# HMP300

## POWER INTEGRATED PROTECTION MODULE

# USER MANUAL


SmartGen

SMARTGEN (ZHENGZHOU) TECHNOLOGY CO., LTD.

**Chinese trademark**

**SmartGen** **English trademark**

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Software Version

| Date | Version | Note |
|---|---|---|
| 2017-09-22 | 1.0 | Original release. |
| | | |
| | | |
| | | |

# CONTENTS



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# 1 OVERVIEW

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

**HMP300** power integrated protection module adopts micro-processor technology with precision parameters measuring, fixed value adjustment, set value adjusting and 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 follows:

- 132x64 LCD with backlight, selectable language interface (Chinese and English), push-button operation.
- Equipped with LINK communication port. Through LINK interface via PC, data and parameters of module can be monitored and adjusted.
- Equipped with CANBUS port and can communicate with J1939 generator-set.
- Protections for over/under voltage, over/under frequency, reverse power, over power and over current.
- With 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: parameters can be modified and 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.
- Widely power supply range DC (8~35) V, suitable to different starting battery voltage environment.
- All parameters used digital adjustment, instead of conventional analog modulation with normal potentiometer, more reliability and stability.
- Relay is mounted on the 35mm guide rail.

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## 3 SPECIFICATION OPERATION

Technical Parameters

| Items | Contents |
|---|---|
| Operating Voltage | DC8.0V to DC35.0V, Continuous Power Supply. |
| Power Consumption | <3W (standby ≤2W) |
| Alternator Volt Input Range<br>3Phase 4Wire<br>3Phase 3Wire<br>Single Phase 2Wire<br>2Phase 3Wire | <br>30V AC ~ 360 V AC (ph-N)<br>30V AC ~ 620 V AC (ph-ph)<br>30V AC ~ 360 V AC (ph-N)<br>30V AC ~ 360 V AC (ph-N) |
| Alternator Frequency | 50 Hz /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 DC250V 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;<br>The leakage current is not more than 3mA within 1min. |
| Net Weight | 0.30kg |

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# 4 OPERATION

Key descriptions are as follows,

| Icons | Function | Description |
|---|---|---|
|  | Set/Confirm | Pressing this key will enter into password screen;<br>In setting parameter status, press this key will shift cursor or confirm setting 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. |
| Press both  and  simultaneously can reset alarms. | | |

# 5 SCREENS DISPLAY

## 5.1 POWER DATA DISPLAY

| 1st 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 |
| **2nd 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 |
| **3rd 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 |
| **4th Screen** | **Description** |
| **Total kWh 276.3 kWh** | Total active energy |
| **Total kvarh 200.0 kvarh** | Total reactive energy |

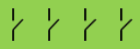
## 5.2 ALARM DISPLAY

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

| Display | Description |
|---|---|
| **Alarm**<br>**Warning Alarm**<br>**Under Volt Warning** | Title<br>Alarm type<br>Alarm content<br> |

## 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,

| Display | Description |
|---|---|
| **OUT: 1 2 3 4**<br>  <br>**Software Version: V1.3**<br>**Hardware Version: V2.1**<br>**Issue Date: 2017-09-20** | Name of output port<br>Outputs Status<br>Software version<br>Hardware version<br>Issue date |

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# 6 PROTECTION

## 6.1 WARNING

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

| No. | Type | Description |
|---|---|---|
| 1 | Over Volt Warning | When the module detects that the generator-set 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 generator-set 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 generator-set 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 generator-set 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 generator-set 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 generator-set current has exceeded the pre-set value, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 7 | Reverse Power Warning | When the module detects that the generator-set 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. |

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## 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.

| No. | Type | Description |
|---|---|---|
| 1 | Over Voltage Trip | When the module detects that the generator-set 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 generator-set 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 generator-set 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 generator-set 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 generator-set 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 generator-set current has exceeded the pre-set value, it will initiate a warning alarm and the corresponding alarm information will be displayed on LCD. |
| 7 | Reverse Power Trip | When the module detects that the generator-set 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. |
| 8 | Loss of Phase Trip | When the module detects that generator-set voltage phase loss, it will initiate trip alarm signals and the corresponding alarm information will be displayed on LCD. |
| 9 | Phase Sequence Wrong Trip | When the module detects that generator-set voltage phase sequence wrong, it will initiate trip alarm signals and the corresponding alarm information will be displayed on LCD. |

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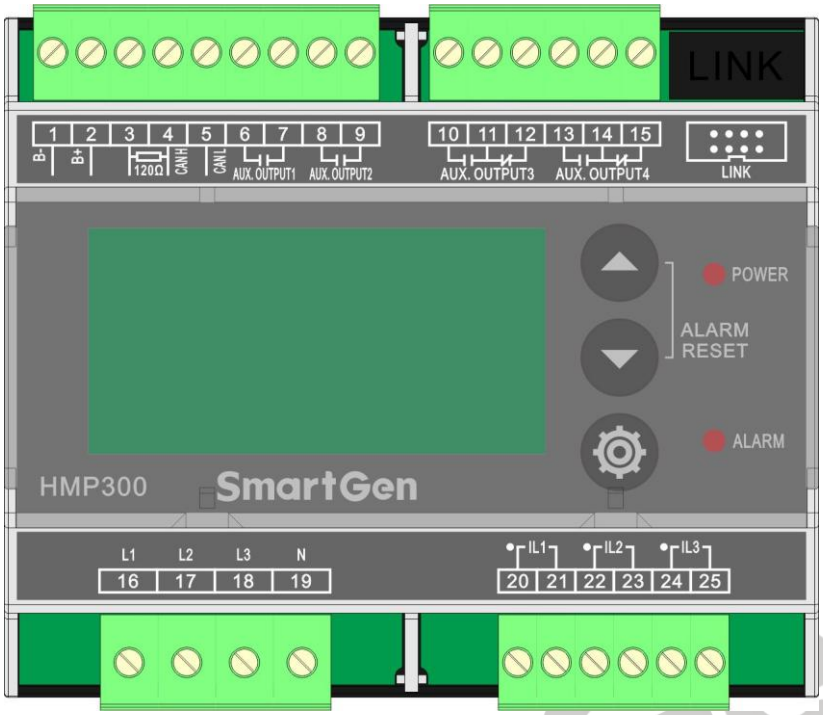
## 7 WIRINGS CONNECTION

HMP300 controller back panel is as follows:




HMP300 Panel

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 CANH, it is needn't external connect with 120Ω. | |
| 4 | CANH | 1.0mm$^2$ | CANBUS Communication port, which is support 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 | |
| 14 | | 1.0mm$^2$ | | |

| No. | Function | Cable Size | Remarks |
|---|---|---|---|
| 15 | | 1.0mm$^2$ | free contact output. |
| 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 (5A). |
| 21 | | 2.5mm$^2$ | |
| 22 | CT B-Phase Monitoring Input | 2.5mm$^2$ | External connected current transformer secondary coil (5A). |
| 23 | | 2.5mm$^2$ | |
| 24 | CT C-Phase Monitoring Input | 2.5mm$^2$ | External connected current transformer secondary coil (5A). |
| 25 | | 2.5mm$^2$ | |
| LINK | | | Test software interface. Connect with PC test software via SG72 module. |

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# 8 SCOPES AND DEFINITIONS OF PROGRAMMABLE PARAMETERS

## 8.1 CONTENTS AND SCOPES OF PARAMETERS

Parameters Settings and Scope (**FORM 1**)

| No | Items | Range | Default | Description |
|---|---|---|---|---|
| **Voltage Settings** | | | | |
| 1 | AC System | (0-3)s | 0 | 0: 3P4W<br>1: 3P3W<br>2: 2P3W<br>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.<br>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)<br>0: Disabled<br>1: Enabled | 0 | Disabled |
| 4 | Primary Voltage | (30-30000) | 100 | Primary voltage of voltage transformer. |
| 5 | Secondary Voltage | (30-30000) | 100 | Secondary voltage of voltage transformer. |
| 6 | Over Volt Warning Enabled | (0-1)<br>0: Disabled<br>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 setting value and warning delay is expired, module will initiate over voltage warning alarm. |
| 8 | Over Volt Warning Delay | (0-3600)s | 3s | Time duration from alarm been detected to initiate alarm. |
| 9 | Over Volt Trip Enabled | (0-1)<br>0: Disabled<br>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 setting value and trip delay is expired, module will initiate over voltage trip alarm. |
| 11 | Over Volt Trip Delay | (0-3600)s | 2s | Time duration from alarm been detected to initiate alarm. |
| 12 | Under Volt Warning Enabled | (0-1)<br>0: Disabled<br>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 setting value and warning delay is expired, module will initiate under voltage warning alarm. |
| 14 | Under Volt Warning | (0-3600)s | 3s | Time duration from alarm been detected to |

| No | Items | Range | Default | Description |
|---|---|---|---|---|
| | Delay | | | initiate alarm. |
| 15 | Under Volt Trip Enabled | (0-1)<br>0: Disabled<br>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 setting value and trip delay is expired, module will initiate under voltage trip alarm. |
| 17 | Under Volt Trip Delay | (0-3600)s | 2s | Time duration from alarm been detected to initiate alarm. |
| 18 | Loss of Phase Detection Enabled | (0-1) | 0 | 0: Disabled<br>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 trip. |
| **Frequency Settings** | | | | |
| 21 | Rated Frequency | (50.0-60.0) Hz | 50.0 | Provide standard for over/under frequency and frequency on load. |
| 22 | Over Frequency Warning Enabled | (0-1)<br>0：Disabled<br>1：Enabled | 1 | When it is enabled, module starts to detect over frequency warning. |
| 23 | Over Frequency Warning Value | (0-200)% | 110% | When generator frequency has exceeded the setting value and warning delay is expired, module will initiate over frequency warning alarm. |
| 24 | Over Frequency Warning Delay | (0-3600)s | 3s | Time duration from alarm been detected to initiate alarm. |
| 25 | Over Frequency Trip Enabled | (0-1)<br>0：Disabled<br>1：Enabled | 1 | When it is enabled, module starts to detect over frequency trip. |
| 26 | Over Frequency Trip Value | (0-200)% | 114% | When generator frequency has exceeded the setting value and warning delay is expired, module will initiate over frequency trip alarm. |
| 27 | Over Frequency Trip Delay | (0-3600)s | 2s | Time duration from alarm been detected to initiate alarm. |
| 28 | Under Frequency Warning Enabled | (0-1)<br>0：Disabled<br>1：Enabled | 1 | When it is enabled, module starts to detect under frequency warning. |
| 29 | Under Frequency Warning Value | (0-200)% | 84% | When generator frequency has fallen below the setting value and warning delay is expired, module will initiate under frequency warning alarm. |
| 30 | Under Frequency | (0-3600)s | 3s | Time duration from alarm been detected to |

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| No | Items | Range | Default | Description |
|---|---|---|---|---|
| | Warning Delay | | | initiate alarm. |
| 31 | Under Frequency Trip Enabled | (0-1)<br>0：Disabled<br>1：Enabled | 1 | When it is enabled, module starts to detect under frequency trip. |
| 32 | Under Frequency Trip Value | (0-200)% | 80% | When generator frequency has fallen below the setting value and warning delay is expired, module will initiate under frequency trip alarm. |
| 33 | Under Frequency Trip Delay | (0-3600)s | 2s | Time duration from alarm been detected to initiate alarm. |
| **Current Settings** | | | | |
| 34 | Rated Full-load Current | (5-6000)A | 500 | It is generator's rated current, and used for provide standard for load current. |
| 35 | Current Transformer Ratio | (5-6000)/5 | 500 | External connected current transformer ratio. |
| 36 | Over Current Warning Enabled | (0-1)<br>0：Disabled<br>1：Enabled | 1 | When it is enabled, module starts to detect over current warning. |
| 37 | Over Current Warning Value | (0-200)% | 110% | When generator current has exceeded the setting value and warning delay is expired, module will initiate over current warning alarm. |
| 38 | Over Current Warning Delay | (0-3600)s | 3s | Time duration from alarm been detected to initiate alarm. |
| 39 | Over Current Trip Enabled | (0-1)<br>0：Disabled<br>1：Enabled | 1 | When it is enabled, module starts to detect over current trip. |
| 40 | Over Current Trip Value | (0-200)% | 114% | When generator current has exceeded the setting value and warning delay is expired, module will initiate over current trip alarm. |
| 41 | Over Current Trip Delay | (0-3600)s | 2s | Time duration from alarm been detected to initiate alarm. |
| **Power Settings** | | | | |
| 42 | Rated Power | (0-6000)kW | 276 | It is generator's rated power, and used for provide standard for power detection. |
| 43 | Over Power Warning Enabled | (0-1)<br>0：Disabled<br>1：Enabled | 1 | When it is enabled, module starts to detect over power warning. |
| 44 | Over Power Warning Value | (0-200)% | 110% | When generator current has exceeded the setting value and warning delay is expired, module will initiate over power warning alarm. |
| 45 | Over Power Warning Delay | (0-3600)s | 3s | Time duration from alarm been detected to initiate alarm. |

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| No | Items | Range | Default | Description |
|---|---|---|---|---|
| 46 | Over Power Trip Enabled | (0-1)<br>0：Disabled<br>1：Enabled | 1 | When it is enabled, module starts to detect over power trip. |
| 47 | Over Power Trip Value | (0-200)% | 114% | When generator current has exceeded the setting value and trip delay is expired, module will initiate over power trip alarm. |
| 48 | Over Power Trip Delay | (0-3600)s | 2s | Time duration from alarm been detected to initiate alarm. |
| 49 | Reverse Power Warning Delay | (0-1)<br>0：Disabled<br>1：Enabled | 1 | When it is enabled, module starts to detect reverse power warning. |
| 50 | Reverse Power Warning Value | (0-200)% | 20% | When reverse power value has exceeded the setting value and warning delay is expired, module will initiate reverse power warning alarm. |
| 51 | Reverse Power Warning Delay | (0-3600)s | 3s | Time duration from alarm been detected to initiate alarm. |
| 52 | Reverse Power Trip Delay | (0-1)<br>0：Disabled<br>1：Enabled | 1 | When it is enabled, module starts to detect reverse power trip. |
| 53 | Reverse Power Trip Value | (0-100)% | 30% | When reverse power value has exceeded the setting value and trip delay is expired, module will initiate reverse power trip alarm. |
| 54 | Reverse Power Trip Delay | (0-3600)s | 2s | Time duration from alarm been detected to initiate alarm. |
| **Outputs Settings** | | | | |
| 55 | Aux. Output 1 Setting | (0-30) | 0 | Default as not used |
| 56 | Aux. Output 1 Type | (0-1) | 0 | 0: Normally open; 1: Normally close |
| 57 | Aux. Output 2 Setting | (0-30) | 0 | Default as not used |
| 58 | Aux. Output 2 Type | (0-1) | 0 | 0: Normally open; 1: Normally close |
| 59 | Aux. Output 3 Setting | (0-30) | 0 | Default as not used |
| 60 | Aux. Output 3 Type | (0-1) | 0 | 0: Normally open; 1: Normally close |
| 61 | Aux. Output 4 Setting | (0-30) | 0 | Default as not used |
| 62 | Aux. Output 4 Type | (0-1) | 0 | 0: Normally open; 1: Normally close |
| **Module Settings** | | | | |
| 63 | Module Address | (1-254) | 1 | Module address when remote monitoring control. |
| 64 | CANBUS Baud rate | (0-1)<br>0：250Kbps<br>0：125Kbps | 0 | CANBUS communication baud rate configuration. |

| No | Items | Range | Default | Description |
|---|---|---|---|---|
| 65 | Module Language Selection | (0-1) | 0 | 0：Simplified Chinese；1：English； |
| 66 | Module Password Setting | (0-9999) | 00318 | It is used to enter into parameter settings. |

## 8.2 ENABLE DEFINITION OF PROGRAMMABLE OUTPUT PORTS 1~4

Programmable outputs 1-4 (**FORM 2**)

| 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 | Phase Sequence Wrong Trip Alarm | Output when phase sequence wrong 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 | Reserved | Reserved |
| 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 | Reserved | Reserved |
| 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 | Reserved | Reserved |
| 24 | Over Power Warning | Output when generator over power warning alarm is occurred. |
| 25 | Reserved | Reserved |
| 26 | Reverse Power Warning | Output when generator reverse power warning alarm is occurred. |

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| No. | Items | Description |
|---|---|---|
| 27 | Custom Output | Separately customized column A and column B output functions, when one is active, module will start output. Detailed to see ***Form 3*** as bellow. |
| 28 | Reserved | Reserved |
| 29 | Reserved | Reserved |
| 30 | Reserved | Reserved |

Custom outputs form **(Form 3)**

| 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 | Phase Sequence Wrong Trip Alarm | Phase Sequence Wrong 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 |

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## 9 PARAMETERS SETTING

After module is power up, pressing  to enter into the password screen.

When entered password interface, inputting correct password (default password is “0318”) to enter into the parameter setting menu and select parameter item via pressing  and  buttons. Then press  to start setting (  to increase value,  to decrease value). After the setting is finished, press  again to confirm it.

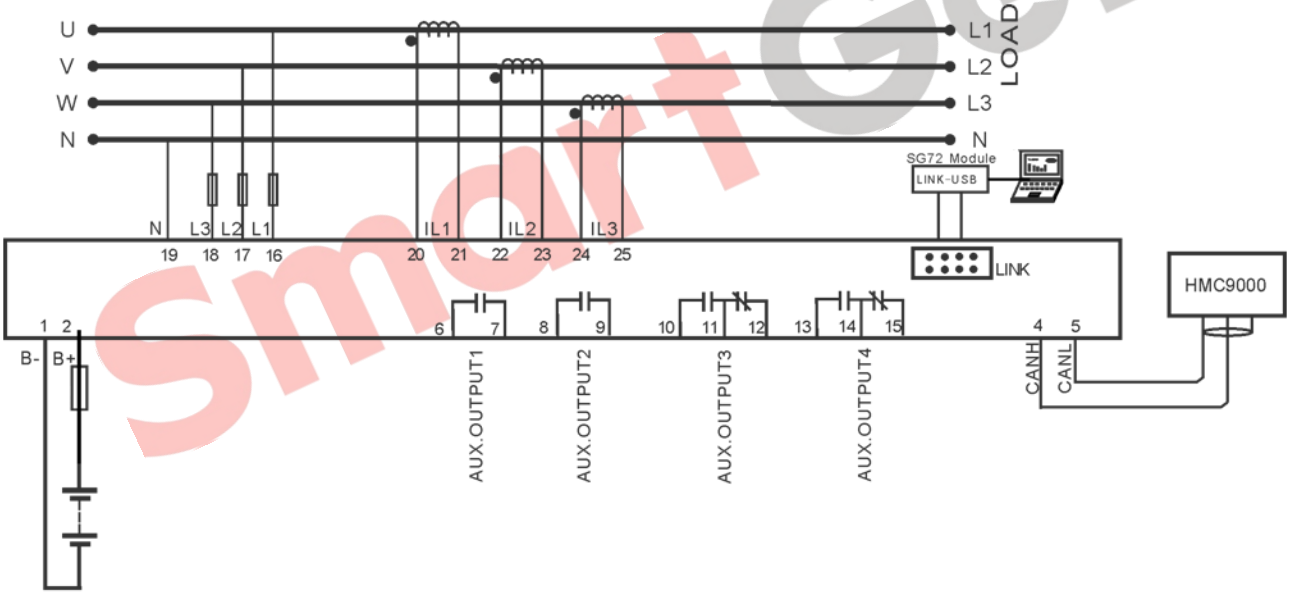
Parameters also can be set through PC software via SG72 module after correctly entry the password (default password is “0318”). If there is need to set more parameters or the password is forgot, please contact the factory.

**NOTES:**

**a) Over voltage set value must be higher than under voltage set value, otherwise over voltage and under voltage condition may occur simultaneously.**

**b) Any alarms don’t need, please select “Disabled” in the alarm enabled selection.**

## 10 TYPICAL APPLICATION




HMP300 Typical Application

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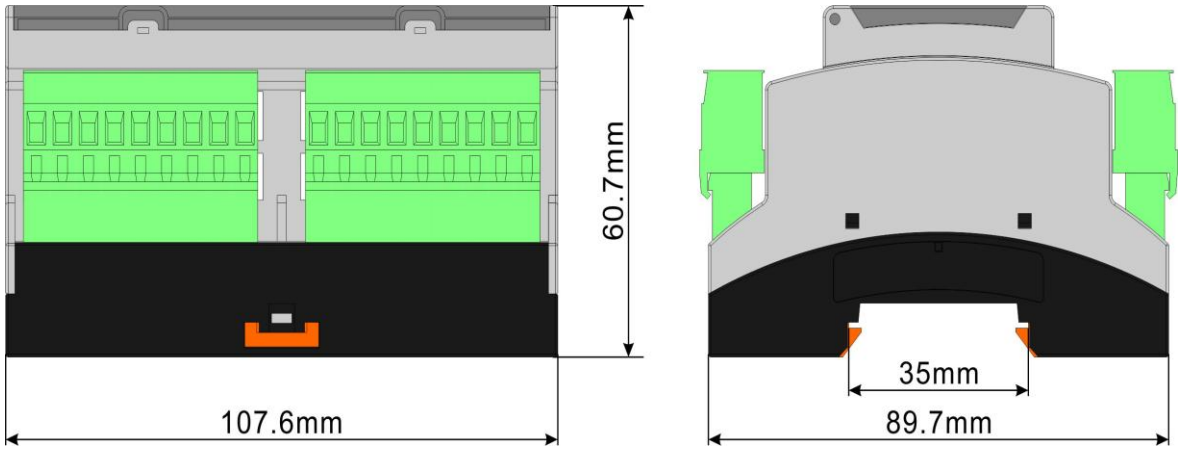
## 11 INSTALLATION

Overall and cutout dimensions:




**Attention:**

**a) OUTPUT AND EXPAND RELAYS**

All outputs of controller 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, increase resistance-capacitance return circuit (when coils of relay has AC current), in order to prevent disturbance to controller or others equipment.

**b) AC INPUT**

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

**NOTE:**

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

**c) WITHSTAND VOLTAGE TEST**

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

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