

SmartGen

MAKING CONTROL SMARTER

HMP300

POWER INTEGRATED PROTECTION MODULE

USER MANUAL



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Table 1 Software Version

Date	Version	Note
2025-06-10	1.0	Original release.
2025-09-16	1.1	1. Modify the ranges of AC phase voltage and AC line voltage; 2. Modify the typical application diagram, figures of home page and front panel.
2025-11-26	1.2	Add differential current application diagram.

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1 OVERVIEW

HMP300 power Integrated protection module integrates digital, intelligent and network technology, which is used for collecting genset data (voltage, current, power and frequency) and outputting related actions if data errors occur, for the purpose of protecting the device. It fits with LCD display, optional Chinese and English language interface. It is reliable and easy to use.

HMP300 power integrated protection module adopts micro-processor technology, which makes it possible to precisely do parameter measuring, fixed value adjustment, set value adjusting etc. All parameters can be configured on front panel or through USB port via PC. It can be widely used for all types of marine/land power distribution devices with compact structure, simple wirings and high reliability.

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2 PERFORMANCE AND CHARACTERISTICS

Main features are as follows:

- 132x64 LCD with backlight, selectable language interface (Chinese and English), push-button operation;
- USB communication port: through which data measuring and parameter setting can be done for the module on PC with software;
- Protections for over/under voltage, over/under frequency, reverse power, over power, over current and differential current;
- Current detection alarm makes it possible to do 3 times over current detection and corresponding alarms;
- With voltage harmonic test function, each phase voltage harmonic distortion rate can be tested;
- With current harmonic test function, each phase current harmonic distortion rate can be tested;
- Both the CT primary ratio and secondary ratio can be set. The CT secondary ratio can be configured as 5A or 1A;
- 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 gen 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: parameters can be modified and stored in internal FLASH memory and cannot be lost even in case of power outage; all of them can be adjusted on front panel of the controller.
- Wide power supply range DC (8~35) V, which is suitable for different power voltage environments.
- All parameters apply digital adjustment, getting rid of conventional analog modulation with normal potentiometer, improving wholesome reliability and stability.
- Module is mounted with the 35mm guide rail or screw fixing.

3 SPECIFICATION

Table 2 Technical Parameters

Item	Contents
Operating Voltage	Range: DC8V to DC35V continuous power supply, DC reverse protection.
Power Consumption	<3W (standby≤2.5W)
Alternator Voltage	Phase Voltage Range: AC35V~AC480(ph-N) Resolution: 1V Accuracy: 1%
	Line Voltage Range: AC60V-AC831(ph-ph) Resolution: 1V Accuracy: 1%
Alternator Frequency	Range: 5Hz~75Hz Resolution: 0.1Hz Accuracy: 0.1Hz
Alternator Current	CT Secondary: 5A/1A Range: 0A~15A/0A-3A Resolution: 0.1A Accuracy: 0.5%
Programmable Relay Output 1	Transistor output. When active, it outputs B- with a rating of 30V @ 1A.
Programmable Relay Output 2	Transistor output. When active, it outputs B- with a rating of 30V @ 1A.
Overall Dimension	107.6mm x 89.7mm x 60.7mm
Working Temperature	(-25~+70)°C
Working Humidity	(20~93)%RH
Storage Temperature	(-30~+80)°C
Insulation Strength	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

Table 3 Key Descriptions

Icons	Function	Description
	Set/Confirm	Press and it shall enter password input interface; Move cursor in parameter settings and confirm the settings.
	Up/Increase	Scroll the screen up; Shift the cursor up or increase the set value in parameter settings.
	Down/Decrease	Scroll the screen down; Shift the cursor down or decrease the set value in parameter settings.
 and 	Press  and  simultaneously and it can reset alarms.	
	Power Indicator	Always illuminated when normal running.
	Alarm Indicator	Flashes when there is an alarm currently.

5 SCREEN DISPLAY

10.2 POWER DATA DISPLAY

Table 4 Power Data Display

1 st Screen	Description
UL-L 690V 690V 690 V	Line voltage Uab, Ubc, Uca
I: 500A 500A 500 A	Phase voltage Ua, Ub, Uc
P: 478kW Q : 358kvar	Current: Ia, Ib, Ic
PF 0.80 50.00Hz	Active power, reactive power
Phase sequence: 0° 120° 240°	Average power factor, frequency
2 nd Screen	Description
THDu(%) THDi(%)	Phase voltage Ua, Ub, Uc
A: 0.5 0.3	Current: Ia, Ib, Ic
B: 0.5 0.3	Active power, reactive power
C: 0.5 0.3	Average power factor, frequency
Phase sequence: 0° 120° 240°	Phase sequence
3 rd Screen	Description
Total kWh 276.3 kWh	Total active energy
Total kvarh 200.0 kvarh	Total reactive energy
Active Power PCT 25%	Active power percentage
Reactive Power PCT 5%	Reactive power percentage

10.2 ALARM DISPLAY

All alarm information (trip alarm and warning alarm) collected by the module is displayed on the alarm screen as bellow.

Table 5 Alarm Display

Display	Description
Alarm	Title
Warning Alarm	Alarm type
Under Volt Warning Alarm	Alarm content

10.2 MODULE INFORMATION DISPLAY

Module I/O status, software version, hardware version and release time are displayed on this screen as bellow.

Table 6 Module Information Display

Display	Description	
OUT: 1 2 IN: 1 2 └┘ └┘ └┘ └┘	No. of output port	No. of input port
	Output port status	Input port status
Software Version: V1.0 (GW) A-HV	Software version	
Hardware Version: V1.0	Hardware version	
Issue Date: 2025-05-20	Issue date	

10.2 SETTING DISPLAY

Press Set key and refer to Table 7 and enter the setting screen.

Table 7 Module Password Setting Display

Display	Description
Please enter the password *****	Press Set key and it will enter parameter settings. (Password is needed)

6 PROTECTION

10.2 WARNING

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

Table 8 Warning Alarms

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

10.2 TRIP ALARM

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

Table 9 Trip Alarms

No.	Type	Description
1	Over Voltage Trip	When the module detects that the genset voltage has exceeded the preset value, it will initiate trip alarm signals 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 preset value, it will initiate trip alarm signals 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 preset value, it will initiate trip alarm signals 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 preset value, it will initiate trip alarm signals 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 preset value, it will initiate trip alarm signals 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 preset value, it will initiate trip alarm signals and the corresponding alarm information will be displayed on LCD.
7	Reverse Power Trip	When the module detects that the genset reverse power value (power is negative) has exceeded the preset value, it will initiate trip alarm signals and the corresponding alarm information will be displayed on LCD.
8	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.
9	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.
10	Differential Protection Trip	When the module detects that genset current is above the preset value, it will initiate trip alarm signals and the corresponding alarm information will be displayed on LCD.

7 WIRING CONNECTION

HMP300 module panel is as follows:

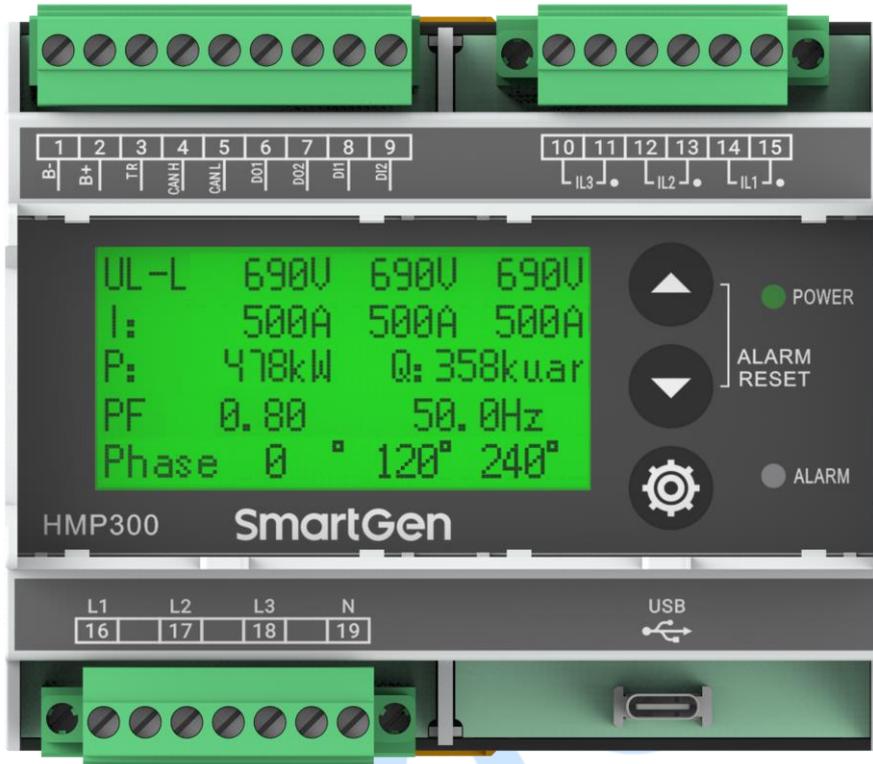


Fig.1 Module Panel

Table 10 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, there is no need to externally connect with a 120Ω resistor.
4	CANH	1.0mm ²	CANBUS communication port.
5	CANL	1.0mm ²	
6	DO1	1.0mm ²	Low-side switch, it outputs B- with a rating of 30V @ 1A
7	DO2	1.0mm ²	Low-side switch, it outputs B- with a rating of 30V @ 1A
8	DI1	0.5mm ²	Programmable input 1.
9	DI2	0.5mm ²	Programmable input 2 .
10	CT A Phase Monitoring	2.5mm ²	External connected current transformer secondary coil (5A rated, maximum 15A).
11		2.5mm ²	
12		2.5mm ²	
13	CT B Phase Monitoring	2.5mm ²	External connected current transformer secondary coil (5A rated, maximum 15A).
14	CT C Phase Monitoring	2.5mm ²	External connected current transformer secondary coil (5A rated, maximum 15A).
15		2.5mm ²	
16	Gen L1 Phase Voltage Monitoring Input	1.0mm ²	Connected with genset output U phase (2A fuse is recommended.)
17	Gen L2 Phase Voltage Monitoring Input	1.0mm ²	Connected with genset output V phase (2A fuse is recommended.)
18	Gen L3 Phase Voltage Monitoring Input	1.0mm ²	Connected with genset output W phase (2A fuse is recommended.)
19	Gen N Wire Input	1.0mm ²	Connected with genset output N wire.

For details see 8.2.

8 SCOPES AND DEFINITIONS OF PROGRAMMABLE PARAMETERS

10.2 CONTENTS AND SCOPES OF PARAMETERS

Table 11 Parameter Settings and Scopes

No.	Items	Range	Default	Description
Voltage Settings				
1	AC System	(0-3)	1	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	PT Fitted Enable	(0-1) 0: Disabled 1: Enabled	0	When it is enabled, voltage value display in proportion can be realized on PT application.
4	Primary Voltage	(30-30000)	100	Primary voltage of voltage transformer.
5	Secondary Voltage	(30-1000)	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 setting 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 alarm is initiated.
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 setting 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 alarm is initiated.
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 setting value and warning delay is expired, module will initiate under voltage warning

No.	Items	Range	Default	Description
				alarm.
14	Under Volt Warning Delay	(0-3600)s	3	Time duration from alarm is detected to alarm is initiated.
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 setting 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 alarm is initiated.
18	Loss of Phase Detection Enabled	(0-1) 0: Disabled 1: Enabled	0	When it is enabled, loss of phase warning starts to be detected.
19	Reverse Phase Sequence Detection Enabled	(0-1) 0: Disabled 1: Enabled	0	When it is enabled, phase sequence wrong warning starts to be detected.
20	Under Volt Threshold Voltage	(0-200)%	60	When threshold voltage is exceeded, module starts to detect under voltage trip.
21	Load Voltage	(0-200)%	90	When module detects voltage is above this limit, it allows voltage of load conditions is satisfied.
Frequency Settings				
22	Rated Frequency	(50.0-60.0)Hz	50.0	Provide standard for over/under frequency and frequency on load.
23	Over Frequency Warning Enabled	(0-1) 0: Disabled 1: Enabled	1	When it is enabled, module starts to detect over frequency warning.
24	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.
25	Over Frequency Warning Delay	(0-3600)s	3	Time duration from alarm is detected to alarm is initiated.
26	Over Frequency Trip Enabled	(0-1) 0: Disabled 1: Enabled	1	When it is enabled, module starts to detect over frequency trip.
27	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.
28	Over Frequency Trip Delay	(0-3600)s	2	Time duration from alarm is detected to alarm is initiated.
29	Under Frequency Warning Enabled	(0-1) 0: Disabled	1	When it is enabled, module starts to detect under frequency warning.

No.	Items	Range	Default	Description
		1: Enabled		
30	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.
31	Under Frequency Warning Delay	(0-3600)s	3	Time duration from alarm is detected to alarm is initiated.
32	Under Frequency Trip Enabled	(0-1) 0: Disabled 1: Enabled	1	When it is enabled, module starts to detect under frequency trip.
33	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.
34	Under Frequency Trip Delay	(0-3600)s	2	Time duration from alarm is detected to alarm is initiated.
35	Frequency On Load	(0-200)%	90	When module detects frequency has exceeded the setting value, it allows frequency of load conditions is satisfied.
36	Frequency Threshold	(0-200)%	60	When it has exceeded the value, frequency alarm detection begins.
Current Settings				
37	Rated Full-load Current	(5-6000)A	500	It is generator's rated current, and used for providing standard for load current.
38	CT Primary Ratio	(5-25000)	500	Externally connected current transformer ratio (Primary).
39	CT Secondary Ratio	1A/5A	5	Externally connected current transformer ratio (Secondary).
40	Over Current Trip	(0-1) 0: Disabled 1: Enabled	1	After enabled, module starts to detect for over current threshold.
41	Over Current Trip Value	(0-200)%	114	When current exceeds this value and this lasts for pre-set delay time, module issues over current trip alarm.
42	Over Current Trip Delay	(0-3600)s	2	Time from when module detects alarm to alarm is issued.
43	Over Current Warning Set	(0-1) 0: Disabled 1: Enabled	1	After enabled, module starts to detect for over current warning.
44	Over Current Warning Delay	(0-200)%	110	When current exceeds this value and this lasts for preset delay time, module issues over current warning alarm.
45	Over Current Warning Delay	(0-3600)s	10	Time from when module detects alarm to alarm is issued.
46	Current Pre-alarm	(0-1)	1	When it is enabled, module starts to detect

No.	Items	Range	Default	Description
	Enabled	0: Disabled 1: Enabled		current pre-alarm.
47	Current Pre-alarm Value	(0-200)%	100	When current has exceeded this value and alarm delay is expired, module will initiate over current pre-alarm signal.
48	Current Pre-alarm Delay	(0-3600)s	3.0	Time from when module detects alarm to alarm is issued.
49	Differential Current Warning Enabled	(0-1) 0: Disabled 1: Enabled	0	When it is enabled, module starts to detect differential current.
50	Differential Current Warning Value	(4-40)%	10	When current has exceeded this value and alarm delay is expired, module will initiate differential protection signal.
51	Differential Current Warning Delay	(0-20)s	2.0	Time from when module detects alarm to alarm is issued.
52	Differential Current Trip Enable	(0-1) 0: Disabled 1: Enabled	0	When it is enabled, module starts to detect differential current.
53	Differential Current Trip Value	(4-40)%	20	When current has exceeded this value and alarm delay is expired, module will initiate differential protection trip signal.
54	Differential Current Trip Delay	(0-20)s	1.0	Time from when module detects alarm to alarm is issued.
Power Settings				
55	Rated Power	(0-6000)kW	276	It is generator's rated power, and used for providing standard for power detection.
56	Rated Reactive Power	(0-6000)kvar	200	It is generator's rated reactive power, and used for providing standard for reactive percentage.
57	Over Power Warning Enabled	(0-1) 0: Disabled 1: Enabled	1	When it is enabled, module starts to detect over power warning.
58	Over Power Warning Value	(0-200)%	110	When generator current power (positive) has exceeded the setting value and warning delay is expired, module will initiate over power warning alarm.
59	Over Power Warning Delay	(0-3600)s	3	Time from when module detects alarm to alarm is issued.
60	Over Power Trip Enabled	(0-1) 0: Disabled 1: Enabled	1	When it is enabled, module starts to detect over power trip.
61	Over Power Trip Value	(0-200)%	114	When generator current power (positive) has exceeded the setting value and trip delay is expired, module will initiate over

No.	Items	Range	Default	Description
				power trip alarm.
62	Over Power Trip Delay	(0-3600)s	2	Time from when module detects alarm to alarm is issued.
63	Reverse Power Warning Enabled	(0-1) 0: Disabled 1: Enabled	1	When it is enabled, module starts to detect reverse power warning.
64	Reverse Power Warning Value	(0-200)%	20	When reverse power value (negative) has exceeded the setting value and warning delay is expired, module will initiate reverse power warning alarm.
65	Reverse Power Warning Delay	(0-3600)s	3	Time from when module detects alarm to alarm is issued.
66	Reverse Power Trip Enabled	(0-1) 0: Disabled 1: Enabled	1	When it is enabled, module starts to detect reverse power trip.
67	Reverse Power Trip Value	(0-200)%	30	When reverse power value (negative) has exceeded the setting value and trip delay is expired, module will initiate reverse power trip alarm.
68	Reverse Power Trip Delay	(0-3600)s	2	Time from when module detects alarm to alarm is issued.
Output Port Settings				
69	Aux. Output 1 Setting	(0-33)	0	Factory default: Not Used Please see Table 12 for output port function configuration.
70	Aux. Output 1 Type	(0-1)	0	0: Normally open; 1: Normally close
71	Aux. Output 2 Setting	(0-33)	0	Factory default: Not Used Please see Table 12 for output port function configuration.
72	Aux. Output 2 Type	(0-1)	0	0: Normally open; 1: Normally close
Input Port Settings				
73	Aux. Input 1 Setting	(0-20)	0	Factory default: Not Used Please see Table 14 for input port function configuration.
74	Aux Input 1 Type	(0-1)	0	0: Close to activate 1: Open to activate
75	Aux. Input 2 Setting	(0-20)	0	Factory default: Not Used Please see Table 14 for input port function configuration.
76	Aux Input 2 Type	(0-1)	0	0: Close to activate 1: Open to activate
Module Settings				
77	Language Selection	(0-1)	0	0: Simplified Chinese; 1: English

No.	Items	Range	Default	Description
78	Password Setting	(0-9999)	00318	It is used to enter parameter settings.
79	Closing Time	(0-20.0)s	5.0	It is output time of allowing on load output after satisfying close conditions; when it is set to 0, it is constant output.
80	Power Data Send Enable	(0-1) 0: Disabled 1: Enabled	0	Real-time power data percentage;
81	CANBUS Communication Baud Setting	0: 250kbps 1: 500kbps 2: 125kbps 3: 50kbps	0	The baud rate for CAN communication with other controllers.
82	CANBUS ID Setting	(0-10)	0	The address for CAN communication with other controllers.

10.2 DEFINABLE CONTENTS OF PROGRAMMABLE OUTPUT PORTS 1~2

Table 12 Definable Contents of Programmable Output Ports 1-2

No.	Items	Description
0	Not Used	Output port is deactivated when "Not Used" is selected.
1	Common Alarm	Output when module detects alarms.
2	Common Warning Alarm	Output when module detects warning alarms.
3	Common Trip Alarm	Output when module detects trip alarms.
4	Over Volt Trip Alarm	Output when over voltage trip alarms occur.
5	Under Volt Trip Alarm	Output when under voltage trip alarms occur.
6	Loss of Phase Trip Alarm	Output when loss of phase trip alarms occur.
7	Reverse Phase Sequence Trip Alarm	Output when reverse phase sequence trip alarms occur.
8	Over Frequency Trip Alarm	Output when over frequency trip alarms occur.
9	Under Frequency Trip Alarm	Output when under frequency trip alarms occur.
10	Over Current Trip Alarm	Output when over current trip alarms occur.
11	Over Current Pre-alarm	Output when over current pre-alarms occur.
12	Over Power Trip Alarm	Output when over power trip alarms occur.
13	Reserved	Reserved
14	Reverse Power Trip Alarm	Output when genset reverse power trip alarms occur.
15	Over Volt Warning	Output when genset over voltage warning alarms occur.
16	Under Volt Warning	Output when genset under voltage warning alarms occur.
17	Allowing On Load Output	Output when on load conditions are satisfied.
18	Input 1 Active	Output when Aux. Input 1 is active.
19	Over Frequency Warning	Output when genset over frequency warning alarms occur.
20	Under Frequency Warning	Output when genset under frequency warning alarms occur.
21	Input 2 Active	Output when Aux. Input 2 is active.
22	Over Current Alarm	Output when genset over current alarms occur.
23	Differential Protection Alarm	Output when differential protection alarms occur.
24	Over Power Warning	Output when genset over power warning alarms occur.
25	Differential Protection Trip	Output when differential protection trips occur.
26	Reverse Power Warning	Output when generator reverse power warning alarms occur.
27	Custom Output	Define Column A, B, C and D output functions; when one of them is active, it will output. For details please see Table 13.
28	Normal Running Output	Output when module is in normal running.
29	No-power Output	Output when there is no current or voltage in any phase of the genset.
30	No-power + Loss of phase Output	Output when either no-power or loss of phase occurs.
31	Start Standby Genset	Output when the SG closed feedback is active, and either an under frequency or over frequency trip alarm occurs.

No.	Items	Description
32	SG Open	Output when SG open feedback is active and over/under frequency trip alarm occurs.
33	Close Output	Output in setting rated voltage and frequency range (voltage/frequency alarm is inactive, no alarm judgement occurs), not output out of the setting range.

Table 13 Custom Output List

No.	Custom Output Column A, B, C, D
1	Over Volt Warning Alarm
2	Under Volt Warning Alarm
3	Over Frequency Warning Alarm
4	Under Frequency Warning Alarm
5	Over Power Warning
6	Over Current Warning
7	Reverse Power Warning
8	Reverse Phase Sequence Trip Alarm
9	Over Volt Trip Alarm
10	Under Volt Trip Alarm
11	Over Frequency Trip Alarm
12	Under Frequency Trip Alarm
13	Over Power Trip Alarm
14	Over Current Trip Alarm
15	Reverse Power Trip Alarm
16	Loss of Phase Trip Alarm
17	Over Current Pre-alarm
18	Differential Protection Warning
19	Differential Protection Trip
20	Input 1 Active
21	Input 2 Active

10.2 INPUT PORTS FUNCTION CONFIGURATIONS

Table 14 Input Ports Function Configurations

No.	Type	Function Description
0	Not Used	Input port function is inhibited.
1	Reserved	
2	Alarm Reset	Alarm is reset when input is active.
3	Frequency-Voltage Protection Enabled	When inputs are enabled, it will initiate voltage/frequency alarm and trip judgement.
4	Reserved	Reserved.
5	Alarm Acknowledge	Alarm reset when inputs are active.
6	SG Closed Feedback	When inputs are active and no closing output is configured, over/under frequency detection is initiated. (If a closing output is configured and an over frequency alarm occurs, the backup unit output activates). If during either under frequency or over frequency

SmartGen

No.	Type	Function Description
		trip alarms, the backup unit output activates.
7	DG Running Feedback	When inputs are active and SG closed feedback is also active, the SG open output activates.
8-20	Reserved	

SmartGen

9 PARAMETERS SETTING

After module is powered on, press  to enter password input screen. Press correct password to enter the parameter setting screen (default: 00318). By  and  the item to be set can be selected. Then press  to set. Press  to add value and press  to decrease value. After settings are completed, press  to confirm.

Parameters also can be set through PC software by connecting with USB to Type-C cable. Password "00318" is needed to be input to do parameter settings via the module. When much more items need to set or password is forgotten, for example: Voltage and Current calibration, please contact the factory.

NOTES:

- 1) Over voltage set value must be higher than under voltage set value, otherwise over voltage and under voltage conditions may occur simultaneously.
- 2) For unneeded alarms please select "Disabled" in the alarm enabled selection.

10 TYPICAL APPLICATION

10.1 MODULE TYPICAL APPLICATION DIAGRAM

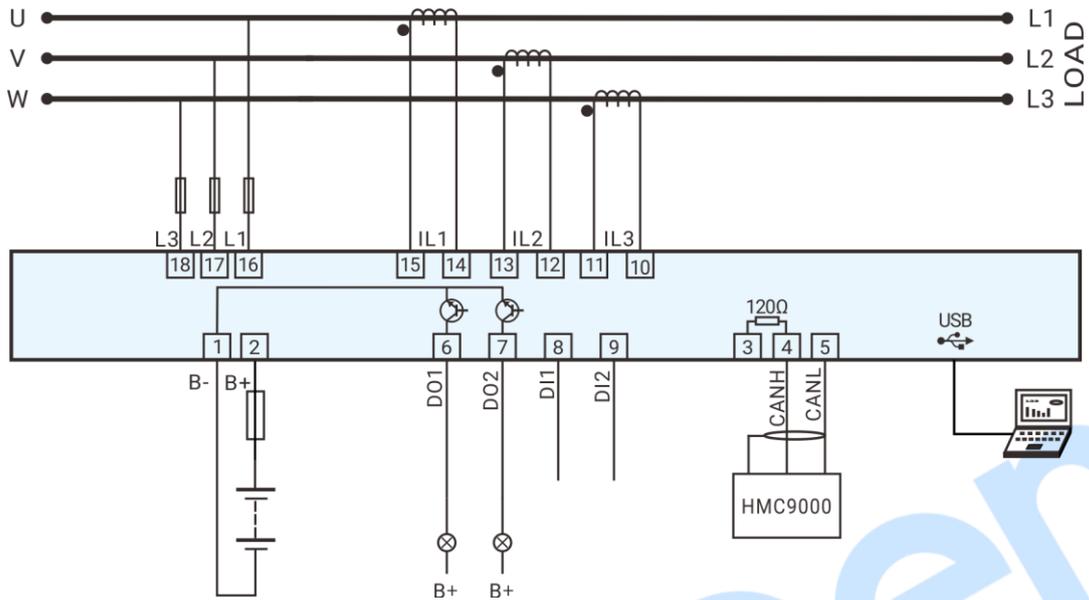


Fig.2 HMP300 Typical Application

10.2 DIFFERENTIAL CURRENT PROTECTION APPLICATION DIAGRAM

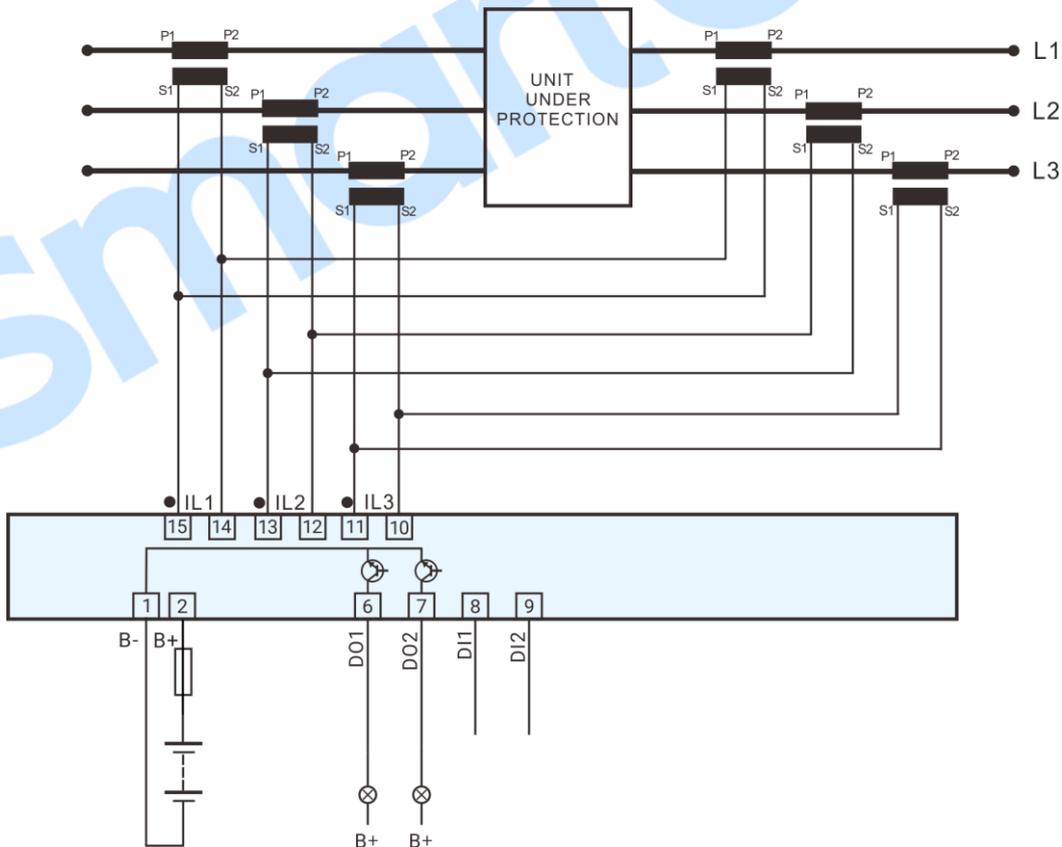


Fig.3 Differential Current Protection Application Diagram

NOTE: The CTs on both sides must have same parameter characteristics, and the cable loads on both sides must also be equal.

Unit: mm

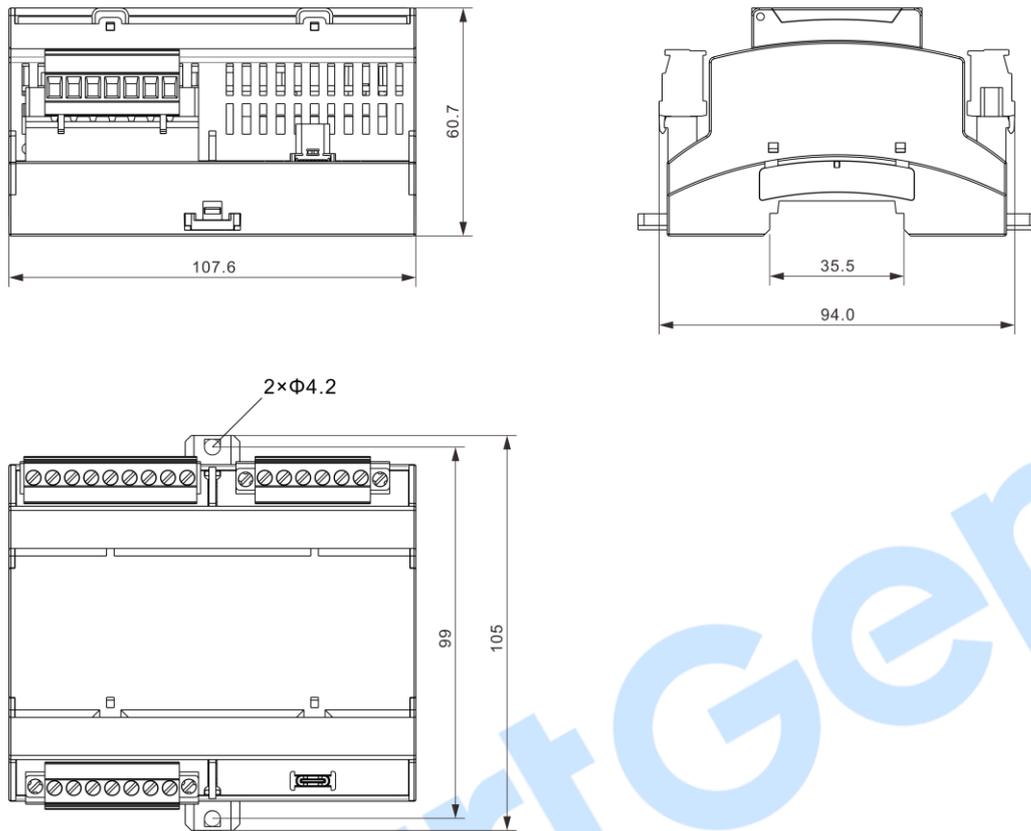


Fig.3 Overall Dimensions and Cutout

NOTES:

✧ **OUTPUT AND EXPAND RELAYS**

All outputs are transistor open-collector outputs. 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), in order to prevent damage to the internal transistors from the back electromotive force (back EMF) generated during relay switching.

✧ **AC CURRENT INPUT**

Generator current input must be connected to outside current transformer. And the current transformer's secondary side current must be 5A (maximum can be 15A). At the same time, the phase of current transformer and input voltage phase must be correct. Otherwise, the collected current and active power may not be correct.

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