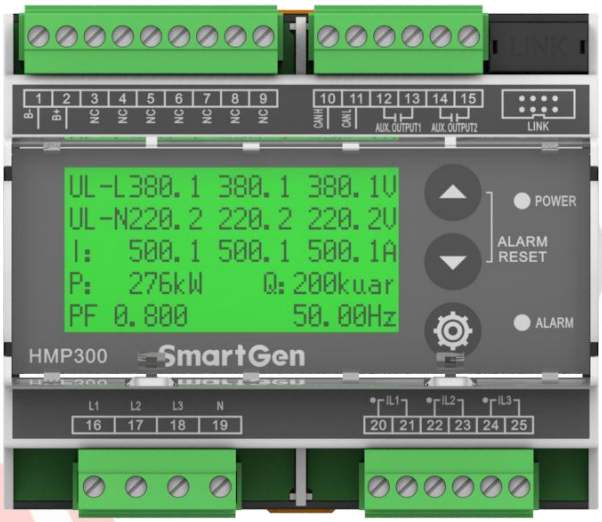
HMP300-S

POWER INTEGRATED PROTECTION MODULE

USER MANUAL



SmartGen

SMARTGEN (ZHENGZHOU) TECHNOLOGY CO., LTD.

Chinese trademark

English trademark

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Table 1 Software Version

Date	Version	Note
2020-11-20	1.0	Original release.

CONTENTS

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1 OVERVIEW

HMP300-S Power Integrated Protection Module integrates digital, intelligent and network technologies, is used to collect genset data (voltage, current, power and frequency) and output related actions for data errors, so as to protect the device. It fits with LCD display, optional Chinese and English bilingual interface, and it is reliable and easy to use.

HMP300-S Power Integrated Protection Module adopts micro-processor technology to realize precise parameter measuring, fixed value adjustment 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, optional 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 configured;
- Equipped with CANBUS port, which can connect with HMC9000/HMC6000 module to realize power and engine data collecting and displaying at the same time;
- Differential protection function, and controller will issue related alarm information after differential protection is active;
- Protection 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;
- Collect and display 3-phase voltage, 3-phase current, frequency and power parameters;

Generator

Line voltage	(Uab, Ubc, Uca)	
Phase voltage	(Ua, Ub, Uc)	
Frequency	Hz	

Load

Current	Ia, Ib, Ic	unit: A
Each phase and total active power	P	unit: kW
Each phase and total reactive power	Q	unit: kvar
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 would not 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 the whole reliability and stability;
- With the 35mm guide rail mounting.

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3 SPECIFICATION

Table 2 Technical Parameters

Items	Contents
Operating Voltage	DC8.0V to DC35.0V, continuous power supply
Power Consumption	<3W (standby ≤2W)
AC Voltage	Phase Voltage Range: AC1V~AC380V (ph-N) Resolution: 0.1V Accuracy: 0.5%
	Line Voltage Range: AC2V~AC650V (ph-ph) Resolution: 0.1V Accuracy: 0.5%
AC Frequency	Range: 41Hz ~ 70Hz Resolution: 0.01Hz Accuracy: 0.5%
AC	Rated: 5A Range: 0A~10A Resolution: 0.1A Accuracy: 0.5%
Total Active Power	Accuracy:0.5%
Programmable Relay Output 1	5 A AC250V volt free output
Programmable Relay Output 2	5 A AC250V volt free output
Overall Dimension	107.6mm x 93mm x 60.7mm
CT Secondary Current	Rated: 5A
Working Conditions	Temperature: (-25~+70)°C; Humidity: (20~93)%RH
Storage Condition	Temperature: (-30~+80)°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	0.3kg

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4 OPERATION

4.1 KEYS FUNCTION DESCRIPTION

Table 3 Keys Function Description

Icons	Function	Description
	Set/Confirm	Pressing this key will enter into password interface; 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

1st Screen	Description
ULL 380.1 380.1 380.1V	Line voltage Uab, Ubc, Uca
ULN 220.2 220.2 220.2 V	Phase voltage Ua, Ub, Uc
I: 500.1 500.1 500.1 A	Current, Ia, Ib, Ic
P: 276 kW Q : 200 kvar	Active power, Reactive power
PF 0.800 50.00Hz	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 0.800 0.800 0.800	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 696.1 kWh **Total kvarh 425.8 kvarh** **kWh % 103%** **kvarh % 246.6%**	Total active energy Total reactive energy Active power percentage 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 interface as bellow:

Table 5 Alarm Display

Display	Description
Alarm **Warning Alarm** **Under Voltage Warning**	Title
	Alarm type
	Alarm content

5.3 MODULE INFORMATION DISPLAY

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

Table 6 Module Information Display

Display	Description
OUT: 1 2 **Software Version: V1.0** **Hardware Version: V1.3** **Issue Date: 2020-11-20**	Number of output port
	Outputs Status
	Software version
	Hardware version
	Release 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 is greater than 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 is less than 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 is greater than 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 is less than 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 (positive) is greater than 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 is greater than 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 greater than 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 (negative) is greater than 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 greater than 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 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 is greater than 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 is less than 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 is greater than 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 is less than 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) is greater than 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 is greater than 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 greater than 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) is greater than 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.

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7 WIRING CONNECTION

HMP300-S controller rear panel is as below:

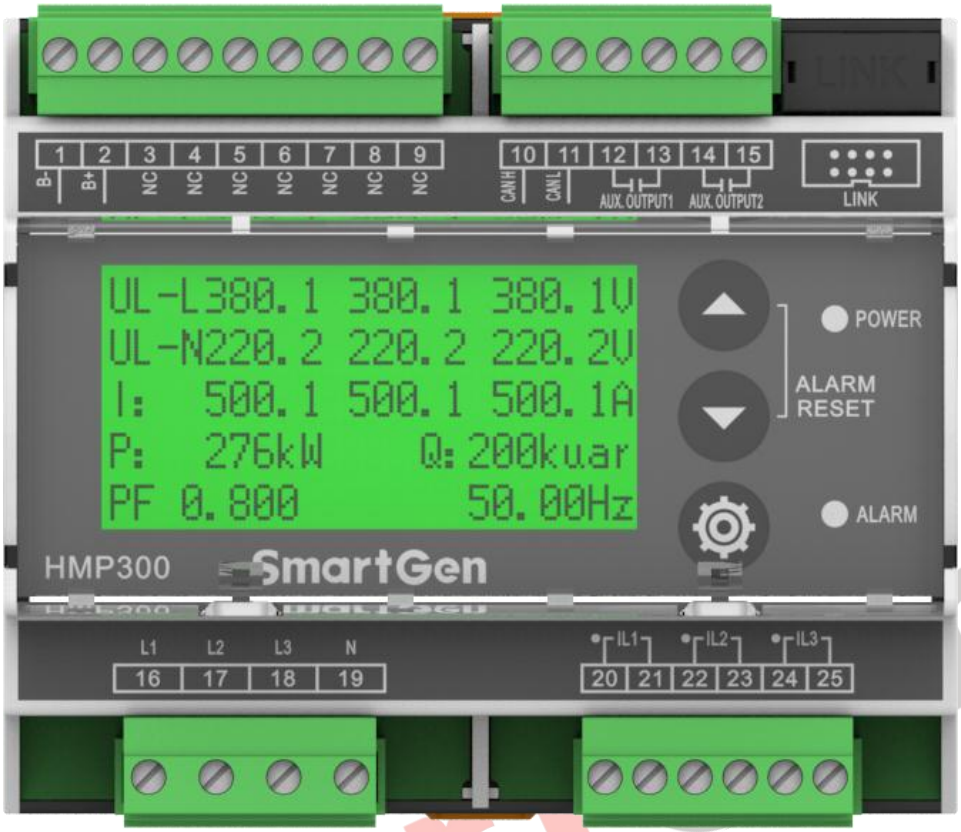

Fig. 1- HMP300-S Panel

Table 9 Terminal Wiring Connection

No.	Function	Cable Size	Remarks
1	B-	1.5mm²	Connected with negative of starter battery, engine starter battery can be used directly.
2	B+	1.5mm²	Connected with positive of starter battery, engine starter battery can be used directly.
3	NC		
4	NC		
5	NC		
6	NC		
7	NC		
8	NC		
9	NC		
10	CANH	0.5mm²	CANBUS communication port, which supports data uploading.
11	CANL	0.5mm²	
12	Aux. Output 1	1.5mm²	Relay normally open volt free contact, rated 5A, and volt free contact output. Details see ***8.2***
13		1.5mm²	
14	Aux. Output 2	1.5mm²	Relay normally open volt free contact, rated 5A, and volt free contact output.
15		1.5mm²	
16	Gen L1 Phase Volt Monitoring Input	1.5mm²	Connected with output U phase of generator (2A fuse is recommended).
17	Gen L2 Phase Volt Monitoring Input	1.5mm²	Connected with output V phase of generator (2A fuse is recommended).
18	Gen L3 Phase Volt Monitoring Input	1.5mm²	Connected with output W phase of generator (2A fuse is recommended).
19	Gen N Wire Input	1.5mm²	Connected with output N wire of generator.
20	CT A-Phase Monitoring Input	1.5mm²	External connected current transformer secondary coil (5A).
21		1.5mm²	
22	CT B-Phase Monitoring Input	1.5mm²	External connected current transformer secondary coil (5A).
23		1.5mm²	
24	CT C-Phase Monitoring Input	1.5mm²	External connected current transformer secondary coil (5A).
25		1.5mm²	
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 SETTING

Table 10 Contents and Scopes of Parameters Setting

No	Items	Range	Default	Description
Voltage Settings				
1	AC Systems	(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 on-load voltage. 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	0: Disabled 1: Enabled
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)	1	When it is enabled, module starts to detect over voltage warning. 0: Disabled 1: Enabled
7	Over Volt Warning Value	(0-200)%	110%	When generator voltage is greater than 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)	1	When it is enabled, module starts to detect over voltage trip. 0: Disabled 1: Enabled
10	Over Volt Trip Value	(0-200)%	120	When generator voltage is greater than 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)	1	When it is enabled, module starts to detect under voltage warning. 0: Disabled 1: Enabled
13	Under Volt Warning Value	(0-200)%	84	When generator voltage is less than the set value and warning delay is expired, module will initiate under voltage warning

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No	Items	Range	Default	Description
				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)	1	When it is enabled, module starts to detect under voltage trip. 0: Disabled 1: Enabled
16	Under Volt Trip Value	(0-200)%	80	When generator voltage is less than 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 the voltage is higher than the threshold, module starts to detect under voltage trip.
21	On-Load Voltage	(0-200)%	90	When voltage is higher than the threshold, it meets the on-load conditions.
Frequency Settings				
22	Rated Frequency	(50.0 or 60.0) Hz	50.0	Provide standard for over/under frequency and on-load frequency.
23	On-Load Frequency	(80-140)%	90	When frequency is over this value, it meets the on-load conditions.
24	Over Frequency Warning Enabled	(0-1)	1	When it is enabled, module starts to detect over frequency warning. 0：Disabled 1：Enabled
25	Over Frequency Warning Value	(80-140)%	110	When generator frequency is greater than 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)	1	When it is enabled, module starts to detect over frequency trip. 0：Disabled 1：Enabled
28	Over Frequency Trip Value	(80-140)%	114	When generator frequency is greater than the setting value and warning 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

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No	Items	Range	Default	Description
	Delay			initiates alarm.
30	Under Frequency Warning Enabled	(0-1)	1	When it is enabled, module starts to detect under frequency warning. 0：Disabled 1：Enabled
31	Under Frequency Warning Value	(80-140%	84	When generator frequency is less than 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)	1	When it is enabled, module starts to detect under frequency trip. 0：Disabled 1：Enabled
34	Under Frequency Trip Value	(80-140)%	80	When generator frequency is less than the set value and warning 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)	1	When it is enabled, module starts to detect over current warning. 0：Disabled 1：Enabled
39	Over Current Warning Value	(0-200)%	110	When generator current is greater than 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)	1	When it is enabled, module starts to detect over current trip. 0：Disabled 1：Enabled
42	Over Current Trip Value	(0-200)%	114	When generator current is greater than the set value and warning 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)	1	When it is enabled, module starts to detect current pre-alarm.

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No	Items	Range	Default	Description
				0：Disabled 1：Enabled
45	Current Pre-alarm Value	(0-200)%	100	When current is greater than 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	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. 0：Disabled 1：Enabled
48	Differential Current Warning Value	(4-40)%	10	When current is greater than this value and warning delay is expired, 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	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 are not displed. 0：Disabled 1：Enabled
51	Differential Current Trip Value	(4-40)%	20	When current is greater than this value and the preset trip delay is expired, 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 detection.
54	Rated Reactive Power	(0-6000)kvar	200	Generator's rated reactive power.
55	Over Power Warning Enabled	(0-1)	1	When it is enabled, module starts to detect over power warning. 0：Disabled 1：Enabled
56	Over Power Warning Value	(0-200)%	110	When active power (positive) is greater than 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)	1	When it is enabled, module starts to detect over power trip. 0：Disabled 1：Enabled
59	Over Power Trip	(0-200)%	114	When active power (positive) is greater

No	Items	Range	Default	Description
	Value			than the set value and trip delay is expired, module will initiate over power trip alarm.
60	Over Power Trip Delay	(0-3600)s	2	Time duration from alarm is detected to it initiates alarm.
61	Reverse Power Warning Delay	(0-1)	1	When it is enabled, module starts to detect reverse power warning. 0：Disabled 1：Enabled
62	Reverse Power Warning Value	(0-200)%	20	When reverse power value is greater than 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 value (negative) is greater than 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
Module Settings				
71	Module Address	(1-254)	1	Module address when remote monitoring control.
72	CANBUS Baud rate	(0-1) 0：250Kbps 1：500Kbps 2: 125Kbps 3: 50Kbps	0	CANBUS communication baud rate configuration.
73	Module Language Selection	(0-1)	0	0：Simplified Chinese；1：English；
74	Module Password Setting	(0-9999)	00318	It is used to enter into parameter settings.
75	Power Data Transmission	Enabled /Disabled	Disabled	Combined with power management controller for using.

8.2 ENABLE DEFINITION OF PROGRAMMABLE OUTPUT PORTS 1~2

Table 11 Definable Contents of Programmable Output 1-2

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	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.

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No.	Items	Description
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 on, press  to enter into the password interface. Input correct password (default password is “0318”) to enter into the parameter setting menu and select parameter item via  and  keys. 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.

NOTES:

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

2. For alarms not needed, please select “Disabled” in the alarm enabled selection.

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10 TYPICAL APPLICATION

10.1 Module Typical Application

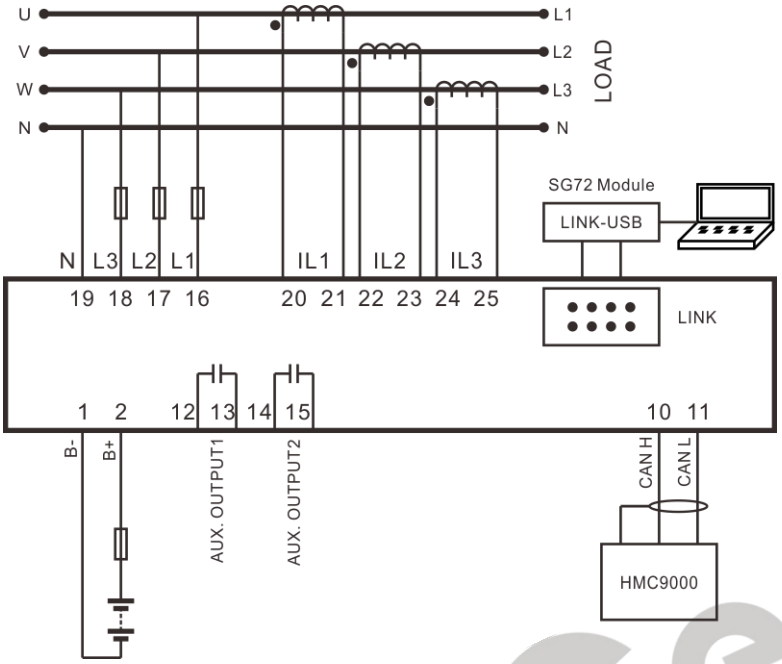

Fig. 2 - HMP300-S Typical Application Diagram

10.2 Differential Current Protection Application

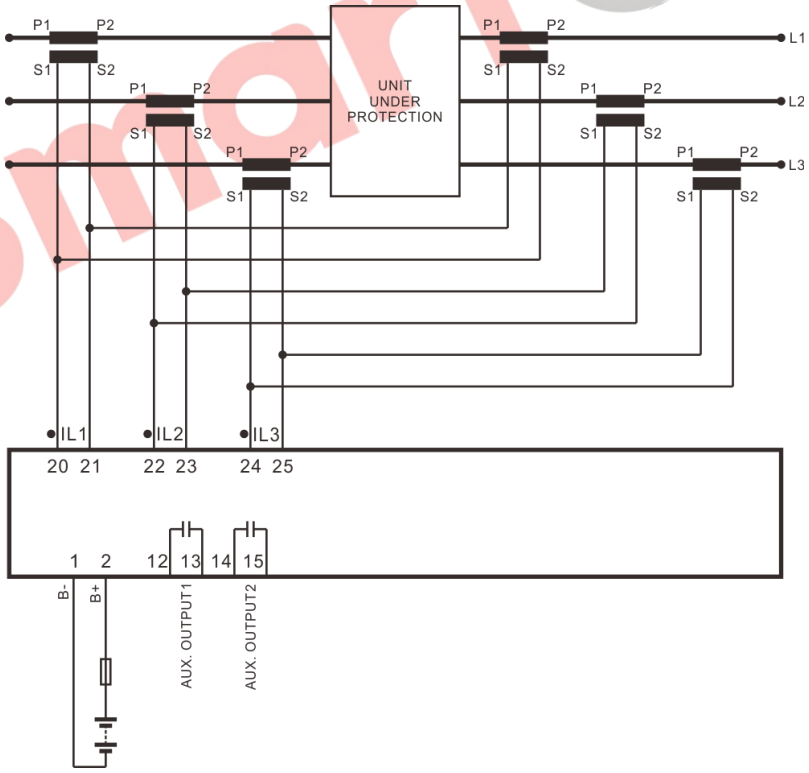

Fig. 3 - Differential Protection Application Diagram

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

11 INSTALLATION

Unit: mm

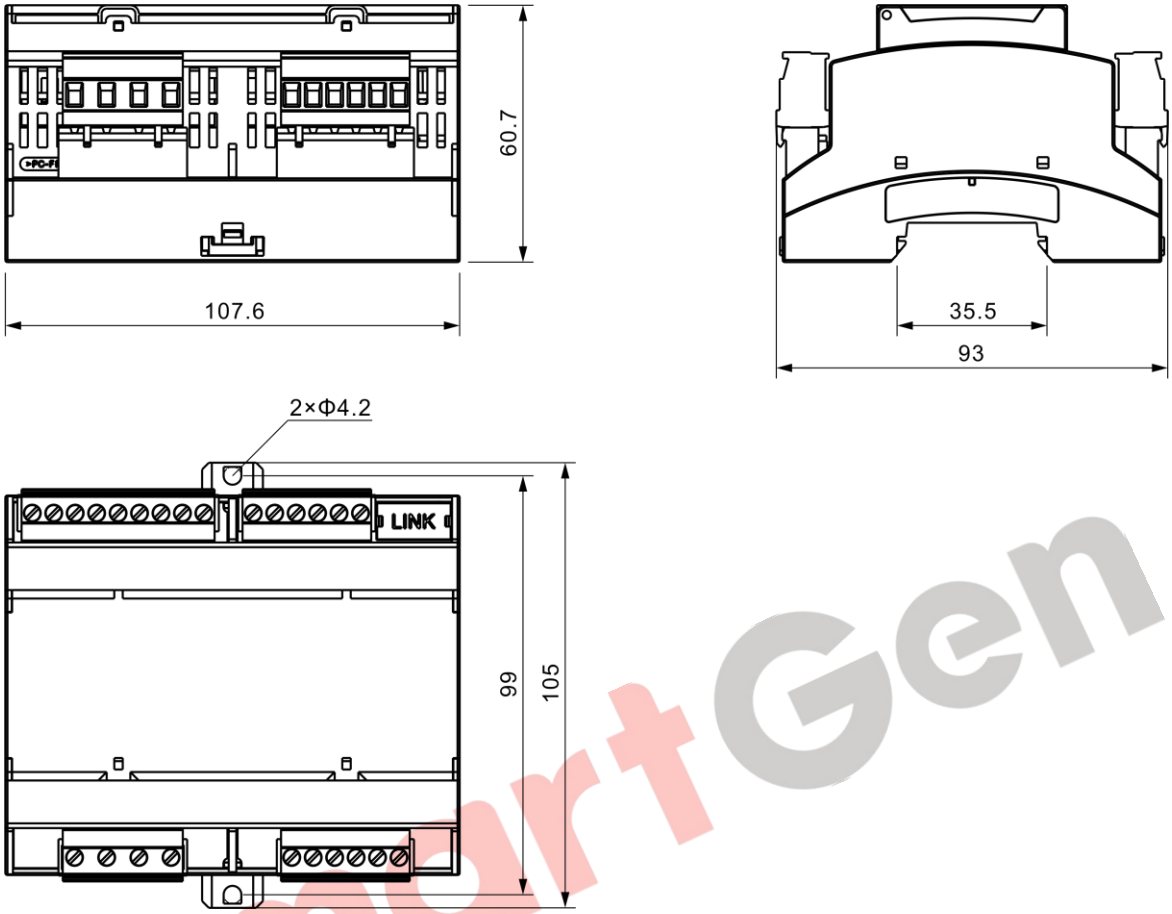

Fig. 4 - Overall and Cutout Dimensions

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 external 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 through the controller and damaging it.