Smartgen®

# HOC300 Over Current Protection Relay

# User Manual



Smartgen Technology

众智电子 **Chinese trademark**

**Smartgen®** **English trademark**

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

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**Software Version**

| Version | Date | Note |
|---|---|---|
| 1.0 | 2014-08-07 | Original release. |
| 1.1 | 2014-10-09 | Rename the product. |
| | | |

This manual is suitable for HOC300 over current protection relay only.

Clarification of notation used within this publication.

| SIGN | INSTRUCTION |
|---|---|
|  NOTE | Highlights an essential element of a procedure to ensure correctness. |
|  CAUTION! | Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment. |
|  WARNING! | Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly. |

# CONTENT

# 1 SUMMARY

HOC300 over current protection relay is widely used in marine genset field and land genset field.

HOC300 over current protection relay detects load current accurately. Over current trip or pre-trip relay outputs and alarm protection activates when the load current has exceeded the set value.

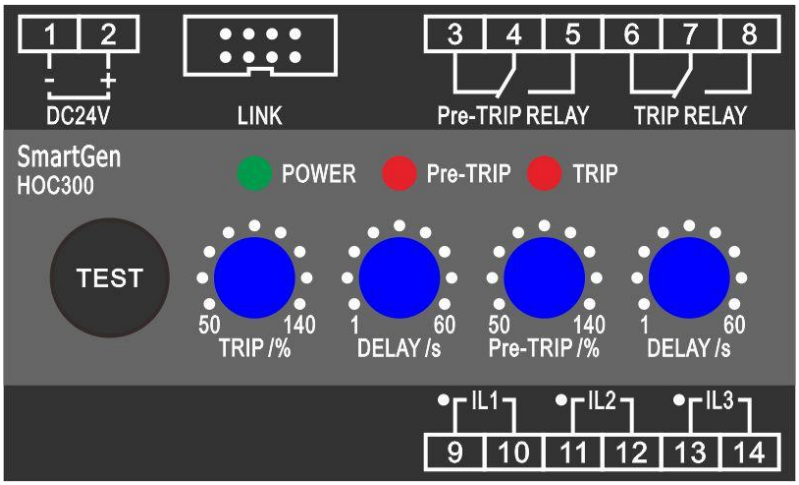
# 2 PERFORMANCE AND CHARACTERISTICS

- ◆ 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;
- ◆ Detects load current accurately.
- ◆ Adjustable potentiometer allows for set value adjusting and delay value setting.
- ◆ 2 relay output；
- ◆ One test button, test the over current trip/pre-trip 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 SPECIFICATION

| Parameter | Details |
|---|---|
| Working Voltage | DC8. 0V to 35. 0V, continuous power supply |
| Overall Consumption | <0.9W (Standby mode: ≤0.28W) |
| Pre-Trip Relay Output | 5A AC250V Volts free output |
| Trip Relay Output | 5A AC250V Volts free output |
| Case Dimensions | 89.7mm x 71.6mm x 60.7mm |
| CT Secondary Current | Rated 5A |
| 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;<br>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 | B- | | 1.0mm$^2$ | Connected with negative of starter battery. | |
| 2 | B+ | | 1.0mm$^2$ | Connected with positive of starter battery. | |
| 3 | Pre-TRIP RELAY | Normally Open | 2.5 mm$^2$ | Active when the load current has exceeded the set value and the delay timer has expired while deactivate when the load current returns to normal. | Normally open; Volts free output; 5A Rated |
| 4 | | COM | | | |
| 5 | | Normally Open | | | |
| 6 | TRIP RELAY | Normally Close | 2.5 mm$^2$ | Active when the load current has exceeded the set value and the delay timer has expired while deactivate when the load current returns to normal. | |
| 7 | | COM | | | |
| 8 | | Normally Open | | | |
| 9 | IL1 | Dotted Terminals | 1.5 mm$^2$ | CT A-phase input; Externally connected to secondary coil of current transformer (rated 5A). | |
| 10 | | | | | |
| 11 | IL2 | Dotted Terminals | 1.5 mm$^2$ | CT B-phase input; Externally connected to secondary coil of current transformer (rated 5A). | |
| 12 | | | | | |
| 13 | IL3 | Dotted Terminals | 1.5 mm$^2$ | CT C-phase input; Externally connected to secondary coil of current transformer (rated 5A). | |
| 14 | | | | | |
| 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) |
| Pre-Trip Indicator | It flashes once per second when the load current has exceeded the set value and Pre-TRIP indicator light on when the delay timer has expired. The indicator extinguished after current returns to normal. (red light) |
| Trip Indicator | It flashes once per second when the load current has exceeded the set value and TRIP indicator light on when the delay timer has expired. The indicator extinguished after current returns to normal. (red light) |
| TEST Button | Pressing and holding the button for 3 seconds, the Pre-Trip relay and Pre-Trip indicator output; Press the button and release the button, within 1 second, again press it for 3 seconds, Trip relay and Trip indicator output. |
| TRIP /%<br>Over Currrent Trip Set Value | Used for adjusting over current set value. Range: (50~140)%; Setting value is the percentage of rated current value(5A). |
| DELAY /s<br>Delay Value Potentiometer | Used for adjusting over current action delay value. Range: (1~60)s |
| Pre-TRIP /%<br>Pre-Trip Set Value | Used for adjusting pre-trip set value. Range: (50~140)%; Setting value is the percentage of rated current value(5A). |
| DELAY /s<br>Delay Value Potentiometer | Used for adjusting delay value. Range: (1~60)s |

# 6 SCOPES AND DEFINITIONS OF PROGRAMMABLE PARAMETERS

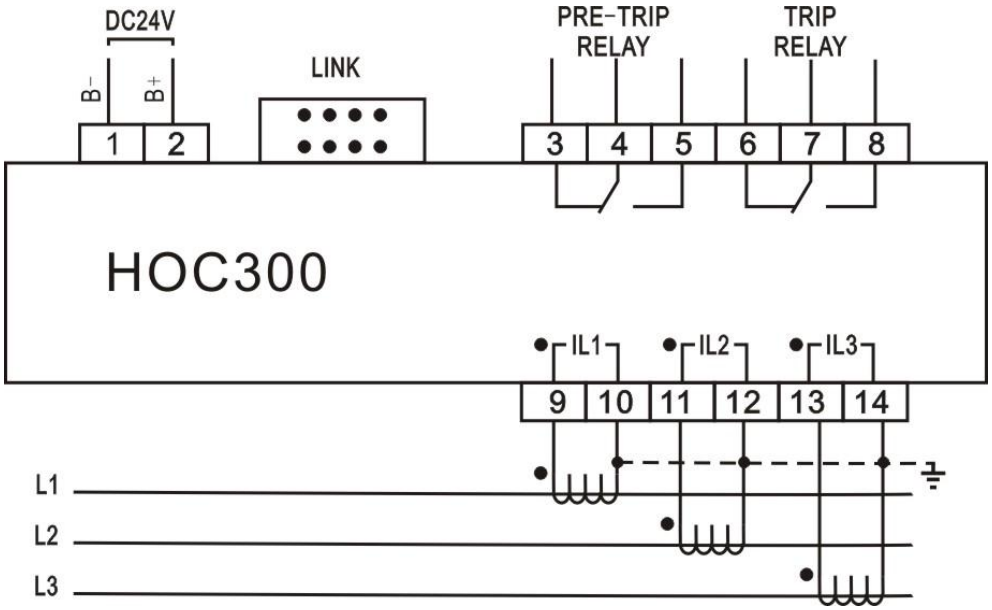
| No. | Items | Parameters | Defaults | Description |
|---|---|---|---|---|
| 1 | AC System | (0-3) | 0 | 0: 3P4W, 1: 3P3W<br>2: 2P3W, 3:1P2W |
| 2 | CT Ratio | (5-6000)/5 | 500 | |
| 3 | Full Load Rated Current | (5-6000)A | 500 | |
| 4 | Communication Address | (1-254) | 1 | |

**PC Program:**

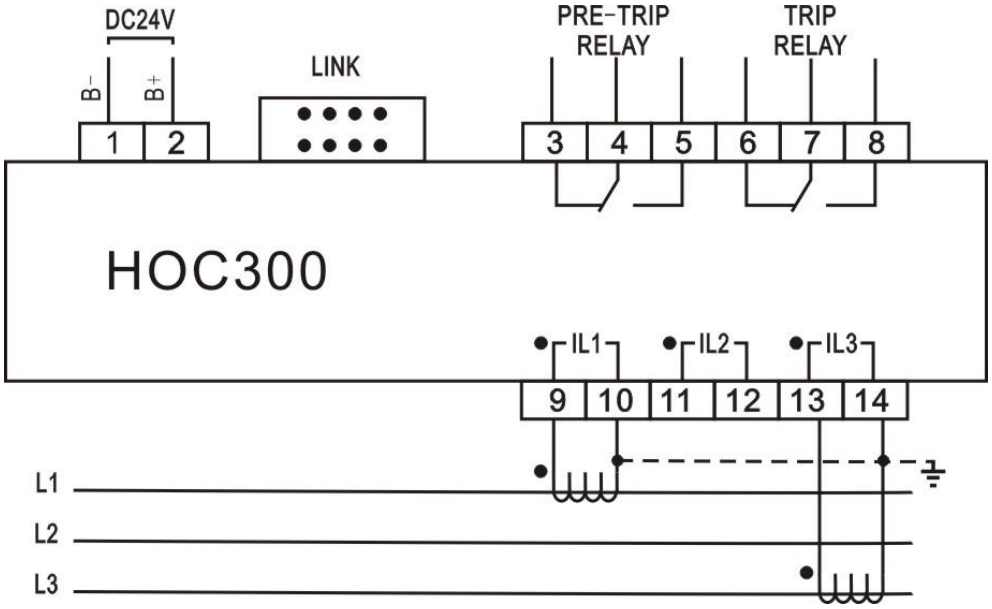
Parameters setting and real-time monitoring can be implemented via LINK port by using PC software and an SG72 adapter which produced by our company. As follows:

# 7 TYPICAL DIAGRAM

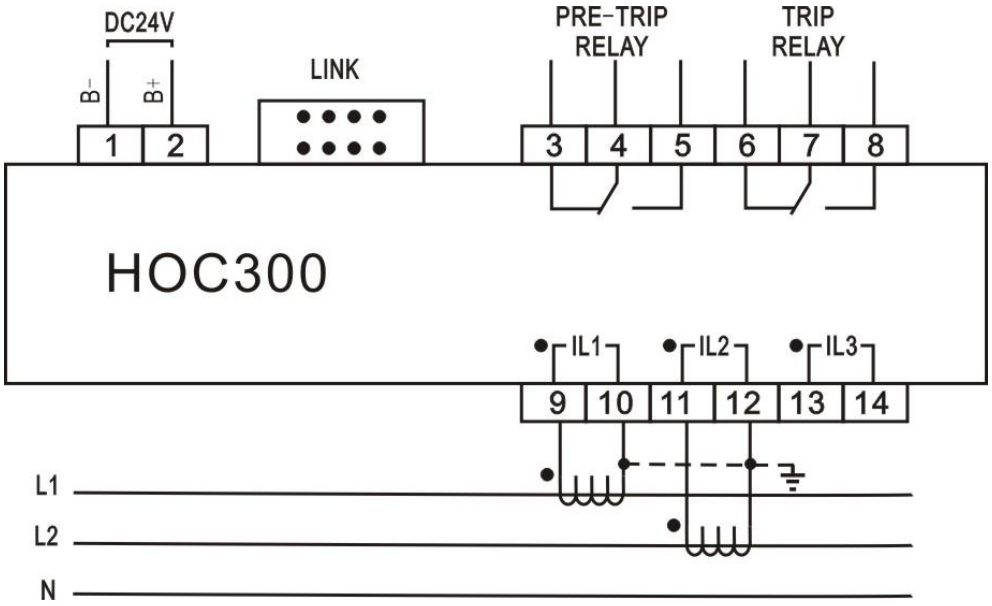
3 Phase 4 Wire



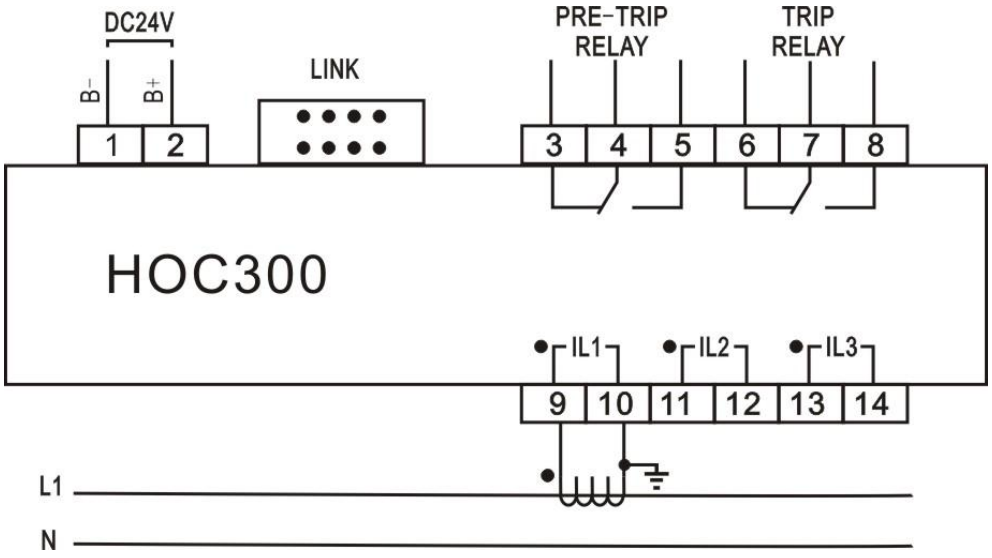

3 Phase 3 Wire



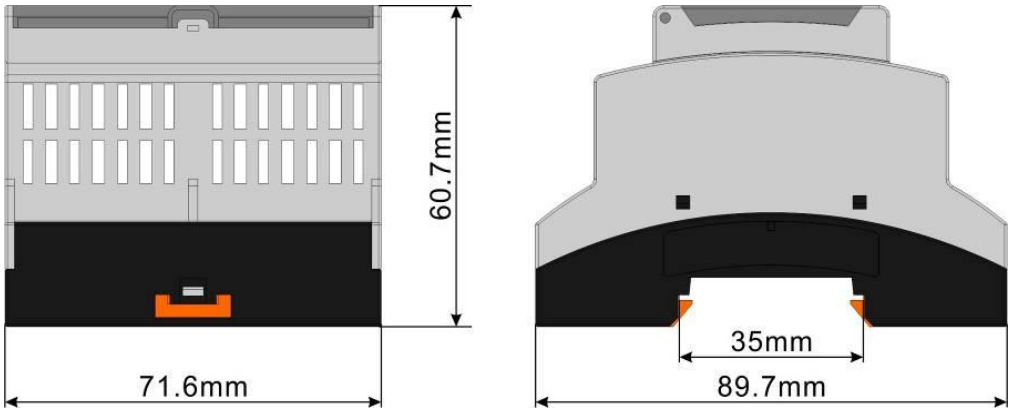
2 Phase 3 Wire




Single Phase 2 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) AC Input**

Current input must be connected to outside current transformer. And the current transformer's secondary side current must be 5A.

Note: When there is load current, transformer's secondary side prohibit open circuit.

**3) 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.