



HMP300

POWER INTEGRATED PROTECTION MODULE

USER MANUAL



SMARTGEN (ZHENGZHOU) TECHNOLOGY CO., LTD.



Chinese trademark

SmartGen English trademark

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Table 1 Software Version

| Date | Version | Note |
|------------|---------|--|
| 2017-09-22 | 1.0 | Original release. |
| 2019-11-05 | 1.1 | Added differential protection contents. |
| 2021-03-05 | 1.2 | Modify the figure 1 error and update the format. |
| | | |

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1 OVERVIEW

HMP300 power integrated protection module integrates digitization, intelligentization and network technology, and are used for collecting generator-set data (voltage, current, power and frequency) and related action output for data errors to protect the device. It fits with LCD display, optional Chinese and English bilingual interface, and it is reliable and easy to use.

HMP300 power integrated protection module adopts micro-processor technology with precise parameter measuring, fixed value adjustment, set value adjusting functions etc. All parameters can be configured from front panel or through LINK interface via PC. It can be widely used in all types of marine/land electrical device with compact structure, advanced circuits, simple connections and high reliability.

2 PERFORMANCE AND CHARACTERISTICS

Main features are as below:

- 132x64 LCD display with backlight, selectable language interface (Chinese and English), push-button operation.
- Equipped with LINK communication port; Through LINK interface on PC, data and parameters can be monitored and adjusted.
- Equipped with CANBUS port, which can connect with HMC9000/HMC6000 module to realize power and engine data collecting and display at the same time.
- Differential protection function, and controller will issue related alarm information after differential protection is active.
- Protections for over/under voltage, over/under frequency, reverse power, over power and over current.
- Harmonic test function, and each phase voltage/current harmonic distortion rate can be tested.
- Suitable for 3-phase 4-wire, 3-phase 3-wire, single phase 2-wire, and 2-phase 3-wire systems with frequency 50/60Hz.
- Collects and shows 3-phase voltage, 3-phase current, frequency and power parameters.

Generator

Line voltage (Uab, Ubc, and Uca)

Phase voltage (Ua, Ub, and Uc)

Frequency Hz

Load

| | | |
|-------------------------------------|------------|-------------|
| Current | Ia, Ib, Ic | A (unit) |
| Each phase and total active power | P | kW (unit) |
| Each phase and total reactive power | Q | kvar (unit) |
| Each phase and average power factor | PF | |

- Parameter setting function: users are allowed to set and change parameters and parameters shall be stored in internal FLASH memory and cannot be lost even in case of power outage; most of them can be adjusted using front panel of the controller.
- Wide power supply range DC (8~35) V, suitable for different starting battery voltage environment.
- All parameters apply digital adjustment, instead of conventional analog modulation with normal potentiometer, improving whole reliability and stability.
- Module is mounted on the 35mm guide rail.






3 SPECIFICATION

Table 2 Technical Parameters

| Items | Contents |
|---|--|
| Operating Voltage | DC8.0V to DC35.0V, Continuous Power Supply |
| Power Consumption | <3W (standby ≤2W) |
| Alternator Volt Input Range 3Phase 4Wire 3Phase 3Wire Single Phase 2Wire 2Phase 3Wire | 30V AC ~ 360 V AC (ph-N) 30V AC ~ 620 V AC (ph-ph) 30V AC ~ 360 V AC (ph-N) 30V AC ~ 360 V AC (ph-N) |
| Alternator Frequency | 50Hz/60Hz |
| Programmable Relay Output 1 | 5 A AC250V volt free output |
| Programmable Relay Output 2 | 5 A AC250V volt free output |
| Programmable Relay Output 3 | 10A AC250V volt free output |
| Programmable Relay Output 4 | 10A AC250V volt free output |
| Overall Dimension | 107.6mm x 89.7mm x 60.7mm |
| CT Secondary Current | 5A rated |
| Working Conditions | Temperature: (-25~+70)°C; Humidity: (20~93)%RH |
| Storage Condition | Temperature: (-25~+70)°C |
| Insulating Intensity | Apply AC2.2kV voltage between high voltage terminal and low voltage terminal and the leakage current is not more than 3mA within 1min. |
| Weight | 0.30kg |

4 OPERATION

Table 3 Key Description

| Icons | Function | Description |
|--|---------------|--|
|  | Set/Confirm | Pressing this key will enter into password screen; In setting parameter status, pressing this key will shift cursor or confirm the set value. |
|  | Up/Increase | Scrolls the screen up; Shift the cursor up or increase the set value in parameter setting menu. |
|  | Down/Decrease | Scrolls the screen down; Shift the cursor down or decrease the set value in parameter setting menu. |
| Pressing both  and  simultaneously can reset alarms. | | |

5 SCREENS DISPLAY

5.1 POWER DATA DISPLAY

Table 4 Power Data Display

| 1 st Screen | Description |
|-------------------------|---|
| UL-L 380V 380V 380 V | Line voltage Uab, Ubc, Uca |
| UL-N 220V 220V 220 V | Phase voltage Ua, Ub, Uc |
| I: 500A 500A 500 A | Current, Ia, Ib, Ic |
| P: 276 kW Q : 200 kvar | Active power, reactive power |
| PF 0.80 50.0Hz | Average power factor, frequency |
| 2 nd Screen | Description |
| P(kW) Q(kvar) S(kVA) | Active power display, reactive power display, apparent power display |
| A: 89.0 65.0 110.0 | A phase: active power, reactive power, apparent power |
| B: 89.0 65.0 110.0 | B Phase: active power, reactive power, apparent power |
| C: 89.0 65.0 110.0 | C Phase: active power, reactive power, apparent power |
| PF 0.80 0.80 0.80 | A phase, B phase and C phase power factors |
| 3 rd Screen | Description |
| THDu(%) THDi(%) | Voltage harmonic distortion rate, current harmonic distortion rate |
| A: 0.5 0.3 | A phase: voltage harmonic distortion rate, current harmonic distortion rate |
| B: 0.5 0.3 | B phase: voltage harmonic distortion rate, current harmonic distortion rate |
| C: 0.5 0.3 | C phase: voltage harmonic distortion rate, current harmonic distortion rate |
| Phase Seq: 0° 120° 240° | Phase sequence |
| 4 th Screen | Description |
| Total kWh 276.3 kWh | Total active energy |
| Total kvarh 200.0 kvarh | Total reactive energy |
| kWh % 32% | Active power percentage |
| kvarh % 32% | Reactive power percentage |

5.2 ALARM DISPLAY

All alarm information (trip alarm and warning alarm) collected by the module is real-time displayed on the alarm screen as bellow:

Table 5 Alarm Display

| Display Content | Description |
|---------------------------|---------------|
| Alarm | Page title |
| Warning Alarm | Alarm type |
| Under Volt Warning | Alarm content |
| | |

5.3 MODULE INFORMATION DISPLAY

Module information including output port status, software version, hardware version and release time can be displayed on this screen as bellow:

Table 6 Module Information Display

| Display Content | Description |
|-------------------------------|--------------------|
| OUT: 1 2 3 4 | Output port number |
| ✓ ✓ ✓ ✓ | Outputs status |
| Software Version: V1.3 | Software version |
| Hardware Version: V2.1 | Hardware version |
| Issue Date: 2017-09-20 | Issue date |

6 PROTECTION

6.1 WARNING

When controller detects the warning signals, alarm indicator flashes and LCD displays the warning information.

Table 7 Module Warning Types

| No. | Type | Description |
|-----|-------------------------|--|
| 1 | Over Volt Warning | When the module detects that the genset voltage has exceeded the pre-set value, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 2 | Under Volt Warning | When the module detects that the genset voltage has fallen below the pre-set value, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 3 | Over Frequency Warning | When the module detects that the genset frequency has exceeded the pre-set value, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 4 | Under Frequency Warning | When the module detects that the genset frequency has fallen below the pre-set value, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 5 | Over Power Warning | When the module detects that the genset power (power is positive) has exceeded the pre-set value, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 6 | Over Current Warning | When the module detects that the genset current has exceeded the pre-set value, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 7 | Current Pre-alarm | When module detects genset current is above the current pre-alarm limit, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 8 | Reverse Power Warning | When the module detects that the genset reverse power value (power is negative) has exceeded the pre-set value, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 9 | Differential Protection | When module detects differential current is above the pre-set current pre-alarm limit, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |

6.2 TRIP ALARM

When controller detects trip alarm, it will send signals to trip the generator and the corresponding alarm information will be displayed on LCD.

Table 8 Trip Alarms

| No. | Type | Description |
|-----|------------------------------|--|
| 1 | Over Voltage Trip | When the module detects that the genset voltage has exceeded the pre-set value, it will initiate a trip alarm and the corresponding alarm information will be displayed on LCD. |
| 2 | Under Voltage Trip | When the module detects that the genset voltage has fallen below the pre-set value, it will initiate a trip alarm and the corresponding alarm information will be displayed on LCD. |
| 3 | Over Frequency Trip | When the module detects that the genset frequency has exceeded the pre-set value, it will initiate a trip alarm and the corresponding alarm information will be displayed on LCD. |
| 4 | Under Frequency Trip | When the module detects that the genset frequency has fallen below the pre-set value, it will initiate a trip alarm and the corresponding alarm information will be displayed on LCD. |
| 5 | Over Power Trip | When the module detects that the genset power (power is positive) has exceeded the pre-set value, it will initiate a trip alarm and the corresponding alarm information will be displayed on LCD. |
| 6 | Over Current Trip | When the module detects that the genset current has exceeded the pre-set value, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 7 | Differential Protection Trip | When the module detects differential current is above the pre-set limit, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 8 | Reverse Power Trip | When the module detects that the genset reverse power value (power is negative) has exceeded the pre-set value, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 9 | Loss of Phase Trip | When the module detects that genset voltage phase loss, it will initiate trip alarm signals and the corresponding alarm information will be displayed on LCD. |
| 10 | Reverse Phase Sequence Trip | When the module detects that genset voltage phase sequence wrong, it will initiate trip alarm signals and the corresponding alarm information will be displayed on LCD. |

7 WIRING CONNECTION

HMP300 controller panel is as below:

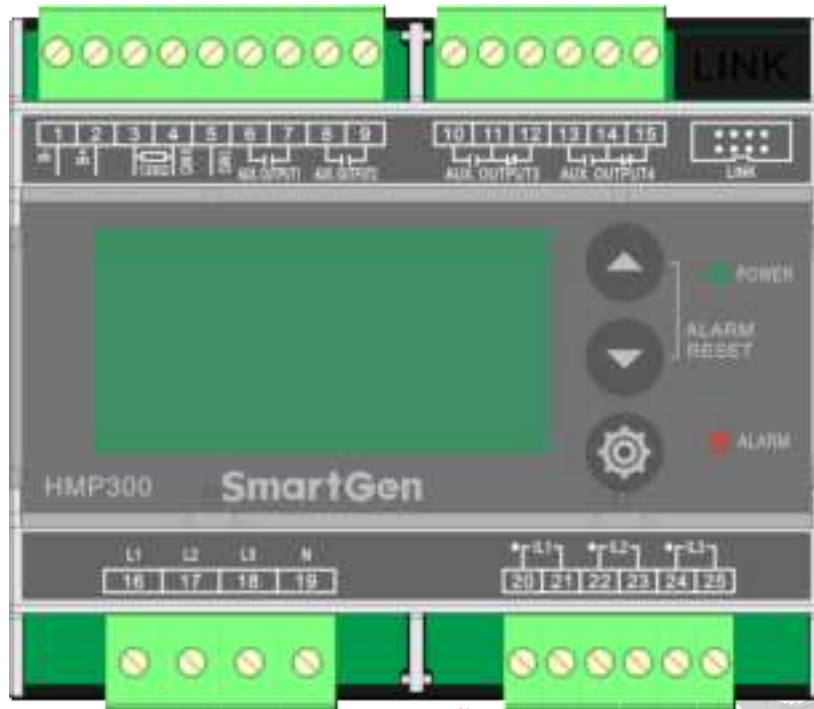


Fig. 1 HMP300 Panel Diagram

Table 9 Terminal Wiring Connection

| No. | Function | Cable Size | Remarks | |
|------|------------------------------------|--------------------|--|--------------------------|
| 1 | B- | 1.5mm ² | Connected with negative of starter battery, engine starter battery can be used directly. | |
| 2 | B+ | 1.5mm ² | Connected with positive of starter battery, engine starter battery can be used directly. | |
| 3 | 120Ω | 1.0mm ² | After short connecting with CANL, it doesn't need to externally connect with 120Ω. | |
| 4 | CANH | 1.0mm ² | CANBUS Communication port, which supports J1939-81 power data communication protocol. | |
| 5 | CANL | 1.0mm ² | | |
| 6 | Aux. Output 1 | 1.0mm ² | Relay normally open volt free contact, rated 5A, and volt free contact output. | Details see 8.2 . |
| 7 | | 1.0mm ² | | |
| 8 | Aux. Output 2 | 1.0mm ² | Relay normally open volt free contact, rated 5A, and volt free contact output. | |
| 9 | | 1.0mm ² | | |
| 10 | Aux. Output 3 | 1.0mm ² | Relay normally open volt free contact, rated 10A, and volt free contact output. | |
| 11 | | 1.0mm ² | | |
| 12 | | 1.0mm ² | | |
| 13 | Aux. Output 4 | 1.0mm ² | Relay normally open volt free contact, rated 10A, and volt free contact output. | |
| 14 | | 1.0mm ² | | |
| 15 | | 1.0mm ² | | |
| 16 | Gen L1 Phase Volt Monitoring Input | 1.0mm ² | Connect with output U Phase of generator (2A fuse is recommended). | |
| 17 | Gen L2 Phase Volt Monitoring Input | 1.0mm ² | Connect with output V Phase of generator (2A fuse is recommended). | |
| 18 | Gen L3 Phase Volt Monitoring Input | 1.0mm ² | Connect with output W Phase of generator (2A fuse is recommended). | |
| 19 | Gen N Wire Input | 1.0mm ² | Connect with output N Wire of generator. | |
| 20 | CT A-Phase Monitoring Input | 2.5mm ² | External connected current transformer secondary coil (rated 5A). | |
| 21 | | 2.5mm ² | | |
| 22 | CT B-Phase Monitoring Input | 2.5mm ² | External connected current transformer secondary coil (rated 5A). | |
| 23 | | 2.5mm ² | | |
| 24 | CT C-Phase Monitoring Input | 2.5mm ² | External connected current transformer secondary coil (rated 5A). | |
| 25 | | 2.5mm ² | | |
| LINK | | | Test software interface. Connect with PC test software via SG72 module. | |

Details see 8.2.

8 SCOPES AND DEFINITIONS OF PROGRAMMABLE PARAMETERS

8.1 CONTENTS AND SCOPES OF PARAMETERS

Table 10 Parameter Setting Contents and Scopes

| No | Items | Range | Default | Description |
|-------------------------|-----------------------------|------------------------------------|---------|---|
| Voltage Settings | | | | |
| 1 | AC System | (0-3) | 0 | 0: 3P4W 1: 3P3W 2: 2P3W 3: 1P2W |
| 2 | Rated Voltage | (30-30000)V | 230 | Provide standard for over/under voltage and voltage on load. If voltage transformer is used, this value is primary voltage of transformer. When AC system is 3P3W, this setting value is line voltage; for other supply AC systems, it is phase voltage. |
| 3 | Voltage Transformer Enabled | (0-1) 0: Disabled 1: Enabled | 0 | Disabled |
| 4 | Primary Voltage | (30-30000)V | 100 | Primary voltage of voltage transformer. |
| 5 | Secondary Voltage | (30-1000)V | 100 | Secondary voltage of voltage transformer. |
| 6 | Over Volt Warning Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect over voltage warning. |
| 7 | Over Volt Warning Value | (0-200)% | 110% | When generator voltage has exceeded the set value and warning delay is expired, module will initiate over voltage warning alarm. |
| 8 | Over Volt Warning Delay | (0-3600)s | 3 | Time duration from alarm is detected to it initiates alarm. |
| 9 | Over Volt Trip Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect over voltage trip. |
| 10 | Over Volt Trip Value | (0-200)% | 120 | When generator voltage has exceeded the set value and trip delay is expired, module will initiate over voltage trip alarm. |
| 11 | Over Volt Trip Delay | (0-3600)s | 2 | Time duration from alarm is detected to it initiates alarm. |
| 12 | Under Volt Warning Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect under voltage warning. |
| 13 | Under Volt Warning Value | (0-200)% | 84 | When generator voltage has fallen below the set value and warning delay is expired, |

| No | Items | Range | Default | Description |
|---------------------------|--|------------------------------------|---------|--|
| | | | | module will initiate under voltage warning alarm. |
| 14 | Under Volt Warning Delay | (0-3600)s | 3 | Time duration from alarm is detected to it initiates alarm. |
| 15 | Under Volt Trip Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect under voltage trip. |
| 16 | Under Volt Trip Value | (0-200)% | 80 | When generator voltage has fallen below the set value and trip delay is expired, module will initiate under voltage trip alarm. |
| 17 | Under Volt Trip Delay | (0-3600)s | 2 | Time duration from alarm is detected to it initiates alarm. |
| 18 | Loss of Phase Detection Enabled | (0-1) | 0 | 0: Disabled 1: Enabled |
| 19 | Phase Sequence Wrong Detection Enabled | (0-1) | 0 | |
| 20 | Under Volt Threshold Voltage | (0-200)% | 60 | When threshold voltage is exceeded, module starts to detect under voltage alarm. |
| 21 | Voltage On Load | (0-200)% | 90 | When voltage is over this threshold, it meets the on-load conditions. |
| Frequency Settings | | | | |
| 22 | Rated Frequency | (50.0-60.0) Hz | 50.0 | Provide standard for over/under frequency and frequency on load. |
| 23 | Frequency On Load | (0-200)% | 90 | When frequency is over this value, it meets the on-load conditions. |
| 24 | Over Frequency Warning Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect over frequency warning. |
| 25 | Over Frequency Warning Value | (0-200)% | 110 | When generator frequency has exceeded the set value and warning delay is expired, module will initiate over frequency warning alarm. |
| 26 | Over Frequency Warning Delay | (0-3600)s | 3 | Time duration from alarm is detected to it initiates alarm. |
| 27 | Over Frequency Trip Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect over frequency trip. |
| 28 | Over Frequency Trip Value | (0-200)% | 114 | When generator frequency has exceeded the setting value and trip delay is expired, module will initiate over frequency trip alarm. |
| 29 | Over Frequency Trip | (0-3600)s | 2 | Time duration from alarm is detected to it |

| No | Items | Range | Default | Description |
|-------------------------|---------------------------------|------------------------------------|---------|---|
| | Delay | | | initiates alarm. |
| 30 | Under Frequency Warning Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect under frequency warning. |
| 31 | Under Frequency Warning Value | (0-200)% | 84 | When generator frequency has fallen below the set value and warning delay is expired, module will initiate under frequency warning alarm. |
| 32 | Under Frequency Warning Delay | (0-3600)s | 3 | Time duration from alarm is detected to it initiates alarm. |
| 33 | Under Frequency Trip Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect under frequency trip. |
| 34 | Under Frequency Trip Value | (0-200)% | 80 | When generator frequency has fallen below the set value and trip delay is expired, module will initiate under frequency trip alarm. |
| 35 | Under Frequency Trip Delay | (0-3600)s | 2 | Time duration from alarm is detected to it initiates alarm. |
| Current Settings | | | | |
| 36 | Rated Full-load Current | (5-6000)A | 500 | It is generator's rated current, and used for provide standard for load current. |
| 37 | Current Transformer Ratio/5 | (5-6000)/5 | 500 | External connected current transformer ratio. |
| 38 | Over Current Warning Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect over current warning. |
| 39 | Over Current Warning Value | (0-200)% | 110 | When generator current has exceeded the set value and warning delay is expired, module will initiate over current warning alarm. |
| 40 | Over Current Warning Delay | (0-3600)s | 3 | Time duration from alarm is detected to it initiates alarm. |
| 41 | Over Current Trip Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect over current trip. |
| 42 | Over Current Trip Value | (0-200)% | 114 | When generator current has exceeded the set value and trip delay is expired, module will initiate over current trip alarm. |
| 43 | Over Current Trip Delay | (0-3600)s | 2 | Time duration from alarm is detected to it initiates alarm. |
| 44 | Current Pre-alarm | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect current pre-alarm. |

| No | Items | Range | Default | Description |
|-----------------------|--------------------------------------|------------------------------------|---------|---|
| 45 | Current Pre-alarm Value | (0-200)% | 100 | When current is over this value and lasts for the pre-set pre-alarm delay, module will initiate current pre-alarm. |
| 46 | Current Pre-alarm Delay | (0-3600)s | 3 | Time duration from alarm is detected to it initiates alarm. |
| 47 | Differential Current Warning Enabled | (0-1) 0: Disabled 1: Enabled | 0 | When this is enabled, module starts to detect differential current warning. NOTE: after enabled, controller only displays differential current information, while other measured data and alarms don't. |
| 48 | Differential Current Warning Value | (4-40)% | 10 | When current is over this value and has lasted for the preset warning delay, module will issue warning alarm. |
| 49 | Differential Current Warning Delay | (0-20.0)s | 2.0 | Time duration from alarm is detected to it initiates alarm. |
| 50 | Differential Current Trip Enabled | (0-1) 0: Disabled 1: Enabled | 0 | When this is enabled, module starts to detect differential current trip. NOTE: after enabled, controller only displays differential current information, while other measured data and alarms don't. |
| 51 | Differential Current Trip Value | (4-40)% | 20 | When current is over this value and has lasted for the preset trip delay, module will issue trip alarm. |
| 52 | Differential Current Trip Delay | (0-20.0)s | 1.0 | Time duration from alarm is detected to it initiates alarm. |
| Power Settings | | | | |
| 53 | Rated Power | (0-6000)kW | 276 | It is generator's rated power, and used for provide standard for power alarm. |
| 54 | Rated Reactive Power | (0-6000)kvar | 200 | Generator's rated reactive power. |
| 55 | Over Power Warning Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect over power warning. |
| 56 | Over Power Warning Value | (0-200)% | 110 | When active power (positive) has exceeded the set value and warning delay is expired, module will initiate over power warning alarm. |
| 57 | Over Power Warning Delay | (0-3600)s | 3 | Time duration from alarm is detected to it initiates alarm. |
| 58 | Over Power Trip Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect over power trip. |
| 59 | Over Power Trip Value | (0-200)% | 114 | When active power (positive) has exceeded the set value and trip delay is expired, module will initiate over power trip alarm. |

| No | Items | Range | Default | Description |
|-------------------------|-------------------------------|--|---------|--|
| 60 | Over Power Trip Delay | (0-3600)s | 2 | Time duration from alarm is detected to it initiates alarm. |
| 61 | Reverse Power Warning Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect reverse power warning. |
| 62 | Reverse Power Warning Value | (0-200)% | 20 | When reverse power (negative) has exceeded the set value and warning delay is expired, module will initiate reverse power warning alarm. |
| 63 | Reverse Power Warning Delay | (0-3600)s | 3 | Time duration from alarm is detected to it initiates alarm. |
| 64 | Reverse Power Trip Enabled | (0-1) 0: Disabled 1: Enabled | 1 | When it is enabled, module starts to detect reverse power trip. |
| 65 | Reverse Power Trip Value | (0-100)% | 30 | When reverse power (negative) has exceeded the set value and trip delay is expired, module will initiate reverse power trip alarm. |
| 66 | Reverse Power Trip Delay | (0-3600)s | 2 | Time duration from alarm is detected to it initiates alarm. |
| Outputs Settings | | | | |
| 67 | Aux. Output 1 Setting | (0-30) | 0 | Default: not used |
| 68 | Aux. Output 1 Type | (0-1) | 0 | 0: Normally open; 1: Normally close |
| 69 | Aux. Output 2 Setting | (0-30) | 0 | Default: not used |
| 70 | Aux. Output 2 Type | (0-1) | 0 | 0: Normally open; 1: Normally close |
| 71 | Aux. Output 3 Setting | (0-30) | 0 | Default: not used |
| 72 | Aux. Output 3 Type | (0-1) | 0 | 0: Normally open; 1: Normally close |
| 73 | Aux. Output 4 Setting | (0-30) | 0 | Default: not used |
| 74 | Aux. Output 4 Type | (0-1) | 0 | 0: Normally open; 1: Normally close |
| Module Settings | | | | |
| 75 | Module Address | (1-254) | 1 | Module address when remote monitoring control. |
| 76 | CANBUS Baud Rate | (0-1) 0: 250Kbps 1: 500Kbps 2: 125Kbps 3: 50Kbps | 0 | CANBUS communication baud rate configuration. |
| 77 | Language Selection | (0-1) | 0 | 0: Simplified Chinese; 1: English |
| 78 | Password Setting | (0-9999) | 00318 | It is used to enter into parameter settings. |

8.2 DEFINED CONTENTS OF PROGRAMMABLE OUTPUT PORTS 1~4


Table 11 Defined Contents of Programmable Output Ports 1-4

| No. | Items | Description |
|-----|-----------------------------------|--|
| 0 | Not Used | Output port is deactivated when "Not Used" is selected. |
| 1 | Common Alarm | Output when alarms occurred. |
| 2 | Common Warning Alarm | Output when warning alarms occurred. |
| 3 | Common Trip Alarm | Output when trip alarms occurred. |
| 4 | Over Volt Trip Alarm | Output when over voltage trip alarms occurred. |
| 5 | Under Volt Trip Alarm | Output when under voltage trip alarms occurred. |
| 6 | Loss of Phase Trip Alarm | Output when loss of phase trip alarms occurred. |
| 7 | Reverse Phase Sequence Trip Alarm | Output when reverse phase sequence trip alarm is occurred. |
| 8 | Over Frequency Trip Alarm | Output when over frequency trip alarm is occurred. |
| 9 | Under Frequency Trip Alarm | Output when under frequency trip alarm is occurred. |
| 10 | Over Current Trip Alarm | Output when over current trip alarm is occurred. |
| 11 | Over Current Pre-alarm | Output when over current pre-alarm is active. |
| 12 | Over Power Trip Alarm | Output when generator over power trip alarm is occurred. |
| 13 | Reserved | Reserved |
| 14 | Reverse Power Trip Alarm | Output when generator reverse power trip alarm is occurred. |
| 15 | Over Volt Warning | Output when generator over voltage warning alarm is occurred. |
| 16 | Under Volt Warning | Output when generator under voltage warning alarm is occurred. |
| 17 | Allow to Output On-load | Output when module meets the set on-load conditions. |
| 18 | Reserved | Reserved |
| 19 | Over Frequency Warning | Output when generator over frequency warning alarm is occurred. |
| 20 | Under Frequency Warning | Output when generator under frequency warning alarm is occurred. |
| 21 | Reserved | Reserved |
| 22 | Over Current Warning | Output when generator over current warning alarm is occurred. |
| 23 | Differential Protection Warning | Output when differential protection warning occurs. |
| 24 | Over Power Warning | Output when generator over power warning alarm is occurred. |
| 25 | Differential Protection Trip | Output when differential protection trip occurs. |
| 26 | Reverse Power Warning | Output when generator reverse power warning alarm is occurred. |
| 27 | Custom Output | Separately customized column A and column B output functions, when one is active, module will start output. Detailed to see Table 12 as bellow. |
| 28 | Reserved | Reserved |
| 29 | Reserved | Reserved |
| 30 | Reserved | Reserved |


Table 12 Custom Output Port List

| No. | Custom Output Column A | Custom Output Column B |
|-----|--|--|
| 00 | Over Volt Warning Alarm | Over Volt Warning Alarm |
| 01 | Under Volt Warning Alarm | Under Volt Warning Alarm |
| 02 | Over Frequency Warning Alarm | Over Frequency Warning Alarm |
| 03 | Under Frequency Warning Alarm | Under Frequency Warning Alarm |
| 04 | Over Power Warning | Over Power Warning |
| 05 | Over Current Warning | Over Current Warning |
| 06 | Reverse Power Warning | Reverse Power Warning |
| 07 | Reverse Phase Sequence Trip Alarm | Reverse Phase Sequence Trip Alarm |
| 08 | Over Volt Trip Alarm | Over Volt Trip Alarm |
| 09 | Under Volt Trip Alarm | Under Volt Trip Alarm |
| 10 | Over Frequency Trip Alarm | Over Frequency Trip Alarm |
| 11 | Under Frequency Trip Alarm | Under Frequency Trip Alarm |
| 12 | Over Power Trip Alarm | Over Power Trip Alarm |
| 13 | Over Current Trip Alarm | Over Current Trip Alarm |
| 14 | Reverse Power Trip Alarm | Reverse Power Trip Alarm |
| 15 | Loss of Phase Trip Alarm | Loss of Phase Trip Alarm |
| 16 | Over Current Warning + Over Current Trip | Over Current Warning + Over Current Trip |
| 17 | Differential Protection Warning | Differential Protection Warning |
| 18 | Differential Protection Trip | Differential Protection Trip |



9 PARAMETERS SETTING

After module is power up, press  to enter into the password screen. Input correct password (default password is "0318") to enter into the parameter setting menu and select parameter item via



and  buttons. Then press  to start setting.  is to increase value, and



 is to decrease value. After the setting is finished, press  again to confirm it.

Parameters also can be set through PC software via SG72 module. Password is not needed for parameter setting on PC software. If it needs to set more parameters (such as voltage/current calibration) or the password is forgotten, please contact the factory.

NOTES:

- Over voltage set value must be higher than under voltage set value, otherwise over voltage and under voltage condition may occur simultaneously.
- For alarms not needed, please select "Disabled" in the alarm enabled selection.

10 TYPICAL APPLICATION

10.1 Module Typical Application

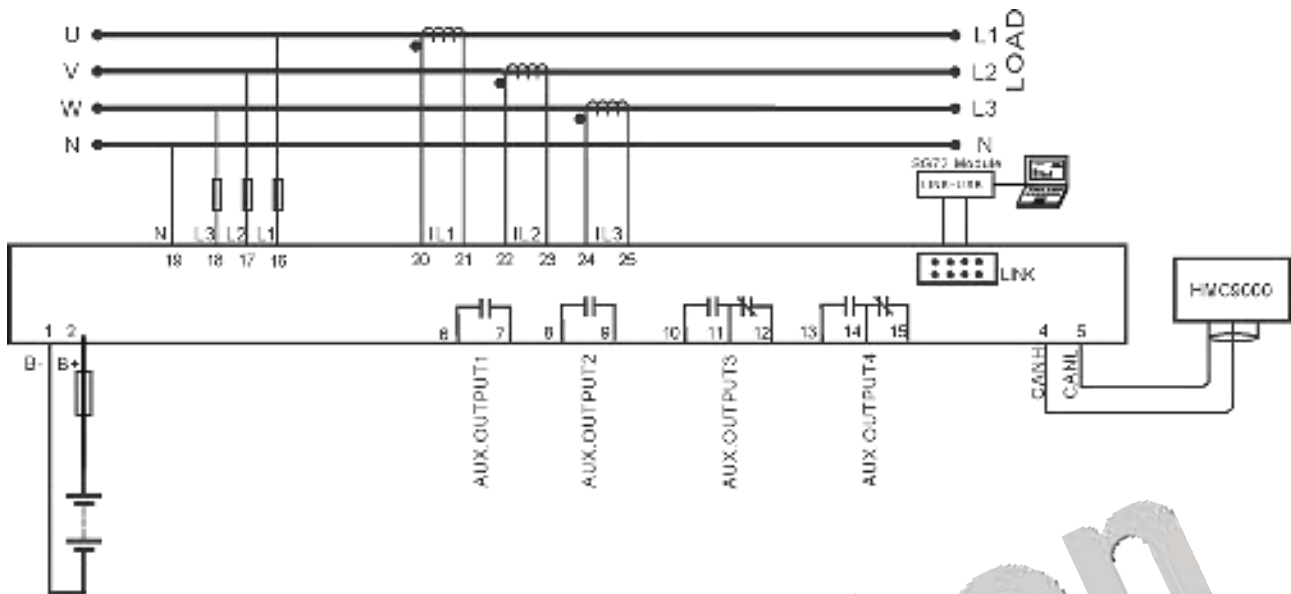


Fig. 2 HMP300 Typical Application Diagram

10.2 Differential Current Protection Application

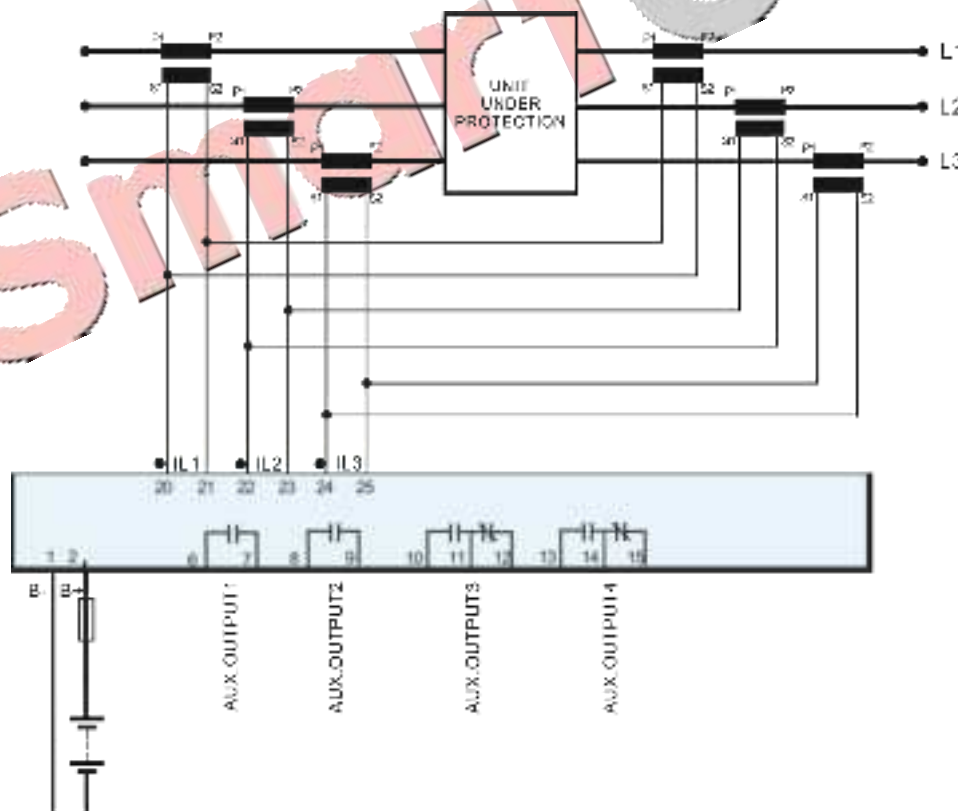


Fig. 3 Differential Protection Application Diagram

NOTE: CTs on the two sides must have same parameter characteristics, and cable load on the two sides also must be equal.

11 INSTALLATION

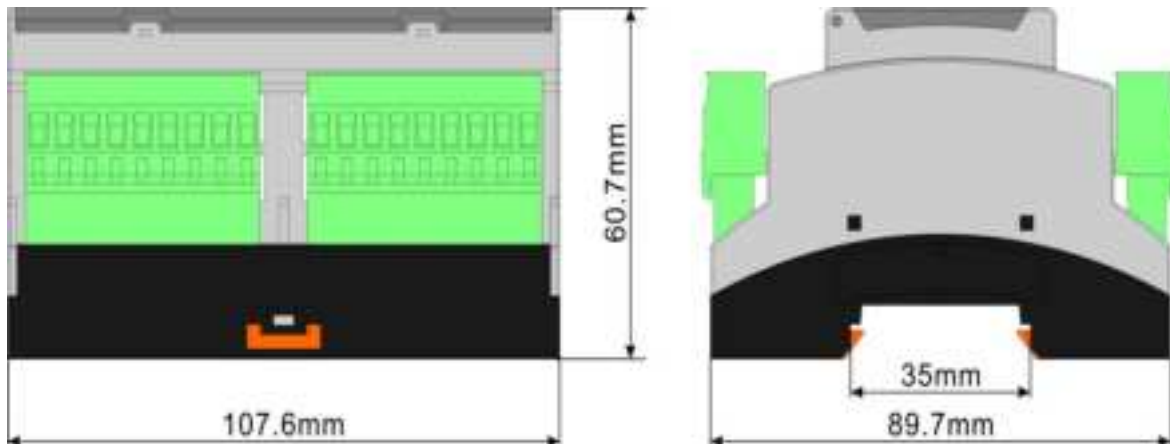


Fig. 4 Overall and Cutout Dimensions

ATTENTION:

– OUTPUT AND EXPAND RELAYS

All outputs of controller are relay contact output type. If it needs to expand the relays, please add freewheel diode to both ends of expand relay's coils (when coils of relay have DC current) or, increase resistance-capacitance return circuit (when coils of relay have AC current), in order to prevent disturbance for controller or other equipments.

– AC INPUT

Current input of controller must be connected to outside current transformer. And the current transformer's secondary current must be 5A. At the same time, the phases of current transformer and input voltage must be correct. Otherwise, the collected current and active power may be not correct.

NOTE: When there is load current, transformer's secondary side is prohibited to open circuit.

– WITHSTAND VOLTAGE TEST

When controller has been installed on control panel, if it needs the high voltage test, please disconnect controller's all terminal connections, in order to prevent high voltage going into controller and damaging it.