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ANRV-100
Voltage relay
Operating ManualV1.1

ACREL Co., Ltd

Declaration

Our company Reserves the right to modify the product specifications described in this manual without prior notice. Before placing an order, please consult your local agent for new specifications of this product.

Catalog

1 Overview

The ANRV-100 voltage relay can monitor and protect single-phase AC or DC voltage and protect equipment from overvoltage or undervoltage. Includes two independent relay output interfaces, optional over voltage, under voltage, window and other protection modes, optional memory function, suitable for rated AC/DC voltage 24-240V, measurement voltage 1V-100V working environment, and through the digital tube intuitively and clearly display the current measurement voltage, relay state.

Product Implementation standards:

——GB/T 14048.5-2017 Low-voltage switchgear and controlgear -- Part 5-1: Control circuit appliances and switching elements -- Electromechanical control circuit appliances.

2 Product Features

- Automatic identification of AC and DC power, digital tube real-time display measurement voltage (true effective value).
- Choose between overvoltage, undervoltage, and window mode.
- Optional memory function.
- Two independent relay outputs can be set up for protection respectively.
- Auxiliary power supply supports AC 24-240V 50Hz / 60Hz or DC 24-240V.
- voltage measurement accuracy of 1.0 level.

3 Technical indicators

The technical indicators are shown in Table 1：

Table 1　Technical indicators

Technical parameters	Technical indicators	
Rated supply voltage	AC 24-240V 50Hz / 60Hz or DC 24-240V	
Measuring voltage range	AC/DC 1V-100V	
Measurement error	±1.0%（full scale）	
Action delay setting range	0.1s-30.0s	
Action delay error	±35ms（time delay <4s）or ±1% setting value（time delay >4s）	
Set the range of lag values	(5%-50%) setting value	
Power on delay time	0.5s	
Relay output contact capacity	2 channels，passive switching output；Contact type：2C/O； Impedance load：AC250V，8A；DC30V，8A	
Environment	Working temperature	-20ºC～60ºC
	Storage temperature	-40ºC～70ºC
	Relative humidity	≤97％no condensation, no corrosive gas

	Altitude	≤2000m
Pollution levels	Class 3	
Protection grade	IP30	
Install the category	Level III	

4 Dimensions and installation

4.1 Overall dimension (unit: mm)

The ANRV-100 is mounted with a 35mm guide rail. Its dimensions are shown in Figure 1:

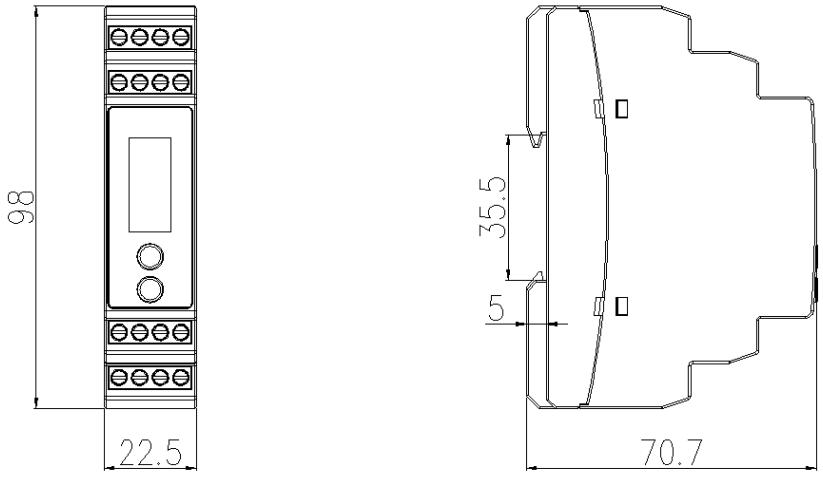

Figure 1 ANRV-100 overall dimension

4.2 Wiring diagram

The wiring diagram of ANRV-100 is shown in Figure 2:

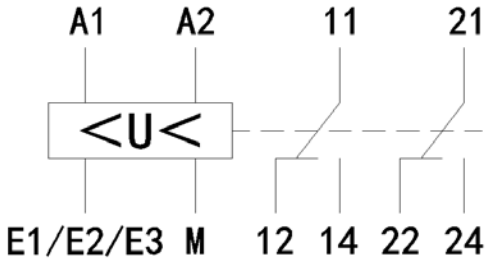

Figure 2 ANRV-100 wiring diagram

ANRV-100 terminal number and function definition are shown in Table 2:

Table 2 Terminal number and function definition

Terminal number	Function definition	Note
A1	Auxiliary power input 1(L/+)	Auxiliary power
A2	Auxiliary power input 2(N/-)	
E1/E2/E3	Input the measured voltage 1(+)	E1/E2/E3 only one is allowed at a time E1、M voltage range measured 1-10V
M	Input the measured voltage 2(-)	

		E2、M voltage range measured 5-50V E3、M voltage range measured 10-100V
11	Output relay 1 common end	Relay output
12	Output relay 1 normally closed contact	
14	Output relay 1 normally open contact	
21	Output relay 2 common end	
22	Output relay 2 normally closed contact	
24	Output relay 2 normally open contact	

5 Operation instructions

5.1 Key instruction

SET

Enter

SET —— Menu page or increase data；(Press this button in normal state to switch between voltage display, relay state and fault state page）

Enter —— Enter the next level menu or confirm; (Press this button in normal state to enter the programming menu page)

5.2 Menu symbols and meanings

By default, the percentage of the current voltage in the range will be displayed on power-on. Press "SET" on the main interface to turn the page and display the relay state, relay 1 fault state and relay 2 fault state, as shown in Figure 3.

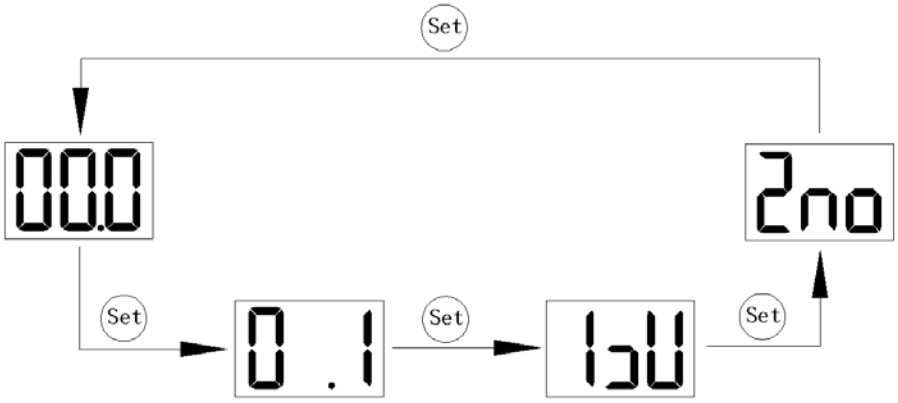

Figure 3 Main interface

Table 3 Display symbol description

Display symbols	Description
no	Normal state
>U	Overvoltage state
<U	Undervoltage state
on	Memory mode open

oFF	Memory mode off

On the main interface, press enter to enter the programming menu and display "P01". Press SET to select the menu number. The menu number is shown in Table 4：

Table 4　Parameter setting

Menu number	Set category	Default value	Set range	Unit
P01	Relay 1 protection mode setting	<U	<U：Undervoltage >U：Overvoltage <U<：Window	
P02	Relay 1 operation threshold	50	10-100	%
P03	Delay time of relay 1 operation	0.1	0.1~30.0	s
P04	Hysteresis of relay 1	5	5-50	%
P05	Relay 2 protection mode setting	<U	<U：Undervoltage >U：Overvoltage	
P06	Relay 2 operation threshold	50	10-100	%
P07	Delay time of relay 2 operation	0.1	0.1~30.0	s
P08	Hysteresis of relay 2	5	5-50	%
P09	Memory Mode Setting	OFF	ON/OFF	

Press enter key in the menu serial number interface to enter the corresponding menu range setting. Short press or long press SET key to increase the number. After setting the required parameters, press Enter key to save and exit the menu. If the key is not pressed for more than 10 seconds or the Enter key is long pressed, the menu will exit from the next level. An example of menu operation is shown in Figure 4-6.

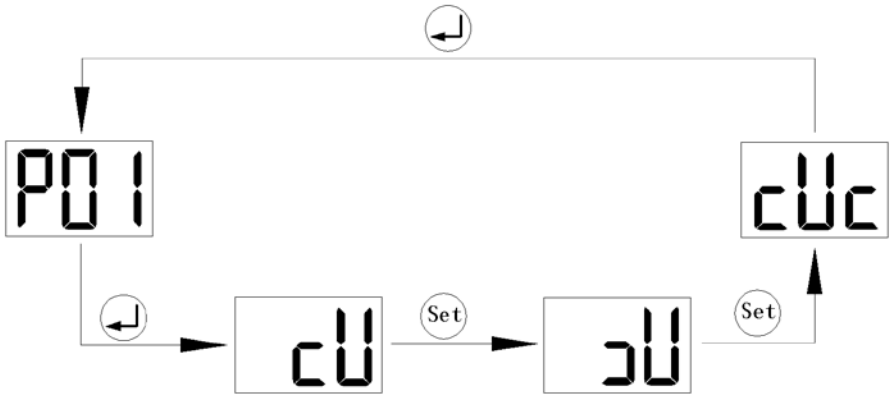

Figure 4　P01　Relay 1 protection mode setting

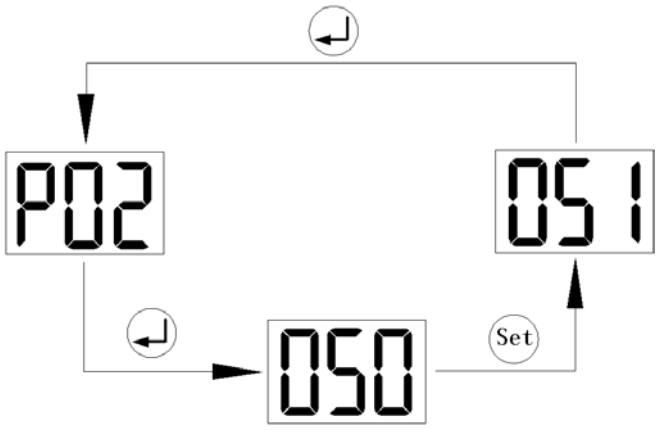

Figure 5　P02　Relay 1 operation threshold setting

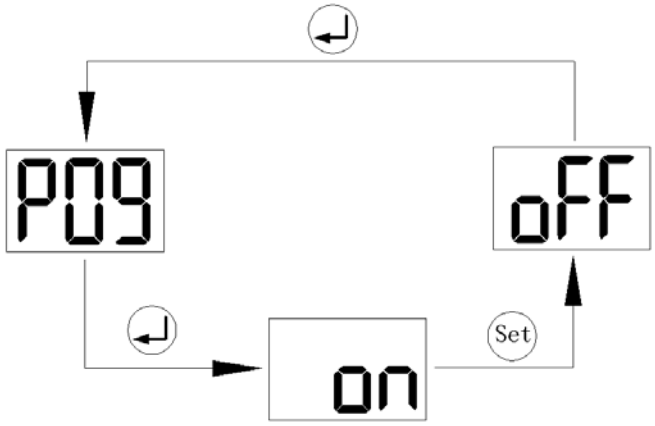

Figure 6　P09　Memory Mode Setting

6 Description of protection function

6.1 Overview

ANRV-100 can choose under voltage, over voltage, window protection mode. When under voltage or over voltage protection mode is selected, the two relay can set the operation threshold, delay time and return coefficient separately.

When the protection mode of P01 is set to <U<：Window mode，the protection mode setting of P05 relay is invalid。

6.2 Undervoltage mode

Taking the first relay output as an example, when the measured voltage is less than the operation threshold and the duration is longer than the delay time, the switching action is performed. Set to the automatic reset mode, when the measured voltage is greater than the lag value, the reset action will be executed immediately. Set to manual reset mode, must disconnect the auxiliary power to reset。

Note：

Lagged value = Action threshold * (100% + Retardation)；

Tt：delay time；

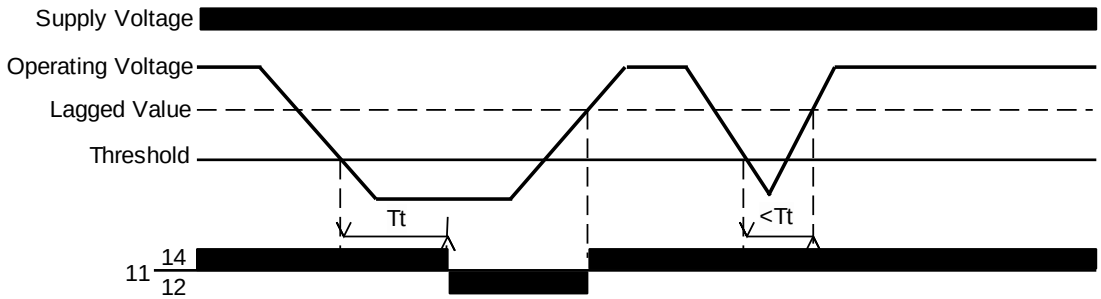

Figure 7 Undervoltage mode memory function off

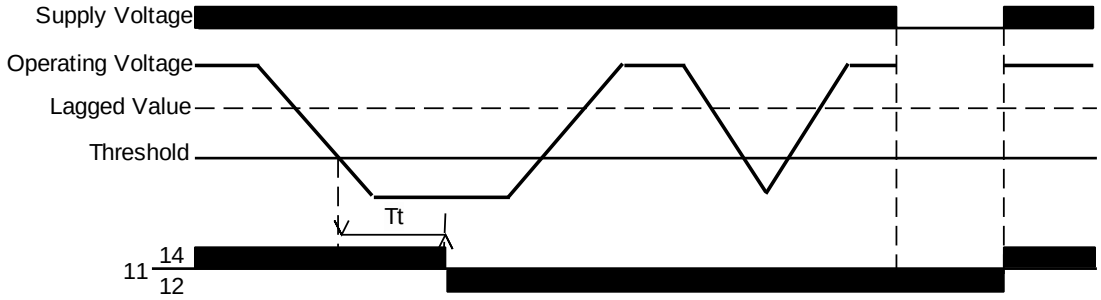

Figure 8 Undervoltage mode memory function open

6.3 Overvoltage mode

Taking the first relay output as an example, when the measured voltage is greater than the operation threshold and the duration is longer than the delay time, the switching action is performed. Set to the automatic reset mode, when the measured voltage is less than the lag value, the reset action will be executed immediately. Set to manual reset mode, must disconnect the auxiliary power to reset。

Note：

Lagged value = Action threshold * (100% - Retardation)；

Tt：delay time；

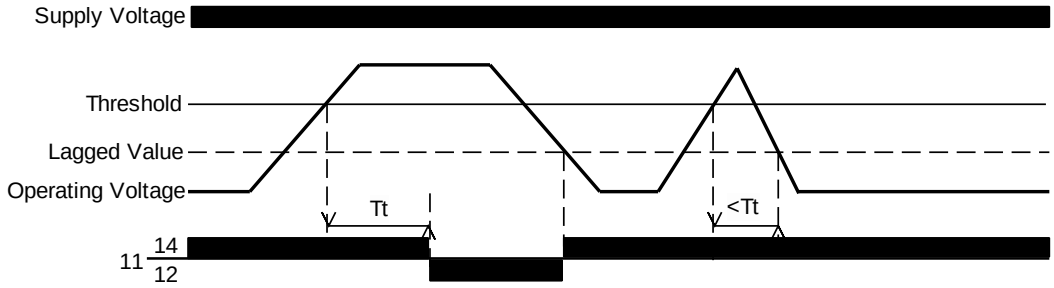

Figure 9 Overvoltage mode memory function off

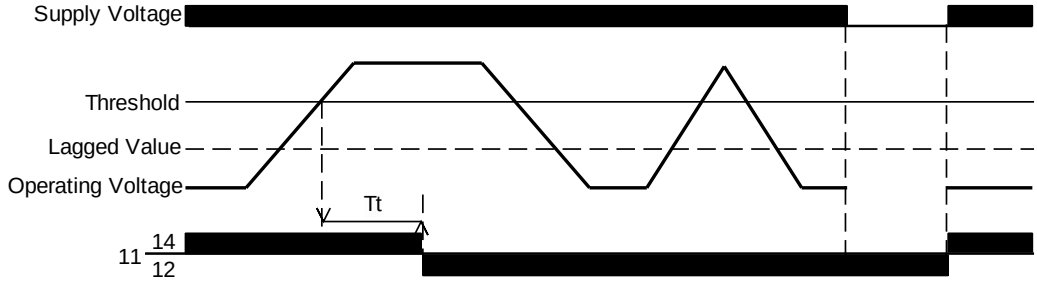

Figure 10 Overvoltage mode memory function open

6.4Window mode

When the measured voltage is less than the first operation threshold of the relay or more than the second operation threshold of the relay, and the duration is longer than the delay time, the switching action is performed. Set to the automatic reset mode, when the measured voltage is greater than the under-voltage lag value and less than the over-voltage lag value, the reset action is immediately executed. Set to manual reset mode, must disconnect the auxiliary power to reset.

Note：

Undervoltage hysteresis value = Relay 1 operation threshold * 105%；

Overvoltage lag value = Relay 2 operation threshold * 95%；

Relay one operating threshold must be less than the relay operating threshold；

Tt：Relay 1 delay time；

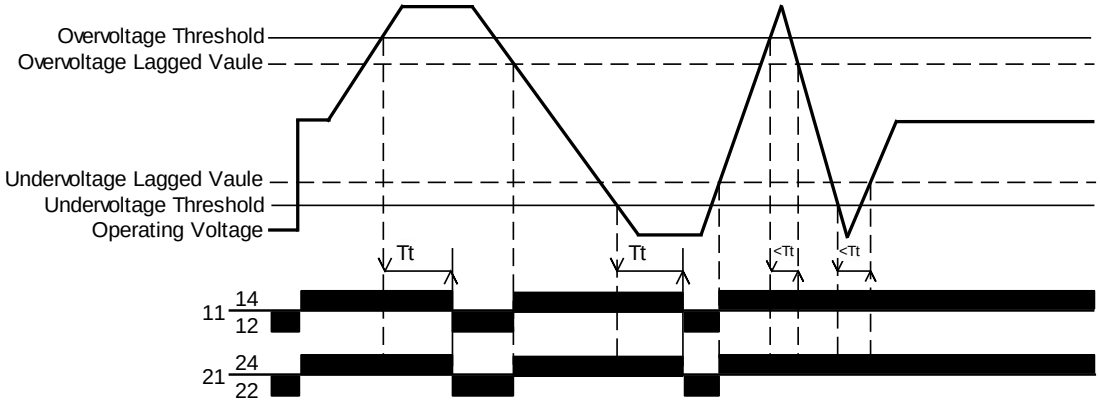

Figure 11 Window mode

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