

# Smartgen®

HAT270A

ATS (Automatic Transfer Switch) CONTROLLER

OPERATING MANUAL



Smartgen Electronics

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## 1 Summary

HAT270A ATS controller has microprocessor as its core, can accurately monitor 2 ways-3 phase, and also can make accurate judgment conditions of abnormal voltage (loss of electricity, over voltage, under voltage, loss of phase); control ATS to transfer after delay. Controller also has a function of sending start signal to genset when one way power is abnormal. HAT270A is suited for SOCOMEC VS, VE, ATyS3, ATySM3s model and other analogy function ATS switch.

## 2 FEATURES

The controller can monitor two ways 3phase voltage (it possibly is two ways mains, two ways gens, or is 1 mains-1 gens) and control ATS to transfer. Its performance and characteristics show as following:

- Realizing the computer programming control, can use computer to set abnormal voltage delay, switch priority, genset shutdown delay, the voltage correction and other functions, fully graphical interface operation. When programming by computer, the controller front panel must be opened, then use SG72 interface module (USB to LINK) via the PC test software. About PC software's operation, please refer to "software manual of HAT270A".
- #I power supply or #II power supply normal delay can be set range (0~60) seconds. Genset start delay can be set range (0~60) seconds;
- #I power supply or #II power supply abnormal delay can be set range (0~60) seconds. Genset stop delay can be set range (0~90) seconds;
- Design of 2 ways N line isolate;
- The controller design have breaking off compulsorily input port, when input is active, ATS will transfer compulsorily to OFF position;
- Panel LED can clearly show switch working position;
- Have a dual power supply change-over circuit output, the output LO, NO (5A 250V AC) can be applied directly to the power supply as ATS;
- Genset start relay(GENS START) output contact capacity for 7A/28VDC, passive normally close contact;
- Controller has strong ability for anti-electromagnetic interference, and very suitable for using in strong electromagnetic interference of complex environment.
- Modular configuration design, Flame Retardant ABS plastic shell, inserted type connection terminals, flush type installation, compactness, compact structure, easy installation.

### 3 SPECIFICATION

◆ Power supply input

The controller AC power supply: AC230V $\pm$ 20% (50/60Hz) (sensing from #I and #II A, N phase)

Measure voltage: rated 380V 50/60Hz 3-phase 4-wire, and other measure voltage class, please consults before ordering.

◆ Threshold setting point

Over-voltage threshold: 264V (adjust only via PC).

Under voltage threshold: 172V (adjust only via PC).

◆ Action time

Closing breaker time: 5 seconds, if detected during the closing breaker the closing status signal is active, then immediately disconnected.

Opening breaker time: 3 seconds, if detected during the open breaker the open status signal is active, then immediately disconnected.

Voltage normal delay: (0~60) seconds (via controller panel potentiometer adjustment).

Voltage abnormal delay (0~60) seconds, default: 5 seconds (only via controller panel potentiometer adjustment).

Genset start delay: when #I confirmed abnormally, delay for (0~60) seconds, (default: 10 seconds, can be adjusted on the panel.)

Genset stop delay: when #I confirmed normally, delay (0~60) seconds, (default: 90 seconds, can via controller panel potentiometer or PC adjustment).

◆ I /#II closing status monitoring (can via controller panel key-press programmed)

Default: detect #I/II closing status input port, the controller must access the closing status signal.

◆ Power supply consumption

Device voltage looping at rated voltage of the power supply consumption of less than 2VA.

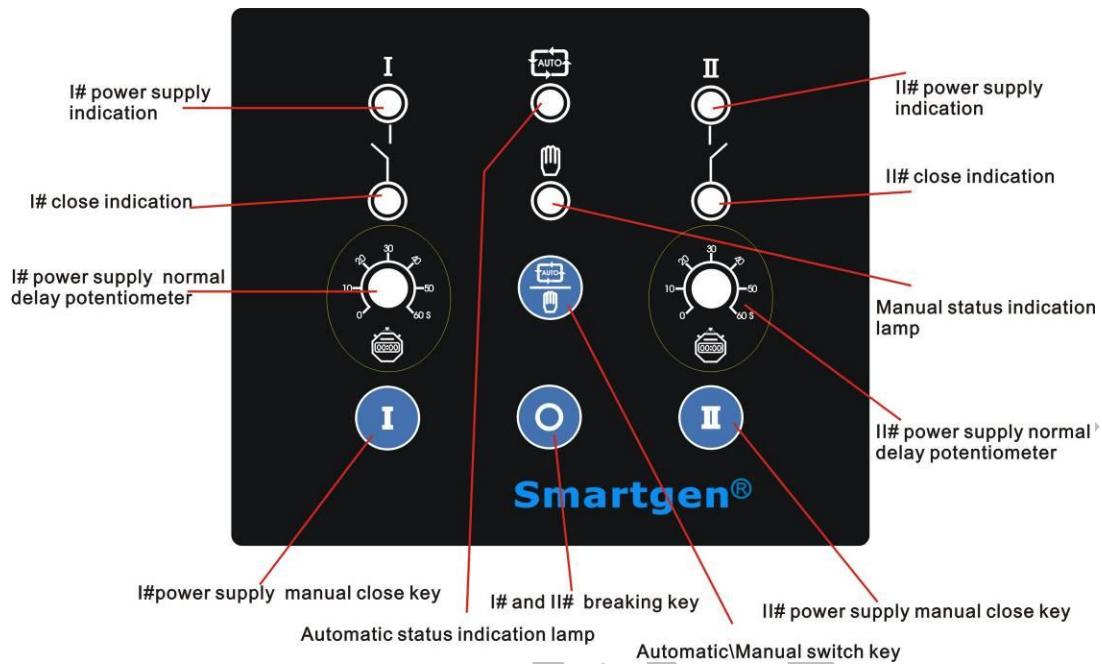
◆ Environment condition

Temperature: (-30~+70) °C Humidity: (20~95)%

◆ Weight

Net weight: 0.47Kg

## 4 PANEL OPERATING INSTRUCTION



## 5 PANEL OPERATION AND WIRING




### 5.1 PANEL DELAY ADJUSTMENT

#I power supply normal delay potentiometer: judgment time (0~60) seconds.



#II power supply normal delay potentiometer: judgment time (0~60) seconds.


### 5.2 CONTROL PARAMETERS SETTINGS






#### a) Automatic/ Manual status operating







When controller is running, press  key, controller will be changed into Automatic mode or Manual mode (via automatic status indication lamp, manual status indication lamp mark). In Manual mode, press the  key, load will be transferred to #I power supply side, press  key, load will be transferred to #II power supply side.

**b) #I/II voltage abnormal delay, genset start/stop delay, #I/II transfer priority, breaker on feedback settings:**

When controller is running, press and hold  key and  key simultaneously, #I power supply indication lamp, automatic status indication lamp, #II power supply indication lamp flashes, as shown that have entered into setting status. The setting steps as follows:

Press  button to cycle to the selection you set the item, different of settings items for the different of flashing LED on the panel lamp, the setting the item as follows:

Item	LED indication	Indication	Confirmation
#I/#II Power supply abnormal delay	#I power supply LED flash	#I power supply abnormal delay	After adjustment "#I power supply normal delay" potentiometer, press the  key, #I power supply indication lamp illuminate, shown that the adjustable potentiometer value (0~60) seconds have be saved successfully.
		#II power supply abnormal delay	After adjustment "#II power supply normal delay" potentiometer, press the  key, #I power supply indication lamp illuminate, shown that the adjustable potentiometer value (0~60) seconds have be saved successfully.
		Restore factory values	Press the  key, #I power indication lamp illuminate, shown to restore the default factory values. <b>(Default #I, #II power supply abnormal delay is 5 seconds.)</b>
Genset start/stop delay	Automatic status LED flash	Genset start delay	After adjustment "#I power supply normal delay" potentiometer, press the  key, automatic status indication lamp illuminate, shown that the adjustable potentiometer value (0~60) seconds have be saved successfully.
		Genset stop delay	After adjustment "#II power supply normal delay" potentiometer, press the  key, automatic status indicator lamp illuminate, shown that the adjustable potentiometer value (0~60) seconds have be saved

			successfully.
		Restore factory values	Press the  key, automatic status indication lamp illuminate, shown to restore the default factory values. <b>(Default genset stop delay is 90 seconds.)</b>
I/II power supply priority(*1)	#II power supply LED indication lamp flash	#I power supply priority	Press the  key, #II power supply indication lamp illuminate, show #I power supply as main power to supply for the load.
		#II power supply priority	Press the  key, #II power supply indication lamp illuminate, show #II power supply as main power to supply for the load.
		#I/#II power supply no priority	Press the  key, #II power supply indication lamp illuminate; show #I/#II power supply no priority supply for the load.
Select #I/#II breaker on feedback (*2)	#I close breaker LED indication lamp flash	Not check breaker on feedback	Press the  key, does not detect #I, #II breaker on feedback input port.
		Check breaker on feedback	Press the  key, detect #I, #II breaker on feedback input port.
<p><b>*1 Note:</b> Every time the controller power on, the following three conditions can judgement the priority of transfer.</p> <p>1) If #I power supply indication lamp flashes rapidly for three times, indicate #I power supply for priority transfer.</p> <p>2) If #II power supply indication lamp flashes rapidly for three times, indicate #II power supply for priority transfer.</p> <p>3) If #I and #II power supply indication lamp simultaneously flashes rapidly for three times, for no priority transfer.</p> <p><b>*2 Note:</b> Every time the controller power on, #I/ #II closing breaker lamp illuminate at the same time, show checking the breaker on feedback, if extinguishment, indicate not detect the breaker on feedback.</p> <p>Detection of the breaker on feedback: Controller will really indicate #I, #II closing status according to breaker on feedback input port status.</p> <p>Does not detect the breaker on feedback: Controller will indicate #I and #II closing status via the built-in control process ignore the breaker on feedback.</p>			

After the parameter settings are completed, pressing #I and #II close press-key

simultaneously, all the controller panel lamps will illuminate, loosen these press-keys, and this setting is completed.

## 6 AC VALID OPTION

User can actually use, and set the rules for an electric.

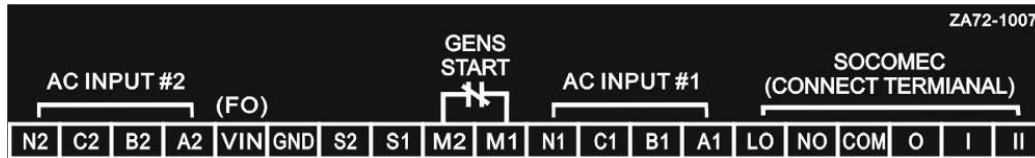
NUM	Rule description	
1	Phase A must have voltage	Phase B, C can not lose of phase.
2		Phase B, C can lose of one phase.
3		Phase B, C can all lose.
4	Phase A must not have voltage	Phase A, B, and C can lose of one phase.
5		Phase A, B, and C can lose of two phases.

## 7 PROGRAMMED PARAMETER AND RANGE

Num	Name	Range	Default	Remark
1	#I voltage normal delay	(0~60)s	Via controller panel potentiometer setting	Only adjust via controller front panel potentiometer
2	#II voltage normal delay	(0~60)s		
3	Genset start delay	(0~60)s		
4	#I voltage abnormal delay	(0~60)s	5s	Adjust via controller front panel potentiometer or PC
5	#II voltage abnormal delay	(0~60)s	5s	
6	Genset stop delay	(0~90)s	90s	
7	Voltage upper limit value	(50~300)V	264V	Only adjust via PC test software.
8	Voltage lower limit value	(50~300)V	172V	
9	Power supply transfer priority setting	1# priority, 2# priority, no priority	1#priority	Adjust Via controller panel front potentiometer or PC test software.
10	AC valid option	See "AC valid option"	Phase A, B and C can not loss of phase	Only adjust via PC test software.
11	Breaker on feedback detection		Detection	Only adjust via controller front panel potentiometer



## 8 TERMINAL FUNCTIONS

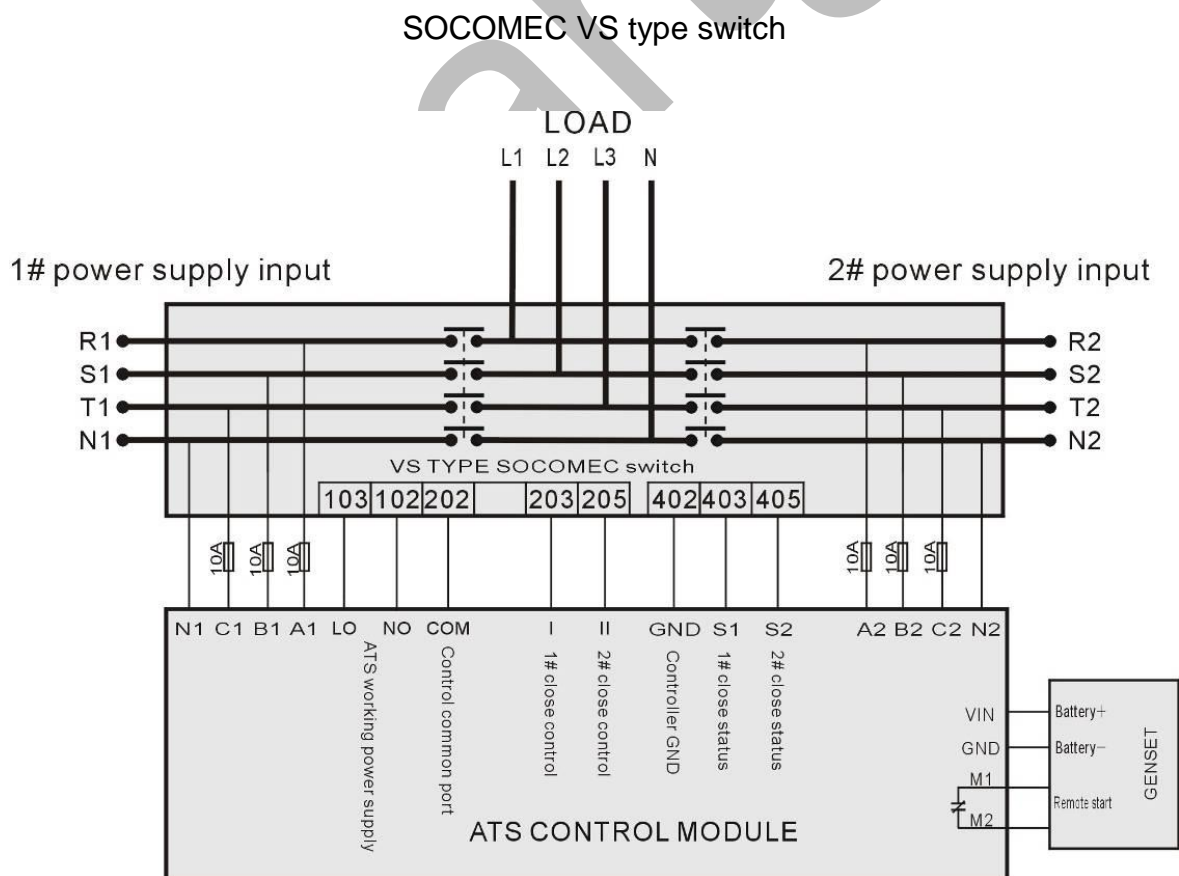


- ◆ Terminal A1, B1, C1, N1 is separately connected to A, B, C, N of #I AC power supply.
- ◆ Terminal A2, B2, C2, N2 is separately connected to A, B, C, and N of #II AC power supply.
- ◆ Terminal S1: #I power supply breaker on feedback input port.(volt-free contact connection, connecting GND activate)
- ◆ Terminal S2: #II power supply switch close status input port.( volt-free contact connection, connecting GND activate)
- ◆ Terminal FO(VIN): this is a superposition port for controller DC power supply positive pole and compulsory breaking off input, when this port connect with GND, the breaker will force into OFF position. When this port connect with DC power supply, if the port connect with to GND, it will be short circuit of DC power supply, only when DC power supply disconnect with DC power supply positive pole, allow to connect with GND and achieve compulsory breaking off function.

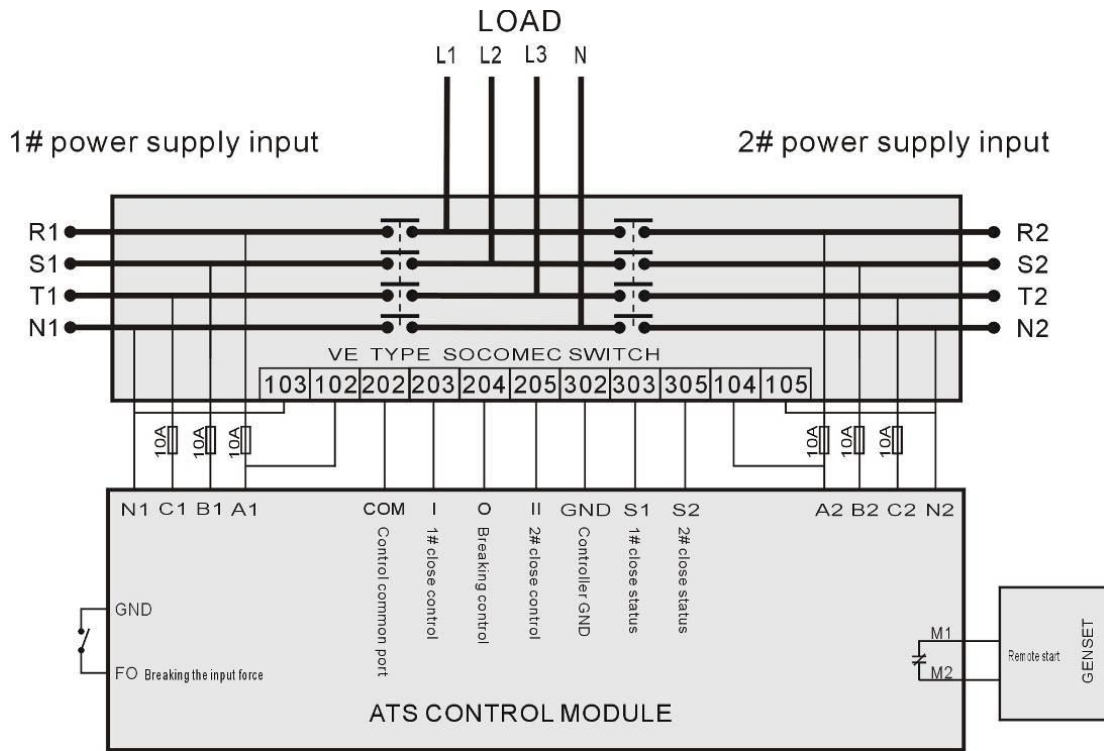
When this port is connected to GND, whether in manual or automatic mode, ATS will be switched to OFF position, manual or automatic operation is prohibited. Only when ATS have OFF position i.e. SOCOMEC VE type, ATyS3 type, and ATySM3S type, the compulsory breaking off function is valid, but SOCOMEC VS type is invalid.

- ◆ Terminal GND: the controller DC power supply cathode.
- ◆ Terminal M1, M2 (GENSET START): for genset start output relay (passive normally close contactor, capacity for 7A).
- ◆ Terminal LO, NO: supply working power supply for ATS, LO/NO separately come from #I, #II power supply A, N phase, when any one way phase A, N is normal, these two terminals will output equal power supply (capacity for 5A/250VAC).
- ◆ Terminal COM: SOCOMEC ATS close and open input common terminal.
- ◆ Terminal O: SOCOMEC OFF position control (contactor capacity for 3A/250VAC).
- ◆ Terminal I: SOCOMEC #I close control capacity for 3A/250VAC.
- ◆ Terminal II: SOCOMEC #II closes control (contactor capacity for 3A/250VAC).

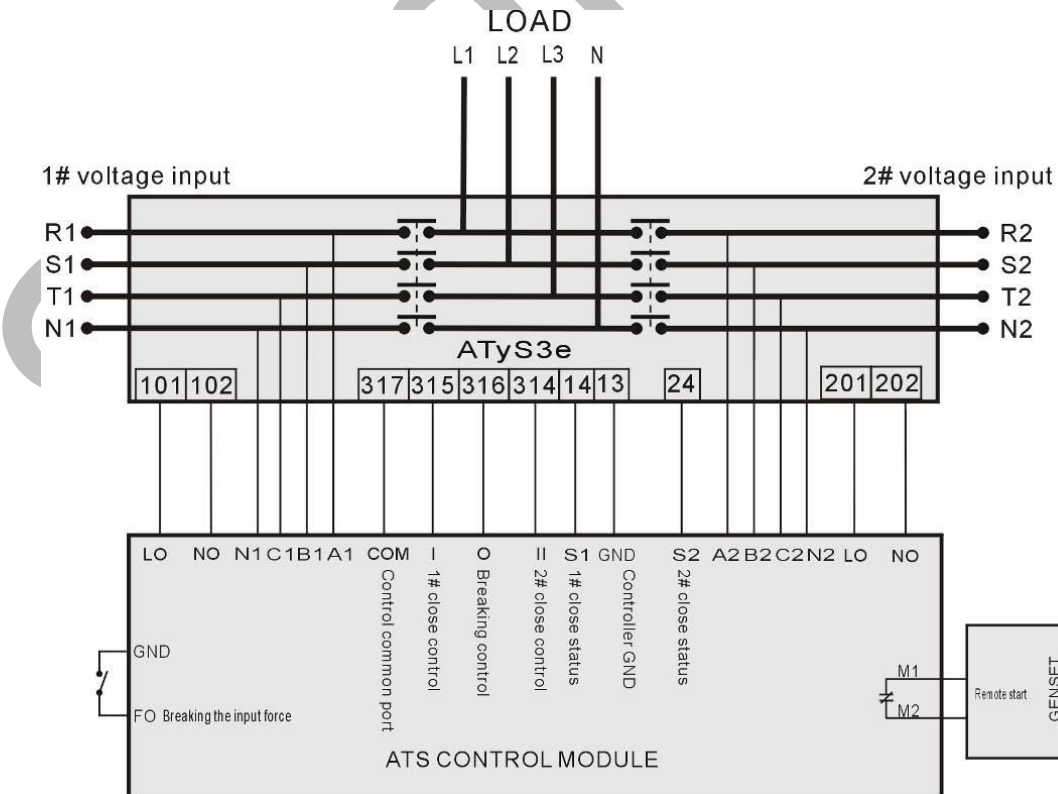
## 9 TYPICAL WIRING DIAGRAMS



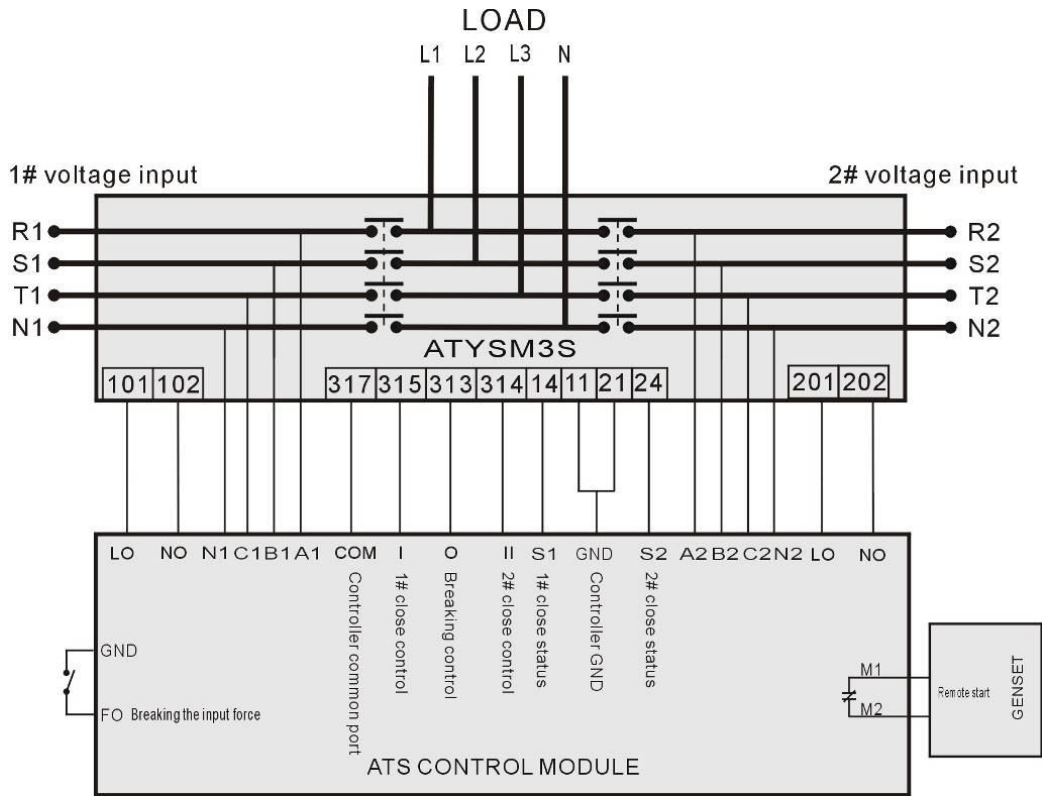
SOCOMEK VE type switch



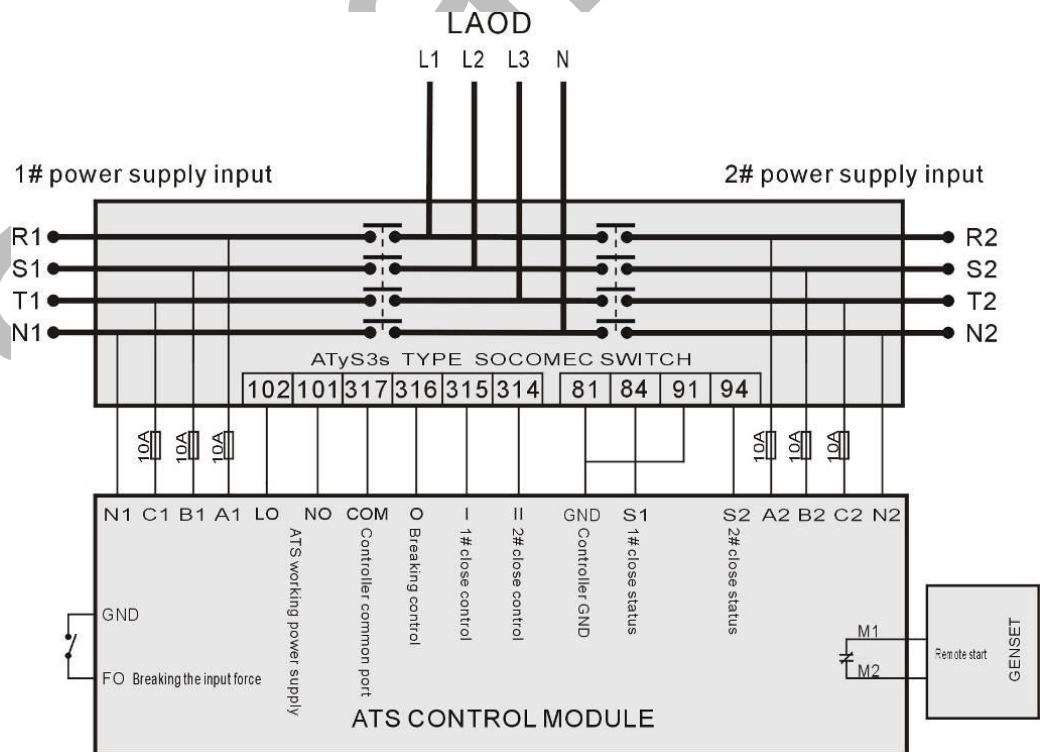
SOCOMEK ATyS3e type switch



SOCOMEC ATySM3s type switch



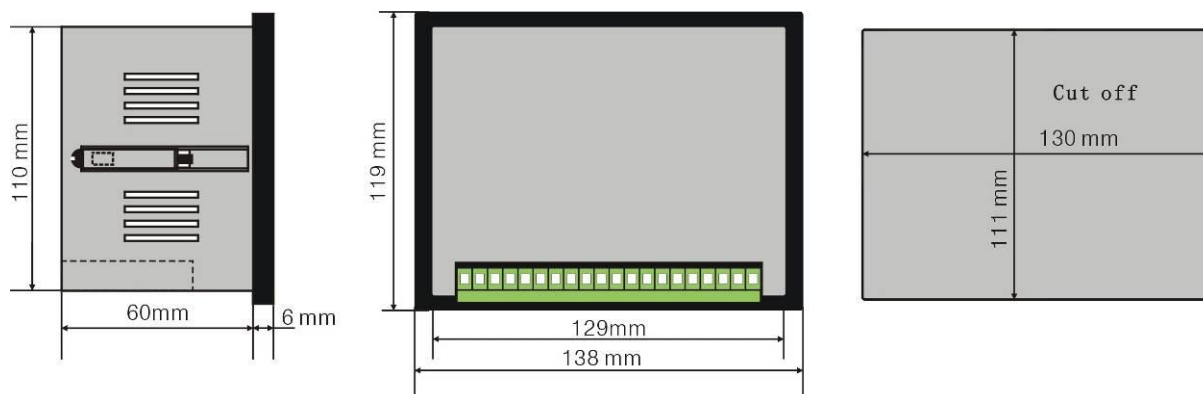
SOCOMEC ATyS3s type switch



**Note:** 81, 84: ATyS3s types switch 1# close normally open auxiliary port;  
91, 94: ATyS3s types switch 2# close normally open auxiliary port;

The small capacity SOCOMEC ATyS3s type switch not label closing status auxiliary port, the specific auxiliary port position refer to switch wiring diagram.

## 10 CASE AND DIMENSIONS



## 11 FAULT FINDING

Symptom	Possible remedy
Controller isn't work	Check #I and #II power supply wiring. Check #I and #II power supply fuse.
Controller normal display but switch inaction	Check ATS mechanism. Check the connection between the ATS and the controller.
#I or #II normal lamp flash.	Check 3 phase voltage whether normal.(Overvoltage, under voltage, loss of phase[include loss of N wire])
In automatic mode, I/II # normal indicate lamp illuminate but switch not act.	Set the controller in manual mode, testing whether act. Check voltage normal delay, shorten the delay time. Check the connection wires between the ATS and the controller.
Genset not start	Genset start signal output only when #I voltage abnormal. Check genset start delay, shorten the delay time.