1. GENERAL WARNING

1.1 PLEASE READ BEFORE USING THIS MANUAL

- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described here under. It cannot be used as safety device.
- Check the application limit before proceeding.

1.2 Safety Precaution

- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation
- Warning: disconnect all electrical connections before any kind of maintenance.
- Fit the probe where it is not accessible by the End User. The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor.
- Consider the maximum current which can be applied to each relay.
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.

2. GENERAL DESCRIPTION

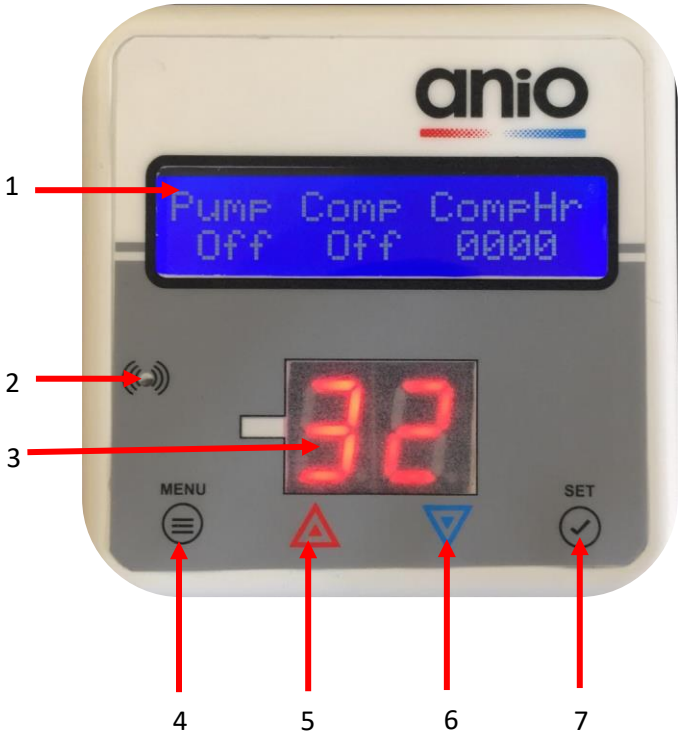
Single Phase Chiller/Heat pump Controller is a single unit for single phase voltage, current and refrigeration process. Capable of power monitoring (HV/LV/OL) and process temperature and protection (HP/LP/FS).

3. FEATUER & SPECIFICATION

- Phase Voltage Display
- Antifreeze Temperature Compensation*
- Cooling Transfer Function*
- Water/Oil/Coolant Temperature Display
- Block day mode
- HP and LP Protection
- Low Voltage Stabilization Sensing
- HV/LV protection
- Over Load Protection
- HT/LT Protection
- On Site Settable Parameter
- Suction and Discharge Temp sensing
- LCD Display
- Water temp lower limit lock
- Leakage Proof sensor
- Sensor Faulty alarm
- Password Protected Parameter

Feature	Specification
Display	2 Line LCD
Voltage Display	Phase Voltage with LV, HV, SPP fault Trip & Display
Current Display	Single Phase Current with O/L fault Trip & Display
Temperature Display	7 Segment 0.56” LED Display
Parameter Display	Comp. ON/OFF, Pump ON/OFF, Comp running Hr.
Power Supply	230 V AC 50 Hz
Temperature Probe NTC	
Water Temp:	-10°C to 99°C
Antifreeze Temp:	-10°C to 99°C
Suction Temp:	-10°C to 99°C (Optional)
Digital Input	
HP	Potential Free NO/NC Type
LP	Potential Free NO/NC Type
Flow Switch	Potential Free NO/NC Type
Relay Output	
Compressor	7A
Pump	7A
Alarm Relay (Trip Relay)	5A
Solenoid	5A
Indication	
Fault indication with LED and Buzzer	Yes

4. DISPLAY



Sl. No.	Item	Function
1	2 Line LCD	Display all running parameter and fault message
2	LED Buzzer	RED LED for fault indication with buzzer beep
3	7 Segment Display	Display Temp
4	Menu Button	To enter menu screen to change parameter
5	Increment Button	To increase the parameter value in Menu screen and to scroll the screen during normal running.
6	Decrement Button	To decrease the parameter value in Menu screen and to scroll the screen during normal running.
7	Enter Button	To go to next parameter in Menu screen and Reset during fault

5. DISPLAY CONTENT

Sl No.	Parameter			Details
1	Pump	Comp	Vol	Display Pump, Comp ON/OFF state and Phase voltage status.
	ON	ON	230	
2	SucT	AfT	Current	Display Suction, Anti-Freeze Temp, (If Suction and Discharge sensor connected)
	22.2	22.2	0.2	
3	DiscT		Comp. ON Hr	Display Discharge Temp. (If Discharge sensor connected) & Comp ON Hr.
	22.2		1234	

Sl No.	Model Available	Description
1	AN-10-P	Panel Mount
2	AN-10-PTP	Panel Mount with Trip Relay
3	AN-10-W	Wall Mount
4	AN-10-WTP	Wall Mount with Trip Relay

5. PARAMETER

SR No.	Parameter	UOM	Default	Min	Max
	User Parameter				
1	Wtr.Temp Set (Chiller)	°C	15	AFT Set Point	40
	Wtr.Temp Set (Ht Pump)	°C	20	20	AhT Set Point
2	Wtr. Temp Diff	°C	3	0	10
3	Screen Auto scroll	-	NO	NO	YES
	Factory Parameter				
4	Application Type	-	Chiller	Chiller	Heat Pump
5	Pump Over Load (Per Phase)	A	4	1	30
6	Comp. Over Load (Per Phase)	A	15	4	30
7	Low Voltage Cut	V	370	350	400
8	High Voltage Cut	V	480	400	500
9	Water Temp Offset	°C	10	0	20
10	Antifreeze Temp. Set point (Chiller)	°C	10	0	20
	Antifreeze Temp. Set point (Ht Pump)	°C	60	45	80
11	Antifreeze Temp. Offset	°C	10	0	20
12	Flow Switch Type	NO/NC	NO	NO	NC
13	HP Switch Type	NO/NC	NO	NO	NC
14	LP Switch Type	NO/NC	NO	NO	NC
15	Pump ON Delay	Sec	60	1	240
16	Compressor ON Delay	Sec	60	1	240
17	Flow Switch Sense Delay	Sec	10	1	100
18	Discharge Temp Set	°C	90	50	105
19	Discharge Temp Offset	°C	10	0	20
20	Suction Temp Set	°C	5	0	50
21	Suction Temp Offset	°C	10	0	20
22	Pump always ON	-	NO	YES	NO
23	Pump OFF Delay	Sec	10	0	240
24	Low Temp Limit	°C	10	-20	99
25	High Temp Limit	°C	40	0	99
26	Temp. Control For?	-	Water	Oil	Coolant

User Parameter Setting

Procedure-

a. Press menu key
b. Enter user password (default password (***)
c. Press Enter key to see and change parameter

6. PARAMETER SETTING

Sl. No.	Parameter			
	Water Temp Set (Chiller)			**Function**: To set the compressor turn OFF point at water temperature set point.
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
01	Wtr Set Point	50°C	15°C	

Sl. No.	Parameter			
	Water Temp Set (Heat Pump)			**Function**: To set the compressor turn OFF point at water temperature set point.
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
01	20°C	50°C	60°C	

Sl. No.	Parameter			
	Water Temp Differential			**Function**: To set the compressor turn ON point at water temperature increment from water temp set point.
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
02	0°C	10°C	03°C	

Sl. No.	Parameter			
	Screen Auto Scroll			**Function**: To set the screen display auto scroll ON/OFF.
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
03	Yes	NO	NO	

Factory Parameter Setting

Procedure-

d. Press menu key
e. Enter user password (default password (***)
f. Press Enter key to see and change parameter

Sl. No.	Parameter: **Application Type**			**Function**: To set the controller application type.
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
04	Chiller	Heat Pump	Chiller	

Sl. No.	Parameter: **Pump Over Load**			**Function**: To set per phase Pump over load current trip limit.
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
05	1 A	30 A	4 A	

Sl. No.	Parameter: **Comp Over Load**			**Function**: To set per phase Compressor over load current trip limit.
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
06	1 A	30 A	10 A	

Sl. No.	Parameter: **Low Voltage**			**Function**: To set the Low voltage (Line to Line) trip limit.
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
07	150 V	200 V	175V	

Sl. No.	Parameter: **High Voltage**			**Function**: To set the high voltage (Line to Line) trip limit.
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
08	240 V	300 V	280 V	

Sl. No.	Parameter: **Water Temp. Offset**			**Function**: To set the on-site water temperature sensor offset drift.
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
09	0°C	20°C	10°C	

Note-Please consider 10°C as center point and to compensate -1 set it to 9°C and for +1 set it to 11°C

Sl. No.	Parameter			**Function**: To set the AFT sensor cut off set point. (if Chiller Application Selected)
	AFT set Point			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
10	0°C	20°C	10°C	

Sl. No.	Parameter			**Function**: To set the Anti-Heat sensor cut off set point. (if Heat Pump Application Selected)
	AhT set Point			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
10	40°C	85°C	60°C	

Sl. No.	Parameter			**Function**: To set the on-site AFT sensor offset drift.
	AFT Temp. Offset			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
11	0°C	20°C	10°C	

Note-Please consider 10°C as center point and to compensate -1 set it to 9°C and for +1 set it to 11°C

Sl. No.	Parameter			**Function**: To set the Flow switch type.
	Flow Switch Type			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
12	NO	NC	NO	

Sl. No.	Parameter			**Function**: To set the HP switch type.
	HP Switch Type			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
13	NO	NC	NO	

Sl. No.	Parameter			**Function**: To set the LP switch type.
	LP Switch Type			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
14	NO	NC	NO	

Sl. No.	Parameter			**Function**: To set the Pump ON Delay.
	Pump ON Delay			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
15	NO	NC	NO	

Sl. No.	Parameter			**Function:** To set the Compressor ON Delay
	Compressor ON Delay			
	Min	Max	Default	**Procedure:** In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
16	1 Sec	240 Sec	10 Sec	

Sl. No.	Parameter			**Function**: To set the Flow switch sensing delay after Pump ON during starting.
	Flow Switch Sens Delay			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
17	1 Sec	100 Sec	10 Sec	

Sl. No.	Parameter			**Function**: To set the Discharge Temperature cut off point
	Discharge Temp. set			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
18	50°C	105°C	80°C	

Sl. No.	Parameter			**Function**: To set the on-site Discharge sensor offset.
	Discharge Temp. Offset			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
19	0°C	20°C	10°C	

Sl. No.	Parameter			**Function**: To set the Low limit of Suction Temperature cut off point.
	Suction Temp. set			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
20	0°C	50°C	5°C	

Sl. No.	Parameter			**Function**: To set the on-site Suction temperature sensor offset.
	Suction Temp. Offset			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
21	0°C	20°C	10°C	

Sl. No.	Parameter			**Function**: To set the Pump always ON (YES or NO) for continuous priming.
	Pump Always ON			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
22	Yes	NO	NO	

Sl. No.	Parameter			**Function**: To set the Pump Off delay if Pump Always ON is NO for delay time after compressor Off and Water Temp reach.
	Pump Off Delay			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
23	0 Sec	240 Sec	10 Sec	

Sl. No.	Parameter			**Function**: To set the Low Temp limit for protection purpose
	Low Temp Limit			
	Min	Max	Default	**Procedure**: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
24	0°C	Wtr Set Temp-1°C	0°C	

Sl. No.	Parameter			Function: To set the High Temp limit for protection purpose
	High Temp Limit			
	Min	Max	Default	Procedure: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
25	Wtr Temp Diff+2°C	40°C	18°C	

Sl. No.	Parameter			Function: To set the Temp Display for Water/Oil/Coolant.
	Temp. Control For?			
	Min	Max	Default	Procedure: In parameter screen press Up/Down key to increase/decrease value, then press Enter Key to save and moving to next parameter.
26	Oil	Coolant	Water	

7. Error Message

Sl. No.	Error Message	Description	Reset Option
1	Water Sensor Faulty	Water Temperature sensor not working	Manual
2	Voltage NOT OK	Input Voltage out of specification	Auto
3	Over Load	Total Load Current more than load current set limit.	Manual
4	Flow Switch Fault	Flow Switch trip.	Manual
5	HP Fault	HP Trip	Manual
6	LP Fault	LP Trip	Manual
7	Suc Temp Fault	Suction Temperature reached below to set limit	Manual
8	Dis Temp Fault	Discharge temperature reached above to set limit.	Manual
9	Wtr Snsr Opn/Shrt	Water Temperature sensor short/Open	Manual
10	AFT Snsr Opn/Shrt	AFT sensor short/Open	Manual
11	Dis Snsr Opn/Shrt	Discharge Temperature sensor short/Open	Manual
12	Suc Snsr Opn/Shrt	Suction Temperature sensor short/Open	Manual
13	Low Voltage Fault	Low Voltage Trip	Auto
14	Low Temp Fault	Reaching low temp limit	Auto
15	High Temp Fault	Reaching high temp limit	Auto

Contact Us

M/S Saayan Technologies, Pune

www.saayan.in

mob: +91-9632099005

niranjan.sahoo@saayan.in