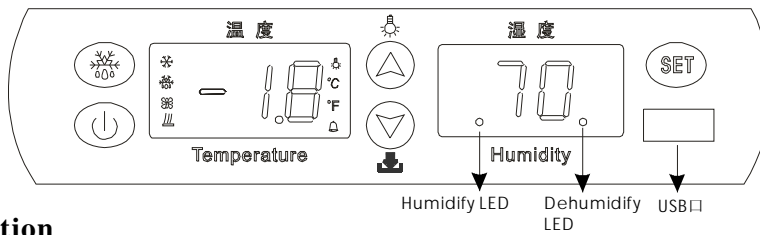


## Model: SF -476S Digital temperature and humidity controller



### Features of Function

Humidity display /Temperature control / Defrost control/ Power switch/ Value storing / Self testing  
Evap. Fan control/ Light control

### Specifications

1. Power supply: 12V, external transformer
2. Temperature sensor: NTC, one sensor (neither positive nor negative), 2m(L)
3. Humidity sensor: one sensor, humidity display range:00~99% Accuracy:±0.3%
4. Range of temperature display: -45~99°C Accuracy: ±0.1°C
5. Range of set temperature: -45~75°C Factory default : Cooling cabinet:10°C/ Refrigeration cabinet: 0.3°C
6. Dimension:181(Length)×41(Width)×47(Depth)mm  
Mounting hole dimension:138(Length)×32.5(Width)mm
7. Temperature of the operating environment: -10~60°C  
Relative Humidity:20%~90%(Non-condensing)
8. Relay output contact capacity
  - Compressor: N. O. 10A/250VAC
  - Light: N. O. 8A/250VAC
  - Fan: N. O. 5A/250VAC

### Front Panel Operation

1. Set temperature adjustment
  - Press **SET** button, the set temperature is flash displayed.
  - Press **▲** or **▼** button to modify and store the displayed value .
  - If no more button is pressed within 10 seconds, the measured temperature will be displayed.
2. Parameters setup
  - Press **SET** button and hold for 6 seconds to enter the parameter setup mode, PA is displayed(otherwise E1) and flash when there is a password. Press **SET** button to enter or exit the parameter.
  - Press **▲** or **▼** button to select sequentially from the parameters : E2,E3,E4,E5.....br3,,E1.
  - Press **SET** button to enter the parameter, then press **▲** or **▼** button, the value of parameter will be displayed and can be modified and stored.
  - If no more button is pressed within 12 seconds(or press **⏻** button), it will return to normal operation.
3. Manual defrost control: Press **☸** button and hold for 3 seconds to start defrost or stop defrost.
4. Refrigerating LED: During refrigeration process, the LED is on; when the cold-room temp. is constant, the LED is off; during the delay, the LED flashes.
5. Power switch: Press **⏻** button for once, it will start to work, press the button again and hold for 3 seconds, --- will be displayed in two windows, all the control outputs will stop and enter the shut down status. (Except for the light.)
6. Press **▲** button for once to turn on or turn off the light, every light duration time will be controlled by parameter P1.
7. Factory default resumption: Press **▲** and **▼** button at the same time and hold for 6 seconds, will flash and display 888, at this time will resume to factory defaults.

### Function details

1. Temperature control
  - After the delay time, the compressor starts operating when cold-room temperature  $\geq$  (set temp.+ Refrigeration hysteresis E3), and will be off when cold-room temperature  $\leq$  set temp.
  - Heating starts when room temperature  $\leq$  (set temperature- heating hysteresis E4); the heating stops when room temperature  $\geq$  set temperature.
  - To protect the compressor, it can re-start unless the time when the compressor stops every time is longer than the delay time (Parameter E5).
  - To protect the heater, it can re-start unless the time when the compressor stops every time is longer than the heating delay time Parameter E6.
  - When switching from refrigeration and heating state, must pass delay time.(parameter E7)

## Cooling cabinet(N1) inner parameters:

Parameter	Function	Set range	Default	Parameter	Function	Set range	Default
PA	Menu password	00~50~99	82	C4	Alarm hysteresis	01~10℃	01℃
E1	Lower set point limit	-45℃ ~ Retain freshness set temperature	10℃	F1	Defrost duration	01~90min	10min
E2	Higher set point limit	Retain freshness set temperature ~ 75℃	14℃	F2	Defrost interval	00~24hours	2hours
E3	Refrigeration Hysteresis	01~ 20℃	04℃	F4	Display when defrost	00=normal display 01=lock display	01
E4	Heating hysteresis	01~ 20℃	02℃	H1	Fan control	H1=01 synchronized with heater and comp., off when defrost H1=02 synchronized with heater and comp., open when defrost H1=03 keep running, open when defrost H1=04 keep running, close when defrost	03
E5	Refrigeration start delay time	00~10min	3min	A1	Lowest humidity display	00~99%	35%
E6	Heating start delay time	00~10min	0min	A2	Higher humidity display	01~99%	75%
E7	Refrigeration and heating switch time	00~90min	15min	A3	Set humidity	10~85%	60%
E8	Offset on room sensor	- 20~20℃	0℃	A4	Humidify hysteresis	01~30%	10%
E9	Offset on humidity sensor	- 20~20%	00%	A5	Dehumidify hysteresis	05~30%	10%
P1	Light duration time	00~180min 00 is infinite length	00min	A6	Humidify dehumidify switch time	01~90min	10min
C1	High temp. alarm value	C2~75℃	45℃	b1	Dehumidify temp. hysteresis	00~10℃	00℃
C2	Low temp. alarm value	- 45℃~C1	- 35℃	b2	Dehumidify duration	01~20min	03min
C3	Alarm delay time	00~60min	0min	T1	Force dehumidify interval	01~90min	10min
At1	Record shortest interval	01~30min	05min	T2	Force dehumidify duration	01~60min	2min
Br1	Highest alarm humidity	01~99%	75%	CPA	Change menu password	00~99(if set to 00, means cancel the password)	82
				Br2	Lowest alarm humidity	01~99%	35%
				Br3	Humidity alarm delay	00~120min	1min

## Refrigeration cabinet(N2) inner parameters:

Parameter	Function	Set range	Default	Parameter	Function	Set range	Default
PA	Menu password	00~50~99	82	C4	Alarm hysteresis	01~10℃	01℃
E1	Lower set point limit	-45℃ ~ Retain freshness set temperature	03℃	F1	Defrost duration	01~90min	10min
E2	Higher set point limit	Retain freshness set temperature ~ 75℃	05℃	F2	Defrost interval	00~24hours	1hour
E3	Refrigeration Hysteresis	01~ 20℃	03℃	F4	Display when defrost	00=normal display 01=lock display	01
E4	Heating hysteresis	01~ 20℃	06℃	H1	Fan control	H1=01 synchronized with heater and comp., off when defrost H1=02 synchronized with heater and comp., open when defrost H1=03 keep running, open when defrost H1=04 keep running, close when defrost	03
E5	Refrigeration start delay time	00~10min	3min	A1	Lowest humidity display	01~99%	35%
E6	Heating start delay time	00~10min	0min	A2	Higher humidity display	01~99%	75%
E7	Refrigeration and heating switch time	00~90min	15min	A3	Set humidity	10~85%	60%
E8	Offset on room sensor	- 20~20℃	00℃	A4	Humidify hysteresis	01~30%	10%
E9	Offset on humidity sensor	- 20~20%	0%	A5	Dehumidify hysteresis	05~30%	10%
P1	Light duration time	00~180min 00 is infinite length	00min	A6	Humidify dehumidify switch time	01~90min	10min
C1	High temp. alarm value	C2~75℃	45℃	b1	Dehumidify temp. hysteresis	00~10℃	00℃
C2	Low temp. alarm value	- 45℃~C1	- 35℃	b2	Dehumidify duration	01~20min	03min
C3	Alarm delay time	00~60min	0min	T1	Force dehumidify interval	01~90min	10min
At1	Record shortest interval	01~30min	05min	T2	Force dehumidify duration	01~60min	2min
Br1	Highest alarm humidity	01~99%	75%	CPA	Change menu password	00~99(if set to 00, means cancel the password)	82
				Br2	Lowest alarm humidity	01~99%	35%
				Br3	Humidity alarm delay	00~120min	1min

## 2. Defrosting function:

- After worked a defrost interval (Parameter F2), will automatic enter the defrost state, the defrost LED will light on, the compressor stop. When the defrost duration ends (Parameter F1), will exit the defrost state, and enter the normal temperature control mode.
- When defrost display (Parameter F4)=1, the room temperature will be locked during defrost, and the last value before defrost will be displayed. After defrost, the room temperature is locked 20 minutes delay (or room temperature is lower than the set temperature), then resume normal display.
- During the delay, the defrost LED flash.
- When defrost display (Parameter F4)=0, during defrost, the room temperature display normally.
- When defrost interval (Parameter F2)=0, the automatic defrost status will be cancelled.

## 3. Alarm control

- After a normal turn on and turn off, the compressor can enter the alarm state. When alarm, the corresponding alarm LED flashes, the buzzer sounds, press random button to cancel. The alarm LED is on all the time. When the cold room temperature > high temperature alarm value (Parameter C1), and duration time more than parameter C3, and enter the high temperature alarm, the compressor starts.
- When the room temperature < (high temperature alarm value- alarm hysteresis C4), will exit the high temperature alarm value.
- When cold room temperature < low temperature alarm value (parameter C2) and duration more than parameter C3, will enter the low temperature alarm, the compressor will stop. When the cold room temperature > (low temperature alarm value+ alarm hysteresis C4), will exit the low temperature alarm state.

## 4. Humidity control

- When humidity is lower than lowest humidity display (parameter A1), the humidity will display A1; when humidity is higher than the highest humidity display (parameter A2), the humidity will display A2 value.
- When humidity is lower than the set humidity A3- humidify hysteresis A4, the humidify LED is on, when higher than A3 will stop humidify.
- When humidity higher than the set humidity A3+ dehumidify hysteresis A5, will enter the compressor dehumidify mode, the dehumidify LED is on.
- When compressor is in dehumidify mode, when cold room temperature is not less than (set temperature-b1), will start the compressor once to dehumidify, until the cold room temperature is lower than (set temp. - b1) or compressor operating time more than parameter b2.
- When in compressor dehumidify mode, the compressor will start to dehumidify when compressor stop time more than T1. When duration more than T2, will stop dehumidify.
- When the humidify and dehumidify mode is switching, must pass delay time (parameter A6).

## 5. Fan control: The fan will work according to H1 parameter setting.

## 6. Abnormal work mode:

- When room sensor is short circuited or overheated (more than 99°C), "HH" is displayed; when room sensor is open-circuited or temperature is too low (less than -45°C), "LL" is displayed. At that time the compressor automatically enters time working mode by the cycle of 30 minutes on and 15 minutes off.

## 7. Press and button at the same time to display or process the actual time, year, month, date, hour, minutes (the left window will display corresponding TE1, TE2, TE3, TE4, TE5), short press display for 10 seconds in the right window (do not flash), long press for 6 seconds, flash and display in the window, press and button can adjust the time.

(Note: 24 hours system; the year will display after minus 2000, for example: 2015 will display 15.)

## 8 When plug in the USB flash disk ( $\leq 16G$ , format FAT 32), the temperature unit indicator °C or °F will flash and alternate display USB. Press button for once can copy the recorded time, temperature and humidity into TXT format file to the disk. When finish copy, the buzzer will sound for once, the window in the right will alternate display the current humidity and CPL. (Note: Please make sure that there is still 5M storage space in the USB flash disk and do not have SF\_TEMP.TXT document in it before connecting.)

## 9. Press the button and button at the same time and hold for 6 seconds, can clear the recorded data. If the USB flash disk operation failed, cut off the power and plug out the USB flash disk, and then power on and try again. If after several attempts, but still failed, please format the USB flash disk to FAT32 and try again.

### 10. Humidity alarm control

- Every time the humidity alarm duration will be no more than 2 minutes.
- When the humidity is more than the highest alarm humidity br1, will be regard as humidity too high, when is lower, it will exit alarm.
- When the humidity is lower than the lowest alarm humidity br2, will be regard as humidity too low, when is higher, it will exit alarm.
- When the humidity is abnormal and duration more than humidity alarm delay br3, will start the humidity alarm, the buzzer will sound, press random button to cancel the alarm.
- Press (SET) button and (▲) button at the same time and hold for 6 seconds, can turn on (flash display “OPN” ) or turn off (flash display “CLE” ) the humidity alarm function.

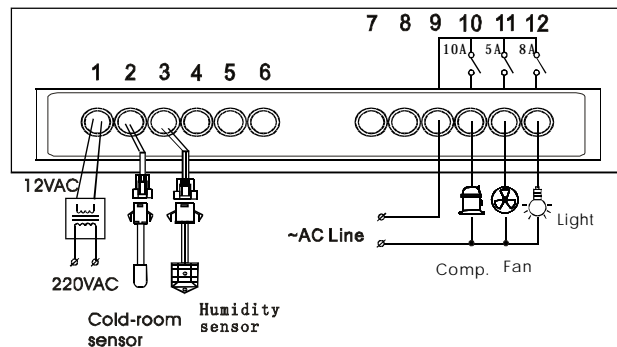
### 11. Operational records (At1, br1, br2, br3, these four parameters will not display in the PC program.)

- When the hardware (as compressor, fan, light, etc.,) Operational state changes, will record immediately.
- Humidity, temperature, will record every parameter AT1.

The recorded temperature, humidity is the controller display temperature, humidity.

12. Press (SET) button and (▼) button at the same time and hold for 6 seconds, can switch from cooling cabinet (display N1) and refrigeration cabinet (display N2). Non-professionals please do not perform this operation.

### 13. Circuit diagram



### Notes for Installation

1. When installation the probe shall be placed with the head upward and the wire downward;
2. The temperature controller can not be installed in the area with water drops.
3. The sensor cable leads must be kept separately from main voltage wires in order to avoid high frequency noise induced. Separate the power supply of the loads from the power supply of the controller.

### Accessories for the temperature controller

1. One temperature sensor
2. One humidity sensor
3. One installation stand