the power supply circuit of the load (230 V AC). And for load of 8-30 V DC - a DC circuit breaker, class B, with rating of not more than 4A.

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

All connections must be performed when the article 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 450V, 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 mm². 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.

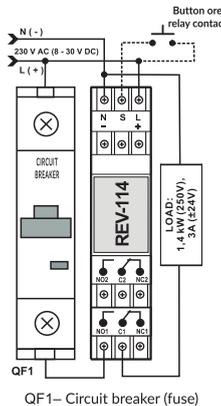


Figure 2

ADJUSTMENT OF THE PRODUCT

Energize the product. On the front panel of the article, press and hold simultaneously the buttons (UP) and (DOWN), after 3 s the indicator prg (Fig. 1 it.8) is on and the display shows the first parameter of main menu (Pr-9), release the buttons.

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

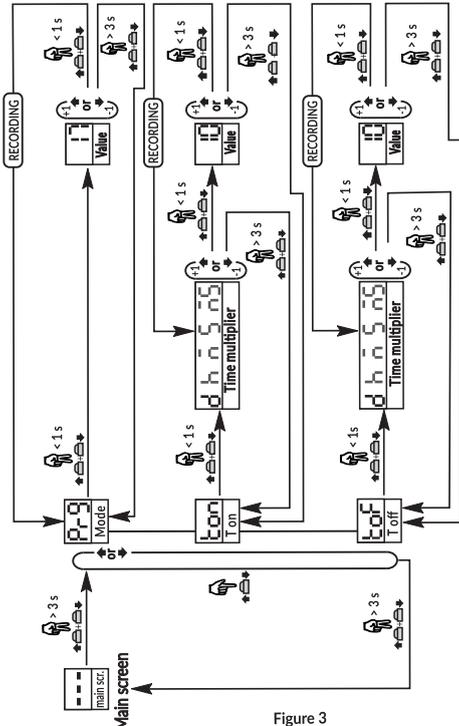


Figure 3

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

- Adjustment of operation mode (Pr-9);
- Adjustment of timing (tON and tOFF).

To exit the main menu, press and hold for more than 3 seconds the buttons (UP) and (DOWN). 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 article will automatically exit from programming mode.

Adjustment of the product operation mode

Using the buttons (UP) or (DOWN) select the main menu item Pr-9 (the product operation mode), confirm the selection by one time pressing of the buttons (UP) and (DOWN). In this case the display will flash the current operation mode in the form of a decimal number.

Using the buttons (UP) or (DOWN) select the required operation mode (list of the operation modes for REV-114 is given in "Product operation mode").

Press the buttons (UP) + (DOWN) 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 (UP) or (DOWN) select the main menu item tON (on-time of the load relay), confirm the selection by one time pressing of the buttons (UP) and (DOWN). In this case, the display shows the submenu to select one of the units of time:

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

Using the buttons (UP) or (DOWN) select the required unit of time, confirm the selection by one time pressing of the buttons (UP) and (DOWN). In this case the display will flash the current value of the selected time unit.

Using the buttons (UP) or (DOWN) set the required value.

Press the buttons (UP) + (DOWN) 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 (UP) + (DOWN) 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+min+S+mS.

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

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 "Product operation modes"), displaying the remaining time to turn on (off) the load relay.

Example of displaying the time:

- 10 d - 10 days;
- 23 h - 23 hours;
- 59 min - 59 minutes;
- 59 S - 59 seconds;
- 900 mS - 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.

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.

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 article from service and send for repair;
- 3) If necessary, wipe with cloth the front panel and the article housing.

Do not use abrasives and solvents for cleaning.

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 article.

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 article.

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

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

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 %.

ACCEPTANCE CERTIFICATE

REV-114 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

Mode name	Description	Mode name	Description
1 On-delay 	<p>After energizing, the indicator ON (Fig.1 it.10) is on and the set delay time occurs t_{of}. During the delay time the indicator --- (Fig.1 it.9) periodically flashes.</p> <p>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.</p>	9 Pulse II with external start 	<p>After energizing, the indicator ON (Fig.1it.10) is on and the product goes into standby mode, in this case the load relay contacts C and NO are open, and the indicator --- (Fig.1 it.9) is off.</p> <p>When control signal S occurs, the product remains in standby mode.</p> <p>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 t_{on}. During the delay time the indicator --- periodically is off.</p> <p>At the end of the delay time the load relay contacts are open, the indicator --- is off and the product goes into standby mode.</p> <p>When control signal S occurs, the algorithm fulfillment is repeated.</p>
2 Time delay when energizing 	<p>After energizing, the indicator ON (Fig.1 it.10) is on, contacts of the load relay C and NO are closed, the indicator --- (Fig. 1 it.9) is on and the set delay time occurs t_{on}. During the delay time the indicator --- periodically is off.</p> <p>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.</p>	10 On/off delay with external start 	<p>After energizing, the indicator ON (Fig.1it.10) is on and the product goes into standby mode, in this case the load relay contacts C and NO are open, and the indicator --- (Fig.1 it.9) is off.</p> <p>When control signal S occurs, there is the set time delay t_{of}. During the delay time the indicator --- periodically flashes.</p> <p>At the end of the delay time the load relay contacts are closed, the indicator --- is on and the product goes into standby mode.</p> <p>When there is no the control signal S, there is the set time delay t_{on}. During the delay time the indicator --- periodically is off.</p> <p>At the end of the delay time the load relay contacts are open, the indicator --- is off and the product goes into standby mode.</p> <p>In case of repeated occurrence of the control signal S, the algorithm fulfillment is repeated.</p>
3 Periodic with on-delay 	<p>After energizing, the indicator ON (Fig.1 it.10) is on and the set delay time occurs t_{of}. During the delay time the indicator --- (Fig.1 it.9) periodically flashes.</p> <p>At the end of the delay time the load relay contacts C and NO are closed for set time t_{on} and the indicator --- is on. During the delay time the indicator --- periodically is off.</p> <p>At the end of the delay time the load relay contacts are open, and the product starts fulfillment of algorithm from the beginning.</p>	11 Pitch of the load relay 	<p>After energizing, the indicator ON (Fig.1 it.10) is on and the product goes into standby mode, in this case the load relay contacts C and NO are open, and the indicator --- (Fig.1 it.9) is off.</p> <p>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.</p> <p>When there is no the control signal S, the product continues to be in standby mode.</p> <p>In case of repeated occurrence of the control signal S, the algorithm fulfillment is repeated.</p>
4 Periodic with time delay when energizing 	<p>After energizing, the indicator ON (Fig.1 it.10) is on, contacts of the load relay C and NO are closed, the indicator --- on and the set delay time occurs t_{on}.</p> <p>During the delay time the indicator --- (Fig.1 it.9) periodically is off.</p> <p>At the end of the delay time the load relay contacts are open for set time t_{of} and the indicator --- is off. During the delay time the indicator --- periodically flashes.</p> <p>At the end of the delay time the product starts fulfillment of algorithm from the beginning.</p>	12 Periodic with external start and on-delay 	<p>After energizing, the indicator ON (Fig.1 it.10) is on and the product goes into standby mode, in this case the load relay contacts C and NO are open, and the indicator --- (Fig.1 it.9) is off.</p> <p>When control signal S occurs, there is the set time delay t_{of}. During the delay time the indicator --- (Fig.1 it.9) periodically flashes.</p> <p>At the end of the delay time the load relay contacts C and NO are closed for set time t_{on} and the indicator --- is on. During the delay time the indicator --- periodically is off.</p> <p>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.</p> <p>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.</p>
5 Pulse generator 	<p>After energizing, the indicator ON (Fig.1 it.10) is on and the set delay time occurs t_{of}. During the delay time the indicator --- (Fig.1 it.9) periodically flashes.</p> <p>At the end of the delay time the load relay contacts C and NO are closed, and the set delay time occurs t_{on}. During the delay time the indicator --- (Fig.1 it.9) periodically is off.</p> <p>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.</p>	13 Periodic with external start and time delay when energizing 	<p>After energizing, the indicator ON (Fig.1 it. 10) 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 --- (Fig.1 it.9) is off.</p> <p>When control signal S, the load relay contacts C and NO are closed for set time t_{on}. During the delay time the indicator --- (Fig.1 it.9) periodically is off.</p> <p>At the end of the delay time the load relay contacts C and NO are open for set time t_{of} and the indicator --- is off. During the delay time the indicator --- periodically flashes.</p> <p>At the end of the delay time the article starts the algorithm fulfillment from the beginning.</p> <p>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.</p>
6 On-delay with external start 	<p>After energizing, the indicator ON (Fig.1 it.10) is on and the product goes into standby mode, in this case the load relay contacts C and NO are open, and the indicator --- (Fig.1 it.9) is off.</p> <p>When control signal S occurs, there is the set time delay t_{of}. During the delay time the indicator --- (Fig.1 it.9) periodically flashes.</p> <p>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.</p> <p>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.</p>	14 Pulse generator with external start 	<p>After energizing, the indicator ON (Fig.1 it.10) 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 --- (Fig.1 it.9) is off.</p> <p>When control signal S occurs, there is the set time delay t_{of}. During the delay time the indicator --- (Fig.1 it.9) periodically flashes.</p> <p>At the end of the delay time the load relay contacts C and NO are closed for the set time t_{on}, and the indicator --- is on. During the delay time the indicator --- periodically is off.</p> <p>At the end of the delay time the load relay contacts are open, and the product goes into the standby mode.</p>
7 Off delay with external start 	<p>After energizing, the indicator ON (Fig.1 it.10) is on and the product goes into standby mode, in this case the load relay contacts C and NO are open, and the indicator --- (Fig.1 it.9) is off.</p> <p>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.</p> <p>When there is no the control signal S, there is the set time delay t_{on}. During the delay time the indicator --- periodically is off.</p> <p>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.</p> <p>In case of repeated occurrence of the control signal S, the algorithm fulfillment is repeated.</p>	15 Start-stop 	<p>After energizing, the indicator ON (Fig.1 it.10) 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 --- (Fig.1 it.9) is off.</p> <p>When control signal S occurs, there is the set time delay t_{of}. During the delay time the indicator --- (Fig.1 it.9) periodically flashes.</p> <p>At the end of the delay time the load relay contacts C and NO are closed for the set time t_{on}, and the indicator --- is on. In case of repeated occurrence of the control signal S, there is the set time delay t_{on}. During the delay time the indicator --- (Fig.1 it.9) periodically is off.</p> <p>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.</p>
8 Pulse I with external start 	<p>After energizing, the indicator ON (Fig.1 it.10) is on and the product goes into standby mode, in this case the load relay contacts C and NO are open, and the indicator --- (Fig.1 it.9) is off.</p> <p>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 t_{on}. During the delay time the indicator --- periodically is off.</p> <p>At the end of the delay time the load relay contacts are open, the indicator --- is off and the product goes into standby mode.</p> <p>In case of absence and repeated occurrence of the control signal S, the algorithm fulfillment is repeated.</p>	16 Always ON 	<p>After energizing, the indicator ON (Fig.1 it.10) 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.</p>
17 Always OFF 	<p>After energizing, the indicator ON (Fig.1 it.10) 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.</p>	17 Always OFF 	<p>After energizing, the indicator ON (Fig.1 it.10) 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.</p>

For all questions, please contact the manufacturer:

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