



**SmartGen**  
ideas for power

**HVD300**

**VOLTAGE DETECTION RELAY**

**MULTIFUNCTIONAL PROTECTION MODULE**

**USER MANUAL**



**SMARTGEN (ZHENGZHOU) TECHNOLOGY CO.,LTD.**



Chinese trademark

**SmartGen** English trademark

**Smartgen** — make your generator *smart*

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Version history

Date	Version	Content
1.0	2014-08-07	Original release.
1.1	2014-10-09	Rename the product.
1.2	2015-03-24	1. Add "Multifunctional Protection Module" to the name 2. Change the minimum of under voltage protection threshold value to 0



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SmartGen

## 1 OVERVIEW

HVD300 voltage detection relay is widely used in marine genset field and land genset field.

HVD300 voltage detection relay detects over voltage, under voltage, loss of phase, phase sequence wrong and other abnormal condition accurately and the corresponding relay will act when abnormal conditions occur.

## 2 PERFORMANCE AND CHARACTERISTICS

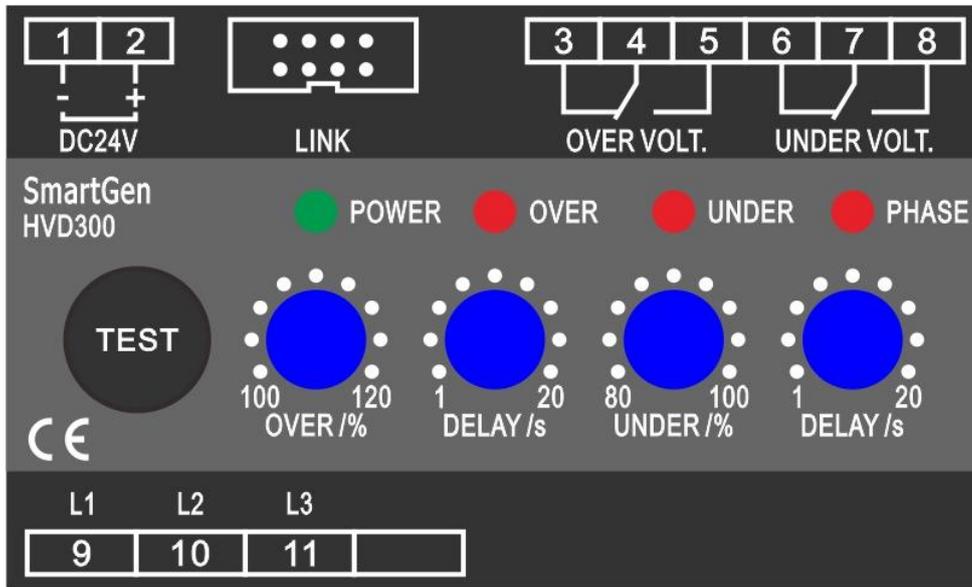
- Suitable for 3-phase 4-wire, 3-phase 3-wire, single phase 2-wire, and 2-phase 3-wire systems with frequency 50/60/400Hz;
- Detect 3-phase voltage and phase sequence accurately;
- With over voltage, under voltage, loss of phase and reverse phase sequence protection function;
- Adjustable potentiometer allows for set value adjusting and delay value setting;
- 2 relay output;
- One test button, test over/under voltage relay and indicator;
- Widely power supply range DC(8~35)V, suitable to different starting battery voltage environment;
- 35mm guide rail mounting;
- Modular design, pluggable terminal, compact structure with easy installation.

## 3 TECHNICAL PARAMETERS

Parameter	Details
Working Voltage	DC8. 0V to 35. 0V, continuous power supply
Overall Consumption	<0.9W (Standby mode: ≤0.28W)
AC Input	AC30V~ AC620V (ph-ph)
AC Frequency	50Hz/60Hz/400Hz
Over Voltage Output	5A AC250V Volts free output
Under Voltage Output	5A AC250V Volts free output
Case Dimensions	89.7mm x 71.6mm x 60.7mm
Working Conditions	Temperature: (-25~+70)°C Humidity: (20~93)%RH
Storage Conditions	Temperature:(-25~+70)°C
Insulation Intensity	Apply AC2.2kV voltage between high voltage terminal and low voltage terminal; The leakage current is not more than 3mA within 1min.
Weight	0.24kg



**4 PANEL BUTTON DESCRIPTION**



Description of terminal connection:

No.	Functions	Cable Size	Remark
1	DC input B-	1.0mm <sup>2</sup>	Connected with negative of starter battery.
2	DC input B+	1.0mm <sup>2</sup>	Connected with positive of starter battery.
3	OVER VOLT. RELAY	Normally Close	Active when the AC voltage has exceeded the set value and the delay timer has expired while deactivate after the AC voltage returns to normal.
4		COM	
5		Normally Open	
6	UNDER VOLT. RELAY	Normally Close	When the VC voltage has exceeded the Under Voltage Set Value and fallen below the Under Voltage Potentiometer Set Value, the under voltage relay output after the delay timer has expired. The output deactivates after the voltage returns to normal.
7		COM	
8		Normally Open	
9	L1	1.0 mm <sup>2</sup>	Phase Voltage Input
10	L2	1.0 mm <sup>2</sup>	
11	L3	1.0 mm <sup>2</sup>	
LINK Port	Used for parameters setting.		



**5 FUNCTION DESCRIPTION**

Item	Description
Power Indicator	Power supply indicator; It is illuminated when the relay is powered up. (green light)
OVER Indicator	Over voltage Indicator; It flashes once per second when the voltage has exceeded the set value and illuminated when the delay timer has expired. When voltage return to normal, the indicator is extinguished.(red light)
UNDER Indicator	Under voltage Indicator; It flashes once per second when the voltage has fallen below the set value and illuminated when the delay timer has expired. When voltage return to normal, the indicator is extinguished (red light)
PHASE Indicator	Phase indicator; It is illuminated when Phase Sequence Wrong occurs; It flashes when loss of phase failure occurs while extinguished when other condition occurs. (red light) Power supply system: 3P3W or 3P4W
TEST Button	Press the button for 3 seconds, the over voltage relay, over voltage indicator and phase indicator output; Press the button and release the button, within 1 second, again press it for 3 seconds, under voltage relay and under voltage indicator output.
OVER /% Over Voltage Set Value Potentiometer	Used for adjusting over voltage set value. Range: (100~120)%; Setting value is the percentage of rated voltage value.
Delay Value Potentiometer	Used for adjusting over/under voltage delay value. Range: (1~20);
UNDER /% Under Voltage Set Value Potentiometer	Used for adjusting under voltage set value. Range: (80~100)%; Setting value is the percentage of rated voltage value.
Delay Value Potentiometer	Used for adjusting over/under voltage delay value. Range: (1~20);



**6 SCOPES AND DEFINITIONS OF PROGRAMMABLE PARAMETERS**

No.	Items	Parameters	Defaults	Description
1	AC System	(0-3)	0	0: 3P4W, 1: 3P3W 2: 2P3W, 3:1P2W
2	Gen Rated Voltage	(30-30000)V	380	
3	Under Voltage	(5-100)	10	Active when the voltage has exceeded the set value.
4	Loss of Phase Enable	(0-1)	1	0: Disable; 1:Enable
5	Phase Sequence Wrong Enable	(0-1)	1	0: Disable; 1:Enable
6	Gen Rated Frequency	(10.0-400.0)Hz	50.0	
7	Volt. Trans.(PT)	(0-1)	0	0: Disable 1: Enable
8	Primary Voltage	(30-30000)V	100	
9	Secondary Voltage	(30-1000)V	100	
10	Communication Address	(1-254)	1	

**PC Program:**

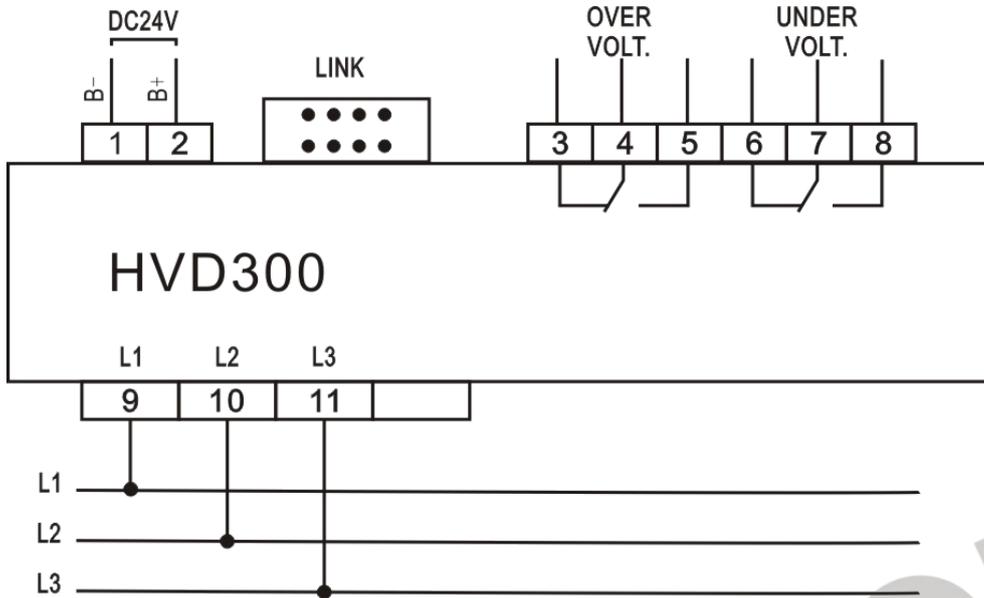
Parameters setting and real-time monitoring can be implemented via LINK port by using PC software and an SG72 adapter which produced by our company. As follows:



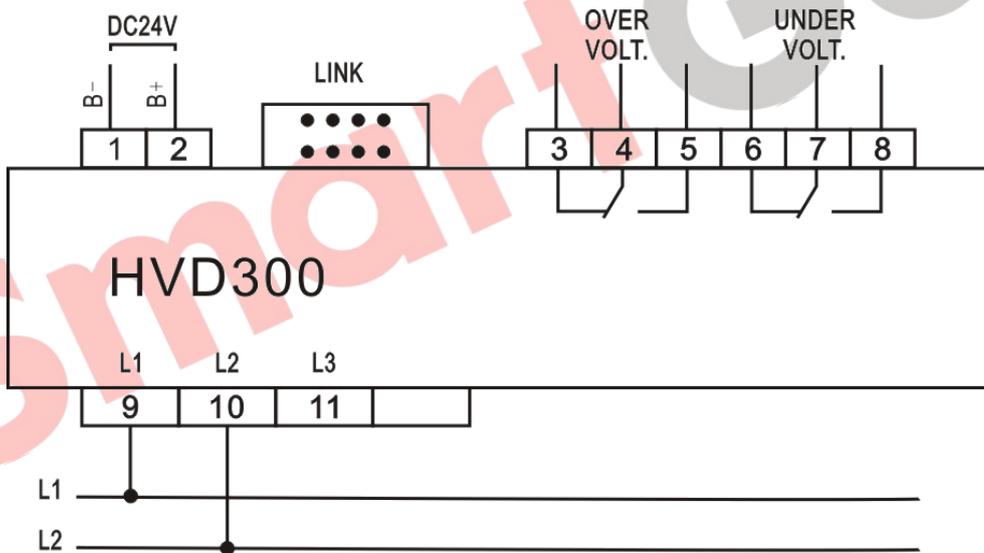


**7 TYPICAL DIAGRAM**

3 phase 3 wire/3 phase 4 wire

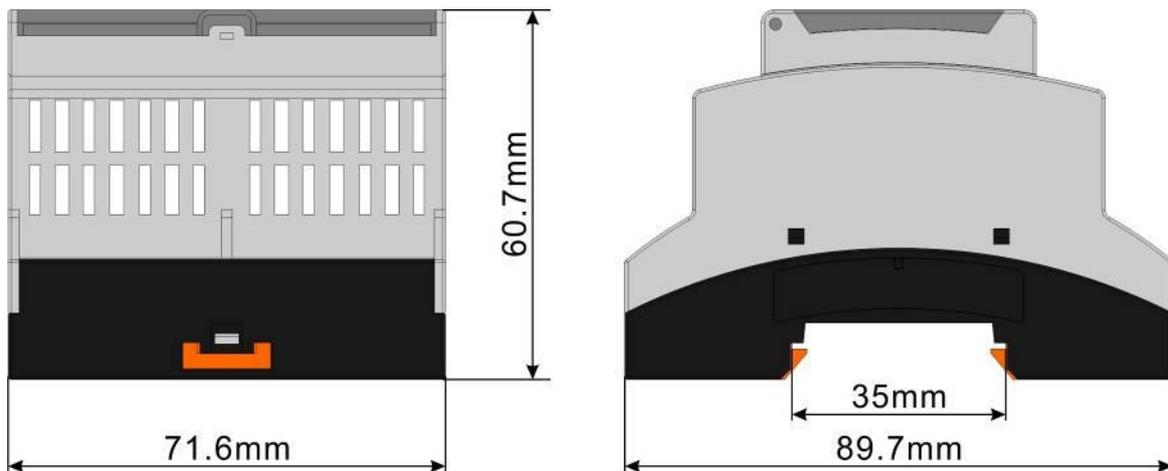


Single phase 2 wire/2 phase 3 wire





## 8 INSTALLATION DIMENSIONS



### 1) Output And Expand Relays

All outputs are relay contact output type. If need to expand the relays, please add freewheel diode to both ends of expand relay's coils (when coils of relay has DC current) or, add resistance-capacitance return circuit (when coils of relay has AC current), in order to prevent disturbance to controller or others equipment

### 2) Withstand Voltage Test

**⚠ CAUTION!** When relay had been installed in control panel, if need the high voltage test, please disconnect relay's all terminal connections, in order to prevent high voltage into relay and damage it.