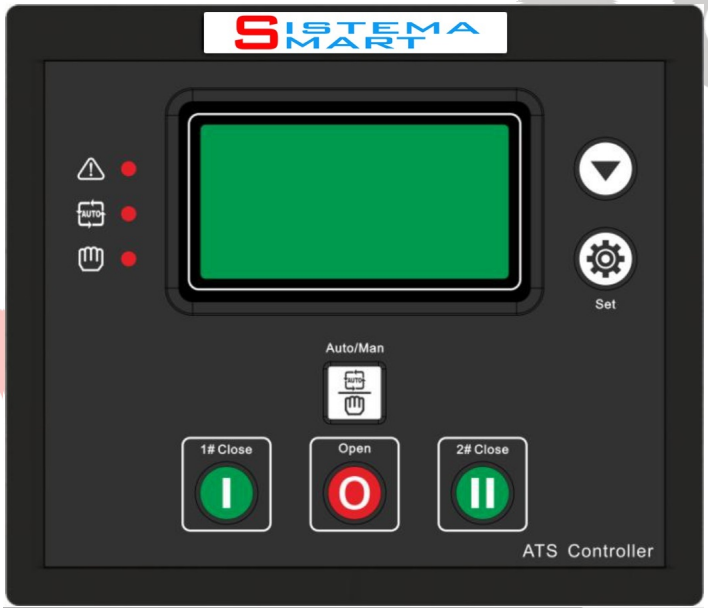
HAT560N Series

(HAT560N /HAT560NB)

ATS CONTROLLER



HAT560N series ATS controller is intelligent dual-supply module with configurable function, automatic measurement, LCD display, and digital communication. It combines digital, intelligence and networking. Automatic measurement and control can reduce incorrect operation. It is an ideal option for ATS.

The powerful Microprocessor contained within the unit allows for precision voltage (2-way-3-phase/single phase) measuring and make accurate judgment; in addition, the corresponding digital output port will active when there is over/under voltage, over/under frequency, loss of phase and other abnormal condition occurs. This controller has full consideration in various application of ATS (automatic transfer system) and can be directly used for specialized ATS, Contactor ATS, Air break ATS etc. It has compact structure, advanced circuits, simple wiring and high reliability, and can be widely used in electrical devices, automatic control and testing system of electric power, telecommunications, petroleum, coal, metallurgy, railways, municipal administration, intelligent building, etc.

PERFORMANCE AND CHARACTERISTICS

1) System type can set as: Mains (1#) & Generator (2#), Generator (1#) & Mains (2#), Mains (1#) & Mains (2#), Generator (1#) & Generator (2#).
2) 132x64 LCD with backlight, optional Chinese and English display, push-button operation.
3) Measure and display 2-way 3 phase Voltage and Frequency:

1#		2#	
Line voltage	(Uab, Ubc, Uca)	Line voltage	(Uab, Ubc, Uca)
Phase voltage	(Ua, Ub, Uc)	Phase voltage	(Ua, Ub, Uc)
Frequency	Hz	Frequency	Hz

4) Over/under voltage, loss of phase, reverse phase sequence, over/under frequency protection.
5) Automatic/Manual mode. In manual mode, can force the switch to close or open;
6) All parameters can be set on site. With Two different passwords which ensures authorized staff operation only.
7) During commissioning, the genset can be set either on On-load or Off-load mode.
8) ATS Controller has function of automatic Re-closing.
9) Closing output signal can be set as on intervals or as continuous output.
10) Applicable for ATS of one neutral position, two neutral position and non-position.
11) Applicable for 2 isolated neutral line.
12) Real-time clock (RTC).
13) Event log can record 50 items circularly.
14) Scheduled start & stop generator (can be set as start genset once a day/week/month whether with load or not).
15) Can control two generators to work in a cycle, even the genset running time and crank rest time can be set.
16) Optional AC system or DC system.
17) With standard LINK communication interface. With "remote controlling, remote measuring, remote communication" function by the ModBus communication protocol. Can remote start/stop the genset and remote control the ATS to close or open.

18) Can check the current status of controller (digital input port, digital output port, over voltage, under voltage, over frequency, under frequency etc.).
19) Suitable for various AC systems (3 phase 4-wires, 3-phase 3-wires, single-phase 2-wire, and 2-phase 3-wire).
20) Modular design, self extinguishing ABS plastic shell, pluggable terminal, built-in mounting, compact structure with easy installation.

HAT560N series controller and its main functions are shown as following,

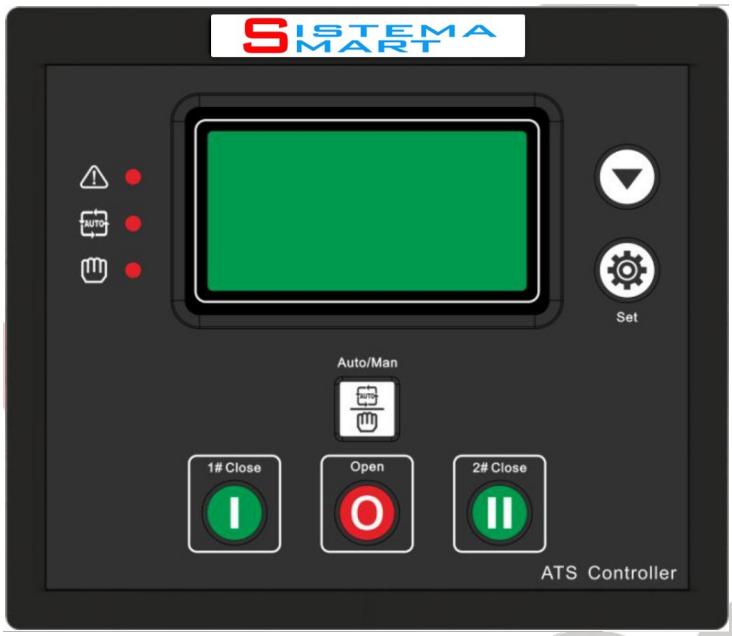
Function			
Type	DC Power Supply	AC Power Supply	AC Current/Power
HAT560N	√	×	×
HAT560NB	√	√ (LN220V)	×

SPECIFICATION

Items	Contents		
Operating Voltage	1. DC 8.0V~35.0V, continuous power supply. 2. AC170V~270V during AC power L1N1/L2N2 supply.		
Power Consumption	<3W (Standby mode: ≤2W)		
AC Voltage Input	AC system	HAT560N	HAT560NB
	3P4W (ph-N)	AC30V~AC360V	AC170V~AC277V
	3P3W (ph-ph)	AC60V~AC620V	Not used
	1P2W (ph-N)	AC30V~AC360V	AC170V~AC277V
	2P3W (ph-N)	AC30V~AC360V	AC170V~AC277V
Rated Frequency	50/60Hz		
Close Relay Output	16A AC250V Volts free output		
Auxiliary Relay Output 1	7A AC250V Volts free output		
Auxiliary Relay Output 2	7A AC250V Volts free output		
Auxiliary Relay Output 3	16A AC250V Volts free output		
Auxiliary Relay Output 4	16A AC250V Volts free output		
Digital Input	GND connect is active.		
Communication	LINK interface, MODBUS Protocol		
Case Dimensions	139mmx120mmx48mm		
Panel Cutout	130mmx111mm		
Working Conditions	Temperature: (-25~+70)°C; Humidity: (20~93)%RH		
Storage Condition	Temperature: (-25~+70)°C		
Protection Level	IP55 Gasket		
Insulation Strength	Apply AC2.2kV voltage between high voltage terminal and low voltage terminal; The leakage current is not more than 3mA within 1min.		
Weight	0.62kg		

OPERATING

OPERATION PANEL



KEY FUNCTION DESCRIPTION

	I# Manual Close	In Manual mode, switch on 1# power to load.
	Open	In Manual mode, switch off 1# or 2# power to off-load.
	II# Manual Close	In Manual mode, switch on 2# power to load.
	Manual/Auto Set	Press the button and controller enter into Manual or Auto mode.
	Menu /Confirm	Press the button to enter into menu interface; pressing and holding it to return to the main menu interface. When an alarm occurs, pressing and holding the button for more than 3s can remove alarm.
	Scroll Screen /Increase	Scroll the screen. In parameter setting, pressing this button can decrease values. Pressing and holding the button for more than 3s, there is a flash on the backlight to confirm the “always illuminated” mode is selected. Pressing and holding the button for more than 3s again, the backlight will extinguished which means the “normal display” mode is selected.

LCD DISPLAY

MAIN SCREEN

U1(L-L) 380 380 380V U2(L-L) 380 380 380V F1 50.0Hz F2 50.0Hz Present Status: MANUAL	This screen shows: 1#/2# line voltage (L1-L2, L2-L3, and L3-L1), frequency, controller's working status, close/open information and load information.
U1(L-N) 220 220 220V U2(L-N) 220 220 220V 2016-06-27 (1) 09:43:36 Present Status: MANUAL	This screen shows: 1# and 2# 3 phase Voltage (L-N), real-time clock, controller's working status, close/open information and load information.
1# Under Volt 2# Volt normal Gens Start signal Out Present Status: AUTO	First line: 1# working status Second line: 2# working status Third line: other working status Fourth line: alarm type and information. Fifth line: close/open information and load information

Display of the #1 status (upper to lower)

No.	Item	Type	Description
1	1# Gens Alarm	Alarm	When 1# genset failure occurs, this will display.
2	1# Fail to Close	Alarm	When 1# close failure occurs, this will display.
3	1# Fail to Open	Alarm	When 1# open failure occurs, this will display.
4	1# Over Voltage	Indication	When 1# power supply voltage has exceeded the set value, this will display.
5	1# Loss of Phase	Indication	Loss of any phase of A, B and C.
6	1# Over Freq	Indication	When 1# power supply frequency is higher than the set value, this will display.
7	1# Under Freq	Indication	When 1# power supply frequency has fallen below the set value, this will display.
8	1# Under Volt	Indication	When 1# power supply voltage has fallen below the set value, this will display.
9	1# Phase Sequence Wrong	Warning	Phase sequence is not A-B-C.
10	1# Volt Normal	Indication	1# power supply voltage is within the setting range.

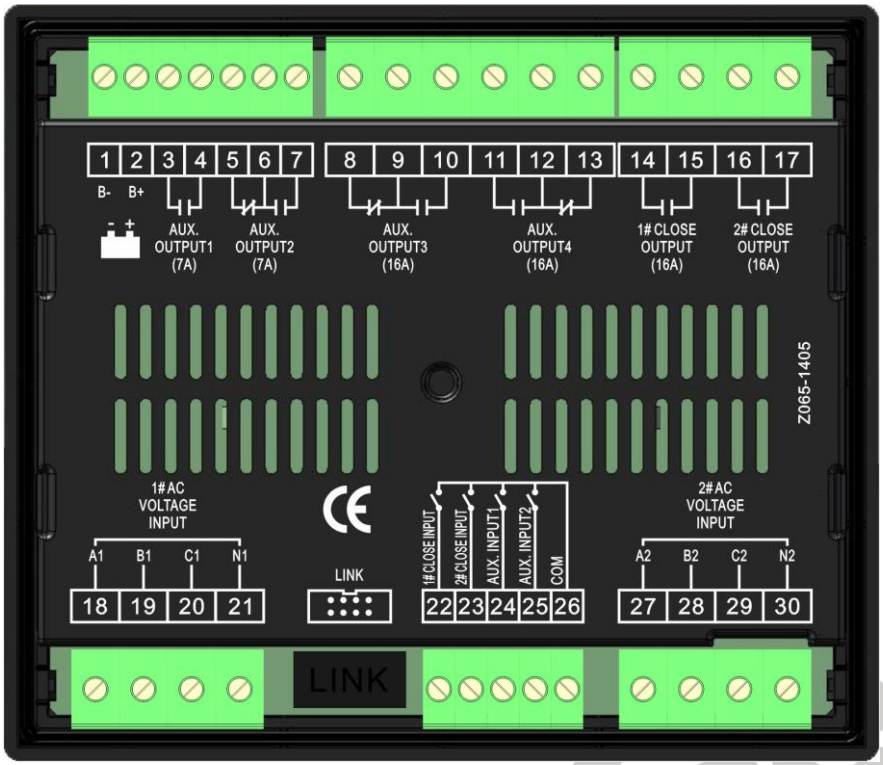
Display of the #2 status (upper to lower)

No.	Item	Type	Description
1	2# Gens Alarm	Alarm	When 2# genset failure occurs, this will display.
2	2# Fail to Close	Alarm	When 2# close failure occurs, this will display.
3	2# Fail to Open	Alarm	When 2# open failure occurs, this will display.
4	2# Over Voltage	Indication	When 2# power supply voltage has exceeded the setting value, this will display.
5	2# Loss of Phase	Indication	Loss of any phase of A, B and C.
6	2# Over Freq	Indication	When 2# power supply frequency is higher than the set value, this will display.
7	2# Under Freq	Indication	When 2# power supply frequency has fallen below the set value, this will display.
8	2# Under Volt	Indication	When 2# power supply voltage has fallen below the set value, this will display.
9	2# Phase Sequence Wrong	Warning	Phase sequence is not A-B-C.
10	2# Volt Normal	Indication	2# power supply voltage is within the setting range.

Display status of the other items (upper to lower)

No.	Item	Type	Description
1	Trip Alarm	Alarm	Trip alarm input is active.
2	Breaking Compulsorily	Warning	Breaking compulsorily input is active.
3	Gens Start Out	Indication	Start input is active.
4	Remote Start Input	Indication	This input is active when start the genset circularly.

DESCRIPTION OF CONNECTING TERMINALS

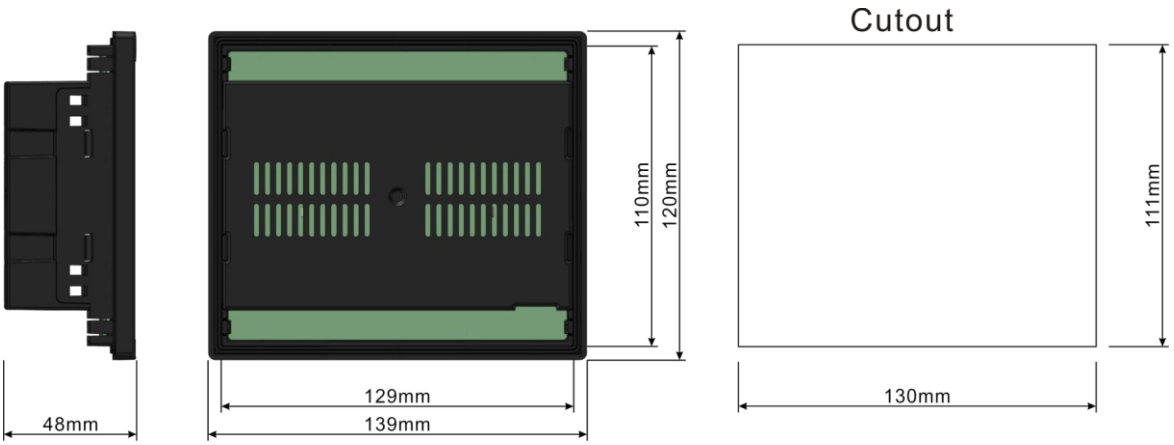


Terminal description,

No.	Functions	Description		Remark
1	B-	Connected with negative of starter battery.		DC input B-
2	B+	Connected with positive of starter battery.		DC(8-35)V; Power supplied by controller.
3	Aux. output 1	Default: 1# open output		Relay contact output; Volts free; Rated 7A
4				
5	Aux. output 2	Normally Close	Default: Gen Start Output (Normally Open)	Relay contact output; Volts free; Rated 7A
6		COM		
7		Normally Open		
8	Aux. output 3	Normally Close	Default: ATS Power A	Relay contact output; Volts free; Rated 16A
9		COM		
10		Normally Open		
11	Aux. output 4	Normally Open	Default: ATS Power N	Relay contact output; Volts free; Rated 16A
12		COM		
13		Normally Close		
14	1# Close Output	Relay contact output; Volts free;		Relay contact output; Volts free; Rated 16A
15				
16	2# Close Output	Relay contact output; Volts free;		Relay contact output; Volts free; Rated 16A
17				
18	A1	1# AC System 3P4W voltage input		For single phase, only connect A1, N1
19	B1			
20	C1			
21	N1			

No.	Functions	Description	Remark
22	1# Close Input	Detect the 1# ATS closing status. Auxiliary contact input.	Ground connected is active.
23	2# Close Input	Detect the 2# ATS closing status. Auxiliary contact input.	Ground connected is active.
24	Aux. Input 1	User-defined.	Ground connected is active.
25	Aux. Input 2	User-defined.	Ground connected is active.
26	COM	GND	
27	A2	2# AC System; 3P4W voltage input	For single phase, only connect A2, N2
28	B2		
29	C2		
30	N2		
LINK	Communication port	Used for PC communication/ program updating.	

18 INSTALLATION



19 FAULT FINDING

Symptom	Possible Solutions
Controller no response with power.	Check starting batteries;
LINK communication failure	If SG72 module is fitted, check its connections. Check module address in parameters settings.
Auxiliary Output Error	Check auxiliary output connections, pay attention to normally open contact and normally close contact. Check the output settings in parameters settings.
Auxiliary Input Abnormal	Ensure that the auxiliary input is soundly connected to GND when it's active, while hung up when it is inactive. (⚠Note: The input port will be possibly destroyed when connected with voltage)
Genset running while ATS not transfer	Check ATS. Check the connection wirings between the controller and the ATS. Ensure that the ATS Neutral position whether is same as the setting.