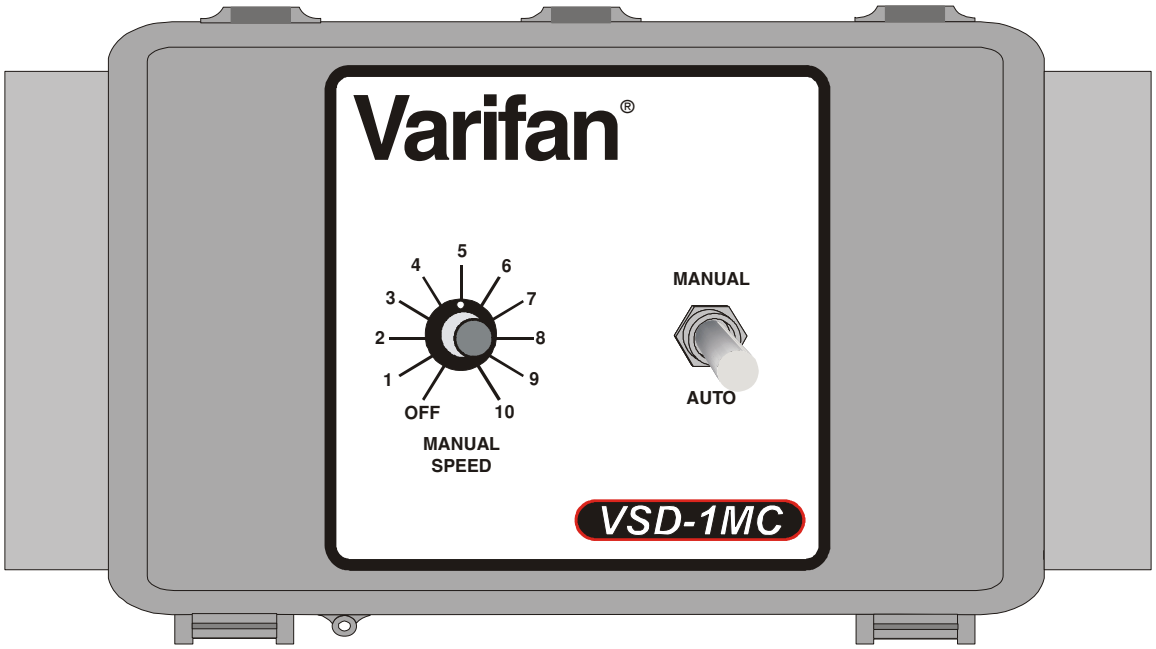
VSD-1MC-20(40) MANUAL

0-10V / 4-20mA Variable Speed Module with Manual Override



Installation / User's Guide

This guide will inform the electrician on proper wiring and installation procedures and, will also inform the user on how to use the VSD-1MC-20(40) module.

The manufacturer recommends that the following installation instructions be followed to as closely as possible, and that all work be performed by a certified electrician. Failure to do so may void the warranty.

Description

The VSD-1MC-20(40) module is designed to control a variable speed fan according to a 0-10 V or a 4-20 mA signal from a master system resulting in a uniform air environment for your livestock or crop. The output can be operating manually with the switch and potentiometer on the faceplate. The VSD-1MC is offered in 3 different models which are VSD-1MC, VSD-1MC-20 or VSD-1MC-40. This manual covers the VSD-1MC-20 and VSD-1MC-40. The module operates on 115/230V and 50/60Hz.

The VSD-1MC-20(40) comes in a PVC non-corrosive enclosure that is protected from dust and humidity. The VSD-1MC-20(40) is covered by a complete two-year warranty.

Unpacking

Unpack the VSD-1MC-20(40) module and inspect contents for damage. Should the contents appear to be damaged, contact your local distributor to return the equipment.

The package should contain the following standard items:
1VSD-1MC-20 or VSD-1MC-40 Module
1 Installation / User's Guide

Mounting hardware required

This is the list of the mounting hardware needed, which is not included with the product:

2 conductor wire, non-twisted, AWG #22
Screws (to mount the module on the wall)
Screwdriver
Soldering iron kit or approved sealed connectors

General installation guidelines

- It is recommended to install the unit in a hallway to limit the VSD-1MC-20(40) exposure to noxious gases.
- In order to avoid condensation problems inside the VSD-1MC-20(40), it is recommended to install the module on an inside wall. If it is not possible, use spacers to have an air gap between the wall and the module.
- The VSD-1MC-20(40) should be installed in easy-access location but away from damaging elements (heat, cold, water, direct sunlight…).
- Do not drill the face, the side, the top or the underside of the module.
- Do not install the VSD-1MC-20(40) near high-voltage equipment, power supply or transformer.

Wiring Procedure

1. Open the VSD-1MC-20(40) module enclosure.
2. Verify the technical specifications to know which wire to use.
3. Connect the equipment to the 2 wires identified as H1 and H2 as shown in figure 1.

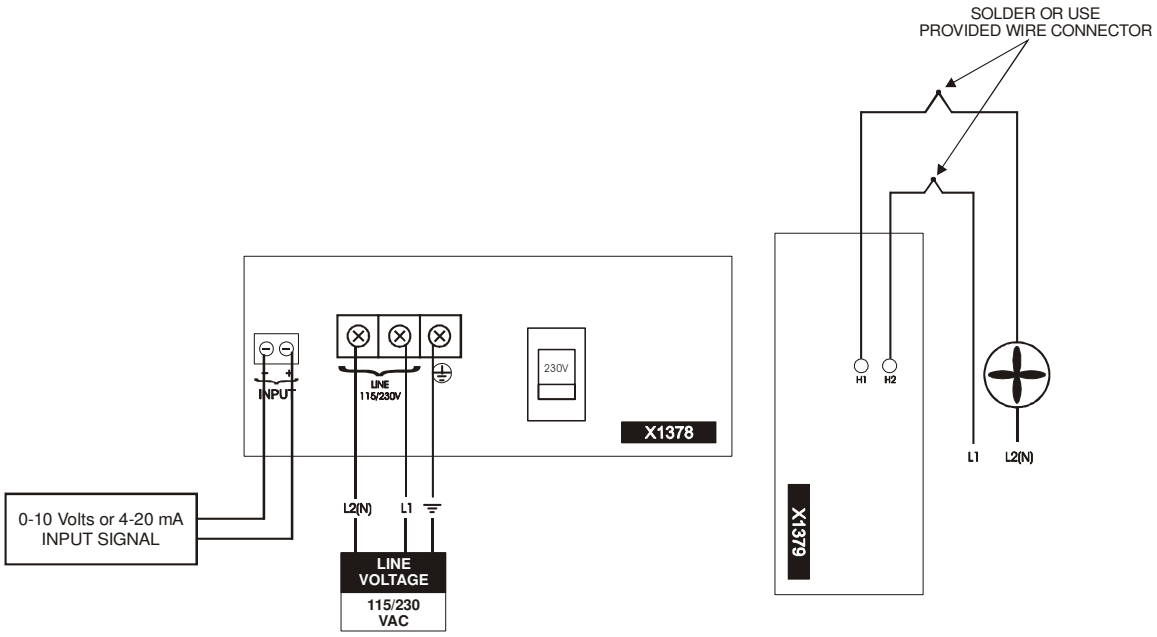
IMPORTANT: The variable output requires the same phase and same voltage as the controller to operate.

4. Connect the power source to the 2 black terminal block identified as LINE as shown in figure 1.
5. Set the JP1 jumper (refer to figure 2 for the location of the jumper) to determine the correct input type. The two types of input are: 0-20 mA (jumper on the 2 left pins) and 0-10 Volts (jumper on the 2 right pins).
6. Connect the 0-10 V or the 4-20 mA signal to the 2 green terminal block identified as INPUT as shown in figure 1.

IMPORTANT: Low-voltage and high-voltage wire must be passed through different conducts at least 1 foot (30 cm) apart. If low-voltage and high-voltage conduits must be crossed, the crossing must be at a 90-degree angle.

7. Make sure that the **Voltage Selector Switch** is set to the correct voltage before powering up the VSD-1MC-20(40) (refer to figure 2 for the location of the **Voltage Selector Switch**).
8. Power up the VSD-1MC-20(40) module. Verify that the module operates correctly.
9. Close the VSD-1MC-20(40) enclosure. Don't forget to put a security screw or a padlock.

Figure 1: Wiring Diagram



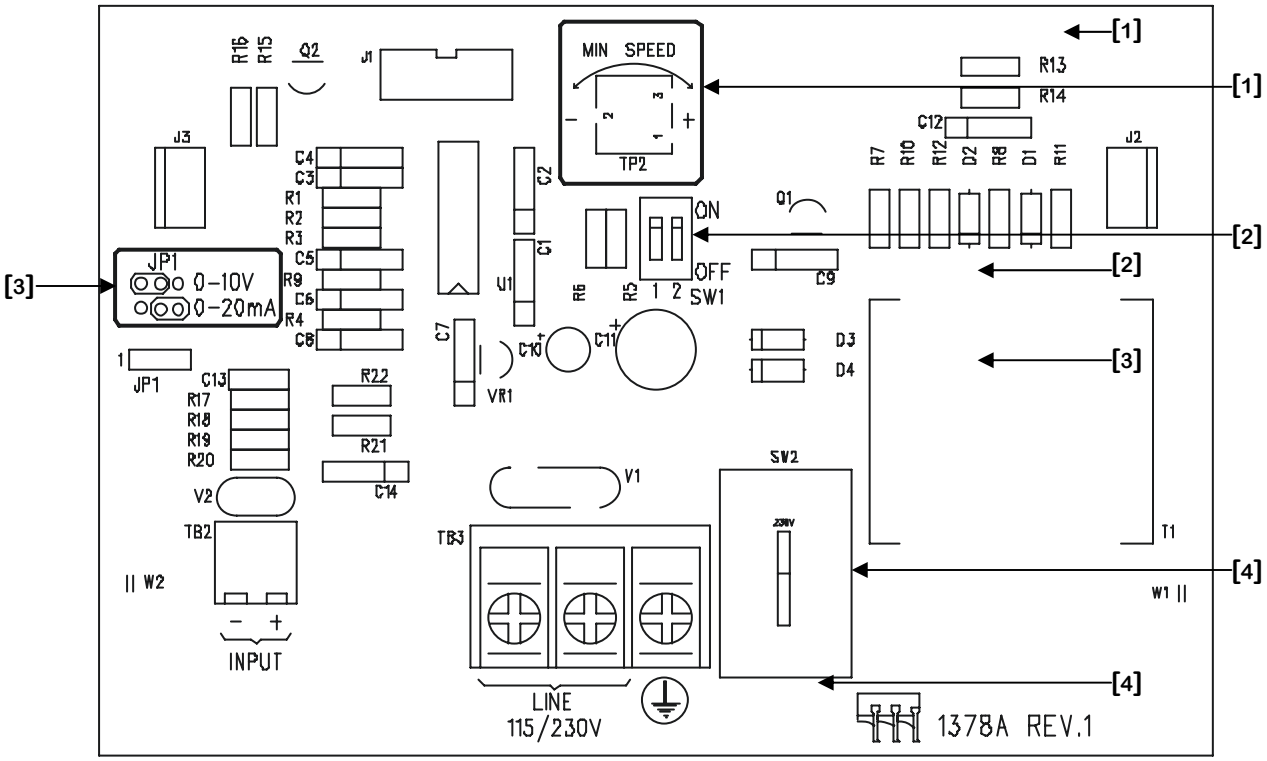
WARNING!

- **To avoid electric shock, disconnect power source prior to installation or troubleshooting.**
- **Make sure that the Voltage Selector switch is set to the correct voltage before powering up the module.**
- **The variable output requires the same phase and same voltage as the controller to operate.**

Using the VSD-1MC-20(40)

With the VSD-1MC-20(40) you can control a variable fan according to a 0-10 Volts or 4-20 mA input signal. Refer to figure 2 for the location of the different switches, jumpers and selectors of the different module.

Figure 2: Electronic Boards and Component Location



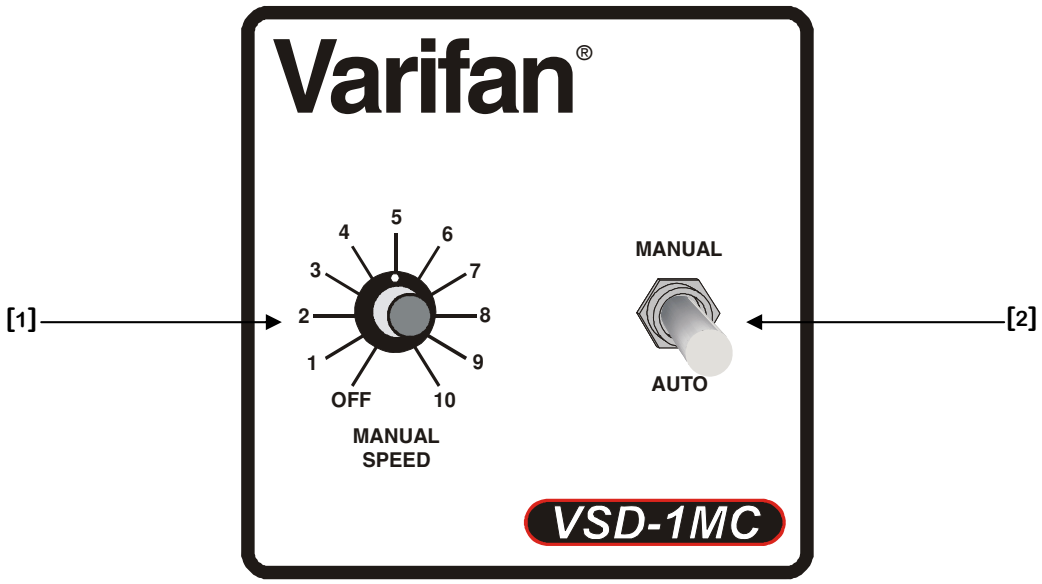
1. **Minimum Speed Potentiometer**
This potentiometer is used to adjust the minimum speed of the fan. This will be the minimum speed when the input signal is at its minimum value.

2. Dip Switches (**Input Range Switch** and **Shutoff 5% Switch**)
Dip Switch 1 is used to select the **Input Range** (ON = 2-10 Volts / 4-20 mA, OFF = 0-10 Volts / 0-20 mA).
Dip Switch 2 is used to adjust the output behavior when the input is below 5% of its total range (ON = Shutoff, OFF = Runs continuously at minimum speed).

3. **Input Type Jumper**
This jumper is used to select which input type is used. Two types of input can be used which are: 0-20 mA (jumper on the 2 left pins) and 0-10 Volts (jumper on the 2 right pins).

4. **Voltage Selection Switch**
This switch is used to select the input voltage value (115V or 230V).

Figure 3: VSD-1MC-20(40) Faceplate



1. **Manual Speed Selector**
This selector is used to set the speed at which the variable output will run when the **AUTO/MANUAL Switch** is set to MANUAL. The variable output will shutoff is the **Manual Speed Selector** is turned completely counter clockwise (OFF).

2. **AUTO/MANUAL Switch**
This switch is used to select if the variable output operates according to the **Manual Speed Selector** (MANUAL) or according to the input signal (AUTO).

The VSD-1MC-20(40) module uses a 0-10 Volts or a 4-20 mA signal to make an output modulates. User can adjust the fan minimum speed with the potentiometer located inside the module box on the electronic board (refer to figure 2). That **Minimum Speed Potentiometer** is used to adjust the speed when the master control input signal is at its lowest value.

User can also set how the fan will operates when the input signal is at or below 5% of its total range. Refer to the logic diagrams at figure 4 and 5 to know the exact values and behavior of the different switches configurations. The fan can either continue to run at minimum speed (**Shutoff 5% Switch** set to OFF) when the input has reach its minimum value or can stop when the input reach 5% of its total range (**Shutoff 5% Switch** set to ON). With the **Shutoff at 5% Switch** set to ON, a differential is applied in order to avoid equipment wear. Refer to figure 4 for the exact value of the differential. Also refer to figure 2 for the location of the **Shutoff 5% Switch**.

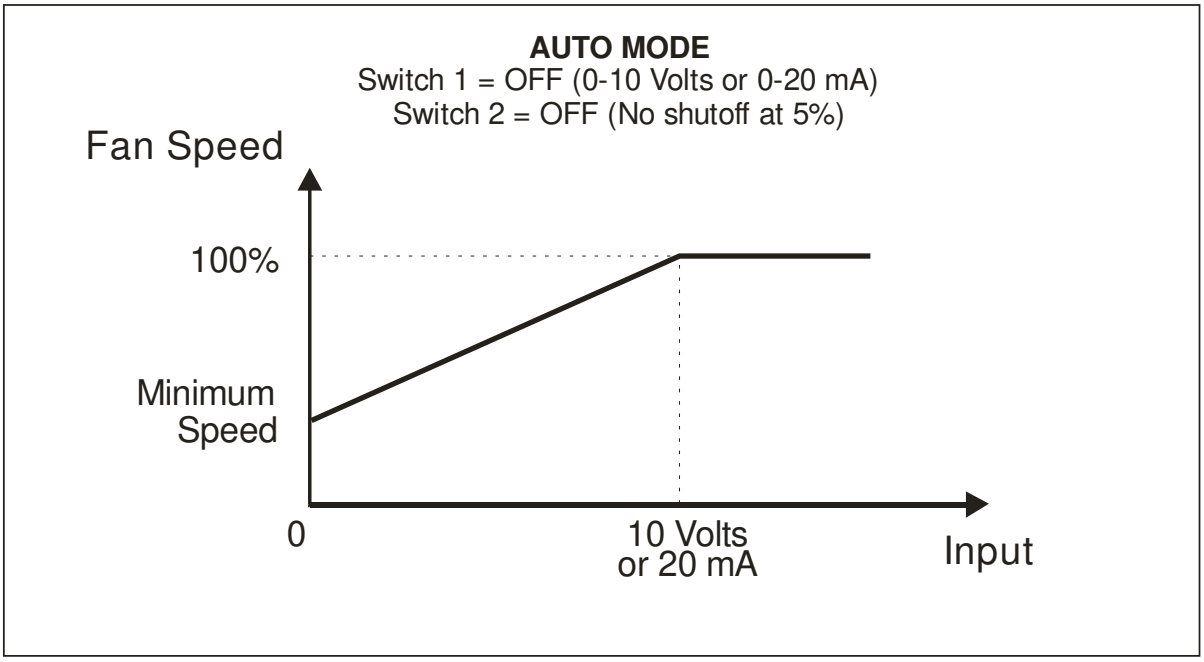
Another switch also located on the electronic board will select if the input is a 0-10 Volts (0-20 mA) or a 2-10 Volts (4-20 mA) signal. Refer to figure 2 for the location of the **Input Range Switch**.

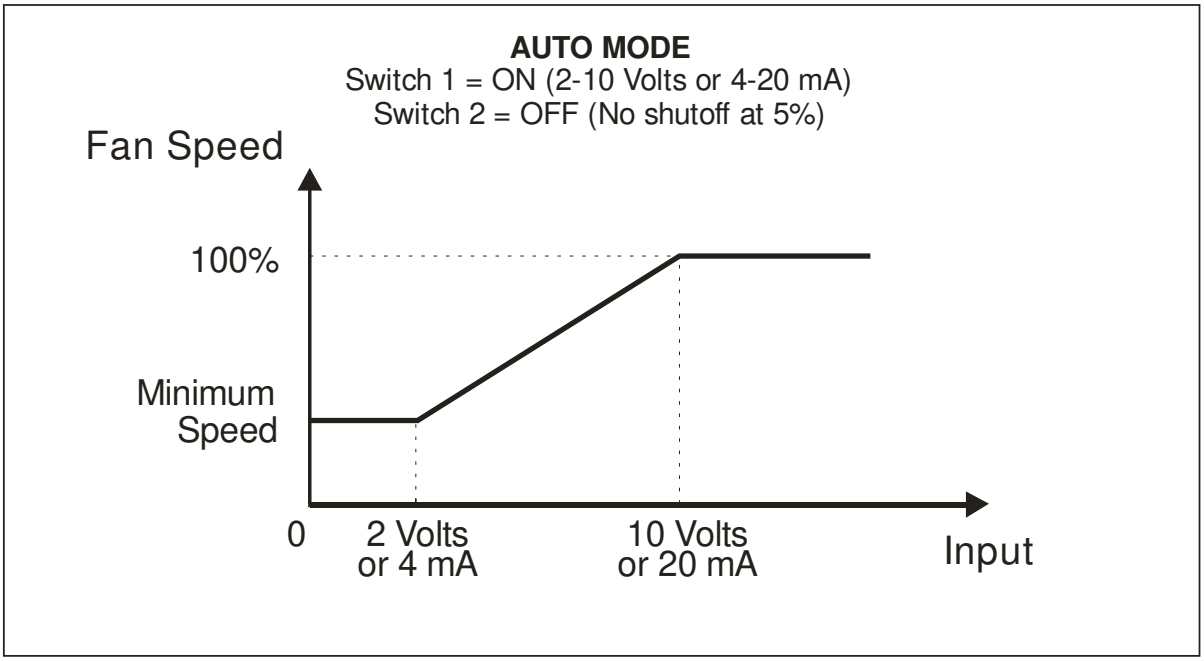
Finally, a jumper (JP1) must be set to determine the input type used. Two types are available which are: 0-20 mA (jumper on the 2 left pins) and 0-10 Volts (jumper on the 2 right pins). Refer to figure 2 for the location of the **Input Type Jumper**.

Here is a description of the VSD-1MC-20(40) operation:

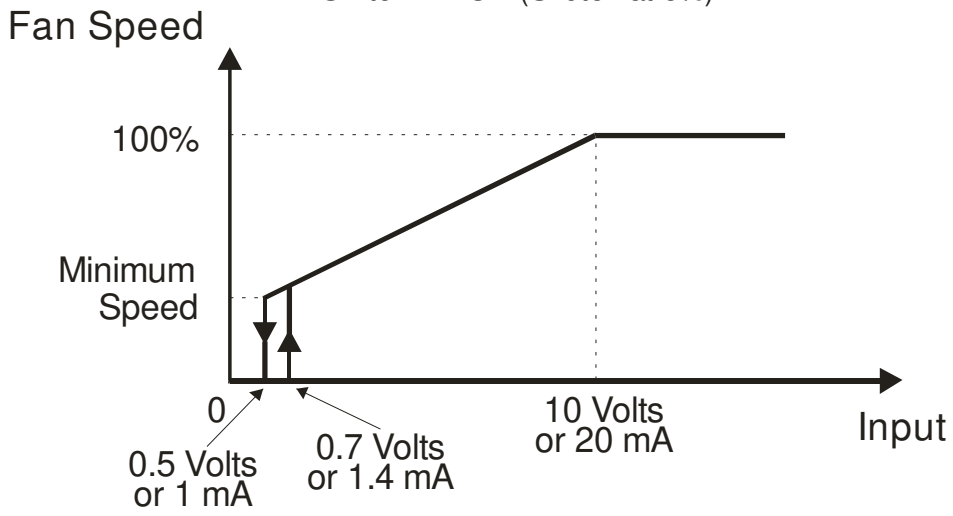
- If the **Shutoff 5% Switch** switch is set to OFF, the fan will run continuously at its minimum speed when the input reads it lowest value. If the **Shutoff 5% Switch** is set to ON, the fan will stop when the input is at or below 5% of its total range. A differential is applied to the 5% value. Refer to figure 4 for the exact value of the differential.
- If the input reads above its minimum value (or 5% if the **Shutoff 5% Switch** is set to ON), the fan will modulate from its minimum speed to 100% of its maximum speed. The full speed will be reached when the input reads 10 Volts or 20 mA.

Figure 4: Logic Diagrams (Auto Mode)





AUTO MODE
Switch 1 = OFF (0-10 Volts or 0-20 mA)
Switch 2 = ON (Shutoff at 5%)



AUTO MODE
Switch 1 = ON (2-10 Volts or 4-20 mA)
Switch 2 = ON (Shutoff at 5%)

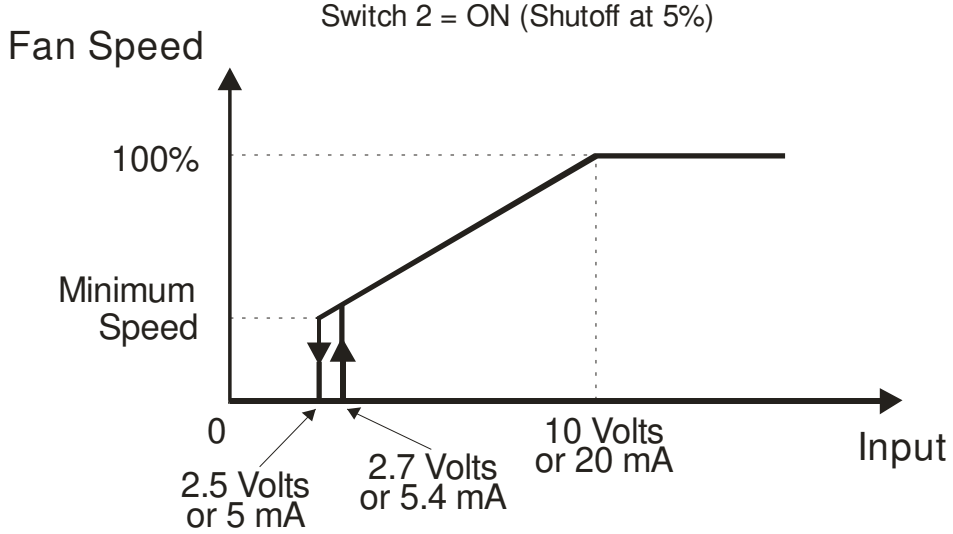
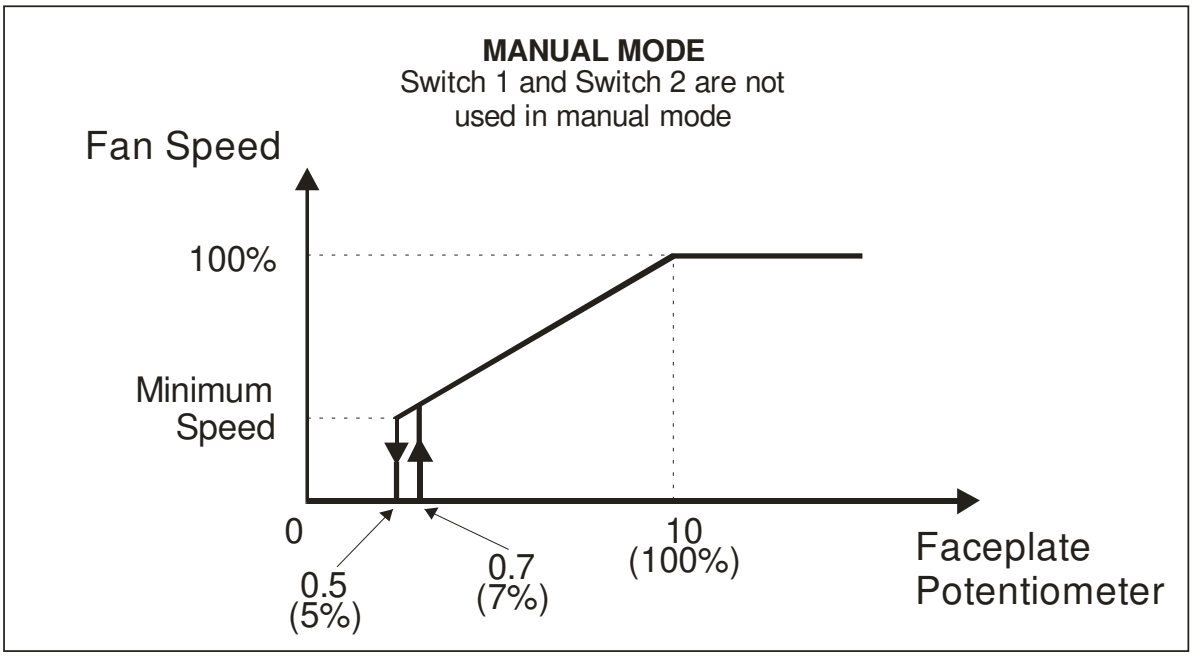


Figure 5: Logic Diagram (Manual Mode)



Specifications

DESCRIPTION	VALUE
Storage temperature	-4°F to 131°F (-20°C to 55°C)
Operating temperature	32°F to 113°F (0°C to 45°C)
Humidity	90% maximum Non-condensing
Weight (VSD-1MC-20)	3,8 lb (1,7 kg)
Weight (VSD-1MC-40)	4,6 lb (2,1 kg)
Size (VSD-1MC-20)	12 1/4" x 7 14/16" x 6 1/4" (31 cm x 20 cm x 16 cm)
Size (VSD-1MC-40)	13 3/4" x 7 14/16" x 6 1/4" (35 cm x 20 cm x 16 cm)
Warranty	2 years
POWER SUPPLY	
Operational voltage range (SW1 @ 115V)	92 to 125 VAC
Operational voltage range (SW1 @ 230V)	184 to 250 VAC
Operational frequency range	45 to 65 Hz
INPUT	
Input Range	0-10 Volts or 0-20 mA
Maximum wire length	500 feet (150 m)
Recommended wires	2 conductor wire, AWG #22
VARIABLE OUTPUT (VSD-1MC-20)	
Recommended maximum current	20 A, 250 VAC
Minimum load	300 mA @ 230 VAC
VARIABLE OUTPUT (VSD-1MC-40)	
Recommended maximum current	2x 20 A, 250 VAC
Minimum load	300 mA @ 230 VAC

Limited Warranty

The manufactured equipment and supplied components have gone through rigorous inspection to assure optimal quality of product and reliability. Individual controls are factory tested under load, however the possibility of equipment failure and/or malfunction may still exist.

For service, contact your local retailer or supplier. The warranty period shall be for two years from manufacturing date. Proof of purchase is required for warranty validation.

In all cases, the warranty shall apply only to defects in workmanship and specifically exclude any damage caused by over-voltage, short circuit, misuse, acts of vandalism, lightning, fortuitous events, acts of God, flood, fire, hail or any other natural disaster. Any unauthorized work, modification or repair on this product automatically voids the warranty and disclaims the manufacturer from all responsibility.

The manufacturer assumes only those obligations set forth herein, excluding all other warranties or obligations. This warranty stipulates that in all cases the manufacturer shall be liable only for the supply of replacement parts or goods and shall not be liable for any personal injury, damages, loss of profits, interrupted operations, fines for infringement of the law or damages to the production of the PURCHASER and the PURCHASER shall take up the defence and hold the manufacturer faultless regarding any legal or extra legal proceedings, notice, or claim by the customer or by a third party, and regarding any legal and extra legal expenses and fees brought forward on by such damages.

VSD-1MC-20(40) VER : 1.0
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