1. Product overview

MEC-H10 is a temperature and humidity controller, used for automatic control of temperature and humidity. It features power switch, light switch, button lock, etc.

2.Technical parameters

Power supply: 230VAC±10%, 50/60Hz

Temperature measuring range: -40~50℃; Temperature accuracy: ±1℃

Humidity measuring range: 0~99.9%RH; humidity accuracy: ±5%RH

Relay output:

16A/250VAC (Resistive load); 12A/277VAC (general load), used to control compressor;

10A/250VAC, used to control fan;

10A, 250VAC, used to control heating wire;

10A/250VAC, used to control light;

10A/250VAC, used to control humidification (fan);

Application environment: temperature: -20~60℃, humidity: 20%~90%RH (non-condensing)

Storage environment: temperature: -30~70℃, humidity: 20%~90%RH (non-condensing)

Product dimension: 132 x 43 x 61.5 (mm)

Mounting size: 112 x 39 (mm)

3. Display

The controller has two display windows for humidity and temperature, six indicator LEDs (up, alarm, down, power, set, light) and three buttons (up/power, set, down/light).

4. Operations

4.1 Set temperature

In normal mode, press and hold SET button for 3 seconds, humidity window displays St and temp set-point flashes in temp window. Use ▲ and ▼ to adjust the set-point (within the range r1~r2). Press SET button to exit with the set-point saved. Or keep the controller inactive for 60 seconds to exit with the set-point not saved.

4.2 On/Off

In running status, press and hold ⏻ for 3 seconds to turn off the controller. Only the power LED flashes, but outputs are off. Press and hold ⏻ for 3 seconds to turn on the controller.

Note: In normal status, power LED is on in ECO mode and off in non-ECO mode.

4.3 Light

Press and release ☼ turn on/off light.

4.4 Manual defrost

In normal status, press and hold ▼for 3 seconds to manually start/stop defrost (d1≠0). When d6=1 or d6=2, the controller delays d8 to display normal values. Press and hold ▼for 3 seconds to manually stop the delay time and display normal values.

4.5 Alarm

When alarm LED flashes in normal status, press SET to view alarm info and alarm code; buzzer beeps (/b=1). Press SET to mute the beeps.

Note: In case data logger fails communication, the communication fault code will be displayed first, i.e. only the communication fault code can be viewed.

4.6 Button lock

In normal status, press and hold ▲ and ▼for 3 seconds or keep the controller inactive for 10 seconds to lock buttons. LocK will be displayed for 5 seconds. In lock status, press and hold ▲ and ▼for 3 seconds to return to normal status; if other buttons are pressed, LocK will be displayed for 5 seconds.

4.7 View default parameter group, one key reset

In normal status, press and hold SET and ▲, humidity window displays PA, temp window displays default parameter group. Press and hold SET and ▲for 3 seconds to enter one key reset status. Humidity window displays PA, default parameter group flashes in the temp window. Use ▲ and ▼ to adjust the value from 0 to 5. Press and hold SET for 3 seconds to exit. When the value is set to 0, one key reset function is disabled. When the value is set to 1~5, parameters are reset per corresponding default values.

Note: When setting parameters except St, default parameter value is 0.

4.8 Set status

In normal status, press and hold SET for 6 seconds, humidity window displays PS, 00 flashes in the temp window.

Use ▲ and ▼ to adjust PS to		In humidity window	In temp window	Press SET to enter
0	Press and hold SET for 3 seconds	rd flashes	Corresponding parameter shows.	settings of A parameter
-15		r1 flashes		settings of B parameter
85		H5 flashes		settings of C parameter
-55		P1 flashes		settings of data logger (the logger turns on in normal communication)

In setting status, use the SET button to switch between menu and parameter items. Use ▲ and ▼ to adjust corresponding value. Press and hold SET button for 3 seconds to return to normal status with the set-point saved. Or keep the controller inactive for 60 seconds to return to normal status with the set-point not saved.

Note: After parameters saved, data logger needs to be started manually to clear the original data.

4.9 View temperature and humidity

In normal status, press and hold SET for 6 seconds, humidity window displays PS, 00 flashes in temp window. Use ▲ and ▼ to adjust PS to 15, press and hold SET for 3 seconds to view current humidity (in humidity window) and current temperature of the cabinet (in temp window). Press ▼ to display evaporator sensor temperature in temp window (evaporator sensor is enabled and its temperature is not the same as cabinet temperature). Press and hold SET button for 3 seconds or keep the controller inactive for 10 seconds to return to normal status.

Note: The greater /0 value, the longer sampling time, the more stable the measured data.

/P is for normal display only. /P=1, resolution is 0.1 (0.1 @ -9.9~99.9℃, 1 @ others); /P=0, resolution is 1.

4.10 View real time

In normal status, press and hold SET for 6 seconds, humidity window displays PS, 00 flashes in the temp window. Use ▲ and ▼ to adjust PS to 55, press SET to view real time. Humidity window displays P1 and temp window displays corresponding time. P1: year; P2: month;

P3: date; P4: hour; P5: minute; P6: second. Press and hold SET button for 3 seconds or keep the controller inactive for 10 seconds to return to normal status.

Note: 1. There is delay time when second is viewed. 2. The operation is valid only when the data logger communicates well.

4.11 View data logger status/Switch on data logger

Press SET and ▼ in normal status, if			Controller display
Data logger switch is not turned on (J1=0)			no LoG
Data logger switch is turned on (J1=1)	Communication fails.		LoG Err
	Communicating well.	Reading USB.	USb ooo
		Finished reading USB.	USb oK
USB is not inserted.	Data logger is switched off.		LoG oFF
	Recording.		LoG ooo
	Recording stops.		LoG End

When data logger is not recording (not turned on or stops recording), press and hold SET and ▼ for 3 seconds to turn on the logger, the controller displays "LoG on".

5. Parameter list

Item	Setup item	Setting range	Unit	Default	Default	Default	Default	Default
St	Temp set-point	r1~r2	°C	15.0	15.0	15.0	15.0	5.0
Parameter A								
rd	Cooling differential	1~10.0	°C	3.0	3.0	3.0	3.0	2.0
C0	Compressor delay after power on	0~99	min	0	0	0	0	0
C1	Min compressor stop time	0~99	min	4	4	4	4	4
d1	Defrost cycle	0~99 0: defrost is disabled	hour	0	0	0	0	0
dp	Defrost time	1~99	min	30	30	30	30	30
dS	Defrost stop temp	0~50 ---: defrost sensor is disabled	°C	20	20	20	20	20
H1	Low humidification limit	1~H2	%RH	40	50	55	40	40
H2	High humidification limit	H1~H3	%RH	53	53	56	53	53
H3	Low dehumidification limit	H2~H4	%RH	60	60	60	60	60
H4	High dehumidification limit	H3~99	%RH	70	70	70	70	70
ru	Heating start temp differential	rH~10.0	°C	3.5	3.5	3.5	3.5	3.5
rH	Heating stop temp differential	0~ru	°C	3.0	3.0	3.0	3.0	3.0
Ht1	Dehumidification start delay	0~250	sec	60	60	60	60	60
Ht2	Heating start delay	0~250	sec	90	90	90	90	90
Parameter B								
r1	Min temp set-point	-40~r2	°C	13	13	13	13	2
r2	Max temp set-point	r1~50	°C	17	17	17	17	8
/0	Sensor stability	1~15	-	4	4	4	4	4
/1	Temp sensor offset	-5.0~5.0	°C	0.0	0.0	0.0	0.0	-0.2
/2	Humidity sensor offset	-10.0~10.0 ---: humidity sensor is disabled; no humidity control	%RH	0.0	0.0	5.0	0.0	0.0
/P	Enable decimal point	0: display resolution is 1 / 1: display resolution is 0.1	-	1	1	1	1	1
/b	Alarm beeps	0: disabled 1: enabled	-	1	0	0	0	0
/H	Enable heating wire	0: disabled 1: enabled	-	0	0	1	1	0
/dH	Defrost mode	0: natural defrost 1: heating defrost	-	0	0	0	0	0
Jn	Enable ECO mode	0: normal mode 1: ECO mode	-	0	0	0	0	0
C2	Fan start delay	0~99	min	1	1	1	1	1
C3	Fan stop delay	0~250	sec	0	0	0	0	90
C4	Compressor run time in sensor fault	0~99 0: compress switches off	min	8	8	8	8	8

C5	Compressor stop time in sensor fault	1~99	min	15	15	15	15	15
d6	Display during defrost	0: measured temp and dF show alternately 1: temp and humidity before defrost starts 2: dF	-	1	1	1	1	1
dd	Dripping time	0~15	min	2	2	2	2	2
d8	Temp display delay after defrost & alarm delay	0~15	min	20	20	20	20	20
AH	High temp alarm` differential	0~50	℃	5	5	5	5	3
AL	Low temp alarm differential	0~50	℃	7	7	7	7	3
A1	High limit of humidity alarm	A2~99	%RH	75	75	75	75	75
A2	Low limit of humidity alarm	1~A1	%RH	35	35	35	35	35
Ad	Alarm delay	0~99	min	5	5	5	5	5
AE	Buzzer delay	0~99	min	30	30	30	30	30
Parameter C								
H5	High limit of humidity display	A1~100	%RH	100	100	100	100	100
H6	Low limit of humidity display	0~A2	%RH	0	0	0	0	0
H7	Humidity display differential	0~20	%RH	0	0	0	0	0
J1	Data logger switch	0: disable communicating with data logger 1: enable communicating with data logger	-	1	1	1	1	1

A3	Select alarm temp/humidity	0: displayed temp/humidity; 1: actual temp/humidity	-	0	0	0	0	0
rE	Select logger temp/humidity	0: record actual temp/humidity; 1: record displayed temp/humidity	-	0	0	0	0	0
t1[②]	Select temp sensor	0~7	-	0	0	0	0	0
C6	Max compressor run time after defrost cycle elapses	0~120	min	10	10	10	10	10

Note:

① /H=1 and /dH=1, heating relay is used to heat to control temperature; The original humidification relay outputs as defrost; no humidification output; only inner fan runs.

② t1: Select temp sensor

0: Sensor 1 adopts SHT temp and humidity sensor; cabinet sensor=evaporator sensor=temp senor of sensor 1; sensor 2 is disabled.

1: Sensor 1 adopts HTG temp and humidity sensor; cabinet sensor=evaporator sensor=temp senor of sensor 1; sensor 2 is disabled.

2: Sensor 1 adopts SHT humidity sensor; Sensor 2 adopts NTC temp sensor; cabinet sensor=evaporator sensor= sensor 2.

3: Sensor 1 adopts HTG humidity sensor; Sensor 2 adopts NTC temp sensor; cabinet sensor=evaporator sensor= sensor 2.

4: Sensor 1 adopts SHT temp and humidity sensor; cabinet sensor=temp senor of sensor 1; Sensor 2 adopts NTC temp sensor; evaporator sensor= sensor 2.

5: Sensor 1 adopts HTG temp and humidity sensor; cabinet sensor=temp senor of sensor 1; Sensor 2 adopts NTC temp sensor; evaporator sensor= sensor 2.

6: Sensor 1 adopts SHT temp and humidity sensor; evaporator sensor=temp senor of sensor 1; Sensor 2 adopts NTC temp sensor; cabinet sensor= sensor 2.

7: Sensor 1 adopts HTG temp and humidity sensor; evaporator sensor=temp senor of sensor 1; Sensor 2 adopts NTC temp sensor; cabinet sensor= sensor 2.

6. Control output

6.1 Temperature control

1) Status:

Cooling: cabinet temp ≥ St (temp set-point) + rd (cooing differential);

Heating: cabinet temp < St - ru (heating start temp differential);

Non-cooling and non-heating: St –rH (Heating stop temp differential) ≤ cabinet temp ≤ St.

2) Cooling

When the controller is in cooling status, compressor runs. It delays per C0 when the controller is powered on for the first time; later, it delays per C1, and compressor starts after the delayed time elapses. In non-cooling status, compressor stops.

3) Heating

/H=1, heating wire works in temperature control status.

In heating, heating wire works after HT2 (heating start delay) elapses.

In non-heating, heating wire stops working.

/H=0, heating wire is disabled. Temperature rises naturally.

Note:Either compressor or heating wire works in the same period.

6.2 Humidity control

1) Status

Dehumidifying: humidity > H4 (high dehumidification limit);

Humidifying: humidity < H1 (low humidification limit);

Non-dehumidifying and non-humidifying: H2 (high humidification limit) ≤ humidity ≤ H3 (low dehumidification limit).

2) Humidify & Dehumidify

/2 (Humidity sensor offset) = ---, no humidification or dehumidification output, humidity = 0.

If /2 ≠ ---

Humidifying: When the controller is not in heating status, it humidifies and humidification fan delays 30 seconds and then switches on; Humidification fan switches off when the controller is in non-humidifying. Humidifying stops when the controller is in heating status;

Dehumidifying: When the controller is in non-cooling and non-heating status, compressor runs. It delays per C0 when the controller is powered on for the first time; later, it delays per C1, and compressor starts after the delayed time elapses. In non-dehumidifying status, compressor stops. No dehumidification output in cooling or heating status.

6.3 Humidity control

When compressor is on in cooling status, fan starts after C2 (fan start delay) elapses; when compressor is off, fan stops after C3 (fan stop delay) elapses.

When compressor is on in dehumidifying status, fan starts after Ht1 (dehumidification start delay) elapse; when compressor is off, fan stops after C3 elapses.

In heating and humidifying, fan starts and stops together with heating wire and dehumidification fan.

Fan starts when any one of the start-up condition above is met, but stops when all the shutdown conditions are met.

6.4 Defrost

Defrost starts: manually start defrost (d1≠0), or cumulative run time of compressor ≥ d1 (defrost cycle), compressor stop conditions are met, or compressor runs for 1 hour.

Defrost stops: manually stop defrost, or dP elapses, or temp ≥ defrost stop temp (dS=---, evaporator sensor is disabled).

After defrost, the controller enters dripping status. It returns to normal status after dripping time (dd) elapses.

In defrost, it displays:

d6=0: measured temp and dF alternately.

d6=1: temp and humidity before defrost starts. The conditions for recovering to normal display: after defrost ends, measured temp ≤ temp set-point, or d8 (temp display delay after defrost) elapses, or manually cancel display delay by pressing ▼ for 3 seconds.

d6=2: dF. The conditions for recovering to normal display: after defrost ends, measured temp ≤ temp set-point, or d8 elapses, or manually cancel display delay.

6.5 ECO (energy saving) mode

Jn=0, non-ECO mode, normal temp and humidity control.

Jn=1, ECO mode, only temp and humidity display and light control, no other outputs or alarm.

6.6 Display correction

1) (Cabinet) temp correction

a. If the controller is powered on for the first time, temp correction is disabled. It displays measured temperature.

b. When St-2 < measured temp < St+2, temp correction is enabled, but the correction does not go on in this range, only measured temp is displayed.

c. When measured temp ≥ St+2, temperature is corrected from St+2. Later, temperature increases 0.1℃ every 6 seconds; When measured temp ≤ current displayed temp, it displays measured temp and correction stops. If correction time exceeds 5 minutes but the temperature still does not reach the actual temp, correction speeds up. Temperature increases 0.1℃ every 1 second; When measured temp ≤ current displayed temp, it displays measured temp and correction stops. If correction time exceeds 8 minutes, displayed temp

quickly reaches measured temp, correction stops.

d. When measured temp ≤ St-2, temperature is corrected from St-2. Later, temperature decreases 0.1℃ every 6 seconds; When measured temp ≥ current displayed temp, it displays measured temp and correction stops. If correction time exceeds 5 minutes but the temperature still does not reach the actual temp, correction speeds up. Temperature decreases 0.1℃ every 1 second; When measured temp ≥ current displayed temp, it displays measured temp and correction stops. If correction time exceeds 8 minutes, displayed temp quickly reaches measured temp, correction stops.

2) Humidity correction

a. If the controller is powered on for the first time, humidity correction is disabled. It displays measured humidity.

b. When A1-7 > measured humidity > A2+3, humidity correction is enabled, but the correction does not go on in this range, only measured humidity is displayed.

c. When measured humidity ≤ A2+3, humidity is corrected from A2+3. Later, humidity decreases 0.1%RH every 6 seconds; When measured humidity ≥ current displayed humidity, it displays measured humidity and correction stops. If correction time exceeds 5 minutes but the humidity still does not reach the actual humidity, correction speeds up. Humidity decreases 0.1%RH every 1 second; When measured humidity ≥ current displayed humidity, it displays measured humidity and correction stops. If correction time exceeds 8 minutes, displayed humidity quickly reaches measured humidity, correction stops.

d. When measured humidity ≥ A1-7, humidity is corrected from A1-7. Later, humidity increases 0.1%RH every 6 seconds; When measured humidity ≤ current displayed humidity, it displays measured humidity and correction stops. If correction time exceeds 5 minutes but the humidity still does not reach the actual humidity, correction speeds up. Humidity increases 0.1%RH every 1 second; When measured humidity ≤ current displayed humidity, it displays measured humidity and correction stops. If correction time exceeds 8 minutes, displayed humidity quickly reaches measured humidity, correction stops.

If H7 (humidity display differential) = 0, when measured humidity ≥ H5, it displays H5; when measured humidity ≤ H6, it displays H6.

If H7≠0, when measured humidity ≥ H5, it skips to H5-H7, and humidity increases 0.1%RH every 1 second until it equals to H6, then it skips to H6+H7; it loops. when H6 ≤ measured humidity ≤ H5, it displays normal humidity.

6.7 Alarm

After d8 (alarm delay) elapses.

When A3=0, alarm temperature and humidity equal to measured temperature and humidity; When A3=1, alarm temperature and humidity equal to displayed temperature and humidity;

When high temp alarm differential AH=0, high temp alarm is canceled;

When AH≠0, alarm temp ≥ St + AH, and Ad (alarm delay) elapses, high temp alarm is triggered; When alarm temp < St +AH, high temp alarm is canceled.

When AL (low temp alarm differential) =0, low temp alarm is canceled;

When AL≠0, alarm temp ≤ St - AL, and Ad elapses, low temp alarm is triggered; When alarm temp > St +AL, low temp alarm is canceled.

When alarm humidity ≥ high limit of humidity alarm (A1), and Ad elapses, high humidity alarm will be triggered. When alarm humidity < A1, high humidity alarm will be canceled.

When alarm humidity ≤ low limit of humidity alarm (A2), and Ad elapses, low humidity alarm will be triggered. When alarm humidity > A2, low humidity alarm will be canceled.

Alarm LED lights in case of high/low temp, high/low humidity, temp/humidity fault, communication fault and data fault.

When Ad=1, buzzer will beep after AE elapses.

When alarm LED lights, press SET button to view alarm info.

Alarm code	Meaning
E0	Cabinet sensor fails.
E1	Humidity sensor fails.
E2	Evaporator sensor fails.
HHH	High temperature or humidity
LLL	Low temperature or humidity
LoG Err	Data logger communication fails.
LoG oFF	Data logger is not turned on.
dAt Err	Data fault.

6.8 Set data logger

Refer to the operation part (4.11) for data logger settings.

In normal status, press and hold SET and ▼ to view data logger status.

No LoG: data logger is not turned on.

LoG Err: communication fails.

LoG ooo: recording.

LoG End: recording stopped.

LoG Off: data logger is switched off.

USb ooo: reading data.

USb oK: USB is read.

USb End: data is transmitted.

When data logger is not started, press and hold SET and ▼ for 3 seconds to start recording. Or press and hold SET for 6 seconds in normal status, humidity window displays PS and 00 flashes in temp window. Use ▲ and ▼ to adjust PS to 35, press and hold SET for 3 seconds to start data logger, it will display "LoG on".

Note: If the parameters of DR-810 are set during recording, it stops. After restart, the original data is cleared. If the parameters of DR-820 are set during recording, it still records per previous settings. After restart, the original data is cleared.

Parameter list of data logger

Menu	Meaning	Setting range	Default
P1	Year	0~99	Current time
P2	Month	0~12	Current time
P3	Day	0~31	Current time
P4	Hour	0~23	Current time
P5	Minute	0~59	Current time
P6	Second	0~59	Current time
P7	High limit of temp alarm	Low limit of temp alarm~50.0	50.0
P8	Low limit of temp alarm	-40~High limit of temp alarm	-20.0
P9	Enable out-of-temp-limits alarm	0~1	0
P10	High limit of humidity alarm	Low limit of humidity alarm~99.9	90.0
P11	Low limit of humidity alarm	-40~High limit of humidity alarm	0.0
P12	Enable out-of-humidity-limits alarm	0~1	0
P13	Log interval: hour	0~23	0
P14	Log interval: minute	0~59	15
P15	Log interval: second	0~59	0

Note: When log interval is less than 10 seconds, count it as 10 seconds.

Copy logger data

Insert the USB disk to the logging module, the module will beep (the length of beep varies with USB disk types and data size). Usually, the beep stops to indicate data has been copied. Plug out the USB (the module will beep at the same time). Insert the USB disk to a computer to view real-time data curve.

7. Safety precautions

★Danger:

Do distinguish the ports of sensor lead, power cord and relay. Please do not connect wires wrong. The relay cannot be overloaded. Wiring requires disconnection of power supply first.

★ Warning:

Do not use the controller in water or too humid environment, high temperature, strong electromagnetic interference or strong corrosion environments.

★Notice:

1) The power voltage must be in accordance with the voltage labeled on the controller. Please ensure the stability of power voltage.
2) Suggest keeping suitable distance between sensor lead and power cord to avoid possible interference.
3) Avoid placing the humidity sensor in volatile gas for a long time when storing and using it.