BTB ELECTRIC

INSTRUCTIONS FOR USING

ATS CONTROLLER ATbS C55

Contents

1 OVERVIEW

The ATbS C55 dual power ATS controller is a comprehensive dual power transfer module equipped with configurable functions, automatic measurement capabilities, LCD display, and digital communication. It integrates digital intelligence and networking to automate measurement and control processes, thereby reducing human errors in operation. Designed for versatility, the ATbS C55 is suitable for non-breaking, one-breaking, and two-breaking switches.

At its core, the ATbS C55 features a microprocessor that enables precise measurement of 2-way 3-phase voltages and phase voltages. It can accurately detect and control outputs in response to various voltage abnormalities, including overvoltage, undervoltage, overfrequency, underfrequency, loss of phase, and reverse phase sequence. With its compact structure, advanced circuits, simple wiring, and high reliability, the ATbS C55 finds applications across a wide range of industries, including electric power, telecommunications, petroleum, coal, metallurgy, railways, municipal administration, and intelligent building systems.

2 MODEL FUNCTION COMPARISON

Table 2 Model Comparison

Function							
Type	**AC Supply**	**3-stage Switch Control**	**2-stage Switch Control**	**XK 3-stage Switch Control**	**Input Num.**	**Output Num.**	**RS485**
ATbS C55	• (170~277)V	•	•	•	4	6	•

- **System Type Options:** Mains - Generator, Generator - Mains, Mains - Mains
- **Display:** 132x64 LCD with backlight, offering optional Chinese and English display, operated via push-buttons
- **Measurement and Display:** Capable of measuring and displaying 2-way 3-phase voltage, frequency, and phase sequence
- **Closure Times Display:** Displays the accumulated closure times for A and B power
- **Power Supply Time Display:** Shows present continuous power supply time and accumulated power supply time for A and B power
- **Abnormality Detection:** Detects over/under voltage, over/under frequency, loss of phase, and reverse phase sequence
- **Transfer Modes:** Supports Auto/Manual mode transfer function, allowing users to control the switch manually to close or open
- **Configurability:** All parameters are configurable, with password verification for security against non-professional operations
- **On-Site Commissioning:** Enables on-site manual execution of genset start/stop operations
- **Re-Closing Function:** Equipped with a switch re-closing function
- **Breaker Close Output:** Offers the option to set breaker close output to pulse or continuous output
- **Isolated Design:** Features a 2-way N wire isolated design
- **Real-Time Clock (RTC) and Event Log:** Displays real-time clock and records events in an event log, capable of storing up to 50 data entries in a circular manner
- **Scheduled Start/Stop Generator Function:** Allows configurable scheduled start and stop of the generator, including options for once/monthly/weekly running and on-load/off-load running
- **AC Supply Power:** Supports phase voltage (L, N) with a supply range of (170~277)V

- **Communication Port:** Includes 1 RS485 isolated communication port with Modbus RTU protocol, enabling remote control, measuring, communication, and adjusting functions for genset start, genset stop, and ATS close/ open operations
- **Compatibility:** Suitable for various AC system types, including 3-phase 4-wire, single-phase 2-wire, and 2-phase 3-wire configurations
- **Design:** Features a modular design with a self-extinguishing ABS plastic shell, pluggable terminal, built-in mounting, and compact structure for easy installation.

4 SPECIFICATION

Table 3 Technical Parameters

Items	Contents	
Operating Voltage	AC supply, voltage range AC (170~277)V	
Power Consumption	≤3W (Standby mode: <2W)	
AC Voltage Input	AC system	ATbS C55
	3P4W (ph-N)	(170~277)V
	3P3W (ph-ph)	N/A
	1P2W (ph-N)	(170 ~277)V
	2P3W (ph-N)	(170 ~277)V
Rated Frequency	50/60Hz	
Close Relay Capacity	8A AC250V Active output	
Open Relay Capacity	8A AC250V Active output	
Auxiliary Relay Output 1 Capacity	8A AC250V Volts free output	
Dynamo Start Relay	8A AC250V Volts free output	
Digital Close Input	Active when ASW1 and ASW2 short connected; Active when BSW1 and BSW2 short connected.	
Forced to Open Input	GND(B-) connected is active.	
Digital Input 1	GND(B-) connected is active.	
Communication	1. 1 RS485 isolated port, MODBUS Protocol; 2. D-type USB port.	
Case Dimensions	139mmx120mmx50mm	
Panel Cutout	130mmx111mm	
Working Temperature	(-25~+70)°C	
Working Humidity	(20~93)%RH	
Storage Temperature	(-30~80)°C	
Protection Level	IP65 Gasket: when there is waterproof gasket installed between controller and the control panel.	
Insulation Strength	Apply AC1.5kV voltage between high voltage terminal and low voltage terminal and the leakage current is not more than 3mA within 1min.	
Weight	0.62kg	

5 MEASURED AND DISPLAYED DATA

Table 4 Display Parameters

No.	Measured and Displayed Data Items
1	A/B power phase voltage
2	A/B power line voltage
3	A/B power voltage phase sequence
4	A/B power frequency
5	Present continuous supply time
6	Last continuous supply time
7	A power accumulated supply time
8	B power accumulated supply time
9	A power accumulated close times
10	B power accumulated close times
11	Close/open status
12	Real-time clock
13	Event log
14	Alarm information
15	Controller information

6 OPERATING

6.1 OPERATION PANEL

Fig. 1 ATbS C55 Front Panel

6.2 INDICATOR DESCRIPTION

Table 5 Indicator Description

Indicator Name	Indicator Description
Alarm Indicator	Slow flashing for warning alarms (1 time per second); Fast flashing for fault alarms (5 times per second);
Auto Mode Indicator	Light on when current is Auto mode;
Manual Mode Indicator	Light on when current is Manual mode;
A Power Indicator	Always light on when A AC power is normal; flashing when it is abnormal; light off when it is outage;
A Power Close Status Indicator	Light on when A power switch auxiliary contact is active; light off when it is inactive;
B Power Close Status Indicator	Light on when B power switch auxiliary contact is active; light off when it is inactive;
B Power Indicator	Always light on when B AC power is normal; flashing when it is abnormal; light off when it is outage.

6.3 KEY FUNCTION DESCRIPTION

Table 6 Key Function Description

Key	Function	Description
	Manual/Auto Key	Used to transfer between Manual or Auto mode.
	A Close Key	Active in manual mode; Press to close the A power switch and supply the load with A power.
	Open Key	Active in manual mode; Press to disconnect the load.
	B Close Key	Active in manual mode; Press to close the B power switch and supply the load with B power.
	Set/Confirm	In the main screen, press to enter the menu interface; After entering the menu interface, this key can be used to move the cursor and confirm the set information
	Down/Lamp Test Key	In the main screen, press to scroll down the screen display; In the menu interface, it can move down the cursor or decrease the value where the cursor is; Pressing longer initiates the lamp test.

NOTE: Press  and  simultaneously to set backlight on always; Again press both simultaneously or power on afresh to cancel backlight on always.

7 LCD DISPLAY

7.1 MAIN INTERFACE

Table 7 Main Interface Display

Item	Display Contents
Homepage	A power status, B power status, generator start status, switch status; A/B power voltage and frequency;
Power	A power line voltage, phase voltage, phase sequence, frequency; B power line voltage, phase voltage, phase sequence, frequency;
Master Status	A/B master setting; Auto Transfer/Restore status Mutual backup setting;
Alarms	Current alarm information (including warning and fault alarms);
Status Line	Alarm status/working status; Supply system diagram; Real time clock; Status line is displayed on the first row of every page in main screen.

7.2 SECOND LEVEL INTERFACE

Table 8 Second Level Interface Display

Item	Display Contents
Parameter Settings	AC Config; Switch Config; Genset Config; Scheduled Start/Stop Config; Digital Inputs Config; Relay Outputs Config; Module Config;
Event Log	Running mode transfer event; Start/stop event; Fault event;
Auto Trans./Restore	Auto Trans./Restore; Mutual Backup;
Manual Test	Manual Start/Stop;
Date and Time Set	Module date and time setting;
Language	Display language setting;
Accumulated Information	Continuous Supply Time; Last Continuous Supply Time; A Accumulated Supply Time; B Accumulated Supply Time; A Accumulated Close Times; B Accumulated Close Times;
Controller	Controller model, version, release date and start interface.

7.3 STATUS DESCRIPTION

Table 9 A Power Voltage Status

No.	Item	Description
1	A Available	Delay for A power available detection
2	A Unavailable	Delay for A power unavailable detection
3	Power Normal	Power value is within normal range
4	Blackout	Voltage is 0
5	Over Volt.	Voltage is above the pre-set upper limit
6	Under Volt.	Voltage is less than the pre-set lower limit
7	Over Freq.	Frequency is above the pre-set upper limit
8	Low Freq.	Frequency is less than the pre-set lower limit
9	Loss of Phase	One or two phases are lost among L1, L2, L3
10	Reverse Phase Seq.	Phase sequence is wrong for L1-L2-L3

Table10 B Power Voltage Status

No.	Item	Description
1	B Available	Delay for B power available detection
2	B Unavailable	Delay for B power unavailable detection
3	Power Normal	Power value is within normal range
4	Blackout	Voltage is 0
5	Over Volt.	Voltage is above the pre-set upper limit
6	Under Volt.	Voltage is less than the pre-set lower limit
7	Over Freq.	Frequency is above the pre-set upper limit
8	Low Freq.	Frequency is less than the pre-set lower limit
9	Loss of Phase	One or two phases are lost among L1, L2, L3
10	Reverse Phase Seq.	Phase sequence is wrong for L1-L2-L3

Table 11 Genset Status

No.	Item	Description
1	Genset Start Delay	Delay time before genset start
2	Genset Stop Delay	Delay time before genset stop
3	Scheduled Start	Lasting time for scheduled start is displayed when scheduled start is active.
4	Genset Working	Genset start signal outputs.
5	Genset Standby	No genset start signal outputs.

Table 12 Switch Status

No.	Item	Description
1	Ready to Transfer	Enter switch transfer procedure
2	Closing A	A power is experiencing close delay
3	Opening A	A power is experiencing open delay
4	Closing B	B power is experiencing close delay
5	Opening B	B power is experiencing open delay
6	Transfer Rest	The interval time for switch transfer
7	Closing A Again	Again close time when A power failed to open for the first time, if Again Close Delay is not set to 0
8	Opening A Again	Again open time when A power failed to close for the first time, if Again Close Delay is not set to 0
9	Closing B Again	Again close time when B power failed to open for the first time, if Again Close Delay is not set to 0
10	Opening B Again	Again open time when B power failed to close for the first time, if Again Close Delay is not set to 0
11	A On Load	A power is closed and A power takes the load
12	B On Load	B power is closed and B power takes the load
13	Off-load	Switch has been open and load is disconnected

When the controller detects a warning alarm, the warning alarm becomes active, causing the alarm indicator to flash slowly (1 time per second). Once the alarm disappears or is resolved, the alarm indicator will turn off. It's important to note that warning alarms are not latched, meaning they do not persist after the condition causing the alarm has been resolved.

Table 13 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 the controller detects a fault alarm, the fault alarm becomes active, causing the alarm indicator to flash quickly (5 times per second). Unlike warning alarms, fault alarms are latched, meaning they persist until manually reset by the user, even after the condition causing the alarm has been resolved.

Table 14 Fault Alarm

No.	Item	Description
1	A Failed to Close	Switch didn't close properly after A power close signal is stopped to output
2	A Failed to Open	Switch didn't succeed to close properly after A power open signal is stopped to output
3	B Failed to Close	Switch didn't close properly after B power close signal is stopped to output
4	B Failed to Open	Switch didn't succeed to close properly after B power open signal is stopped to output
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	Simult. Close	Side switches of A/B power are in closed status

When reminder information is active, it displays for 2 seconds and then disappears automatically.

Table 15 Reminder Information

No.	Item	Description
1	Press Reset Alarm	The reminder for manual transfer to auto mode before alarm clear as fault alarm occurs
2	A Closed	Set it to one breaking or two breakings; reminder information for pressing A power close key as A power is closed
3	B Closed	Set it to one breaking or two breakings; reminder information for pressing B power close key as B power is closed
4	Opened	Reminder information for pressing open key as load is disconnected

Table 16 Other Status Information

No.	Item	Description
1	Start Inhibit	Genset start inhibit input is active
2	Remote Gen On Load	Remote start on-load input is active
3	Remote Gen Off Load	Remote start off-load input is active
4	Gen Start Mains NG	Start when Mains is abnormal
5	Auto Mode	Current is in auto mode
6	Manual Mode	Current is in manual mode

7.4 MAIN MENU

In main interface, press  key to enter main menu screen.

1. Exit 2. Parameters Set 3. Event Log 4. Auto Trans./Restore 5.Manual Test 6. Date & Time Set 7. Language 8.Accumulated Information 9.Controller	Press Down key and select different parameter line (current line turns black) and then press Confirm key, to enter related interface

NOTE: Password is required to access parameter settings, and the default password is “01234”. Operators have the option to change the password to prevent unauthorized changes to the controller configurations. It’s important to remember the new password after changing it. If the password is forgotten, please contact our company personnel for assistance.

8 GENSET START/STOP OPERATIONS

8.1 MANUAL START/STOP

8.1.1 PANEL START/STOP

In the main screen, press the Set/Confirm key to access the main menu interface. From there, select option 5, “Manual Test,” to enter the manual start operation screen. If the system type is set to “A Mains B Gen,” “A Gen B Mains,” or “A Mains B Mains,” you will directly enter the manual start operation interface.

Manual Test	Press Down key to select different parameter line (current line turns black) and press Confirm key to confirm
Return Genset Stop Genset Start	

Genset Stop: The controller disconnects the outputted genset start signal, effectively stopping the genset.

Genset Start: The controller controls the output of the genset start signal, initiating the start of the genset.

8.1.2 REMOTE COMMUNICATION START/STOP

Through the RS485 port using the Modbus protocol, remote start/stop commands can be issued as follows:

Remote Stop: This command disconnects the outputted genset start signal, effectively controlling the genset to stop.

Remote Start: This command controls the output of the genset start signal, initiating the start of the genset.

8.2 AUTO START/STOP

8.2.1 START CONDITIONS

8.2.1.1 INPUT PORT START

To configure the remote start functionality, you can choose between “Remote Start On-load” and “Remote Start Off-load” for configurable input ports. It’s important to note that these settings cannot be enabled simultaneously. Here’s how each option works:

Remote Start On-load: When this option is selected, the genset start outputs when the generating is okay and the GB (generator breaker) closes. When the remote start is inactive, it disconnects the genset start output signal.

Remote Start Off-load: With this option, the genset start outputs when the mains power is okay, and the MB (mains breaker) closes. When the remote start is inactive, it disconnects the genset start output signal.

8.2.1.2 GEN START MAINS NG

When Mains is abnormal, genset start outputs; when generating is Ok, Gen closes.

8.2.2 SCHEDULED START

The “Scheduled Start” feature allows users to set specific times for the generator to start automatically. Here’s how it works:

Enable Scheduled Start: Users can enable the Scheduled Start function in the controller settings.

Set Scheduled Start Time: Users can specify the desired start time for the generator. This could be a specific time of day, week, or month, depending on the scheduling options available.

Start Signal Issuance: When the scheduled start time is reached, the controller issues a start signal to initiate the generator start sequence.

Scheduled Start Delay: The controller may include a delay time before issuing the start signal. This delay ensures that the generator starts at the precise scheduled time.

On-load or Off-load Start: Users can choose whether the generator starts under load (On-load) or without load (Off-load). This selection depends on the specific requirements of the application.

Scheduled Start Cycle Time: Users can configure the frequency of the scheduled start, which could be set to start monthly, weekly, or daily.

- **Start Monthly:** Users can specify the month, start date, and time for the generator to start.
- **Start Weekly:** Users can set the generator to start at the same time on selected days of the week. For example, the generator could start every Monday to Friday at 8:00 AM and run for 10 hours.
- **Start Daily:** Users can set the generator to start at the same time every day.

9 PARAMETER CONFIGURATION

9.1 ILLUSTRATION

In the first page of the main screen, press key to enter menu screen; select Parameters Set and press Confirm key to confirm and enter parameter setting password check interface. Input correct password and it will e nter parameter main interface. If password is wrong, then it directly returns to main interface. Default password is 01234.

In parameter setting page, press longer to directly exit from this screen and return to main screen.

9.2 PARAMETER CONFIGURATION TABLE

Table 17 Parameter Configuration Items

No.	Item	Range	Default	Description
AC Setting				
1	A Available Delay	(0~3600)s	10	The check time from A power abnormal to normal
2	A Unavailable Delay	(0~3600)s	5	The check time from A power normal to abnormal
3	B Available Delay	(0~3600)s	10	The check time from B power abnormal to normal
4	B Unavailable Delay	(0~3600)s	5	The check time from B power normal to abnormal
5	Master Selection	(0~1)	0	0: A Master 1: B Master
6	System Type Set	(0~2)	0	0: A Mains B Gen 1: A Gen B Mains 2: A Mains B Mains
7	AC System	(0~3)	0	0: 3-Phase, 4-Wire 1: 3-Phase, 3-Wire 2: 2-Phase, 3-Wire 3: Single Phase, 2-Wire Special custom is needed for 3 Phase 3 Wire
8	Rated Voltage	(0~30000)V	220	Rated voltage value for AC system
9	Over Volt Set	(0~1)	1	0: Disable 1: Enable
10	Over Volt Value	(0~200)%	120	Voltage upper limit; abnormal when it is over upper limit
11	Over Volt Return	(0~200)%	115	Voltage upper limit return value; normal when it is lower than return value
12	Under Volt Set	(0~1)	1	0: Disable 1: Enable
13	Under Volt Value	(0~200)%	80	Voltage lower limit; abnormal when it is lower than this limit
14	Under Volt Return	(0~200)%	85	Lower limit return value; normal when it is above return value
15	Rated Frequency	(10.0~75.0)Hz	50.0	Rated frequency value for AC system
16	Over Freq. Set	(0~1)	1	0: Disable 1: Enable
17	Over Freq. Value	(0~200)%	110	Frequency upper limit; abnormal when it is above upper limit
18	Over Freq. Return	(0~200)%	104	Upper limit return value; normal when it is lower than return value
19	Under Freq. Set	(0~1)	1	0: Disable 1: Enable
20	Under Freq. Value	(0~200)%	90	Frequency lower limit value; abnormal when it is lower than this limit
21	Under Freq. Return	(0~200)%	96	Lower limit return value, normal when it is above return value
22	Loss of Phase	(0~1)	1	0: Disable 1: Enable
23	Reverse Phase Sequence	(0~1)	1	0: Disable 1: Enable
24	PT Fitted	(0~1)	0	0: Disable 1: Enable
25	PT Primary Volt	(30~30000)V	100	
26	PT Secondary Volt	(30~1000)V	100	

No.	Item	Range	Default	Description
Switch Setting				
1	Close Delay	(0.0~100.0)s	5.0	Pulse time for close relay output; continuous output when it is 0
2	Open Delay	(0.1~100.0)s	5.0	Pulse time for open relay output
3	Transfer Interval	(0 ~9999)s	1	Waiting delay time from A open to B close, or B open to A close
4	Over Transfer Delay	(0~20.0)s	0.0	Continuous output time of close relay after detecting closed signal
5	Again Close Delay	(0~20.0)s	1.0	For the first time switch open failed, then it closes again and close again delay starts; when delay is over, it opens again; if it cannot open, then it issues failed to open alarm signal
6	Again Open Delay	(0~20.0)s	1.0	For the first time switch close failed, then it opens again and open again delay starts; when delay is over, it closes again; if it cannot close, then it issues failed to close alarm signal
7	Switch Type	(0~3)	0	0: Two Breaking 1: One Breaking 2: No Breaking 3: XK 3-stage
8	Forced Open Action	(0~1)	0	0: Warning 1: Fault
9	Auto Trans/Restore	(0~1)	1	0: Auto Trans/Non Restore 1: Auto Trans/Restore
10	Mutual Backup	(0~1)	1	0: Inactive 1: Active
11	Open Input Enable	(0~1)	0	0: Disable 1: Enable If this is not connected, please set it to Disable
12	No Open Transfer Enable	(0~1)	0	0: Disable 1: Enable When it is set to Enable, controller directly transfers to the other circuit from one circuit; and there is no open control output in the transfer process
Genset Setting				
1	Genset Start Delay	(0~9999)s	1	Delay starts when genset prepares to start; when delay is over, controller issues genset start signal
2	Genset Stop Delay	(0~9999)s	5	Delay starts when genset prepares to stop; when delay is over, controller disconnects genset start signal
Scheduled Start/Stop Setting				
1	Start Enable	(0~1)	0	0: Disable 1: Enable
2	Start On load	(0~1)	0	0: Off Load 1: On Load
3	Start Period	(0~2)	0	0: Monthly 1: Weekly 2: Daily
4	Start Monthly	Month		☑January ☑February ☑March ☑April ☑May ☑June ☑July ☑August ☑September ☑October ☑November ☑December
5	Start Date	(1~31)	1	Date for genset start for each month.

No.	Item	Range	Default	Description
6	Start Weekly	Week	1	☑Sunday ☐Monday ☐Tuesday ☐Wednesday ☐Thursday ☐Friday ☐Saturday
7	Start Hours	(0~23)h	0	Time for scheduled start.
8	Start Minutes	(0~59)min	0	
9	Start Time	(0~30000)min	30	Lasting time for scheduled start running.
Auxiliary Input Setting				
1	Aux. Input 1	(0~20)	0	Not Used
2	Active Type	(0~1)	0	0: Close to Activate; 1: Open to Activate
Auxiliary Output Setting				
1	Output 1 Active Type	(0~1)	0	0: Output (N/O) 1: Output (N/C)
2	Output 1 Setting	(0~36)	1	Common Alarm
3	Output 2 Active Type	(0~1)	1	0: Output (N/O); 1: Output (N/C).
4	Output 2 Setting	(0~36)	16	Genset start.
Module Setting				
1	Power On Mode	(0~2)	0	0: Previous Mode 1: Manual Mode 2: Auto Mode
2	Language	(0~1)	0	0: Simplified Chinese 1: English
3	Password	(0000~65535)	01234	Password for entering parameter setting
4	Module Address	(1~254)	1	Communication address for RS485 network
5	Comm. Baud Rate	(0~3)	2	0: 2400bps 1: 4800bps 2: 9600bps 3: 19200bps
6	Comm. Parity Bit	(0~2)	0	0: None 1: Odd Parity 2: Even Parity
7	Comm. Stop Bit	(1~2)	2	1 or 2 stop bits can be set.
8	Date/Time Setting			
9	Communication Set	(0~3)	0	0: Enable Remote Adj/Ctrl 1: Disable Remote Control 2: Disable Remote Adjust 3: Disable Remote Adj/Ctrl

9.3 DIGITAL INPUT/OUTPUT FUNCTION DESCRIPTION

9.3.1 INPUT PORT FUNCTION DESCRIPTION

Table 18 Input Port Function Description

No.	Item	Description
0	Not used	Invalid
1	Handle Operation	After the input port is active, the controller will exit the control and the closing/opening is operated by the switch itself. When it is active, the control will display: handle operation
2	Remote Gen On Load	Genset start outputs; when Mains is normal, gen closes
3	Remote Gen Off Load	Genset start outputs; when Mains is normal, Mains closes
4	Lamp Test	LED lamps are all illuminated on the panel, LCD backlight is on, LCD is all dark
5	Reserved	
6	Reserved	
7	Start Inhibit Input	Inhibit genset start signal output; In auto mode, after stop delay is over, controller disconnects genset start signal output; In manual mode, if genset is started, manual stop is needed; after stop manual start is inactive
8	Breaker Trip Input	Breaker trip fault input
9	A Master Input	Force to set A Master
10	B Master Input	Force to set B Master
11	A Close Key	Same as A Close key on the panel; Auto reset key is needed
12	B Close Key	Same as B Close key on the panel; Auto reset key is needed
13	Open Key	Same as Open key on the panel; Auto reset key is needed
14	Forced Manual Mode	Force controller mode to manual mode
15	Forced Auto Mode	Force controller mode to auto mode
16	Alarm Reset	Reset current alarm
17	Remote Control Inhibit	Remote operation is inactive when this is active
18	Auto Trans /Restore	
19	Open IN	Open auxiliary feedback input; if switch needs open IN, please first set Open IN Enable
20	Reserved	

9.3.2 OUTPUT PORT FUNCTION DESCRIPTION

Table 19 Output Port Function Description

No.	Item	Description
0	Not used	Invalid
1	Common Alarm	Common alarms include fault alarm, warning alarm
2	Common Fault Alarm	Fault alarm includes switch transfer failure
3	Common Warn Alarm	Warning alarms include A phase sequence wrong, B phase sequence wrong, and forced to open
4	Transfer Fault	Switch transfer failures include A failed to close, A failed to open, B failed to close, and B failed to open
5	Audible Alarm	When fault alarms are active, external annunciator can be connected After delay for 60s, clear the audible alarm output
6	Reserved	
7	A/B Abnormal	Output when one of A and B is abnormal
8	Transfer Output	Relay outputs when switch close/open transfers; it stops outputting when transfer is over; shorte st output time is 1s
9	A&B Abnormal	Output when A and B both are abnormal
10	A Available	Output when A is normal
11	A Unavailable	Output when A is abnormal
12	B Available	Output when B is normal
13	B Unavailable	Output when B is abnormal
14	Auto Mode	Output when controller is in auto mode
15	Manual Mode	Output when controller is in manual mode
16	Genset Start	Control genset to start
17	Forced Open	Output when Forced to Open is active
18	A Close Control	Control A breaker close
19	A Open Control	Control A breaker open
20	B Close Control	Control B breaker close
21	B Open Control	Control B breaker open
22	Open Control	Control A and B breaker open
23	Reserved	
24	Reserved	
25	A Closed Input	A breaker closed status is outputted when switch is at I position
26	B Closed Input	B breaker closed status is outputted when switch is at II position
27	Opened Input	Breaker open status is outputted when switch is at 0 position and it needs to enable open input function and configure input to open input; when this input is active, it outputs
28	Reserved	
29	Reserved	
30	Reserved	
31	Reserved	
32	Reserved	
33	Reserved	
34	Remote Control	Communication command control output by RS485 .
35	Reserved	
36	Reserved	

10 EVENT LOG

In the first page of the main interface, press key, and enter menu page. Select “Event Log”, and then select to confirm. In this way Event Log interface is entered.

Each item of Event Log contents includes:

Date and time;

Type of record;

Event of record;

A power status;

B power status;

A power 3-phase voltage;

B power 3-phase voltage;

A power frequency;

B power frequency

Event log can be recorded up to max. 50 items. The first one is the newest. Users can check each item via Down key. When recorded items are over 50, new item will cover the newest record.

Record type includes: Action Event, Warn Event, Fault Event. Fault events are all fault alarms, warn events are all warning alarms.

Table 20 Action Events

No.	Action Event	Description
1	Closing A	Record when A power close is outputted;
2	Closing B	Record when B power close is outputted;
3	Opening A	Record when A power open is outputted;
4	Opening B	Record when B power open is outputted;
5	Simult. Close	Record when A power and B power take load simultaneously;
6	Genset Start	Record when genset start signal is outputted;
7	Genset Stop	Record when genset start signal is disconnected;
8	Auto Mode	Record when it is transferred to Auto mode;
9	Manual Mode	Record when it is transferred to Manual mode
10	Handle Operation	Record when it is transferred to handle operation.

11 SWITCH OPERATION RUNNING

11.1 MANUAL OPERATION RUNNING

Press manual/auto transfer key , and manual status indicator is illuminated; Controller is in manual status.

After the switch transfer key is pressed, switch transfers immediately; When the switch is transferred to the position, the related indicator is illuminated always.

Table 21 Manual Transfer Key

Icon	Key Name	Function Description
	A Power Close	Press and if load is in open status, A power closes, and load is supplied by A power.
	B Power Close	Press and if load is in open status, B power closes, and load is supplied by B power.
	Open Key	Press and load is disconnected.

11.2 AUTO OPERATION RUNNING

11.2.1 ILLUSTRATION

Press manual/auto transfer key  , and auto status indicator is illuminated; Controller is in auto status.

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

11.2.2 AUTO TRANS./RESTORE

When “Auto Trans./Restore” is set, A power functions as the master source. If A power is normal, it closes the A power switch, supplying the load. If A power becomes abnormal while B power remains normal, the controller opens the A power switch and closes the B power switch, transferring the load to B power. Once A power recovers and becomes normal again, the controller opens the B power switch and closes the A power switch, transferring the load back to A power.

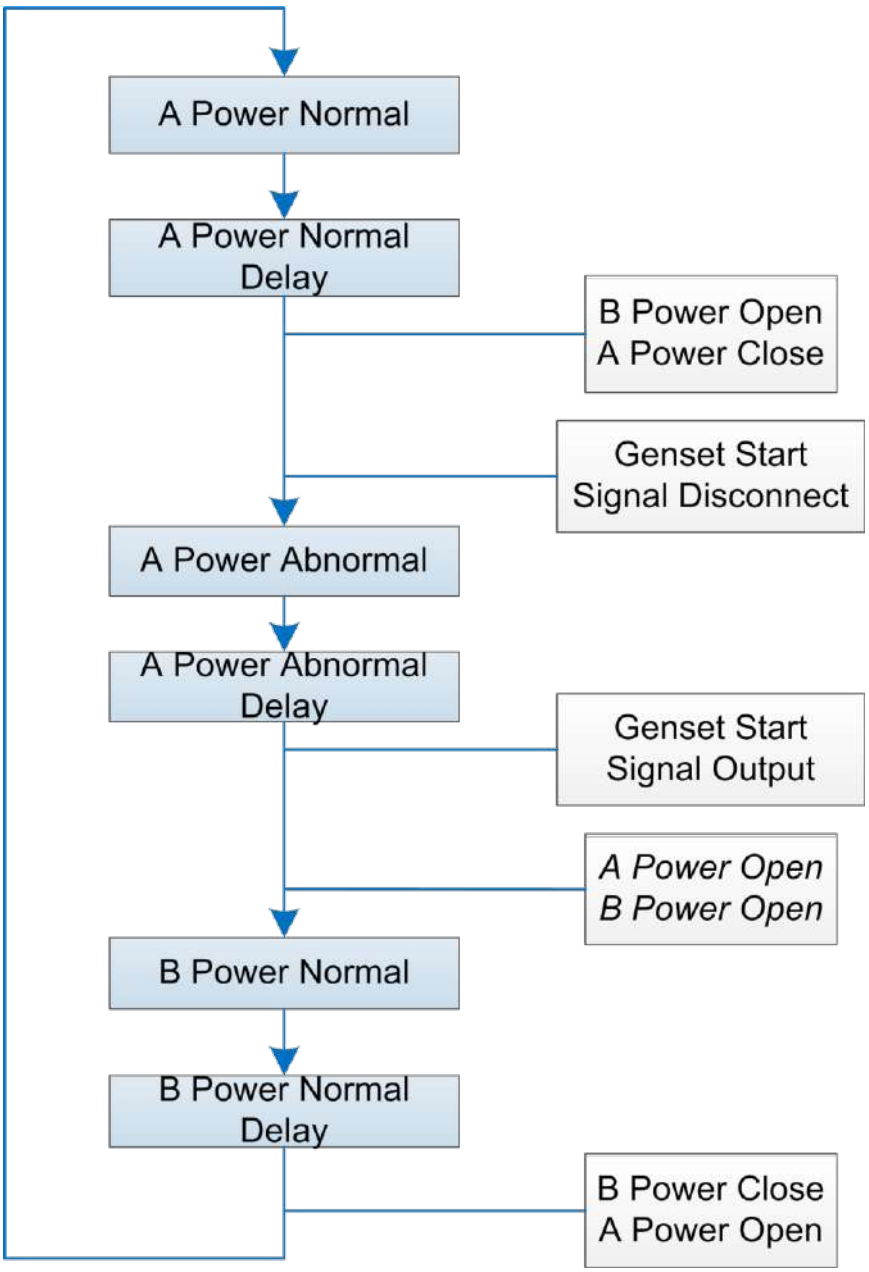


Fig.2 Auto Trans./Restore Flow chart

11.2.3 AUTO TRANS. NONE RESTORE (ACTIVE FOR MUTUAL BACKUP)

When the “Auto Trans None-Restore” function is set, and “Mutual Backup” is active, A power acts as the master source. If A power is normal, it closes the A power switch, supplying the load. If A power becomes abnormal while B power remains normal, the controller opens the A power switch and closes the B power switch, transferring the load to B power. Even after A power recovers and becomes normal again while B power remains normal, the system keeps the load supplied by B power, maintaining the switch in the B power closed status for continuous supply from B power.

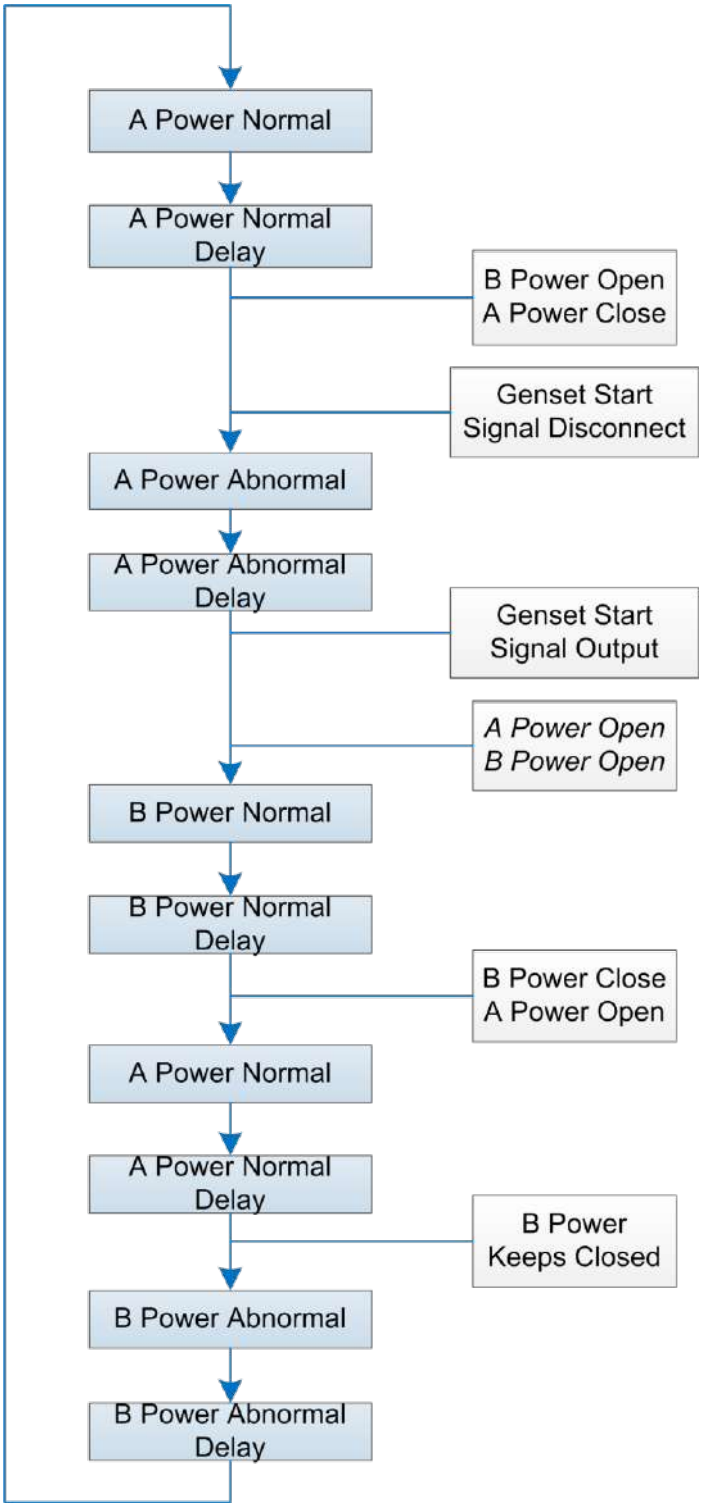


Fig.3 Auto Trans. Non-restore (Active for Mutual Backup) Flowchart

11.2.4 AUTO TRANS. NONE RESTORE (IN ACTIVE FOR MUTUAL BACKUP)

When Auto Trans. None-restore and Mutual Backup is inactive, A power is master. If A power is normal, it closes. When A power is abnormal and B power is normal, A power opens and B power closes. If A power recovers to normal, the switch remains at B power close status. When B power is abnormal, B power opens, and even though A power is normal, it doesn't close.

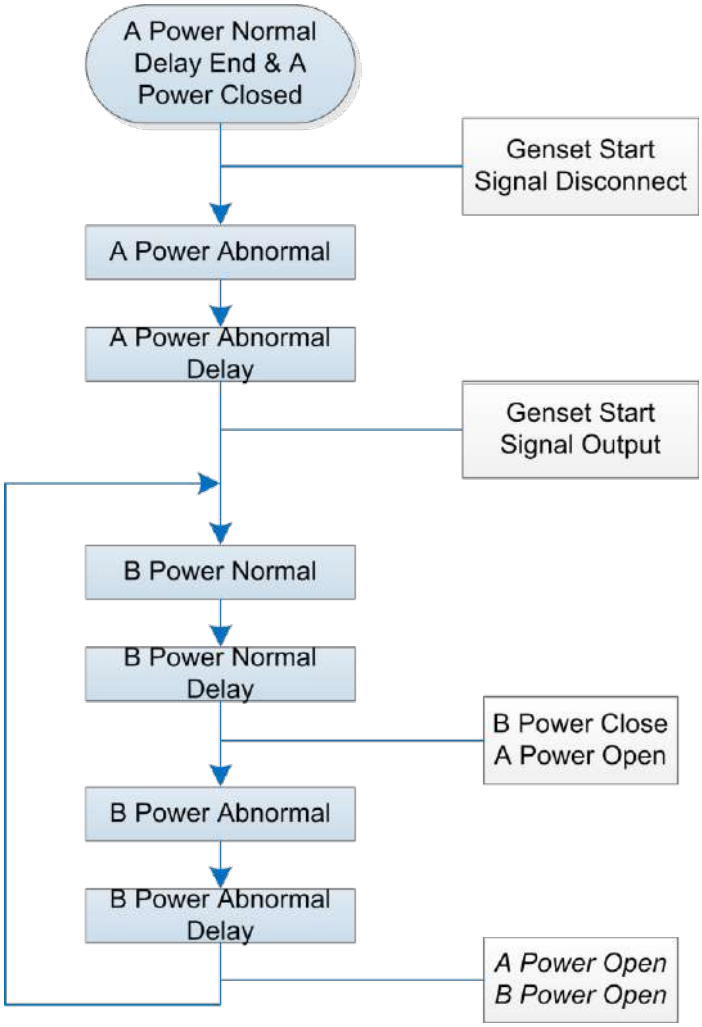


Fig.4 Auto Trans. Non-restore (Inactive for Mutual Backup) Flowchart

NOTE: Master power (A power) close needs to be realized by transferring to manual mode via the key; otherwise, in auto mode, the switch only transfers between the open and backup power (B power) positions.

11.2.5 NON-OPEN TRANSFER

When "non-open transfer" is enabled, the controller refrains from executing the open operation. Here's the detailed setting method: Enter the "switch setting" interface within the parameter setting interface, locate "Non-open Transfer," and enable it. The following illustrates the control logic using the example of "A power master," "A Mains B Gen":

- When A power is normal, A power closes.
- When A power is abnormal and B power is normal, the controller issues a B power close order. The switch directly transitions from A power loading to B power loading. The intermediate steps for A power opening are skipped.

NOTE: This function is solely suitable for switches with breakings and those permitted to transfer directly from A power loading to B power loading.

11.3 AUXILIARY CONTACT FEEDBACK INPUT OF SWITCH OPEN

If the switch needs to access the open feedback input, please first enable the open input. Detailed setting method: Enter the “switch setting” interface in the parameter setting interface, find “Open Input Enable,” and set it to enabled. Then set auxiliary input port 1 to “19: Open IN.” When auxiliary input 1 detects a low electrical level, the open input is active.

During the transfer process, if a failed close of A power occurs, the A power switch won’t execute the close action. If B power is OK, the B power close is executed. If a failed open occurs, the controller won’t execute switch close/open actions.

NOTE: This function is only suitable for switches with breakings.

11.4 HANDLE OPERATION

Handle operation: After the input port is active, the controller will exit the control, and the closing/opening is operated by the switch itself. When it is active, the control will display: handle operation.

12 COMMUNICATION CONFIGURATION AND CONNECTION

12.1 ILLUSTRATION

The ATbS C55 dual power ATS controller has an RS485 communication port and a USB communication port. The RS485 communication port allows connection to LAN of open structure. The communication port applies the Modbus communication protocol. By running software on PC or data collecting systems, it provides a simple and practical dual power transfer management method for factories, telecommunications, industries, and civil buildings, realizing “remote control, remote measuring, remote communication” functions of dual power monitoring.

For detailed information on the communication protocol, please refer to the *ATbS C55 Communication Protocol.*

12.2 RS485 COMMUNICATION PORT

Communication Protocol: Modbus RTU

Communication Parameters:

- Module Address: 1 (Range: 1~254)
- Baud Rate: 9600bps (2400/4800/9600/19200bps)
- Data Bit: 8-bit
- Parity Bit: None (None, Odd, Even)
- Stop Bit: 2-bit (1 bit or 2 bits)

12.3 USB COMMUNICATION PORT

The D-type USB communication port can be used to connect PC test software and configure parameters. At the same time, it can be used for module program upgrades.

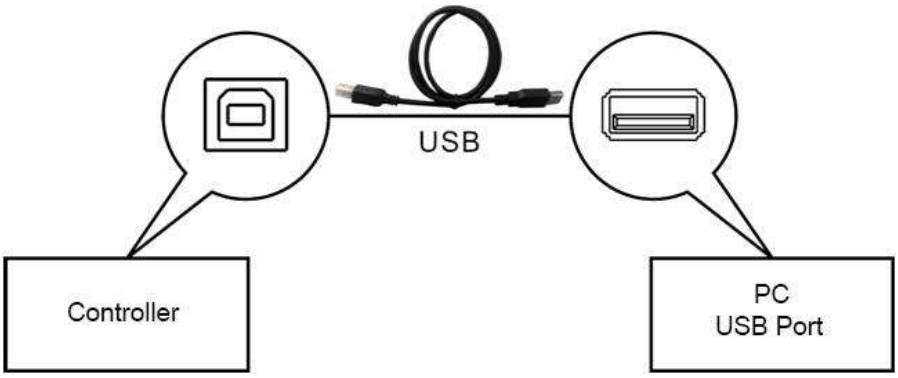


Fig.5 USB Connecting Diagram

13 DEFINITION OF CONNECTING TERMINALS

13.1 DESCRIPTION OF CONNECTING TERMINALS

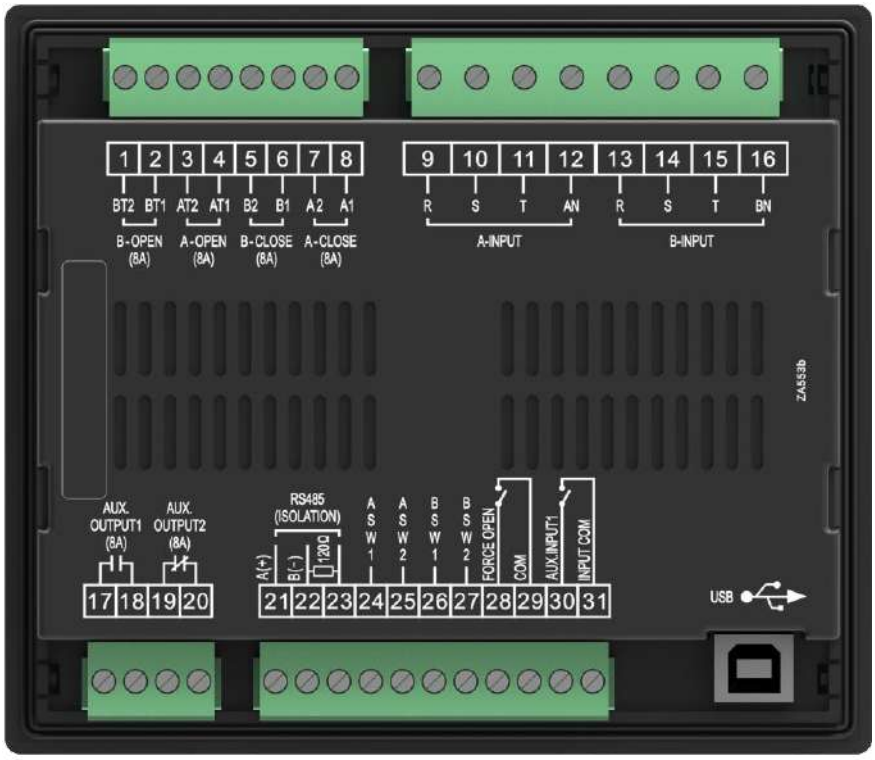


Fig.6 Controller Back Panel

Table 22 Terminal Function Description

No.	Functions		Description	Remark
1	BT2		B disconnects output N	Output AC power; control B power switch to disconnect, rated 8A
2	BT1		B disconnects output L	
3	AT2		A disconnects output N	Output AC power; control A power switch to disconnect, rated 8A
4	AT1		A disconnects output L	
5	B2		B puts into output N	Output AC power; control B power switch to put into , rated 8A
6	B1		B puts into output L	
7	A2		A puts into output N	Output AC power; control A power switch to put into , rated 8A
8	A1		A puts into output L	
9	R	A-INPUT	AC 3 Phase 4 Wire voltage input of A power	For single phase input, only connect R and AN
10	S			
11	T			
12	AN			
13	R	B-INPUT	AC 3 Phase 4 Wire voltage input of B power	For single phase input, only connect R and BN
14	S			
15	T			
16	BN			
17	AUX. OUTPUT1		Auxiliary output 1	Default: common alarm output, N/O output, capacity 8A 250VAC
18				
19	AUX. OUTPUT2		Auxiliary output 2	Default: genset start control output, N/C output, capacity 8A 250VAC
20				

21	A(+)	RS485 communication port	120Ω Resistor (for impedance matched) has been connected inside
22	B(-)		
23	120Ω Resistor	RS485 impedance-matched resistor	Users need to connect this terminal to Terminal 21 based on on-site network arrangement; used to connect with the 120Ω resistor inside the controller
24	ASW1	A switch close status input	Detect A switch close status, volt-free contact input, active when ASW1 and ASW2 are short connected
25	ASW2		
26	BSW1	B switch close status input	Detect B switch close status, volt-free contact input, active when BSW1 and BSW2 are short connected
27	BSW2		
28	FORCE OPEN	Forced open input	Forced open, active when it is short connected
29	COM		
30	AUX. INPUT1	Auxiliary Input 1	Default: not used, active when it is short connected
31	INPUTCOM		
USB	USB	D-type USB communication port	Configure parameters and upgrade program by connecting with PC

13.2 DESCRIPTION OF CONTROLLER SUPPLY

The controller is AC supplied directly by the two AC sampling terminals.

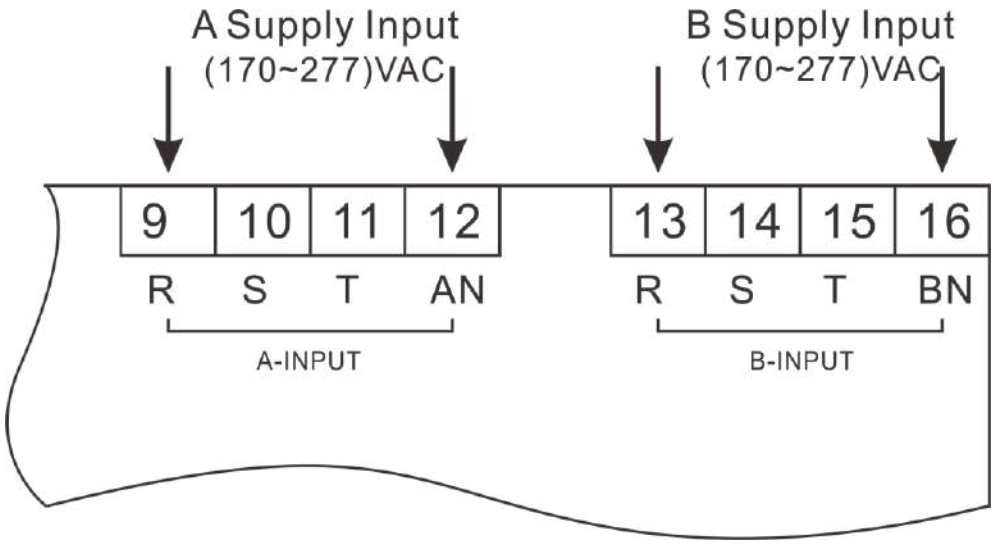
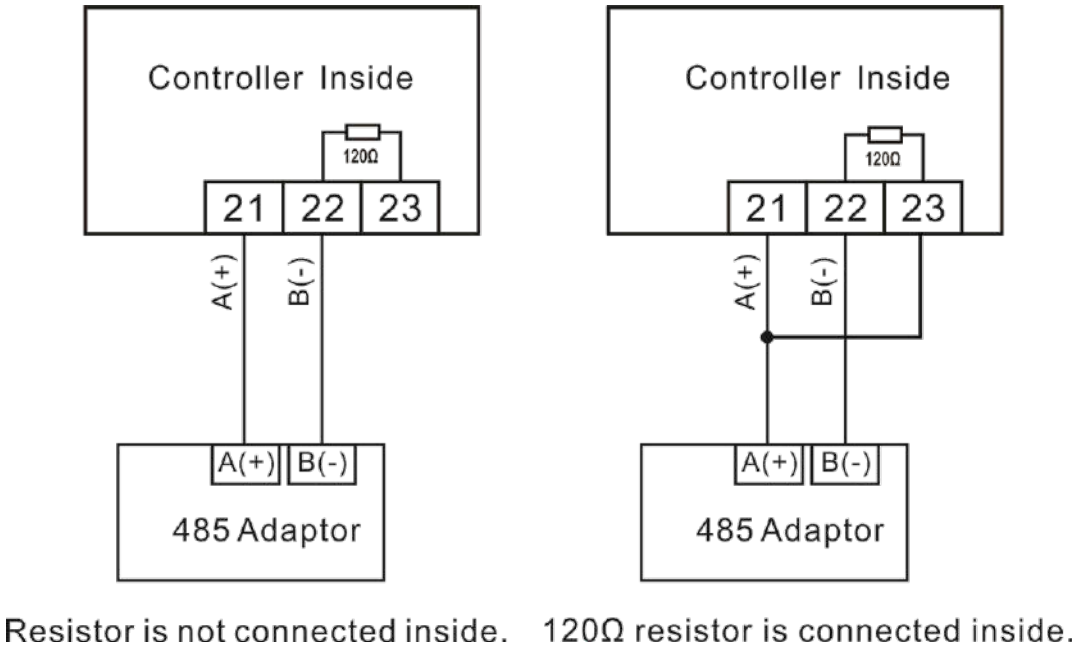


Fig.7 AC Supply Diagram

13.3 DESCRIPTION OF RS485 CONNECTION

Connecting of RS485 and a daptor is like below:



Resistor is not connected inside. 120Ω resistor is connected inside.

Fig.8 RS485 Connection Diagram

14 TYPICAL WIRING DIAGRAM

14.1 APPLICATION DIAGRAM

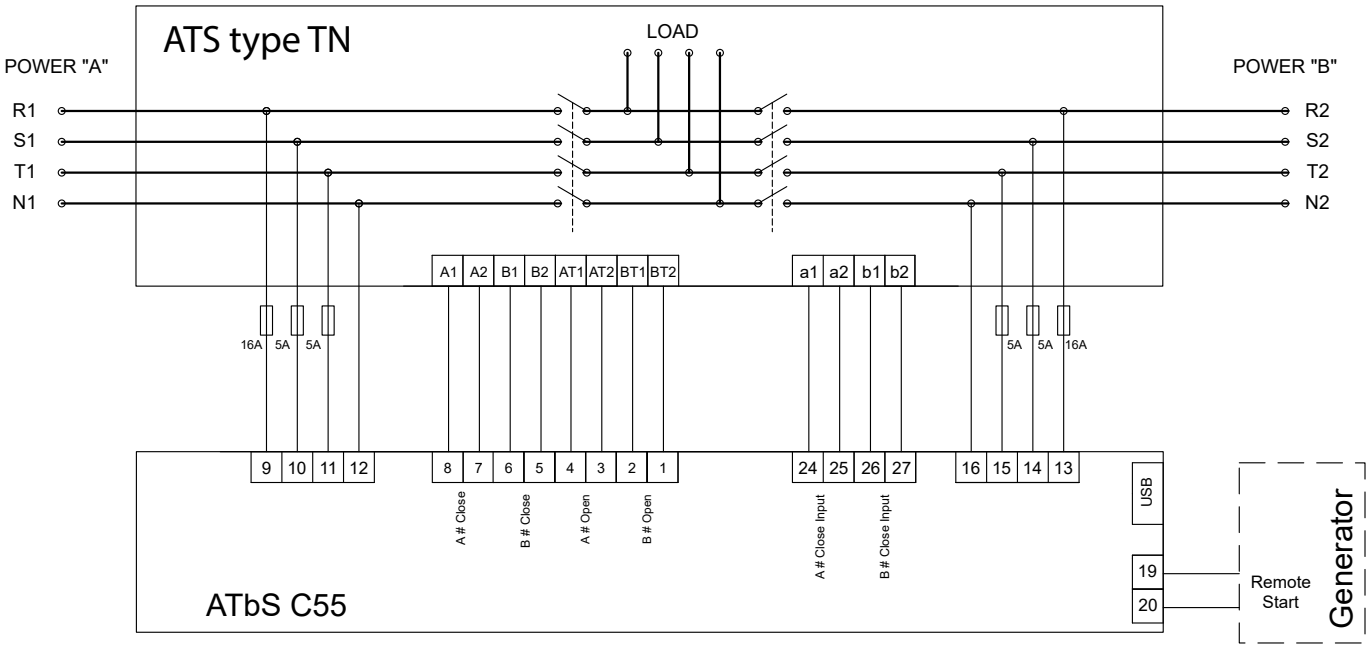


Fig.9 ATS type TN Application Diagram

Table 23 Related Settings

Partial Parameter Setting	
Switch Type Setting	Two breakings

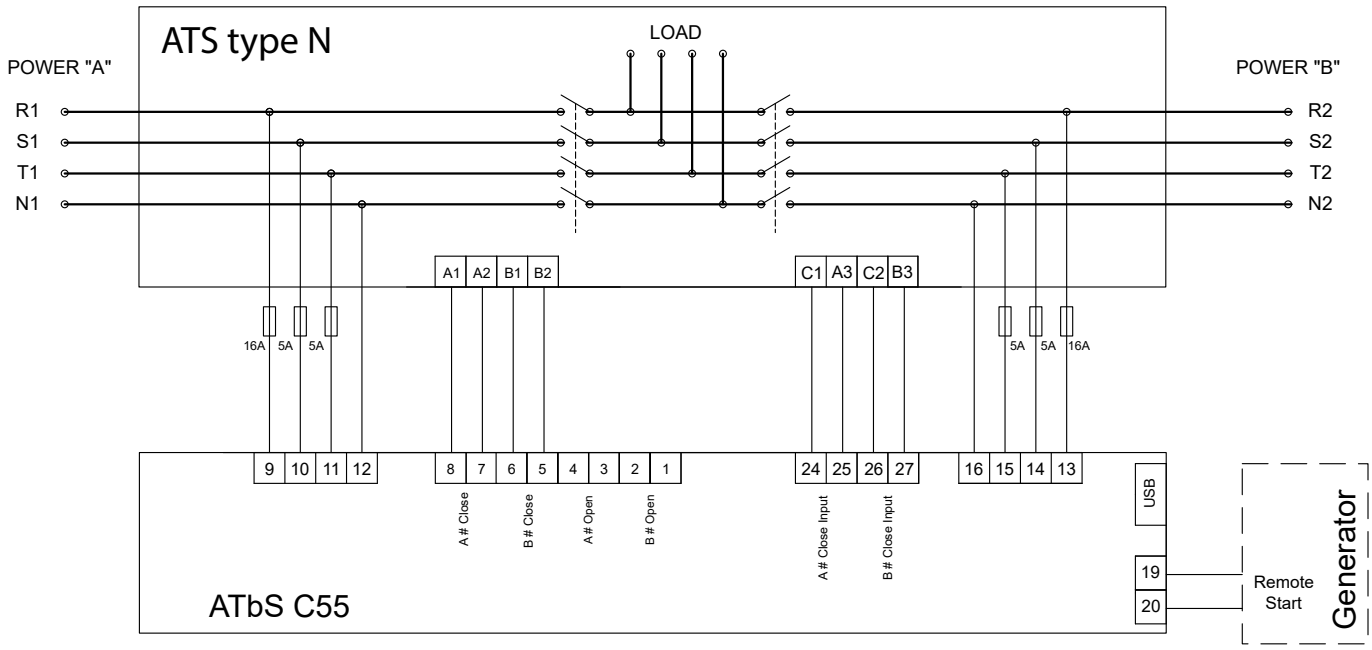


Fig.10 ATS type N Application Diagram

Table 24 Related Settings

Partial Parameter Setting	
Switch Type Setting	No breakings

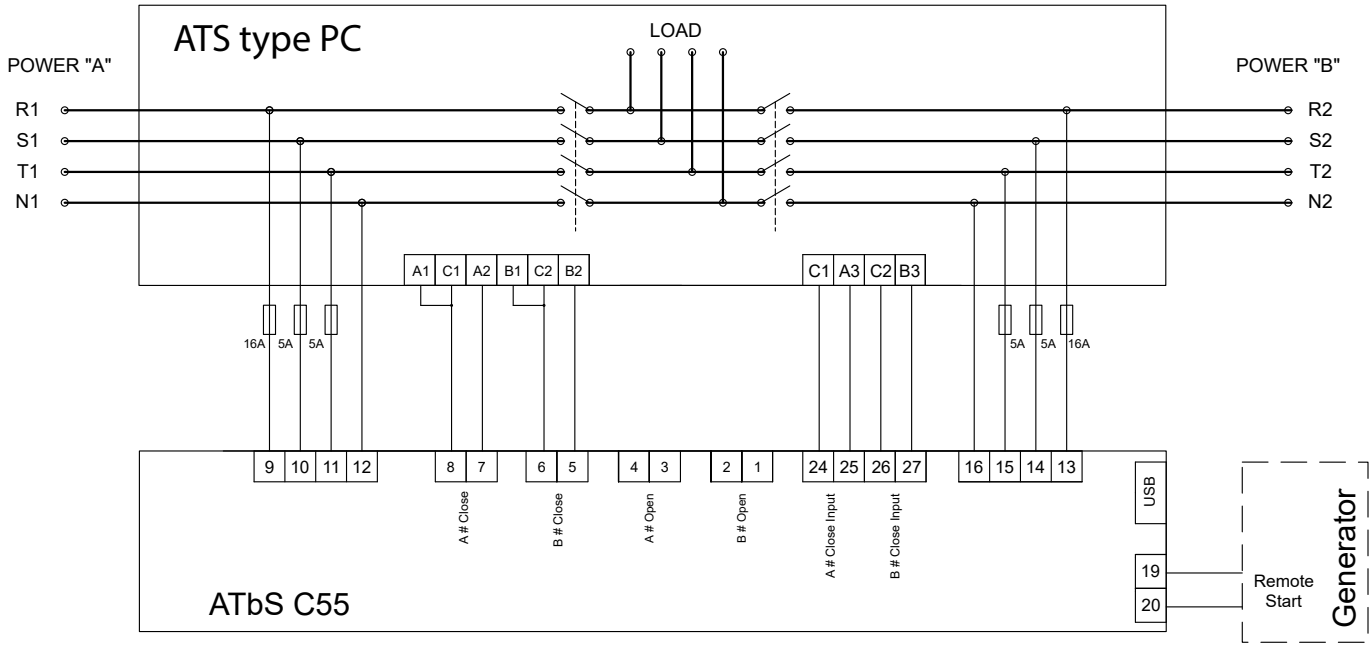


Fig.11 ATS type PC Application Diagram

Table 25 Related Settings

Partial Parameter Setting	
Switch Type Setting	No breakings

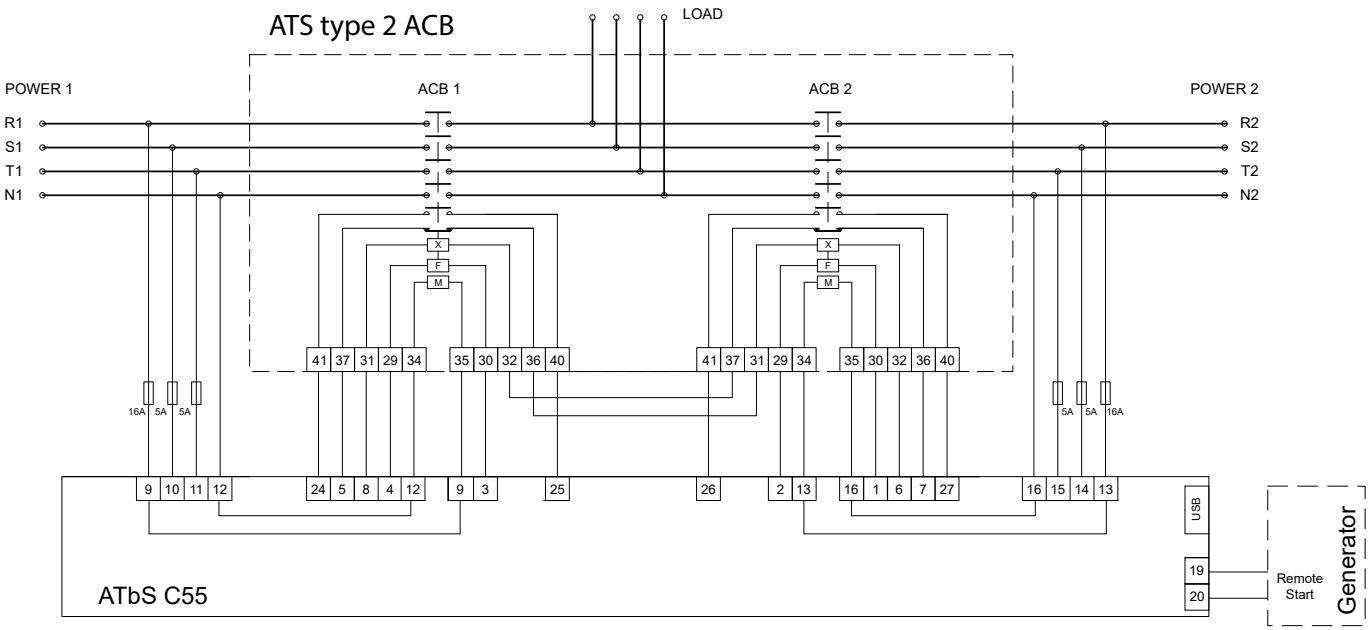


Fig.12 Breaker (ACB) Application Diagram

M: Energy-saving motor; F: Open coil; X: Close coil.

Table 26 Related Settings

Partial Parameter Setting	
Switch Type Setting	Two breakings

NOTE: The diagrams provided are merely examples; Users must wire connections according to their specific circumstances.

14.2 ATTACHED ILLUSTRATION FOR LO, NO CONNECTION INSIDE CONTROLLER

The ATbS C55 controller has an automatic transfer function for the ATS power supply inside. Normal ATS power supply is ensured only if one voltage of A power and B power is normal, achieved by transferring between the normally open (N/O) contact and normally closed (N/C) contact of intermediate relay 1 and intermediate relay 2. The output is LO, NO. The output value is the LN voltage value of A power or the LN voltage value of B power. The internal wiring is as follows: R1 and N1 are connected to the AR and AN inputs of A power, respectively; R2 and N2 are connected to the BR and BN inputs of B power.

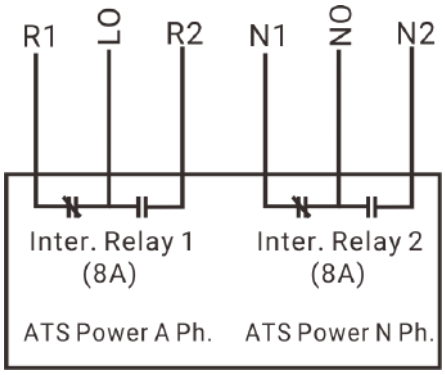


Fig.13 Internal LO, NO Connection

15 INSTALLATION

The controller is designed for panel installation and is secured in place using clips for installation.

Unit: mm

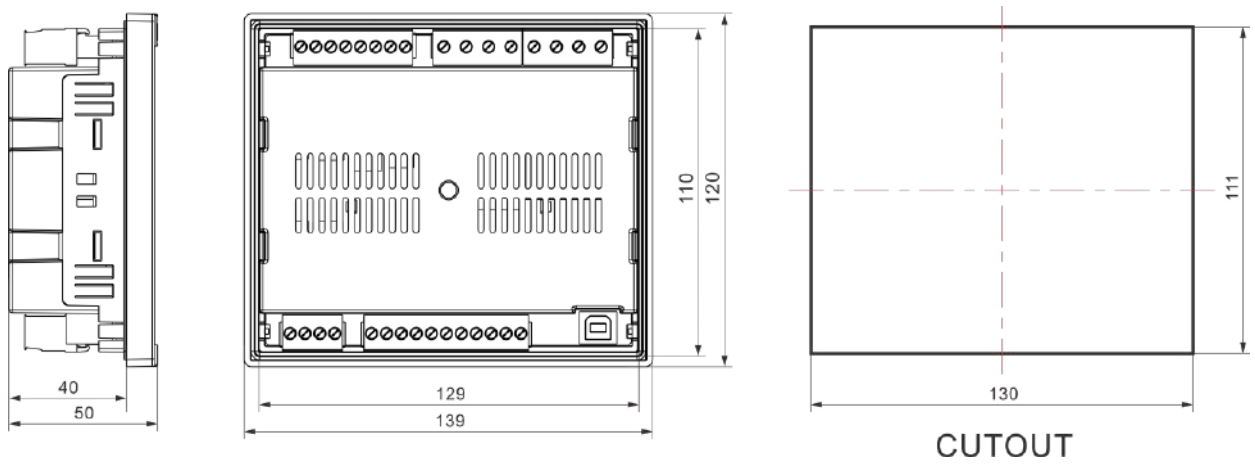


Fig.14 Overall Dimensions and Cutout

16 FAULT FINDING

Table27 Fault Finding

Symptom	Possible Solutions
Controller does not respond with power	Verify DC supply voltage; Inspect DC fuse; Check AC power supply.
RS485 Communication Abnormal	Ensure correct connection of RS485 positive and negative terminals; Verify the functionality of the RS485 converter; Confirm the correctness of the module address in the parameter settings; If the above steps fail, consider parallel connection of a 120Ω resistor between A and B terminals of the controller's RS485.
Error in Auxiliary Output	Examine auxiliary output connection wires, focusing on N/O and N/C contacts; Review output port settings and output type in parameter settings.
Abnormality in Auxiliary Input	Verify that the auxiliary input port is grounded when active and disconnected when inactive; (**NOTE:** Connecting the input port with high voltage may damage it). Confirm the input settings in the parameter settings and their activation type.
ATS Transfer Abnormality	Inspect the ATS; Check the wiring connections between the controller and the ATS; Review ATS-related parameter settings.
Abnormality in Genset Start Control	Verify the system type settings; Check output function settings and output types; Review start/stop function settings for all items.

Designed by BTB Electric
Add: Orhangazi Mah. Mimsan San. Sit. 1780 sok.
No: 5 Esenyurt / İstanbul / Türkiye
E-mail: sales@btb-electric.com
Web: btb-electric.com

04 I 2024

BTB ELECTRIC

REALVALUE FORLIFE