SmartGen

MAKING CONTROL SMARTER

HAT360 SERIES

(HAT361/HAT361C/HAT363/HAT363C)

DUAL POWER ATS CONTROLLER

USER MANUAL

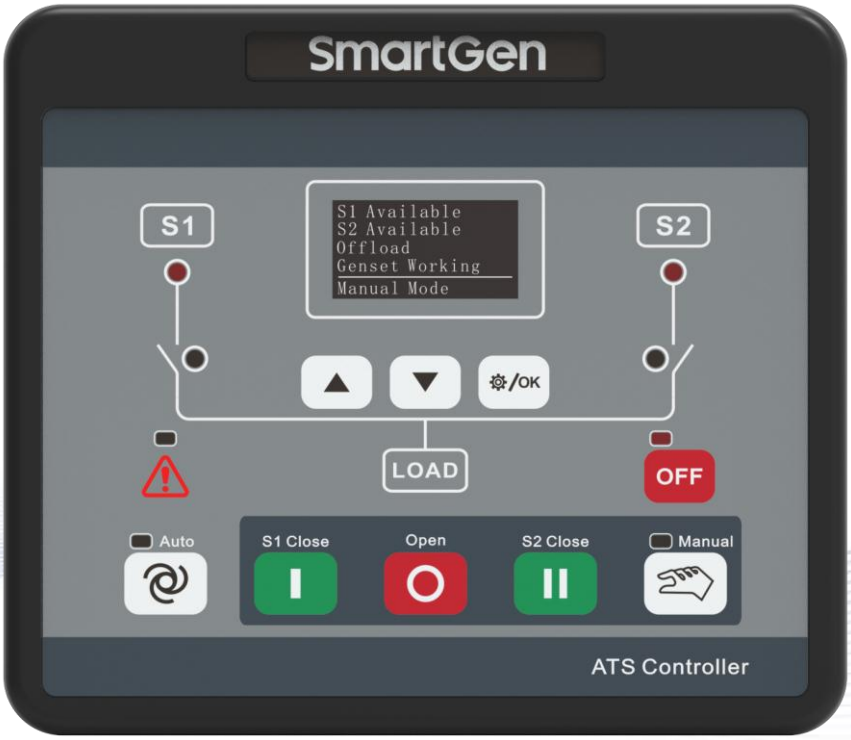

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Table 1 Software Version

Date	Version	Note
2023-07-06	1.0	Original release.
2023-08-03	1.1	Modify notes of model comparison.
2023-09-20	1.2	1. Modify the picture of main interface; 2. Add phase sequence display; 3. Modify protection level to front panel IP40.

Table 2 Symbol Instruction

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

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1 OVERVIEW

HAT360 series dual power ATS controller is made with the microprocessor as the core, which can precisely measure 2-way voltages, make correct judgment and control outputs for occurred voltage abnormal (over voltage, under voltage, over frequency, under frequency, loss of phase, reverse phase sequence). It realizes automatic and intelligent transfer of ATS, integrates OLED display, digital communication at the same time, and realizes good human-computer interaction function, which is an ideal product for dual power ATS.

2 NAMING CONVENTION AND MODEL COMPARISON

2.1 NAMING CONVENTION

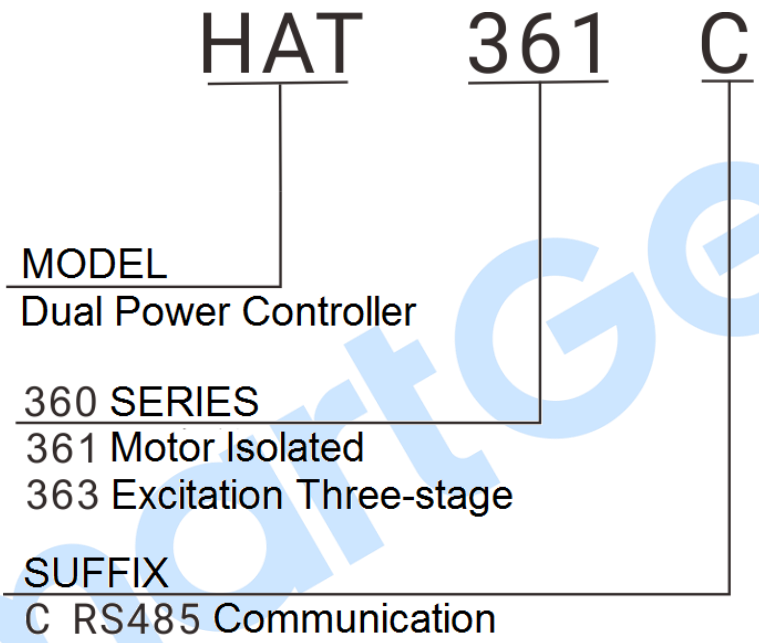

Fig.1 Naming Convention

2.2 MODEL COMPARISON

Table 3 Model Comparison

Item	HAT361	HAT361C	HAT363	HAT363C
AC Supply (LN170V~277V)	•	•	•	•
Inputs (Fixed + Aux.)	3+1	3+1	3+1	3+1
Outputs (Fixed + Aux.)	4+1	4+1	5+1	5+1
Genset Control	•	•	•	•
RS485		•		•
LONO Output			•	•

NOTE: HAT361/HAT361C defaults to one breaking, HAT363/HAT363C defaults to two breakings.

3 PERFORMANCE AND CHARACTERISTICS

- System can be set to: 3P4W, 3P3W, 2P3W, or 1P2W AC type;
- With MCU intelligent and precise monitoring and control;
- S1 master, S2 master can be set, auto transfer/restore, auto transfer, non-restore switch of master power is fitted;
- With Auto/Manual mode;
- With OFF mode, in which breaker close/open is inactive;
- System type can set to: S1 Mains S2 Mains, S1 Mains S2 Gen, S1 Gen S2 Mains;
- Measure and display 2-way 3-phase voltage, frequency and alarm status;
- Suit for two-breaking, one-breaking, no-breaking switch;
- Switch re-closing function is fitted;
- ATS can be configured to work through master and backup power supply, it can work normally as long as any power supply is normal;
- With RS485 isolated communication port (option), enables “remote control, remote measuring, remote communication, remote adjusting” function with ModBus communication protocol; ATS close/open can be controlled remotely;
- With overvoltage, undervoltage, overfrequency, underfrequency, loss of phase, reverse phase sequence detection function, overvoltage/undervoltage threshold, overfrequency/underfrequency threshold can be set;
- Manual test is fitted, which can conduct genset start/stop;
- LED can intuitively display current ATS close status, power status, manual/auto/OFF mode and alarm;
- 2-way N wire isolated design.

4 SPECIFICATION

Table 4 Technical Parameters

Items	Contents	
Operating Voltage	AC supply, voltage range AC(170~277)V	
Power Consumption	≤5W (Standby mode: <2W)	
AC Voltage Input	3P4W (L-N)	AC170V~AC277V
	2P3W (L-N)	AC170V~AC277V
	1P2W (L-N)	AC170V~AC277V
Rated Frequency	Rated: 50/60Hz Range: 10Hz~75Hz Resolution: 0.1Hz Accuracy: 0.1Hz	
Close Relay Output	10A AC250V Volts free output	
Auxiliary Relay Output	10A AC250V Volts free output	
Genset Crank Relay Output	7A AC250V Volts free output	
LONO Relay Output	12A AC250V Active output	
LINK	SmartGen special interface for program upgrade, parameter configuration	
RS485	Isolated, half-duplex, 2400/4800/9600/19200 baud rate can be set, Modbus-RTU communication protocol, max communication distance is 1000m.	
Design Standard	Meet GB/T14048.11-2016 and IEC/EN 60947-6-1	
Safety Requirement	Meet EN 61010-1 installation category (overvoltage type) III, 300V, pollution degree 2, altitude 3000m	
Case Dimensions	143mmx124mmx49mm	
Panel Cutout	132mmx113mm	
Working Temperature	(-25~+70)°C	
Working Humidity	(20~95)%RH	
Storage Temperature	(-30~+80)°C	
Protection Level	Front panel: IP40	
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; insulation resistor: 100MΩ.	
Weight	0.56kg	

5 OPERATION

5.1 INDICATOR DESCRIPTION

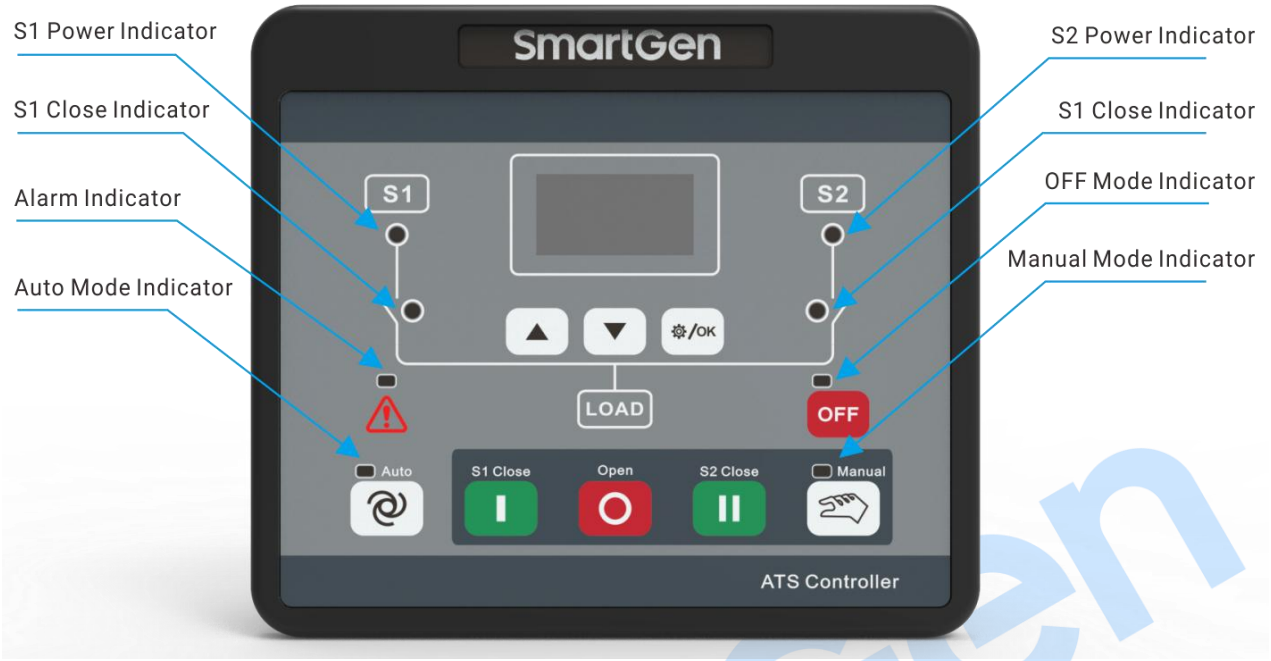

Fig.2 Front Panel

Table 5 Indicator Description

Indicator	Description
S1 Power Indicator	Extinguishes when S1 power blackout; Illuminates when S1 power is normal; Flashes when S1 power is abnormal (under/over voltage, under/over frequency, loss of phase, reverse phase sequence).
S2 Power Indicator	Extinguishes when S2 power blackout; Illuminates when S2 power is normal; Flashes when S2 power is abnormal (under/over voltage, under/over frequency, loss of phase, reverse phase sequence).
S1 Close Indicator	Illuminates when S1 is closed; otherwise, it extinguishes.
S2 Close Indicator	Illuminates when S2 is closed; otherwise, it extinguishes.
Alarm Indicator	Flashes when there is alarm; Extinguishes when there is no alarm.
OFF Mode Indicator	Illuminates in OFF mode; extinguishes in other modes.
Auto Mode Indicator	Illuminates in Auto mode; extinguishes in other modes.
Manual Mode Indicator	Illuminates in Manual mode; extinguishes in other modes.

5.2 KEY FUNCTION DESCRIPTION

Table 6 Key Function Description

Icon	Key	Description
▲	Up	Press it in main interface can scroll up the screen; After entering menu interface, press it can move the cursor up or increase the number at the cursor position.
▼	Down	Press it in main interface can scroll down the screen; After entering menu interface, press it can move the cursor down or reduce the number at the cursor position.
/OK	Set/Confirm/ Lamp Test	Press it in main interface can enter menu interface; After entering menu interface, press it can move cursor and confirm setting information. In the main interface, long press it can test the lamp, screen display is all white, all LEDs illuminate and alarms are reset.
OFF	OFF	Press it to enter **OFF** mode, controller exits control.
	Auto Mode	Press it to enter **Auto** mode.
I	S1 Close	It is active in manual mode; After pressing it, S1 close outputs, S1 takes load.
O	Open	It is active in manual mode; After pressing it, load disconnects.
II	S2 Close	It is active in manual mode; After pressing it, S2 close outputs, S2 takes load.
	Manual Mode	Press it to enter **Manual** mode.

6 LCD DISPLAY

6.1 MAIN INTERFACE DISPLAY

Table 7 Main Interface Display

Content	Description
S1 Blackout S2 Blackout Offload Genset Working Manual Mode	S1 voltage status S2 voltage status ATS status Genset status Status line
LL1 380 380 380V LL2 380 380 380V Volt	S1 line voltage S2 line voltage
LN1 220 220 220V LN2 220 220 220V Volt	S1 phase voltage S2 phase voltage
F1 50.0Hz F2 50.0Hz Freq	S1 frequency S2 frequency
P1 L1 – L2 – L3 P2 L1 – L2 – L3 Phase Sequence	S1 Phase Sequence S2 Phase Sequence
1/1 S1 Failed to Close	Alarm Information

6.2 MAIN STATUS DESCRIPTION

Table 8 S1 Power Status

No.	Item	Description
1	S1 Available	Delay for S1 power available detection.
2	S1 Unavailable	Delay for S1 power unavailable detection.
3	S1 Normal	Power value is within normal range.
4	S1 Blackout	Voltage is 0.
5	S1 Over Volt.	Voltage is above the pre-set upper limit.
6	S1 Under Volt.	Voltage is less than the pre-set lower limit.
7	S1 Over Freq.	Frequency is above the pre-set upper limit.
8	S1 Under Freq.	Frequency is less than the pre-set lower limit.
9	S1 Loss of Phase	One or two phases are lost among A, B, C.
10	S1 Reverse Phase Seq.	Phase sequence is wrong for A-B-C.

Table 9 S2 Power Status

No.	Item	Description
1	S2 Available	Delay for S2 power available detection.
2	S2 Unavailable	Delay for S2 power unavailable detection.
3	S2 Normal	Power value is within normal range.
4	S2 Blackout	Voltage is 0.
5	S2 Over Volt.	Voltage is above the pre-set upper limit.
6	S2 Under Volt.	Voltage is less than the pre-set lower limit.
7	S2 Over Freq.	Frequency is above the pre-set upper limit.
8	S2 Under Freq.	Frequency is less than the pre-set lower limit.
9	S2 Loss of Phase	One or two phases are lost among A, B, C.
10	S2 Reverse Phase Seq.	Phase sequence is wrong for A-B-C.

Table 10 Genset Status

No.	Item	Description
1	Start Delay	Delay time before genset start.
2	Stop Delay	Delay time before genset stop.
3	Genset Working	Genset start signal outputs.
4	Genset Standby	No genset start signal outputs.

Table 11 ATS Status

No.	Item	Description
1	Ready to Transfer	Enter switch transfer procedure.
2	Closing S1	S1 is experiencing close delay.
3	Opening S1	S1 is experiencing open delay.
4	Closing S2	S2 is experiencing close delay.
5	Opening S2	S2 is experiencing open delay.
6	Transfer Rest	The interval time for switch transfer.
7	Closing S1 Again	Again close time when S1 failed to open for the first time.
8	Opening S1 Again	Again open time when S1 failed to close for the first time.
9	Closing S2 Again	Again close time when S2 failed to open for the first time.
10	Opening S2 Again	Again open time when S2 failed to close for the first time.
11	S1 On Load	S1 is closed and takes the load.
12	S2 On Load	S2 is closed and takes the load.
13	Off-load	ATS has been opened and load is disconnected.

When controller detects warning alarm, warning alarm becomes active, alarm indicator will slow flash (1 time per second), and when alarm disappears, alarm indicator will extinguish. Warning alarm isn't latched.

Table 12 Warning Alarm

No.	Item	Description
1	Forced Open	Forced to open (non-fire cutoff input) action is set to Warning; when it is active, the warning alarms.

When controller detects fault alarm, fault alarm becomes active, alarm indicator will quick flash (5 times per second). Fault alarm is latched, and it disappears until user resets it manually.

Table 13 Fault Alarm

No.	Item	Description
1	S1 Failed to Close	S1 failed to close in auto mode.
2	S1 Failed to Open	S1 failed to open in auto mode.
3	S2 Failed to Close	S2 failed to close in auto mode.
4	S2 Failed to Open	S2 failed to open in auto mode.
5	Forced Open Fault	Forced Open Fault (non-fire cutoff input) action is set to Fault; when it is active, Forced Open Fault alarm is issued.
6	Switch Trip Alarm	Switch trip alarm input is active.
7	Simultaneous Close	S1 closed signal and S2 closed signal are active simultaneously, fault alarm is issued after 300ms.

6.3 MAIN MENU

In main display interface, press ⚙/OK key to enter main menu interface.

1. Return 2. Configuration 3. Start/Stop Genset 4. Language 5. Auto Trans./Restore	Press ▲ and ▼ to select different parameter lines (current turns white), then press ⚙/OK can enter corresponding display interface.
2. Configuration 3. Start/Stop Genset 4. Language 5. Auto Trans./Restore 6. About	

NOTE: Password is needed for entering configuration, and default password is "01234"; Operators can change the password to prevent others changing controller configurations randomly. Please remember clearly after the change, or it is forgotten, please contact our company personnel.

7 PARAMETER SETTING

7.1 ILLUSTRATION

Relative parameters only can be set under OFF mode. In the homepage of main interface, press ⚙/OK key to enter menu interface; select "2. Configuration" and then press ⚙/OK key to confirm, then enter password check interface. Input correct password and it will enter parameter main interface. If password is wrong, then it directly returns to main interface. Default password is 01234.

7.2 CONFIGURATION TABLE

Table 14 Configuration List

No.	Item	Defaults	Range	Description
AC Voltage				
1	S1 Available Delay	10s	(0-3600)s	
2	S1 Unavailable Delay	5s	(0-3600)s	
3	S2 Available Delay	10s	(0-3600)s	
4	S2 Unavailable Delay	5s	(0-3600)s	
5	Master Set	0	(0-1)	0: S1 Master 1: S2 Master
6	System Type	0	(0-2)	0: S1 Mains S2 Gen 1: S1 Gen S2 Mains 2: S1 Mains S2 Mains
7	AC Supply Mode	0	(0-3)	0: 3P4W 1: 3P3W 2: 2P3W 3: 1P2W
8	Rated Voltage	220V	(0-600)V	
9	Overvoltage Enable	1	(0-1)	0: Disable 1: Enable
10	Threshold	120%	(0-200)%	
11	Return Value	115%	(0-200) %	
12	Undervoltage Enable	1	(0-1)	0: Disable 1: Enable
13	Threshold	80%	(0-200)%	
14	Return Value	85%	(0-200)%	
15	Rated Frequency	50.0Hz	(10.0-75.0)Hz	
16	Overfrequency Enable	1	(0-1)	0: Disable 1: Enable
17	Threshold	110%	(0-200)%	
18	Return Value	104%	(0-200)%	
19	Underfrequency Enable	1	(0-1)	0: Disable 1: Enable
20	Threshold	90%	(0-200)%	

No.	Item	Defaults	Range	Description
21	Return Value	96%	(0-200)%	
22	Reverse Phase Seq. Monitoring	1	(0-1)	0: Disable 1: Enable
ATS Setting				
1	Fixed Close/Open Time	0	(0-1)0	0: Disable 1: Enable
2	Close Time	5.0s	(0.1-20.0)s	
3	Open Time	5.0s	(0.1-20.0)s	
4	Transfer Rest	1s	(0-9999)s	
5	Auto Trans./Restore	1	(0-1)	0: Auto Trans./Restore 1: Auto Trans. Non-restore
6	Closing Again Delay	1.0s	(0-20.0)s	
7	Opening Again Delay	1.0s	(0-20.0)s	
8	ATS Type	0	(0-2)	0: Two-breaking 1: One-breaking 2: No-breaking
9	Forced Open Action	0	(0-1)	0: Warning Alarm 1: Fault Alarm
10	Continuous Close Output	0	(0-1)	0: Disable 1: Enable When close control signal is continuous, it needs to be enabled, close time and open time are inactive at the moment.
11	Mutual Backup	1	(0-1)	0: Disable 1: Enable
12	AC Supply Voltage Lower Limit	70%	(0-200)%	Lower limit of AC supply voltage.
13	AC Supply Voltage Upper Limit	200%	(0-400)%	Upper limit of AC supply voltage
14	No Open Transfer	0	(0-1)	0: Disable 1: Enable
Genset Setting				
1	Genset Start Delay	1s	(0-9999)s	
2	Genset Stop Delay	5s	(0-9999)s	
Aux. Input Setting				
1	Aux. Input 1 Set	8	(0-39)	Details see table 15.
2	Active Type	0	(0-1)	0: Close to Activate 1: Open to Activate
Aux. Output Setting				
1	Active Type	0	(0-1)	
2	Input 1 Setting	5	(0-49)	Details see table 16
Module Setting				
1	Module Address	1	(1-254)	

No.	Item	Defaults	Range	Description
2	Language	0	(0-2)	0: Simplified Chinese 1: English 2: Others
3	Password Set	1234	(00000-65534)	
4	Communication Port Baud Rate	2	(0-3)	0: 2400bps 1: 4800bps 2: 9600bps 3: 19200bps
5	Communication Port Stop Bit	1	(1-2)	1: 1-bit 2: 2-bit
6	Communication Port Parity Bit	0	(0-2)	0: None 1: Odd Parity 2: Even Parity
7	Communication Function Set	0	(0-3)	0: Enable Remote Adjust & Control 1: Disable Remote Control 2: Disable Remote Adjust 3: Disable Remote Adjust & Control

7.3 DIGITAL INPUT FUNCTION DESCRIPTION

Table 15 Input Function Description

No.	Item	Description
0	Not Used	Invalid.
1	Forced Open	It is only suitable for ATS with breaking. When it is active, ATS will switch to 0 position whether in manual or auto mode.
2	Remote Start On-load	Genset start outputs, gen will close when mains power is normal.
3	Remote Start Off-load	Genset start outputs, gen will not close when mains power is normal.
4	Lamp Test	All LEDs on the panel illuminate, screen displays all white.
5	Reserved	Reserved
6	Reserved	Reserved
7	Start Inhibit	Inhibit genset start signal outputs. In auto mode, after stop delay is over, disconnect genset start signal; while in manual mode, if it has started, manually stop is required, manual start is inactive after stopping.
8	Trip Input	Trip fault input.
9	S1 Close Inhibit	Inhibit S1 close with load.
10	S2 Close Inhibit	Inhibit S2 close with load.
11	Reserved	Reserved
12	Reserved	Reserved
13	S1 Close Key	Same as S1 close/open key, control S1 close/open.
14	S2 Close Key	Same as S2 close/open key, control S2 close/open.
15	Alarm Reset	Reset current alarms.

No.	Item	Description
16	Reserved	
17	Reserved	
18	Reserved	
19	S1 Master	Force to set S1 as the master power.
20	S2 Master	Force to set S2 as the master power.
21	Forced Manual Mode	Force controller to manual mode.
22	Forced Auto Mode	Force controller to auto mode.
23	Panel Lock	Inhibit panel key operation, except for up, down and confirm keys.
24	Reserved	
25	Reserved	
26	Simulate S1 Normal	Simulate S1 normal, S1 voltage abnormal is inactive.
27	Simulate S2 Normal	Simulate S2 normal, S2 voltage abnormal is inactive.
28	Open Key	
29	Reserved	
30	Auto Trans./Restore	Auto transfer/restore for active, auto transfer, non-restore for inactive.
31	Reserved	
32	Reserved	
33	Remote Control Inhibit	When it is active, remote commands sent through all communication ports are inactive.
34	Transfer Inhibit	In auto mode, when it is active, it can inhibit ATS transfer.
35	Reserved	
36	S1 Close Signal	Detect 1# close status.
37	S2 Close Signal	Detect 2# close status.
38	Reserved	
39	Reserved	

7.4 DIGITAL OUTPUT FUNCTION DESCRIPTION

Table 16 Output Function Description

No.	Item	Description
0	Not Used	Invalid.
1	Common Alarm	Common alarm includes fault alarm, warning alarm.
2	Common Fault Alarm	Fault alarm includes transfer failure, overcurrent trip.
3	Common Warning Alarm	Warning alarm includes forced open.
4	Transfer Failure	Transfer failure includes S1 close failure, S1 open failure, S2 close failure, S2 open failure.
5	Reserved	
6	Reserved	
7	Genset Start Delay	Output in genset start delay.
8	Genset Stop Delay	Output in genset stop delay.
9	Reserved	
10	Fire Linkage	Output when forced open (fire) input signal is active and ATS is opened.

No.	Item	Description
11	Reserved	
12	Reserved	
13	S1 Available	Output when S1 is available.
14	S1 Unavailable	Output when S1 is unavailable.
15	S2 Available	Output when S2 is available.
16	S2 Unavailable	Output when S2 is unavailable.
17	Reserved	
18	Reserved	
19	Reserved	
20	Auto Status	Output in auto mode.
21	Manual Status	Output in manual mode.
22	Genset Start	Control genset start.
23	Reserved	
24	QS1 Close Control	QS1 closed command outputs.
25	QS1 Open Control	QS1 opened command outputs.
26	QS2 Close Control	QS2 closed command outputs.
27	QS2 Open Control	QS2 opened command outputs.
28	QS1 Closed Status	QS1 closed status.
29	QS2 Closed Status	QS2 closed status.
30	Remote Control	Control output through RS485 communication command
31	Aux. Input 1 Status	
32	S1 Blackout	S1 power status
33	S1 Overvoltage	
34	S1 Undervoltage	
35	S1 Overfrequency	
36	S1 Underfrequency	
37	S1 Loss of Phase	
38	S1 Reverse Phase Sequence	
39	Reserved	
40	Reserved	
41	S2 Blackout	S2 power status
42	S2 Overvoltage	
43	S2 Undervoltage	
44	S2 Overfrequency	
45	S2 Underfrequency	
46	S2 Loss of Phase	
47	S2 Reverse Phase Sequence	
48	Transferring	Output in transferring.
49	Simultaneous Close Fault	Output in simultaneous close fault.

8 RUNNING

8.1 MANUAL MODE

Press key, manual status indicator illuminates, controller enters manual mode.

Table 17 Manual Key

Icon	Key	Function Description
I	S1 Close	Press it and if load is in open status, S1 closes, and load is supplied by S1.
II	S2 Close	Press it and if load is in open status, S2 closes, and load is supplied by S2.
O	Open	Press it and load is disconnected.

8.2 AUTO MODE

8.2.1 ILLUSTRATION

Press key, auto status indicator illuminates, controller enters auto mode.

In auto mode, controller will transfer switch based on the status of S1 power, S2 power, transfer priority and auto trans./restore status to ensure supply for load. The following illustrates control logics by the example of “S1 master” and “S1 Mains S2 Gen”.

8.2.2 AUTO TRANSFER/RESTORE

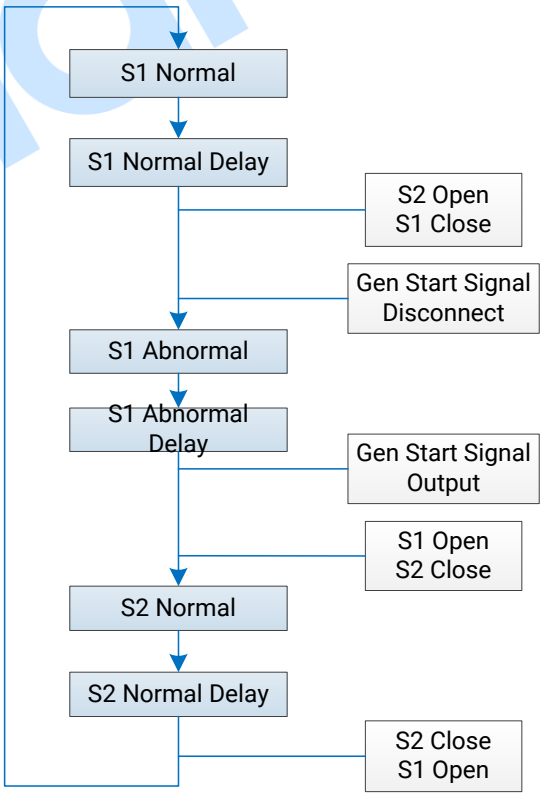

Fig.3 Auto Transfer/Restore Flowchart

8.2.3 AUTO TRANSFER NON-RESTORE (MUTUAL BACKUP ACTIVE)

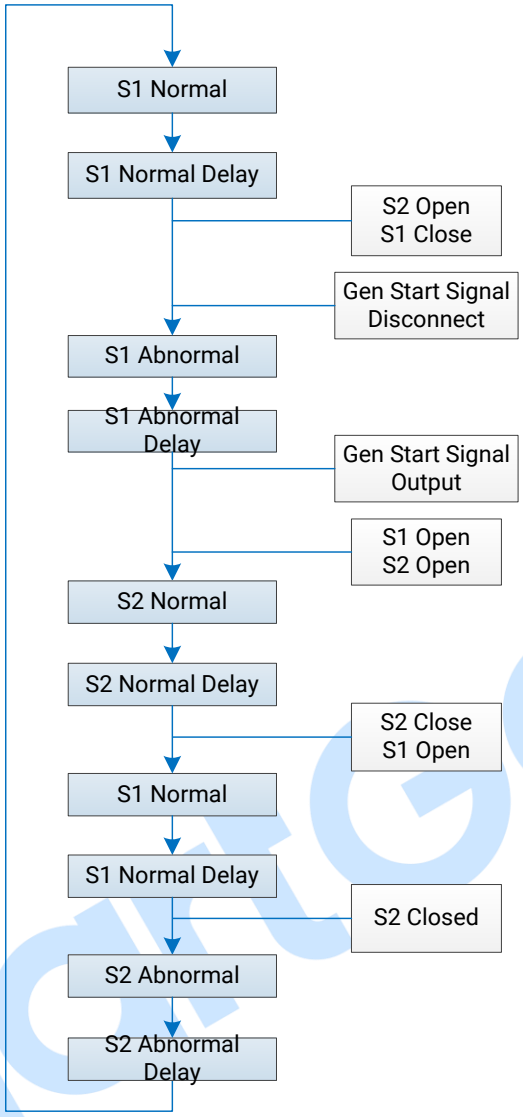

Fig.4 Auto Transfer Non-restore (Mutual Backup Active) Flowchart

8.2.4 AUTO TRANSFER NON-RESTORE (MUTUAL BACKUP INACTIVE)

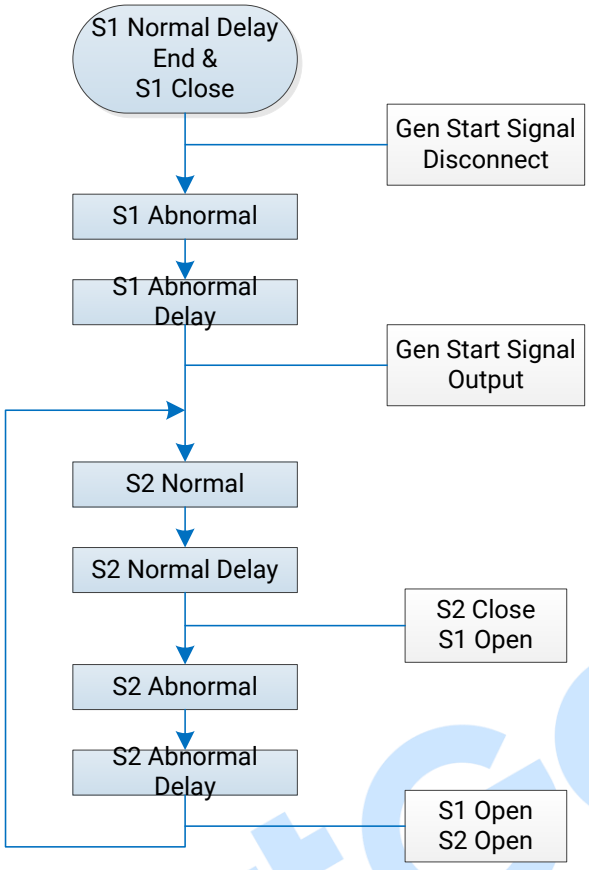

Fig.5 Auto Transfer Non-restore (Mutual Backup Inactive) Flowchart

NOTE: Master power (S1) close needs to be realized by key operation in manual mode, otherwise, ATS only switch between open and backup power (S2) in auto mode.

9 GENSET START & STOP OPERATION

9.1 MANUAL START & STOP

9.1.1 PANEL START & STOP

In main menu screen, select “3. Manual Test” to enter manual start operation screen.
When system type is “S1 Mains S2 Gen”, “S1 Gen S2 Mains”, “S1 Mains S2 Mains”, the below operation interface is directly entered.

1.Return 2.Genset Stop 3.Genset Start	Press Up/Down key to select different parameter lines (current line turns white), then press Confirm key to confirm the operation.

Genset Stop: Disconnect the outputted genset start signal, i.e. control genset stop.
Genset Start: Control genset start signal output, i.e. control genset start.

9.1.2 REMOTE START & STOP VIA COMMUNICATION

Through RS485 port and by using Modbus-RTU protocol control, remote start/stop commands can be issued.
Remote Stop: Disconnect the outputted genset start signal, i.e. control genset stop.
Remote Start: Control genset start signal output, i.e. control genset start.

9.1.3 REMOTE CLOSE & OPEN VIA COMMUNICATION

Through RS485 port and by using Modbus-RTU protocol control, remote S1 close, S2 close or S1 open, S2 open commands can be issued.
Remote S1 Close: S1 closed output, S1 takes load.
Remote S1 Open: S1 opened output, S1 disconnects load.
Remote S2 Close: S2 closed output, S2 takes load.
Remote S2 Open: S2 opened output, S2 disconnects load.

9.2 AUTO START & STOP

Start conditions:

— **Input Port Start**

Set “Remote Start On-load” or “Remote Start Off-load” for configurable input ports.
Remote Start On-load: Genset start outputs, when generating is Ok, GB closes; when it is inactive, disconnect genset start output signal.
Remote Start Off-load: Genset start outputs, when mains power is Ok, MB closes; when it is inactive, disconnect genset start output signal.

— **Gen Start Mains NG**

When mains power is abnormal, genset start outputs; when generating is Ok, gen closes.

10 CONTROLLER PORT DESCRIPTION

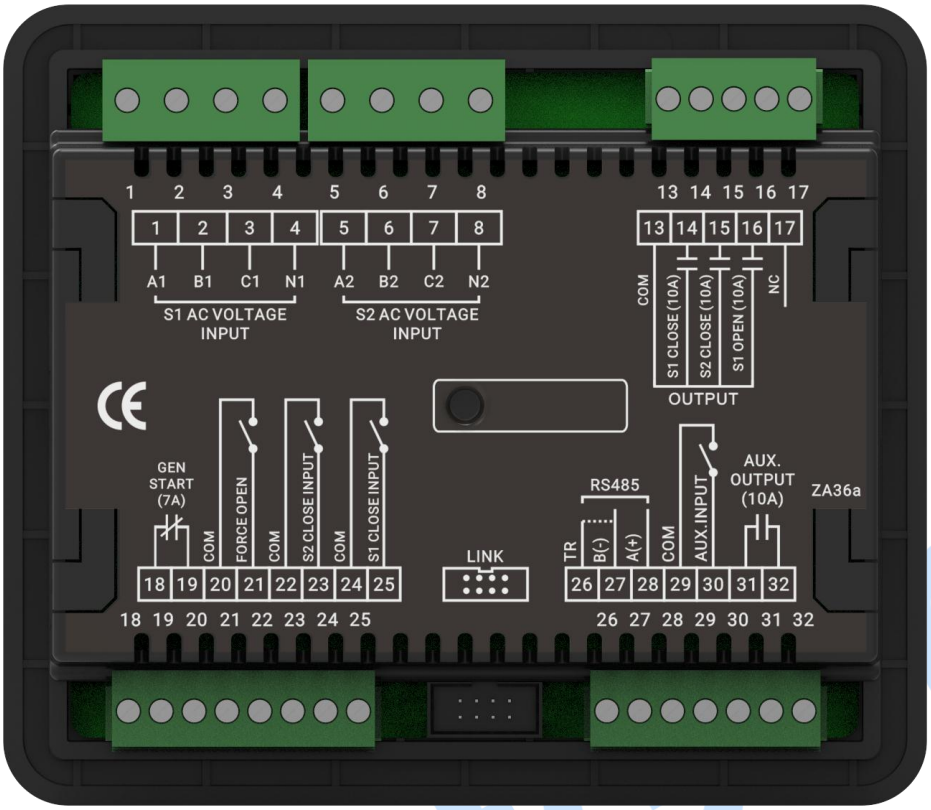

Fig.6 HAT361C Panel

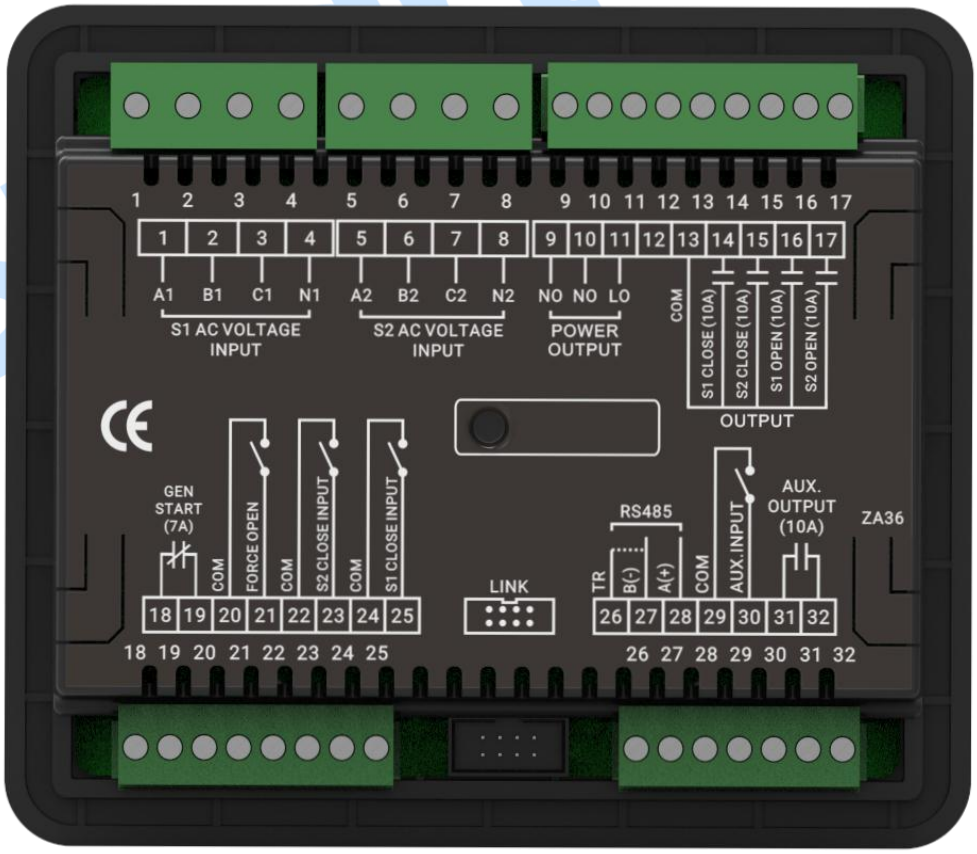

Fig.7 HAT363C Panel

Table 18 Connection Terminals Description

No.	Item	Description	Remark
1	A1	AC 3 phase 4 wire voltage input of S1	For single phase input, only connect A1, N1
2	B1		
3	C1		
4	N1		
5	A2	AC 3 phase 4 wire voltage input of S2	For single phase input, only connect A2, N2
6	B2		
7	C2		
8	N2		
9	NO	ATS supply power N	Provide supply power for ATS Capacity: 12A 250VAC NC for terminal 9-11 of HAT361
10	NO		
11	LO	ATS supply power L	
12	NC	NC	
13	COM	Output common port	
14	S1 CLOSE OUTPUT	S1 close output	Capacity: 10A 250VAC
15	S2 CLOSE OUTPUT	S2 close output	Capacity: 10A 250VAC
16	S1 OPEN OUTPUT	S1 open output	Capacity: 10A 250VAC
17	S2 OPEN OUTPUT	S2 open output	Capacity: 10A 250VAC NC for terminal 17 of HAT361
18	GEN START	Genset start output	Capacity: 7A 250VAC
19			
20	COM	Input common port	
21	FORCE OPEN	Forced open input	Connect GND of input common port
22	COM	Input common port	
23	S2 CLOSE INPUT	S2 close input	Connect GND of input common port
24	COM	Input common port	
25	S1 CLOSE INPUT	S1 close input	Connect GND of input common port
26	TR	RS485 impedance matching resistor	Users need to connect this terminal to terminal 27 based on on-site network arrangement; used to connect with the 120Ω resistor inside the controller
27	B(-)	RS485 communication port	
28	A(+)		
29	COM	Common port	
30	AUX.INPUT	Aux. input	Connect GND of input common port
31	AUX.OUTPUT	Aux. output	Capacity: 10A 250VAC
32			

11 TYPICAL WIRING DIAGRAM

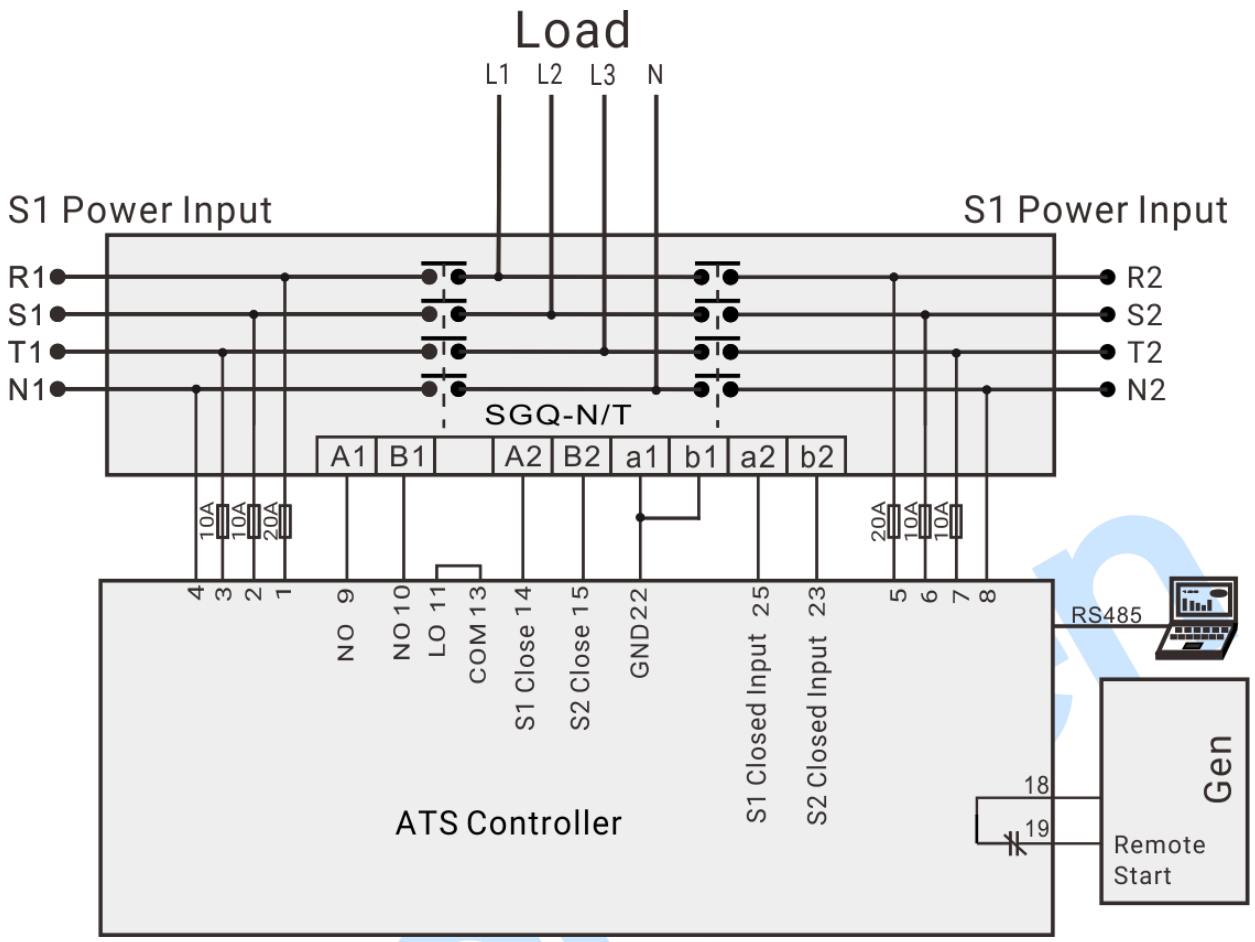

Fig.8 SGQ-N/T Application Diagram

Table 20 Related Settings

Partial Parameter Setting	
ATS Type Setting	No breaking
Suitable controller model: HAT363	

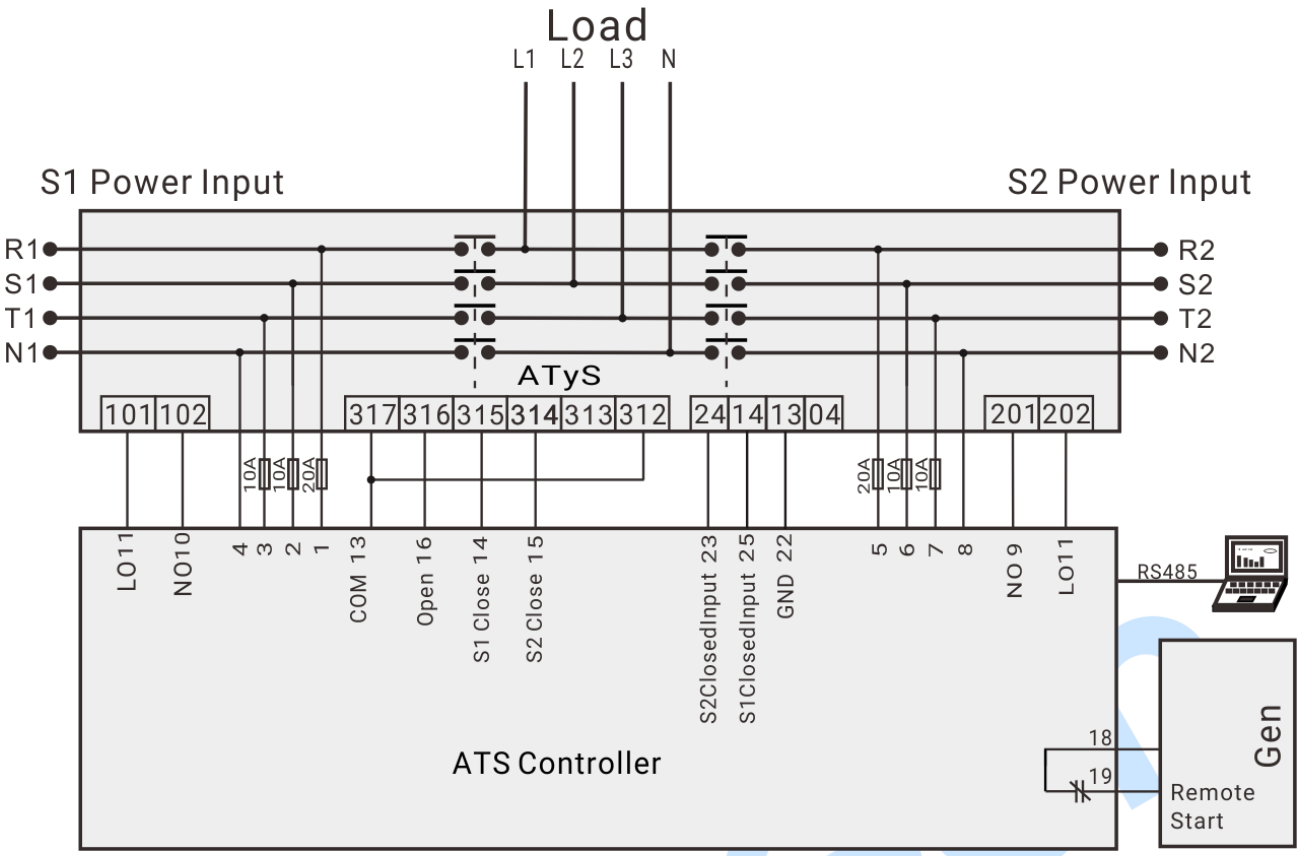

Fig.9 ATyS Application Diagram

Table 20 Related Settings

Partial Parameter Setting	
ATS Type Setting	One breaking
Suitable controller model: HAT363	

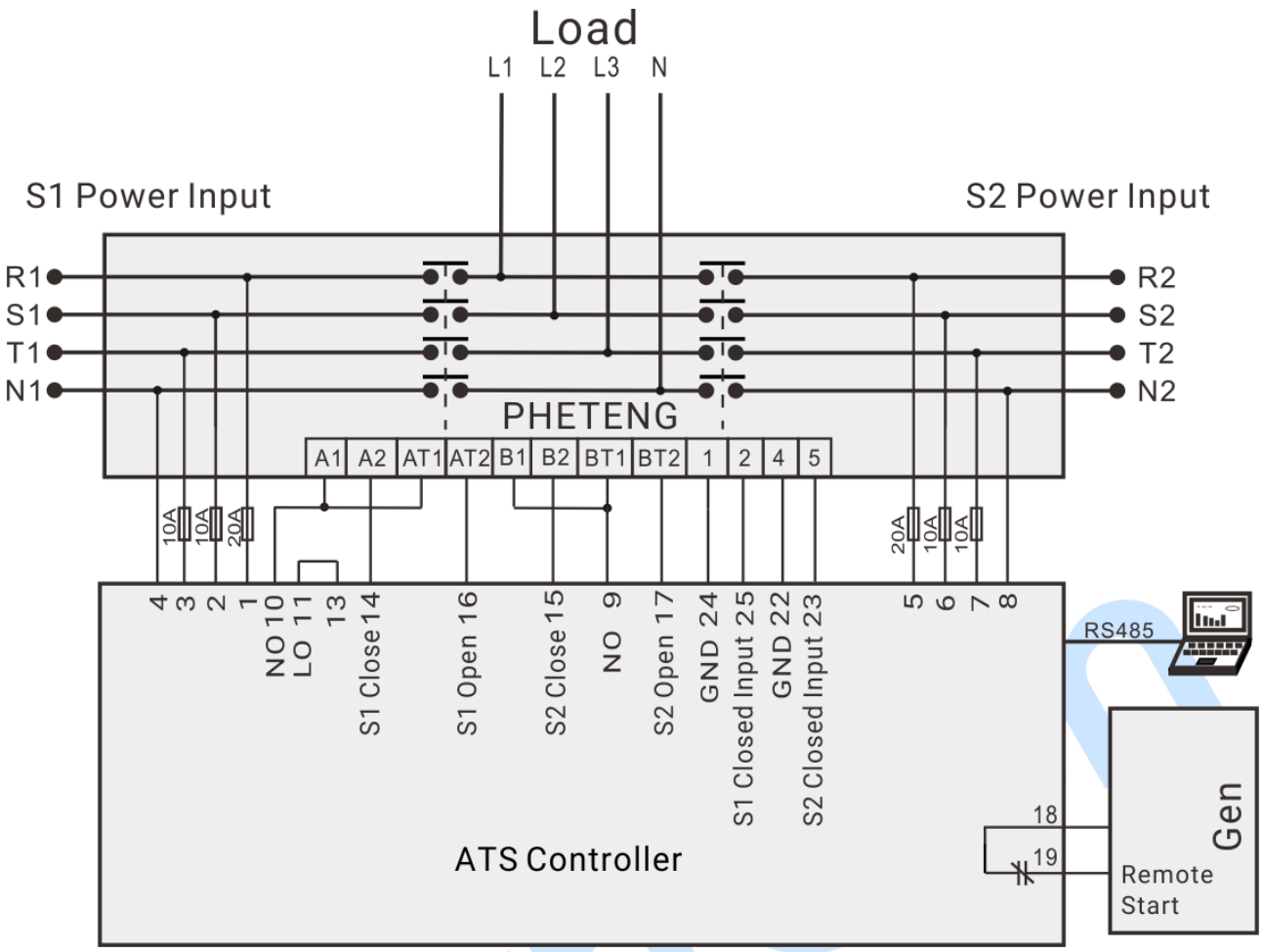

Fig.10 PHETENG Application Diagram

Table 21 Related Setting

Partial Parameter Setting	
ATS Type Setting	Two breakings
Suitable controller model: HAT363	

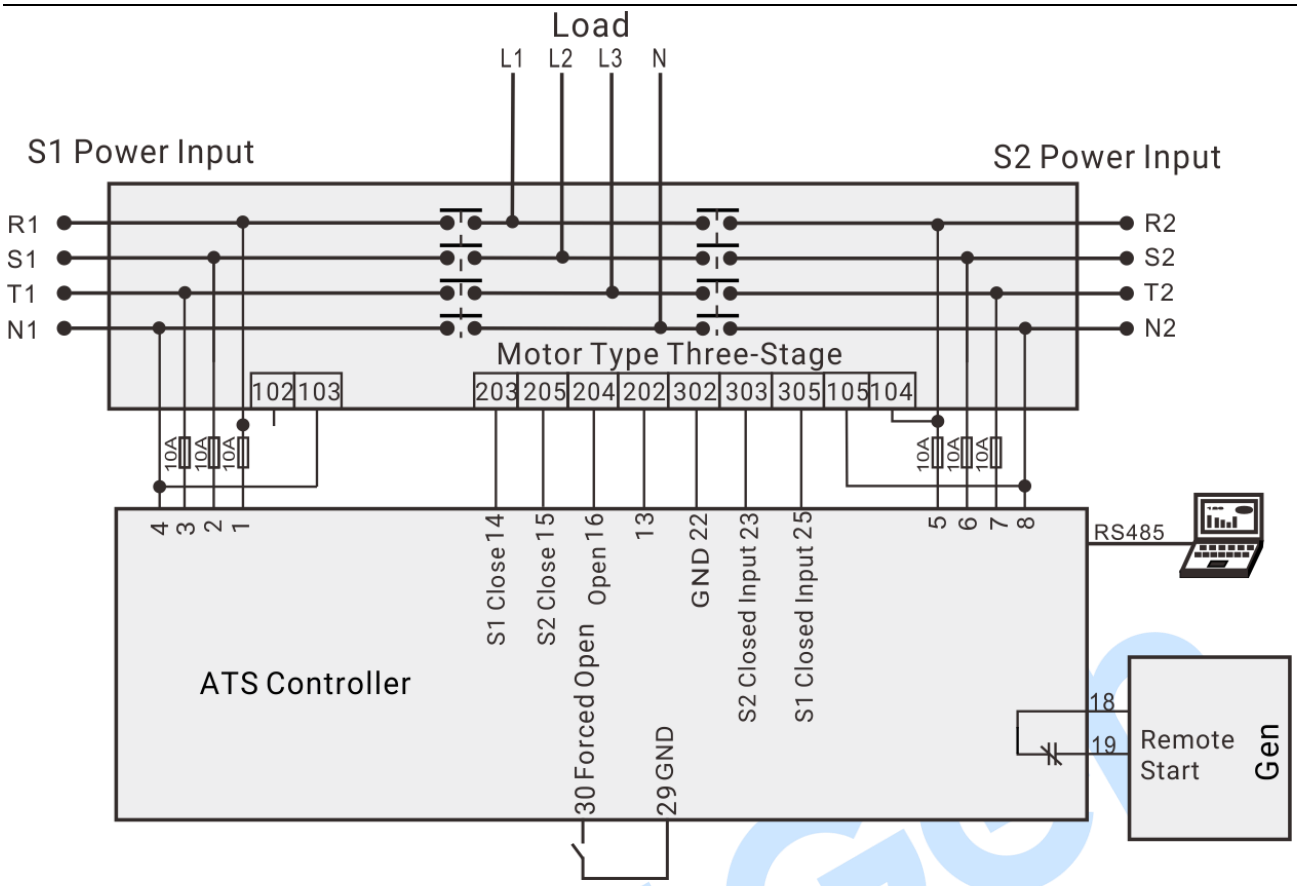

Fig.11 Motor Type Application Diagram

Table 22 Related Setting

Partial Parameter Setting	
ATS Type Setting	One breaking
AUX.INPUT	Forced open input
Suitable controller model: HAT361/HAT363	

12 INSTALLATION

The controller is designed by panel installation method, and is fixed by clips for installation.

Unit: mm

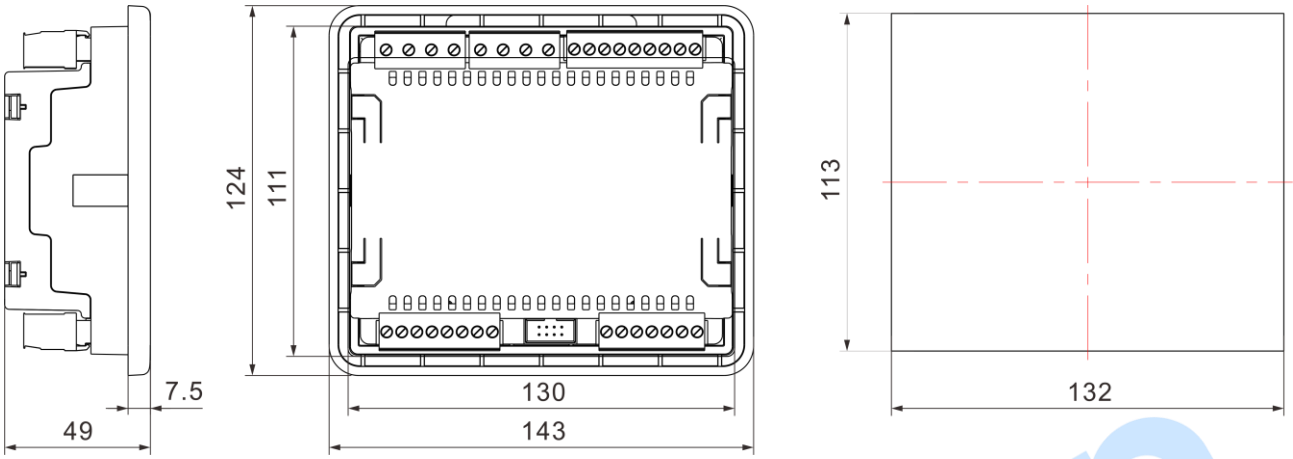

Fig.12 Overall Dimensions and Cutout

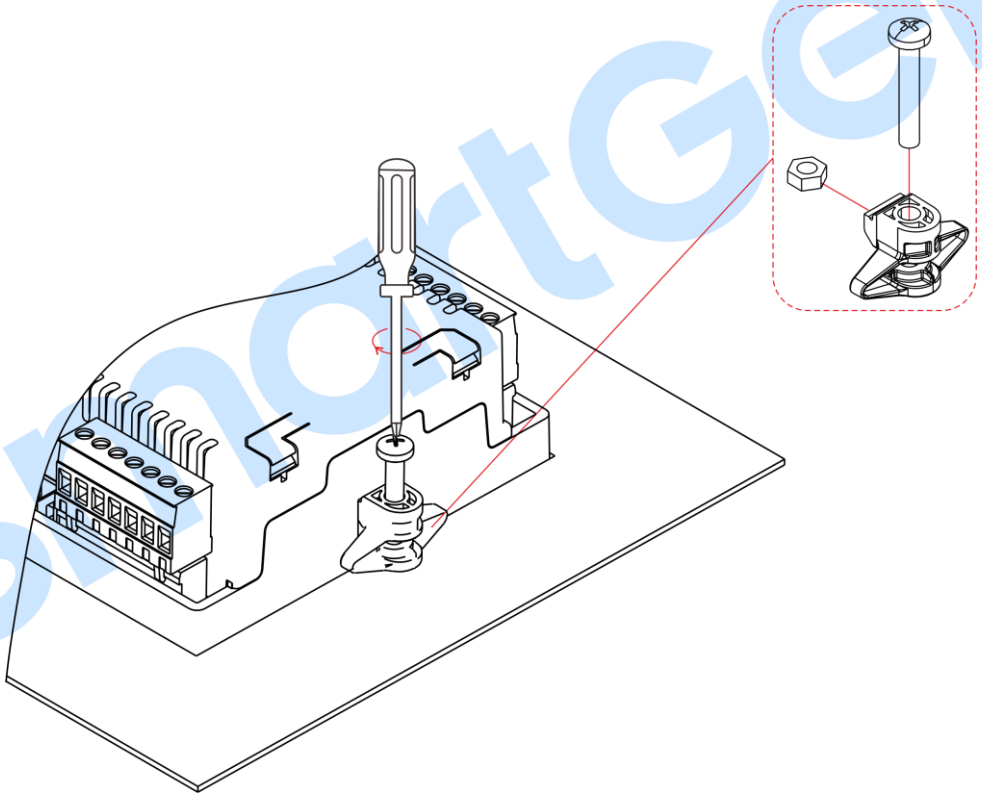

Fig.13 Clip Installation

13 FAULT FINDING

Table 23 Fault Finding

Symptom	Possible Solutions
Controller No Response with Power	Check AC power.
RS485 Communication Abnormal	Check whether RS485 positive and negative are correctly connected; Check RS485 converter is normal or not; Check module address in the parameter settings is correct or not.
Auxiliary Output Error	Check auxiliary output connecting wire, pay attention to N/O, N/C contacts; Check output port setting function and output type in parameter settings.
Auxiliary Input Abnormal	Check whether aux. input port is GND connected when it's active, and it shall hang up when it is inactive; (**NOTE:** The input port will be possibly destroyed when connected with high voltage.) Check the input setting function of parameter settings and active type.
ATS Transfer Abnormal	Check ATS; Check the connection wires between controller and ATS; Check whether ATS type setting is consistent with ATS; Check ATS power setting and connection wires.
Genset Start Control Abnormal	Check system type settings; Check output function settings and output type; Check start/stop function settings of all items.
Parameter Setting Disable	Check whether in OFF mode.