

**MULTIFUNCTIONAL
TWO-CHANNEL
TIME DELAY RELAY
REV-201M**



USERS MANUAL

This present manual contains necessary information about application, main operation principles and adjustment setting for the two-channel electronic time delay relay REV-201M (hereinafter **REV-201M**).

1 GENERAL DESCRIPTION AND OPERATION

1.1 APPLICATION

REV-201M is designed for the commutation of electrical circuits of 240V 50Hz AC as well as 24 – 100V DC electrical circuits with the adjustable time delay setting.

REV-201M contains 2 channels – each of them may work in 4 user preset algorithms:

- **Turn ON** time delay relay;
- Impulse relay;
- Cyclic relay for the periodic events;
- Operation relay *.

* *REV-201M could be used as the relay of pre-starting signalization for the machinery that require to announce that some mechanism or machinery will soon take a start to make people aware of this and get away from the risky zones. Widely used for steel plants, heavy machinery, cranes and construction mechanisms as well as mining companies for the technological stuff safety.*

Time delay setting for each channel starts from the moment of the power supply given to the corresponding channel. REV-201M allows to provide 2 modes of operation:

Mode 1. Independent operation of channels. To each of two channels power supply is given independently and thus each channel starts the countdown from the moment the power supply is given. This is the mode when 2 independent time relays are functioning in one compact case housing (2 time delay relays in one case).

Mode 2. Parallel operation of the channels. To each of two channels the power supply is applied simultaneously. Thus the time countdown on each channel starts at the same time and comes one and the same input power supply. Triggering time corresponds to the user-adjusted settings for each of the channels. So the REV-201M in this mode operates like one time delay relay with 2 output contacts that have the same or different time settings.

ATTENTION!!! When using the REV-201M in Mode 1. The power supply of both channels must necessarily have common neutral.

1.2 TECHNICAL PARAMETERS

1.2.1 Basic technical characteristics are shown below in Table 1.

Table 1

Rated AC input power supply (terminals L, N), V	160 – 300
Rated DC input power supply (terminals +24, N), V	24 □ 10%
Rated power circuit frequency, Hz	50 – 60
Initialization readiness time after the power supply application to the channel, sec, less then	0,25
Timing accuracy, %, not less then	1,5
Time setting accuracy (scale accuracy), %, not less then	3
Number of operation algorithms	4
User -adjustable time range, sec	0 – 36000
Time setting adjustment	Smooth
Number of scale marks for the potentiometer knobs	10
Type and quantity of the output commutation terminals	1 changeover
Protection degree: <ul style="list-style-type: none"> - housing - contact terminals 	IP40 IP20
Commutation lifetime of the output terminals at $\cos\phi=1$: <ul style="list-style-type: none"> - under the load of 7A, times, not less then - under the load of 1A, times, not less then 	100 000 1 000 000
Rated power consumption (under the load), VA, not more then	1,0
Weight, kg, not more then	0,150
Outer dimensions, mm	35 x 92 x 58
Operation temperature range, °C	From - 20 to +55
Storage temperature, °C	From - 45 to +70

Electrical characteristics for the Output terminals

Cos ϕ	Maximal current at U~250B	Maximal capacity	Maximal Voltage ~	Maximal Current at U _{DC} =28V
1,0	7 A	1250 BA	250 B	3 A

Arbitrary mounting position
Standard 35 mm DIN rail mounting

1.2.2 Front panel view and outer dimensions are shown on figure 1.

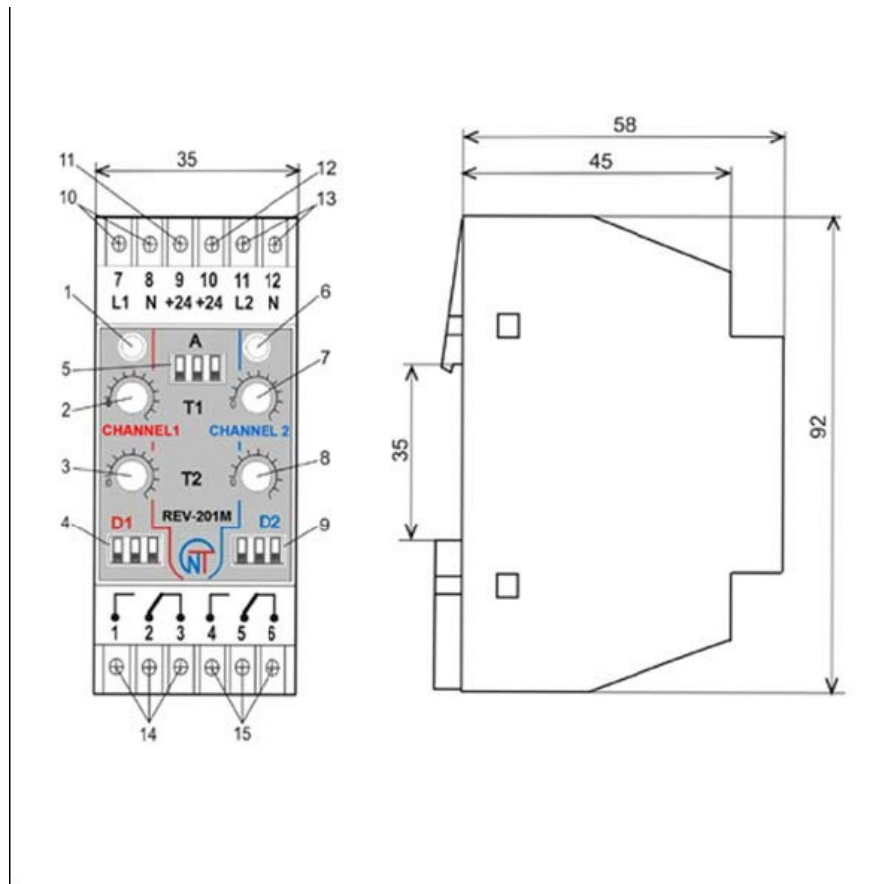


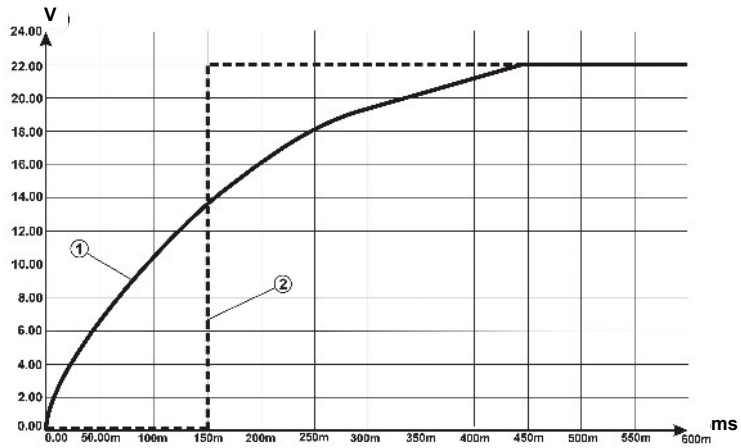
Figure 1

- 1, 6 – Two color LED indicators for channels – glows **GREEN** - when the voltage is present on the power supply input and glows **RED** – when the triggering output terminals are ON;
- 2, 3 – Adjustment knobs for the **Channel 1**;
- 7, 8 – Adjustment knobs for the **Channel 2**;
- 4, 9 – DIP switches to select timing ranges for the Channel 1 (**D1**) and Channel 2 (**D2**);
- 5** – DIP switch (**A**) to select the operation mode for the REV-201M;
- 10, 13 – AC input terminals ~240V for both Channels;
- 11, 12 – DC input terminals +24V for both Channels;
- 14, 15 – output terminals for both Channels.

1.2.3 REV-201M operation algorithms.

- Energized (Turned **ON**) state of the REV-201M corresponds the **closed** position of the output terminals **1-2** (Channel 1) and **4-5** terminals (Channel 2). Thus the terminals **2-3** (Channel 1) and terminals **5-6** (Channel 2) are **open** when the REV-201M turned ON.
- Deenergized (Turned **OFF**) state of the REV-201M is when terminals **1-2** (Channel 1) and terminals **4-5** (Channel 2) are open. And accordingly when the REV-201M is in **OFF** state – then terminals **2-3** (Channel 1) and terminals **5-6** (Channel 2) are closed.
- Initialization time delay. After the power supply is given to the input terminals of the REV-201M with the initially preset Zero time delay settings REV-201M turns ON not momentarily but within the time of

approximately 250 milliseconds. This happens due to smooth voltage increase on the power supply source of REV-201M. Kindly see Figure 2 below for more details.



1 – Voltage growth curve on the REV-201M input power supply
 2 – Curve showing the triggering time for the output terminals when the REV-201M has minimal (zero) time delay settings.

Figure 2 – Initialization time for REV-201M after the power supply is given to the device input terminals

1.2.3.1 Turn ON time delay

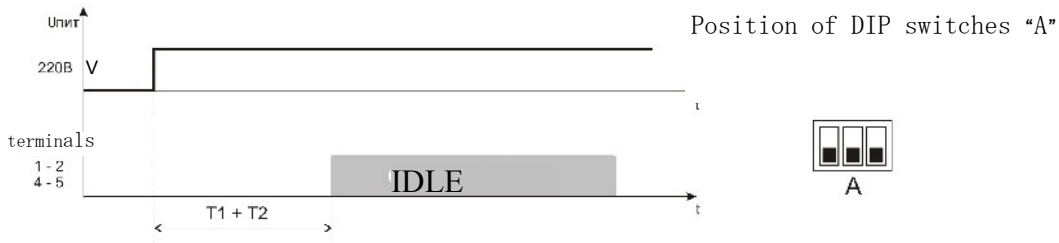


Figure 3 – Turn ON time delay

Timing countdown on each channel starts from the moment when the power supply source is applied to the input terminals «L1-N», (Channel 1); «L2-N», (Channel 2). Time delay setting is selected using the knobs of potentiometers. Each channel has two adjustable knobs: **T1** and **T2**. Time delay for the output contacts triggering of is determined as the sum of the values adjusted by both knobs for each channel separately.

When the power supply is present – **GREEN** LED starts glowing and timing countdown begins. After the expiry of time delay interval – **RED** LED turns on and the output contacts change the position to the **ON** state.

1.2.3.2 Impulse operation mode

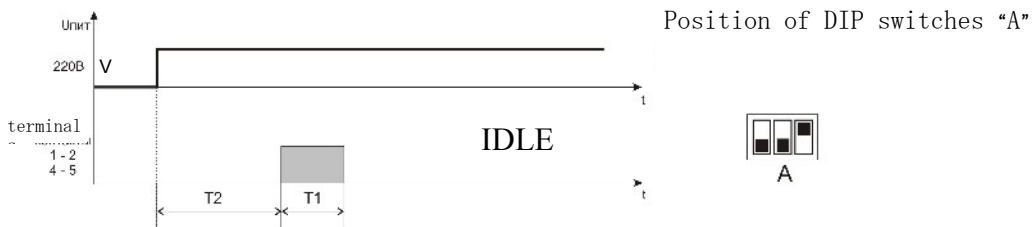


Figure 4 – Impulse operation mode

Timing countdown on each of the channels starts from the moment the power is applied to the terminals «L1-N», (Channel 1); «L2-N», (Channel 2).

When the power supply is given – on the channel **GREEN** LED starts glowing and countdown begins. Time delay intervals are adjusted using the knobs **3** and **8** (Figure 1.) in the diapason **T2** for the Channel 1 and Channel 2 respectively – pause time.

After the turn **ON** time delay expiry REV-201M turns **ON** for the time determined by the knobs **2** and **7** (Figure 1) in the diapason **T1** – LED indicator change the color to **RED**.

When the Turn **ON** time interval comes to an end REV-201M turns **OFF** the load and REV-201M switches to the idle mode. **LED** color indicator changes to **GREEN**.

1.2.3.3 Cyclic operation mode



Figure 5 – Cyclic operation diagram

Each Channel work independently. Timing countdown on each channel starts from the moment of power supply application to the input terminals «L1-N» (Channel 1); «L2-N» (Channel 2).

When the power supply is given to both or any of the channel then starts the timing countdown which is adjusted by the upper potentiometer knob **T1** at this moment **GREEN** LED indicator glows and the power load is turned **OFF**. After the termination of this time interval (**T1**) power load turns **ON** and starts the timing countdown of another interval that is adjusted by lower potentiometer knob **T2** and this is indicated with the **RED** LED indicator.

After the termination of the **T2** timing countdown REV-201M turns **OFF** the power load and the **LED** indicator changes to **GREEN**. From this moment new countdown basing the **T1** timing starts and the process keep on working in cycle mode in this way further.

If you want to restart the cyclic process – you will have to turn **OFF** the power supply and turn it **ON** afterwards.

1.2.3.4 Control Operation function

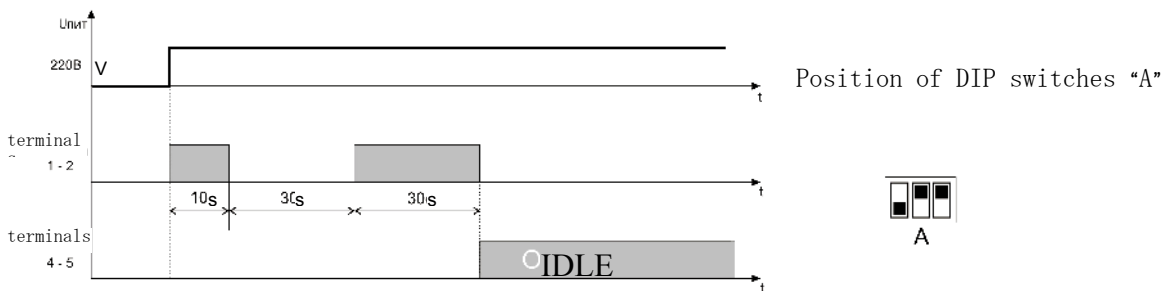


Figure 6 – Control Operation function diagram

ATTENTION! For the proper operation of REV-201M it should be connected in accordance with the parallel channels operation – Mode 2 (for details kindly see paragraph 1.1. Application).

After the power supply is given to the input terminals REV-201M turns **ON** the power load for the Channel 1 – simultaneously **RED** LED (**Channel 1**) and **GREEN** LED (**Channel 2**) indicator starts glowing – this indicates about the preliminary signalization with the fixed time delay of 10 seconds.

After this interval the output relay of the “Channel 1” turns **OFF** for the fixed time of 30 seconds – this is indicated by **GREEN** LED glowing on the “Channel 1”.

After the expiration of the pause for the “Channel 1” **GREEN** LED change the color to **RED** – second announcement signal with the time of 30 seconds;

After the end of the second announcement signal the output relay of the “Channel” 1 turns **OFF**, LED changes from **RED** to **GREEN** and the output relay of the “Channel 2” turns **ON**. At the same time **GREEN** LED of the “Channel 2” change the color to **RED** and switches to **IDLE** state.

If you want to restart the algorithm – you will have to turn **OFF** the power supply and turn it **ON** afterwards.

ATTENTION!!!

- In this mode of operation time adjustment knobs (**T1** and **T2**) as well as the DIP switched for the time ranges (**D1** and **D2**) doesn't function. All timing frames and intervals are preprogrammed and

fixed. On special customer request for the algorithm “START-PAUSE-START” it’s possible to change the timing intervals and delays as per requirement

- REV-201M has internally preprogrammed block that doesn’t allow to turn **ON** the power load on **Channel 2** until output contacts of **Channel 1** are being closed (**ON**).

2 GENERAL USE AND APPLICATION

2.1 FIRST START UP PREPARATIONS

2.1.1 Safety precautions

All wiring or cable connections (disconnections) to the REV-201M must be necessarily made on fully deenergized device.

2.1.2 All settings and adjustments of REV-201M should be made on deenergized device.

Adjustment should be made in the following sequence:

- Setting the operation algorithm
- Setting of timing parameters and delays

IMPORTANT NOTICES:





- **To change the operation algorithm of the REV-201M it’s necessary to turn OFF the power supply for the time of 0,5-1 seconds and change the position of the DIP switches “A” on the front panel (See Figure 1).**
- **When changing the operation algorithm it’s necessary to take into account that newly set up algorithm will take effect only after full deenergization of the REV-201M input terminals with the subsequent turning ON of the device.**
- **If during operation any of the timing settings has been modified by the user it’s necessary to note that the new timing setting will take effect only from the next operation cycle (not immediately).**

2.1.2.1 Operation algorithms selection

List of the operation algorithms is shown in the Table 2 below. For more details kindly see paragraphs of section 1.2.3.

Select the required operation algorithm and set an appropriate position of DIP switches “A” (Fig.1).

Table 2

No	OPERATION MODE	A	DESCRIPTION
1	Turn ON time delay		After the power supply application REV-201M performs user preset time delay that will be followed by opening of the output contacts and REV-201M will switch to idle state.
2	Impulse mode		After power supply application comes time delay interval adjusted by the potentiometer knob T1 , then the output contacts close for the time T2 and by the end of the T2 time interval output contacts open and REV-201M comes to idle state
3	Cyclic mode		Periodic repetitive turning ON/OFF the output contacts with the preset timing intervals
4	Control operation mode		After power supply application REV-201M output contacts close, then comes fixed time interval of 10 seconds and output contacts open. Then comes new fixed time interval of 30 seconds and output contacts close again for the time of 30 seconds. Then contacts open and REV-201M switch to idle state.

NOTICE:

- *In case the DIP switches “A” position are set up in a different combination that is not stated in the table above – then LED indicators will flash with **GREEN** and **RED** color in turns and the output contact terminals will keep on being in open state.*
- *When using the REV-201M in **Control operation mode** it doesn’t respond to any position or change of the knobs position **D1**, **D2** as well as timing knobs **T1**, **T2** (see Figure 1).*

2.1.2.2 Timing parameters adjustment.

Adjustment of time intervals should be made with the use of potentiometer knobs **2, 3** (Figure 1) for the Channel 1 and potentiometer knobs **7, 8** (Figure 1) for the Channel 2. Timing limits for the knobs are set up below with the use of DIP switches **4** (Channel 1), **9** (Channel 2) (see Figure 1) in accordance with the Table 3:

Table 3

DIP switch position (D1, D2)	Time intervals adjusted by T1 / T2
	0 – 1 sec / 0 – 10 sec
	0 – 10 sec / 0 – 60 sec
	0 – 60 sec / 0 – 10 min
	0 – 10 min / 0 – 60 min
	0 – 60 min / 0 – 10 hours
	0 – 10 hours / 0 – 10 hours

NOTICE:

- If DIP switches **D1, D2** are set in the position not mentioned in the **Table 3** above – then REV-201M will operate with the time settings 0 – 1 sec / 0 – 10 sec.
- On special customers request the timing ranges and other parameters could be changed as per requirement.

2.1.3. Connect REV-201M as shown on Figure 7 depending on the chosen operation mode (Paragraph 1.1.)

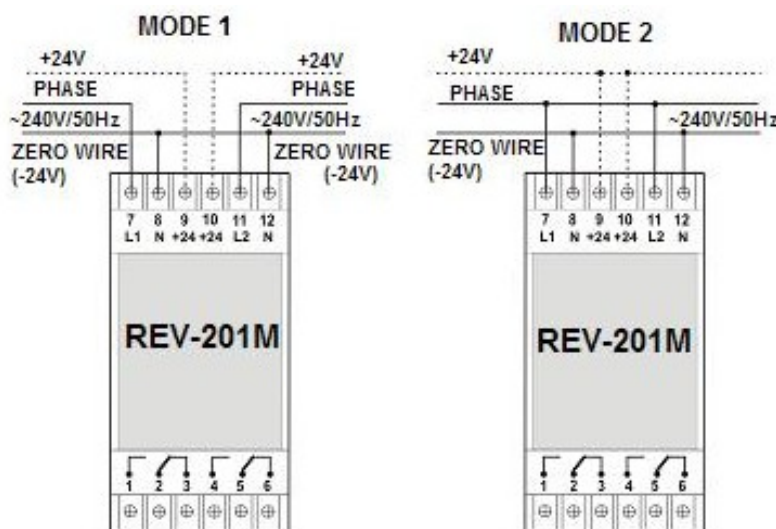


Figure 7 – Wiring diagram depending on required operation mode

ATTENTION!!! It is strictly prohibited to use simultaneously both power supply inputs for 24V DC and mains 240VAC. Only one power supply input should be used.

2.2 USAGE AND OPERATION OF REV-201M

Connect the power supply to the input terminals of the REV-201M. Turn **ON** the device. **GREEN** LED indicator of the corresponding channel should glow and timing countdown begins in accordance with the user-selected operation algorithm (see paragraph 2.1.2.1.). When the output relay is turned **ON** (closed state of the contacts **1-2** (**Channel 1**) and contacts **4-5** (**Channel 2**) – then LED indicator change the color and start glowing **RED**.

3 TECHNICAL MAINTAINANCE

3.1 SAFETY PRECAUTIONS

When making technical maintenance REV-201M must be deenergized

3.2 It is recommended to perform technical maintenance every 6 months of use. Look at the case of REV-201M and make sure that there are no dents or any other mechanical damages. Make sure that all the wires are tightened well and properly connected and pay attention to the absence of burned contacts.

4 PRODUCT LIFETIME WARRANTY AND STORAGE CONDITIONS

Manufacturer assures 10 years operation lifetime for the REV-201M. On the expiration of this time kindly contact to the manufacturer.

Manufacturer guarantees safe operation of the device within 36 calendar months from the sales date on the following conditions:

- Proper device connection according to the points stated in this present manual;
- The QA department seal should not be damaged or affected;
- Integrity of the case, absence dents, mechanical defects and absence of the signs to open the product case.

5 TRANSPORTATION

Transportation of the product could be made with the use of any transport in accordance with standard rules and safety requirements for the chosen transportation method. When transporting or handling product should be prevented from beats, drops and the action of increased humidity.

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