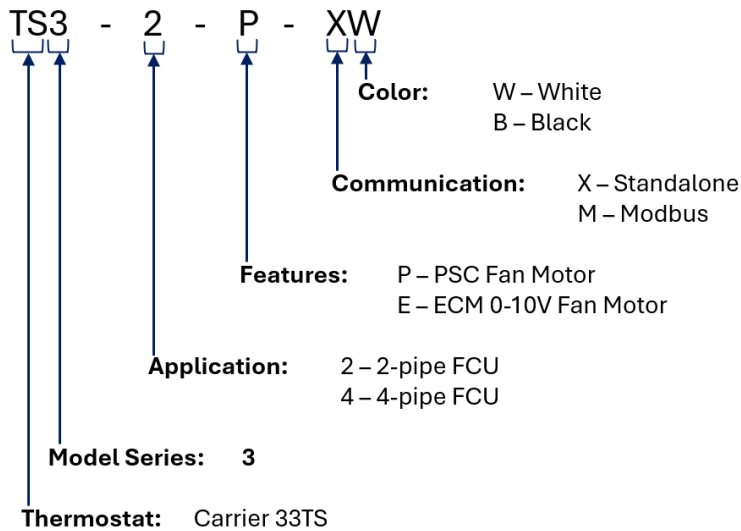


Identification and Overview

TS3 series thermostats feature a simple and sleek appearance design with white and black color options. Equipped with a TFT color touchscreen display, it controls regulating valves plus ECM and AC three-speed fans with enhanced temperature control precision. The -BW/MW series is additionally equipped with an RS-485 interface, allowing integration with building automation systems via the BACnet MS/TP / Modbus-RTU protocol.



Part Number	FCU Type	Fan Type	Valve Type	After Temp Setpoint Achieved	Key Card	External Sensor	Protocol	Color
TS3-2-P-XW	2-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•	•	Standalone	White
TS3-4-P-XW	4-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•		Standalone	White
TS3-2-E-XW	2-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•	•	Standalone	White
TS3-4-E-XW	4-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•		Standalone	White
TS3-2-P-MW	2-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•	•	Modbus	White
TS3-4-P-MW	4-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•		Modbus	White
TS3-2-E-MW	2-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•	•	Modbus	White
TS3-4-E-MW	4-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•		Modbus	White
TS3-2-P-BW	2-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•	•	BACnet	White



TS3 Thermostats Specification

TS3 – 7/16/2026

TS3-4-P-BW	4-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•		BACnet	White
TS3-2-E-BW	2-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•	•	BACnet	White
TS3-4-E-BW	4-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•		BACnet	White
TS3-2-P-XB	2-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•	•	Standalone	Black
TS3-4-P-XB	4-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•		Standalone	Black
TS3-2-E-XB	2-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•	•	Standalone	Black
TS3-4-E-XB	4-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•		Standalone	Black
TS3-2-P-MB	2-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•	•	Modbus	Black
TS3-4-P-MB	4-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•		Modbus	Black
TS3-2-E-MB	2-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•	•	Modbus	Black
TS3-4-E-MB	4-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•		Modbus	Black
TS3-2-P-BB	2-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•	•	BACnet	Black
TS3-4-P-BB	4-pipe	PSC	ON/OFF or 0-10V	Fan Continues to Operate	•		BACnet	Black
TS3-2-E-BB	2-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•	•	BACnet	Black
TS3-4-E-BB	4-pipe	ECM	ON/OFF or 0-10V	Fan Continues to Operate	•		BACnet	Black

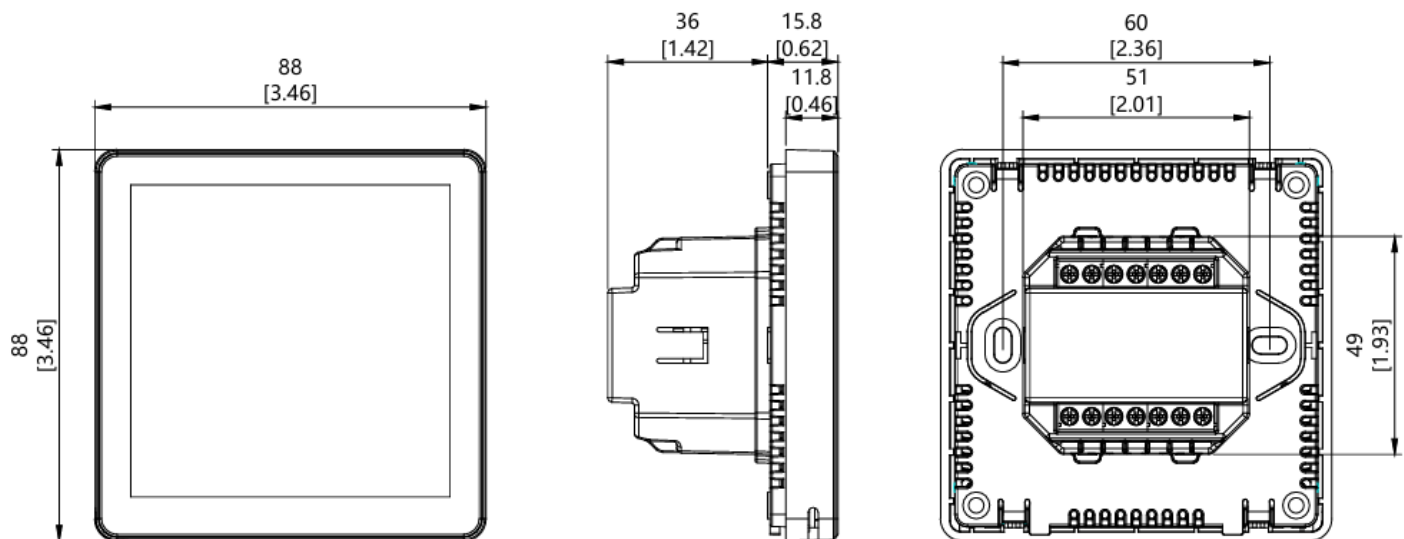
Specifications

Product Type	FCU Thermostat
Application Options	2-pipe or 4-pipe FCU; 3-speed (PSC) or 0-10V (ECM) fan control; ON/OFF and 0-10V valve control
Communication Options	Standalone, Modbus RTU, or BACnet MS/TP (EIA-485 A, B wiring terminals), with baud rates up to 115,200 bps Recommended Max. of 32 devices
Power Requirements	Supply: AC 90–240VAC (L,N), 50/60Hz Max. Load Current: < 5 A (Resistive) , < 2 A (Inductive) Consumption: < 1W
Wiring Termination	Max. cable 2.5 mm ² per terminal
Display	TFT Color Touchscreen with Metric Units (°C)
Input	AI - Remote Temperature Sensor (low voltage) DI – Keycard Accessory (Dry Contact Input)

TS3 – 7/16/2026

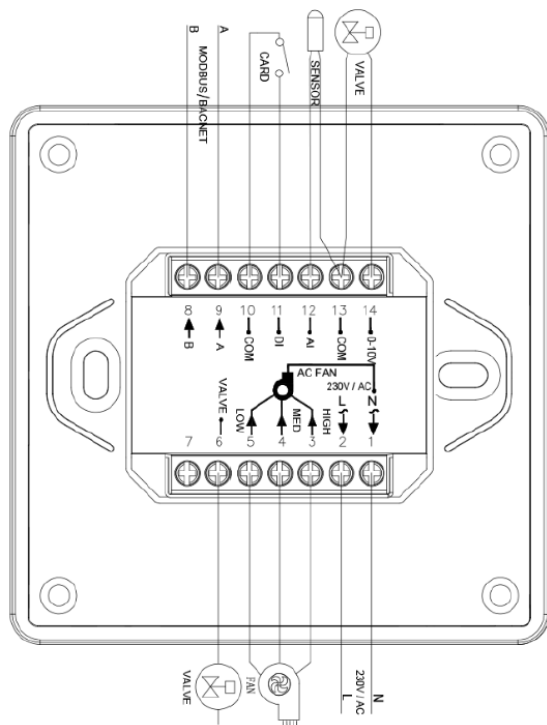
Output	L, M, H, Valve, 0-10V (2-Pipe, PSC/AC Fan) L, M, H, C-Valve, H-Valve, 0-10V, 0-10V (4-Pipe, PSC/AC Fan) 0-10V (EC Fan), Valve, 0-10V (2-Pipe, ECM Fan) 0-10V (EC Fan), C-Valve, H-Valve, 0-10V, 0-10V (4-Pipe, ECM Fan) Minimum Load = 0.5 ohms Maximum Load = <5A (resistive), <2A (inductive) Supports line voltage (90-240VAC) for fan speed and valve control.
Environmental Operating Range	0°C to 50°C, Humidity: 5–85% RH (non-condensing)
Compliance	CE mark, LVD 2014/35/EU, EMC 2014/30/EU, RoHS 2011/65/EU, REACH #1907/2006
Enclosure	PC+ABS UL94-5 Fire Retardant, IP30 rated, 86(H) × 86(W) × 16.75(D) mm
Scheduling	7-day/multiple periods per day
Temperature Sensor	Accuracy: ±1°C Range: 5 to 35°C
Humidity Sensor	Accuracy: ±5% Range: 0-100%
Display Resolution	±0.5°C
Setpoint Range	5°C – 35°C
Mounting	Standard 60 mm wall box mounting

Dimensional Drawing



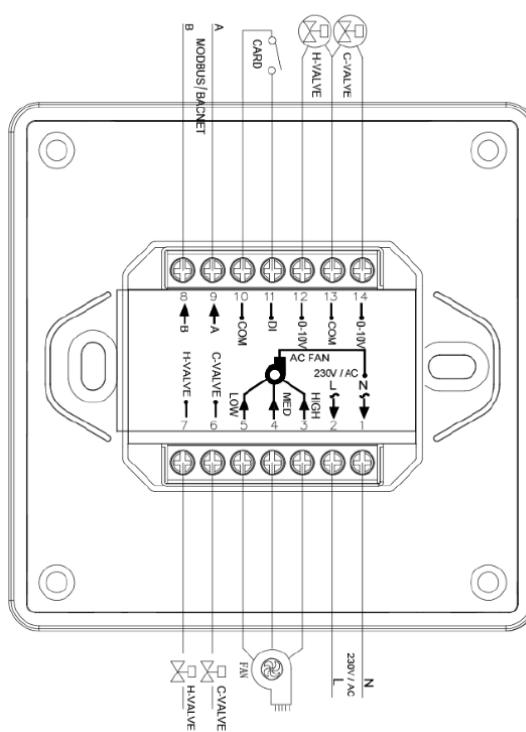
Wiring Diagram

2-pipe with PSC Motor



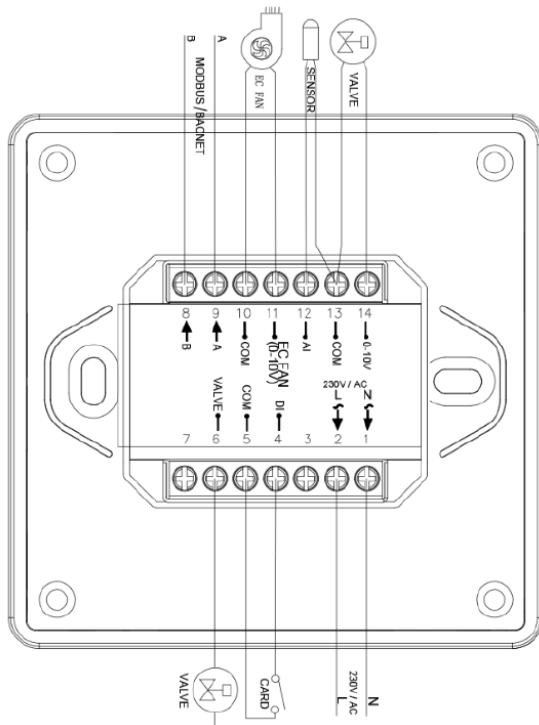
- For standalone models, there is no A, B terminals
- For Modbus/BACnet models the terminals are 8, 9

4-pipe with PSC Motor

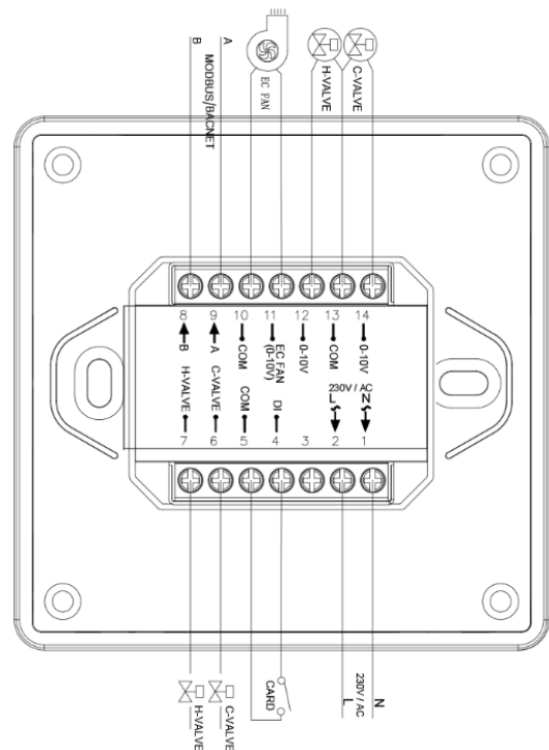


- For standalone models, there is no A, B terminals
- For Modbus/BACnet models the terminals are 8, 9

2-pipe with ECM Motor



4-pipe with ECM Motor



- For standalone models, there is no A, B terminals
- For Modbus/BACnet models the terminals are 8, 9

- For standalone models, there is no A, B terminals
- For Modbus/BACnet models the terminals are 8, 9



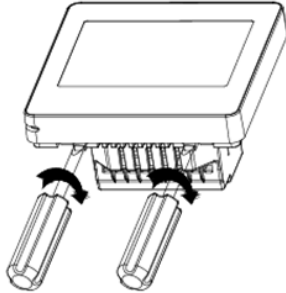
Warning Risk of electric shock and property damage. Disconnect power supply before making any and all electrical connections. The installation and troubleshooting is to be performed by a qualified electrician only.



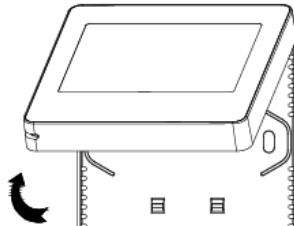
Caution If a normally closed two-wire valve is used, connect only the **Open** terminal. For **2-pipe models**, **Terminal 14** must use shielded wire, with **Terminal 13** used as ground. For **4-pipe models**, **Terminal 12** and **Terminal 14** must use shielded wire, with **Terminal 13** used as the ground connection. Communication terminals **A (Terminal 8)** and **B (Terminal 9)** require shielded twisted-pair cable. All **AI**, **DI**, **valve output**, **ground**, and **communication terminals** are low-voltage and must not share conduit with **AC 220V high-voltage wiring**. For **2-pipe models**, low-voltage terminals include **AI (Terminal 12)**, **DI (Terminal 4)**, **Valve Output (Terminal 14)**, and **Ground (Terminal 13)**. For **4-pipe models**, low-voltage terminals include **DI (Terminal 4)**, **Valve Output (Terminal 12)**, and **Ground (Terminal 13)**. Always separate low- and high-voltage wiring to prevent damage to the thermostat.

Installation Diagram

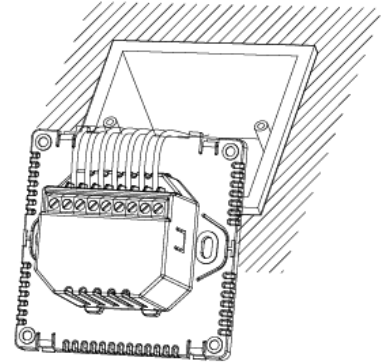
Step 1: Lift housing by utilizing a screw driver



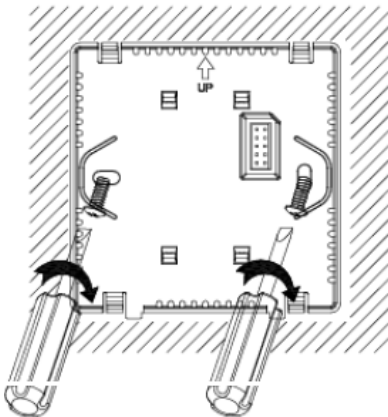
Step 2: Open the housing



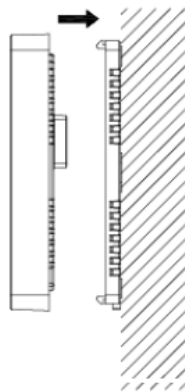
Step 3: Wire the cables to the terminals



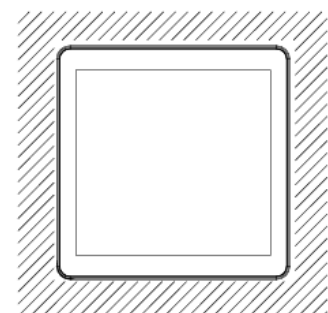
Step 4: Fasten the wall plate to the surface



Step 5: Attach the thermostat to the wall plate

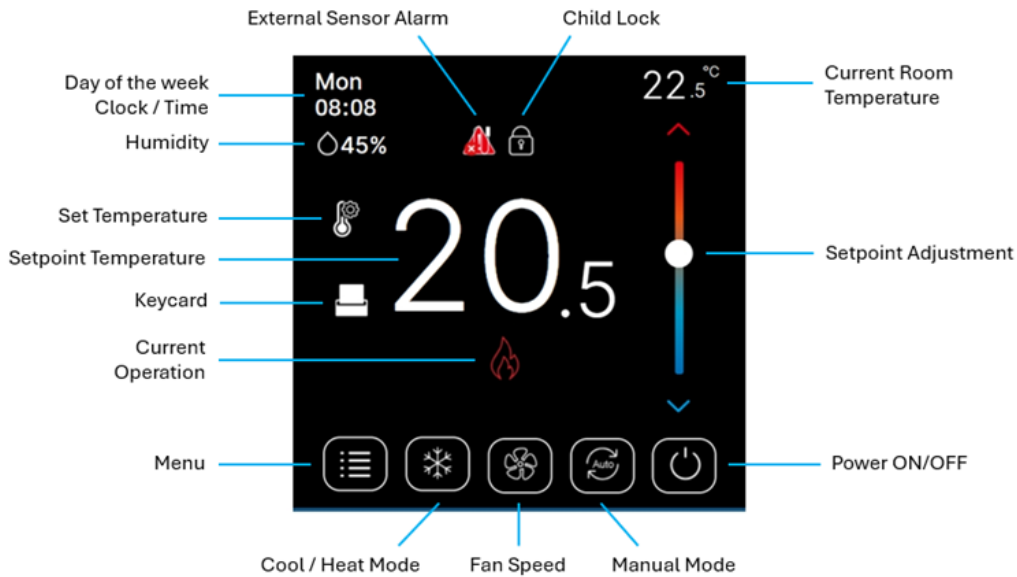


Step 6: Installation is complete



This product must be installed by a professional. Read this manual carefully before installation. Improper installation will cause damage to the equipment. Wire correctly in strict accordance with the wiring diagram.

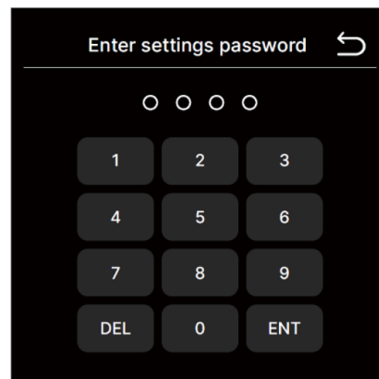
User Interface Description



Standby screen, room temperature

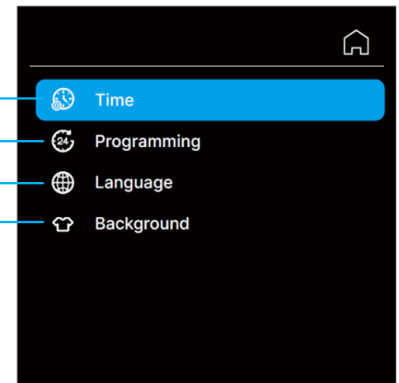


Hold the menu button 5 seconds to enter the password "1915" to enter the installer setting.

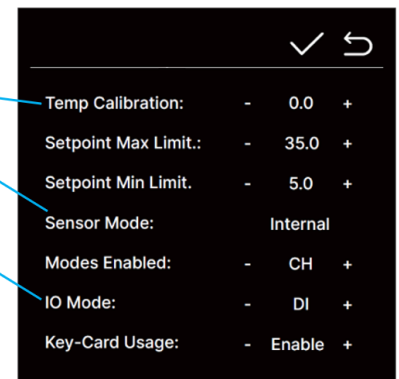


Short-press menu button to enter user menu:

- Day/Clock/Time Setting
- 7 days 6 periods schedule setting
- Select device language
- Select Home Page background



- Calibrate Room Temperature
- Select Working Mode
- 4-Pipes Only – Select the IO contact as room card or external sensor. Corresponding menu appears / disappears based on the setting



- Fan continues to operate at low speed when setpoint is reached or OFF when temperature is satisfied.
- Deadband / Hysteresis setting
- PWM setting for the 0-10V valves

- PWM setting for the 0-10V valves
- Set range for 0-10V valves
- Standby Backlight

BACnet Parameters Configuration for BACnet SKU only

Setting the percentage of 0-10V for the EC Fan Motor

BACnet Parameters Configuration for BACnet SKU only

When the device is BACnet, it can be configured as Modbus

Parameter Configuration

The TS3 series thermostat shows parameter configuration menu directly from the home screen.

BACnet Protocol

Serial	Register type	R/W	Name	Type	Object ID	Description
1	AI	R	RoomTemp	float	0	Current room temperature
2	AI	R	ExternalTemp	float	1	Current external sensor temperature
3	AI	R	Humidity	float	2	Current humidity
4	AI	R	ECOut	uint	3	EC fan output voltage, range 0~100, data=ECout*0.1
5	AI	R	ColdPIOut	uint	4	Cool valve output voltage, range 0~100,data=ColdPIOut*0.1
6	AI	R	HeatPIOut	uint	0	Heat valve output voltage, range 0~100,data=HeatPIOut*0.1
7	AV	RW	SetTemp	uint	0	Set temperature
8	BI	R	CardSta	Boolean	0	Room card status: Insert (1) or Remove (0)
9	BV	RW	ON-OFF	Boolean	1	Power on(1)/off(0) control

Serial	Register type	R/W	Name	Type	Object ID	Description
10	BV	RW	Lock	Boolean	0	Child lock activate 1: on 0: off
11	MI	R	RelaySta	uint	0	Relay status bit 0~7: 1:on 0:off bit 0: low speed bit 1: mid speed bit 2: high speed bit 3: valve 1 status bit 4: valve 2 status bit 5~7: reserved function
12	MI	R	Main_SV	uint	1	Host software version; Bit addressing; e.g. V1.0 High 8 bits:sub version e.g. -0 Low 8 bits: main version e.g. -1
13	MV	RW	NowWorkMode	uint	0	Current operating modes of the equipment: 1=Ventilation 2= Cooling 3=Heating 4=Automatic (4-pipe only)
14	MV	W	FanSpeed	uint	1	Fan speed control 1=auto 2=low 3=mid 4=high
15	MV	RW	TempAdjustMode	unit	2	Temperature control modes; 1 =Manual mode 2 =Programmable mode
16	MV	RW	Logochoose	unit	3	The enumerated values are as follows: 1=Automated Logic logo 2=Carrier logo 3=No brand logo

Modbus Protocol

No.	Address	Item	R/W	Description
1	40000	POWER ON/OFF	RW	= 55H ON = AAH OFF
2	40001	Child lock ON/OFF	R	= 55H ON = AAH OFF
3	40002	Current working mode	RW	= 00H: Ventilation = 11H: Cool mode = 22H: Heat mode = 33H: Auto (4-pipe only)
4	40003	Fan speed	RW	= 00H: Auto = 01H: Low speed = 02H: Mid speed = 03H: High speed



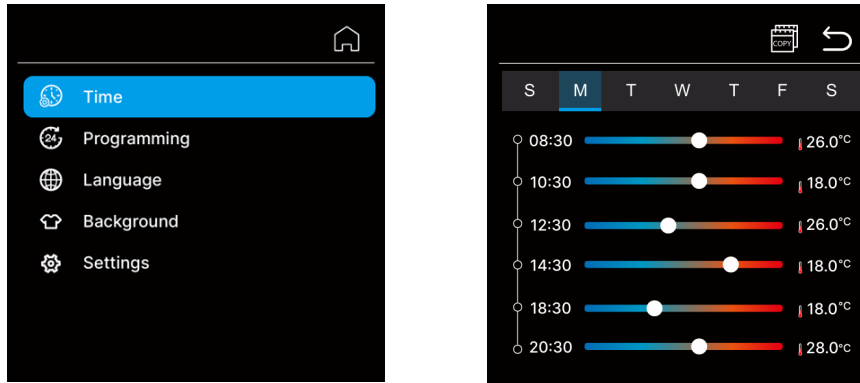
5	40004	Relay status	R	bit0~15; value 1: ON, 0:OFF bit0: Low speed relay bit1: Mid speed relay bit2: High speed relay bit3: Valve1 status bit4: Valve2 status bit5~15: reserved function
6	40005	Room temp	R	Data = RoomTemp * 10
7	40006	Set temp	RW	Data = TargetTemp * 10
8	40007	Room card status	R	= 0: out = 1: in
9	40008	External sensor temp	R	Data = ExternalTemp * 10
10	40009	Cool PI Output	R	Cool valve output voltage, range 0~100,data=ColdPIOut*0.1
11	40010	Heat PI Output	R	Heat valve output voltage, range 0~100,data=ColdPIOut*0.1
12	40011	EC (0~10V) fan output setting	R	EC fan output voltage,range 0~100,data=ECout*0.1
13	40012	Software version	R	e.g. V1.0.2 bit15~12: first number, eg. = 1 bit11~8: second number, eg. = 0 bit7~0: third number, eg. = 2
14	40013	Humidity	R	0~100%
15	40014	Temperature setting mode	RW	= 0: manual mode =1: schedule mode
16	40015	Logo selection	RW	= 01H: Automated Logic logo = 02H: Carrier logo = 03H: no brand logo

NOTES

- Modbus Register Address mentioned in the table above is for controller Modbus setting “**Register Address start with 0**”.
- FWEX and Gen5 devices with **Register Address start with 1**: Increase by 1 from the mentioned register address .(For example: for reading the Power On/Off value, configure the register address as 40001).
- Gen5 devices: Enabling the **Restrict Coil and Register Commands** setting precludes you from including some Modbus devices on the same serial network. This is particularly relevant for devices that contain datatypes requiring multiple register writes, such as “float” and “float32”, commonly present in Variable Frequency Drivers (VFDs)

Functions and Logic Control

Setting the Clock and Schedule



1. To set the schedule use the sliders to select the correct temperature setpoint.
2. Select the **Day** and then customize the temperature setpoint for each time period.
3. Press **Copy**  to copy a day's schedule to another day.

NOTE The schedule function is intended only for setting the setpoint (i.e., 4/6 time periods per day can be configured with specific setpoints for those time periods). It is not designed for the On/Off function or typical BACnet Schedule objects.

Manual / Auto Mode Setting

To select manual or auto (programming – schedule) mode, short touch the  or  icon on the home screen.

Thermostat Working Modes

1. Press **Working Mode**  on the home page to switch to different modes (ie. Heat, Cool, Auto).
2. Hold for 5 seconds and then click **On**.
3. To enter **Settings** menu item, you must enter the password code. The code is 1915.

Function	Description
Temperature control	HVAC equipment is controlled by the internal temperature sensor and thermostat programming. If a remote temperature sensor is connected, the advanced configuration parameter must be configured so the same programming is utilized.

Function	Description
HVAC Equipment Mode	 Select Mode to switch between the selected modes. Available modes are: - Heat - Cool - Ventilation - Auto (<i>4-pipe only</i>)
Valve control	Thermostats are compatible with ON/OFF type valve or PWM valve (0-10V). Follow the PID settings in the advanced configuration parameter menu (installer menu) to configure the PID values for the valve. - In cooling mode, when the room temperature is higher than the set point + differential (1°C by default), the cooling valve is opened. When the room temperature drops to the set point, the cooling valve closes. - In heating mode, when the room temperature is lower than the set point-differential (1°C by default), the heating valve is opened. When the room temperature rises to the set temperature, the heating valve closes.
PSC / AC Fan control	The fan is controlled by 3 x outputs (Low, Medium, High or L, M, H terminals). Each output regulates the speed of the fan when the fan is set to ON. If the fan is OFF or the thermostat is OFF, no operation of the HVAC equipment occurs. The fan outputs are controlled via ~230V power supply. The fan speed can be controlled manually or automatically if selected and available. - In manual mode, the  icon allows the user to select the fan speed, regardless of room temperature. - In automatic mode, the thermostat will adjust the speed according to the room temperature. Fan status after valve closing: Fan continues to operate/run after setpoint is reached
ECM Fan control	The fan is controlled by 0-10V (EC Fan terminal). The thermostat provides a 0-10V modulating output with a default value of 3V / 6V / 10V for 3 x speeds. The value is configurable in the advanced configuration parameter menu. The fan speed can be controlled manually or automatically if selected and available. - In manual mode, the  icon allows the user to select the fan speed, regardless of room temperature. - In automatic mode, the thermostat will adjust the speed according to the room temperature. Fan status after valve closing: Fan continues to operate/run after setpoint is reached
Digital Input (DI) / Analog Input (AI)	When a thermostat is activated and disconnected, the thermostat turns off (showing OFF), and closes the valves and fans. When the digital signal is on again, the thermostat returns to its previous status (if ON, it returns to ON, if OFF it returns to OFF).
Room Temp source	The AI input is a wired external sensor contact that uses the NTC 3950 10K temperature sensor. You must select the external sensor on the display. The thermostat runs the logic based on the external sensor value.
Deadband	The temperature sensor reads the room temperature every 5 seconds. Place the sensor in a well-ventilated area, away from the heating components of the PCB to ensure it reads correctly.

Function	Description
Freeze Protection	A hysteresis value allows the thermostat to not open/close immediately based on the setpoint temperature and room temperature difference (for example, when the deadband is 0, and when setpoint temperature > room temperature, valves open for heating mode). When the deadband is set to 1, the valve only opens when setpoint temperature > room temperature + 1, the deadband allows the room temperature to stay comfortable.
4 pipe Auto Mode	When the system is configured as a 4 pipe application, the control and the mode is set to cool and heat (auto); manual switching mode is prohibited. The thermostat automatically switches between cooling and heating modes according to the set point and room temperature.
Auto fan speed	When set to Auto fan speed the system operates the fan speed automatically based on the room temperature and setpoint temperature difference (for example, in cooling mode, deadband = 1°C, low speed: when setpoint temperature < room temperature - deadband (1°C) , mid speed: when setpoint temperature < room temperature - deadband (1°C) - 1°C , high speed: when setpoint temperature < room temperature - deadband (1°C) - 2°C).

Faults and Alarms

Display	Failure Type
	Remote Sensor Failure

Environmental Protection

Dispose of this thermostat in accordance with local regulations and guidelines. This product has an onboard battery and must be recycled accordingly.

- Do not dispose with ordinary waste
- Never recharge non-rechargeable batteries or throw them into a fire
- Do not expose thermostat/battery to high temperatures or direct sunlight
- Do not incinerate

Troubleshooting

Issue	Recommendation
Error message: “Error: 20 – No connection available when modifying communication settings (e.g., refresh rate, communication status enabled, register address, etc.) and writing values from the WebCTRL Network Points page”. NOTE This issue occurs only when a user has a Gen5 device and more than 10 Modbus Thermostats are connected.	• All required parameters and Points must be configured with the necessary communication settings (e.g., refresh rate, communication status enabled, address, etc.) before downloading to the controller. • Any modifications to the communication parameter settings on the Network Properties page require the controller to be re-downloaded to resolve the error and ensure the thermostat functions properly



Appendix – Symbols Key

 Warning	Potential for death, serious injury, or permanent damage to a system.
 Caution	Potential for injury, damage to a system, or system failure.
 Tip	Useful information not related to injury or system damage.