

CONTROL LOGIC DESCRIPTION DOCUMENT

POWER VENTILATION

Configuration # : 610MF19V2

Inputs/Outputs Table

Inputs	Qty	Outputs	Qty
Inside temperature	2	Variable fan stage(s)	6
Relative humidity probe	1	On/Off fan stages(s)	4
		Heater stage(s)	2

Equipment required:

Item	Description	Qty
IC-610	Intelligent Control, 6 inputs / 10 outputs	1
VPM-2	Variable Speed Module	3
RHP-1	Relative humidity probe	1
2004-1k	Temperature Probe (-6.3 to 168.7 °F)	2

Configuration Versions:

Version	Date	Modification
v0	97-12-19	New.
V1	98-04-17	Minimum speed adjusting can now go up to 100% instead of 50%.
V2	00-05-11	Change PM-1s for VPM-2. -Remove stage #8 -Variable fan #4 is now ON/OFF.

1. GENERAL

The IC-610 is a powerful control which can be programmed to work in many types of building just by changing the configuration logic. The configuration logic is the software that makes the connection between the sensor reading, the parameter and the outputs. This software is stored in a chip identified with the configuration number mentioned in the title of this document, and appearing on the left-hand side label of your control. Make sure you have this configuration at hand when calling your dealer.

For proper installation and full understanding of your IC-610, it is important to read both the **IC-610 User's Manual** and this Control Logic Document. The User's Manual informs you on safety issues, warranty, sensors, adjustments of parameters and many others characteristics of the IC-610. However, this document explains all particularities of the configuration logic. This control limits the parameters access to employees (referred to as users in this document) and gives full access to the supervisor. Section 2 explains what users can control, while section 3 provides additional information for the supervisor. To enter the supervisor mode, users have to enter the access code mentioned in section 3.

Definition

The following terminology is used throughout this present document:

-DRT → **Desired Room Temperature**. This is the temperature goal for the room and also the reference temperature for all relative settings. Note that **the DRT is influenced by the growth curve function** which reduces the value on a daily basis. See the User's Manual for more details.

-RSP → **Relative Set Point**. Number of degrees relative to the DRT where a function begins.

-DIFFERENTIAL → Number of degree changed before stopping the output. For example, with a differential = 1°F, when the IC-610 turns on a fan at 70°F as the temperature increases, it will shut it off only at 69°F as the room cools down. The differential is necessary to avoid oscillations.

MOD BAND → Number of degrees that a variable speed fan takes to reach its full speed.

Expressions in *ITALICS* are user parameters, whereas expressions in *COURIER* are supervisor parameters. Supervisor parameters are read-only for users.

Ventilation System Overview

This configuration can control a one zone building using the average of 2 inside temperature probes. There are 3 variable speed fan stages, 4 On/Off fan stages, and 2 heater stages.

Refer to the wiring diagram in attachment for a typical installation.

2.0 LOGIC DESCRIPTION

2.1 Room Temperature

-Room temperature by the average of the two inside temperature probes.

2.2 Heating (2 Stages)

-Each stages is activated when the room temperature reaches *HEATER#1 (or #2) RSP*.

-HEATER DIFF = adjustable

Ex: If the *DRT* is 70°F and the *HEATER #1 RSP* is -4°F and the *DIFF* is set at 2°F then the heater will start at 66°F and will stop at 68°F.

2.3 Variable speed stages #1

-When room temperature is below *STAGE #1 RSP* then, stage #1 operate continuously at minimum speed (*STAGE 1 MIN SPEED %*).

- Stage #1 begin to speed up when room temperature reach *STAGE #1 RSP* and is at full speed (100%) when room temperature reach *STAGE #1 RSP + STAGE #1 MOD BAND*.

-If humidity is higher than the *HUMIDITY SET POINT* then stage #1 increases its minimum speed by the percentage set by the parameter *ST. 1 ADD MIN SPEED TO DEHUM*.

There is a differential of 3 % on the humidity logic.

Ex: If the minimum speed setting is at 50% and the “ADD MIN SPEED TO DEHUM” is at 25% then when humidity is higher than the set point, the min. speed will be 75%.

2.4 Variable speed stages #2 and #3

-Same than variable stage #1 with the exception that when temperature is below *STAGE #2,3 RSP*, stages #2, #3 **can** be deactivated by adjusting the parameter *STAGE #2,3 ON BELOW RSP* to OFF.

-If humidity is higher than the *HUMIDITY SET POINT* then stage #2, and 3 increases its minimum speed by the percentage set by the parameter *ADD STAGE 2, 3 MIN SPEED TO DEHUM*. If parameter *STAGE 2,3 ON BELOW RSP* is set to OFF stage 2,3 will stay OFF below RSP. There is a differential of 3 % on the humidity logic.

Ex: *MIN SPEED* = 50%, *ADD MIN SPEED TO DEHUM* = 25%,

STAGE 2 ON BELOW RSP = ON, *STAGE 3 ON BELOW RSP* = OFF

then, when humidity is greater than the set point, the minimum speed of stages will be 75%. Stage #3 will stay OFF if room temperature is **below** their RSP.

2.5 Single speed stages #4, #5, #6 and #7

-Each stages are activated when room temperature reach their respective *STAGE # RSP*.

-STAGE #4 (to #7) *DIFF* are adjustable.

2.6 Growth Day

-The growth day is equipped with eight set points, including the *SET DAY* (8 points) and *SET TEMPERATURE* (8 points). The growth day can be adjusted or turned off.

2.7 Manual override

Each internal output can be controlled manually with manual override parameters.

2.8 Alarm

The alarm relay is normally activated, but it will deactivate 8 sec. after a power failure or after one of the following events:

- a. the IC-610 fails
- b. the room temperature exceeds the limits *HI or LO TEMP. ALARM SP.*
- c. a probe in room temperature vary more than 10.0°F / minute
- d. a probe in room temperature is defective (open or short circuit, off of 20°F from room temperature parameter).


















It is possible to deactivate the alarm by adjusting the parameter *ALARM RELAY ON/OFF* to OFF. In that case, a message will appear on IC-610 display as a reminder.

3. SUPERVISOR'S MODE

This mode allows to set parameters not accessible by the daily user. To enter that mode, the supervisor must enter the following code:

SUPERVISOR CODE: 1 19 0

PARAMETER TABLE

DESCRIPTION			CONTROL VALUES				
			*Restriction	MIN	MAX	PRESET	
1. ROOM TEMP F2: Probe Input # F3: Hi/Lo	deg. F		-6.3	168.7	*****	*****	*****
			-6.3	168.7	P1,P2	*****	*****
	deg. F	CLR	-6.3	168.7	*****	*****	*****
2. REL. HUMIDITY F2: Probe Input # F3: Hi/Lo	RH%		0	100	*****	*****	*****
			0	100	P3	*****	*****
	RH%	CLR	0	100	*****	*****	*****
3. DESIRED ROOM TEMP (DRT) F2: Set Day (8 points) F3: Set Value (8 points)	deg. F		32.0	120.0	70.0		
		none	1	127	1,10,15,20, 25,30,35,40		
		none	32.0	120.0	75,74,73,72, 71,70,69,68		
4. GROWTH DAY F2: Adjust Day			OFF	120	OFF		
		none	OFF	120	OFF		
5. HEATER #1 RSP F2: Heater #1 Diff.	deg. F	none	-15.0	-0.5	-2.0		
	deg. F		0.5	5.0	1.0		
6. HEATER #2 RSP F2: Heater #2 Diff.	deg. F	none	-15.0	-0.5	-2.0		
	deg. F		0.5	5.0	1.0		
7. VARIABLE STAGE #1 RSP F2: Stage #1 Min Speed F2: Stage #1 Mod Band	deg. F	none	0.0	20.0	0.0		
	%	none	12	100	30		
	deg. F	none	0.0	10.0	3.0		
8. VARIABLE STAGE #2 RSP F2: Stage #2 Min Speed F2: Stage #2 Mod Band F2: Stage #2 ON Below RSP	deg. F	none	0.0	20.0	3.0		
	%	none	12	100	30		
	deg. F	none	0.0	10.0	3.0		
	ON/OFF		OFF	ON	OFF		
9. VARIABLE STAGE #3 RSP F2: Stage #3 Min Speed F2: Stage #3 Mod Band F2: Stage #3 ON Below RSP	deg. F	none	0.0	20.0	6.0		
	%	none	12	100	30		
	deg. F	none	0.0	10.0	3.0		
	ON/OFF		OFF	ON	OFF		
10. STAGE #4 RSP F2: Stage #4 Diff.	deg. F	none	0.0	20.0	9.0		
	deg. F		0.5	5.0	1.0		
11. HUMIDITY SET POINT F2: Stage #1 Add Min Speed to Dehum % F2: Stage #2 Add Min Speed to Dehum % F2: Stage #3 Add Min Speed to Dehum %	RH%	none	0	100	70		
	%		0	100	30		
	%		0	100	30		
	%		0	100	30		
12. STAGE #5 RSP F2: Stage #5 Diff.	deg. F	none	0.0	20.0	12.0		
	deg. F		0.5	5.0	1.0		
13. STAGE #6 RSP F2: Stage #6 Diff.	deg. F	none	0.0	20.0	13.0		
	deg. F		0.5	5.0	1.0		
14. STAGE #7 RSP F2: Stage #7 Diff.	deg. F	none	0.0	20.0	14.0		
	deg. F		0.5	5.0	1.0		

15. ALARM HI TEMP	RSP	none	1.0	40.0	10.0		
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DESCRIPTION			CONTROL VALUES			
		*Restriction	MIN	MAX	PRESET	
F2: Alarm Lo Temp	RSP	none	-20.0	-1.0	-5.0	
F3: Alarm Relay	ON/OFF		OFF	ON	ON	
16. MANUAL OVERRIDE HEATER #1		none	AUTO,0	ON	AUTO	
F2: Manual Override Heater #2		none	AUTO,0	ON	AUTO	
F2: Manual Override Stage #1		none	AUTO,0	100	AUTO	
F2: Manual Override Stage #2		none	AUTO,0	100	AUTO	
F2: Manual Override Stage #3		none	AUTO,0	100	AUTO	
F2: Manual Override Stage #4		none	AUTO,0	ON	AUTO	
F2: Manual Override Stage #5		none	AUTO,0	ON	AUTO	
F2: Manual Override Stage #6		none	AUTO,0	ON	AUTO	
F2: Manual Override Stage #7		none	AUTO,0	ON	AUTO	
17. CLOCK			0:00	23:59	0:00	
F2: Adjust Minutes		none	00	59	00	
F3: Adjust Hours		none	0	23	0	
18. SUPERVISOR CODE						

* Restriction legend	
None	Parameter adjustable by the user or the supervisor
	Invisible to the user when supervisor mode OFF
	Read only to the user when supervisor mode OFF
	Follow a growth curve when the ramping function ON
	Can not be changed
CLR	Press simultaneously to clear

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- 1 Room Temperature
- 2 Rel. Humidity
- 3 Desired Room Temp (DRT)
- 4 Growth Day
- 5 Heater #1 Settings
- 6 Heater #2 Settings
- 7 Variable Stage #1 Settings
- 8 Variable Stage #2 Settings
- 9 Variable Stage #3 Settings
- 10 Stage #4 Settings
- 11 Humidity Settings
- 12 Stage #5 Settings
- 13 Stage #6 Settings
- 14 Stage #7 Settings
- 15 Alarm Settings
- 16 Manual Override
- 17 Clock
- 18 Supervisor Code

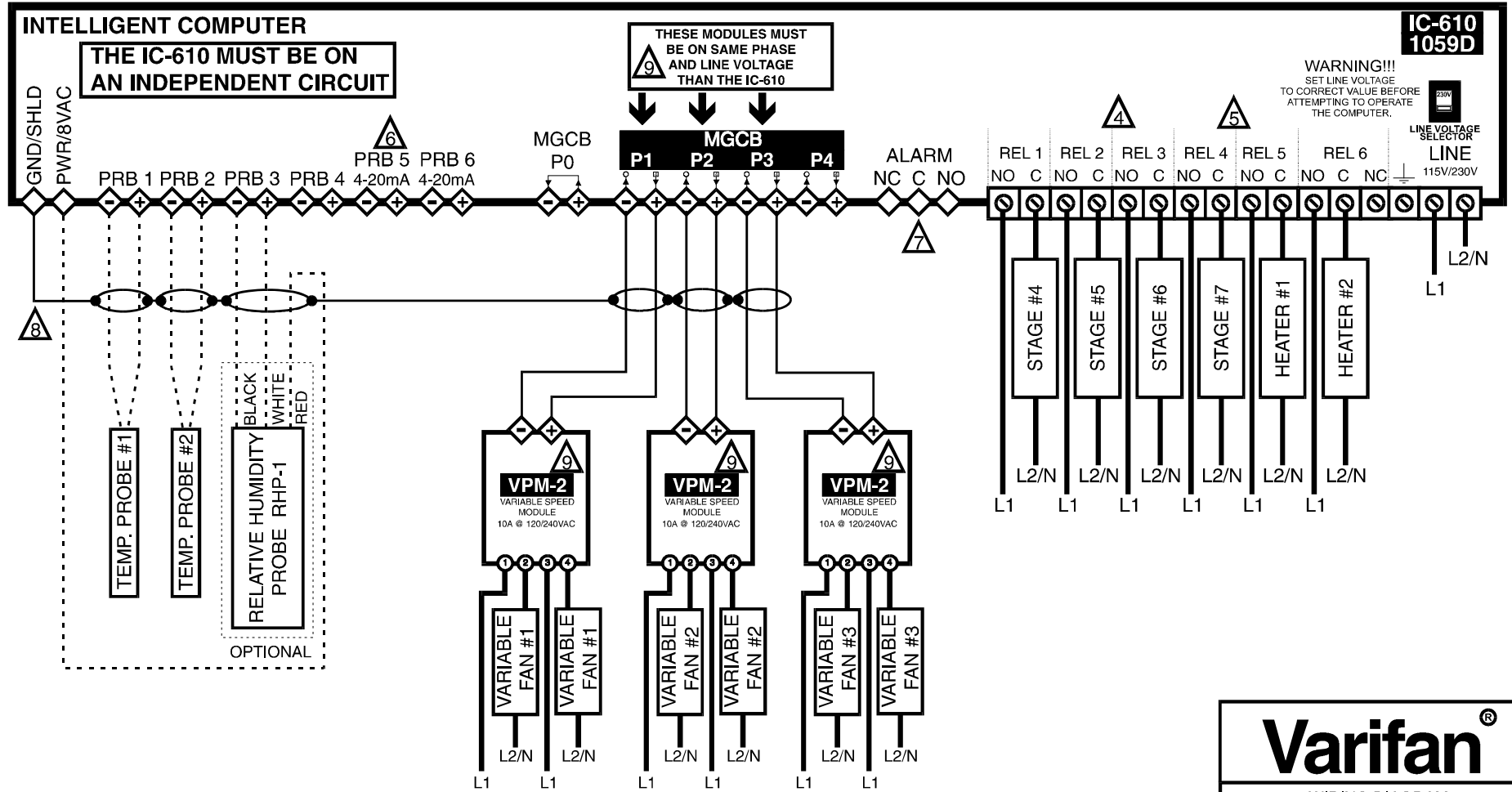
610MF19v2

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- 13 Stage #6 Settings
- 14 Stage #7 Settings
- 15 Alarm Settings
- 16 Manual Override
- 17 Clock
- 18 Supervisor Code

- 1 Variable Stage #1 ON
- 2 Variable Stage #2 ON
- 3 Variable Stage #3 ON
- 4 Stage #4 ON
- 5 Stage #5 ON
- 6 Stage #6 ON
- 7 Stage #7 ON
- 8 Heater #1 ON
- 9 Heater #2 ON

- 1 Variable Stage #1 ON
- 2 Variable Stage #2 ON
- 3 Variable Stage #3 ON
- 4 Stage #4 ON
- 5 Stage #5 ON
- 6 Stage #6 ON
- 7 Stage #7 ON
- 8 Heater #1 ON
- 9 Heater #2 ON

WIRING DIAGRAM CONFIGURATION 6MF19V2



SEE NOTES ON NEXT PAGE

Varifan[®]			
WIRING DIAGRAM			
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	COMPUTATION	6MF19V2	DIR: IAGIC/6MF19V2
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6MF19V2

Electrician's notes wiring tips and hints (see guide for details)

- 1 ----- (INPUT WIRING) SHIELDED WIRE, AWG #18 FOR TEMP. PROBE (2004-1k), 500FT/150M MAX LENGTH WITH AWG#18 WIRE (SUPPLIED BY ELECTRICIAN).
For other probe, refer to specific probe manual for appropriate maximum length and wire size or use AWG #18, 500FT/150M MAX (whichever is shorter).
- 2 ————— (COMMUNICATION WIRING) SHIELDED LOW CAPACITANCE WIRE, AWG #18 TO 22, 750 FT/250 M MAX LENGTH
- 3 ————— HIGH VOLTAGE WIRE INSTALLED ACCORDING TO LOCAL WIRING CODE
- 4 THE CURRENT SHALL NOT EXCEED 10A AT EACH OUTPUTS (OUT 1-6).
- 5 MAXIMUM 2 WIRES OF SAME SIZE PER TERMINAL, NOT BIGGER THAN AWG #12, NOT SMALLER THAN AWG #22.
- 6 1 WIRE ONLY PER TERMINAL. USE WIRE CONNECTOR IF YOU WANT TO CONNECT MORE THAN 1 WIRE.
- 7 CHECK INSTALLATION GUIDE FOR ALARM WIRING.
- 8 USE SHIELD FOR SHIELDING PURPOSE ONLY. CONNECT THE SHIELD TO THE CONTROL CIRCUIT COMMON END ONLY. NEVER LEAVE THE SHIELD UNCONNECTED AT BOTH ENDS. NEVER CONNECT BOTH ENDS OF THE SHIELD TO COMMON.
- 9 THESE MODULES MUST BE ON SAME POWER PHASE AND LINE VOLTAGE THAN THE IC-610.