

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.

The fan monitoring system is designed to provide live access to key operating metrics as well as routine maintenance notifications. The fan monitoring system ultimately can assist in both reducing the operating cost of your system as well as helping avoid costly shut downs.



Fan Monitoring System Features:

- NEMA-4 and IP56 Enclosure Rating
- Factory calibrated, plug and play wiring
- 120-240 Vac or 24 Vac/Vdc input voltage
- Two analog sensor inputs using any of the following:
 - 4-20 mA
 - 0-10 Vdc
 - 2-10 Vdc
- Available system monitoring
 - Airstream Temperature
 - Bearing Temperature
 - Motor Current
 - Motor Vibration
 - Motor Speed
 - Fan Vibration
 - Motor Vibration
 - Static Pressure
 - Differential Pressure
- One resistive temperature input (not used)
- Three selectable isolated outputs matched to inputs
 - 4-20 mA
 - 0-10 Vdc
 - 2-10 Vdc
- LCD display with user-friendly touch panel interface
- English or Metric readings
- Simple Installation

General Safety Information

This instruction manual provides installation, operating, maintenance, and replacement parts information for the Fan Monitoring System.

WARNING

Improper installation, adjustment, alterations, service or maintenance can cause injury and property damage, as well as possible voiding of factory warranty. No person may install, operate, or maintain the fan monitor controller and transmitters without first being fully trained and qualified in the installation, operation and maintenance, and carefully reading and understanding the contents of this manual. If you have any questions about these instructions, contact your local representative.

CAUTION

Risk of electrical shock! More than one disconnect switch may be required to de-energize the equipment before servicing.

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Installation

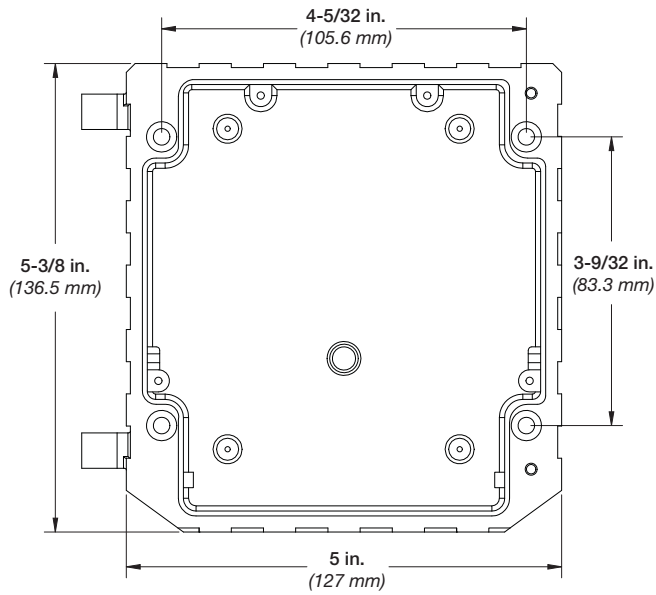
WARNING

When wiring the instrument, you must follow industry standard practices for control and protection against electrostatic discharge (ESD). Failure to exercise good ESD practices may cause damage to the controller

1. Mount the monitor in the vertical plane using four #8-32 screws. Open the front cover by unscrewing the two captive thumb screws to gain access to the four mounting locations pictured at right.
Note: Mount the controller within 100 feet of the fan being monitored.
2. Disconnecting switch or breaker is required for the installation. It also must be suitably located and easily reached to remove power to the controller and must be marked as being the disconnecting means for the controller.
3. Remove terminal block TB1 and perform wiring for the pins listed below. For liquid tight applications, use only 1/2-inch liquid tight conduit.
Terminal Block TB1: Input Power
 - Pin 1 = Line (+)
 - Pin 2 = Neutral (-)
 - Pin 3 = Ground**Note:** All field wiring to be in ordinance with equivalent national standard. All wiring to be copper and 75°C rated minimum.
4. Wire TB2 accordingly. See wiring details for all sensor input(s), scaled output(s), and alarm signal.
Note: Signal isolator may be required when two or more output signals share a common connection at the PLC/controller.
5. For resistive temperature sensor (by others): Only use Honeywell Industrial Temperature sensor part number 6655-90980004. Caution must be taken at install to not short sensor terminals or permanent damage may occur.
6. Provide power to the monitor to turn it on.
7. The monitor is factory programmed per sensor selections. Verify settings menu and adjust to meet installation requirements. (Refer to Display Setting Options and Setup section for details).
When the above steps are completed, make sure the front cover is properly aligned to the housing and the two captive thumb screws are securely tightened.



Dimensions and Mounting Patterns



Label and Order Information

Unit specific label is located on the inside cover of the controller.



CONFORMS TO
UL STD 61010-2-030
CERTIFIED TO
CAN/CSA STDC22.2 #61010-2-030

Intertek
E3192905

Equipment For Measurement

WARNING!
Maximum Sensor Loop Power: DO NOT
EXCEED 24Vdc @ 100mA Per Sensor Input

Description: Fan Monitoring System

Fan Size: 24F17

Input Power: 24Vac/dc, 10VA, 50/60Hz

Fan Model: VADS

P/N: 5550123

Sensor 1: Pressure

Tag Mark: EF-1 Sales Order: 6606573

Sensor 2: RPM

Sensor 3: Resistive

Agent Order #: K1543

P.O.# 597728

Date Code: 10/14

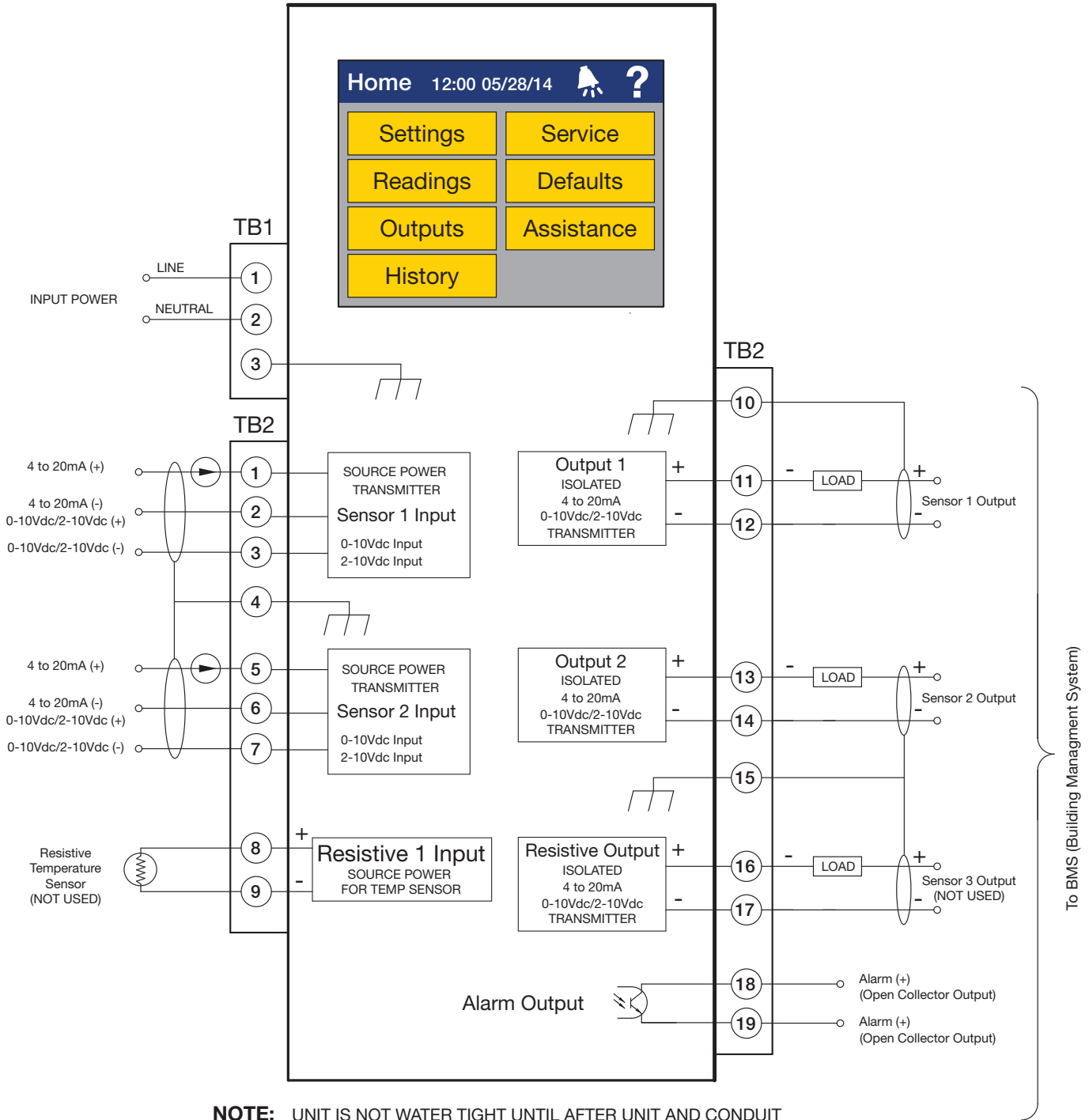


Schofield, WI 54476 U.S.A.

Wiring and System Components



Wiring Diagram



NOTE: UNIT IS NOT WATER TIGHT UNTIL AFTER UNIT AND CONDUIT CONNECTION ARE SEALED BY CUSTOMER AFTER WIRING.

WARNING: BEFORE APPLYING INPUT POWER, CHECK FOR PROPER INPUT VOLTAGE. REFER TO DOOR LABEL FOR DETAILS.

Airstream Temperature Sensor Kit

Sensor used to detect system process temperature. Temperature sensor kit is provided with one temperature probe and transmitter. Fan monitor can provide a system fault alarm for high or low temperature and current status reading.

Ratings:

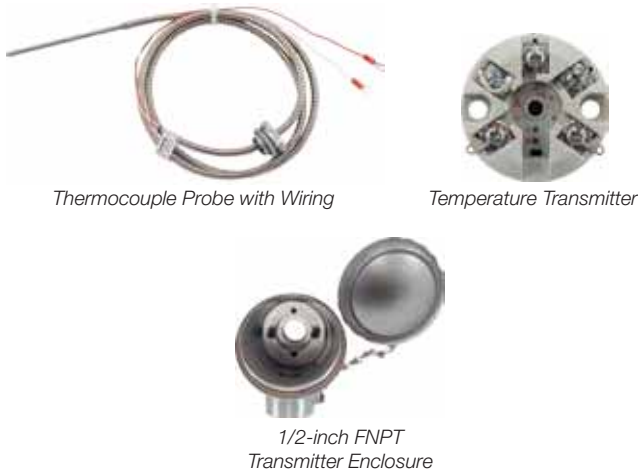
- Enclosure:** NEMA-4X (IP 66) with supplied mounting enclosure
- Temperature Range:**
 - Temperature Probe: -148° to 212°F (-100° to 100°C)
 - Transmitter: -4° to 158°F (-20° to 70°C)
- Input Voltage:** 24 Vdc
- Output Signal:** 4-20 mA
- Accuracy:** ±0.9°F (±0.5°C)

WARNING

Turn fan off and lock out power prior to mounting any sensors or running connection wiring.

Kit includes:

- J type thermocouple probe with wiring, 4 ft. (1.2 m) length
- Temperature transmitter
- Transmitter enclosure



Hardware not included:

- Signal wiring between transmitter enclosure and fan monitor
- Mounting fasteners for transmitter housing
- Mounting fasteners for temperature probe bracket

Thermocouple Probe and Transmitter Installation

Thermocouple Probe Mounting:

At location to have temperature measured, secure provided mounting bracket to ductwork or other fixture. Attach mounting bracket in desired orientation. If needed, drill 5/16 inch (6.3 mm) diameter hole at location where the temperature probes would pass through ductwork. Secure probe to mounting bracket. Note the thermocouple section of probe should not touch bracket as this will give false temperature reading.

Transmitter and Enclosure Mounting:

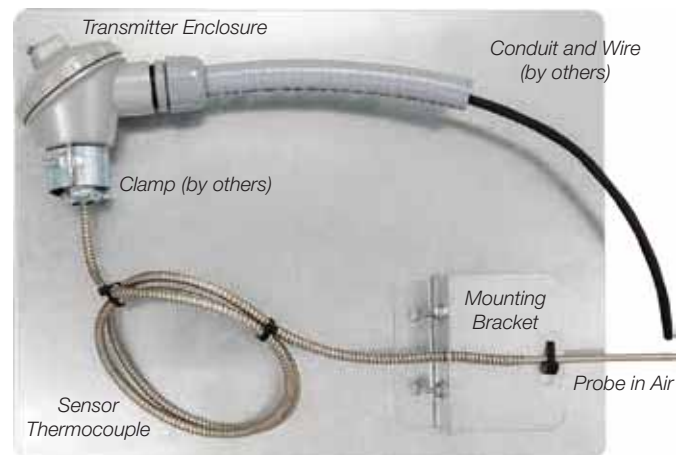
The mounting location of the temperature transmitter enclosure should be near the probe mounting location. Note that the maximum distance between transmitter and fan monitor is 100 feet (30 m). Mount temperature transmitter enclosure using conduit and fittings. Lower connection stem has offset collar to accept conduit clamp.

Install temperature transmitter in enclosure using supplied screws, located inside of enclosure.

Temperature Probe and Signal Wire Connection:

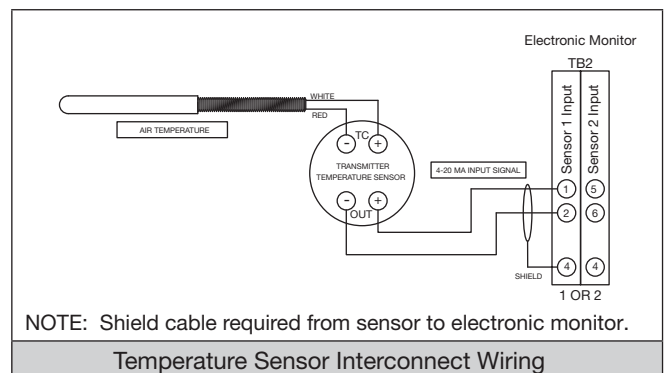
Bring temperature probe wiring in through bottom stem of transmitter enclosure. See Temperature Sensor Interconnect Wiring Diagram (below) for terminal connection locations. Final connection wiring from transmitter to fan monitor is brought through side stem center opening of the temperature transmitter.

Mock Assembly Detail



Sensor Wiring and Point Connection:

- Wiring size: 18/22 AWG (by others) to fan monitoring system
- Wiring Type: 2w shield
- Wiring diagram / connection:



Factory Fan Monitor Default Settings for Airstream Temperature Sensor(s):

Type: Temperature
Signal: 4-20 mA
Scale Min: -148°F (-100°C)
Scale Max: 212°F (100°C)
Alarm Low: No
Alarm Low Value: None
Alarm High: No
Alarm High Value: None
Output Signal: 4-20 mA

Custom Range Settings:

Refer to fan monitor section for adjustments in range or default settings.

Bearing Temperature Sensor Kit

Sensor used to detect bearing temperatures. Each bearing temperature sensor kit is provided with one thermocouple terminal ring and temperature transmitter. Fan monitor provides a system fault alarm for high temperature and analog outputs for current status reading.

Ratings:

Enclosure: NEMA-4X (IP 66) with supplied mounting enclosure

Temperature Range:

Temperature Terminal Ring: 32° to 482°F (0 to 250°C)

Transmitter: -4° to 158°F (-20 to 70°C)

Input Voltage: 24 Vdc

Output Signal: 4-20 mA

Accuracy: ±0.9°F (±0.5°C)

WARNING

Turn fan off and lock out power prior to mounting any sensors or running connection wiring.

Kit includes:

- J type thermocouple terminal ring with wiring 4 ft. (1.2 m) length
- Packet of epoxy adhesive
- Temperature transmitter
- Transmitter enclosure



Thermocouple Probe with Wiring



Epoxy Adhesive



Temperature Transmitter



1/2-inch FNPT Transmitter Enclosure

Hardware not included:

- Signal wiring between transmitter enclosure and fan monitoring system
- Mounting fasteners for transmitter housing
- Tie downs and zip ties

Temperature Ring and Transmitter Installation

Terminal Ring Mounting:

The thermocouple terminal ring is mounted on the bearing housing. For best results, install terminal ring near the bearing grease zerk or bearing insert. Do not install on bearing feet or directly on the insert.

Prepare surface where sensor will mount by removing any dust or oils with a dry cloth or with alcohol wipe.

Follow directions on epoxy packaging to activate adhesive. Mix until a uniform color is achieved. Apply epoxy adhesive to one surface. Press terminal ring into place and hold for five to ten minutes to achieve holding bond. Allow 24 hours for bond to fully cure.

Bring wiring out of fan and away from any moving components. Care should be taken to ensure wiring is not interfering with moving components. Tie downs and zip ties are recommended to secure wiring.

Transmitter and Enclosure Mounting:

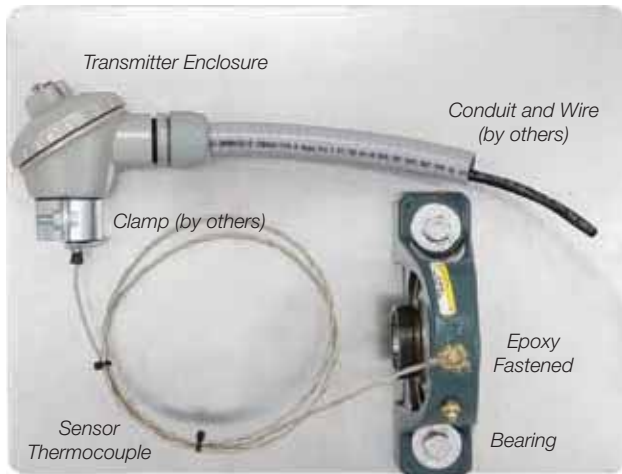
Install temperature transmitter enclosure near terminal ring mounting location, either on fan or remotely. Note the maximum distance between transmitter and fan monitor is 100 feet (30 m). Mount enclosure using conduit and fittings. Lower connection stem has offset collar to accept conduit clamp.

Install transmitter in enclosure using supplied screws, located inside of enclosure.

Terminal Ring and Signal Wire Connection:

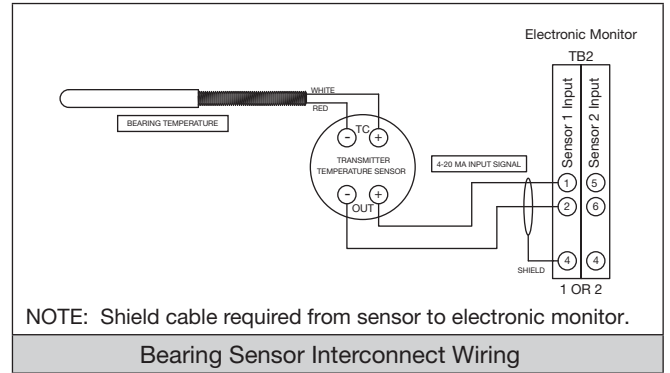
Bring terminal ring wiring in through bottom stem of transmitter enclosure. See the Temperature Sensor Interconnect Wiring diagram (below) for terminal connection locations. Final connection wiring from transmitter to fan monitor brought through side stem center opening of transmitter.

Mock Assembly Detail



Sensor Wiring and Point Connection:

- Wiring size: 18/22 AWG (by others) to fan monitor
- Wiring Type: 2w shield
- Wiring diagram / connection:



Factory Fan Monitor Default Settings for Bearing Temperature Sensor(s):

- Type: Temperature
- Signal: 4-20 mA
- Scale Min: 32°F (0°C)
- Scale Max: 482°F (250°C)
- Alarm Low: No
- Alarm Low Value: None
- Alarm High: No
- Alarm High Value: None
- Output Signal: 4-20 mA

Custom Range Settings:

Refer to fan monitor section for adjustments in range or default settings.

Vibration Sensor Kit

Sensor used to detect vibration on fan shaft bearing or motor bearing. Fault setting for alarm or trend indicating future failure. Fan monitoring system is available with one or two bearing vibration sensors. Single vibration sensor kit systems can monitor a single vibration point either on a fan shaft bearing or the motor depending which is more critical. Two vibration sensor kit systems can monitor both fan shaft bearings or one shaft bearing and motor.

Ratings:

Enclosure: NEMA-4 (IP 67)

Temperature Range: -40° to 185°F (-40° to 85°C)

Input Voltage: 10 Vdc minimum, 30 Vdc maximum

Output Signal: 4-20 mA

Accuracy: 5% transverse sensitivity, ±2% repeatability

WARNING

Turn fan off and lock out power prior to mounting any sensors or running connection wiring.

Kit includes:

- One vibration sensor
- Sensor mounting base
- Packet of epoxy adhesive
- Connection cable



Vibration Sensor



Sensor Mounting Base



Epoxy Adhesive



Connection Cable

Hardware not included:

- Tie downs and zip ties

Vibration Sensor Assembly

Bolt sensor into threaded hole in mounting base, use breakable thread lock if necessary for a stronger connection.

Positioning:

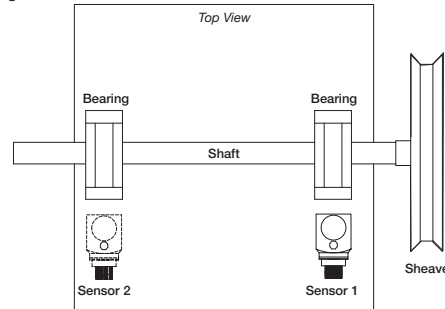
Vibration sensor detects vibration in a single plane parallel to sensor base. The orientation of the vibration sensor determines which axis is measured.

If single vibration sensor is being connected or if two vibration sensors are used with second vibration sensor for motor vibration detection, place first sensor between the fan shaft bearings, but closer to the drive bearing, nearer to the fan drive sheaves or motor.

Fan Shaft Bearing Monitoring:

Align the sensor to the shaft as shown in Figure 1. Vibration sensor positioned to detect vibration in the horizontal direction. Orient sensor with wiring pin connection in the direction cable will run. Position sensor and wiring not to interfere with moving components (belts, shafting, sheaves). Mark sensor mounting location prior to applying epoxy adhesive.

Figure 1

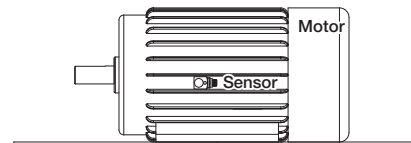


One sensor per kit is provided.

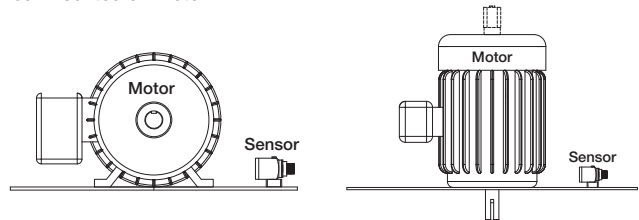
Motor Monitoring

Vibration sensor can be positioned to detect vibration in either the horizontal or axial direction. Align the sensor to the shaft as shown in Figure 2. Sensor can be mounted on motor or on motor mounting pedestal. Orient with wiring pin connection in the direction cable will run. Position sensor and wiring not to interfere with moving components (belts, shafting, sheaves). Mark sensor mounting location prior to applying epoxy adhesive.

Figure 2



Sensor mounted on motor



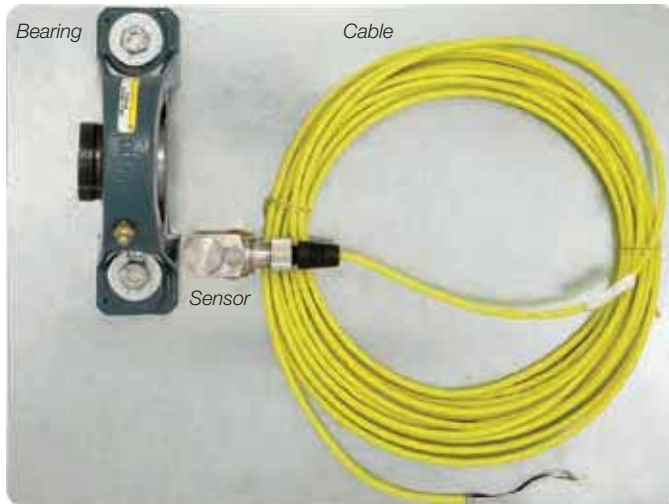
Sensor mounted on motor mounting pedestal

Vibration Sensor Mounting:

Prepare surface where sensor will mount by removing any dust or oils with a dry cloth or with alcohol wipe. Follow directions on epoxy packaging to activate adhesive. Apply epoxy adhesive to one surface. Press sensor into place and hold for five to ten minutes to achieve holding bond. Allow 24 hours for bond to fully cure.

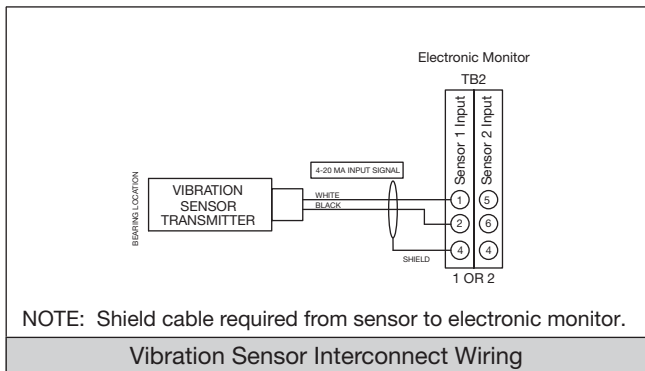
Connect wiring cable and run out of fan and away from any moving components. Care should be taken to ensure wiring is not interfering with moving components. Tie downs and zip ties are recommended to secure wiring.

Mock Assembly Detail



Sensor Wiring and Point Connection:

- Wiring size: 18 AWG
- Wiring Type: 2w shield
- Wiring diagram / connection:



Factory Fan Monitor Default Settings for Vibration Sensor(s):

Type: Vibration
 Signal: 4-20 mA
 Scale Min: 0 IPS (inches per second) [0 mm/sec]
 Scale Max: 1.66 IPS [42.2 mm/sec]
 Alarm Low: No
 Alarm Low Value: None
 Alarm High: Yes
 Alarm High Value: 0.65 IPS [16.5 mm/sec]
 Output Signal: 4-20 mA

Custom Range Settings:

Refer to fan monitor section for adjustments in range or default settings.

Current Sensor Kit

Sensor used to detect current (amps) usage of motor. Fan monitor provides fault setting for alarm, run time value for maintenance and power usage.

Ratings:

Enclosure: NEMA-4/4X, (IP 66/67) with supplied mounting enclosure
Temperature Range: 5° to 104°F (-15° to 40°C)
Input Voltage: NA
Output Signal: 0 to 10 Vdc
Maximum Motor Current: 0 to 50 amps or 0 to 100 amps
Maximum Distance from Fan Monitor: 100 feet (30 m)
Accuracy: ±1%, 2 to 100% FSO

WARNING

Turn fan off and lock out power prior to mounting any sensors or running connection wiring.

Kit includes:

- Current sensor
- Polycarbonate mounting enclosure



Current Sensor
Inside Enclosure



Polycarbonate Mounting
Enclosure

Hardware not included:

- Mounting fasteners for enclosure
- Signal wire between sensor and fan monitoring system

Current Sensor Installation

Enclosure Mounting:

Current sensor enclosure can be installed on the fan or remotely. Do not exceed maximum distance between current sensor and fan monitor. Final wiring to primary system transmitter is the responsibility of others.

Install enclosure to desired mounting location using the four (4) through holes in the back of the enclosure. See Figure 3 or Figure 4 on next page.

Figure 3: 0 to 50 amps

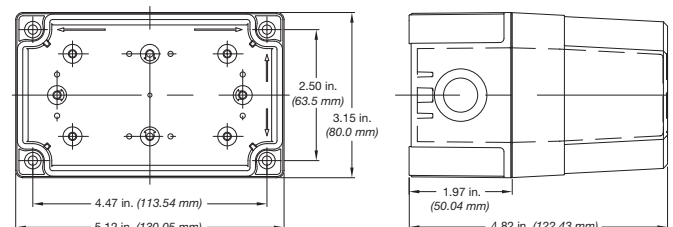
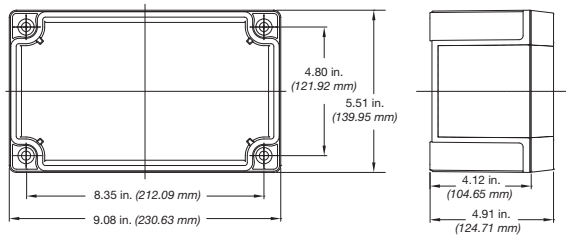


Figure 4: 0 to 100 amps



Current Sensor Connection:

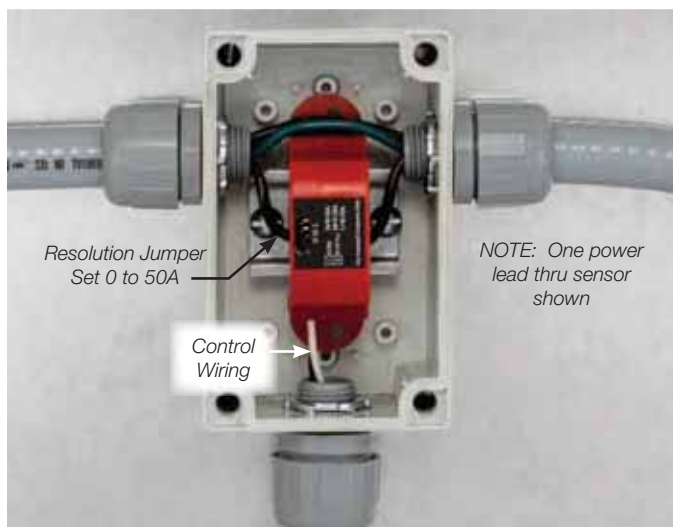
- Remove current sensor from enclosure
- Remove required knock-outs on enclosure for installation.
Main power wiring is run through the sides and control wiring can be run through the bottom.
- Install any connector fitting into knock-out locations as necessary
- Feed control wiring in through enclosure housing
- Connect control wiring to current sensor, see Mock Assembly Detail Image #1 and the Current Sensor Interconnect Wiring Diagram.
- Mount current sensor back into enclosure
- Run main power wiring in through corresponding knock-out holes. See Mock Assembly Detail #1 and #2 for wire placement.

NOTE

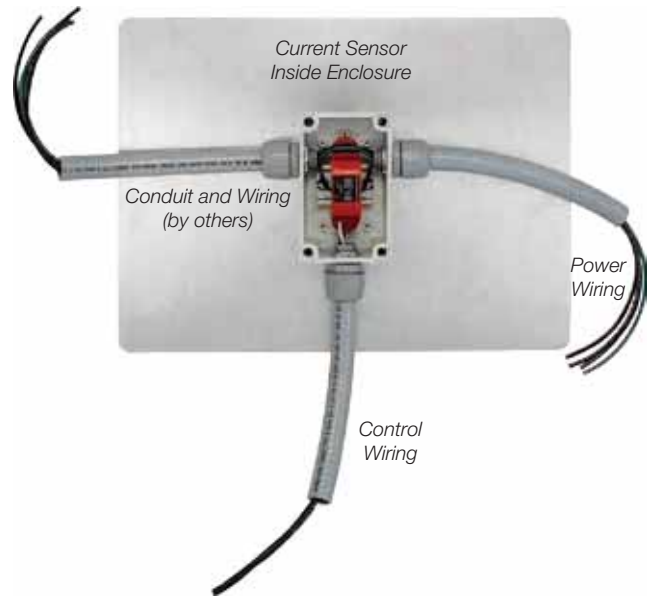
All local electrical codes and proper wiring techniques are to be followed during installation. Liquid tight conduit is required to maintain enclosure rating.

Mock Assembly Detail #1

- Only one lead thru sensor, single and three phase

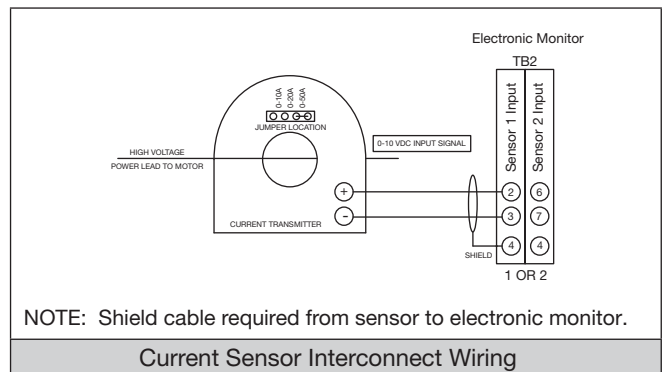


Mock Assembly Detail #2



Sensor Wiring and Point Connection:

- Wiring size: 18/22 AWG (by others) to fan monitoring controller
- Wiring Type: 2w shield
- Wiring diagram / connection:



Factory Fan Monitor Default Settings for Current Sensor:

- Type: Current
- Signal: 0 to 10 Vdc
- Scale Min: 0 amps
- Scale Max: 50 or 100 amps
- Alarm Low: No
- Alarm Low Value: None
- Alarm High: Yes
- Alarm High Value: Fan mark specific, factory set at motor nameplate FLA x 1.15
- Output Signal: 0 to 10 Vdc

Custom Range Settings:

Refer to fan monitor section for adjustments in range or default settings.



Pressure Sensor Kit

Pressure sensor used to detect system pressure or pressure differential. Each pressure sensor kit is provided with two pressure probes and a pressure transmitter. For static pressure reading relative to atmosphere a single pressure probe is necessary. For pressure differential measurements two pressure probes are required. Fan monitor can provide a system fault for alarm or current status reading.

Ratings:

- Enclosure:** NEMA-4X (IP 66) with supplied mounting enclosure
- Temperature Range:** 0° to 150°F (-18° to 66°C)
- Input Voltage:** 10 to 35 Vdc
- Output Signal:** 0 to 10 Vdc
- Accuracy:** ±1%

WARNING

Turn fan off and lock out power prior to mounting any sensors or running connection wiring.

Kit includes:

- Two (2) pressure probes with integral mounting bracket and gasketing
- Pressure transmitter



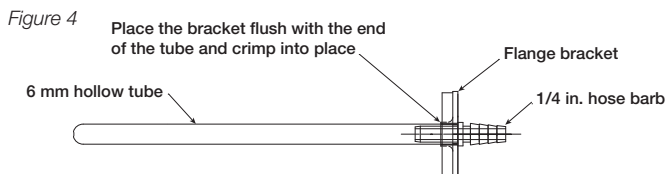
Hardware not included:

- 3/16 inch (4.8 mm) inner diameter tubing required for connection between probe(s) and transmitter
- Mounting fasteners for transmitter housing
- Mounting fasteners for pressure probe(s)

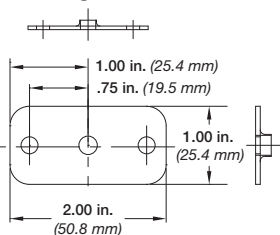
Pressure Probe and Transmitter Installation

Pressure Probe Mounting:

Drill 5/16 inch (6.3 mm) diameter hole at location where pressure measurement is desired. Insert pressure probe into hole. Secure probe using pre-punches holes until bracket is flush with mounting location and gasket is compressed.

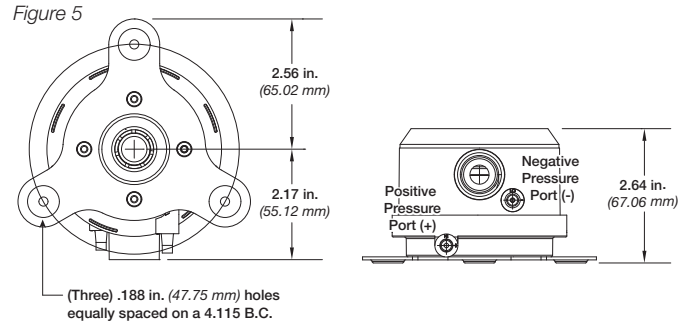


Mounting bracket detail for the pressure probe.



Transmitter Mounting:

Install pressure transmitter in a location near pressure probe(s) mounting location(s). Note maximum distance between pressure transmitter and primary system transmitter is 100 feet (30 m). Mount pressure transmitter with pressure ports and electrical connection downwards.



Pressure Probe Connection:

Connect pressure probe(s) to transmitter using round tubing. Actual tubing length required varies based on distance between probes to transmitter mounting location.

Static pressure - single probe

Negative static pressure measurement. Connect the pressure probe to the negative (-) port, as indicated on the transmitter. Leave positive (+) port open to atmosphere.

Positive static pressure measurement. Connect the pressure probe to the positive (+) port, as indicated on the transmitter. Leave negative (-) port open to atmosphere.

Figure 6



Differential pressure – two probes

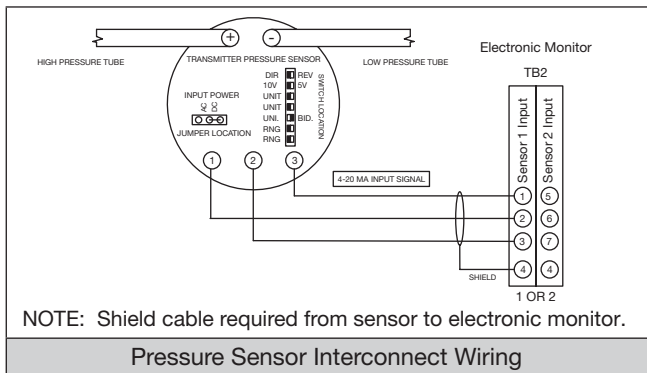
Connect each probe to the corresponding port on the transmitter. If measured results are opposite, then switch tubing into opposite port.

Mock Assembly Detail



Sensor Wiring and Point Connection:

- Wiring size: 18/22 AWG (by others) to fan monitor
- Wiring Type: 2w shield
- Wiring diagram / connection:



Factory Fan Monitor Default Settings for Pressure Sensor(s):

Type: Pressure
 Signal: 0 to 10 Vdc
 Scale Min: -28 inches w.g. (-6.9 KPa)
 Scale Max: 28 inches w.g. (6.9 KPa)
 Alarm Low: No
 Alarm Low Value: None
 Alarm High: No
 Alarm High Value: None
 Output Signal: 0 to 10 Vdc

Custom Range Settings:

Refer to fan monitor section for adjustments in range or default settings.

RPM Sensor Kit

Sensor used to detect rpm of fan. Fan monitor provides fault setting for alarm exceeding maximum limit, actual run time, and maintenance for fan bearing lubrication, motor lubrication and belt replacement.

Ratings:

Enclosure: NEMA-4X, (IP 67) proximity sensor and supplied transmitter enclosure

Temperature Range: 32° to 120°F (0° to 50°C)

Input Voltage: 9 Vcd minimum, 32 Vdc maximum

Output Signal: 4-20 mA

Maximum Distance from fan monitor: 100 feet (30 m)

Accuracy: ±0.1%

WARNING

Turn fan off and lock out power prior to mounting any sensors or running connection wiring.

Kit includes:

- Proximity sensor
- Stainless steel sensor mounting bracket
- Polycarbonate enclosure
- Wiring between sensor and rpm transmitter
- Transmitter



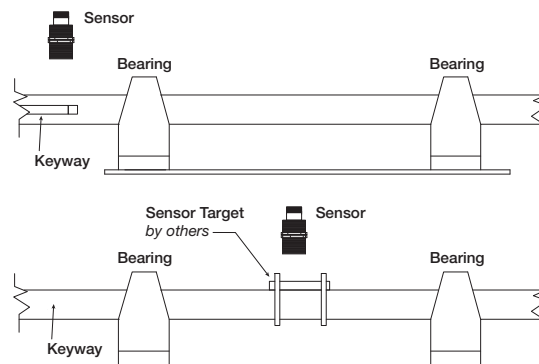
Hardware not included:

- Signal wiring from enclosure to fan monitor
- Sensor target
- Mounting fasteners for mounting bracket
- Mounting fasteners for transmitter enclosure
- Tie downs and zip ties
- Adapter bracket

Installation of RPM Sensor

Proximity Sensor Mounting:

Determine location of sensor mounting bracket. Sensor needs to be mounted near fan shaft to detect rotation. Maximum distance between sensor and target is .60 inch (15.2 mm). Mounting bracket adjustment may be necessary depending on fan configuration.



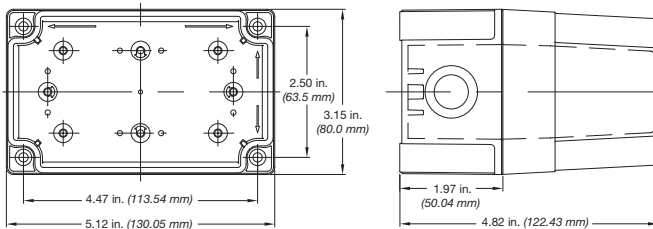
Remove one adjustment nut from sensor and slide proximity sensor into mounting bracket. Thread nut back on sensor to secure the sensor to the bracket. Final adjustments to proximity sensor location can be made through loosening and tightening of threaded nuts. Attach wiring to end of sensor. Locate mounting position of bracket and mark location. Remove sensor and wiring from bracket and secure bracket to fan at location marked. Bracket can be secured using self-taping screws or using an epoxy adhesive. Reinstall sensor and wiring in mounting bracket. Secure sensor wiring avoiding any rotating components. Tie downs and zip ties are recommended to secure wiring.

Transmitter Enclosure Mounting:

Transmitter enclosure can be installed on the fan or remotely. Do not exceed maximum distance of 100 ft. (30 m) between transmitter and electronic monitor. Wiring to electronic monitor is the responsibility of others.

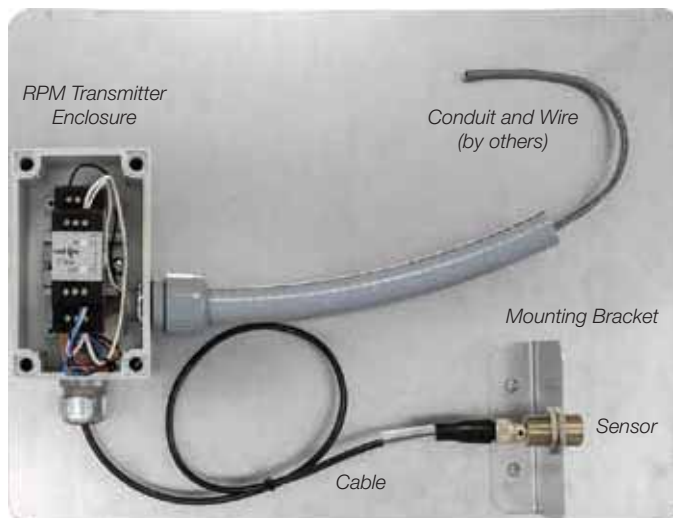
Install enclosure to desired mounting location using the four (4) thru-holes in the back of the enclosure. See Figure 8.

Figure 8



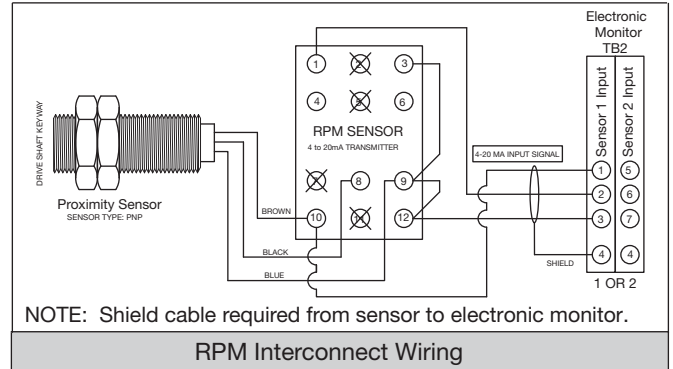
Connect proximity sensor wiring cable to transmitter. Make final connection between transmitter enclosure and fan monitor.

Mock Assembly Detail



Sensor Wiring and Point Connection:

Wiring size: 18 AWG
 Wiring Type: 3w shielded
 Wiring diagram / connection:



Factory Fan Monitor Default Settings for RPM Sensor(s):

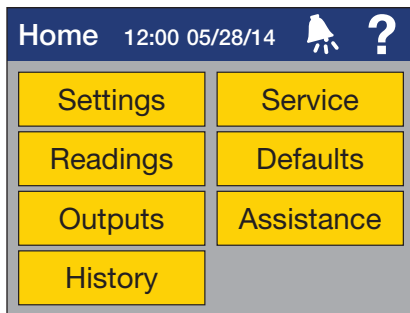
- Type: RPM
- Signal: 4-20 mA
- Scale Min: 0 RPM
- Scale Max: 4200 RPM
- Alarm Low: No
- Alarm Low Value: None
- Alarm High: Yes
- Alarm High Value: Nameplate fan RPM x 1.02
- Output Signal: 4-20 mA

Custom Range Settings:

Refer to fan monitor section for adjustments in range or default settings.

Monitor Settings, Options and Setup

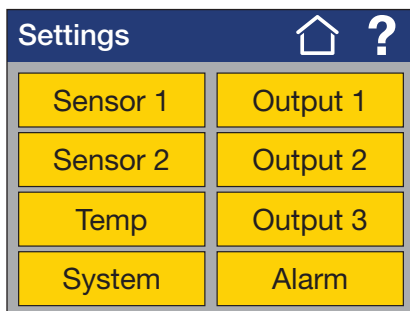
Navigation		
	Input	Yellow – Menu; Grey – Name; Green – Reading/Entry, status ok; Red – Reading, Alarm value
	Alarm	White Alarm icon system ok; Red Alarm icon flashing or solid color system in alarm
	Select	Green – Control item selected; Red – Alarm item selected
	Not Select	Green – Control item is not selected; Red – Alarm item is not selected
	Back	Move back one screen to previous page
	Next	Move forward one screen to the next page
	Home	Quick button to go directly back to the home screen
	Help	Quick button to the help screen



Home Screen

Settings: System settings menu screen(s) selection.
Readings: Sensor inputs real-time readings from system.
Outputs: System output analog real-time readings to building management system.
History: System history for sensors and alarms.
Service: Maintenance functions and set up.
Defaults: Reset to factory defaults or save user defaults.
Assistance: General assistance to Greenheck Fan Corporation.

The screen is a LCD touch screen. Pressing any of the yellow bars will take you into the menu for that portion of the monitoring system. Touching the alarm icon will show you the alarm history and the question mark will take you to the help information for that screen.

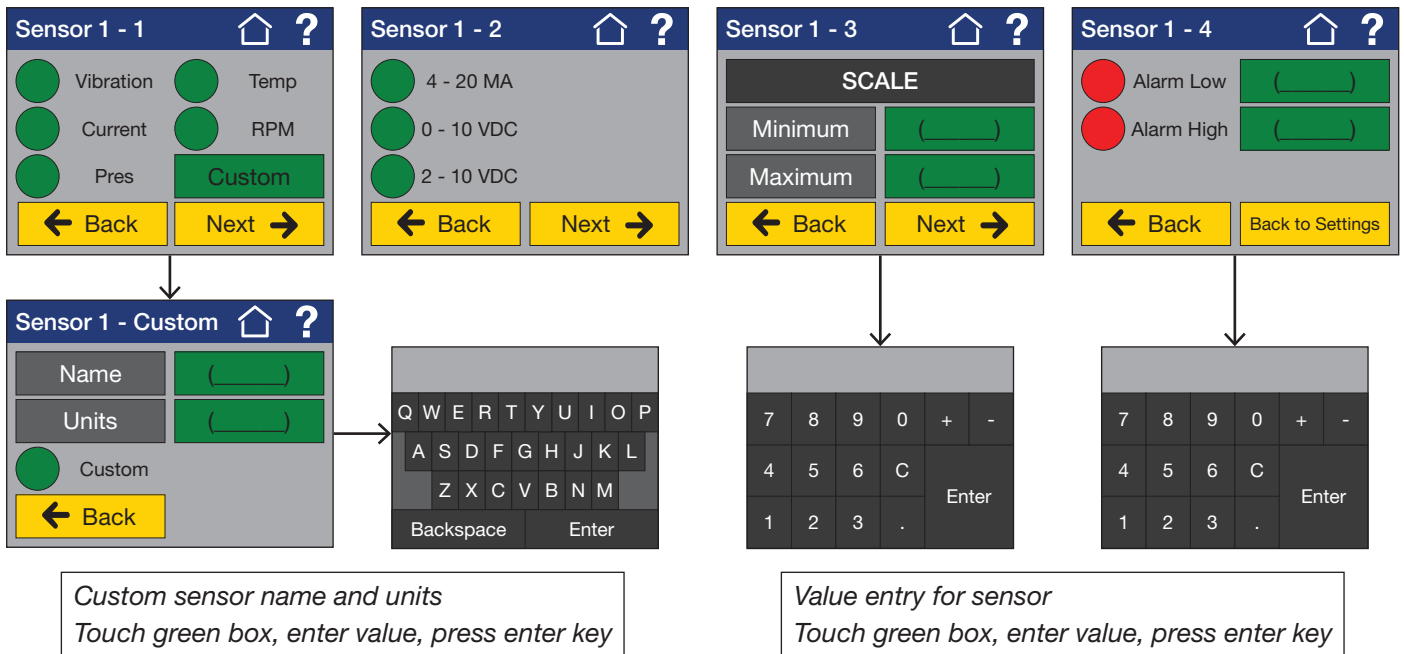


Settings Main Screen

Sensor 1: Settings screen(s) access for Sensor #1
Sensor 2: Settings screen(s) access for Sensor #2
Temp: Setting screen(s) access for Resistive Temperature
System: Setting screen(s) access for general system settings
Output 1: Settings screen(s) access for Output #1
Output 2: Settings screen(s) access for Output #2
Output 3: Settings screen(s) access for Output #3
Alarm: Settings screen(s) access for system Alarm

The screen is a LCD touch screen. Pressing any of the yellow bars will take you into the menu for that portion of the monitoring system. Touching the home icon take you back to the home screen and the question mark will take you to the help information for that screen.

Settings – Sensor 1 and Sensor 2 setup screen information:



Settings – Sensor 1 and Sensor 2

Sensor (1 or 2) -1: Sensor selection (Vibration, Current, Pressure, Temperature, RPM, Custom)

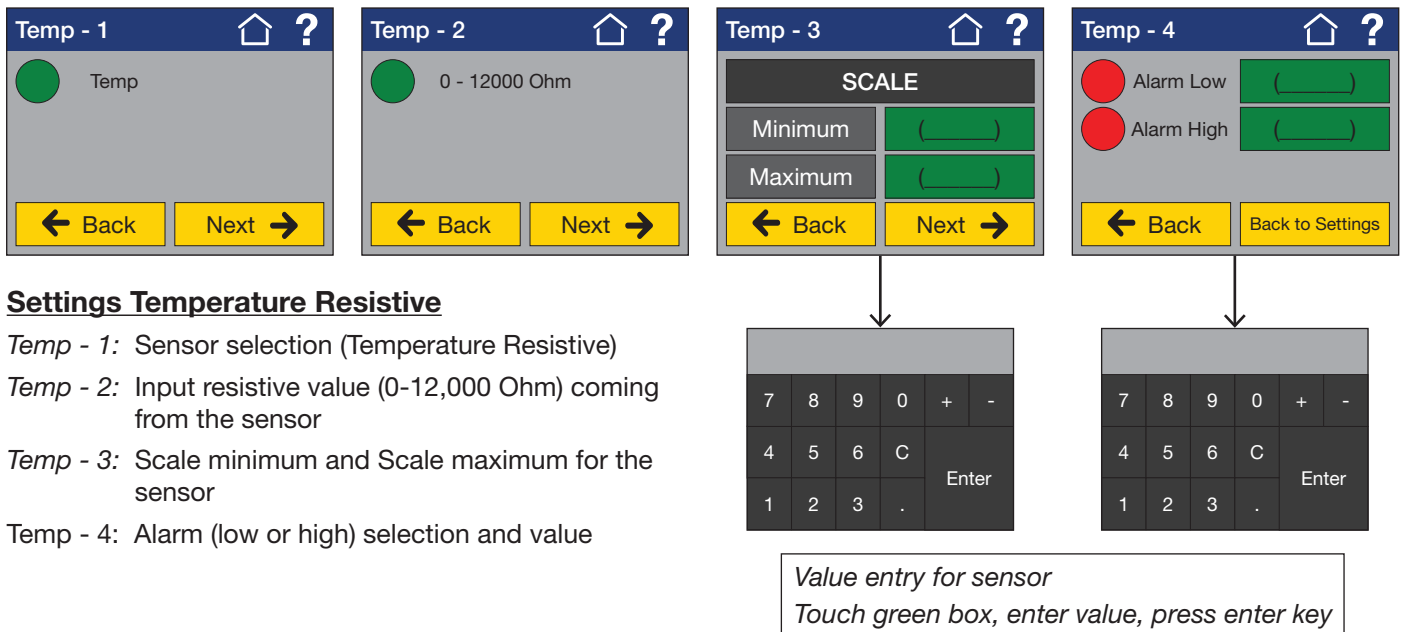
Sensor (1 or 2) -2: Input analog (4-20 mA, 0-10 Vdc, 2-10 Vdc) signal coming from the sensor

Sensor (1 or 2) -3: Scale minimum and Scale maximum for the sensor

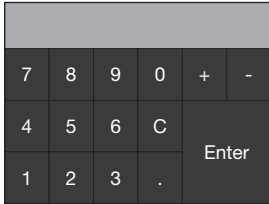
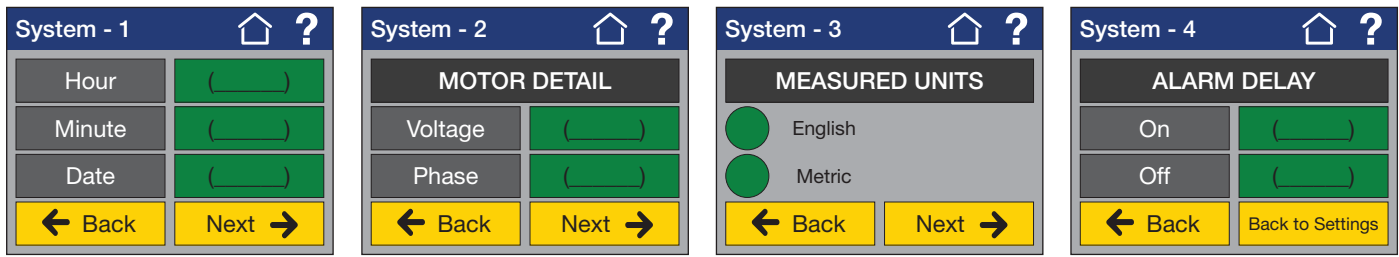
Sensor (1 or 2) -4: Alarm (low or high) selection and value

Note: Sensor 1 and Sensor 2 are similar settings screens. System is set up with factory defaults for the sensors ordered, but they can be changed or added available features selected by customer.

Settings – Temperature Resistive setup screen information:



Settings – Systems setup screen information



Value entry for system inputs
Touch green box, enter value, press enter key

Settings System General

System - 1: Time (Military) and Date (MM/DD/YY)

System - 2: Motor Detail information, voltage and phase (with current sensor)

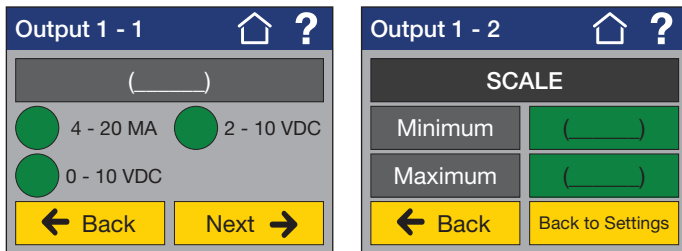
System - 3: Measurement unit (English or Metric) for readings and values (see below)

- Vibration: English (in/sec) or Metric (mm/sec)
- Pressure: English (in-wg) or Metric (Pa)
- Temperature: English (°F) or Metric (°C)
- Current: English and Metric (Amps)
- RPM: English and Metric (RPM)

System - 4: Alarm delay for On and Off (seconds)

Note: System is setup with factory defaults but they can be changed or added available features selected by customer.

Settings – Output 1, Output 2, Output 3 setup screen information



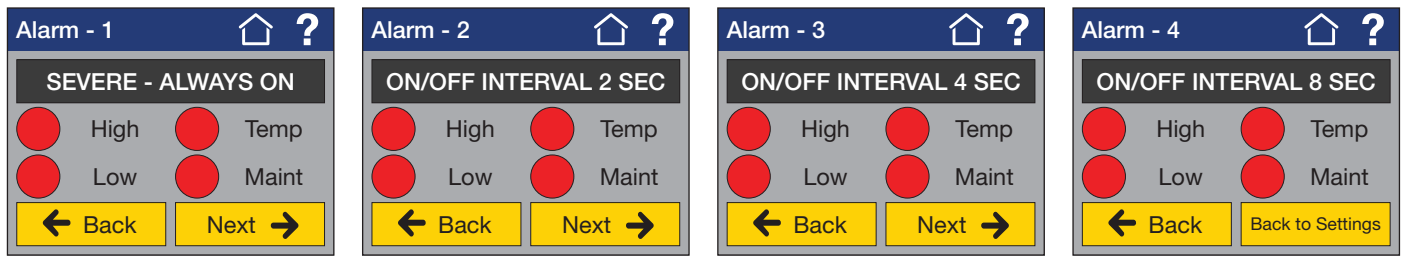
Settings Output 1, Output 2, Output 3

Output (1,2,3) - 1: Output analog (4-20 mA, 0-10 Vdc, 2-10 Vdc) signal from monitor

Output (1,2,3) - 2: Output scale automatic from appropriate input sensor. Read only value for reference and can be changed at sensor input only.

Note: Output 1 is programmed to follow Sensor 1. Output 2 is programmed to follow Sensor 2. Output 3 is programmed to follow Sensor 3. System is set up with factory defaults. Only output signal is changed, if scale is incorrect changes are made at the appropriate sensor input setting screen.

Settings – Alarm setup screen information



Settings Alarm Relay Output

Alarm - 1: Select (High, Low, Temperature Resistive, Maintenance) Category 4 (Severe Closed)

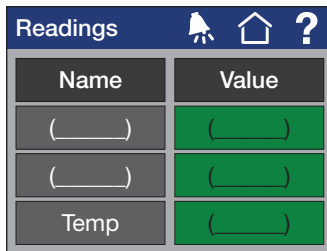
Alarm - 2: Select (High, Low, Temperature Resistive, Maintenance) Category 3 (Pulse 2 sec.)

Alarm - 3: Select (High, Low, Temperature Resistive, Maintenance) Category 2 (Pulse 4 sec.)

Alarm - 4: Select (High, Low, Temperature Resistive, Maintenance) Category 1 (Pulse 8 sec.)

Note: System is set up with factory defaults but they can be changed or added available features selected by customer. All maintenance alarms are selected and the responsibility of the installer. Each alarm type can only be selected once. Will shade out in other screens once selected.

Home - Readings screen information



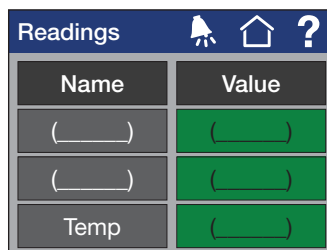
*Sensor settings will automatically fill in name
Value will be active reading from sensor with units
All boxes are read-only*



Value box will change from green to red during an alarm

Note: System is set up with factory defaults and changes to these screens are done at the settings level of the monitor. Items for this screen will automatically change depending on the sensor settings.

Home - Output screen information:

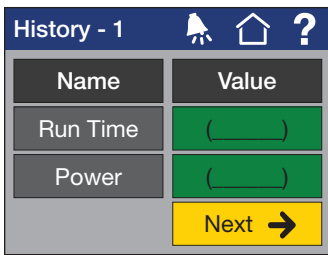


*Output settings will automatically fill in name
Value will be active reading from output with units
All boxes are read-only*

Value box will always be green and are not programmed to an alarm

Note: System is set up with factory defaults and changes to these screens are done at the settings level of the monitor. Items for this screen will automatically change depending on the output settings.

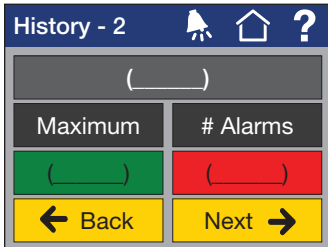
Home - History screen(s) information:



History - 1

Live readings tracking run time and motor power. No values will display if these sensors are not installed.

1. Run time is tracked with Current or RPM sensor
2. Power is determined by current sensor, then settings for the motor voltage and phase.



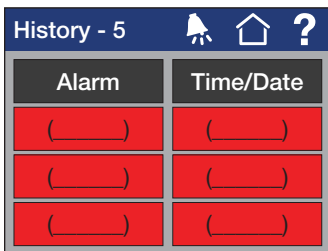
History - 2, - 3, - 4

Screens are similar, History 2 (Sensor 1), History 3 (Sensor 2), History 4 (Resistive)

1. Name is automatically entered with sensor settings
2. Maximum value is history of the highest sensor reading over time
3. Number of alarms are tracked over time
4. Reset of maximum value and alarm count by factory password



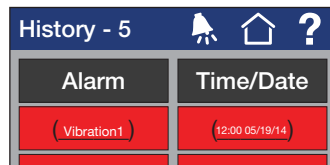
Touching the alarm icon will launch the History - 5 screen



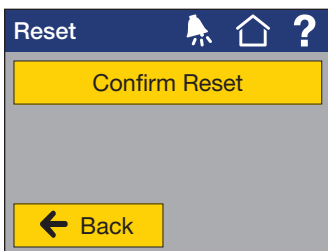
History - 5

Live history of the past three alarms present in the system

1. Alarm is the type of alarm (High, Low, Temp, Service)
2. Time and date stamp of the recorded alarm



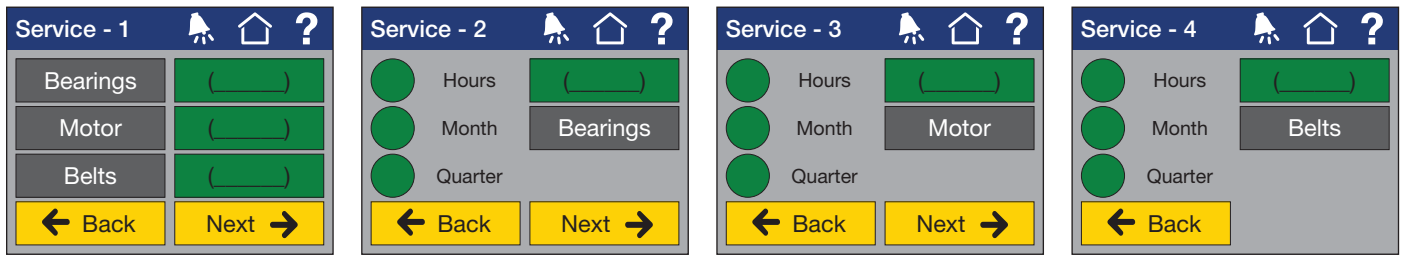
Touch red box to reset alarm(s)



Reset confirmation to show alarm history line to be reset

Note: History is set up with factory defaults and changes to these screens are done at the settings level of the monitor unless noted. Items for this screen will automatically change depending on the system settings.

Home - Service screen information:



Settings System General

Service - 1: Current maintenance status for equipment components.

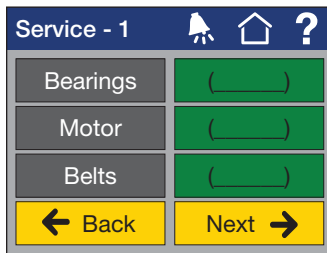
Service - 2: Bearing maintenance schedule, 24/7 or Actual Time (with Current or RPM sensor)

Service - 3: Motor maintenance schedule, 24/7 or Actual Time (with Current or RPM sensor)

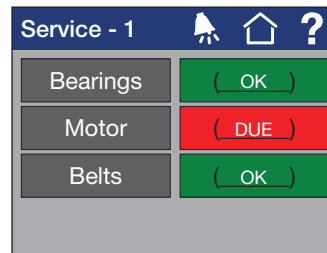
Service - 4: Belts maintenance schedule, 24/7 or Actual Time (with Current or RPM sensor)

Note: System is set up with factory defaults and changes to these screens are done at the settings level of the monitor. Items for this screen will automatically change depending on the output settings.

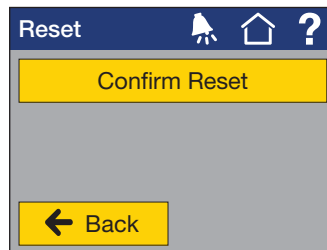
Value in green box will be either "OK" or "Due" for service. Maintenance function will need to be active in Systems settings. Each function is separate from each other so sequence can be different.



Value box will change from green to red during an alarm

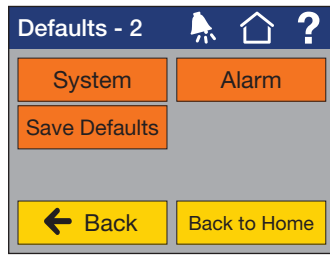
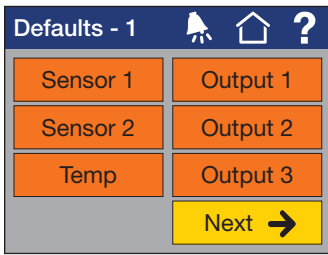


Touch "DUE" red box to reset alarm back to "OK"

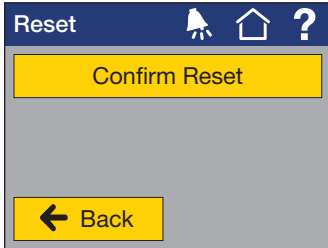


Reset confirmation to show service has been completed and system is now "OK"
Note: Remove service alarm from history

Home - Default screen information:



Touch orange box to reset to defaults



Reset confirmation to verify that the saved default setting for a sensor or the system are required by the user

Note: System is set up with factory defaults. However, the customer can make changes to the settings. If the original defaults are needed to be recovered, each specific component or the entire system can be set back to defaults. The customer can also create their own defaults and save them, this will override the factory settings and they will not be able to be recovered.

Home - Assistance screen information:



Note: Assistance with the monitoring system can be obtained by calling Greenheck Fan Corporation at the phone number shown. Additional information regarding the monitoring system is found on our website.

Specifications

Service:	Air and non-combustible, compatible gases
Enclosure Rating:	NEMA-4 and IP56
Dimensions:	5 x 5-3/8 x 2-1/2 inches (127 x 136.5 x 63.5 mm)
Mounting:	Mount unit in vertical plane with #8-32 screws (4 hole locations)
Thermal Effects:	0.015% / °F (0.027% / °C) from -13° thru 185°F (25° thru 85°C)
Stability:	< ±1% per year
Temperature Range:	-4° to 140°F (-20 to 60°C)
Power Requirements:	100 to 240 Vac at 50/60 Hz or 24 Vac/24 Vdc
Power Consumption:	Power = 21 VA at 120 Vac
Output Signal:	User selectable. 4-20 mA (900 ohms max.) or 0-10 Vdc or 2-10 Vdc
Connections:	Euro-type removable or push button terminal block and 1/2 inch watertight conduit fittings.
Fusing:	A 250 Vac MEDIUM LAG fuse required.
Zero/Span Adjust:	Accessible via touch screen menu.
Display Type:	2.8 inch 320 x 240 TFT color backlight LCD display with touch panel.
Resistive Temp:	Honeywell Industrial Temp sensor part number 6655-90980004
Weight:	Less than 3 lbs.
Agency Approvals:	ETL

Wiring Notes

1. **Input power:** Two versions of this controller are available; Verify requirements prior to applying power.
2. **High Voltage Input:** Apply 100 to 265 Vac to terminals TB1-1 (line), TB1-2 (Neutral), and TB1-3 (Earth Ground).
3. **Low Voltage Input:** Apply 24 Vac or 24 Vdc to terminals TB1-1 (+ or ~), TB1-2 (- or ~), and TB1-3 (Earth Ground).
4. **4-20 mA Sensors:** Controller provides loop power for sensor (24 Vdc at 100 mA max.) See wiring diagram for hookup. The configuration can be verified via the LCD touch screen menu. Changes to factory sensor defaults can be adjusted as required in settings.
5. **0-10 or 2/10 Vdc Sensors:** Controller provides loop power for sensor (24 Vdc at 100 mA max.) See wiring diagram for hookup. The configuration can be verified via the LCD touch screen menu. Changes to factory sensor defaults can be adjusted as required in settings.
6. **Resistive Sensor:** Use only Honeywell Temperature sensor part number 6655-90980004. See wiring diagram for hookup. The configuration can be verified via the LCD touch screen menu. Changes to factory sensor defaults can be adjusted as required in settings.
7. **Output 1:** Optically isolated, will track readings from Sensor 1 input. See wiring diagram for hookup. The signal output can be verified via the LCD touch screen menu. Changes to factory output defaults can be adjusted as required in settings.
8. **Output 2:** Optically isolated, will track readings from Sensor 2 input. See wiring diagram for hookup. The signal output can be verified via the LCD touch screen menu. Changes to factory output defaults can be adjusted as required in settings.
9. **Output 3:** Optically isolated, will track readings from Temp Resistive input. See wiring diagram for hookup. The signal output can be verified via the LCD touch screen menu. Changes to factory output defaults can be adjusted as required in settings.
10. **Alarm Output:** Optically isolated open collector output. Maximum collector emitter voltage is 80 Vdc at 50 mA.

Maintenance

WARNING

Disconnect all electrical power and secure to the "OFF" position prior to inspection or servicing. Failure to comply with this safety precaution could result in serious injury or death.

The following list is recommended preventive maintenance of the controls system. All of these items should be done before initial power up of the system and then done on a routine maintenance schedule.

It is also recommended to follow the component manufacturer maintenance recommendations which are stated in their Installation, Operation and Maintenance (IOM) document(s).

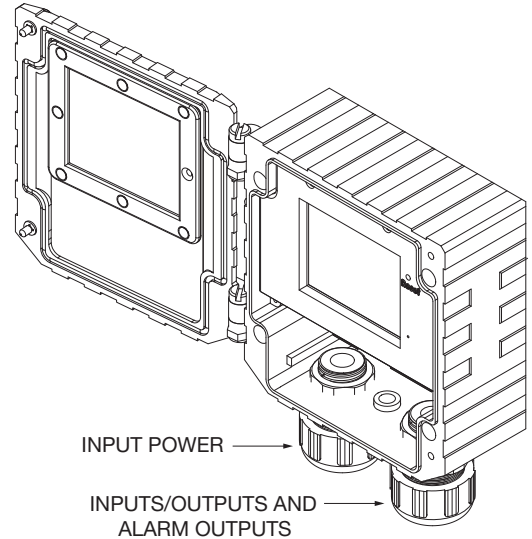
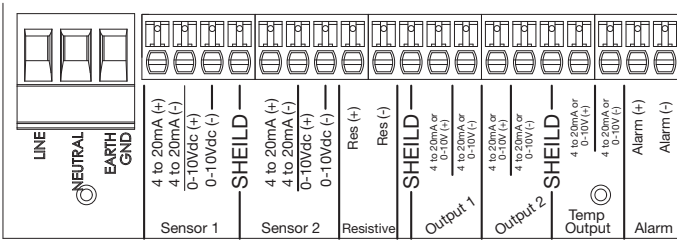
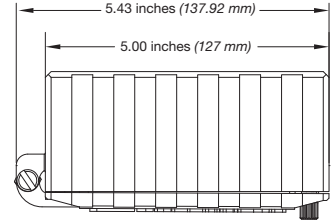
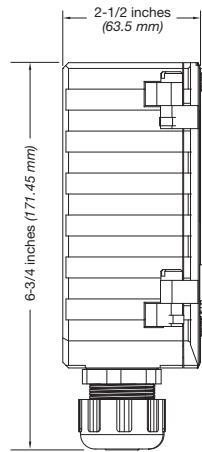
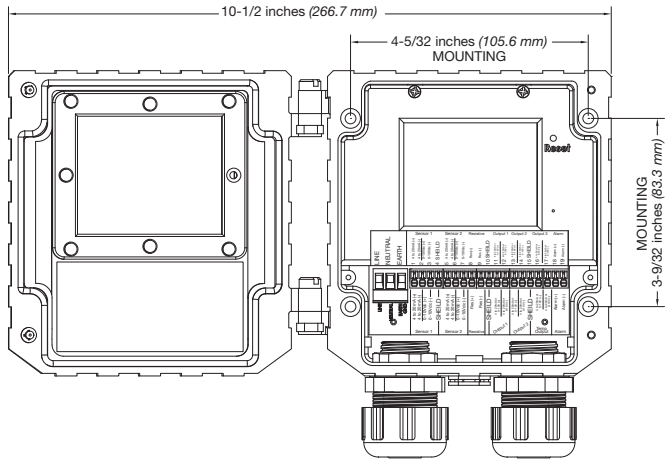
Description	Action	Occurrence
Inspect System Wire	Look for cracked, frayed, bare wiring. Replace as necessary	Quarterly
Inspect System Conduit	Look for loose fittings and cracked or broken down seal tight. Replace as necessary	Quarterly
Inspect Wiring Terminations	Look for loose or broken terminals. Tighten to required torque for each or replace as necessary.	Quarterly
Inspect Weather Proof Gaskets	Inspect all gaskets and look for moisture. Replace if necessary.	Quarterly
Inspect Electrical Enclosures	Inspect all enclosures and look for broken hardware. Replace as necessary	Quarterly

Finally, it is recommended to follow the fan IOM document for recommended service and also routine maintenance on the mechanical components of the remaining items in the system.

Replacement Parts

Description	Mfg.	Manufacturer Part Number
Fan Monitor System	As required	Consult Factory
Sensor, Vibration Transmitter	Wilcoxin	PC420VR-20
Cable, Vibration Transmitter	Wilcoxin	R6W-0-J9TA-32
Mounting Pad, Vibration Transmitter	Wilcoxin	SF8-2
Epoxy Kit	Wilcoxin	VERSIL406
Sensor, Current Transmitter	ACI	A/CTV-50
Enclosure, Outdoor NEMA-4X	Fibox	PCM100/125G
Enclosure, Mounting Rail	Fibox	MIV-5
Sensor, RPM Transmitter	Red Lion	IFMA0035
Switch, RPM Proximity PNP	Square D	XS518B1PAM12
Cable, RPM Proximity Switch	Pepperl+Fuchs	V1-G-BK5M-PVC-U
Sensor, Pressure Transmitter	Dwyer	MS2-W103-LCD
Tap, Static Pressure Probe	Dwyer	A-489
Sensor, Air Temperature Transmitter	Dwyer	659TC-JI-200C
Sensor, Bearing Temperature Transmitter	Dwyer	659TC-JM-250C
Probe, Air Temperature	Dwyer	122095-06
Probe, Bearing Temperature	Dwyer	122095-32

Dimensions



Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Specific Greenheck product warranties are located on greenheck.com within the product area tabs and in the Library under Warranties.

AMCA Publication 410-96, Safety Practices for Users and Installers of Industrial and Commercial Fans, provides additional safety information. This publication can be obtained from AMCA International, Inc. at www.amca.org.

