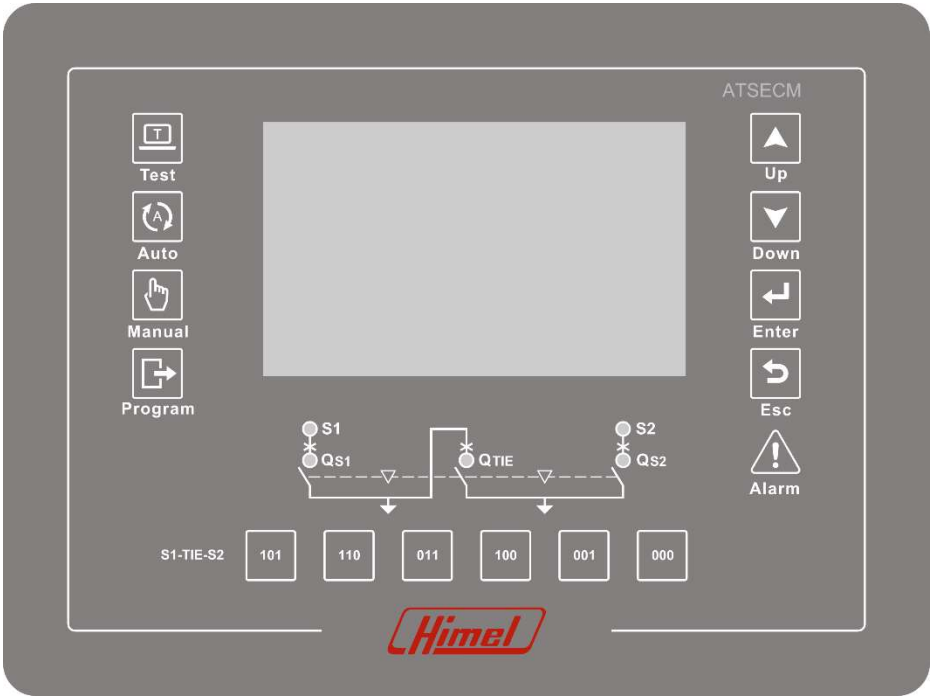
ATSECM Controller

Operation Manual



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Attention:

- The complete set must including 3 set of ACB， cable interlock ,220VAC motor/shunt release /closing coil / ATS Controller
- Do not install key lock with ACB, it will damaged the ACB when automatic transfer
- Do not install the under voltage release with ACB, It will impact ATS automatic transfer
- Do not use ACB's MODBUS or remote signal to Switch ON/OFF breaker by MX/XF, It will impact the ATS automatic transfer
- Please refer to HDW3 air circuit breaker’ s user manual before installed ACB
- Please refer to HDW3 cable mechanical interlock ‘s user manual before assemble mechanical interlock with ACB

- Default with 3m controller cable

1. Product Introduction

ATSE2CM automatic transfer controller is an intelligent ATSE controller with programmable functions, automatic measuring, LCD menu display, and digital communication. It can automatically realize voltage, frequency, phase etc. electrical parameters measurement and automatic control according to setting strategy which can reduce human operation error. It is an ideal product of ATSE.

ATSE2CM automatic transfer controller consists of microprocessor as core. It can precisely detect two- source 3-phase voltage and make precise recognition about abnormal voltage (over-voltage, under-voltage, missing phase, over-frequency, under-frequency) and output passive control digital. This device can be widely applied to power plant, post and telecommunications, petroleum, coal, metallurgical, railway, municipal, intelligent building etc.

Functional parameter

●Graphic LCD 800x480 pixel, 5 inch TFT;

●Two-source AC power input: 3-phase 4-wire;

●Measured values, settings, and message texts are supported in English and Chinese;

●12~30VDC power supply;

●Detection function for over-voltage, under-voltage, phase loss, reverse phase sequence, over-frequency, under-frequency;

●8-channel programmable digital input (grounding effective);

●10-channel programmable digital output;

●Integrated RS-485 isolation interface, MODBUS protocol;

●Storage of last 200 events;

●Real time clock;

●All parameters are field programmable, use password access to avoid mis-operation by unprofessional persons;

●The fixed washer is IP65 degree of protection;

● Module structure design, Retardant PC cover, pluggable terminal, embedded installation mode, compact structure and easy installation;

2. Front panel touch button function

Icon	Key name	Function description
	101 Key	In Manual mode, press this button to transfer breakers S1-TIE-S2 to ON-OFF-ON(101)
	110 Key	In Manual mode, press this button to transfer breakers S1-TIE-S2 to ON-ON-OFF (110)
	011 Key	In Manual mode, press this button to transfer breakers S1-TIE-S2 to OFF-ON-ON (011)
	100 Key	In Manual mode, press this button to transfer breakers S1-TIE-S2 to ON-OFF-OFF (100)
	001 Key	In Manual mode, press this button to transfer breakers S1-TIE-S2 to OFF-OFF-ON (001)
	000 Key	In Manual mode, press this button to transfer breakers S1-TIE-S2 to all OFF (000)
	Test mode Key	Press this Key for 3 seconds to enter test function
	Auto mode Key	Press this Key for 3 seconds to set controller as Auto mode.
	Manual mode Key	Press this Key for 3 seconds to set controller as manual mode
	Programming mode Key	Press this Key for 3 seconds to set controller as programming mode.
	Increase/ up Key	In menu page, press this Key to scroll page. In parameter setting page. Press this key to up cursor or increase value.
	Decrease / down Key	In menu page, press this Key to scroll page. In parameter setting page. Press this key to down cursor or decrease value..
	Enter Key	Press this Key to enter sub-menu or confirm setting information.
	Return Key	Press this Key to return prior menu screen, press this button for 3 seconds to lock/unlock the button. press it can clear fault alarm when alarm occur.

3. Front panel LED

- Alarm LED (Red) –when fixed, indicates an alarm is active;
- S1 voltage status LED (Green) –S1 normal, fixed; S1 abnormal, blinking;
- S2 voltage status LED (Green) –S2 normal, fixed; S2 abnormal, blinking;
- Qs1 switch status LED (Green) –on, Qs1 close; off , Qs1 open;
- Qs2 switch status LED (Green) –on, Qs2 close; off, Qs2 open;
- Qtie switch status LED (Green) –on, Qtie close; off, Qtie open;

4. Working mode

● Programming mode: Parameter setting operation under this mode, long pressing “programming mode” key for 3s to enter, set password before visiting programming menu.

● Manual mode: Can control switch manually, long pressing “manual mode” button for 3s to enter, pressing 101 key、110 key、011 key、100 key、001 key、000 key switch the switch to the corresponding state.

● Automatic mode: Long pressing “automatic mode” button for 3s to enter. Under automatic mode, device automatically executes operation of open/close switch and start/stop generator. When the time of exceeding limit of prior source is longer than the set delay time, the device will open the load of the main source and connect to the emergency source.

5. Main menu

●Main menu consists of Public parameters, System parameters, Switch setting, Programmable Control, communication parameters and Language Menu, Disconnect the alarm to make it convenient for user to fast visit measuring value and revise parameters.

●Parameter setting: This operation is only valid under the programming mode. When there are changes of parameter, it will show “save parameter?” before returning to main menu. Select ”YES” to save parameters.

5.1、Public parameters

No	Option	Definition	Default 值	Adjustment Range
1.1	SYSTEM TIME	\	\	Real time
1.2	BACKLIGHT	Min	Active	Active /1-30 Min
1.3	BRIGHTNESS REGULATION	Standby / work	15/30	0-100/10-100
1.4	PERMISSIONS VALID TIME	Min	Active	Active /1-30 Min
1.5	USER PASSWORD	\	1000	0000-9999

5.2、System parameters

No	Option	Definition	Default	Adjustment Range
2.1	NETWORK	Network Type	4NBL	4NBL
2.2	NOM.VOLT.	P-P Voltage	400	50-690V
2.3	APP	M-M:Mains to Mains Supply	M-M	M-M
2.4	RETURNS	Inhibit the automatic retransfer	Automatc retransfer to the priority source	Automatic retransfer to the priority source / Don't automatic retransfer to the priority source
2.5	NOM.FREQ.	Nominal network frequency	50 Hz	50/60Hz
2.6	POT PH.	Select and verify Phase Sequence	OFF	L1L2L3/ L3L2L1/ OFF
2.7	1RT	Source I Return Timer	3S	0-99S
2.8	1FT	Source I Failure Timer	3S	0-99S
2.9	2RT	Source II Return Timer	3S	0-99S
2.10	2FT	Source II Failure Timer	3S	0-99S
2.11	UND.U	Under-voltage threshold	85%	70-95%
2.12	UND.U.HYS	Under-voltage hysteresis	95%	75-100%
2.13	OV.U	Over-voltage threshold	115%	105-130%
2.14	OV.U.HYS	Over-voltage hysteresis	110%	100-125%
2.15	UND.F	Under- Frequency threshold	95%	80-99%
2.16	UND.F.HYS	Under- Frequency hysteresis	97%	88-100%
2.17	OV.F	Over- Frequency threshold	105%	101-120%
2.18	OV.F.HYS	Over- Frequency hysteresis	103%	100-119%

5.3、Switch setting：

No	Option	Definition	Default	Adjustment Range
3.1	Signal hold time	Pulse time of the opening and closing relay output	0.5S	0.1-20.0S
3.2	Action timeout time	When the output pulse is timed, If DI is not detected within the set time, the alarm is given	0.5S	0.1-90.0S
3.3	Interlock time	The waiting time of the interlock that before or after the closing of the TIE Breaker	0.5	0-2.0S

5.4、Programmable Control：

No	Option	Default	Adjustment Range
4.1	Digital Input		1-2
4.1.x.1	Input function		
4.1.x.2	Contact Type	NO	NO/NC
4.1.x.3	Input delay	0.05S	0.01-600.00S
4.2	Digital Output		0
4.2.x.1	Output function		
4.2.x.2	Contact Type	NO	NO/NC

Input function

Input Menu	Input code definition
Inhibit	Inhibit input function
Forced to pos. 0	The transfer switch is immediately driven to 0 position,and the controller in manu mode, meantime,when the input signal disappear,the controller feedback to auto mode
Priority	Priority network select; change S1 or S2 priority state when input is activated, return to current priority state when input is not activated
Remote control	Remote control is enable when input is activated
Remote position I	Switch transfer to position I when input is activated
Remote position II	Switch transfer to position II when input is activated
Remote position 0	Switch transfer to position 0 when input is activated
Test off load	Activates on an off load test,this will start/stop the generator without transferring the load to S2
Test on load	Activates on an on load test,this will start/stop the generator with transferring the load to S2
LS	Verify the generator don’t overload before transfer to S2

notes：INPUT1, INPUT2 and INPUT3 solidify for detecting Qs1, Qs2 and Qtie open or close state；INPUT4, INPUT5 and INPU6 solidify for detecting the fault state of Qs1, Qs2 and Qtie.

Output function

Output Menu	Output code definition
Inhibit	Inhibit output function
ATS ready	The output signal is activated when switch and controller are OK
SI available	The output signal is activated when SI available
SII available	The output signal is activated when SII available
Alarm	The output signal is activated when controller failure
Manu mode	The output signal is activated when controller in manu mode
Auto mode	The output signal is activated when controller in auto mode
Test mode	The output signal is activated when controller in auto mode
Position I	The output signal is activated when ATS in position I
Position II	The output signal is activated when ATS in position II
Position 0	The output signal is activated when ATS in position 0
Forced to pos. 0	The output signal is activated when ATS forced to 0 position
LS	Verify the generator don't overload before transfer to S2
ATS Source N	Auxiliary Source N
ATS Source A	Auxiliary Source A
ATS Source B	Auxiliary Source B
ATS Source C	Auxiliary Source C
Start generator	When APP is M-G/G-M, the mains source failure，the output signal is activated
Universal	The Communication control

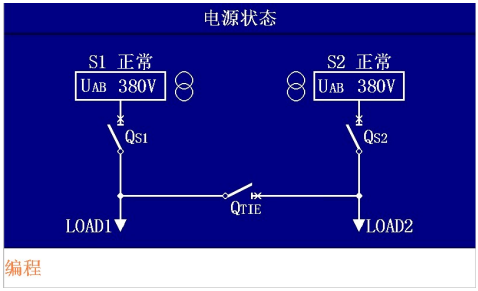
5.5、Communication parameters

No	Option	Default	Adjustment Range
6.1	Serial node address	3	001-254
6.2	Serial Baud rate	19200	2400/4800/9600/ 19200/38400
6.3	Data format	8N	8N/8O/8E/7O/7E
6.4	Stop bit	1	1/2

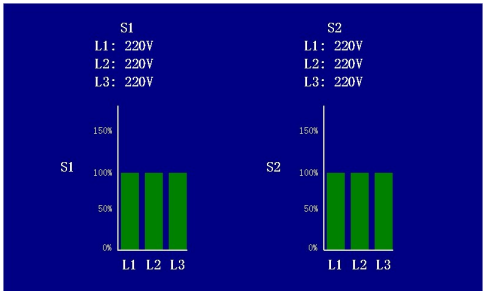
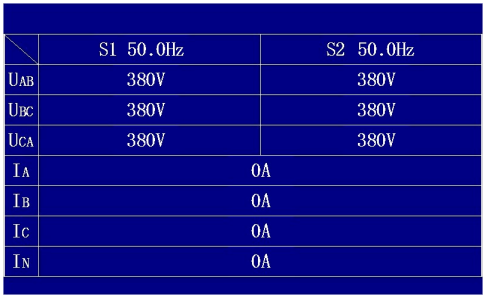
5.6、Language ：

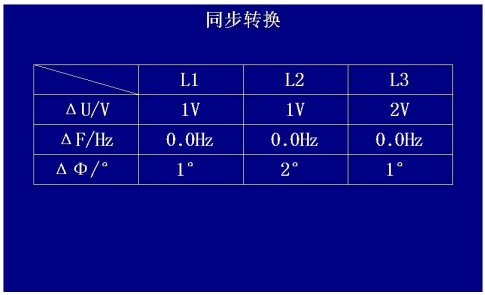
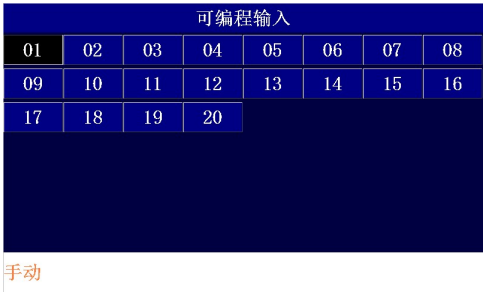
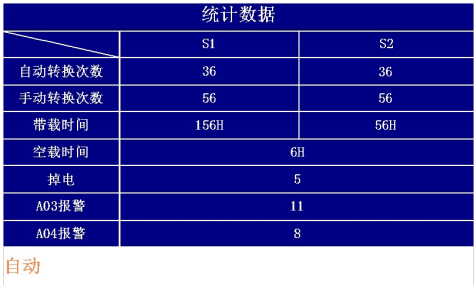
No	Option	Definition	Default	
6.1	Language setting	\	Chinese	Chinese/English

●Power supply status icon, refer to pic1

page	example	Note
Pic.1 Power supply status		

●Data display icon, refer to pic2-pic8

page	example	Note
Pic2 . Data display		Phase voltage(220V)
Pic3. Data display		Line voltage(380V)

Pic4. Data display		Data display of the required conditions for synchronous transfer
Pic5. Data display		Programmable input, if there is signal detected in 01 input port, then the 01 will be selected.
Pic6. Data display		Programmable output, if there is output action in 01 output port, the 01 will be selected.
Pic7. Data display		Statistic data

Pic8. Data display		Real time clock

●Alarm status icon, refer to pic9

page	example	Note
Pic9. Alarm status		Alarm status, If there is A01 alarm, A01 in the pic will be selected

●Commissioning icon, refer to pic9

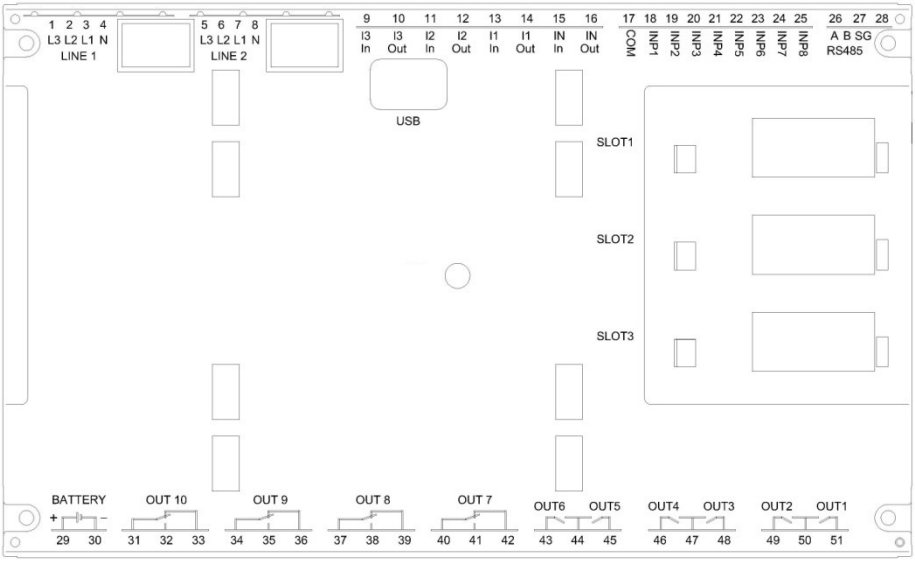
page	example	Note
Pic10. Commissioning menu		Simulation test

●Event record Icon, refer to pic11

page	example	Note

Pic11 Event record		Device Event record

6. Wiring diagram



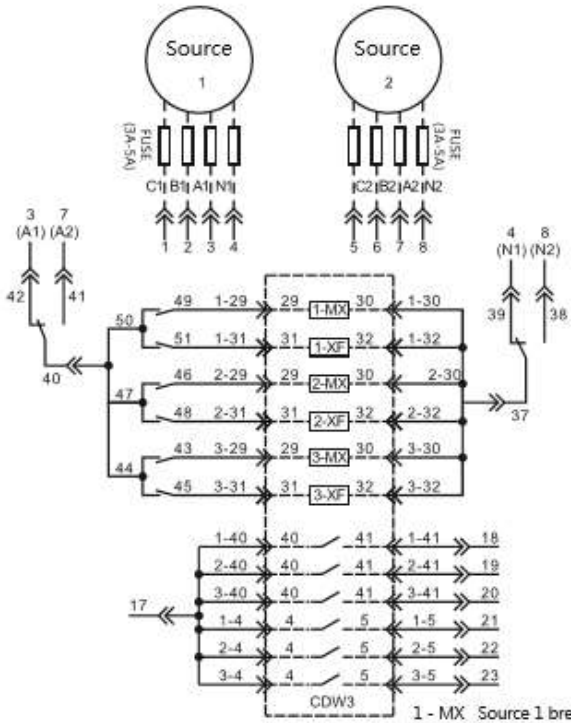
6.1 Terminal definition and description：

Terminal No.	Item	Function description	Note
1	L1	S1 AC 3-phase 4-wire voltage input	L1,N are AC power supply terminal.
2	L2		
3	L3		
4	N		
5	L1	S2 AC 3-phase 4-wire voltage input	L1,N are AC power supply terminal.
6	L2		
7	L3		
8	N		
17	COM	Module grounding	Module ground terminal
18	INPUT1	Break1 closure detection	Grounding effective
19	INPUT2	Break2 closure detection	
20	INPUT3	Break-TIE closure detection	
21	INPUT4	Break1 fault detection	
22	INPUT5	Break2 fault detection	

23	INPUT6	Break-TIE fault detection	
24	INPUT7	input port function defined by user	
25	INPUT8		
26	A	RS485 communication interface	RS485A
27	B		RS485B
28	SG		RS485 grounding
29	BATTERY+	Positive electrode of DC power supply	
30	BATTERY-	Negative electrode of DC power supply	
31	OUT10	Relay COM	auxiliary power output port 10A
32		Relay NO	
33		Relay NC	
34	OUT9	Relay COM	auxiliary power output port 10A
35		Relay NO	
36		Relay NC	
37	OUT8	Relay COM	Genset start output port 10A
38		Relay NO	
39		Relay NC	
40	OUT7	Relay COM	Programmable output port 10A
41		Relay NO	
42		Relay NC	
43	OUT6	Break-TIE OPEN	Programmable output port 10A
44	COM	43 and 45 Common	
45	OUT5	Break-TIE CLOSE	Programmable output port 10A
46	OUT4	Break2 OPEN	Programmable output port 10A
47	COM	46 and 48 Common	
48	OUT3	Break2 CLOSE	Programmable output port 10A
49	OUT2	Break1 OPEN	Programmable output port 10A
50	COM	49 and 51 Common	
51	OUT1	Break1 OPEN	Programmable output port 10A

6.2. Terminal diagram (ATSECM controller with air circuit breaker)

Electrical Schematic Diagram



1 - MX Source 1 breaker - shunt release
1 - XF Source 1 breaker - closing coil

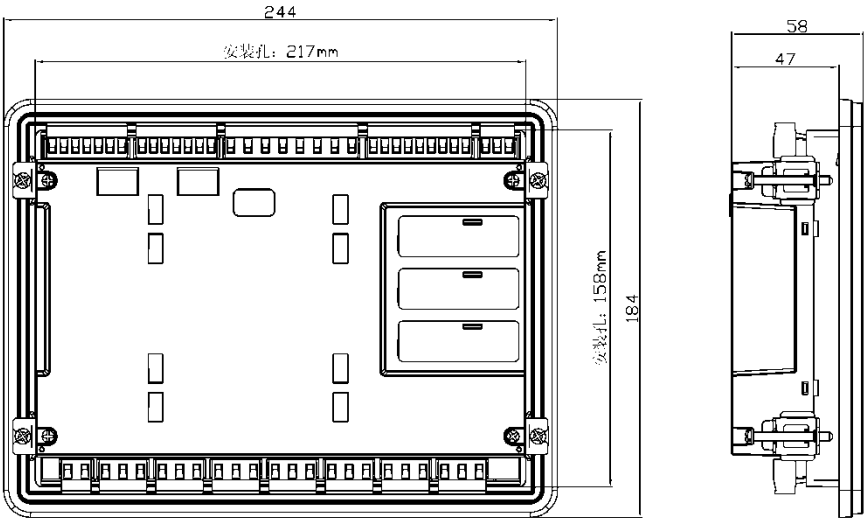
2 - MX Source 2 breaker - shunt release
2 - XF Source 2 breaker - closing coil

3 -MX bus tie breaker - shunt release
3 - XF bus tie breaker - closing coil

1-40 1-41 Source 1 breaker - Auxiliary contact
2-40 2-41 Source 2 breaker - Auxiliary contact
3-40 3-41 bus tie breaker - Auxiliary contact

Note
1: Default 4m cable
2: MX - shunt release 220VAC
XF - Closing coil 220VAC
OF3- Auxilary contact
AL - Alarm contact
3: The ACB must install with cabel interlock
4: out of dotted line is connect to ACB terminal by customer
5: ATS already have under & over voltage protection, do not install undervoltage release into ACB
6: Intelligent controller iTR326H, don't use MODBUS control ACB ON/OFF(MX+XF)
7: Not suitable for 1600 frame size

7. Mechanical dimension and panel opening



8.Technical parameters

1.AC supply: terminal 3,4 and 7,8	
Rated voltage	400VAC(LL)
Operating limit value	90-415VAC(LN)
Frequency	45-65Hz
Power consumption	10W
2.DC supply：terminal 29,30	
Rated battery voltage	24VDC
Operating limit value	10-30VDC
Max power consumption	10W
3.Digital input：terminal 17—25	
Input type	negative
Input current	≤8mA
Low input signal	≤1.0V
High input signal	≥3.0V

4.RS485 serial interface：terminal 26,27,28	
Interface Type	isolation
Baud rate	2400-38400bps
5、Output 31-33（OUT10）、34-36（OUT9）、37-39(OUT8)、40-42(OUT7)	
Contact Type	single-pole double throw
Rated value	DC：10A、30V，AC：10A、250V
6、Output 43(OUT6)、45(OUT5)、46（OUT4）、48(OUT3)、49(OUT2)、51(OUT1)	
Contact Type	single-pole single throw
Rated value	DC：10A、30V，AC：10A、250V
7.Working environment condition	
Working temperature	-25℃-70℃
Storage temperature	-30℃-80℃
Relative humidity	20%-93%
Max environmental pollution	Level 3