



MonsterFans
by Schwank

MonsterFans Direct-Drive [DD] Series Fan

Electrical Installation Manual

Table Of Contents

Safety Precautions.....	2
General Electrical Installation	3 - 5
LVC Wiring Diagram	6
MonsterFans Simple Fan Control Installation	7 - 10
MonsterFans Smart Fan Control Installation	11 - 19
MonsterFans Smart Multi-Fan Control Installation	20 - 31

Safety Precautions



All installations must be installed by a qualified person.
Do not work on live equipment. Use of lock-out procedures is a must.

Important!

The installation of a wind sensor is mandatory in agricultural installations.

Electrical Installation

Included Components

- Fan Mounted VFD
- VFD Mounting Plate
- Remote Keypad in Control Box
- Wiring Harness
- 100' CAT 5 Cable

Reference Acronym Key

- VFD - Variable Frequency Drive

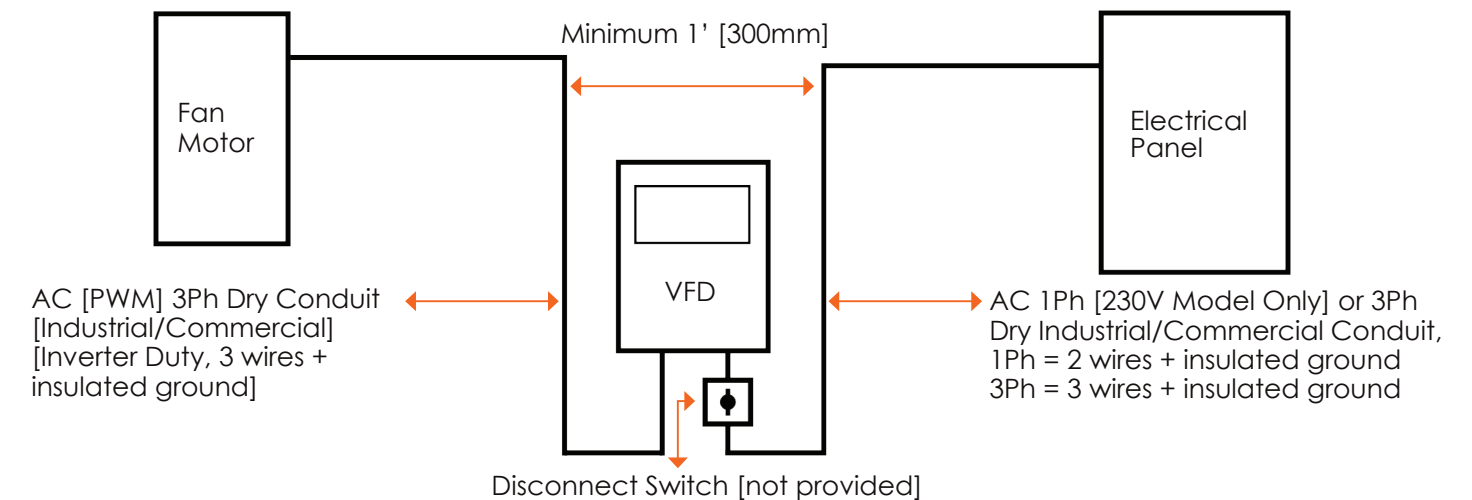
Wire Requirements

- The size of the input and output wires depends on the length and current draw of the VFD and Motor.
- Use a continuous run of wires between the Motor and VFD [no splices or connections].
- Use adequately sized, shielded VFD cables for VFD to motor wiring.

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

Motor is rated with an Insulation Class F;
Ensure proper wiring is used as per current electrical codes.

Wiring Schematic



Wire Location

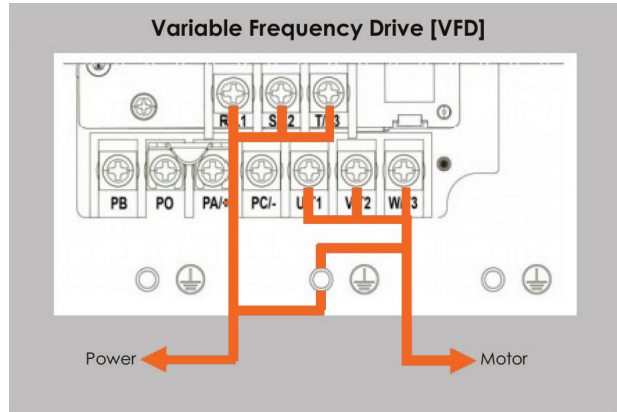
- DO NOT RUN input and output power cables in the same conduit
- DO NOT RUN control cables with any power cables in the same conduit
- DO NOT RUN different fan's output power cables in the same conduit

Electrical Installation

Wire Connections [VFD]

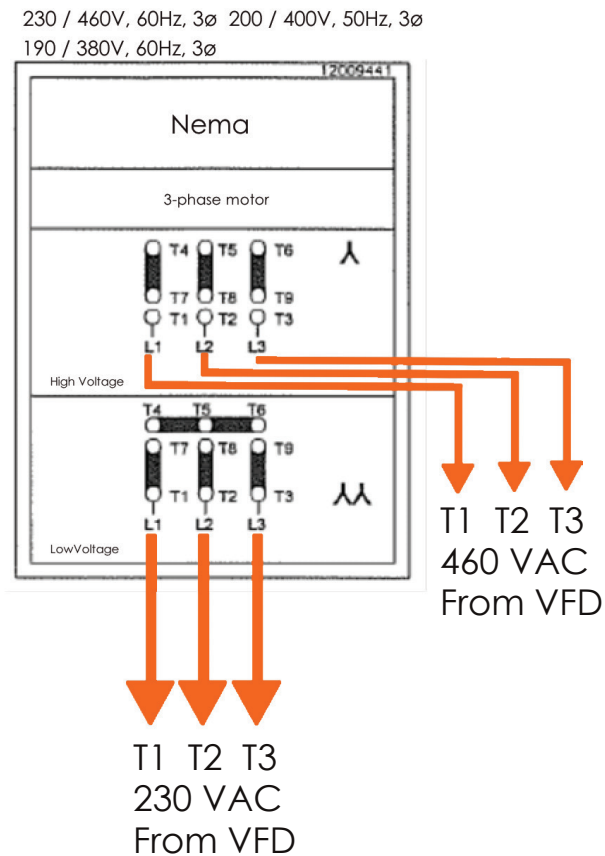
Input Power

- Single phase [1Ph] use L1 - L2 + PE [Ground]
- Three phase [3Ph] use L1 - L2 - L3 + PE [Ground]



Wire Connections [Motor]

The Variable Frequency Drive provides the over temperature and overload protection.



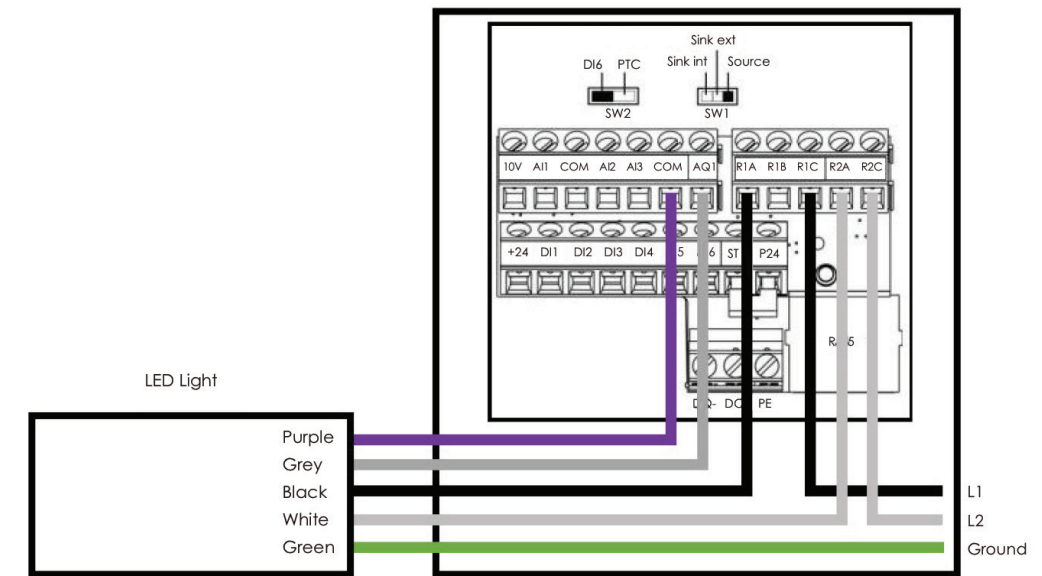
Electrical Installation

LED Light

If unit is fitted with the LED light it is capable of being controlled through the VFD with the MonsterFans Smart control or by a suitable ON/OFF/Dimmer switch.

MonsterFans Smart Control

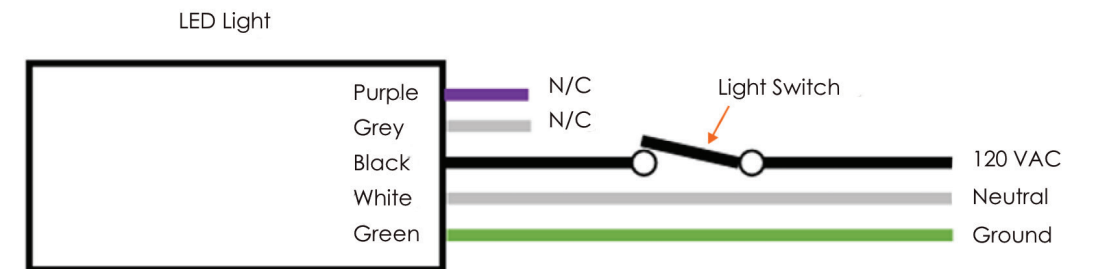
Wire the LED light to drive as pictured below to allow ON/OFF and Dimming control from the HMI.



External Switch without Dimming

A standard 120 VAC light switch can be used for ON/OFF light control without dimming.

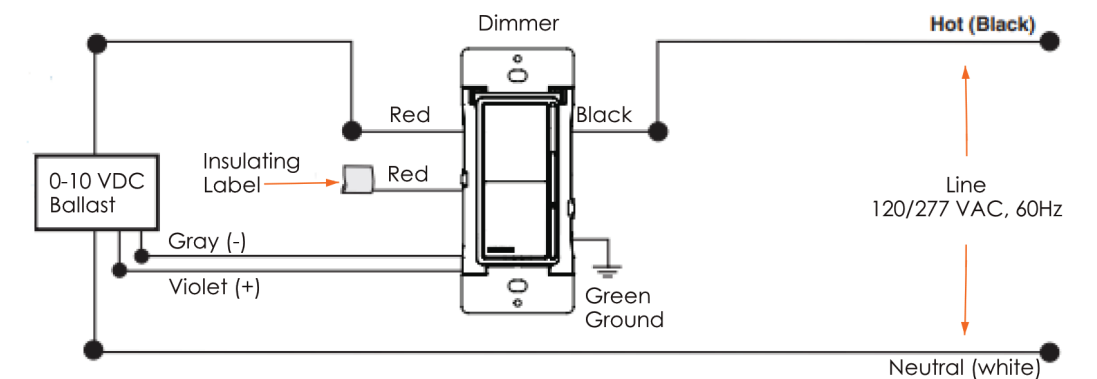
The light will operate at 100% brightness when turned ON if no dimmer is connected.



External Switch with Dimming

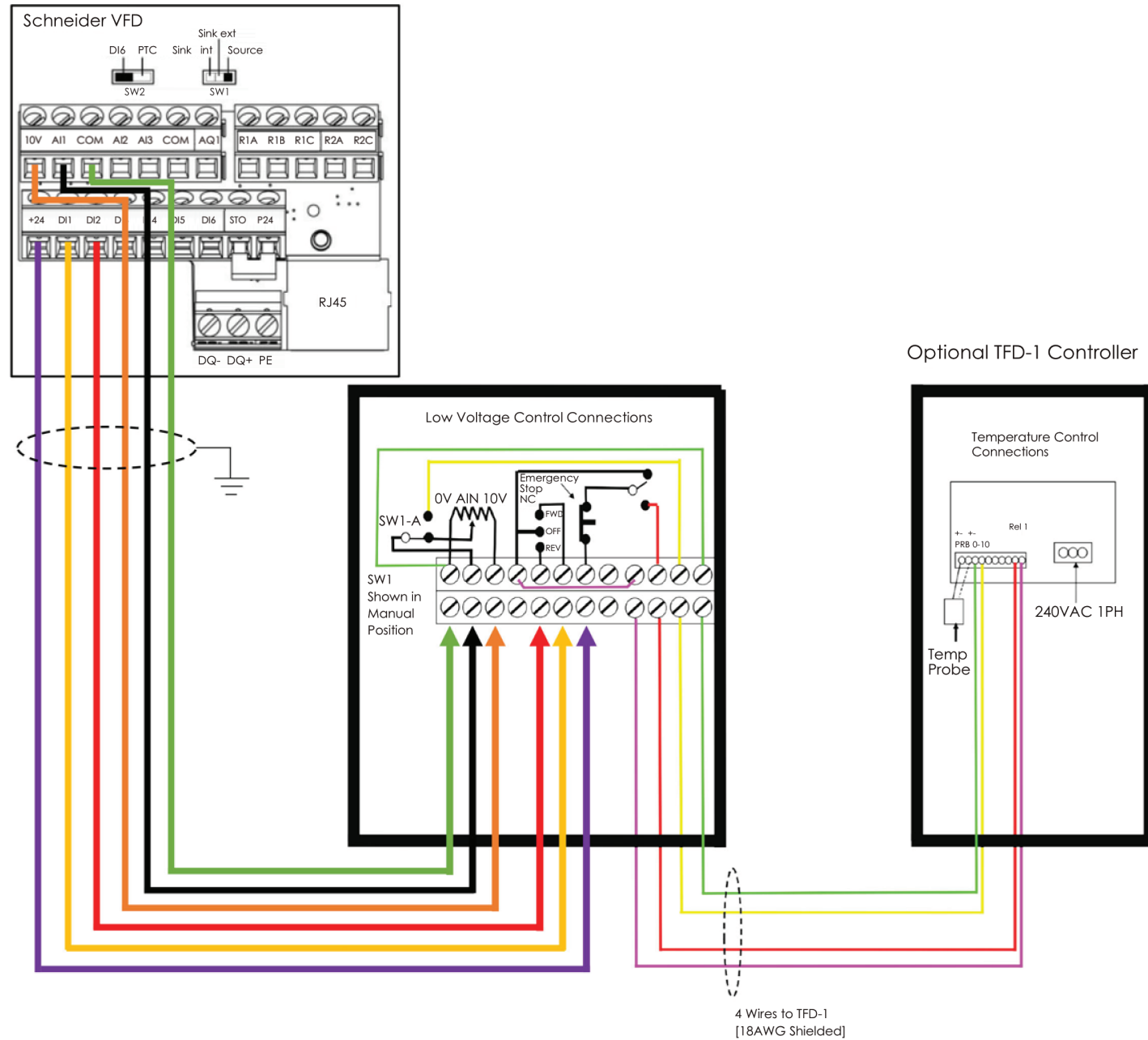
A 0-10V LED compatible Dimmer switch must be used to control the light with dimming.

Leviton DS710-10Z or Lutron DVSTV-WH are examples of suitable 0-10V dimmer switches.



LVC Controller Wiring Diagram

Schneider VFD to Low Voltage Controller Wiring Diagram [OPTIONAL]



MonsterFans Simple Fan Control Installation

MonsterFans Simple Fan Control

Included Components

- MonsterFans Simple Control Keypad
- Split Cable Gland

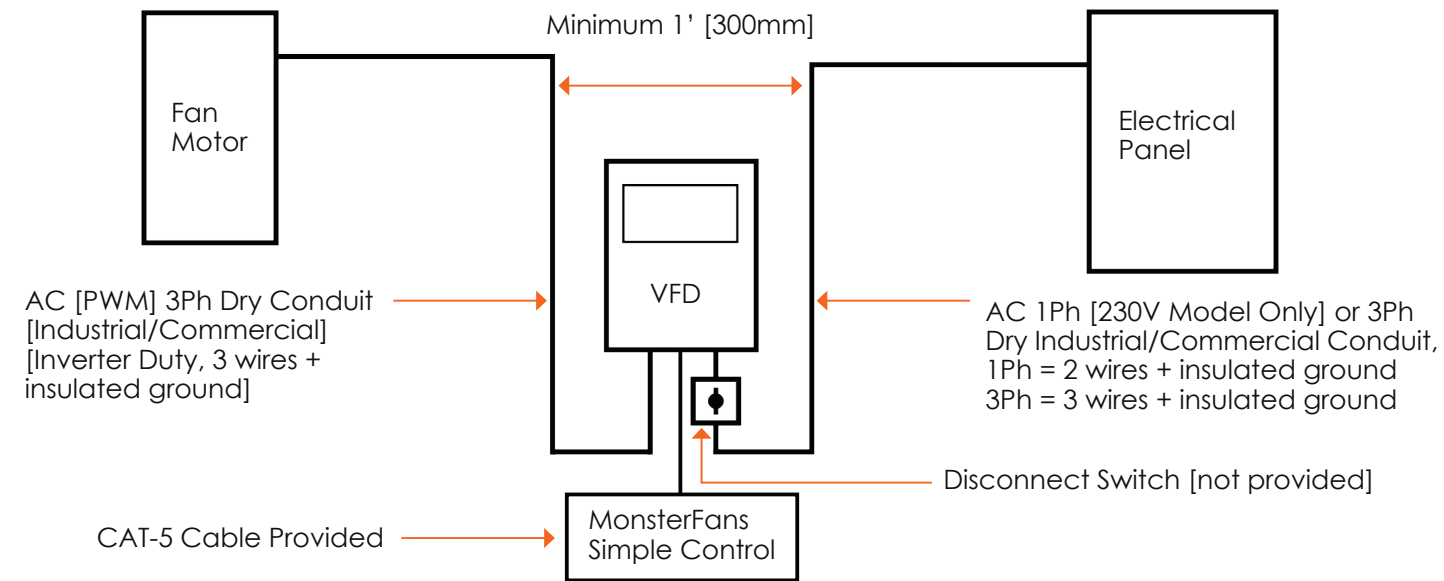
Reference Acronym Key

- VFD- Variable Frequency Drive



MonsterFans Simple Fan Control Installation

Control Schematic



Cable Location:

DO NOT RUN control cables and any power cables in the same conduit.

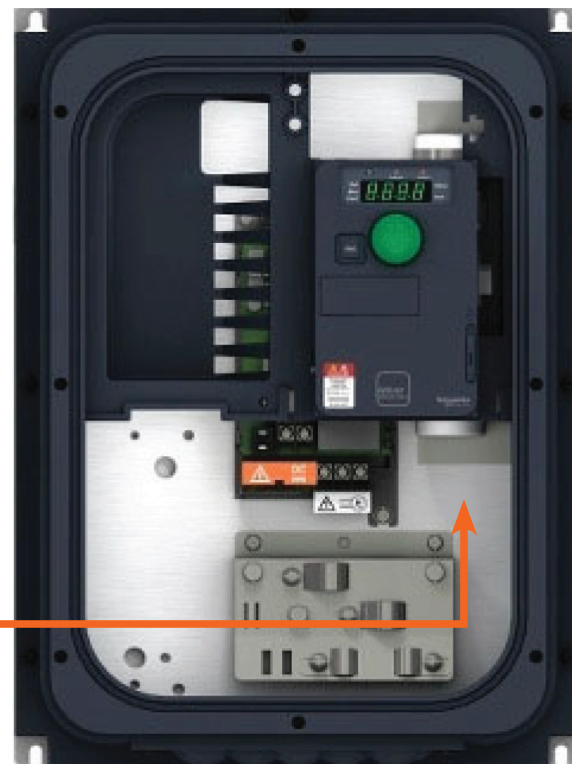
Cable Connection [VFD]

Cat5 cable should be connected to the RJ45 port INSIDE of the VFD enclosure, as not to be exposed to environmental conditions. Do not connect to the external RJ45 port on the drive.

A minimum of Cat 5 cable must be used to connect between devices.

If required cable length is greater than the 100' of Cat5 supplied with the VFD, bulk cable should be used to make a cable with no additional connections.

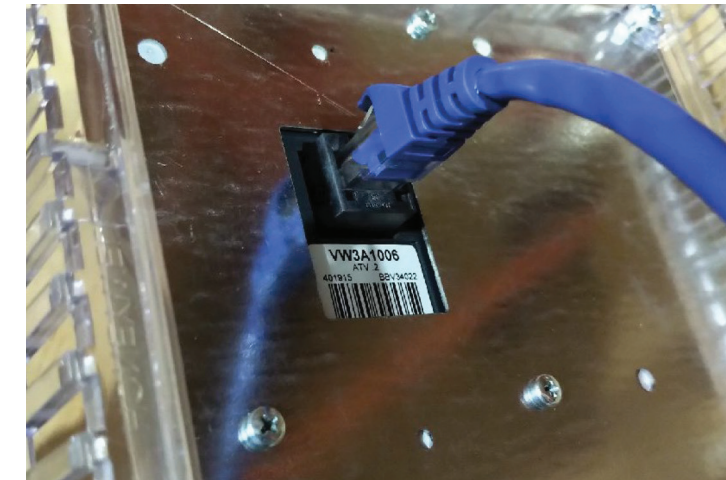
* Connect Cat5 Cable to port inside of VFD enclosure.



MonsterFans Simple Fan Control Installation

Cable Connection [Keypad]

Connect Cat5 cable from VFD to RJ45 port on the back of the keypad.



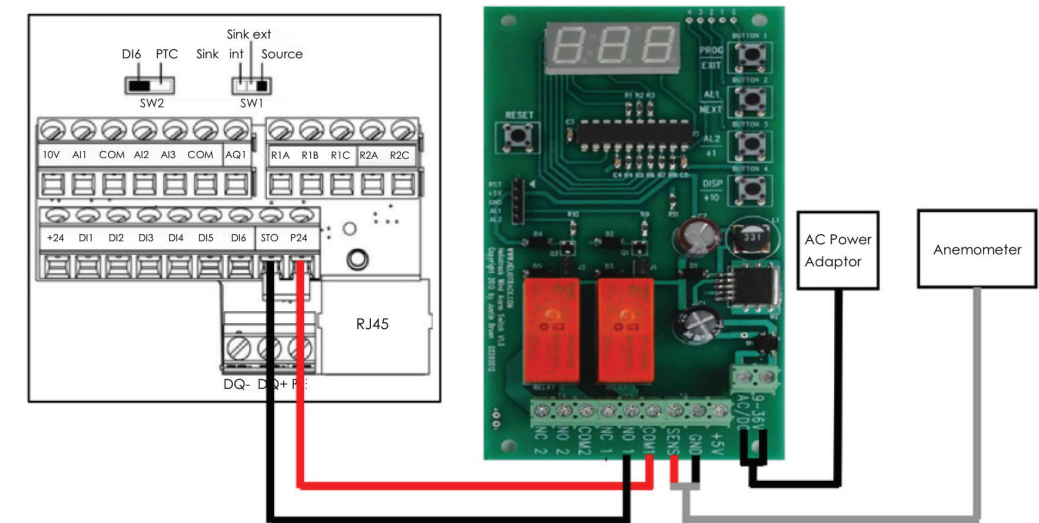
Wind Speed Switch [Optional]

If a Wind Speed Switch is to be used, the control must be wired as pictured below, to allow for automatic shutdown of the fan based on high wind speeds.

The Keypad will display "STo" while high wind speeds are active.

The fan must be manually reset once the wind speed drops below the controller set point.

* Please refer to Wind Speed Switch supplement for further installation and operation details.

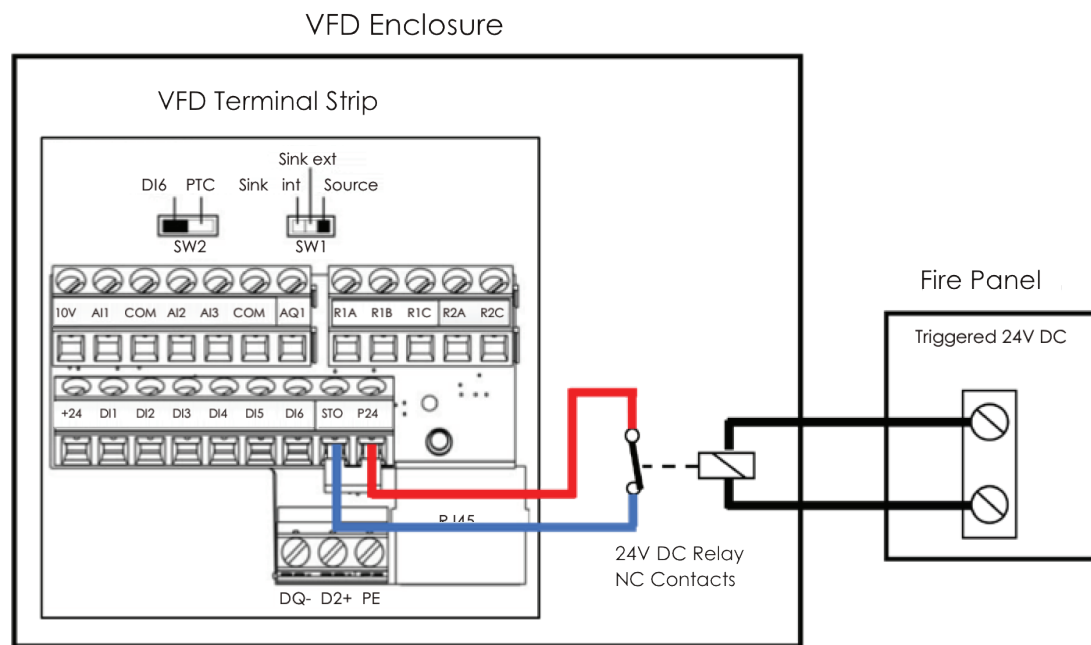


MonsterFans Simple Fan Control Installation

Fire Suppression System Relay [Optional]

To integrate fan controls with a fire detection / suppression system wire fire panel to supplied relay in VFD enclosure as shown below.

The Keypad will display "STo" while the fire shutdown is active.
The fan must be manually restarted once the fire suppression system has been reset.



Operating Instructions

To Start:	
To Stop/Reset Fault:	
To Change Rotation:	
To Adjust Speed:	



MonsterFans Smart Fan Control Installation

MonsterFans Smart Fan Control



Included Components

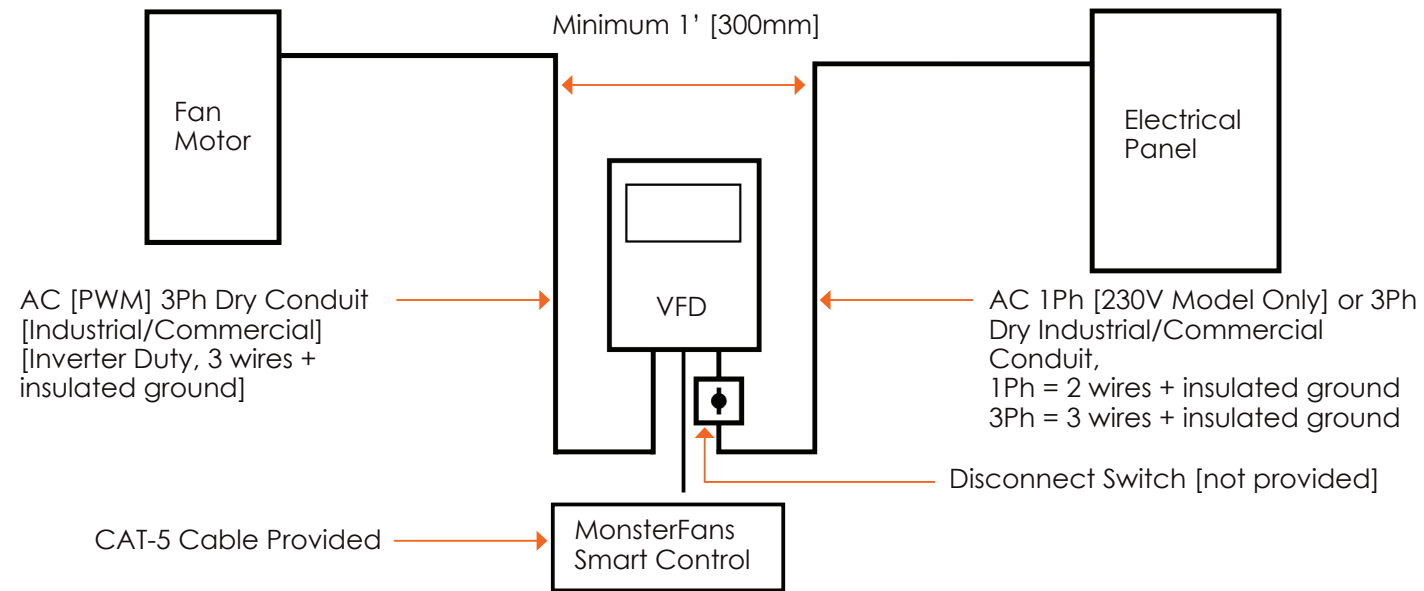
- MonsterFans Smart Control Graphic Interface
- RJ45 Coupler
- 100' CAT5 Cable
- Split Cable Gland

Reference Acronym Key

- VFD- Variable Frequency Drive

MonsterFans Smart Fan Control Installation

Control Schematic



Cable Location:

DO NOT RUN control cables and any power cables in the same conduit.

Cable Connection [VFD]

Cat5 cable should be connected to the RJ45 port INSIDE of the VFD enclosure, as not to be exposed to environmental conditions. Do not connect to the external RJ45 port on the drive. A minimum of Cat 5 cable must be used to connect between devices.

If required cable length is greater than the 100' of Cat5 supplied with the VFD, bulk cable should be used to make a cable with no additional connections.

* Connect Cat5 Cable to port inside of VFD enclosure.



MonsterFans Smart Fan Control Installation

Installation Considerations

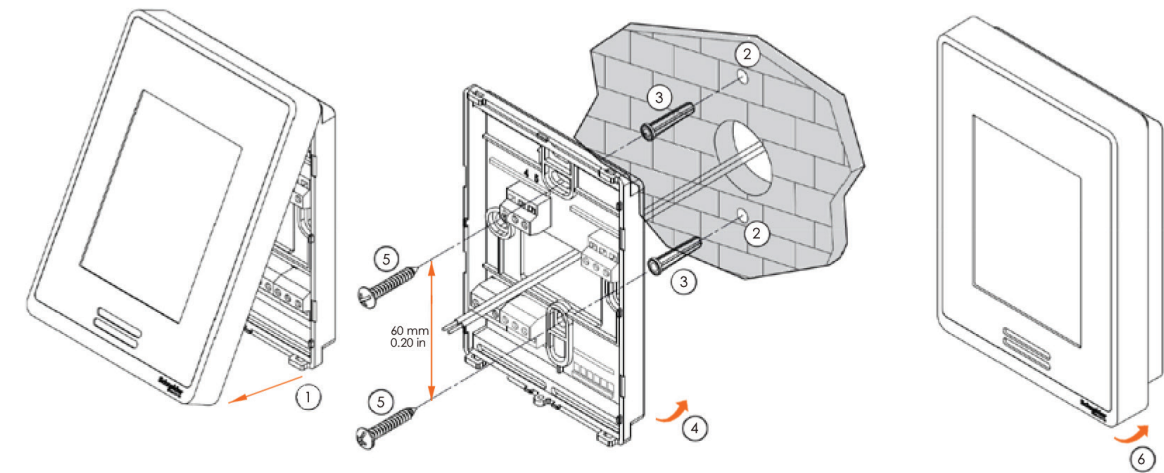
- The HMI must be mounted in a safe and dry location.
- It should not be mounted in a location that it is exposed to direct liquid contact [i.e., splashing or washdown].
- If utilizing the built-in temperature and/or humidity sensors of the HMI, placement of the HMI in a proper location to ensure its efficiency, accurate readings, and the proper automatic function of the fan is very important.

If possible place the HMI away from:

- Direct sunlight, drafts, exterior doorways, skylights, windows, and exterior walls.

Mounting

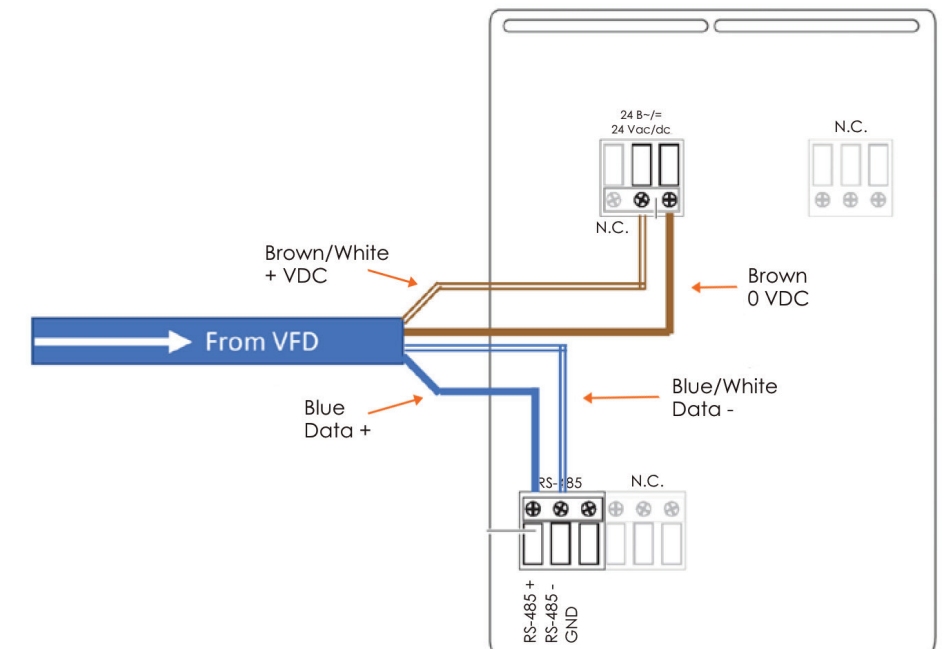
The HMI can be mounted directly to a wall with or without the use of a electrical box in the wall. If the HMI is to be mounted on a structural steel column or similar, a single gang weatherproof box is recommended to space the HMI off of the column to avoid inaccurate temperature readings.



Wiring

The HMI comes with a Cat5 cable prewired.

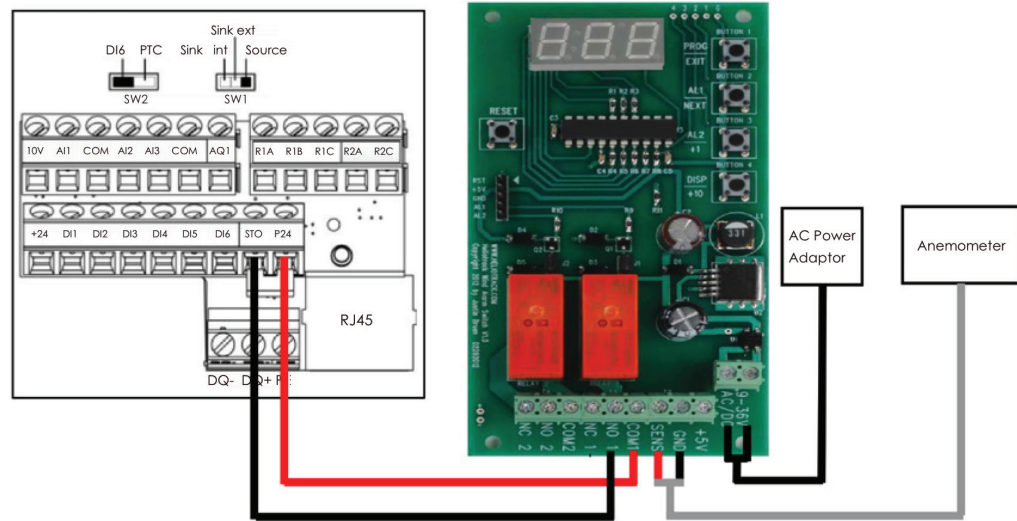
In some cases it may be necessary to terminate the Cat5 cable from the VFD directly to the HMI.



MonsterFans Smart Control Fan Control Installation

Wind Speed Switch [Optional]

If a Wind Speed Switch is to be used, the control must be wired as pictured below, to allow for automatic shutdown of the fan based on high wind speeds.



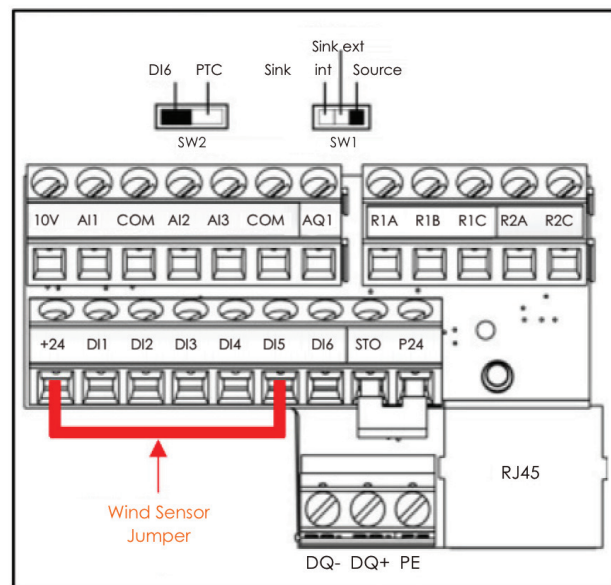
* Please refer to Wind Speed Switch supplement for further installation and operation details.

Wind Speed Alarm

If high wind speeds are detected the fan will decelerate to a stop and a message will display on the HMI [pictured below.] Once the wind speed drops below the set point the fan will automatically restart.

Wind Sensor Jumper

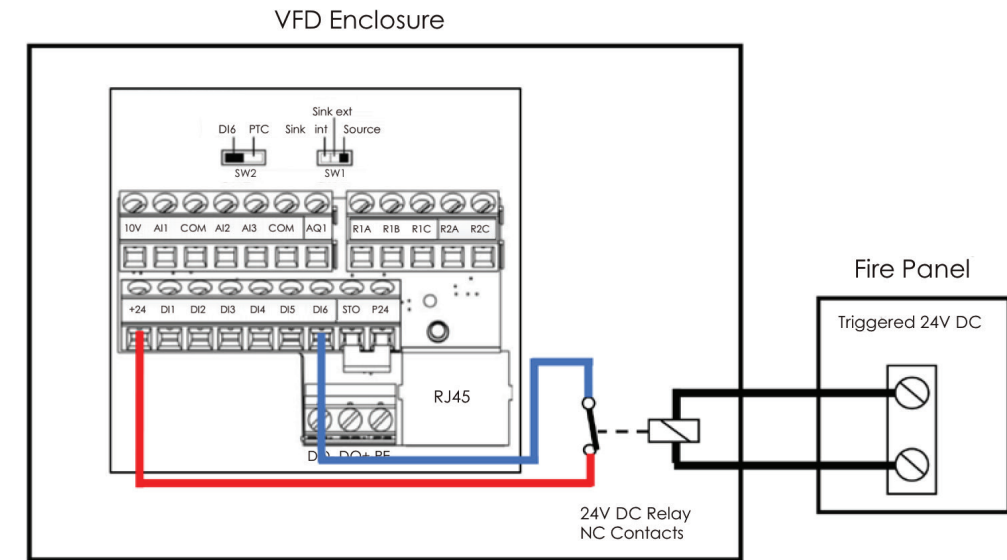
If no Wind Speed Sensor is to be installed a jumper MUST be installed as pictured below for the unit to operate with the MonsterFans Smart Control.



MonsterFans Smart Control Fan Control Installation

Fire Suppression System Relay [Optional]

To integrate fan controls with a fire detection / suppression system wire fire panel to supplied relay in VFD enclosure as shown below.

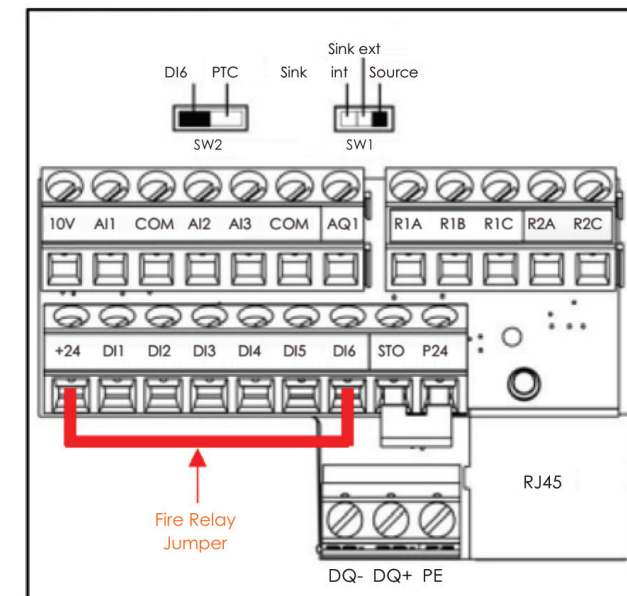


Fire Relay Alarm

If the Fire Relay is activated the fan will decelerate to a stop and a message will display on the HMI [pictured below.] Once the Fire Relay is reset the fan will automatically restart.

Fire Relay Jumper

If no Fire Relay is to be installed a jumper MUST be installed as pictured below for the unit to operate with the MonsterFans Smart Control.



MonsterFans Smart Fan Control Installation

Operation

Controlling the speed, direction of rotation, as well as the ON/OFF and intensity of the LED light is done through the screens on the MonsterFans Smart Control HMI.

Fan Control

Auto/Manual modes, speed and direction selections are done on this screen.

Fault Indicator:
The bar at the top and bottom of all screens indicates the status of the FD.
Green: Normal
Red: Faulted

Manual Controls:
Operational control of fan. ON/OFF and FWD/REV.
Reset clears faults on drive.
Set desired fan speed by tapping number or with +/- buttons.

Readings Display:
Actual speed, Temperature, and Humidity readings displayed.
Temperature reading units can be displayed in °C or °F.
Units can be selected on Setting page 2.

Navigation Buttons:
Navigate to the various pages on the display.

Light Control Screen

Control of the LED Light is done from this screen.

Note: This screen is only accessible if the unit is equipped with the LED light option.

Light Controls:
ON/OFF and Dimming control of light
Set desired light intensity by tapping number or with +/- buttons.

Navigation Buttons:
Navigate to the various pages on the display.

MonsterFans Smart Fan Control Installation

Main Screen

Selecting this page enters the control into Auto Mode.

This screen displays the sensor readings and the fans current speed as calculated based on the set-points set in the Settings screens.

Readings Display:
Actual speed, Temperature, and Humidity readings displayed.
Temperature reading units can be displayed in °C or °F.
Units can be selected on Setting Screen 2.

Navigation Buttons:
Navigate to the various pages on the display.

Settings Screen 1

Auto Mode speed is calculated based on the settings entered in the fields on this screen.

Set-point Entry:
Enter desired set-point values in each of the respective fields.
*When changing temperature units the value will not automatically convert, the desired set-point value must be entered manually.

Setting Screen 2 Button:
Navigate to the second settings page.

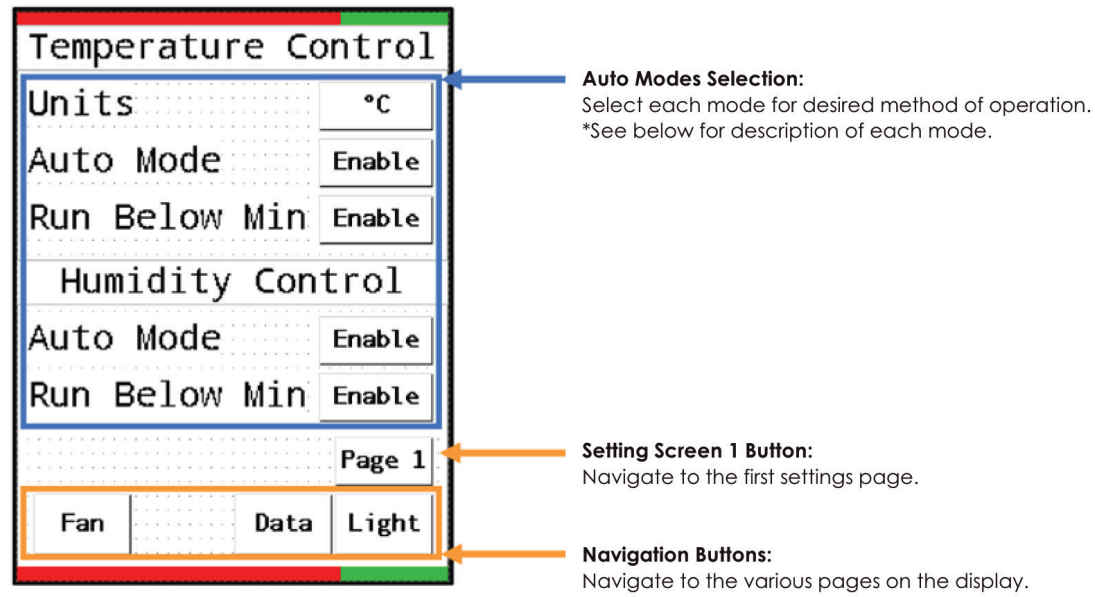
Navigation Buttons:
Navigate to the various pages on the display.

MonsterFans Smart Fan Control Installation

Settings Screen 2

Auto Mode functions are based on the settings enabled on this screen.

* The settings on this screen are not retentive, if power to the HMI is lost, they will reset to Disabled and must be re-enabled for fan to function in Auto Mode



Controls Modes

Units

Select temperature units displayed °C/°F.

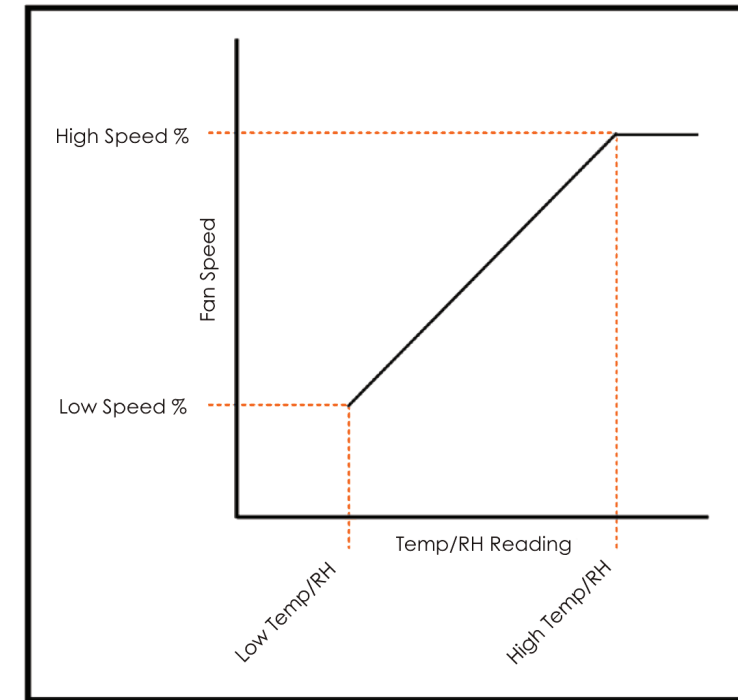
Auto Mode

- Enabling Auto Mode allows the fan to automatically start if the temperature or humidity rises to the Low Temp/RH set-point, beginning to run at the Low Speed % set-point.
- The fan speed will continue to increase to the High Speed % based on the sensed temperature or humidity until the High Temp/RH set-point is reached.
- The fan will continue to run at the High Speed % set-point if the sensed temperature or humidity is above the High Temp/RH set-point.
- If both Temperature and Humidity Auto Modes are enabled the fan will run at the higher calculated required speed.

Run Below Min

- Allows the fan to run at the Low Speed % set-point if the sensed temperature is below the Low Temp set-point.

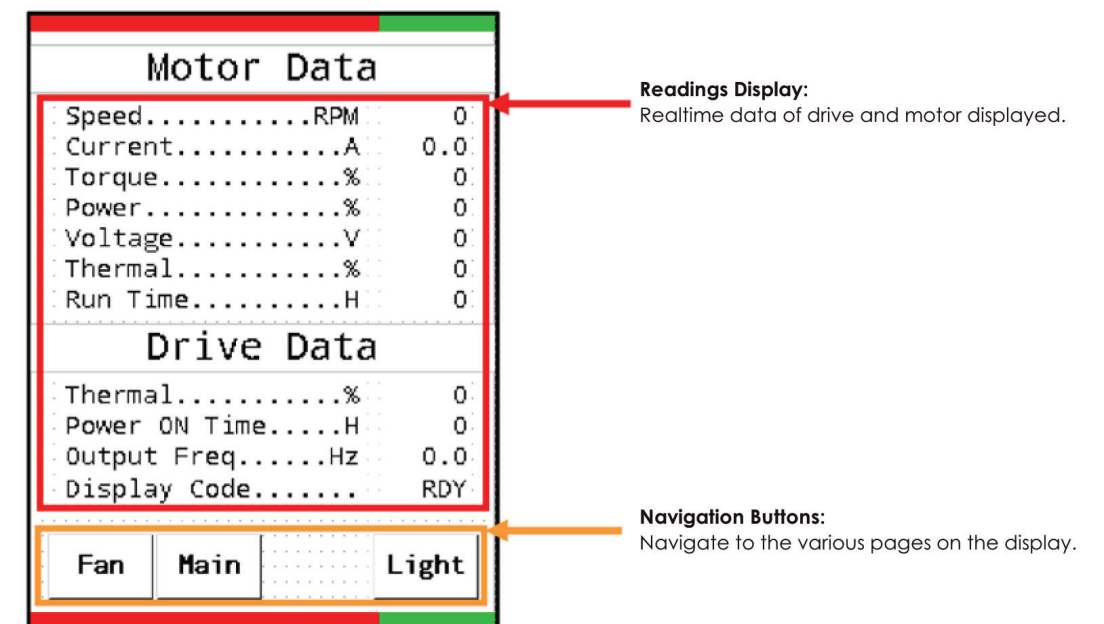
MonsterFans Smart Fan Control Installation



This chart shows how the fan speed is calculated relative to the sensed temperature and humidity

Data Screen

Realtime data from the drive is displayed on this page allowing live monitoring of fan performance



MonsterFans Smart Multi-Fan Control Installation

MonsterFans Smart Multi-Fan Control

Included Components

- HMI Control
- Control Box
- RJ45 Splitters
- 100' CAT5 Cable

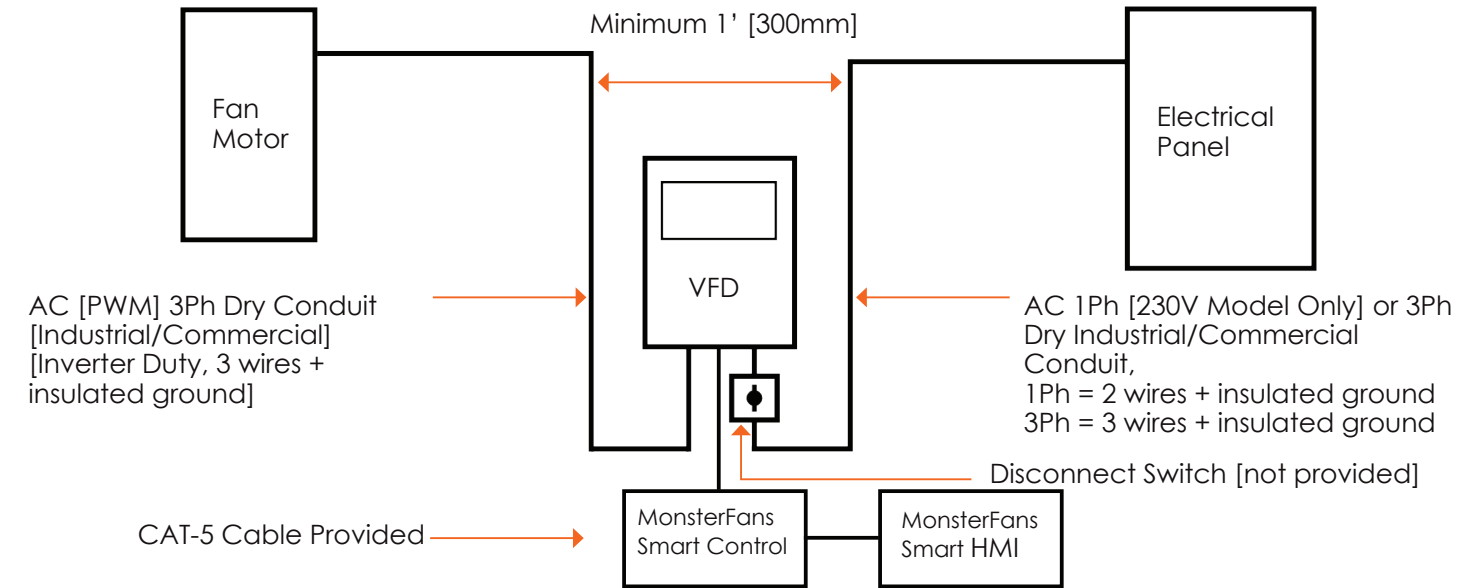
Reference Acronym Key

- VFD- Variable Frequency Drive



MonsterFans Smart Multi-Fan Control Installation

Control Schematic



VFD Mounting and Electrical Connection:

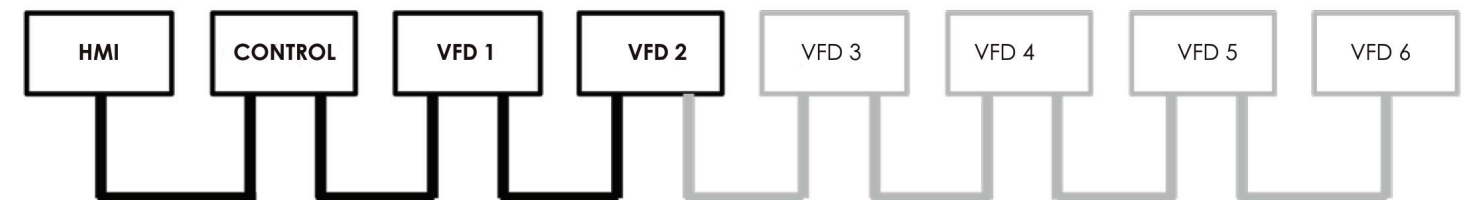
Please refer to the Electrical Installation Guide for full recommended VFD mounting and electrical connection instructions.

Network Configuration

- Using the short CAT 5 cable in the VFD, connect the supplied RJ45 splitter as shown.
- Connect the CAT 5 cable from the control box to VFD 1 to one of the ports of the splitter.
- Connect a CAT 5 cable for VFD 2 to the remaining port of the splitter.
- Connect the remaining VFD's in the same manner.
- The last VFD in the network does not require a splitter. Remove the short CAT 5 cable from the VFD and connect the CAT 5 cable from the previous VFD directly the RJ45 port inside the VFD enclosure.

** All CAT 5 connections should be made inside of an enclosure.

The connection diagram below outlines how to create the fan control network. It is important to connect the Cat5 cables in the control box to the correct field device.



MonsterFans Smart Multi-Fan Control Installation

Cable Location:

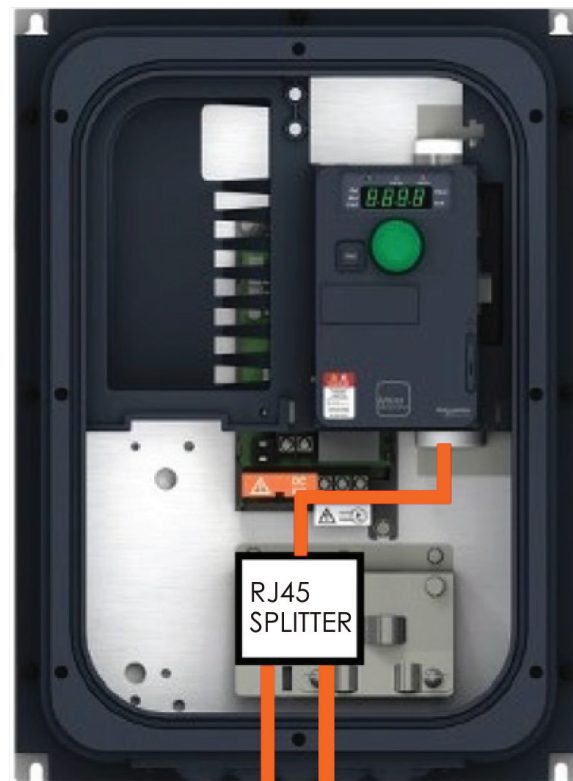
- DO NOT RUN control cables and any power cables in the same conduit.

Cable Connection [VFD]

Cat5 cable should be connected to the RJ45 port INSIDE of the VFD enclosure, as not to be exposed to environmental conditions. Do not connect to the external RJ45 port on the drive. A minimum of Cat 5 cable must be used to connect between devices.

If required cable length is greater than the 100' of Cat5 supplied with the VFD, bulk cable should be used to make a cable with no additional connections.

The last fan on the network does not require a splitter to be installed, connect directly to internal RJ45 port.



From Control Box/
previous VFD → To next VFD

* Connect Cat5 Cable and splitter to port inside of VFD enclosure

MonsterFans Smart Multi-Fan Control Installation

Installation Considerations

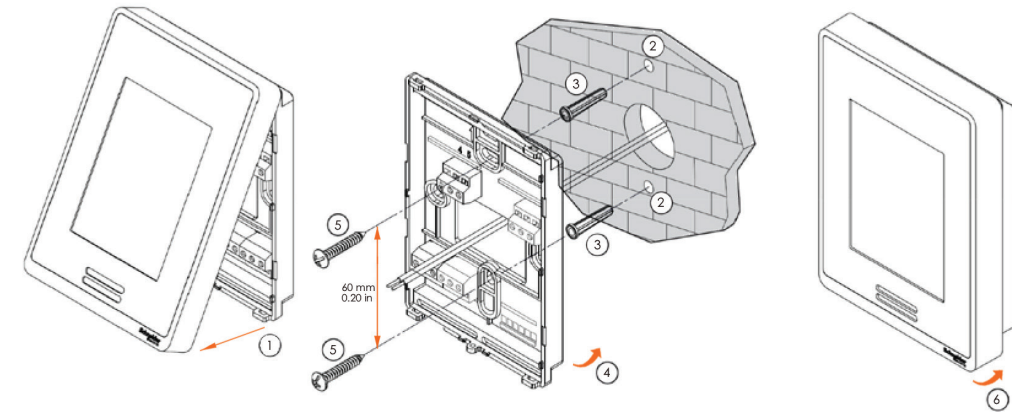
- The HMI must be mounted in a safe and dry location.
- It should not be mounted in a location that it is exposed to direct liquid contact [i.e., splashing or washdown].
- If utilizing the built-in temperature and/or humidity sensors of the HMI, placement of the HMI in a proper location to ensure its efficiency, accurate readings, and the proper automatic function of the fan is very important.

If possible place the HMI away from:

- Direct sunlight, drafts, exterior doorways, skylights, windows, and exterior walls.

Mounting

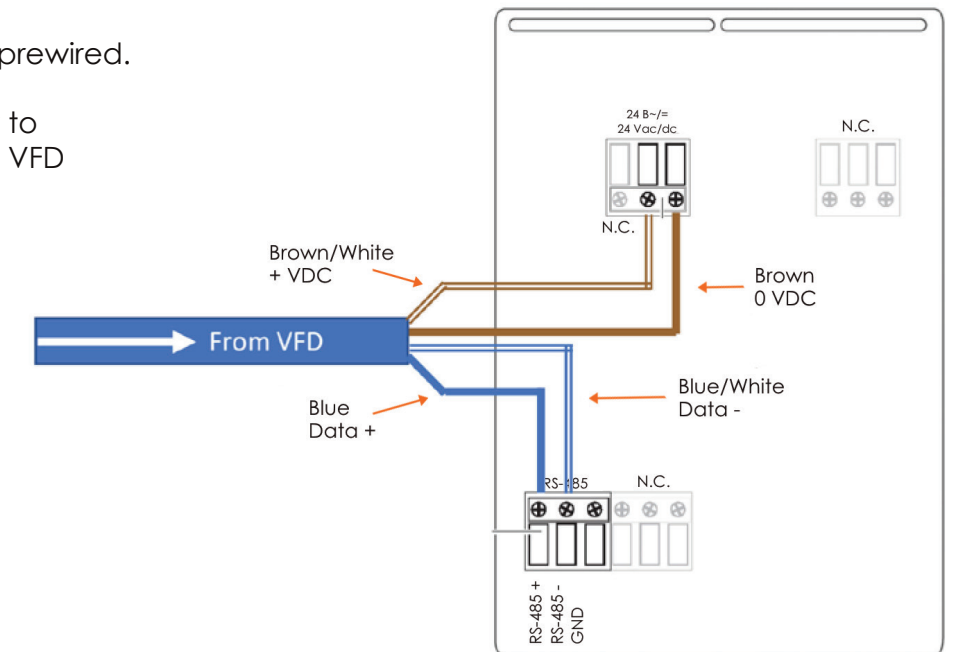
The HMI can be mounted directly to a wall with or without the use of a electrical box in the wall. If the HMI is to be mounted on a structural steel column or similar, a single gang weatherproof box is recommended to space the HMI off of the column to avoid inaccurate temperature readings.



Wiring

The HMI comes with a Cat5 cable prewired.

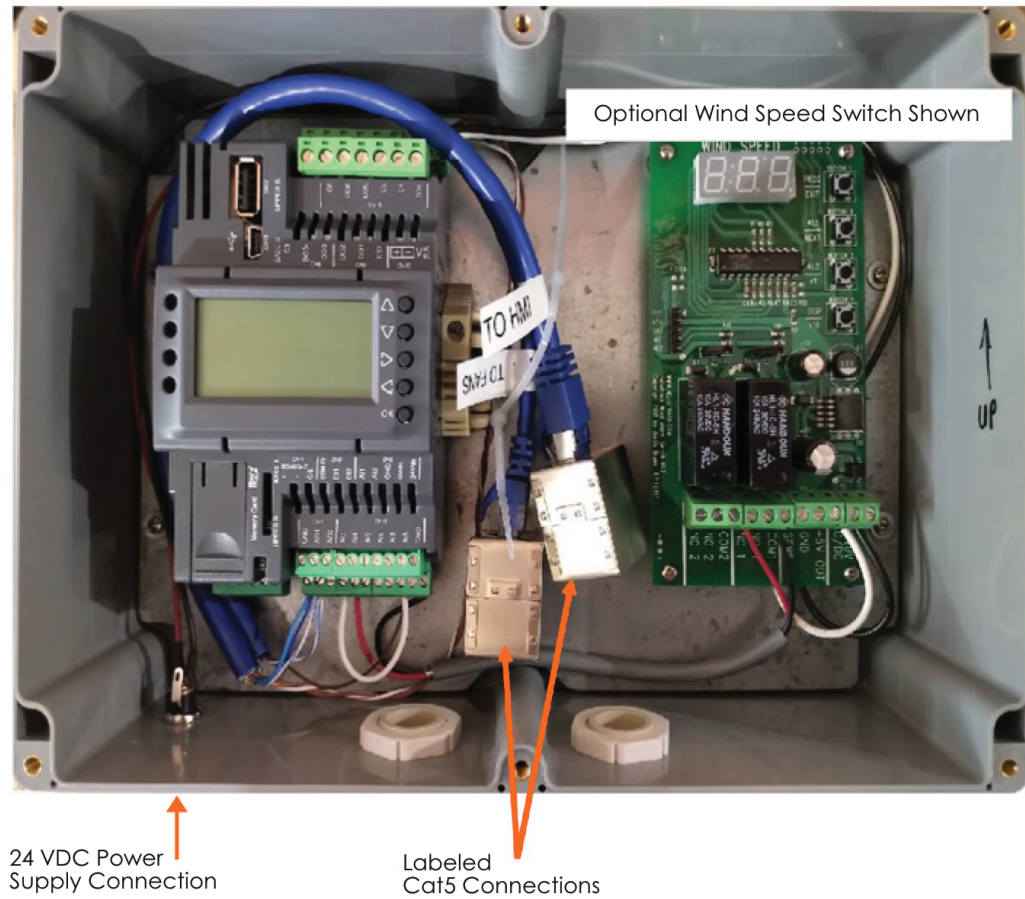
In some cases it may be necessary to terminate the Cat5 cable from the VFD directly to the HMI.



MonsterFans Smart Multi-Fan Control Installation

Control Box Mounting & Connections

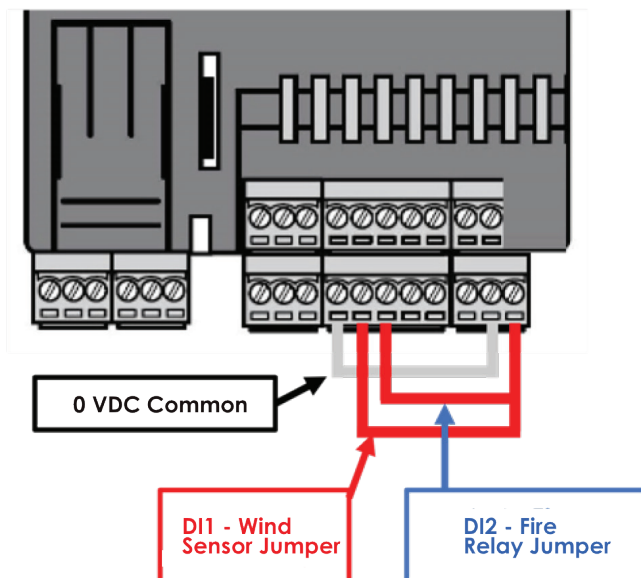
The control box should be mounted in a dry location, do not wash the control box with pressurized water. Connect CAT 5 cables for the HMI and VFD #1 to labeled connectors inside control box. Connect power supply to receiver on bottom of control box.



Optional Equipment

The controller is provisioned for integration with a wind speed sensor or fire suppression system. If these options are not requested at time of manufacture, jumpers are installed to allow for normal operation of the fans.

The picture shows the jumper connections to the controller.

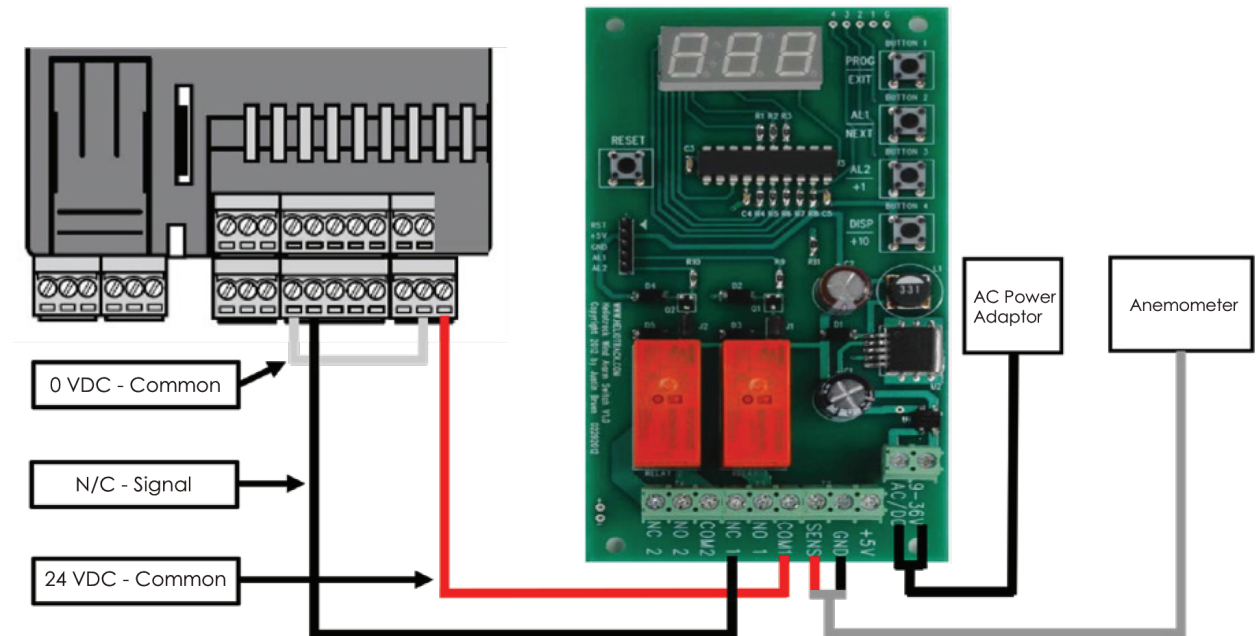


MonsterFans Smart Multi-Fan Control Installation

Wind Speed Switch [Optional]

If a Wind Speed Switch is to be used, the control must be wired as pictured below, to allow for automatic shutdown of the fan based on high wind speeds.

* Please refer to Wind Speed Switch supplement for further installation and operation details.



Wind Speed Alarm

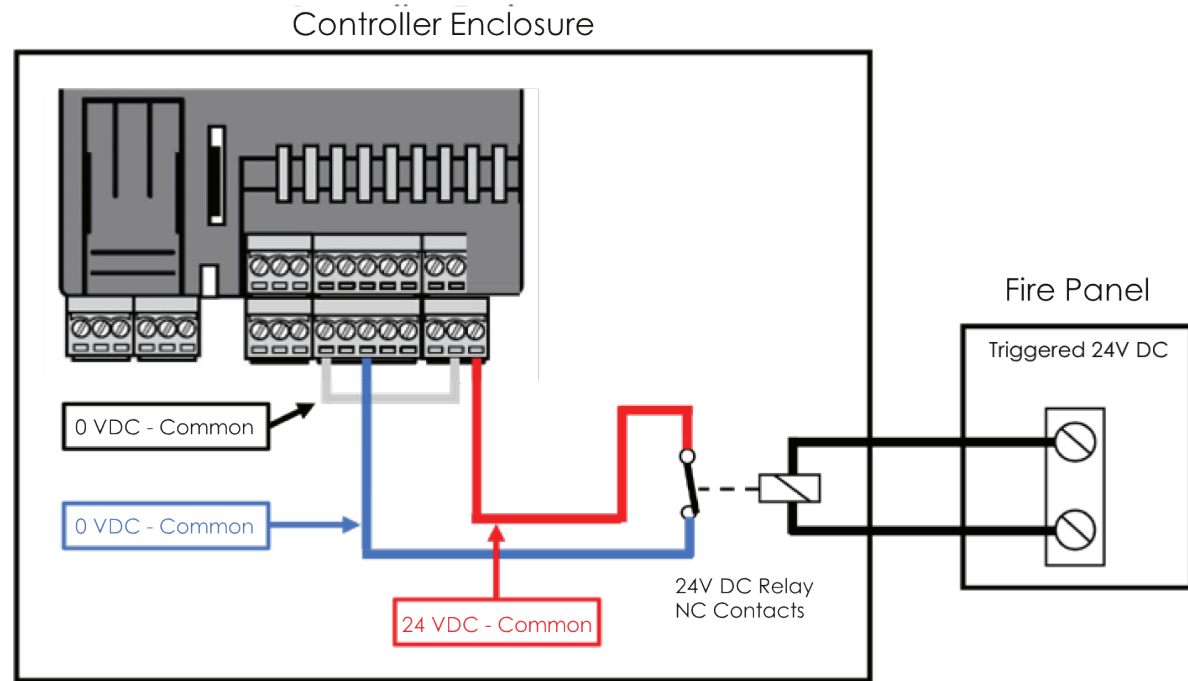
If high wind speeds are detected the fan will decelerate to a stop and a message will display on the HMI [pictured below.] Once the wind speed drops below the set point the fan will automatically restart.



MonsterFans Smart Multi-Fan Control Installation

Fire Suppression System Relay [Optional]

To integrate fan controls with a fire detection / suppression system wire fire panel to supplied relay in VFD enclosure as shown below.



Fire Relay Alarm

If the Fire Relay is activated the fan will decelerate to a stop and a message will display on the HMI [pictured below.] Once the Fire Relay is reset the fan will automatically restart.



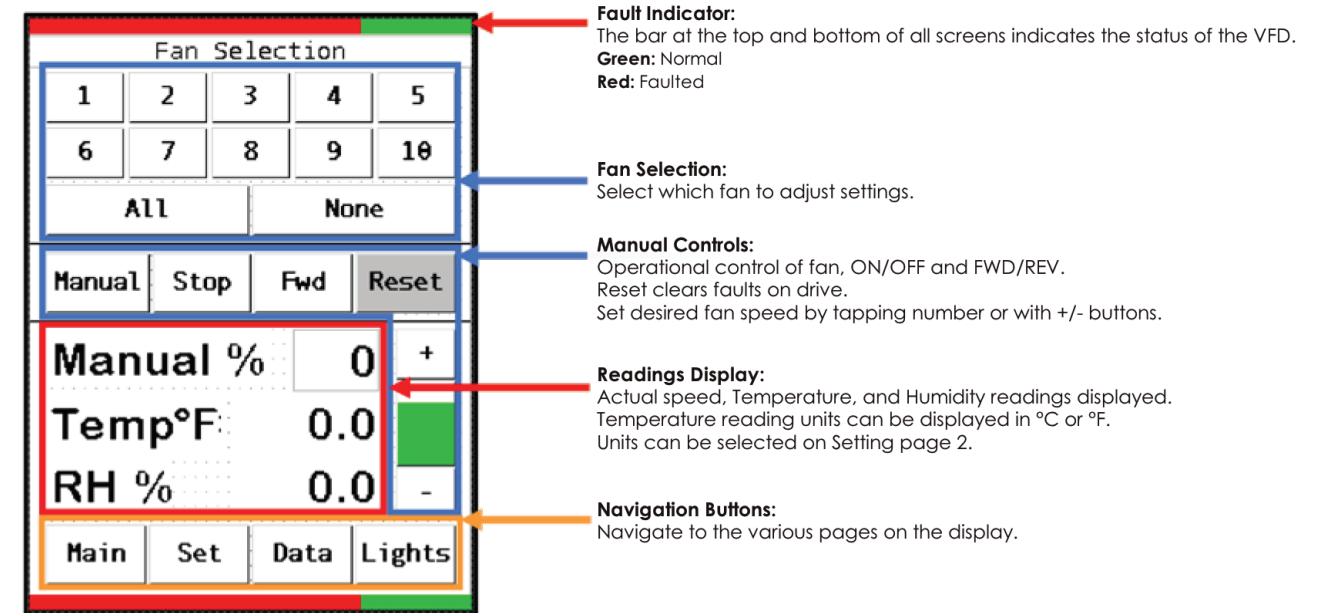
MonsterFans Smart Multi-Fan Control Installation

Operation

Controlling the speed, direction of rotation, as well as the ON/OFF and intensity of the LED light is done through the screens on the MonsterFans Smart HMI.

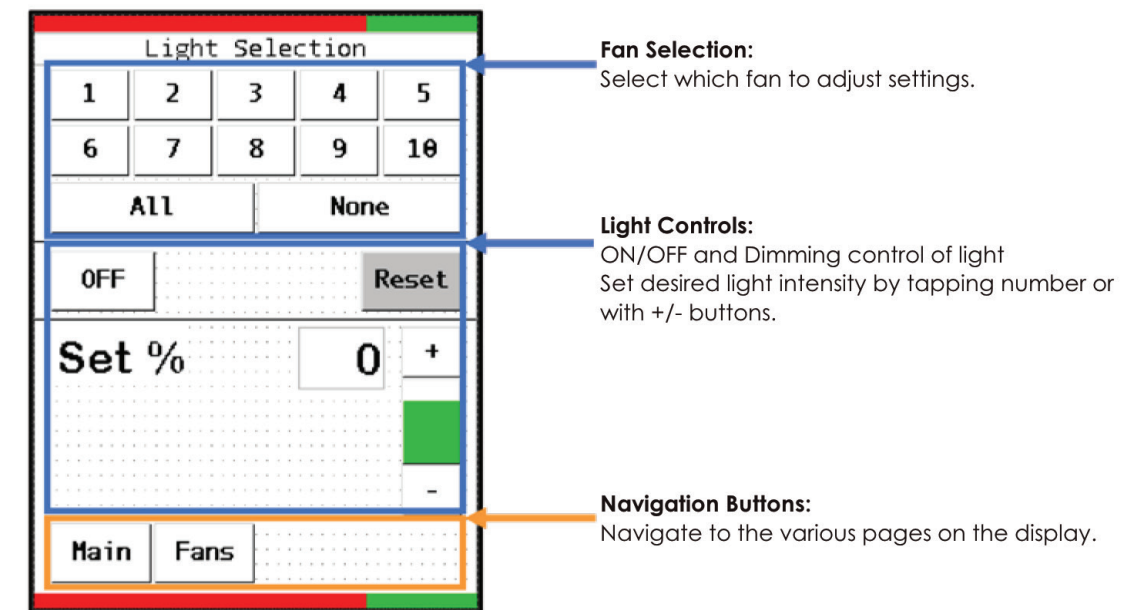
Fan Control

Auto/Manual modes, speed and direction selections are done on this screen.



Light Control Screen

Control of the LED Light is done from this screen.



Note: This screen is only accessible if the unit is equipped with the LED light option.

MonsterFans Smart Multi-Fan Control Installation

Main Screen

Sensor readings displayed on this screen.

The Main Screen displays the MonsterFans logo and 'Fan Control' title. It shows a large 'Temp: 0.0°C' and 'Humidity: 0.0%' reading. At the bottom, there are three navigation buttons: 'Fans', 'Lights', and 'System'.

Readings Display: Temperature, and Humidity readings displayed. Temperature reading units can be displayed in °C or °F. Units can be selected on System Screen.

Navigation Buttons: Navigate to the various pages on the display.

System Setting Screen

This screen allows selection of system wide settings.

The System Settings screen has a title 'System Settings' and a 'Units' dropdown menu currently set to '°C'. At the bottom, there are three navigation buttons: 'Main', 'Fans', and 'Lights'.

System Settings Selection: Select temperature units displayed °C/°F.

Navigation Buttons: Navigate to the various pages on the display.

MonsterFans Smart Multi-Fan Control Installation

Settings Screen 1

Auto Mode speed is calculated based on the settings entered in the fields on this screen.

Settings Screen 1 for 'Fan 1' contains several input fields: 'Low Temp°F', 'High Temp°F', 'Low RH %', 'High RH %', 'Low Speed %', and 'High Speed %'. At the bottom, there are four navigation buttons: 'Fans', 'Set', 'Data', and 'Lights'.

Set-point Entry: Enter desired set-point values in each of the respective fields. *When changing temperature units the value will not automatically convert, the desired set-point value must be entered manually.

Setting Screen 2 Button: Navigate to the second settings page.

Navigation Buttons: Navigate to the various pages on the display.

Settings Screen 2

Auto Mode functions are based on the settings enabled on this screen.

* The settings on this screen are not retentive, if power to the HMI is lost, they will reset to Disabled and must be re-enabled for fan to function in Auto Mode

Settings Screen 2 is titled 'Temperature Control' and 'Humidity Control'. It has 'Units' set to '°C'. Under 'Temperature Control', 'Auto Mode' and 'Run Below Min' are both set to 'Enable'. Under 'Humidity Control', 'Auto Mode' and 'Run Below Min' are both set to 'Enable'. At the bottom, there are three navigation buttons: 'Main', 'Data', and 'Page 1'.

Auto Modes Selection: Select each mode for desired method of operation. *See below for description of each mode.

Setting Screen 1 Button: Navigate to the first settings page.

Navigation Buttons: Navigate to the various pages on the display.

MonsterFans Smart Multi-Fan Control Installation

Controls Modes

Units

Select temperature units displayed °C/°F.

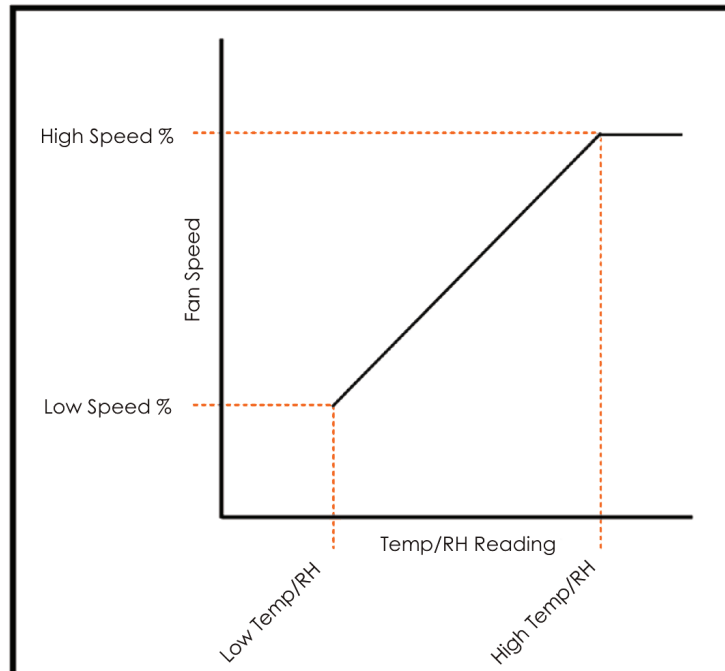
Auto Mode

- Enabling Auto Mode allows the fan to automatically start if the temperature or humidity rises to the Low Temp/RH set-point, beginning to run at the Low Speed % set-point.
- The fan speed will continue to increase to the High Speed % based on the sensed temperature or humidity until the High Temp/RH set-point is reached.
- The fan will continue to run at the High Speed % set-point if the sensed temperature or humidity is above the High Temp/RH set-point.
- If both Temperature and Humidity Auto Modes are enabled the fan will run at the higher calculated required speed.

Run Below Min

- Allows the fan to run at the Low Speed % set-point if the sensed temperature is below the Low Temp set-point.

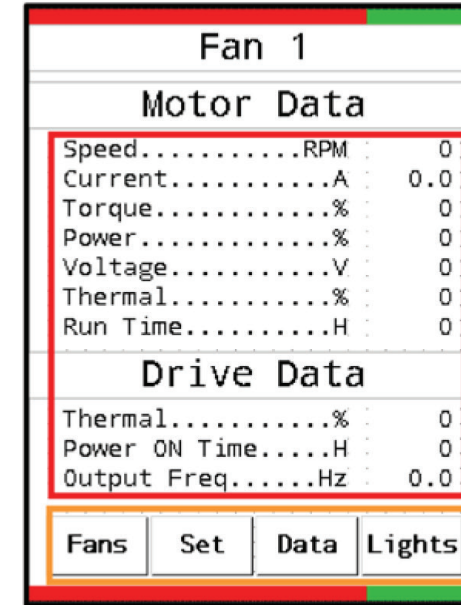
This chart shows how the fan speed is calculated relative to the sensed temperature and humidity.



MonsterFans Smart Multi-Fan Control Installation

Data Screen

Realtime data from the drive is displayed on this page allowing live monitoring of fan performance.



Readings Display:
Realtime data of drive and motor displayed.

Navigation Buttons:
Navigate to the various pages on the display.



MonsterFans
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