

ZHRV2-S45 User manual

Digital voltage monitoring relay

Function features

- High-performance microcontroller and digital processing technology are adopted, with high reliability, strong anti-interference ability.
- Three-phase voltage protector, chronograph and counter are integrated into one.
- Operating voltage value, failure state, time, counting number and other information are displayed on the LCD.
- It is equipped with the protective functions for overvoltage, undervoltage, loss of phase, phase sequence and unbalanced three-phase voltage.
- The protector will work normally in case of disconnection of any one phase.
- Various protection parameters are set by pressing the buttons and the protective functions can be opened or closed in the same way.
- Measurement for true effective value and the measurement accuracy is not more than 1%.
- The measurement frequency is 45Hz-65Hz.
- The counting input signal of wide range is AC/DC20-450V
- The three-phase voltage value, timing and counting numbers are inquired by pressing the buttons.
- Test and manual reset functions can be completed by pressing the buttons.

Application

It is suitable for real-time monitoring and protecting the power supply for the equipment which needs to be started frequently, such as Elevators, cranes, traveling crane, machine tools and compressors, and it can accumulate numbers of starts and operation time of the equipment, meanwhile, it can monitor the power supply of the equipment; in case of abnormal condition of the power supply, it will cut off the power supply and record the numbers of power failure and the cumulative time as the basis for repair and maintenance.

Technical data

Supply voltage	Three phase 220V~450VAC
Rated frequency	50/60Hz
Loss of phase and phase sequence	≤0.5s
Dely error	±10%+0.1s
Measurement accuracy	±1%, (measurement for true effective value)
Storage time of data	10 year
Maximum count capacity	999999
Maximum timing capacity	9999hours and 59minutes
Maximum count frequency	5Hz
Cumulative counting error	≤0.001%
Counting input signal	AC/DC 20V~450V
Conventional thermal current	5A
Utilisation category	AC-15
Conacts capacity	Ue/Ie: 240V/1.5A, 415V/0.95A
Contacts output type	1C/O+1NC
Maximum fuse ratings	RT36-00 6A
Level of protection	IP20
Class of pollution	3
Electrical life	10 ⁵
Mechanical life	10 ⁶
Altitude	≤2000m
Operating temperature	-5°C~40°C
Permissible relative humidity	≤50% (40°C) (without condensation)
Storage temperature	-25°C~55°C
Cross-section of conductors	0.5mm ² ~1mm ²
Tightening torque	0.5Nm
Installation Method	Mounting on 35mm rail(IEC/EN60715)

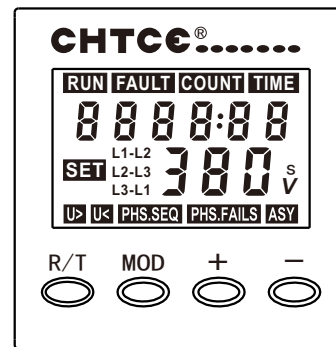
Category	Code	Technical parameters	Setting range	Factory set value	Stepping quantity
Set category of voltage	F11	overvoltage action value	OFF-381V~500V	437V	1V
	F12	undervoltage action value	260V~379V-OFF	304V	1V
	F13	Recovery to difference value under overvoltage or undervoltage	1~20V	5V	1V
	F14	Imbalance action value	OFF-20V~80V	32V	1V
	F15	Recovery to difference value under imbalance	3~15V	5V	1V
Set category of time	F21	overvoltage delay time	0.1~20s	2s	0.1s
	F22	undervoltage delay time	0.1~20s	5s	0.1s
	F23	imbalance delay time	0.1~20s	2s	0.1s
	F24	Self-starting delay time	0.3~30s	2s	0.1s
	F25	Reset delay time	0.3~30s	2s	0.1s

Category	Code	Technical parameters	Setting range	Factory set value	Stepping Quantity
Set category of protection	F31	Phase sequence protection	ON-OFF	ON	
	F32	Auto-reset	ON-OFF	ON	
Set category of function	F90	Restore factory setting	ON-OFF	OFF	
	F91	Timing and counting reset	ON-OFF	OFF	
	End	Exit setting			

- ON: start the function, OFF: stop the function.

Description of operation

- Pane schematicl



- R/T → Test/reset button
- MOD → Parameters setting/timing counting query button
- + → Digit+/phase switch key
- → Digit-/phase switch key

Display	Description
0000:00	Timing counter display value
380V	Voltage value
L1-L2 L2-L3 L3-L1	Phase indication, switched by pressing "+" "-" button
S	Second indication
RUN COUNT	working times
RUN TIME	woring hours
FAULT COUNT	Faults number
FAULT TIME	Faults hours
SET	overvoltage and undervoltage setting indication
U>	overvoltage faults indication or overvoltage setting indication
U<	undervoltage faults indication or undervoltage setting indication
PHS.SEQ	phase sequence failure indication
PHS.FAILS	Loss of phase indication
ASY	Imbalance failure indication

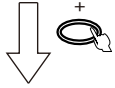
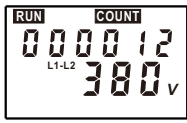
- Failure protection specification

- 1.If voltage faults occur, the corresponding segment for the fault will flash; the output relay will be disconnected and the segment for the fault will be always ON after the set fault delay for the relay is over.
- 2.After fault protection, if the supply voltage is normal, the segment for faults will be OFF and the segment for phase indication flashes; the output relay will trip and the segment for phase indication stop flashing after the reset time of the relay is over.
- 3.If Auto-reset mode is OFF (the relay will be in manual reset mode), it will only be reset by pressing R/T key.

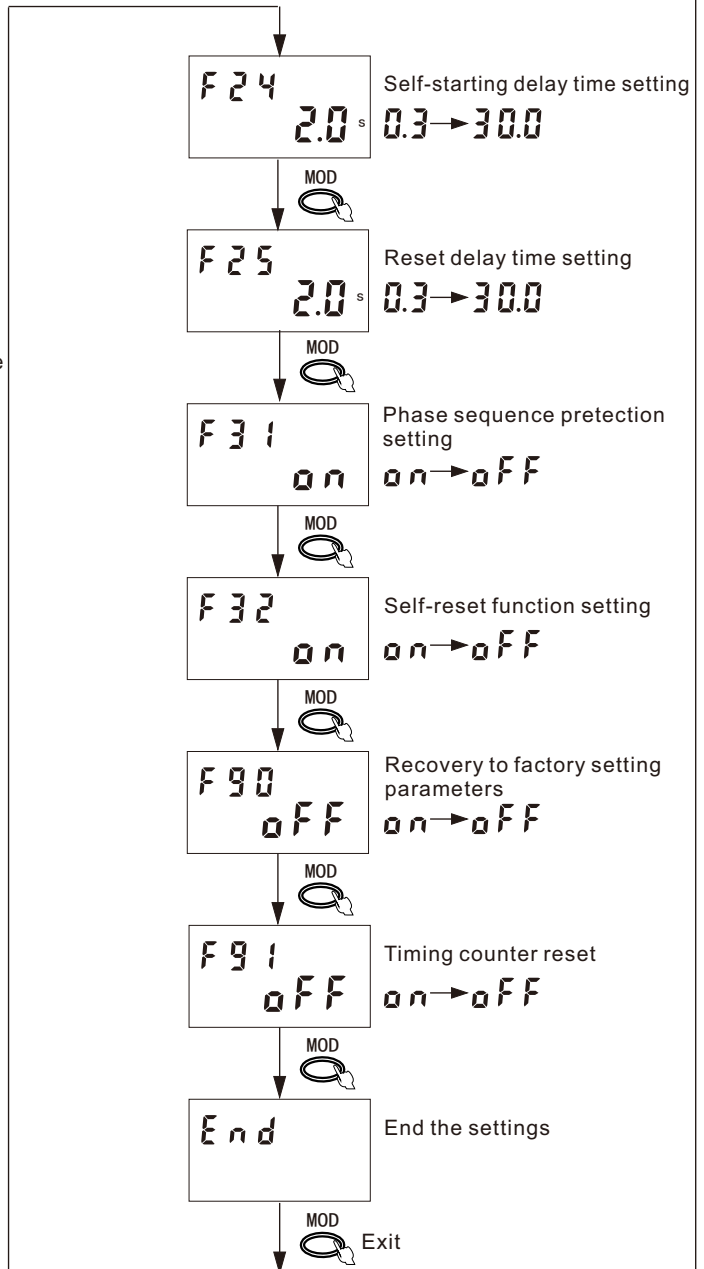
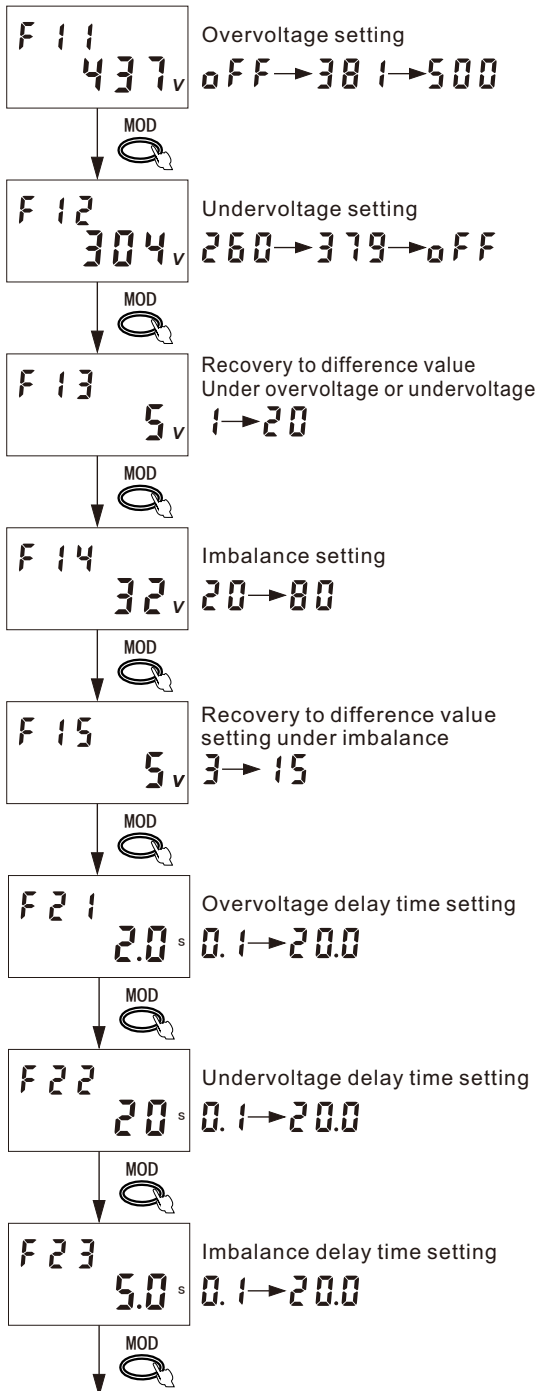
○ Operation instance

Internal parameters alternation

Long press “+” keys for 5s, enter into parameters setting interface:



Long press for 5s



- Press “+” “-” buttons to change the setting values, and fast increase and decrease can be realized by long press of 0.5s.
- If no press on the button for 60s during internal parameter setting, the relay will automatically quit the menu.
- **on** : start the function, **off** : stop the function.

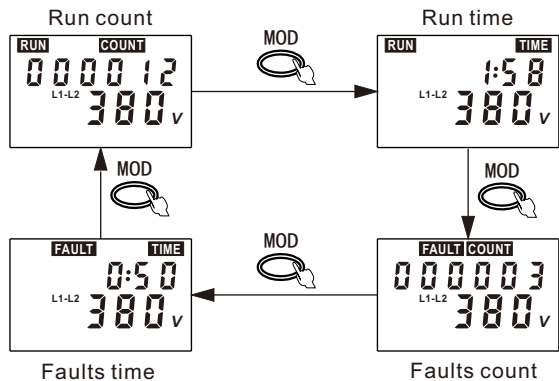
Three phase voltage query

Three phase voltage value can be obtained by short press of "+" and "-" button:



Query of timing/counting record for working and failure

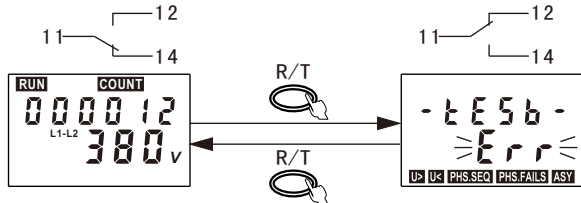
The timing/counting record can be circularly inquired by short press "MOD" button.



- It will automatically return to the display interface for run count if no press on the button for 30s.
- The time for pressing the button shall not be longer than 2s.

Test and reset

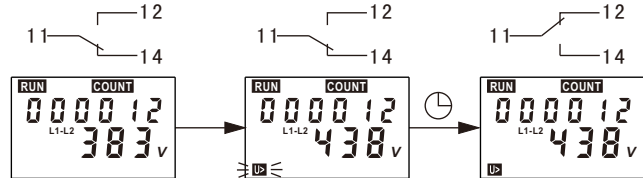
The test of relay action can be realized by short press on the R/T button for 0.5s:



- It is effective to press the button only under the condition that the supply is normally displayed.
- Other buttons are invalid under the test of function.
- ≧ ≦ : Means segment code flicker

Overvoltage failure instance

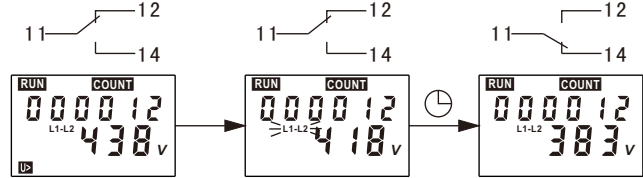
U> setting value 437V



- ≧ ≦ : Means segment code flicker

Overvoltage failure self-recovery instance

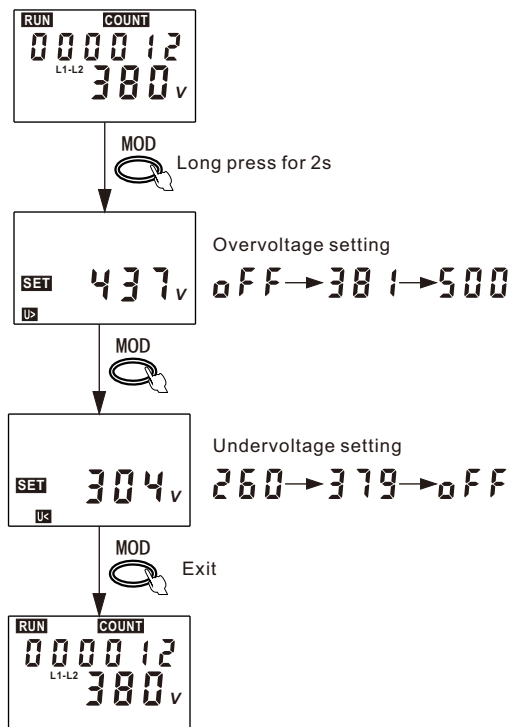
U> setting value 437V



- ≧ ≦ : Means segment code flicker

Overvoltage and undervoltage trip value setting

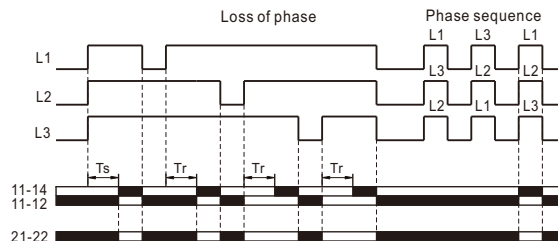
Long press "MOD" key for 2s, enter into overvoltage/undervoltage setting interface



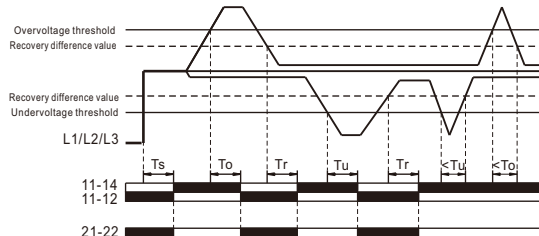
- Press "+" "-" buttons to change the setting values, and fast increase and decrease can be realized by long press of 0.5s.
- When setting, if not pressing the buttons for continuous 60s, the relay will exit from the overvoltage/undervoltage setting interface automatically.
- It is effective to press the button only under the condition that the supply is normally displayed.

Function diagrams(auto-reset mode)

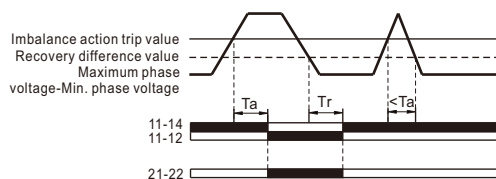
○ Loss of phase and phase sequence



○ Overvoltage and undervoltage

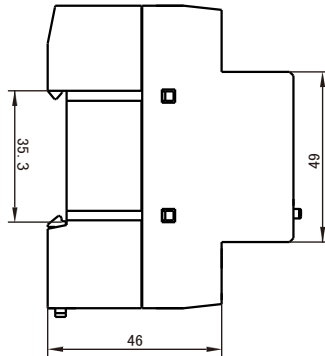
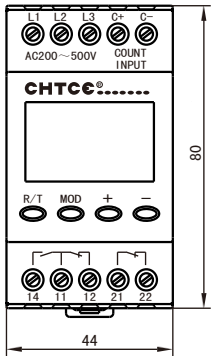
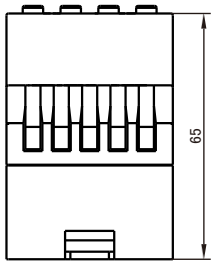


○ Imbalance

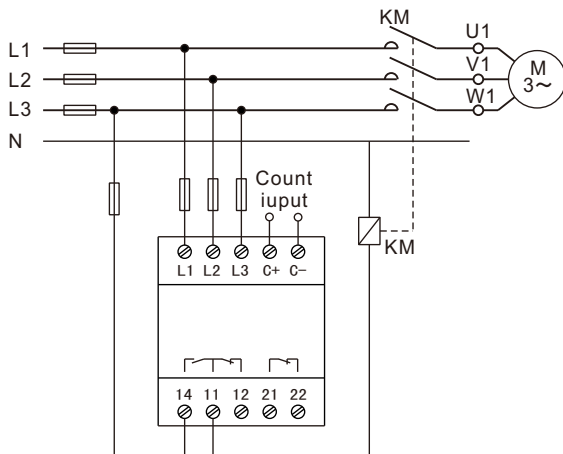


- Ts: Self-starting delay time
- Tr: Reset delay time
- To: Overvoltage delay time
- Tu: Undervoltage delay time
- Ta: Imbalance delay time

Overall dimensions



Wiring diagrams



- The contact of the output relay is normal on the protector, 11 and 14 are switched on, 11 and 12 are switched off, 21 and 22 are switched off. In the state of power-loss or failure protection of the protector, 11 and 14 are switched off, 11 and 12 are switched on, 21 and 22 are switched on.
- The counting input terminal is the voltage signal, suitable for the voltage input range of AC/DC20V-450V. If it is DC input, the positive and negative poles shall be cared about. The C+ input terminal is positive pole, the C- input terminal is negative pole.

Precautions

1. The installation, operation and overhaul of this product shall be carried out by a professional. The product warranty period is 18 months under regular service condition.
2. The user is prohibited to take apart or maintain the product regardless of whether the product is normal or damaged, otherwise our company will not assume any liability for any accident caused.
3. Please refer to the wiring diagram for wiring.
4. Power incoming line is prohibited for wiring in the same tube with other electric wires of strong current. And please use shielded wire if necessary to avoid interference and influencing the normal operation of the protector.
5. It is prohibited to use the product in places with dustiness, corrosive gas, direct sunlight or rain.
6. The product is prohibited to be used in medium with explosion hazard, which medium shall not contain corroding metal, gas destroying insulation and conducting dust.
7. Please store and use the product under rated supply voltage and the stipulated temperature, altitude and humidity.