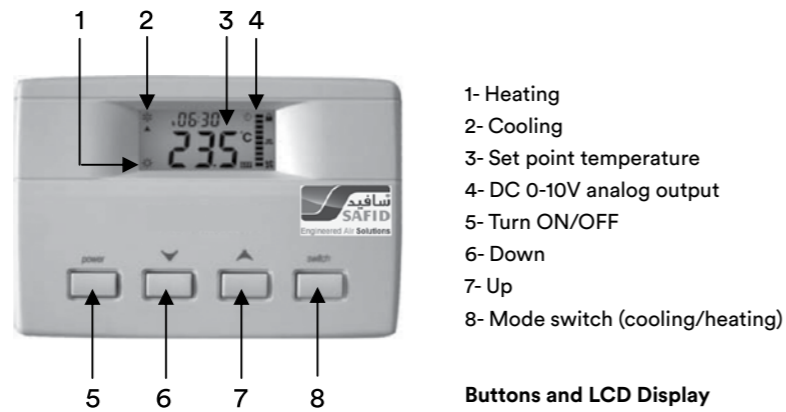


DIGITAL THERMOSTATS FOR AIR TERMINAL UNITS



DIGITAL ROOM THERMOSTAT

Propotional Action Control for VAV and Bypass Air Terminal Units F2000LV-A Series



Models and Descriptions

Type	Model	Characteristics
Room Thermostat VAV, CAV systems Power Supply	F2000LV-A-N	1X0-10V output for an actuator of VAV or Bypass air terminal with cool/heat manual switch.
	F2000LV-A01	1x0-10V output for an actuator, 1X on/off contact output for a 1-stage heater. Cool/heat manual switch.
	F2000LV-A02	1x0-10V output for an actuator, 2X on/off contact output for a 2-stage heater. Cool/heat manual switch.

Standard Features

- Designed to control the room temperature for VAV and Bypass air terminals with 1x0-10V VDC output to cooling/heating or 2x0-10 VDC outputs to cooling and heating dampers. Also one or two relay outputs to control one or two stages electric aux. heater.
- LCD can display working status such as room temperature, set point, analog output, etc. Makes reading and operating easy and accurate
- All models feature user-friendly setting buttons.
- Up to two -stage electric aux. Heater control makes temperature controlling more accurate and energy saving.
- Large set point adjustment, the min and max limit of temperature preset by end users.
- Low temperature protection.
- Celsius or Fahrenheit degree selectable.
- Cooling/heating mode auto changeover or manual switch selectable.
- 12 Hours Timer Option can be preset 0.5-12 hours to turn off the thermostat automatically
- Two parts structure and quick wire terminal blocks make mounting easy.
- Infrared Remote Control (Optional)
- Blue backlight (Optional)
- RS 485 communication interface (optional) makes the thermostat connection with a PC or the center control system.

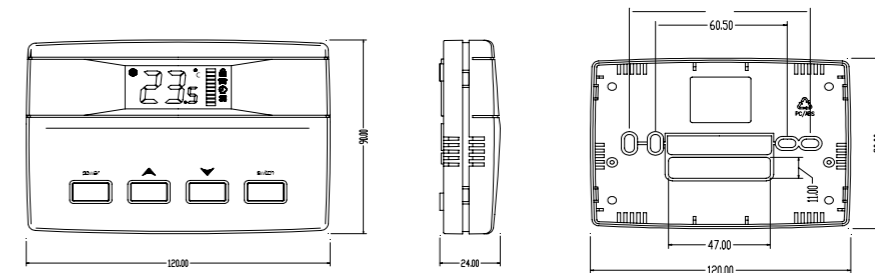
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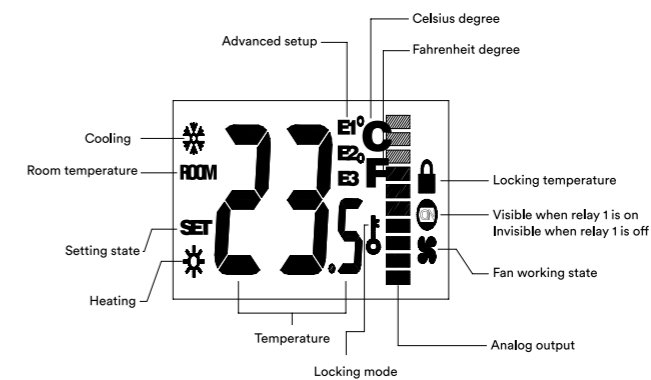
Standard Specifications F2000LV-A Series

Power Supply	24 VAC ± 20% 50/60HZ
Electrical Rating	2 amp load per terminal
Sensor	NTC 5k
Temperature control range	5 - 60°C (41 -95°F)
Accuracy	± 0.5°C (1°F) @ 25°C
Analog Output	One or two analog outputs Voltage DC 0V-DC 10V Current 1 mA
Protection Class	IP30
Environment Condition	Operating temperature: 0 - 50 °c Operating humidity: 5 - 99% RH Storage temperature: -10 - 60°C Storage humidity: <95% RH
Display	LCD
Net Weight	240g
Dimensions	120mm(L)x90mm(W)x24mm(H)
Material and Colors	PC/ABS Fireproofing house with white color
Mounting Standard	Mounting on the wall, or 2"x4" 65mmx65mm pipe box

Mounting and Dimensional Details



LCD Display Details

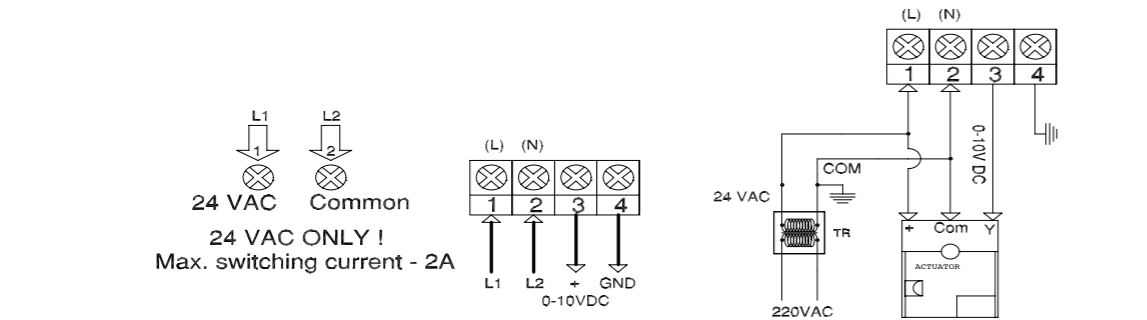


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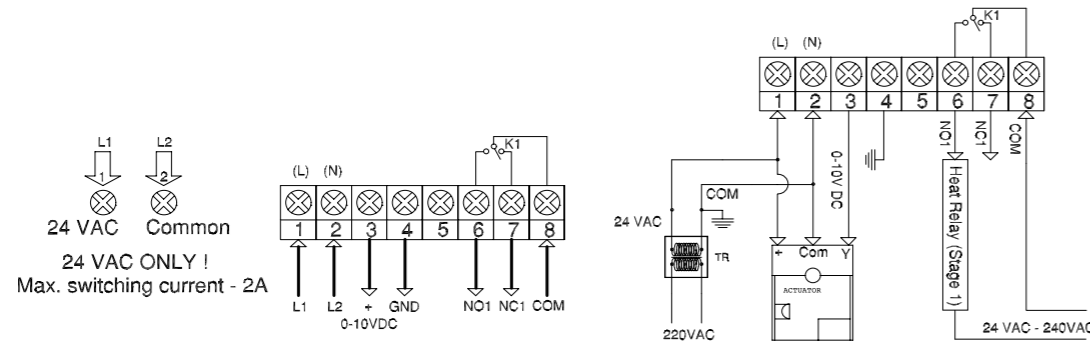
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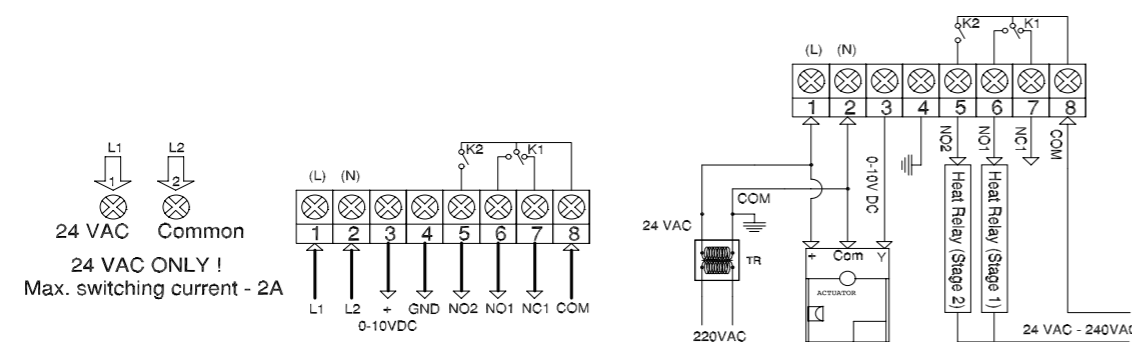
Wiring Layout - F2000LV-A-N - Thermostat for an Actuator Only (Without Heater)



Wiring Layout - F2000LV-A01 - Thermostat for an Actuator and 1-Stage Heater



Wiring Layout - F2000LV-A02 - Thermostat for an Actuator and 2-Stage Heater



With 1X Analog and Optional One or Two On/Off Outputs

User's Manual

Model: F2000LV-A-N, F2000LV-A01, F2000LV-A02

Important Safety Information

- Always turn off power before mounting, removing, and cleaning thermostat.
- Read all of the information in this manual before mounting the thermostat.
- Notice of the supply power voltage of the thermostat is 24 VAC. Do not mount it on voltages higher than 24VAC±10%.

Mounting and Wiring

- Cut off power and simultaneously depress the 2 clips on either of the sides of the thermostat gently with your nails or other unsharp tools to open the thermostat cover.
- Mount the thermostat on the wall, 1.2-1.3 meter above the floor. Do not behind a door, in a corner, in direct sunlight, or near any heat or steam generating fixtures.
- Mount the wall plate first and make sure wires will be drilled through holes on the wall plate. See Fig 1. There are two dimensions usable.
- Connect wires to terminal strip. Wiring diagrams is as figure 2 and figure 3. K1 means the 1st stage relay, and K2 means the 2nd stage relay. K2 is useless for F2000LV-A01, K1 and K2 are useless for F2000LV-A-N.
- Mount the cover on the wall plate.

Operation

1. After electrifying, OFF displays on the right-down corner of LCD.

Buttons and LCD Display

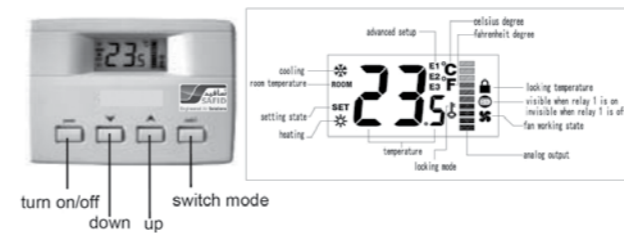


Figure 3. Connection

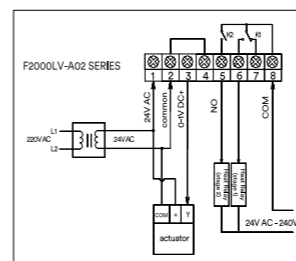
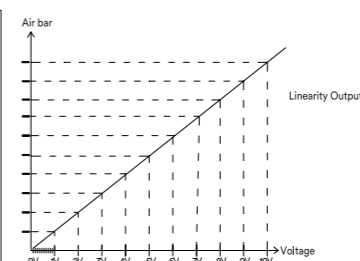


Figure 4. Analog Output



2. Press **power** key to turn on the thermostat. Then room temperature displays on LCD. Press **▲** or **▼** to see the set point.
3. Setting temperature: press **▲** or **▼** key and 0.5° changes each time. When adjusting, the number of temperature is blinking, it indicates that the set point is not be confirmed until 6 seconds, it stops to blink and return back to display room temperature. Then the setting is confirmed. The range of adjusting temperature is from 5° to 35°.
4. Locking set point: Press **▼** and **▲** keys at the same time about 5 seconds, then the **🔒** symbol appears on the right top of LCD and the temperature is locked. After that, you cannot adjust set point.
5. Unlocking set point :Under the locking mode, press **▼▲** keys at the same time about 5 seconds until **🔒** disappears and the temperature is unlocked. Then you can adjust the room temperature as you want.
6. Switch working mode: Press **switch** key to switch heating **🔥** or cooling **❄️**. After the working mode has been selected and its symbol blinks on the left of LCD for about 6 seconds, the mode is confirmed.
7. Lock the working mode of cooling or heating: press **switch** for more than 6 seconds up to **🔒** symbol appearing on the right of LCD. It means that the working mode is locked successfully. Now you cannot switch working mode by pressing **switch** key.

Figure 1. Wall Plate

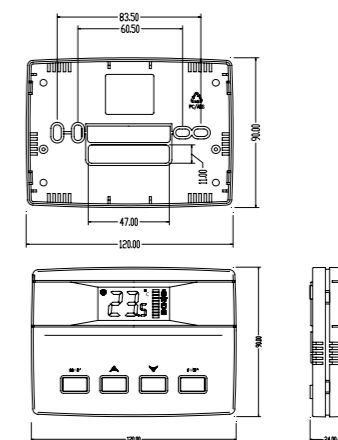
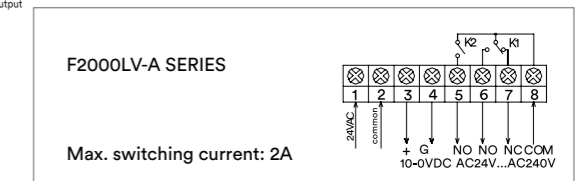


Figure 2. Wiring Diagram



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With 1XAnalog and Optional One or Two On/Off Outputs

User's Manual

8. Unlock the working mode: press **switch** for more than 6 seconds up to **🔒** symbol disappearing on the LCD.

9. For F2000LV-A-N, following contents are useless. They are just effective for F2000LV-A-01 and F2000LV-A-02.

The first stage heating: Under the heating mode, if the room temperature \leq the set point -1°C, the first stage heating is on with **🔥** appearing. If the room temperature \geq the set point + 1°C, the first stage heating is off with **🔥** disappearing. Under the cooling mode, you may preset the 1st relay is not work or on work. If you set it on work, the control way likes as in heating mode.

10. The second stage heating (just for F2000LV-A02): Under heating mode, if the room temperature \leq the set point -3°C (differential temperature which is set in Advanced Setup), the second stage heating is on. If the room

temperature \geq the set point, the second stage heating is off. Under the cooling mode the second stage heating is always off.

Attention:

1. The damper actuator is controlled by the analog output between the minimum limited and the maximum limited. Under the cooling mode, if the room temperature $<$ the set point, the output is limited by minimum; If the room temperature $>$ the set point, the output is limited by maximum.

2. The scale bars corresponds with 0~10V output (see figure 4). The **🔌** symbol on the right of LCD running indicates the analog output is more than 0V DC.

Advanced Setup (V.LV-12-S_27)

Cut off power first, simultaneously depress the 2 clips on either of the sides of the thermostat gently to open the cover of the thermostat with your nails or other unsharp tools. There are four DIP switches at the top-right corner on the circuit board. Put the DIP up to ON, put it down to OFF.

DIP1: ON- set parameters (see below table)	OFF- normal operation	(factory preset: OFF)
DIP2: ON- Fahrenheit display	OFF- Celsius display	(factory preset: OFF)
DIP3: ON- the relays doesn't work in heating	OFF- the relays works in heating	(factory preset: OFF)
DIP4: ON- the 1st relay doesn't work in cooling	OFF- the 1st relay works in cooling	(factory preset: ON)

(DIP3 and DIP4 setting are useless for F2000LV-A-N)











When DIP1=ON, press **switch** key to select the parameters and press **▲** or **▼** key to set values. The parameters guiding symbol will display on the upper line of LCD



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Guiding Symbol	Parameter	Set Range	Default
E1	The minimum limited of the analog output in heating	00~maximum (corresponding 0V~max DC)	20 (2VDC)
E2	The maximum limited of the analog output in heating	Minimum~99 (corresponding min~10V DC)	99 (10VDC)
E3	The minimum limited of the analog output in cooling	00~maximum (corresponding 0V~max DC)	20 (2VDC)
E1E2	The maximum limited of the analog output in cooling	Minimum~99 (corresponding min~10V DC)	99 (10VDC)
E1E3	Adjusting the change rate of the analog output	0.5 ~ 99.5 (The less is the number, the quicker is the change of analog output. The figure 3 indicates the corresponding relation of analog output with the time under the different setting number (at the same temperature difference).	5
E2E3	Just for adjusting before leaving factory		10 (don't change it)
E1E2E3	Just for adjusting before leaving factory		0.5 (don't change it)
E1 + 	Just for adjusting before leaving factory		7.5 (don't change it)
E2 + 	The state of thermostat electrifying after power broken	-00 Turn off as electrifying -01 Keep the last state before power broken	00
E3 + 	Un-effective for the model		0
E1E2 + 	Un-effective for the model		0
E1E3 + 	Un-effective for the model		0
E2E3 + 	Measured temperature modification	+3°C~ -3°C	0
E1E2E3 + 	The delay time of 0VAC output as pressing power key to turn off	0~99.5 (0~199 second)	15 (30')
E1 + 	The state of analog output once room temperature reaches at the set point	00— The output is 0V DC as room temperature reaches at the set point. 01— The output is minimum as room temperature reaches at the set point.	01
E2 + 	Set the maximum limit of the set point	18 °C~90 °C	35.0 °C
E3 + 	Set the differential of temperature for starting the second stage heating (just for F2000LV-A02)	-1.5 °C~-5 °C	-3.0 °C

RESET: Put the DIP1 up to ON and then turn the thermostat on, keep to press **power** key for about 40 seconds until the thermostat turning off. Then the reset is successfully. All parameters will be returned back the defaults.

Special Attention:

On the circuit board, you may see there is a X1 jumper at upper of the terminal P1. The relay will be a dry contact output when X1 jumper is disconnection (default) or will be a source contact output when X1 jumper is connection.