



ELECTRICAL INSTALLATION

Subject to change without notice.

All installation wiring must conform to your country Electrical Code and local codes. While we believe that using NORDOCK's controls and following our instructions will result in an installation that meets those requirements, we cannot guarantee it. Code compliance is ultimately the installer's and/or user's responsibility.

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- Safety Precautions
 - All installations must be performed by a qualified person.
 - Do not work on live equipment. Use lock-out procedures.

WIRE REQUIREMENTS

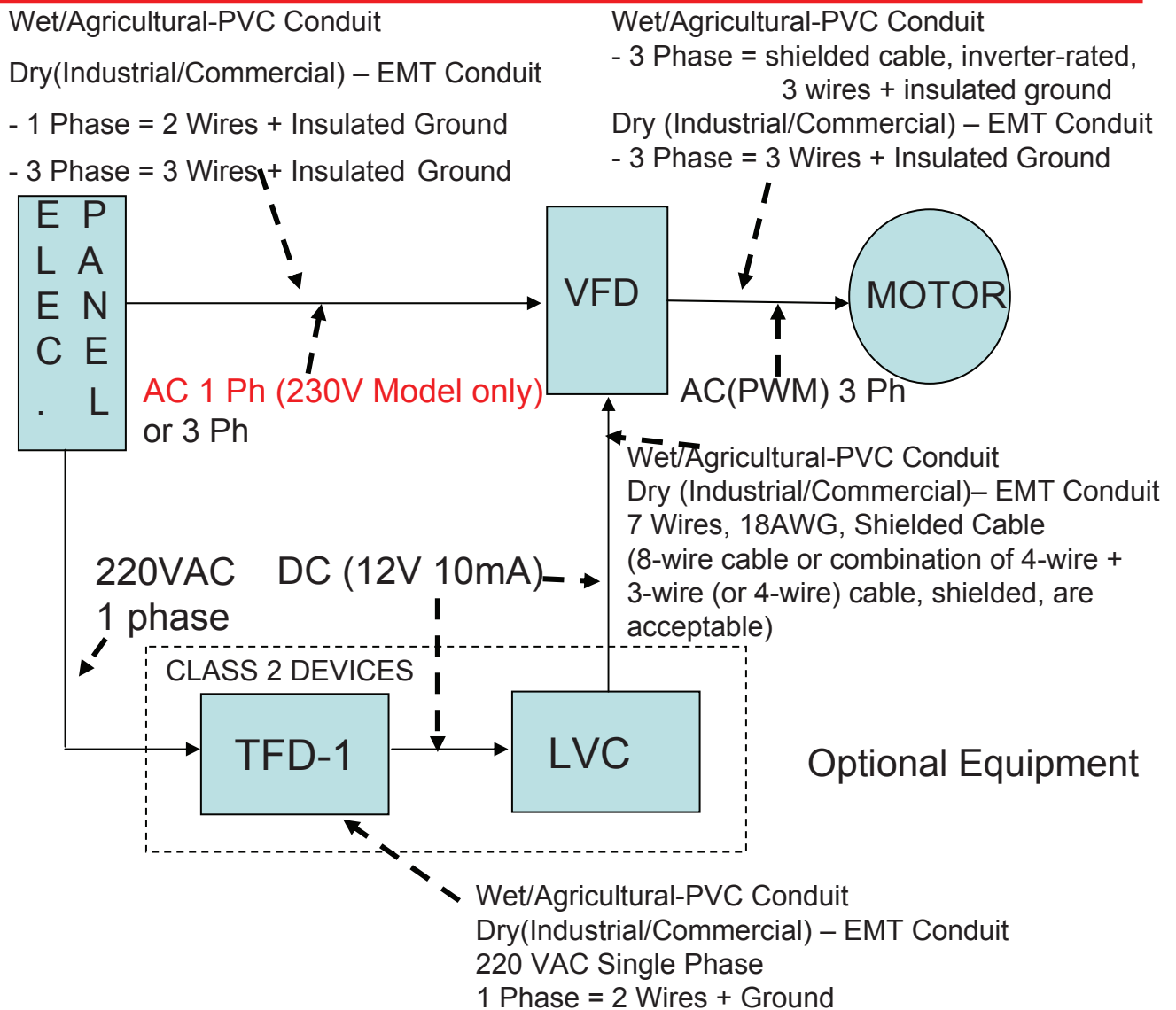
- Size of input and output wires depend on length and current draw of VFD and motor.
- See Power Requirements for current draw of VFD and motor.

VFD = Variable Frequency Drive

LVC = Low Voltage Controller

TFD-1 = Temperature Controller

An separate insulated ground must be provided to each VFD from the electrical panel. This will reduce the noise from being radiated in other equipment.



dV/dT Filter

PART NUMBER	RATED VOLTS	NEC HP 480V	NEC HP 600V	NEC HP 240V	AMPS	HEIGHT	WIDTH	DEPTH	ENCL TYPE	TERM TYPE	TERM TORQUE	TORQUE UM	WATTS LOSS	WEIGHT
V1K2A01	600	0.75	1	-	2	9	5.5	10	1	tb	10	LB-IN	75	11
V1K3A01	600	1 - 1.5	2	0.5	3	9	5.5	10	1	TB	10	LB-IN	75	11
V1K4A01	600	2	3	0.75	4	9	5.5	10	1	TB	10	LB-IN	75	11
V1K6A01	600	3	-	1 - 1.5	6	9	5.5	10	1	TB	10	LB-IN	80	11
V1K8A01	600	5	5	2	8	9	5.5	10	1	TB	10	LB-IN	90	11
V1K12A01	600	7.5	10	3	12	9	5.5	10	1	TB	10	LB-IN	95	11

A dV/dT filter **is required** between the VFD and motor for:

- 240VAC VFD - anything above 200ft line-of-sight and up to 1000ft
- 480VAC VFD - anything above 125ft line-of-sight and up to 1000ft
- 600VAC VFD - anything above 100ft line-of-sight and up to 1000ft (*1)

The filter can operate both 50 and 60Hz motors.

The horsepower rating of the VFD might have to increase with the use of a filter, i.e. a 1Hp motor will require a 2HP VFD, a 1.5/2HP motor will require a 3HP VFD for long distance (over 300 feet).

The dV/dT filter has to match the horsepower rating of the VFD, i.e. a 3HP 240VAC VFD require a V1K12A01 filter.

VFD manufacturers have lowered the distances between VFD and motor due to use of non-fully rated cables and motors. (IE2 vs IE1, use of non-rated inverter-duty cables)

(*1) When using 600VAC VFD, special care will have to be taken as VFD manufacturers have noted that excessive reflective voltages are generated due to the distance. The voltages shorten the life expectancy of the motors and VFDs and may cause bearings failures.

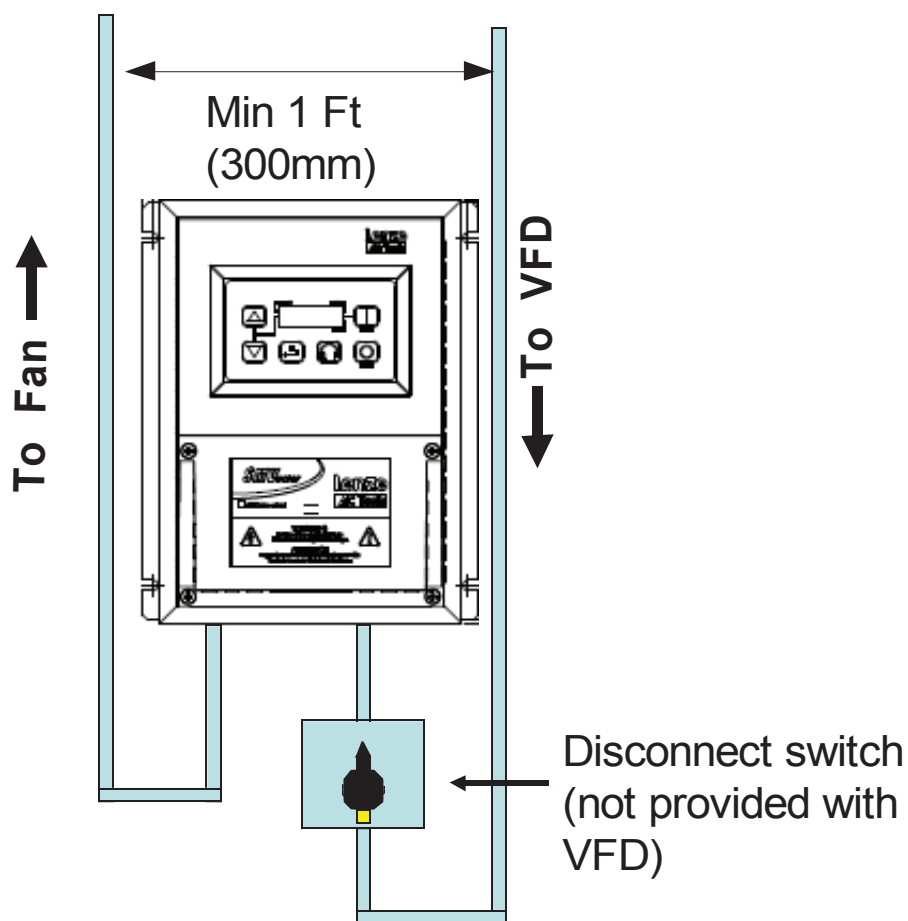
POWER REQUIREMENTS

	Input 240V		Output 240v	Input 400V	Output 400V	Input 480V	Output 480V	Input 600V	Output 600V
	1 Ph	3Ph							
VFD	1 Ph	3Ph	3Ph	3Ph	3Ph	3Ph	3Ph	3Ph	3Ph
1 HP .75 kW	8.8A	5.0A	4.2A	2.9A	2.4A	2.5A	2.1A	2A	1.7A
1.5 HP 1.1 kW	12.0A	6.9A	6.0A	4.2A	3.5A	3.6A	3.0A	N/A	N/A
2 HP 1.5 kW	13.3A	8.1A	7.0A	4.7A	4.0	4.1A	3.5A	3.2A	2.7A
	170- 264 VAC 48-62 Hz	170- 264 VAC 48-62 Hz		340- 440 VAC 48-62 Hz		340- 528 VAC 48-62 Hz		425- 660 VAC 48-62 Hz	

The above values are full-load current values.

WIRE LOCATION

- DO NOT RUN input and output power cables in the same conduit.
- DO NOT RUN control cables with any power cables in the same conduit.
- DO NOT RUN different fans output power cables in the same conduit.
- You can run different fans input power cables in the same conduit.

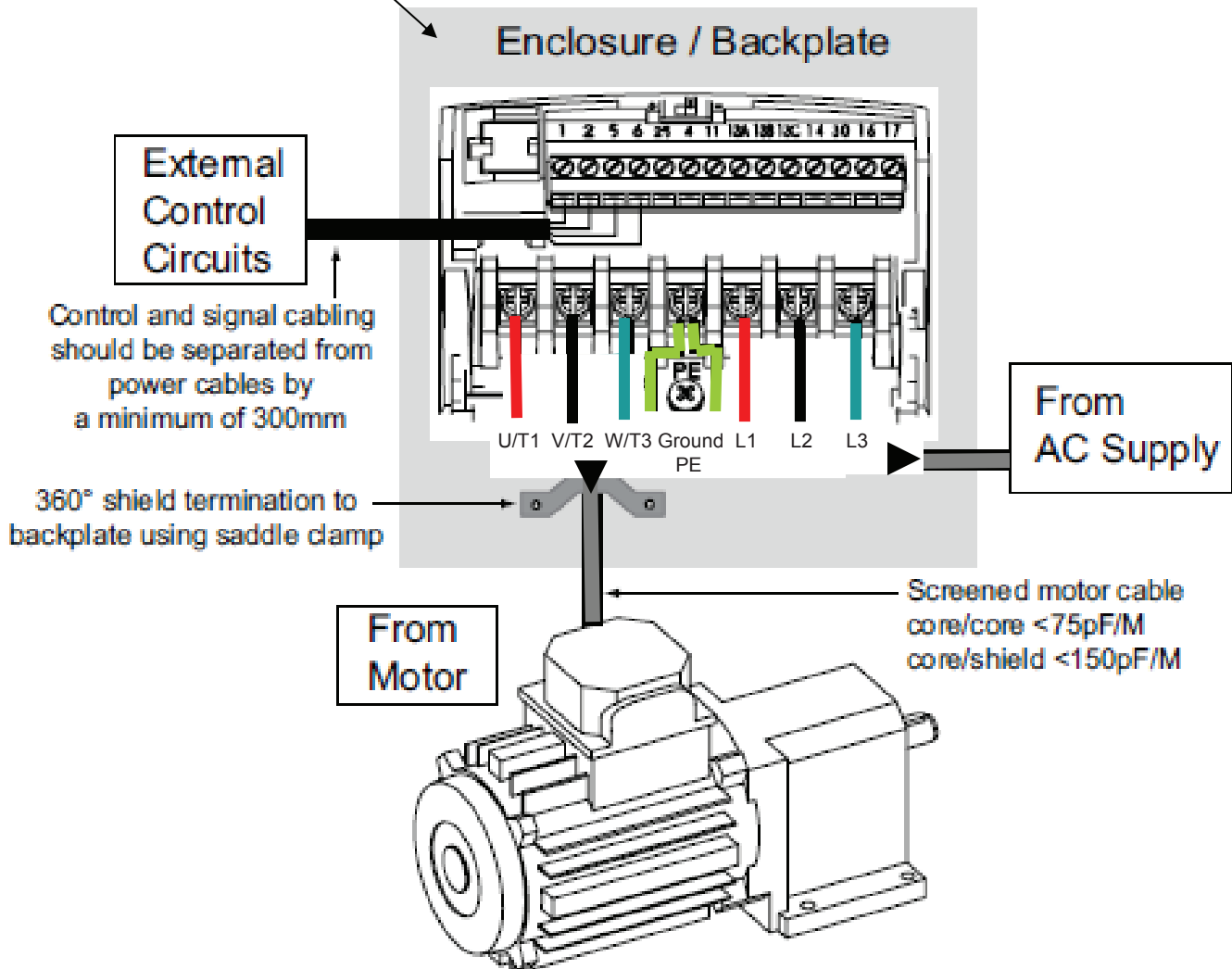


WIRE CONNECTIONS (VFD)



Input power

- 1 Ph use L1 – L2 + PE (Ground)
- or 3 Ph use L1 – L2 – L3 + PE (Ground)

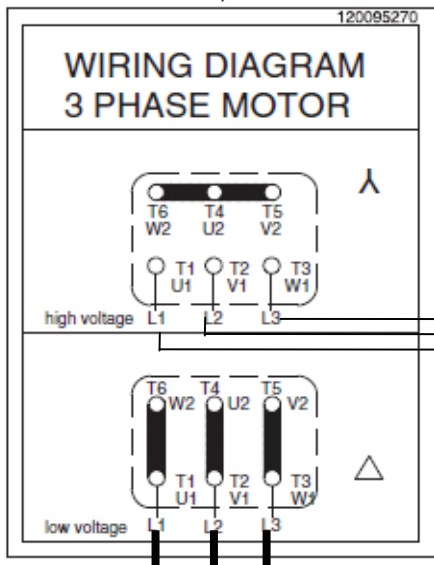
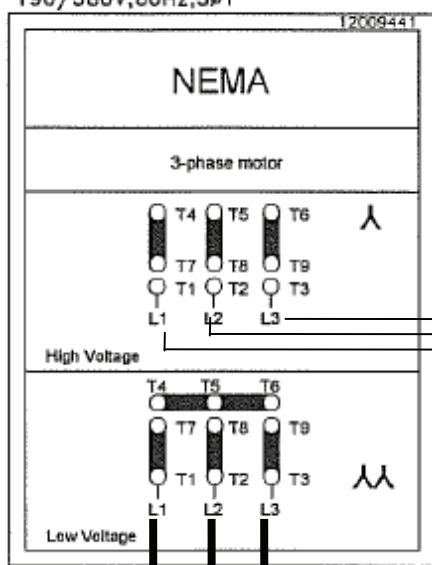


WIRE CONNECTIONS (MOTOR)

Nord Motor

230 / 460V, 60Hz, 3Ø | 200 / 400V, 50Hz, 3Ø
190 / 380V, 60Hz, 3Ø

460 / 800V, 60Hz, 3Ø | 230 / 400V, 50Hz, 3Ø
208 / 360V, 60Hz, 3Ø | 400 / 690V, 50Hz, 3Ø
332 / 575V, 60Hz, 3Ø



T1 T2 T3
460VAC
From VFD

T1 T2 T3
230VAC
From VFD

T1 T2 T3
460VAC
From VFD

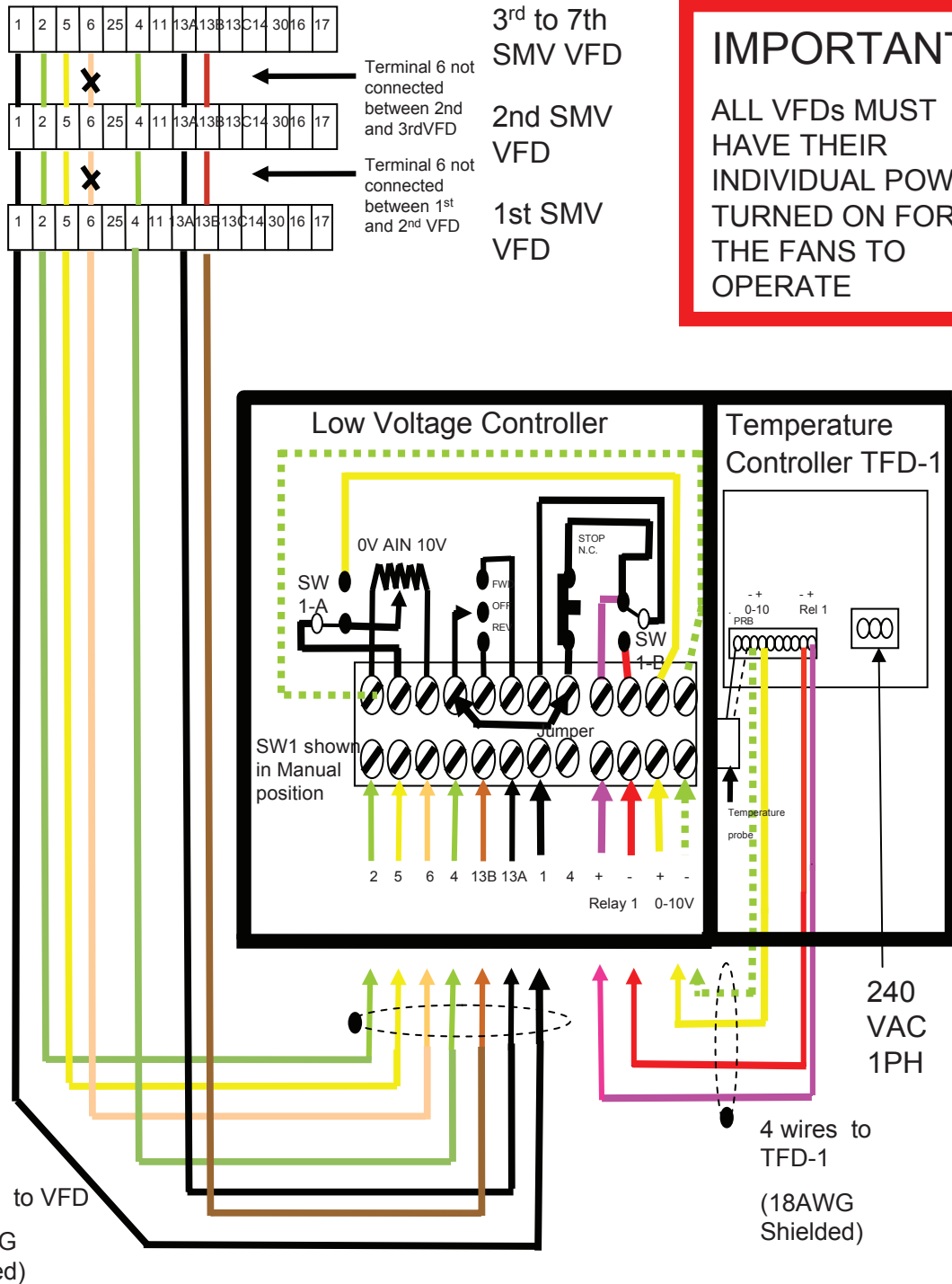
T1 T2 T3
400VAC
From VFD

T1 T2 T3
230VAC
From VFD

T1 T2 T3
400VAC
From VFD

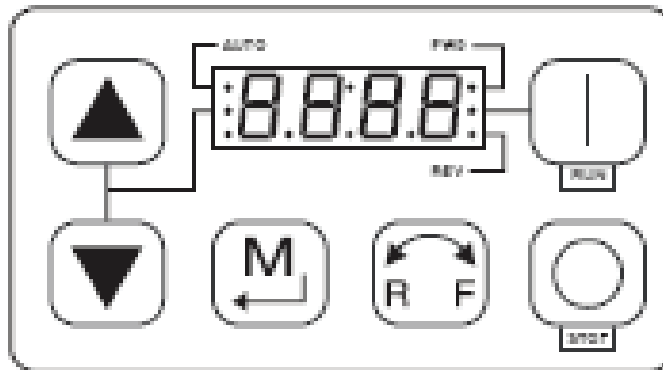
WIRE CONNECTIONS (VFD to LVC and TFD-1)





Maximum distance between the LVC and the
LAST or 7th VFD is 700 feet (214meters)





OPERATION INSTRUCTIONS OF THE VFD without LVC

(These instructions will not work if the LVC is installed, see next page)



To start: Press the 
To stop: Press the 
To change speed:
Press the 


To change the rotation:
Press the 
Then press the 
within 4 seconds to
confirm the change

OPERATION INSTRUCTIONS ON LOW VOLTAGE CONTROLLER AND TFD-1 TEMPERATURE CONTROLLER

- **DO NOT TURN OFF THE FAN WHILE IN MOTION USING THE DISCONNECT SWITCH.**
- Make sure the “TFD-1/Manual” switch is the “TFD-1” position to control automatically the speed of the fans in the temperature mode.
- In the “Manual” mode, use the speed potentiometer to adjust the fan’s speed.
- **Always use the RED STOP button (on the right of the Low Voltage Controller) to turn off or stop the fan.**
- To reverse or forward the direction of the fan while in motion, change the direction using the “forward/reverse” switch. Setup of TFD-1 Temperature Controller.
- To adjust the TFD-1:
 - Rotate Selector dial to position (1) Set point
 - Rotate the Adjustor dial to desired set point temperature. Example 20°C
 - Rotate Selector dial to position (2) Modulation band
 - Rotate the Adjustor dial to desired modulation band. Example 10°C
 - Rotate Selector dial to position (3) Minimum ventilation off
 - Rotate the Adjustor dial to desired minimum. Example 5°C

In the example above, from start-up the fan will start to turn only if the interior building temperature reaches 20°C. The speed that will be indicated on the fan controller should be approximately 15Hz or 27%. As the temperature rises in the building the fan will increase speed until the temperature reaches the end of the modulation band. At 30°C (set point + modulation band) the fan will be at its maximum (60Hz or 100% on the fan controller).

- As the temperature decreases the speed will decrease until you reach the set point (20°C). At that point the speed will be at its minimum .
- As the temperature decreases below the set point, the fan will continue to operate at its minimum rate until you reach 15°C (set point minus the minimum ventilation off).
- Below this point of 15°C the fan will stop and will stay in the off condition until the temperature rises to the set point – minimum off (15°C) and then the cycle repeats itself.
- NOTES:
- The minimum speed has been programmed to 15 Hz or 27%. **DO NOT lower it pass this limit otherwise your warranty will be void.** Lowering the speed below 15 Hz or 27% will cause the motor to overheat because the motor will not draw enough air to cool down at these low speeds.

