AWOS 3000

## Automated Weather Observing System

# Installation and Checkout Manual

## 3000-017

**Rev. V**

allweatherinc

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**Disclaimer**
The information and specifications described in this manual are subject to change without notice.

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# Revision History

| Revision | Date | Summary of Changes |
|---|---|---|
| D | 2012 Jan 6 | Updated Drawing M403316-003 Sheet 3 to show 7150 BP sensor. |
| E | 2015 Oct 25 | Updated Freezing Rain Sensor and Present Weather sensor wiring to DCP, removed 7190 BP instructions, added PW sensor wire colors to Table 4, added Ceilometer RS-485 connections, revised Ceilometer enclosure mounting instructions based on tabs, and used updated 3000-A-019 and 3000-B-019 drawings |
| F | 2016 Aug 22 | Updated for the addition of the 1793 VHF Transmitter |
| G | 2017 October 5 | Updated for new motherboard, revised local KVM power connections |
| H | 2017 December 18 | Removed AWOS Net details |
| J | 2020 March 9 | Replaced 8364-E with 6498 Present Weather and Visibility Sensor section |
| K | 2020 March 26 | Added Model 6022 series Rain Gauge |
| L | 2020 February 14 | Updated reference to UHF Data Radio model |
| M | 2020 April 30 | Updated DCP backup battery installation instructions |
| N | 2020 April 30 | Added connectorized wind sensor options |
| P | 2021 Jan 25 | Updated to connect 8339-FAA Ceilometer directly to TB4 in DCP without Serial Interface Board and to add Lightning surge suppression to Ceilometer data line |
| R | 2021 Mar 12 | Added 1192 DCP, enhanced instructions for installation Model 2040 series of ultrasonic wind sensors |
| S | 2021 Apr 23 | Added PTB330 BP sensor to Chapter 5 |
| T | 2021 July 2 | Added installation and connection information for 6498 *Direct Connect* sensors and for Model 6500-DC Thunderstorm/Lightning sensor |
| U | 2021 Nov 23 | Updated 3000-019 wiring diagram to reflect M406186-02 motherboard |
| V | 2021 Dec 23 | Added Vaisala sensors |

# Table of Contents

Chapter 1

# 1. Using This Manual

This manual details installation and checkout procedures for the All Weather, Inc. Automated Weather Observing System (AWOS) 3000. The AWOS 3000 is available in multiple configurations, with each AWOS configuration having a unique suite of sensors. This manual is organized around the individual sensors, with each sensor covered in its own chapter. A table at the beginning of each chapter lists the AWOS configurations that include the sensor.

The first two chapters cover installation and checkout of the Central Data Processor (CDP) and Data Collection Platform (DCP), which are included in all systems. The remaining chapters cover the installation of the sensors and their accessories.

Detailed installation drawings and wiring diagrams are provided in Appendix A.

Checkout procedures are provided for each sensor or component. These are intended to verify operation when a sensor or component is replaced in an existing system. When a complete system is installed, checkout is accomplished by performing the Annual System Revalidation procedure described in the ***AWOS 3000 Maintenance Manual (3000-027)***.

## 1.1 General Precautions

Note that ultraviolet-resistant cable ties must be used whenever cable ties are called for.

Note that the metallurgy of the stainless U-bolts will cause the nuts to seize to the U-bolts and twist them off. Lubricate the threads with anti-seize compound before assembling.

Electrostatic discharge (ESD) precautions must be followed when working with printed circuit boards and wiring the data interfaces. At a minimum, wear a grounding wrist strap and connect the ground to a chassis ground inside the enclosure you are working in.

Observe basic electrical safety procedures such as turning the power or circuit breaker off when working with the AC power interfaces.

All test and calibration equipment must be traceable as specified by the National Institute of Standards or other standards organizations where specified.

Chapter 2

# 2. Central Data Processor

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| CDP | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

The Central Data Processor (CDP) is mounted in an industrial-grade rack (Figure 1) along with an Uninterruptible Power Source (UPS), VHF ground-to-air radio, voice/RMM (Remote Maintenance Monitoring)) modem, and any of the CDP options. The available options include UHF data link radio, AWOS Net, and AWOS/ATIS Interface.


**Figure 1. AWOS 3000 CDP Rack**

# 2.1 CDP Installation

The CDP is self-contained. It is installed indoors, at a location with access to AC power and any auxiliary communication and data lines required. Installation of the CDP primarily involves routing external cables into the CDP rack and connecting them to the CDP back panel. The installation of individual CDP options (UHF Radio, etc.) is covered later in this chapter in the sections devoted to those options.

The CDP is a 22" × 20.5" × 20" 11RU small equipment rack that weighs 138 pounds. The CDP must be place in a stable location for its size and weight.

Drawing 3000-019 in Appendix A provides the CDP wiring diagram for reference.

## 2.1.1 Back-Panel Connections

Connections to external devices and data sources (such as the AWOS DCP, ADAS, GPS NTP server, and printer), as well as internal components (such as VHF Radio and Modem) are made at the back panel. The back panel is located inside the CDP rack, just above the bottom shelf (see Figure 9). Figure 2 shows the back panel connectors.

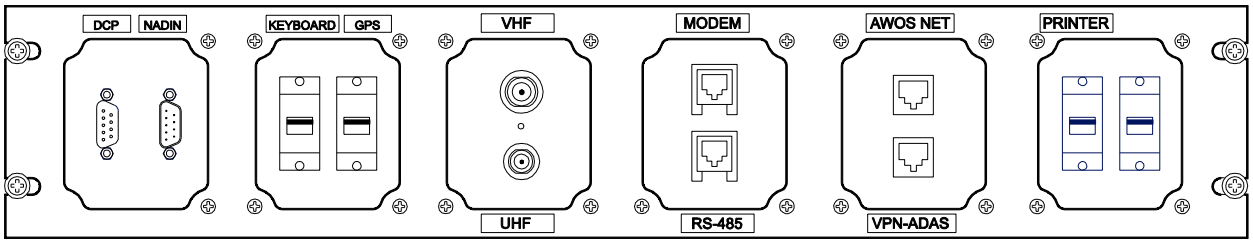



**Figure 2. CDP Back Panel Connectors (front end)**

External cables are routed to the back panel through an access hole located in the right rear corner at the top of the rack enclosure.

## 2.1.2 Connecting Power

Power is supplied to the CDP through the UPS housed in the base of the CDP rack. A power cord is included and installed, and is routed through the access hole in the top of the CDP enclosure. Connect this power cord to a suitable AC outlet.

## 2.1.3 Connecting the VHF Antenna

The VHF antenna and antenna cable must be installed. A mast for the antenna should have been installed as part of the site preparation. The cable from the VHF Ground-to-Air (GTA) radio antenna must be routed to the CDP rack and connected to the back panel.

1. Using the radiator length chart on the UHF/VHF Antenna Assembly instructions (included with the VHF antenna and also in Appendix A), find the optimum radiator length for the VHF radio frequency.

   *Note that the radiator lengths remain unchanged from the provided length for standard VHF GTA frequencies used for AWOS systems.*

2. Using a hacksaw, trim the radial length of the antenna (Part M489103) to the length specified. Cover the end of the radiator with the plastic end cap provided with the antenna.
3. Coat the threaded ends of the radials with PTFE lubricant (supplied with antenna). Attach the radials to the radiator section.
4. Coat the threaded portion of the U-bolt with PTFE. Attach the U-bolt to the antenna as shown.
5. Coat the threaded portion of the radiator with PTFE. Attach the completed antenna to the U-bolt mount as shown.
6. Attach the antenna to the mast installed on the building for the VHF radio antenna.
7. Attach the VHF radio antenna cable (Part M491361) UHF connector to the antenna.
8. Route the antenna cable to the CDP location.
9. Do not trim the antenna cable before you attach the BNC connector to the antenna cable since shorter antenna cable lengths mean less signal loss, and this translates to an increased effective radiated power by the antenna, which may then exceed regulatory specifications. Figure 3 shows how to attach the BNC connector to the antenna cable.
10. Connect the cable to the BNC connector labeled **VHF** on the front side of the back panel.

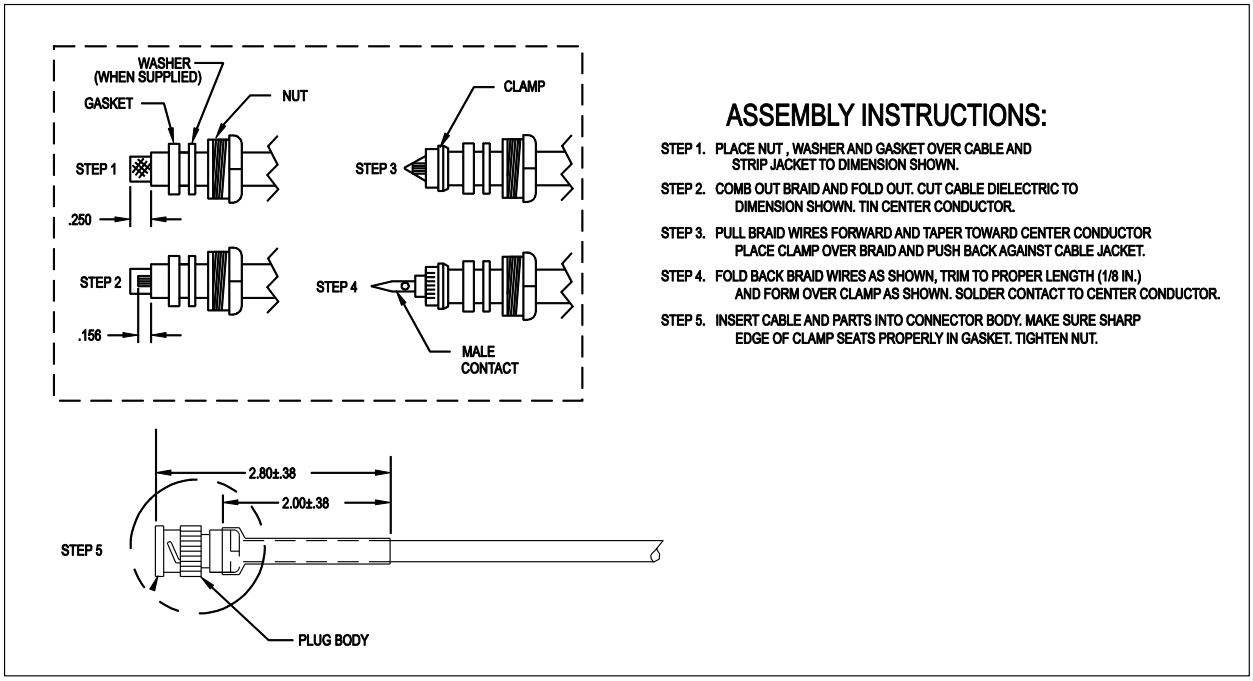



**Figure 3. BNC Connector Installation**

### 2.1.4 Connecting Optional Printer

A USB port is available on the CDP back panel for connection to a printer. Connect the printer as follows:

1. Connect the USB cable to the printer's USB port.
2. Feed the USB cable through the access hole in the top of the CDP enclosure.
3. Connect the other end of the printer cable to the USB connector labeled **PRINTER** on the front side of the back panel.

## 2.2 CDP Rack Layout

The CDP components are housed on two shelves inside the rack's lockable enclosure. The shelves can be accessed via the front door or either of the side doors. The easiest entry point will depend on the component being accessed.

## 2.3 CDP Top-Shelf Components

The top shelf (Figure 5) is attached to the back of the CDP monitor and contains the CPU assembly, Power Supply, Interface Board, Voice Modem, and communication option (RS-485 converter or UHF radio). The shelf is accessed by removing four screws from the corners of the front panel (see Figure 4) and sliding the entire shelf, including the monitor, forward.

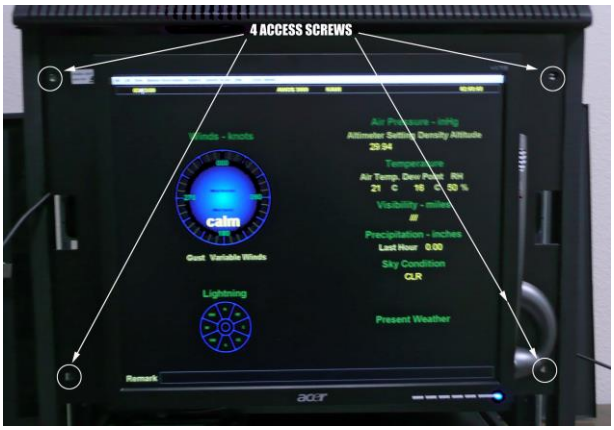



**Figure 4. Front Panel Screws**

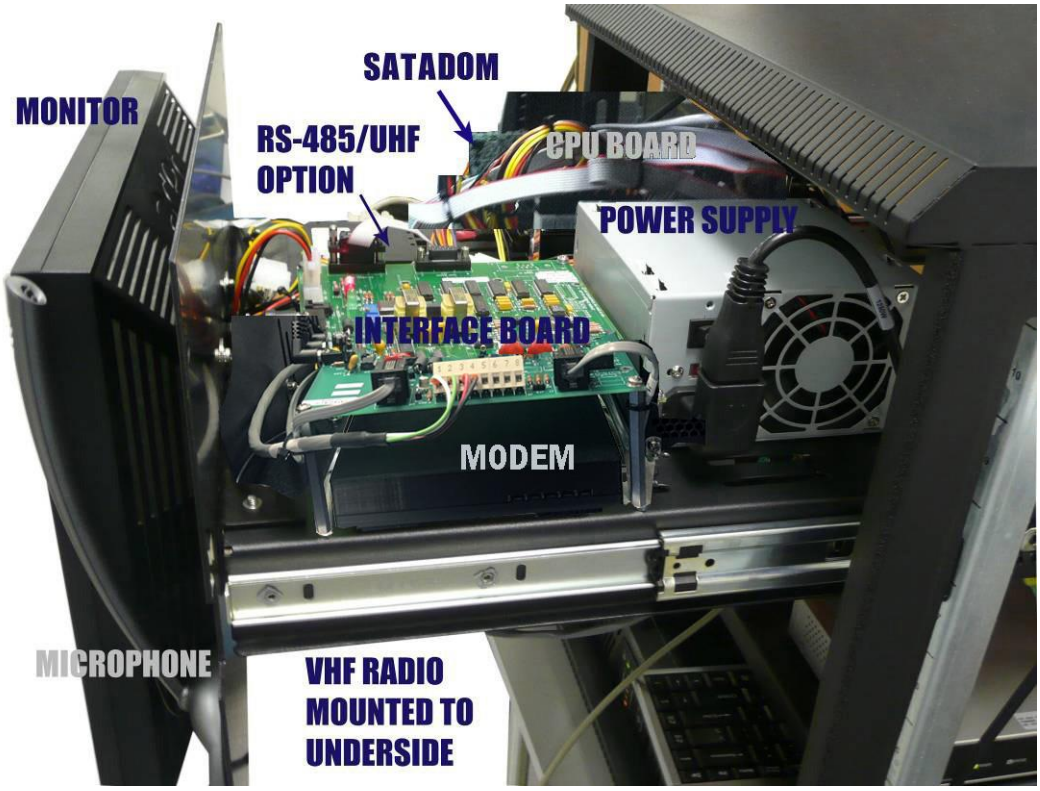



**Figure 5. CDP Top-Shelf Components**

## 2.3.1 Communications

The communication options—RS-485 converter or UHF radio—mount to the CDP top shelf in front of the CPU Board assembly.

### *2.3.1.1 RS-485 Landline Converter Installation*

When an RS-485 landline is used for communicating with the DCP, an RS-485 converter is installed on the top shelf using Velcro.

The RS-485 converter kit includes:

- M417210-00 RJ-11 terminal box
- M438205-00 RS-485 converter
- M491860-00 serial cable
- M491848-00 power cable
- M491851-00 RS-485 to panel cable
- M491861-00 RJ-11 cable
- Velcro

The following steps describe how to install the RS-485 converter kit. Figure 6 illustrates the connections.

1. Power off the CDP.
2. Affix one side of the Velcro backing to the underside of the converter. Attach the other side of the Velcro backing to the top shelf so that the converter is located at the front-left of the shelf with sufficient clearance from other components (see Figure 5).
3. Connect the male end of the DB9 connector on cable M491860-00 to the RS-485 converter's female DB9 connector.
4. Connect the other end of the cable to the **DCP** connector on the back panel (see Figure 6). *This connection will be modified if the AWOS Net option is installed.*
5. Connect the M491848-00 power cable's yellow wire to the **V+** connector on the converter.
6. Connect the power cable's black wire to the **0V-** connector on the converter.
7. Connect the other end of the power cable to the mating connector on the CDP power supply's unused power cable.
8. Connect the M491851-00 RS-485 cable to the converter as follows:
    - Red wire to D+ terminal on the converter.
    - Green wire to D- terminal on the converter.
    - Black wire to GND terminal on the converter.
9. Connect the RJ-11 connector end of the RS-485 cable to the back of the RS-485 RJ-11 jack on the back panel (see Figure 2, Figure 6, and Figure 9).
10. If the RS-485 cable from the DCP is already terminated in an RJ-11 jack, which is likely to be in a wall-mounted terminal box close to the CDP rack, use the M491861-00 RJ-11 cable to connect to this jack, then feed the cable through the top of the rack and connect the other end to the front of the RS-485 jack on the CDP back panel. This completes the installation.

    If there is no wall-mounted terminal box, use the M417210-00 RJ-11 terminal box included with the RS-485 converter kit. Try to install the M417210-00 RJ-11 terminal box within 3 ft (1 meter) of the CDP rack on a convenient surface using the two mounting screws that are included. Use the fork lugs provided to terminate the wires from the DCP. Although the wires from the DCP may have various colors, the corresponding signals must be matched with the specified colors inside the terminal box.

    - Connect the RS-485(+) wire to the screw terminal associated with the *red* wire.
    - Connect the RS-485(-) wire to the screw terminal associated with the *green* wire.
    - Connect the RS-485 ground wire to the screw terminal associated with the *black* wire.

    Now you may connect the M491861-00 RJ-11 cable as described at the start of this step.

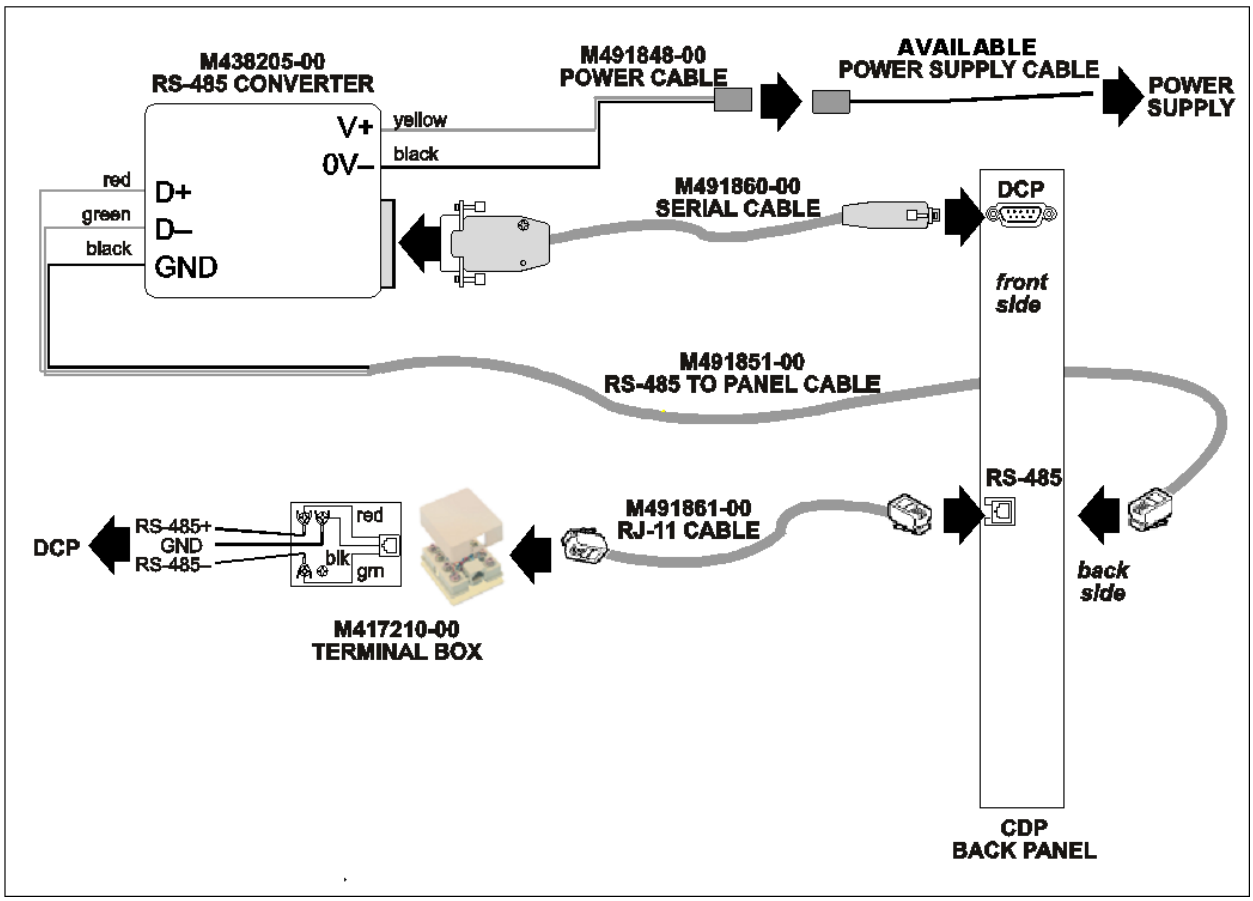



**Figure 6. RS-485 Landline Converter Installation**

### *2.3.1.2 UHF Radio Installation*

When a radio data link is used between the DCP and the CDP, a UHF radio is mounted to the inside of the front panel above the top shelf. The UHF antenna connects to the BNC connector labeled **UHF** on the back panel, The radio mounts to the inside of the front panel using Velcro.

The radio kit includes:

- Model 20981 UHF Radio
- M489171-00 attenuator
- M491852-00 antenna cable
- M493135-00 serial and power cable
- Velcro

The following steps describe how to install the radio kit. Figure 8 illustrates the connections. See Appendix A for additional information about the antenna and mast assembly and installation.

1. Power off the CDP.
2. Connect the female end of the DB9Install the UHF Data Radio on the inside front panel using two Velcro pads.

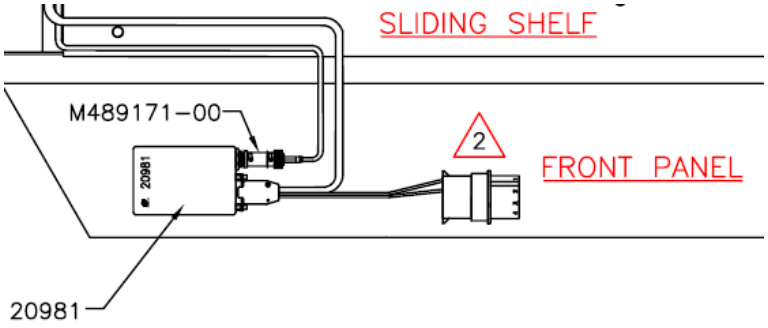



**Figure 7. Install Model 20981 UHF Data Radio**

3. Add the M489171-00 attenuator to the BNC antenna connector on the UHF Data Radio.
4. Use the M493135-00 cable to connect the DB15 connector on the UHF Data Radio to an unused connector of the M491862-00 splitter cable from the CDP ATX power.
5. Connect the other end of the cable to the **DCP** connector on the back panel (see Figure 8). *This connection will be modified if the AWOS Net option is installed.*
6. Connect one end of the included antenna cable (M491852-00) to the **BNC** connector on the M489171-00 attenuator already connected to the radio.
7. Connect the other end of the antenna cable to the connector on the back side of the back panel labeled **UHF**.

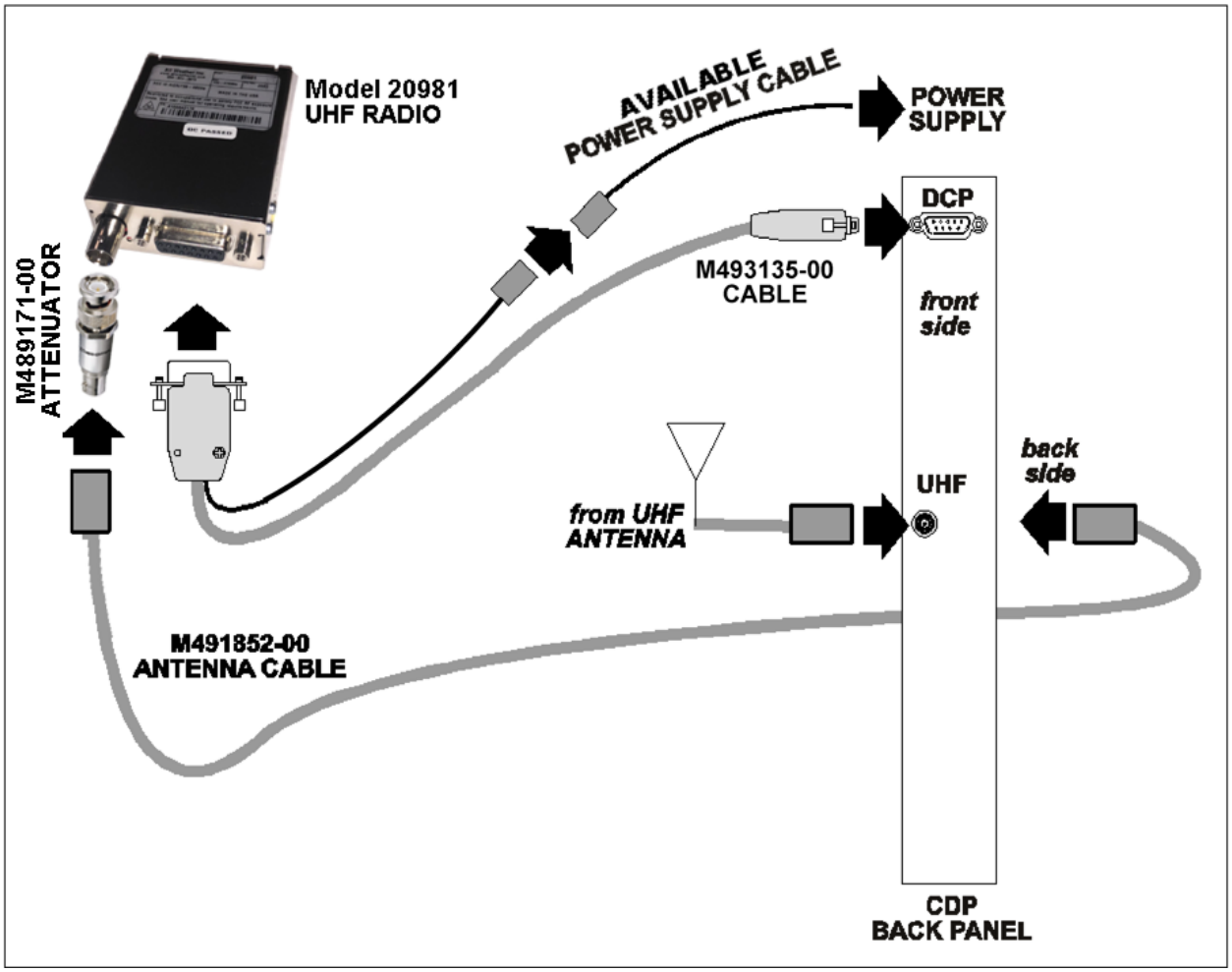



**Figure 8. UHF Radio Installation**

## Connecting the UHF Antenna

When a UHF radio data link is used for communication between the DCP and CDP, the antenna and antenna cable must be installed. A mast for the antenna should have been installed as part of the site preparation. The cable from the UHF antenna must be routed to the CDP rack and connected to the back panel.

1. Install the antenna on the mast provided on the roof of the building, or other appropriate location. The antenna should be pre-cut for the 450–470 MHz range (standard AWOS UHF frequency range). Refer to the UHF/VHF Antenna Assembly instructions (in Appendix A) for more information on how to do this.
2. Connect the UHF connector of the RG-58 antenna cable (Part M491361) to the antenna.
3. Route the antenna cable to the CDP location.
4. Feed the cable through the access hole in the top of the CDP enclosure.
5. If you wish, you may trim the antenna cable before you attach the BNC connector to the antenna cable. The length of the antenna cable will not affect the operation of the UHF data link, which will remain within regulatory specifications, although shorter antenna cable lengths mean less signal loss, and this translates to an increased effective radiated power by the antenna. The BNC connector is attached as for the VHF antenna cable as shown in Figure 3.
6. Connect the cable to the BNC connector labeled **UHF** on the front side of the back panel.

## 2.4 CDP Bottom-Shelf Components

The CDP rack's bottom shelf (Figure 9) is fixed in place. Components are accessible through the rack's front or side doors.

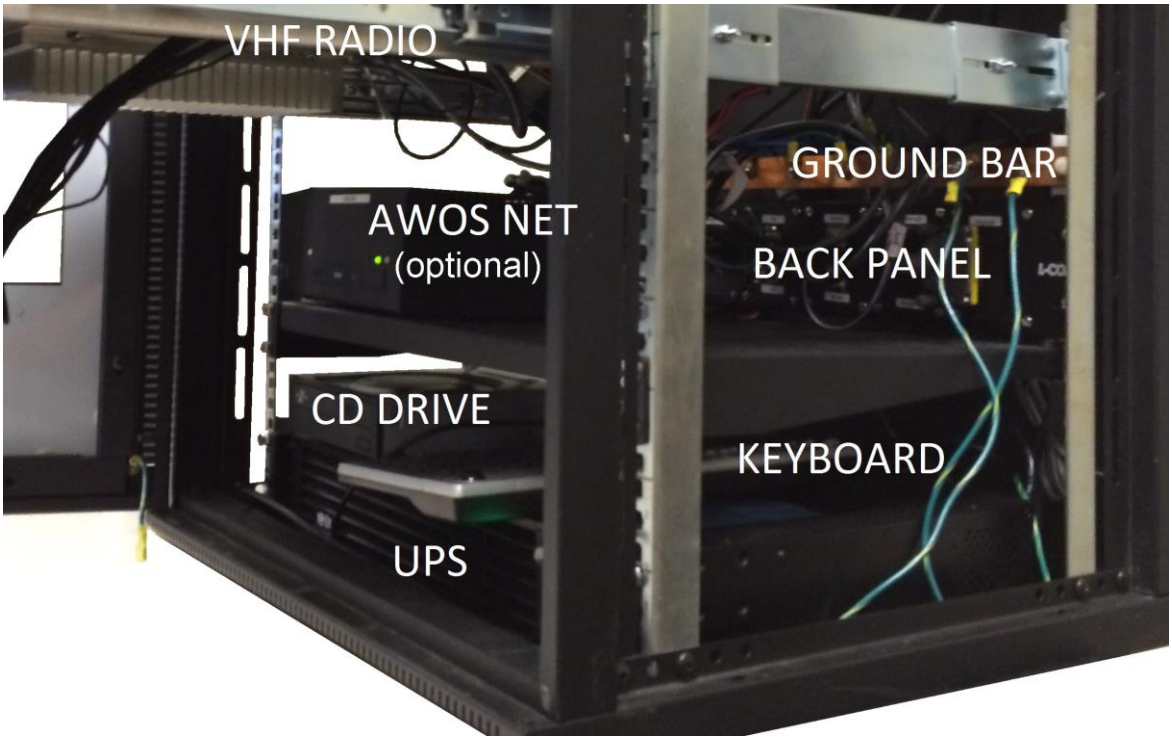



**Figure 9. CDP Bottom-Shelf Components**

The UPS is housed in the base of the rack, beneath the bottom shelf. The CD drive rests on the UPS. When not in use, the keyboard is stowed on top of the UPS as well.

The **back panel**, where cable connections are made to the major components, is mounted to the back of the rack just above the bottom shelf.

The CDP's ground cables connect to the **ground bar**, which is mounted to the rear of the rack just above the back panel.

## 2.5 GPS NTP Time Standard

A Network Time Protocol server using a GPS receiver (see Figure 10) maintains time synchronization at the CDP. The server, housed in a small, oval package, is installed outside the CDP. It can often be affixed to the top of the rack, depending on satellite reception.


**Figure 10. GPS NTP Time Standard Server**

To install the GPS NTP Server:

1. Install the server at a location outside the rack with good satellite reception. Depending on conditions, the server can often simply be affixed to the top of the rack.

   If you experience difficulty accessing the GPS satellite signal, move the server to a location where it has a clear line of sight to the sky without any metal shielding it.
2. Route the server's cable through the access hole in the top of the rack enclosure
3. Connect the cable to the USB connector labeled **GPS** on the CDP's back panel (see Figure 2).

## 2.6 NADIN Interface Connection

If a NADIN interface is used with the AWOS 3000, the NADIN serial cable is routed into the CDP and connected to the back panel as follows:

1. Route the NADIN cable to the CDP location.
2. Feed the cable through the access hole in the top of the CDP enclosure.
3. Connect the cable to the DB9 connector on the back panel labeled **NADIN**.

   The NADIN connector is a standard male DB9 RS-232 serial connector that accepts the female DB9 female cable from the optional customer-procured NADIN interface.

## 2.7 KVM Extender for Remote Operation

The KVM Extender Kit (M488342-00) is used to interface a remote operator terminal to the CDP using a CAT6 Ethernet cable between the local and remote KVM Extender units, with the Local Unit connected to the CDP. This is necessary when the CDP is installed in an equipment room and the actual operator of the AWOS is located elsewhere, such as in the control tower. The remote location will allow the same access to the CDP as if the user is physically at the CDP. This location must be within 700 ft of the CDP.


**Figure 11. KVM Extender**

The KVM Extender (M406245-00) consists of the following parts.

1. Local Unit – This unit connects to the CDP. The top unit in Figure 11 is a front view of the Local Unit.
2. Remote Unit – This unit is located where the operator terminal is desired. The bottom unit in Figure 11 is a front view of the Remote Unit.

   *Note that the Local Unit and the Remote Unit are a matched set. If the need arises to replace either unit, they* ***must*** *be replaced as a set.*

3. Two grounding cables — One grounding cable for the Local Unit, one grounding cable for the Remote Unit. The grounding cables are used to connect the ground posts of the Local Unit and the Remote Unit to their respective devices, the CDP and the remote operator terminal.
4. KVM cable assembly – This cable connects the Local Unit to the CDP's monitor and audio speaker/microphone jacks. The cable assembly includes the USB connection to the motherboard.
5. Two power supplies – One power supply will power the Local Unit and the other power supply will power the Remote Unit.

6. Remote Operator Interface — Monitor, keyboard, mouse, speaker, and microphone.

A customer-supplied standard CAT6 Ethernet cable built to standard TIA/EIA-568-B.2-2001 with RJ-45 connectors wired to the T568B scheme is used to connect the Remote Unit to the Local Unit. Figure 12 shows a wiring diagram for the cable end. This cable may be up to 700 ft long and must be a straight-through cable, *not* a crossover cable.

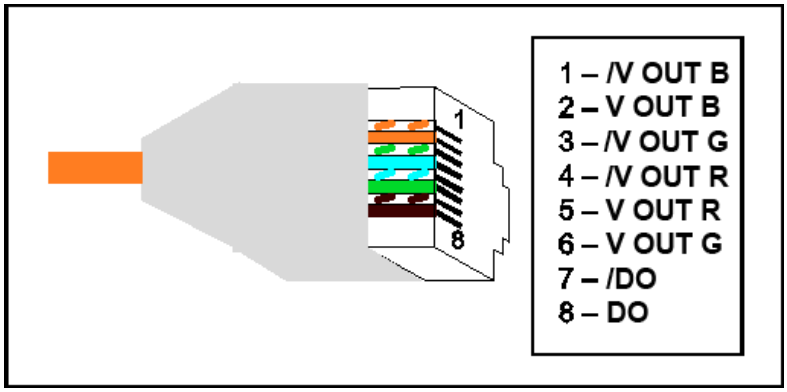



**Figure 12. RJ-45 Connectors Wired to T568B Scheme**

*The Ethernet cable between the two KVM extender units must not be connected to an Ethernet network or any other connections. There must be no other connections between the two KVM extender units.*

Figure 13 illustrates the connection of the KVM extender units using the Ethernet cable.

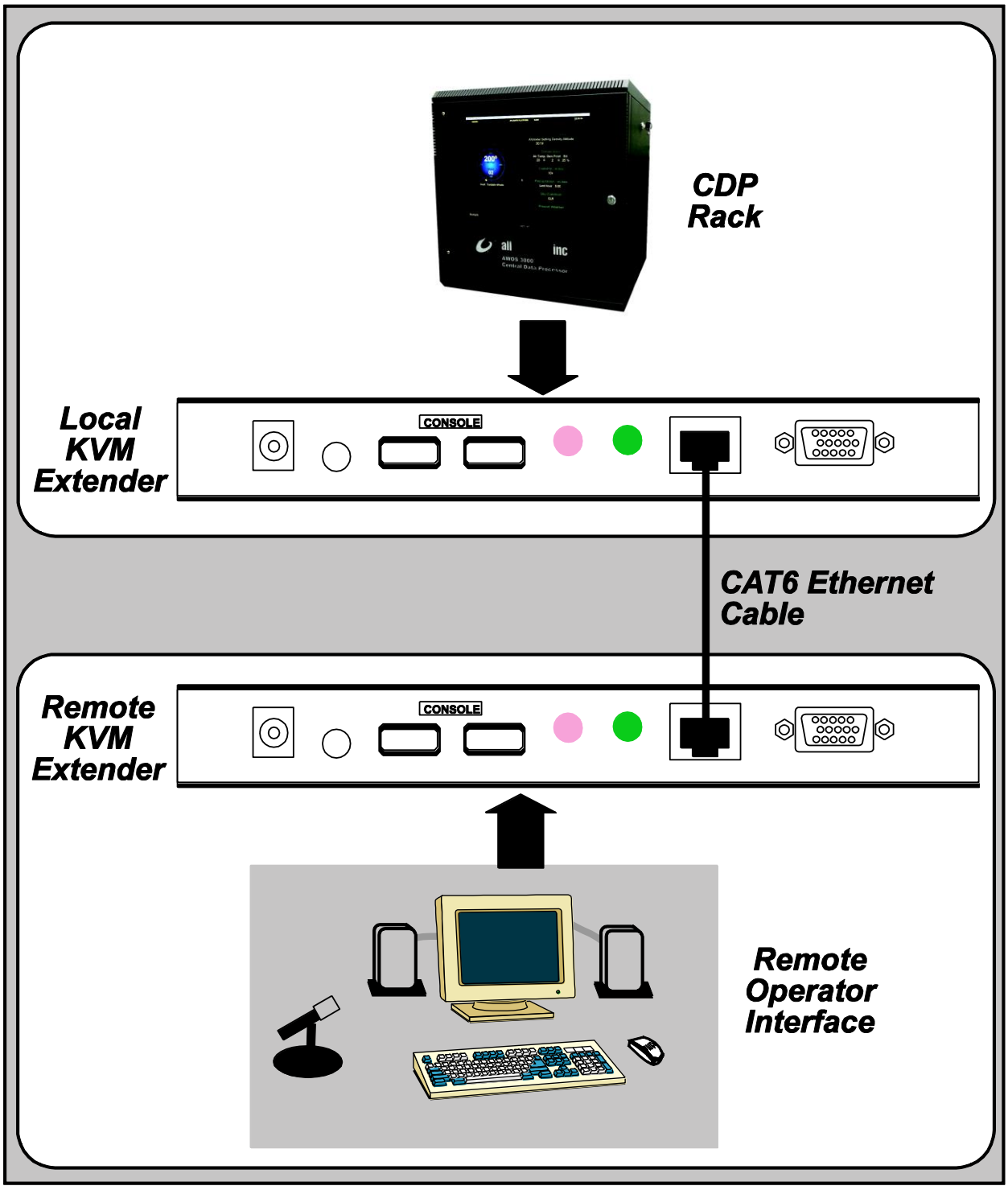



**Figure 13. Topology of Local and Remote KVM Extender**

## 2.7.1 Local Unit Installation

The Local Unit of the KVM extender is essentially installed between the computer in the CDP and the keyboard/mouse combination, microphone, and speakers.

The following steps summarized in Figure 14 describe the process to connect the Local Unit to the CDP. Care should be taken to keep all cables routed cleanly and added to cable bundles as necessary for neatness.

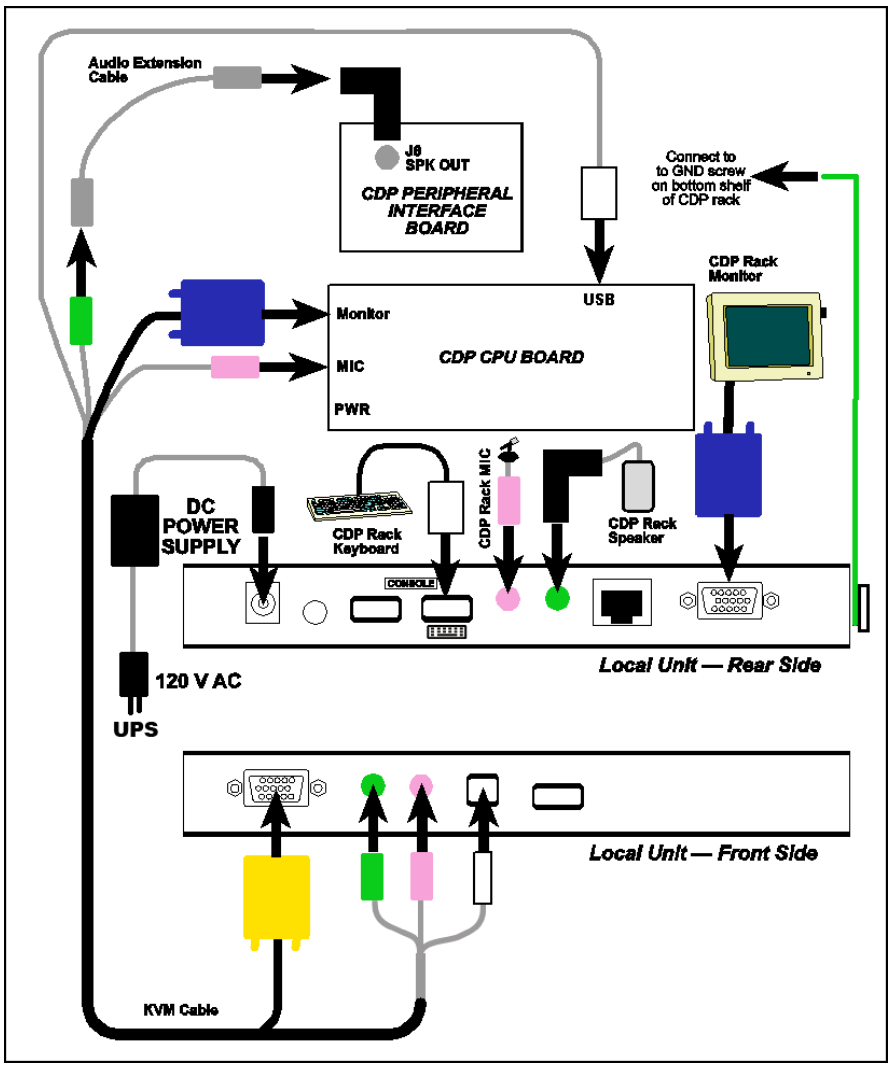



**Figure 14. Local Unit Connections**

1. Remove the two side doors on the CDP and the front door.
2. Remove the four screws holding the front panel to the rack rail in the enclosure (see Figure 5). Slide the top shelf out for easier access.
3. Connect the yellow connector on the KVM cable (see Figure 14) to the CPU connector on the front of the Local Unit.

4. Remove all the caps from the ends of the 3.5 mm mini stereo audio connectors on the KVM cable.

5. Connect the green 3.5 mm mini stereo audio connector on the end of the cable with the yellow connector to the green speaker jack  next to the CPU connector.

6. Connect the pink 3.5 mm mini stereo audio connector on the end of the cable with yellow connector to the pink microphone mini stereo jack  next to the speaker connector.

7. Connect the B type USB connector on the KVM cable provided with the KVM Extender Kit in to the B type USB connector  on the front of the Local Unit.

8. Remove the monitor connector from the back of the CPU board (see Figure 15). Plug this connector into the blue monitor connector on the back of the Local Unit (Figure 16).

9. Connect the blue connector on the KVM cable to the monitor connector on the CPU board (where the cable was just removed).

10. Remove the pink microphone connector from the back of the CPU board (Figure 15). Plug this connector into the pink microphone connector  on the back of the Local Unit (Figure 16).

11. Plug the pink microphone connector on the KVM cable into the pink connector on the back of the CPU board (where the cable was just removed).

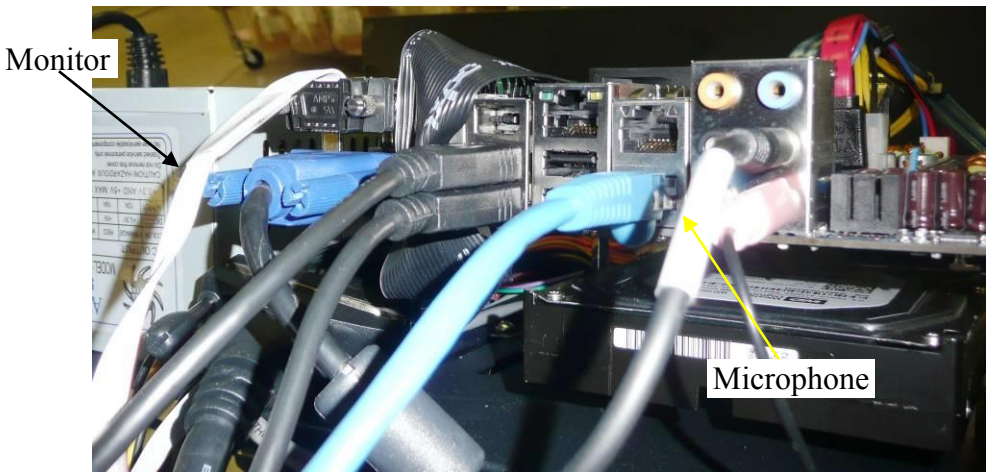



**Figure 15. CPU Monitor & Microphone Connections**

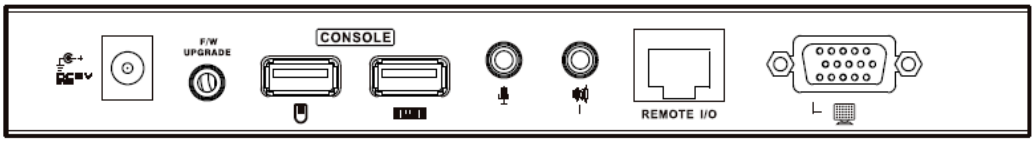



**Figure 16. Local Unit Back Connections**

12. Connect the remaining USB connector wired to the blue connector on the KVM cable to a USB port on the CPU board.

13. Connect the audio extension cable provided in the KVM Extender Kit onto the green speaker connector on the KVM cable.

14. Remove the right angle audio connector in the J8 SPK OUT jack on the peripheral interface board (Figure 17). Connect this to the green speaker connector on the back of the Local Unit (Figure 16). You may have to cut some cable ties to pull this cable to the Local Unit.

15. Install the right angle audio adapter into J8 on the peripheral interface board (where the cable was just removed). Plug the extended audio cable into the right angle adapter.

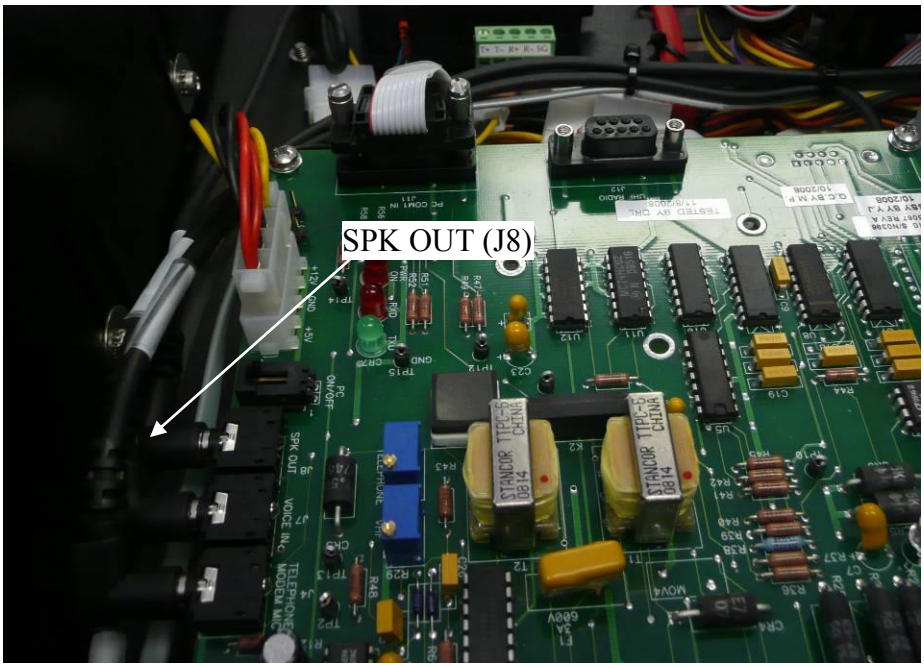



**Figure 17. Peripheral Interface Board**

16. Remove the keyboard USB connector from the back panel of the CDP (see Figure 2 and Figure 9 for the back panel location and the connector location on the panel). Connect this cable to the keyboard connector on the back of the Local Unit.

17. Use one of the green ground wires to connect the ground screw terminal on the side of the Local Unit to the ground screw on the bottom shelf of the CDP rack.

18. Plug the power cable provided with the kit in to the power connector on the back of the Local Unit.

19. Plug the circular connector on the power supply provided with the KVM extender into the DC power jack  on the back of the Local Unit. Plug the other end into the UPS AC power.

20. Verify that the LED flashes are alternating on the Local and Remote units to ensure that the Local Unit is in the correct mode and powered before completing the installation.

21. Use a straight-through CAT6 Ethernet cable to connect the Local Unit to the Remote Unit via the **REMOTE I/O** RJ-45 jack on the back of the Local Unit (see Figure 13). *WARNING: This is not an Ethernet connection. Do not connect the KVM units to an Ethernet network.*

22. Place the Local Unit on the lower shelf of the CDP rack.

23. Slide the top shelf back into the CDP rack and secure the front panel to the rails with the four screws previously removed.

24. Reinstall the front and side doors.

## 2.7.2 Remote Unit Installation

The Remote Unit of the KVM extender is installed in the desired operational location for the user. The Remote Unit requires a standard AC power connection (100 – 240 V AC) within 6 ft of the Remote Unit.

The following steps summarized in Figure 18 describe the process to connect the Remote Unit to the CDP. Care should be taken to keep all cables routed cleanly and added to cable bundles as necessary for neatness.

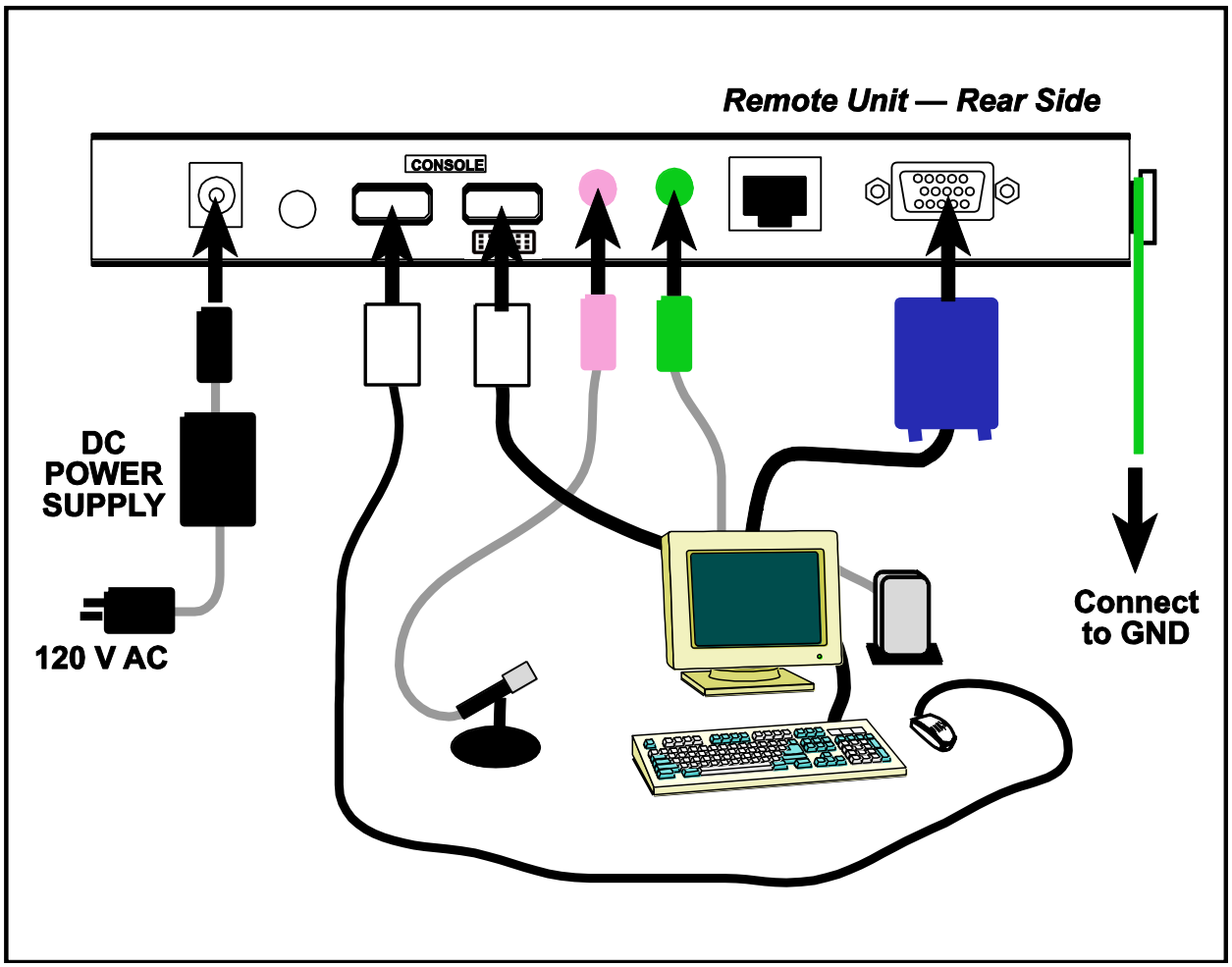



**Figure 18. Remote Unit Connections**

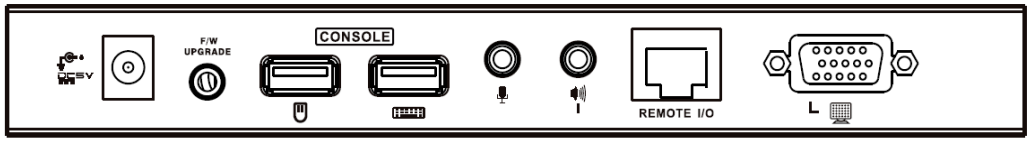



**Figure 19. Remote Unit Back Connections**

1. Place the monitor, keyboard, mouse, and microphone in the desired locations.
2. Connect the straight-through CAT6 Ethernet cable from the Local Unit to the **REMOTE I/O** connector on the back of the Remote Unit (Figure 13). *WARNING: This is not an Ethernet connection. Do not connect the KVM to an Ethernet network.*
3. Connect the blue VGA video cable from the monitor to the monitor connector on the back of the Remote Unit.
4. Connect the audio cable provided with the monitor into the speaker connector on the back of the monitor. Plug the other end of the cable into the speaker input on the back of the Remote Unit.
5. Connect the pink microphone connector in to the microphone input on the back of the Remote Unit.
6. Plug the USB connector on the keyboard cable to the keyboard connector on the back of the Remote Unit.
7. Plug the USB connector on the mouse cable to the mouse connector on the back of the Remote Unit.
8. Use one of the green ground wires to connect the ground screw terminal on the side of the Remote Unit to an available ground such as the power supply ground.
9. Plug the circular connector on the power supply provided with the KVM extender into the DC power jack on the back of the Remote Unit. Plug the other end into AC power.

### 2.7.3 KVM Extender Checkout

1. Perform a visual inspection once the Local Unit and Remote Unit connections have been completed to make sure they match the connections shown in Figure 14 and Figure 18.
2. Power on the Remote Unit. The link light on the front of the Remote Unit should be on to indicate the link between the Local Unit and the Remote Unit is working.
3. For proper operation, the KVM extender should be in AUTO mode. This mode is controlled by the buttons on both the Remote Unit and the Local Unit. On the Local Unit, this button is labeled **AUTO/REMOTE** and on the Local Unit it is labeled **AUTO/LOCAL**. Pressing these buttons will switch between AUTO mode and the mode for that unit. AUTO mode allows both locations to be used.
4. There are LEDs near the mode buttons to indicate the operational status of the KVM extender units. On the Local Unit, there are two LEDs, remote and local. If they are flashing, the KVM extender is in AUTO mode. If one LED is on with the other off, that unit has control.
5. There is only one mode LED on the Remote Unit. If this LED is flashing, the KVM extender is in AUTO mode. If it is on, the Remote Unit has control, and if it is off, the Local Unit has control.
6. When the LEDs indicate a unit has control, this may be that there is a user actively using the CDP and not that the KVM extender is in that particular mode (local or remote).
7. Only one user can access the CDP at a time. The KVM extender will wait a few seconds once activity has stopped at one unit (remote or local) before it allows the other unit to access the CDP.
8. Verify that you can hear the METAR report on the speaker.
9. Verify that the keyboard and mouse attached to the Remote Unit are working by performing keystrokes and moving the mouse, then observing the desired response on the monitor.
10. Verify that the microphone attached to the Remote Unit is recording a voice remark.

If any problem is noted with the operation of the KVM extender, both the Local and Remote units should be replaced as a set.

## 2.8 AWOS/ATIS Interface

FCC Title 47 (regulation 87.527c) only allows one VHF frequency for sites that have both ATIS and AWOS systems. If an ATIS system is used at an airport, the AWOS/ATIS Interface connects the VHF and telephone modem outputs of both systems to one VHF transmitter and one telephone modem (see Figure 20). A switch controls which audio source (AWOS or ATIS) goes to the VHF transmitter and modem — the RMM capability remains active regardless of the switch position. Power (+12 V DC) is supplied by the CDP.

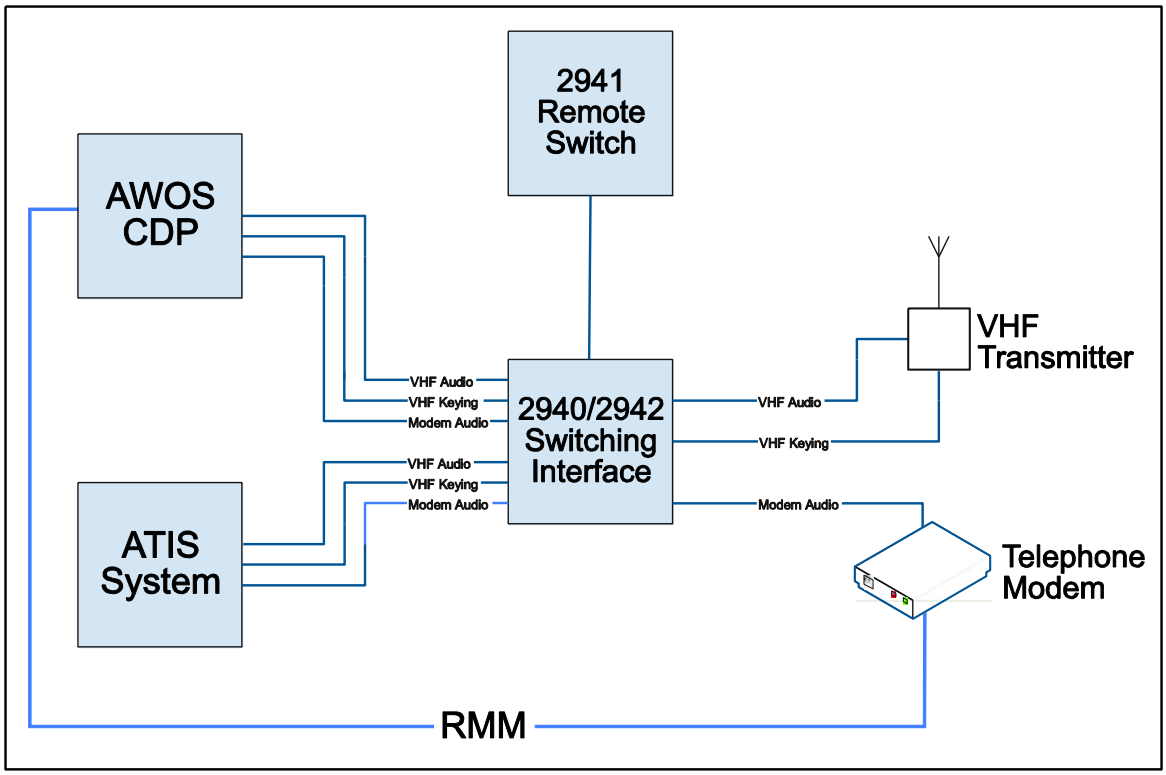



**Figure 20. AWOS/ATIS Interface Block Diagram**

Two enclosure models are available for the ATIS Interface.

- The Model 2940 AWOS/ATIS Interface is a 19” rack-mountable enclosure. This model fits into the standard ATIS communication rack, or any other standard 19" rack. The 2940 AWOS/ATIS Interface is a one-rack unit (1RU) enclosure. There is no external mode switch on the 2940; therefore a Remote Switch (Model 2941) is required.
- The Model 2942 is a desktop version of the AWOS/ATIS Interface. This model has an LED and mode switch on the front of the enclosure, and so does not require the Remote Switch. The Remote Switch may still be used with this model if desired. If the remote switch is used, the 2942 should be installed inside the AWOS 3000 enclosure to prevent access to the mode switch.

### 2.8.1 ATIS Peripheral Interface Cable (M491838-00)

The ATIS Peripheral Interface Cable is used to connect the AWOS/ATIS Interface assembly to the CDP Peripheral Interface PCB. Figure 21 illustrates the connections.

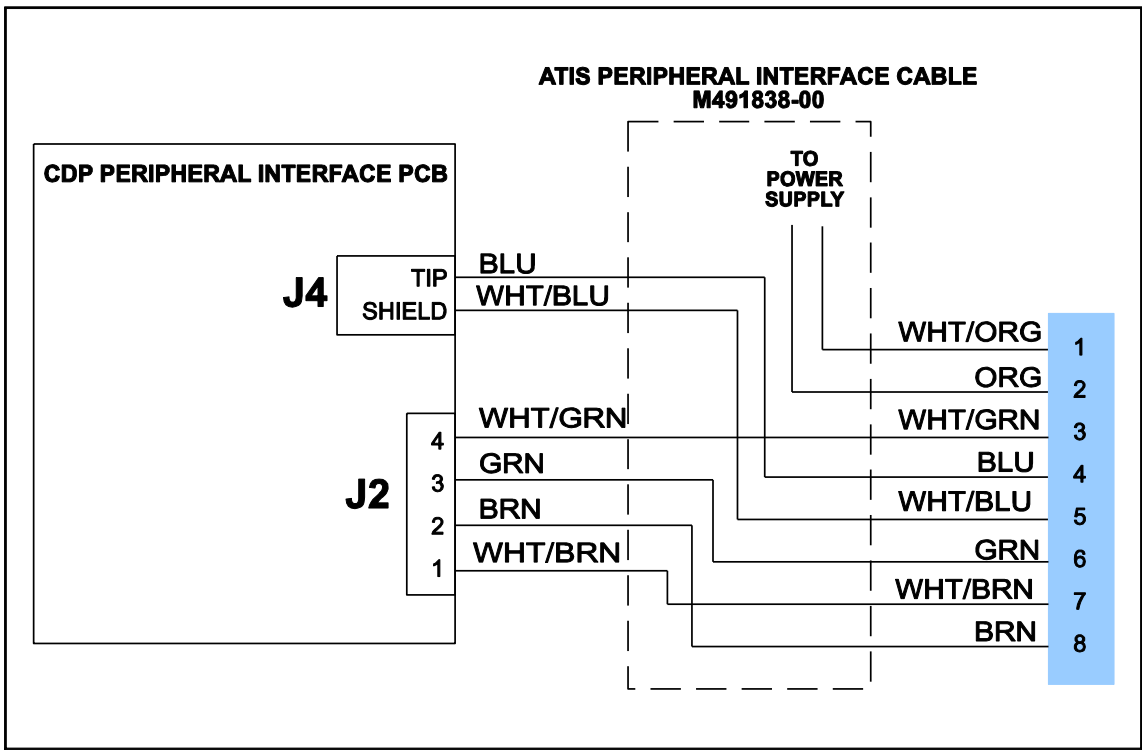



**Figure 21. AWOS/ATIS Interface Assembly Connections to CDP Peripheral Interface PCB**

1. Turn the CDP power off.
2. Disconnect any existing connections from the Peripheral Interface PCB at J2, terminals 1 through 4, and from the J4 Telephone Audio jack.
3. Connect the interface cable's BROWN wire pair to terminals 1 and 2 of J2 on the Interface PCB.
    a. Connect the BROWN wire to terminal 1.
    b. Connect the WHT/BRN wire to terminal 2.
4. Connect the Peripheral Interface Cable's GREEN wire pair to terminals 3 and 4 of J2 on the Peripheral Interface PCB.
    a. Connect the GREEN wire to terminal 3.
    b. Connect the WHT/GRN wire to terminal 4.
5. Plug the 3.5 mm stereo jack on the BLUE wire pair into J4.
6. Connect the 4-pin Molex connector on the ORANGE wire pair to one of the unused power supply cables.

### 2.8.2 AWOS/ATIS Remote Switch Assembly

Mount the Model 2941 Remote Switch used with the Model 2940 AWOS/ATIS Interface at the location where the AWOS/ATIS Interface is controlled from. The switch assembly can be mounted to a vertical or horizontal surface with the provided machine screws.

The Model 2941 Remote Switch can be located up to 1000 ft away from the AWOS/ATIS Interface. It is connected to the interface with a customer-supplied CAT6 straight-through Ethernet cable. This cable is not provided with the kits. The cable should be black, or should be marked in some way as a black cable to maintain the interface assembly color scheme.

The Remote Switch may still be used with the Model 2942 AWOS/ATIS Interface. If the remote switch is used, the 2942 should be installed inside the CDP enclosure to prevent access to the mode switch on the 2942. Set the mode switch on the 2942 AWOS/ATIS Interface to the ATIS position ( 

) — if the 2942 AWOS/ATIS Interface is left in the AWOS position, the Remote Switch will not be able to toggle between the AWOS and ATIS options.

When using the ATIS/AWOS switch, also set the **VHF Radio** to *Enable* on the *Edit > Configuration > Voice* tab with the AWOS software.

### 2.8.3 AWOS/ATIS Interface Assembly

The Model 2940 Rack Mount Interface assembly is mounted into any 19" equipment rack with the four 10-32 SEMS screws provided. The normal location for the installation of this assembly is in the ATIS communication rack. This rack has punch-down blocks to connect the ATIS to the VHF radio and telephone modem.

The Model 2942 Interface assembly can be located anywhere between the AWOS and ATIS equipment. It is usually located at the CDP.

Regardless of which model ATIS Interface is used, the connections to the interface are the same.

There are four RJ-45 jacks on the back of the interface assembly for connection to the AWOS and ATIS equipment, and to the Remote Switch. Each of these jacks is color-coded. During installation, a CAT6 Ethernet cable patch cord will be connected to each of the jacks, with the possible exception of the BLACK jack (when no Remote Switch is used). The patch cords should be routed to prevent undue stress, and should preferably be protected within conduit or cable ducting.

The AWOS/ATIS Interface package consists of:

- Three Ethernet cable patch cords — one blue, one white, one gray
- Power cable, which connects the AWOS/ATIS Interface to AC power (2940 AWOS/ATIS Interface only; the 2942 AWOS/ATIS Interface receives its power from the CDP rack power supply).
- Serial and power cable, which comes pre-installed on the Communication Interface and connects the UHF Communication Interface to the AWOS Net Controller

Figure 22 shows the AWOS/ATIS Interface connections.

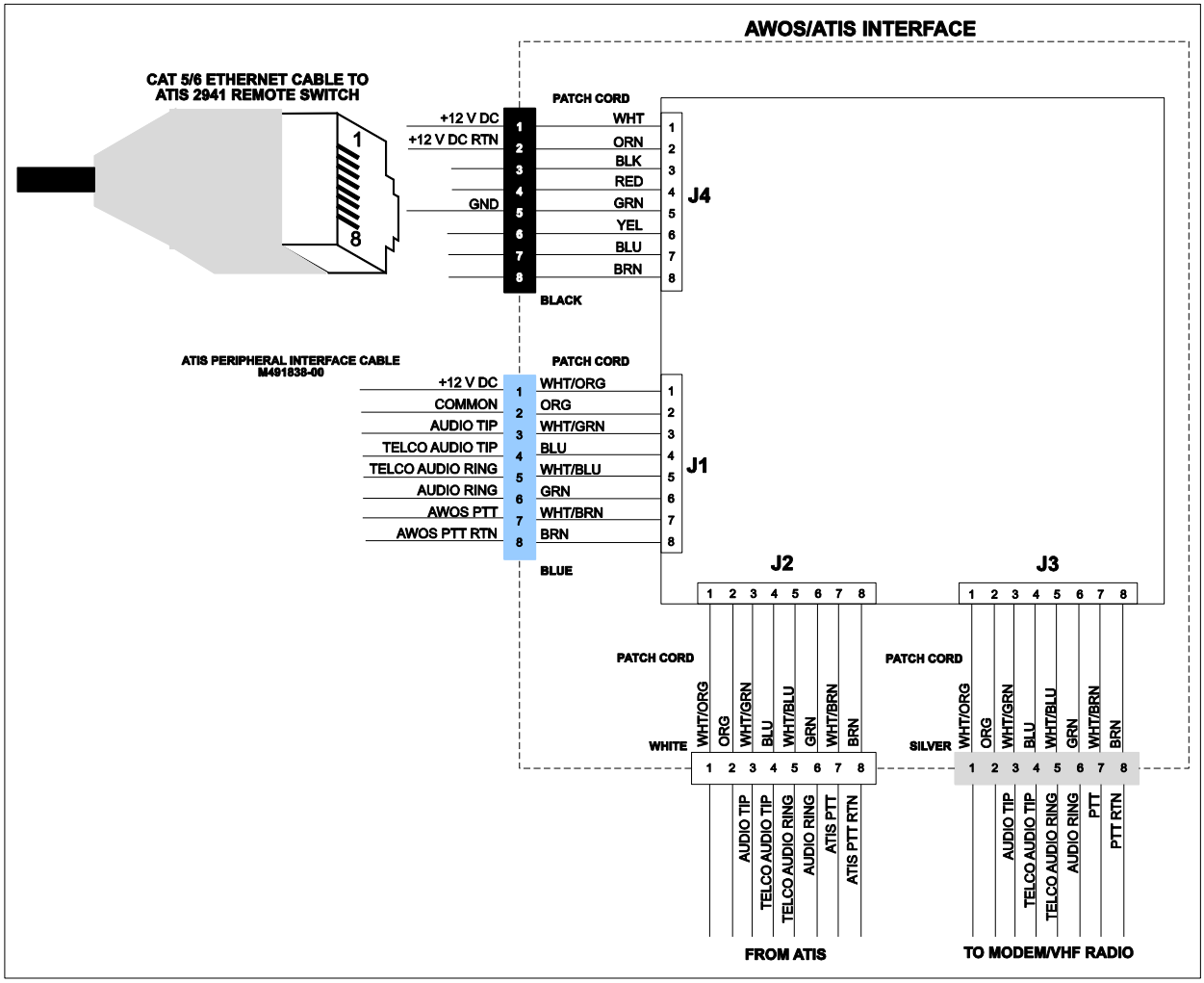



**Figure 22. AWOS/ATIS Interface Connections**

1. If a Remote Switch is used, connect its Ethernet patch cord to the BLACK jack.
2. Connect the supplied blue patch cord between the ATIS Peripheral Interface cable (using the coupler) and the BLUE jack on the back of the AWOS/ATIS Interface.

   Since the expected wiring between the ATIS and the VHF radio and telephone modem is through a punch-down block, a pair of solid-wire patch cords and couplers is provided. The couplers are used to connect the long patch cord to the shorter patch cord. The other end of the shorter patch cord has bare wires for connection to the ATIS punch block.

3. Connect the WHITE patch cords between the Interface assembly's WHITE jack and the ATIS's VHF PTT Keying output, VHF audio output, and Telco audio output. The polarity of these wires is not important.
    a. Connect the GREEN wire pair to the VHF Audio output.
    b. Connect the BLUE wire pair to the Telco Audio output.
    c. Connect the BROWN wire pair to the PTT Keying output.
4. Connect the GRAY patch cords between the Interface assembly's SILVER jack and the VHF Radio's PTT Keying input, the VHF radio's Audio input, and the telephone modem's Audio input. Polarity of these wires is not important.
    a. Connect the GREEN wire pair to the VHF Audio input.
    b. Connect the BLUE wire pair to the telephone modem Audio input.
    c. Connect the BROWN wire pair to the PTT Keying input of the VHF radio.

### 2.8.4 AWOS/ATIS Interface Checkout

1. Power on the AWOS with the AWOS/ATIS mode switch in the AWOS position. Verify that the red LED is on.
2. Verify that the AWOS audio is heard over the VHF radio. Adjust the modulation as necessary by adjusting the VHF modulation potentiometer on the CDP Peripheral Interface Board.
3. Verify that the AWOS audio is heard over the telephone modem. Adjust audio levels as necessary by adjusting the modem volume potentiometer on the CDP Peripheral Interface Board.
4. Switch the mode switch to ATIS.
5. Verify that the ATIS audio is heard over the VHF radio. Any adjustments to the ATIS VHF modulation will have to be performed by the ATIS technician.
6. Verify that the ATIS audio is heard over the telephone modem. Any adjustments to the ATIS audio settings will have to be performed by the ATIS technician.

## 2.9 CDP Checkout

1. Check display operation.
2. Check that either the RS-485 converter or UHF radio connections are in place so that the CDP can display data from DCP. If the corresponding connections are already supported and in place on the DCP and sensors are connected to the DCP, you may view the data on the display to verify the operation of the serial landline or UHF radio link to the DCP.
3. Check keyboard operation.
4. Check printer operation if installed.
5. Check the printer ribbon and replace as necessary if installed.
6. Check the printer paper and replace as necessary if installed.
7. Check microphone operation by recording a voice remark. Delete the remark when done.
8. Check dial-up telephone operation by dialing the CDP from an outside line.
9. Verify VHF radio operation by listening to the AWOS voice output over a remote receiver.
10. Check the system clock against a known standard. If the difference is greater than 10 seconds, relocate the GPS. If the difference persists after relocating, replace the GPS.
11. Check speaker operation.
12. Check UPS operation by unplugging the AC power cord for the 3000. The system should still run. The UPS is designed to operate the CDP for at least 45 minutes. Plug the AC power cord back into AC power.

## 2.10 CDP Block Diagram

Figure 23 shows a block diagram of the CDP components and their connections.

Many of the connections shown in Figure 23 are via the CDP back panel, and are listed in Table 1.

**Table 1. CDP Back-Panel Connections**

| Component | CDP Back-Panel Connection | |
|---|---|---|
| | Front Side | Back Side |
| DCP | × | |
| Keyboard | × | |
| GPS | × | |
| VHF Radio | × | |
| UHF Radio | × | × |
| Modem | × | |
| RS-485 | × | × |
| AWOS Net | | × |
| VPN | × | |
| Printer | × | |

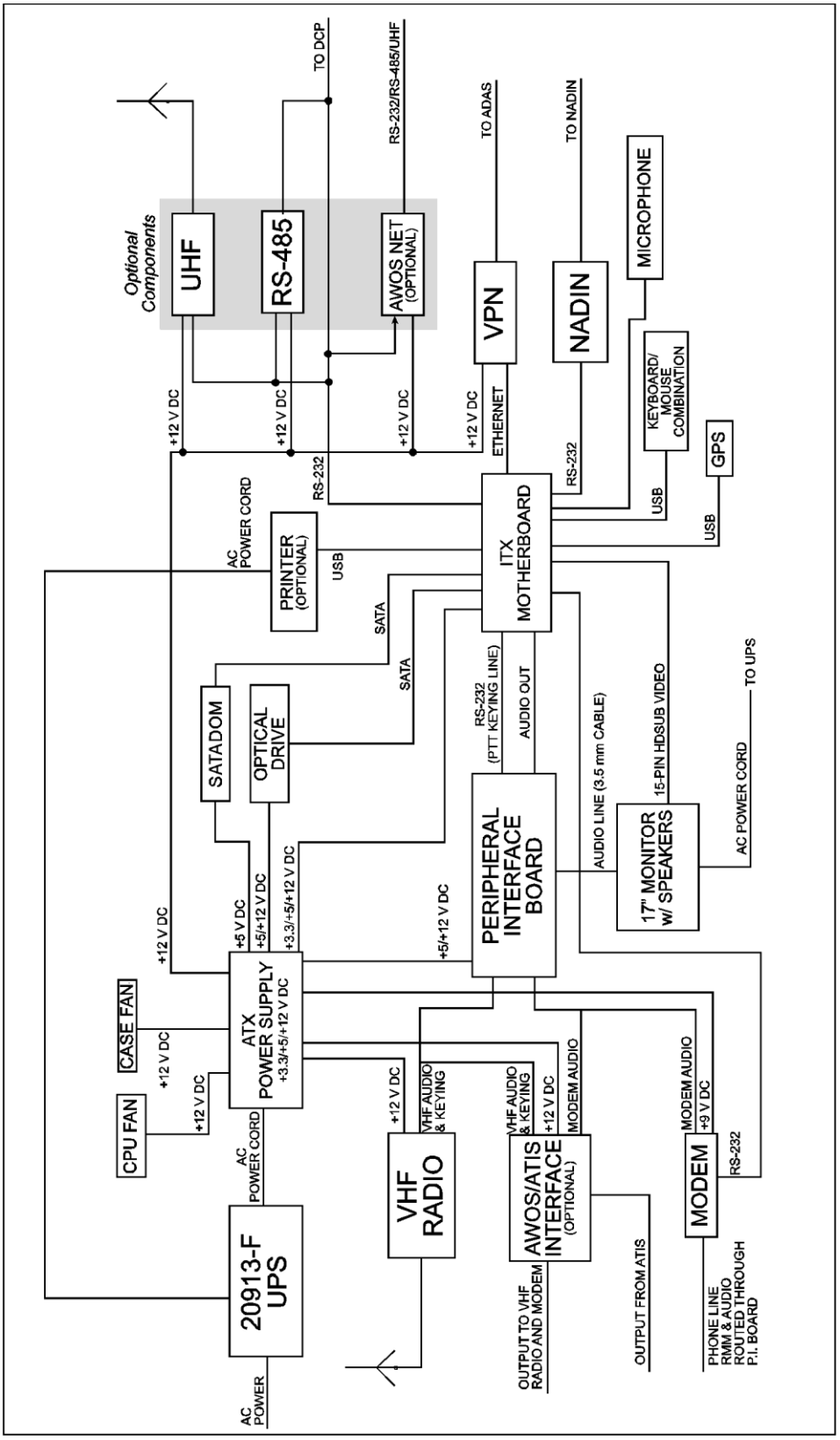



**Figure 23. AWOS 3000 CDP Block Diagram**

Chapter 3

# 3. Model 1190 Data Collection Platform

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| DCP | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## 3.1 DCP Mounting

The Model 1190 DCP mounts to the sensor tower using Unistrut. The Model 7150 Barometric Pressure sensor and the optional UHF Radio mount inside the DCP enclosure. Drawing 1190-007 in Appendix A illustrates the installation procedures. The DCP mounts to the tower using a Model M488119-01 or Model M488176-01 if the AWOS has a Present Weather sensor.

Two or three junction boxes—1) AC power, 2) Ceilometer and visibility signal, and 3) landline (present only when a radio data link is not used)—that were installed during the site preparation procedure are located at the edge of the tower foundation. After installing the DCP on the tower, install flexible or rigid conduit between the junction boxes and the holes in the underside of the DCP enclosure. Route the wires from the junction boxes through the conduit into the DCP.

Wiring diagrams in in Appendix A illustrate the wiring connections described below.

## 3.2 Sensor Wiring

The AWOS sensors are connected to the DCP at a series of terminal blocks along the left side of the backplane. The sensor data connections are described in separate chapters for each sensor later in this manual.

**TB2** The MARS (Motor Aspirated Radiation Shield), Wind Speed sensor, and Temperature/Relative Humidity sensor connect to TB2.

**TB3** The Day/Night sensor, Rain Gauge, Auxiliary sensor, and Wind Direction sensor connect to TB3.

**TB4** The Ceilometer, Visibility Sensor, and Thunderstorm/Lightning Sensor connect directly to TB4. The Present Weather Sensor is connected to a serial sensor interface card that is also connected to TB4.

**H4** The Freezing Rain Sensor is connected to a serial sensor interface card that is accessed via H4.

## 3.3 Auxiliary Sensor Wiring

An auxiliary voltage output sensor (such as a solar radiation sensor) can be connected to the DCP via pins 5 and 6 of TB3.

1. Connect the positive lead from the auxiliary sensor to pin 5 of TB3.
2. Connect the negative lead from the auxiliary sensor to pin 6 of TB3.

## 3.4 +5 V Power

A +5 V output is available at pin 4 of TB3. The Model 11920 Sensor Simulator or a voltmeter is used to verify the DCP's +5 V power supply on this pin.

## 3.5 -5 V Power

A -5 V output is available at pin 8 of TB4. The Model 11920 Sensor Simulator or a voltmeter is used to verify the DCP's -5 V power supply on this pin.

## 3.6 Communication Connections

The DCP can communicate with the CDP (Central Data Platform) using one of three available methods: RS-232, RS-485, or UHF Radio. Only one of these methods can be in use at any one time, with the active method determined by the settings of switch SW1 (refer to the DIP switch settings in Section 3.14). Connections for RS-232 and RS-485 communication are found at TB4.

### 3.6.1 RS-232 Wiring

Since the distance separating the DCP and CDP is generally too great for RS-232 communications, since cable lengths longer than 50 ft (15 m) will have too much capacitance, it is an impractical method for this use. The RS-232 port provided at pins 5–7 of TB4 is intended as a maintenance port, allowing DCP operation to be checked with a laptop computer. The three pins have the following functions:

1. Pin 5 is data transmit (TX), and should be connected to the laptop's data receive (RX) line.
2. Pin 6 is data receive (RX), and should be connected to the laptop's data transmit (TX) line.
3. Pin 7 is ground (GND).

*Note: Remember that only one communication method can be in effect at any one time, and is determined by the SW1 switch settings. If communication between the DCP and CDP is via RS-485 or UHF radio, these communication protocols will stop working while the RS-232 port is activated.*

### 3.6.2 RS-485 Wiring

When RS-485 communication is used to communicate with the CDP, pins 7, 9, and 10 of TB4 are used to make the connection. Rs-485 may be used for CDPs located up to 4000 ft (1200 m) from the CDP.

1. Connect the positive lead of the RS-485 line from the CDP to pin 9 of TB4.
2. Connect the negative lead of the RS-485 line from the CDP to pin 10 of TB4.
3. Connect the ground lead of the RS-485 line from the CDP to pin 7 of TB4.

### 3.6.3 UHF Radio

The UHF radio antenna is installed on the tower as part of the site preparation. The 25 ft antenna cable (Model M491541) must be attached to the end of the antenna using the UHF connector. Attach the BNC connector at the other end of the antenna cable to the UHF radio installed in the DCP as shown on the M403316-003 drawing. Make sure that the UHF radio in the DCP is grounded to the DCP backplane.

Secure the antenna cable to the tower approximately every 3 ft using cable ties.

See the UHF/VHF Antenna Assembly drawings in Appendix A for additional information.

## 3.7 Other RS-485 Connections

The RS-485 connections on TB4 (1–2, 7) are used to connect the 6490 Present Weather sensor and the 6500 Thunderstorm/Lightning sensor; the remaining RS-485 connections on TB4 (3–4, 7) are used to connect the 8364-E Visibility sensor. Connections for these sensors are covered in the chapter in this manual dedicated to the sensor.

*Wait until all sensor wires have been inserted when connecting more than one wire to a terminal block pin before securing the terminal block screw.*

## 3.8 Serial Sensor Wiring

When using a 2040 Ultrasonic Wind Sensor, 8339 Ceilometer, or 6495 Freezing Rain sensor, a separate “serial sensor interface daughter board” is added to the backplane to interface each sensor. There is room for up to three such daughter boards, one for each sensor, which are connected to one another via an internal RS-485 bus. Connect the sensors’ signal cables to their appropriate daughter boards at TB1 pins 1–3 on the daughter boards.

## 3.9 AC Power Wiring

AC line power is input to the DCP via the AC Interface Board (M404802). Connect incoming AC power to TB1 on the AC Interface Board (not TB1 on the DCP backplane) as follows:

1. Connect the AC LINE (hot) wire to TB1, pin 1.
2. Connect the AC NEUTRAL wire to TB1, pin 2.
3. Connect the AC GROUND wire to TB1, pin 3.

## 3.10 DC, Battery Backup, and Solar Power Wiring

TB1 on the DCP backplane provides input power connections for a +15 V DC supply, backup battery power, and solar power.

## 3.11 +15 V DC Power Input

The DCP is powered by the AC Interface Board and a power supply, which provides a +15V DC output. This +15 V is input to the DCP at pins 5 (+) and 6 (-) of TB1.

1. Connect the positive lead from the power supply to pin 5 of TB1.
2. Connect the negative lead from the power supply to pin 6 of TB1.

## 3.12 Battery Power

An optional Battery Backup Kit with a battery charging circuit and a rechargeable 12 V backup battery allows the DCP to remain powered during short power outages. The Battery Backup Kit connects to pins 1 (+) and 2 (-) of TB1.

1. Connect the positive lead to pin 1 of TB1.
2. Connect the negative lead to pin 2 of TB1.

The battery charging circuit supplies current to the battery at different levels and voltages depending on the state of the battery. If the battery is low, the circuit senses this and provides a trickle charge, and continues to charge the battery to full capacity. The state of the battery and the progress of the charging process are monitored by two LEDs on the DCP backplane.

When lit, the green **BATT. CHARGE** LED indicates that the battery is charged to operating levels. The LED is off while the battery is being charged up to a certain level.

When lit, the red **FLOAT CHARGE** LED indicates that the battery is in the final stages of its charging cycle.

When the battery voltage falls below the disconnect voltage and there is no power being supplied to the DCP, both the **FLOAT CHARGE** and the **BATT. CHARGE** LEDs will be off.

## 3.13 Solar Power

Where conditions permit, the DCP can be powered by a solar power kit rather than by the AC Interface Board. (Consult AWI for solar power requirements for a given site.) The solar power unit connects to TB1 at pins 3 (+) and 4 (-).

1. Connect the positive lead from the solar power unit to pin 3 of TB1.
2. Connect the negative lead from the solar power unit to pin 4 of TB1.

## 3.14 DIP Switches

Two DIP switch assemblies (SW1 and SW2) on the DCP backplane are used to set configuration parameters for the DCP. These switches are set at the factory and should not need to be changed.

The first set of switches, SW1, specifies the communication method in use between the DCP and CDP (RS-232, RS-485, or UHF Radio). Table 2 shows the switch settings for each communication setup.

**Table 2. DCP SW1 DIP Switch Settings**

| Communication Input/Output | SW1 Switches | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| RS-232 | ON | OFF | OFF | ON | OFF | OFF | OFF | OFF |
| RS-485 | OFF | ON | OFF | OFF | ON | OFF | ON | ON |
| UHF Radio | OFF | OFF | ON | OFF | OFF | ON | OFF | OFF |

The second set of switches, SW2, is used to set the station address, type of wind speed sensor, and the auxiliary input gain.

- The station address should normally be set to 0, unless multiple DCPs are used.
- The wind speed sensor setting should agree with the model sensor used (2100, 2040, or 2030).
- The auxiliary input gain can be set to 1, 10, or 50, depending on the type of sensor (if any) connected to the auxiliary input.

Table 3 shows the setting combinations for DIP switch SW2.

**Table 3. DCP SW2 DIP Switch Settings**

| Selection | SW2 Switches | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Station 0 | OFF | OFF | | | | | | |
| Station 1 | ON | OFF | | | | | | |
| Station 2 | OFF | ON | | | | | | |
| Station 3 | ON | ON | | | | | | |
| 2100 Wind Speed | | | OFF | OFF | ON | | | |
| 2030 Wind Speed | | | OFF | ON | OFF | | | |
| 2040/2040-H | | | ON | OFF | OFF | | | |
| Aux. Gain 1 | | | | | | ON | OFF | OFF |
| Aux. Gain 10 | | | | | | OFF | ON | OFF |
| Aux. Gain 50 | | | | | | OFF | OFF | ON |

## 3.15 DCP Checkout

1. Verify that all cables are connected and in good condition.
2. Verify that the DIP switches are set to the factory settings specific to the sensor assembly and CDP communication link being supported.
3. Check that either the RS-485 connections to TB4 or UHF radio connections are in place so that the CDP can display data from DCP. If the corresponding connections are already supported and in place on the CDP and sensors are connected to the DCP, you may view the data on the CDP display to verify the operation of the serial landline or UHF radio link between the DCP and the DCP.
4. Press the maintenance switch (SW3).
5. On the DCP display, navigate to the analog-to-digital reference voltage screen (“ADC Vref-“ and “ADC Vref+”).
    a. Verify that ADC Vref- is in the range 0–5.
    b. Verify that ADC Vref+ is in the range 4090–4095.

Chapter 4

# 4. Model 1192 Data Collection Platform

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| DCP | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## 4.1 Installation

The Model 1192 DCP mounts to the sensor tower or to a mounting pipe (see Section 4.1.1) using the M488119-01 Unistrut Mounting Kit. The Model 7150 Barometric Pressure sensor and the optional UHF Radio mount inside the DCP enclosure.

If possible, mount the enclosure on the side of the tower opposite to where the sun is shining.

If the DCP electronics enclosure is being mounted on a fold-over tower, find a tower side with enough room and spacing to hold the enclosure. This could turn out to be the hinged side if the hinge is above ground, or it might have to be a side other than the hinged side if the hinge is at the base of the tower. If the tilts in the middle, then the DCP electronics enclosure should be on the fixed part of the tower; if it tilts at the base, then the electronics enclosure should be above the tilt. Note that all wires should be routed along leg on the hinged side with a bit of additional slack at the hinge to allow for the tower to fold over without stressing the wires.

1. Prepare the bolts by applying anti-seize.

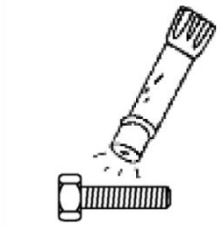


**Figure 24. Apply Ant-Seize to Bolts**

2. Position the upper Unistrut strip approximately 2 m (6 ft) above the ground next to a face of the tower centered on the tower legs and secure it to the tower legs using the mounting hardware provided (Figure 25). Keep the Unistrut parallel to the ground.

   In areas with snow, the lower Unistrut should be at least 30 cm (1 ft) above the average maximum snow depth.

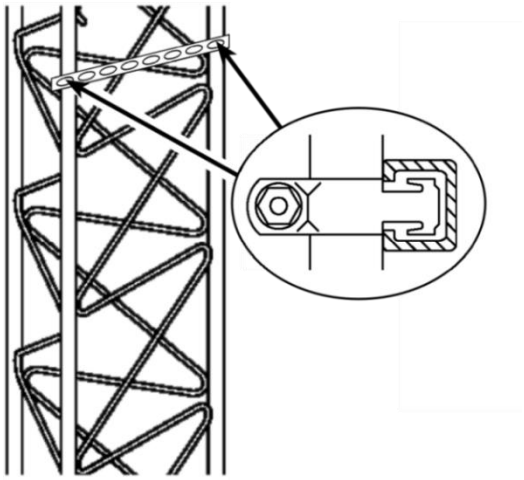


**Figure 25. Secure Top Unistrut to Tower Leg**

3. Line up and center the top of the DCP electronics enclosure on the upper Unistrut and secure the enclosure to the Unistrut using the mounting hardware provided (Figure 26).

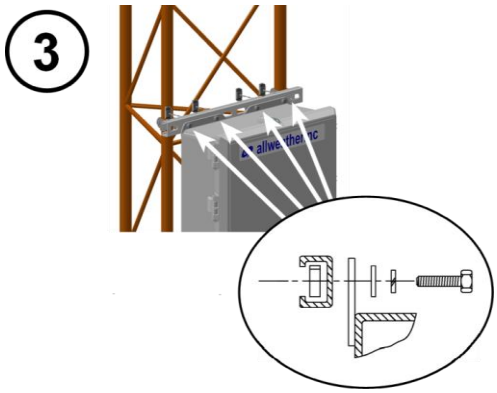



**Figure 26. Secure Electronics Enclosure to Top Unistrut**

4. Line up and center a Unistrut with the bottom of the DCP electronics enclosure and secure the enclosure to the Unistrut using the mounting hardware provided (Figure 27).

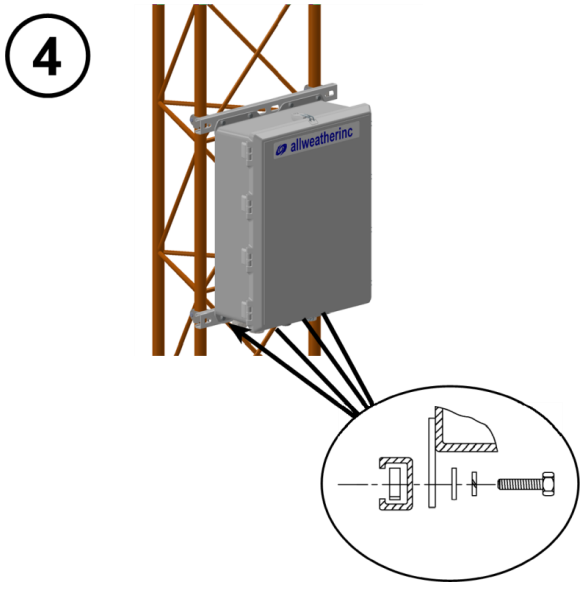



**Figure 27. Secure Bottom Unistrut to Enclosure**

5. Secure the lower Unistrut to the tower legs using the mounting hardware provided (Figure 28).

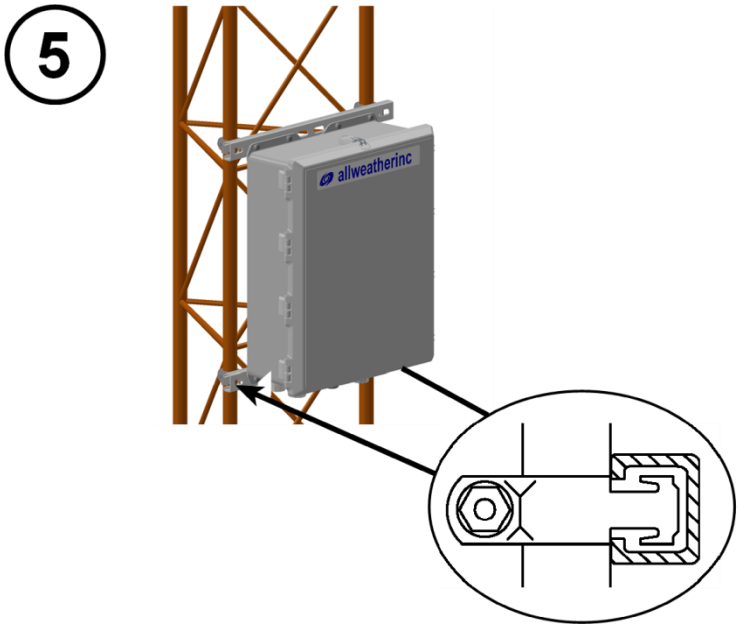



**Figure 28. Secure Bottom Unistrut to Tower Leg**

6. Apply a light spray of anti-corrosion to all the threaded fasteners. *Avoid spraying other areas such as the gasket surrounding the enclosure door.*

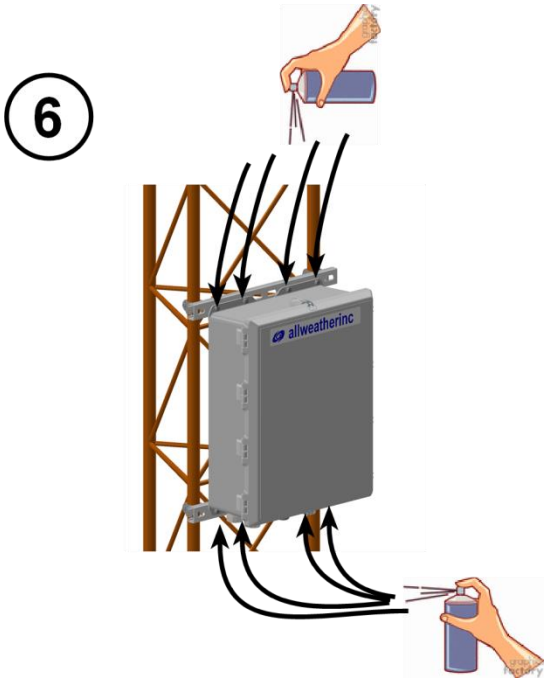



**Figure 29. Apply Anti-Corrosion Spray to Threaded Fasteners**

7. Tighten all the nuts.

Figure 30 shows the completed installation on a stacked tower as an example.

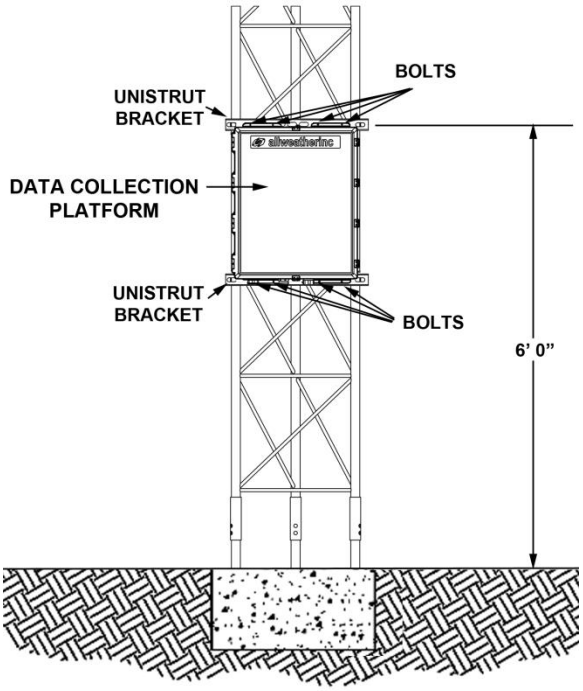



**Figure 30. Completed Installation**

## 4.1.1 Pole Mounting

The enclosure may also be mounted on a pole or mounting pipe with an outside diameter of 2"–3". Use a multi-strut pipe clamp to attach the Unistrut strips to the pole instead of a tower.

**Figure 31. Multi-Strut Pipe Clamp**

## 4.2 Sensor Wiring and Power Connections

Two or three junction boxes—1) AC power, 2) sensor signals, and 3) landline (present only when a radio data link is not used)—that were installed during the site preparation procedure are located at the edge of the tower foundation. After installing the DCP on the tower, install flexible or rigid conduit between the junction boxes and the holes in the underside of the DCP enclosure. Route the wires from the junction boxes through the conduit into the DCP.

Route the cables from the junction boxes to the bottom of the electronics enclosure and secure the cables and the ground wire to a tower leg with UV-resistant zip ties. Cables should be secured at least every 60 cm (2 ft). Do not cinch the zip ties so tightly that they deform the cable. Cut excess length off the zip ties with a flush cutter so that no sharp stubs are exposed.

Figure 32 shows the layout of the various electronics subassemblies inside the electronics enclosure and the routing of cables from the cable glands. As can be seen in Figure 32, the 1192 consists of consists of two parts, the Main Board and the Sensor Interface Board (SIB), with other DIN-rail-mounted parts inside the enclosure.

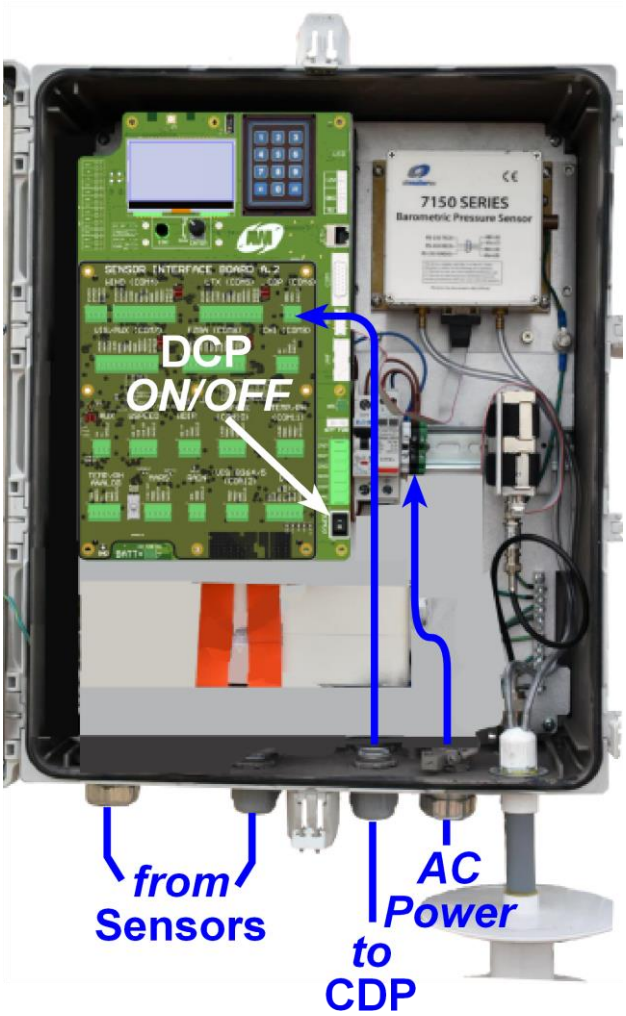



**Figure 32. DCP Layout and Connections Inside Enclosure**

### 4.2.1 Electrical Connections

Figure 33 shows the external connections at the bottom of the enclosure.

- AC power conduit.
- Signal cables from sensors.
- Serial connection to CDP.
- Ground lug.

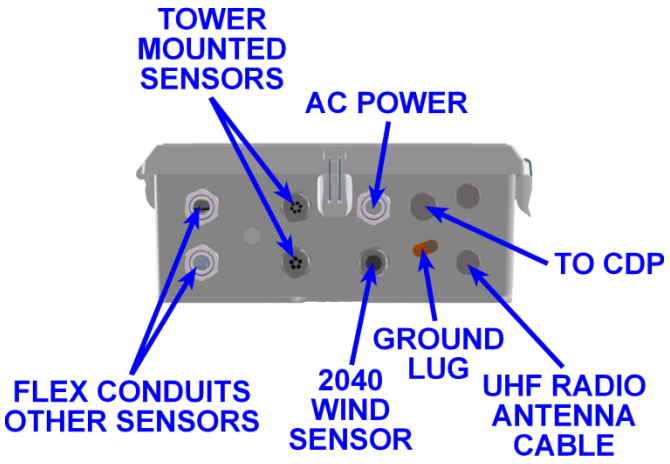



**Figure 33. External Connections at Enclosure Bottom**

The 1192 DCP must be properly grounded by taking a ground wire with a minimum conductor diameter of 2.9 mm (9 AWG) and maximum length of 5 m from the brass ground lug at the bottom of the electronics enclosure (Figure 34) to the ground clamp near the bottom of the tower or mounting pipe. Cut the end of the ground cable to length and connect this end that ground clamp.

Check that the contractor provided a ground connection from the ground rod to the tower or pipe. If not, that will have to be done using de-ox grease on the below-ground connections.

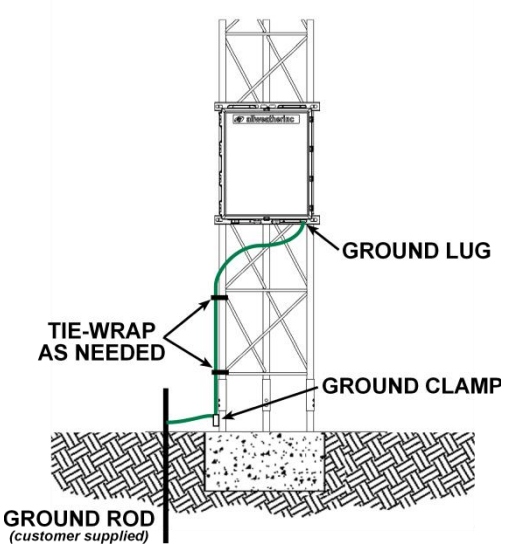



**Figure 34. DCP Grounding**

Sensor cables are from sensors not on the tower typically run to a junction box near the base of the tower or mounting pole and then underground in conduit according to local code requirements.

1. Route the cables from the sensors into the electronics enclosure using the cable glands and grommets shown in Figure 33.
2. Connect the wires to the connectors as shown in Figure 32 according to the wiring information provided in this chapter.

#### *4.2.1.1 Main Board*

Note that the AC power switch should be in the OFF position while connections are being made.

The terminal blocks use friction-lock plugs that can be unplugged from the terminal block headers to make connecting wires more convenient.

The **VHF Radio** and **NTC** connectors on the Main Board are not supported at the present time.

**GPS**

The onboard GPS receiver has a built-in antenna and an SMA connector that can be used for an external antenna. The system is configured to use the internal antenna by default. To use an external antenna, attach it to the SMA connector and route the cable through one of the gland seals provided for tower-mounted sensors (Figure 33). The ***Model 1192 Data Collection Platform User's Manual*** explains how to change the system configuration when an external antenna is used. The antenna will likely be mounted near the enclosure on the tower.


**Figure 35. GPS Antenna Connector**

**COM 1 — UHF Radio**

**COM1** is a male DB15 COM port used to connect the UHF data radio to the DCP with a serial cable.

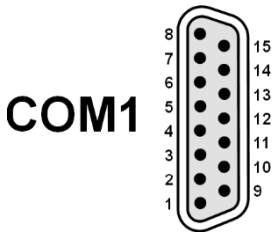



**Figure 36. COM1 UHF Radio DB15 Connector**

### BP

The **BP** header accommodates the barometric pressure sensor using a keyed prewired plug, and supports both RS-232 and RS-485.

*Header Connections Summary*

- RS-485 D– to Pin 6
- Ground to Pin 7
- RS-485 D+ to Pin 8
- +12 V DC to Pin 9
- RS-232 Tx to Pin 2
- RS-232 Rx to Pin 3

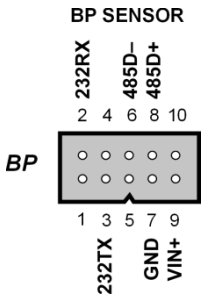



**Figure 37. BP Sensor Connector Pinout**

### *4.2.1.2 Sensor Interface Board A.3 (U.S. non-Federal AWOS)*

Sensor Interface Board A.3 supports AWI sensors for U.S. non-Federal AWOS systems. Wiring diagrams in in Appendix A summarize the wiring connections described in this section..

#### COM4 — Wind

The **J5** terminal block accommodates ultrasonic wind sensors such as the Model 2040 series. The DIP switches at position S1D configure this terminal block for full duplex RS-485 serial communication (Table 5).

Terminal Block **J14** and Pins 1 and 2 on Terminal Block **J5** provide 24 V AC power for the heaters in the heated ultrasonic wind sensors such as the Model 2040H and 2040HH.

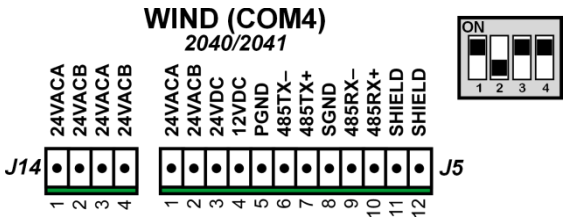



**Figure 38. COM4 Ultrasonic Wind Sensors Pinout**

***Each twisted pair in a 2040 cable uses a black wire as power ground or RX–/TX–. The colored wire in the pair can be used to identify the pair's function. Make sure to dress the end of the cable so that it is clear which black conductor belongs with each pair.***

*Signals Terminal Block Wiring Summary*

- RED wire (+24 VDC) to Pin 4
- BLACK wire (PGND) to Pin 5
- BLACK wire (RS-485 Rx–) to Pin 6
- WHITE wire (RS-485 Rx+) to Pin 7
- BLUE wire (SGND) to Pin 8
- BLACK wire (RS-485 Tx–) to Pin 9
- GREEN wire (RS-485 Tx+) to Pin 10
- SHIELD to Pin 11

*Heaters Terminal Block Wiring Summary*

All the 24VACA pins are wired to the same 24 VAC-L power source, and all the 24VACB pins are wired to 24 VAC-N.

- YELLOW wire (all models) to **J5** Pin 1
- BLACK wire (all models) to **J5** Pin 2
- BROWN wire (2040HH) to **J14** Pin 1
- BLACK wire (2040HH) to **J14** Pin 2
- ORANGE wire (2040HH) to **J14** Pin 3
- BLACK wire (2040HH) to **J14** Pin 4

#### COM5 — Lightning

The **J7** terminal block accommodates the Model 6500 lightning sensors. The DIP switches at position S1B are set up for half duplex RS-485 (Table 5).

*Terminal Block Wiring Summary*

- WHITE wire (RS-485 D+) to Pin 7
- BLACK wire (RS-485 D–) wire to Pin 6
- RED wire (SGND) to Pin 8

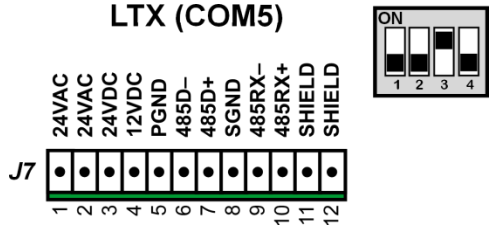



**Figure 39. COM5 Lightning Sensor Pinout**

### COM7 — Visibility/Present Weather

Use the **J6** terminal block to connect either standalone Present Weather sensors or combined Present Weather/Visibility sensors.

- Model 6490 Present Weather sensor
- Model 6498-P Present Weather sensor
- Model 6498-PV Present Weather/Visibility sensor

Use the **J10** terminal block described in **COM12** to connect standalone Visibility sensors.

- Model 6498-V Visibility sensor
- Model 8364/8365 Visibility sensor

The DIP switches at position S1C are set up for half duplex RS-485 (Table 5).

*Terminal Block Wiring Summary*

- WHITE wire (RS-485 D+) to Pin 7
- BLACK wire (RS-485 D–) wire to Pin 6
- RED wire (SGND) to Pin 8

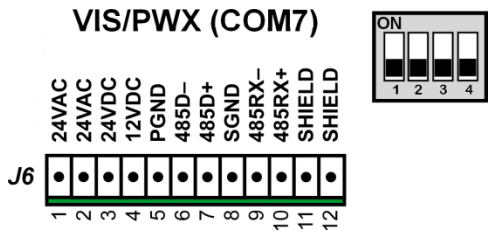



**Figure 40. COM7 Visibility/ Present Weather Sensor Pinout**

### COM8 — Freezing Rain

The **J8** terminal block accommodates the Model 6495 Freezing Rain sensor. The DIP switches at position S1A are set up for RS-232 (Table 5).

*Note that the silkscreen shows the default half-duplex RS-485 pinouts.*

*Terminal Block Wiring Summary*

- WHITE wire (RS-232 Tx) to Pin 10
- RED wire (RS-232 Rx) wire to Pin 6
- BLACK wire/shield (SGND) to Pin 8

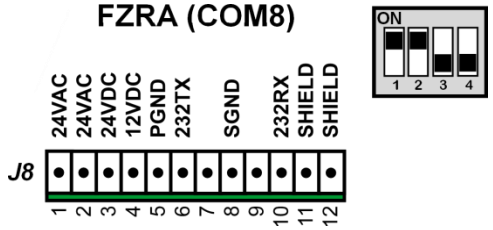



**Figure 41. COM8 Freezing Rain Sensor Pinout**

### COM9 — CHI

The **J22** terminal block is used to connect the Ceilometer to the DCP over an RS-232 serial connection.

*Terminal Block Wiring Summary*

- WHITE wire (RS-232 Tx) to Pin 1
- RED wire (RS-232 Rx) to Pin 2
- BLACK wire (SGND) to Pin 3
- SHIELD wire to Pin 4

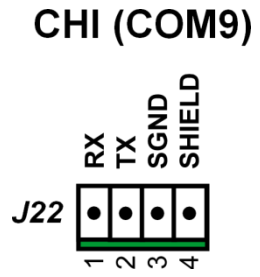



**Figure 42. COM9 Ceilometer Pinout**

### COM12 — VIS 8364/5

Use the **J10** terminal block to connect standalone Visibility sensors over an RS-485 serial connection.

- Model 6498-V Visibility sensor
- Model 8364/8365 Visibility sensor

Use the **J6** terminal block described in **COM7** to connect either standalone Present Weather sensors or combined Present Weather/Visibility sensors.

- Model 6490 Present Weather sensor
- Model 6498-P Present Weather sensor
- Model 6498-PV Present Weather/Visibility sensor

*Terminal Block Wiring Summary*

- WHITE wire (RS-485 D+) to Pin 1
- BLACK wire (RS-485 D–) to Pin 2
- RED wire (SGND) to Pin 3

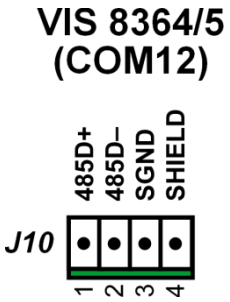



**Figure 43. COM12 8364/8365 Visibility Sensors Pinout**

### WSPEED — Wind Speed Sensor

The **J17** terminal block accommodates the Model 2030. The circuitry measures the frequency information from the wind speed sensor. The frequency depends on the wind speed.

*2030 Terminal Block Wiring Summary*

- BLACK positive wire (WS V+) to Pin 1
- WHITE wire (SIG) to Pin 2
- GREEN wire (SIG RTN) to Pin 3
- RED ground or common wire (SGND) to Pin 4
- SHIELD (if present) to Pin 5

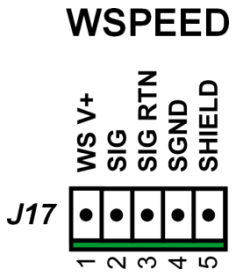



**Figure 44. WSPEED Wind Speed Sensor Pinout**

### WDIR — Wind Direction Sensor

The **J18** terminal block accommodates the Model 2020 wind direction sensor. The circuitry measures the voltage across a variable resistor on the wind direction sensor. The resistance depends on the wind direction.

*2020 Terminal Block Wiring Summary*

- WHITE positive wire (WD V+) to Pin 1
- RED wire (SIG) to Pin 2
- BLACK common wire (SGND) to Pin 3
- SHIELD (if present) to Pin 4

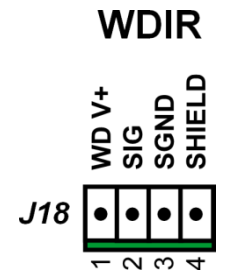



**Figure 45. WDIR Wind Direction Sensor Pinout**

### TEMP/RH ANALOG — Analog Temperature/Relative Humidity Probe

The **J11** terminal block accommodates the analog Model 5190-F Temperature/Relative Humidity Probe. The probe needs to have a 0–1 VDC output for both temperature and relative humidity. The range needs to correspond to -40°C to 60²C.

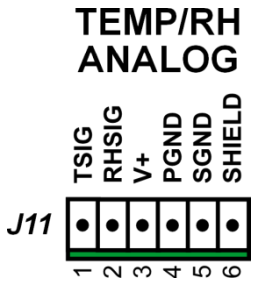



**Figure 46. Analog Temp/RH Probe Pinout**

*Terminal Block Wiring Summary*

- BROWN wire (TSIG) to Pin 1
- WHITE wire (RHSIG) to Pin 2
- GREEN wire (V+) to Pin 3
- GRAY and BLUE or YELLOW wire to (V–) Pin 4 and to (SGND) Pin 5; a jumper wire between Pin 4 and Pin 5 may be used
- SHIELD wire to Pin 6

### MARS — MARS Radiation Shield

The **J12** terminal block accommodates the Motor Aspirated Radiation Shield MARS). It provides power to the MARS.

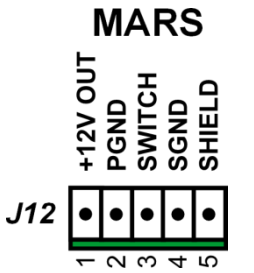



**Figure 47. MARS Pinout**

*Terminal Block Wiring Summary*

- WHITE wire of the MARS power cable (+12V OUT to Pin 1
- BLACK wire of the MARS power cable (PGND) to Pin 2
- MARS power cable SHIELD (if present) to Pin 5

### RAIN — Rain Gauge

The **J19** terminal block accommodates the Model 6011/6012, Model 6021/6022 rain gauges. The circuitry counts bucket tips from the rain gauge.

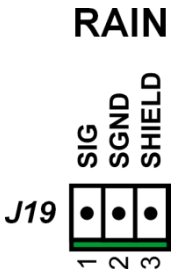



**Figure 48. Rain Gauge Pinout**

*Terminal Block Wiring Summary*

- Either wire to Pin 1
- Remaining wire to Pin 2
- SHIELD to Pin 3

### 4.2.1.3 AC Power Line

**WARNING**

Turn off electrical power at the source before making the electrical connections to the DCP!

Connect the three power cable wires to the DIN rail terminal blocks to the side of the circuit breaker and surge suppressor (Figure 49).

- LINE to BLACK
- NEUTRAL to WHITE
- GROUND/EARTH to GREEN

*If there is no green terminal block, connect the green power cable wire to the ground bar at the bottom right of the enclosure (Figure 50).*

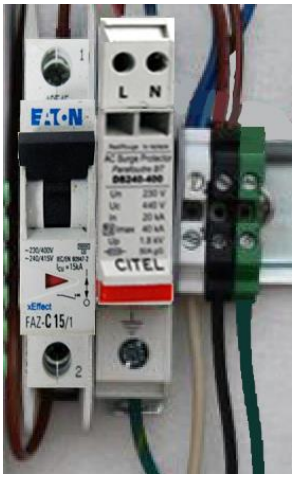



**Figure 49. AC Wiring to Terminal Blocks**

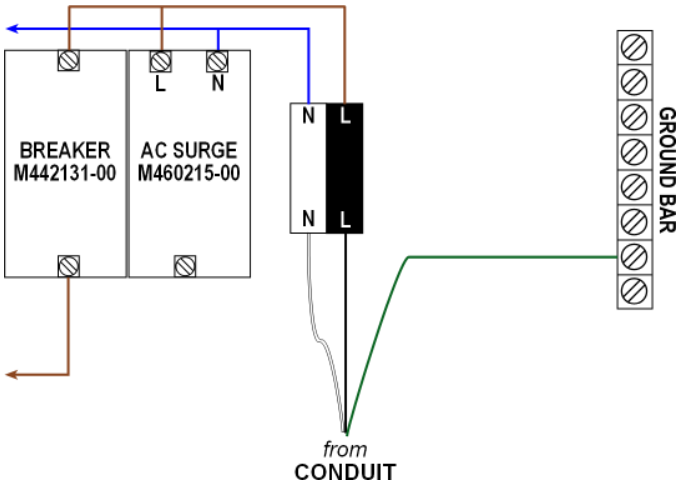



**Figure 50. AC Wiring Using Ground Bar**

# 4.3 Communication Connections

The Model 1192 DCP can communicate with the CDP (Central Data Platform) using RS-485 or UHF Radio. Only one of these methods can be in use at any one time.

## 4.3.1 RS-485 Wiring

The **J13** terminal block on the Serial Interface Board is used to connect the DCP to the CDP over an RS-485 serial connection.

*Terminal Block Wiring Summary*

- RED wire (RS-485 D+) to Pin 1
- WHITE wire (RS-485 D–) to Pin 2
- BLACK wire/shield to Pin 3

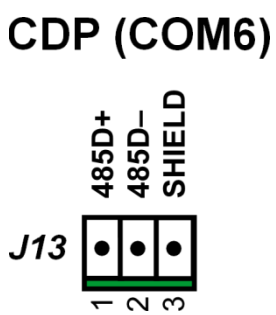



**Figure 51. COM6 CDP Pinout**

## 4.3.2 UHF Radio

**COM1** on the Main Board is a male DB15 COM port used to connect the UHF data radio to the DCP with a serial cable.

The UHF radio antenna is installed on the tower as part of the site preparation. The 25 ft antenna cable (Model M491541) must be attached to the end of the antenna using the UHF connector. Attach the BNC connector at the other end of the antenna cable to the UHF radio installed in the DCP as shown on the M403316-003 drawing. Make sure that the UHF radio in the DCP is grounded to the DCP backplane.

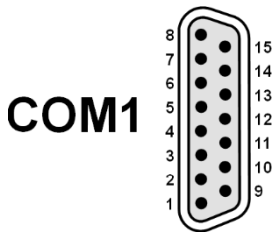



**Figure 52. COM1 UHF Radio DB15 Connector**

Secure the antenna cable to the tower approximately every 3 ft using cable ties.

See the UHF/VHF Antenna Assembly drawings in Appendix A for additional information.

## 4.3.3 LED Indicators

LED indicators are located to the left of the LCD/keypad on the Main Board. The LEDs described in this section are useful to observe Tx or Rx activity on the respective serial COM ports.

- COM 1 — UHF radio or RS-232 CDP connection
- BP —Barometric Pressure sensors
- GPS — GPS receiver
- COM4 — Serial based wind sensors
- COM5 —Thunderstorm/Lightning Detector
- COM6 — CDP RS-485 connection

- COM7 —Combined Present Weather/Visibility sensor or standalone Present Weather sensor
- COM8 —Freezing Rain sensor
- COM9 —Ceilometer
- COM10 —Surface Condition sensors
- COM11 — Serial Temperature/Relative Humidity probe
- COM12 — Standalone Visibility sensor
- COM13 — *not supported at this time*

## 4.4 Battery Power

An optional Battery Backup Kit with a battery charging circuit and a rechargeable 12 V backup battery allows the DCP to remain powered during short power outages. The Battery Backup Kit connects to pins 1 (+) and 2 (-) of TB1.

The **BATT** terminal blocks allow the backup battery inside the enclosure to be connected to the DCP.


**Figure 53. External Power Inputs**

- RED wire to + pin
- BLACK wire to – pin

This location is used for the backup battery supplied with the 1192 DCP, which supplies a current of less than 10 A.

The two LEDs near the LCD display indicate the charging status for the backup battery.

| S0 | S1 | |
|---|---|---|
| ☐ | ☐ | not charging, battery fault or shutdown |
| ☐ | ■ | float charge, charge on the batteries is maintained at an optimum level, also known as trickle charge |
| ■ | ☐ | absorption charge, charging tapered within 80–90% of full voltage |
| ■ | ■ | bulk charge, charge at maximum rate until 80–90% of full voltage is reached |

## 4.5 DIP Switches

Some serial ports have fixed serial configurations; others may be configured using DIP switches. The configurable serial ports are set at the factory for the sensors described in this manual.

*Note: The DIP switch assemblies are set at the factory for the connections described in this chapter.*

Two sets of DIP switch assemblies on the Sensor Interface Board (SIB) are used to set configuration parameters for the DCP. The configuration and setting of these switches is outlined below.

The four S1A to S1D switches specify RS-232 or RS-485 communication between the DCP and a particular serial COM port. Table 4 identifies the serial protocols for the pins on the terminal blocks that can be set with these DIP switches.

**Table 4. Serial Protocol Options for COM4, COM5, COM7, COM8**

| Pin | RS-485 (Full Duplex) | RS-485 (Half Duplex) | RS-232 |
|---|---|---|---|
| 6 | RS-485 Tx– | RS-485 D– | RS-232 Tx |
| 7 | RS-485 Tx+ | RS-485 D+ | — |
| 8 | SGND | SGND | SGND |
| 9 | RS-485 Rx- | — | — |
| 10 | RS-485 Rx+ | — | RS-232 Rx |

Table 5 shows the switch settings for each serial protocol option. The specific settings set at the factory are shown in Section 0 and should not need to be changed.

**Table 5. S1A–S1D DIP Switch Settings**

| DIP Switch Setting | Mode | | RS-485 Termination | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| ON | Full Duplex | RS-232 | Tx | Rx |
| OFF | Half Duplex | RS-485 | OFF | OFF |

The S2 switches are used to set the auxiliary voltage gain for the solar radiation sensor connected to the AUX terminal block. The gain is normally set to 50.

Table 6 shows the switch settings. DIP Switch 4 is not used.

**Table 6. S2 DIP Switch Settings for Solar Radiation Sensor**

| Selection | DIP Switch Setting | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Aux Gain 1 | ON | OFF | OFF | |
| Aux Gain 10 | OFF | ON | OFF | |
| Aux Gain 50 | OFF | OFF | ON | |

## 4.6 DCP Checkout

1. Verify that all cables are connected and in good condition.
2. Check that either the RS-485 connections to COM6 or UHF radio connections are in place so that the CDP can display data from DCP. If the corresponding connections are already supported and in place on the CDP and sensors are connected to the DCP, you may view the data on the CDP display to verify the operation of the serial landline or UHF radio link between the DCP and the DCP.
3. Verify that sensor data are being displayed on the CDP and that there are no errors on the CDP Diagnostics screens.
4. Alternatively, scroll through the menus on the DCP's LCD Display to verify that sensor data are being displayed and that there are no status errors.

Chapter 5

# 5. Model 7150/PTB330 Dual Digital Barometer

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Dual Digital Barometer | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## 5.1 Installation

The Model 7150 Dual Digital Barometer is located inside the 1190 DCP as shown in Figure 54, and is normally installed at the factory.


**Figure 54. Model 7150 Dual Digital Barometer with Pressure Port in 1190 DCP**

Either the Model 7150 or the PTB330 Dual Digital Barometer may be installed in the 1192 DCP. The installation is similar for both.

**Model 7150 Dual Digital Barometer** **PTB330 Dual Digital Barometer**


**Figure 55. Dual Digital Barometer with Pressure Port in 1192 DCP**

## 5.1.1 Pressure Connections

The barometer is equipped with standard Clippard 11752-1 barbed pressure fittings with 10-32 external thread installed in the barometer. These fittings are ideal for 1/8" internal diameter tubing.

If some other pressure fittings need to be used, it is possible to replace the standard barbed fittings. The pressure connections in the barometer housing have a metric M5 internal thread, which is compatible with a non-metric 10-32 internal thread.

The barbed pressure fittings are not recommended for use in turbulent or high-speed static wind conditions: the accuracy quoted for the digital barometers does not include any wind effects. The pressure fittings must also be carefully protected from rain since any water that gets into the pressure connectors will cause errors in the pressure measurement.

The digital barometers are designed to measure the pressure of clean, non-condensing, non-conducting and non-corrosive gases only.

## 5.2 Checkout

Use the formula below to calculate the Altimeter Setting from the barometric pressure measured using the Setra Systems Model 370 Ultra-High Accuracy Setraceram™ pressure standard.

$$Alt.\,Setting\ (in\ Hg) = \left(BP^{\alpha} + SE \times 1.313 \times 10^{-5}\right)^{5.25486}$$

*where*:

$\alpha = 0.1903$

*SE = Sensor elevation above sea level in feet*

*BP = Barometric pressure in in Hg*

Compare the calculated altimeter setting with the altimeter setting reported by the AWOS at the CDP. The values must agree to ±0.02 inHg or less. If they do not, the barometric pressure readings for both transducers have to be adjusted as necessary to be within ±0.005 inHg of the barometric pressure reported by the pressure standard as explained below.

A keypad and LCD display screen are located inside the Model 1190 DCP enclosure, and are used to view sensor data and perform maintenance checks. Use the * and # keys on the keypad to move through the screens—press the # key to move to a higher numbered screen, or press the * key to move to a lower numbered screen. Screen 8 shows the readings for the two pressure transducers using inHg units. A value of 99.999 indicates missing data.

For the Model 1192 DCP, rotate rotating the **ENTER** button below the LCD screen to advance to the BP In formation screen to see the readings for the two pressure transducers using inHg units.

Note the difference in readings for each pressure transducer from the pressure standard. If either of the pressure transducer readings in the 7150 or 7190 differs from the reference sensor reading by more than 0.02 inHg, replace the sensor.

Chapter 6

# 6. Model 2020 Micro Response Wind Vane

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Wind (2020/2030 or 2040) | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

*Systems including a wind sensor consist of either a Model 2020 Micro Response Wind Vane and Model 2030 Anemometer in combination or a Model 2040 Ultrasonic Wind sensor.*

## 6.1 Installation

This instrument is thoroughly tested and fully calibrated at the factory and is ready for installation. Please notify All Weather Inc. if damage has occurred.

The sensor is shipped complete with a tail assembly, counterweight, and electrical connector. The vane will mount directly onto the Model M403256-01 Crossarm Assembly. A cable (Part Number 20206) is included with AWOS installations, and may also be ordered separately.

*Note that it might not be possible to completely comply with the minimum distance requirements from large obstructions when installing the wind vane in an oil rig or rooftop environment. Consult All Weather Inc. for guidance if this appears to be an issue.*

### 6.1.1 Assembly

With the exception of installing the tail and counterweight, the Model 2020 Micro Response Vane is ready for mounting. The counterweight is generally shipped unattached and is packed in the 2020 housing's packing carton. The tail is packed inside a folded cardboard container taped to the side of the 2020 carton. Install the tail and counterweight as explained in the steps below.

1. Slide the vane tail shaft into the vane hub, entering the hub at the side opposite the scribe mark. Do not tighten the set screw on the hub yet.
2. Slide the counterweight onto the end of the shaft as far as it will go, and tighten the set screw with a 1/16" Allen wrench.

3. *Perform this step indoors where there is no air movement.* Holding the sensor in a horizontal position, slide the vane shaft until it balances (the vane does not tip in either direction). Tighten one of the set screws and check that the vane tail is parallel to the shaft of the sensor. If not, use the nose weight to turn the shaft. Do not turn the shaft by holding the tail; the tail may break if twisted. When the vane is straight and balanced, tighten the two screws fully against the shaft.

### 6.1.2 Mounting

The Model 2020 Micro Response Wind Vane must be completely assembled (Section 6.1.1) before it is mounted on the tower.

The Model 2020 Micro Response Wind Vane and Model 2030 Anemometer mount to the face of the tower using the M403256-01 mounting kit. The mounting kit includes a crossarm, mounting bolts, and all necessary hardware. The crossarm is assembled first, and is then mounted on the tower. The Model 2020 Micro Response Wind Vane and Model 2030 Anemometer are then mounted on the crossarm. Refer to drawing M403256-01-003 during installation.

*Note: Exercise care when handling the wind vane because it is fragile.*

1. Install the U-bolts on the crossarm. There are three sets of holes in the crossarm.
    a. When mounting to a stacked tower, the far left and far rights sets of holes are used.
    b. When mounting to a foldover tower, the two leftmost sets of holes are used.
2. Assemble the sensor mount (M104866) on the crossarm, leaving the bottom mounting bolt loose enough that the sensor mount can be turned.
3. Climb to the top of the tower and set the crossarm in place, lowering the U-bolts over the tower legs.

    *Note: Always use a climbing belt when climbing the AWOS tower.*
4. Position the crossarm near the top of the tower legs, and tighten one of the U-bolts. Level the crossarm, and tighten the other U-bolt.
5. At the top of the tower, install the Model 2020 Micro Response Wind Vane on the longer end of the crossarm. Rotate the wind vane on the sensor mount (M104866) until the keying pin on the sensor mount aligns with the mating hole in the wind vane base and the wind vane drops into place. Tighten the mounting bolt on the side of the wind vane base.
6. Align the scribe mark on the sensor neck with the scribe mark on the sensor hub by rotating the hub and tail assembly. Hold the two marks in alignment. The Model 1249-A Wind Direction Calibrator can be used to easily hold the sensor in position.
7. Loosen the adapter mounting bolt on the underside of the crossarm.
8. Using the wind direction benchmark as a reference located approximately 100 to 150 ft from the tower in one of the four cardinal points referenced to true North), rotate the sensor and adapter together until the vane nose points to the referenced cardinal point. Tighten the adapter mounting bolt.

9. When removing the wind vane for any reason in the future, do not loosen the mounting bolt on the sensor mount or remove the sensor mount from the crossarm. Remove the wind vane from the sensor mount by loosening the mounting bolt on the side of the sensor base. This will allow you to remove and reinstall the wind vane without repeating the orientation procedure.

Section 7.1.2 describes how to mount an assembled Model 2030 Anemometer.

### 6.1.3 Connection

Connect the connector on the end of the cable (Part Number 20206) to the connector on the wind vane. The connector is a quick release type and requires only a quarter turn of the nut to lock it in place. Do not tighten with a wrench.

- **1190 DCP** — Connect the other end of the cable to terminal block TB3 on the DCP, and secure the cable to the tower with cable ties every 3 ft.
- **1192 DCP** — Connect the other end of the cable to the **WDIR** terminal block (J18) on the DCP, and secure the cable to the tower with cable ties every 3 ft.

Figure 56 shows the connections.

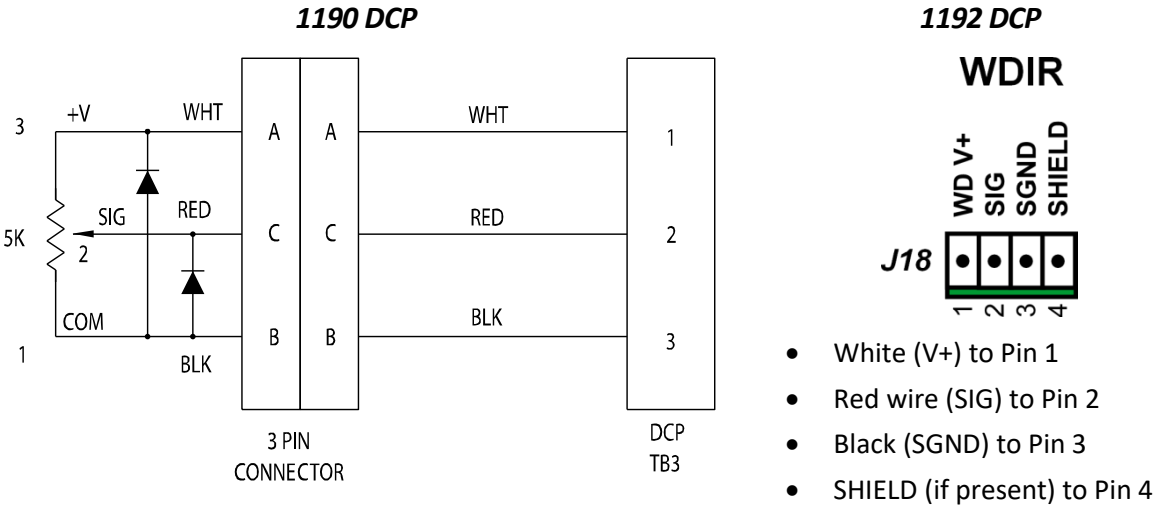



**Figure 56. Model 2020 Wind Vane Wiring**

## 6.2 Checkout

Locate the direction benchmark determined in the initial site survey. It should be approximately 100 to 150 ft from the tower in one of the four cardinal points referenced to true north. A final detailed alignment will be completed during site validation and commissioning.

Follow the procedures below specific to either the stationary or the foldover tower.

*Note: Always use a climbing belt when climbing the AWOS tower.*

### 6.2.1 Stationary Tower Installations

This procedure requires two people, one on the ground observing the DCP's LCD display, and the other on the tower.

1. While observing the LCD display inside the DCP, rotate the vane until the display indicates 180°. (If the benchmark is located at East or West, rather than North or South, rotate the vane until the display reads 90 or 270.) Secure the vane in this position.
2. With the sensor locked in position, stand at the direction benchmark and verify that the tail of the vane is aligned with the vane body. If the vane is not aligned, loosen the mounting screw located at the bottom of the Unistrut, align the sensor (and base) with the benchmark, and tighten the mounting bolt.
3. In turn, rotate the vane slowly through a full 360°, noting the reading on the LCD display. When the LCD display reads 90°, hold the vane still and visually verify that it is pointing approximately East. Continue rotating the sensor, pausing at each of the remaining cardinal directions (180°, 270°, and 360°) and visually verifying that the vane is pointing in the appropriate direction. As the vane is turned, the displayed values should change smoothly, with no sudden jumps or dropouts. Note, however, that there is a 10° dead band at North where suspicious readings are likely to be seen. This behavior is normal near North, but in any other direction indicates a potentiometer failure. If the sensor fails any part of this test, replace the potentiometer.
4. Verify that the vane's movement is free and smooth. If it is not, replace the bearings. The shaft should turn freely at all times.
5. Inspect all mounting hardware and cable assemblies for wear and damage. Replace as necessary.
6. Apply a thick coating of silicon lubricant to the connector shell after the connector is attached and in place. Use a noncorrosive lubricant such as bee's wax on all screws and fasteners whenever disassembly is required. The use of these lubricants will make future servicing easier.

### 6.2.2 Foldover Tower Installations

Chapter 21 explains how to lower and raise the foldover tower.

1. When the sensor is mounted to a foldover tower, the tower will often need to be lowered and raised several times and the vane's orientation adjusted until the vane is visually aligned with the benchmark. Initially, rotate the vane until the display indicates 180°. (If the benchmark is located at East or West, rather than North or South, rotate the vane until the display reads 90 or 270.) Lock the vane in place and raise the tower.
2. Stand at the direction benchmark and verify that the tail of the vane is aligned with the vane body. If it is not, lower the tower slowly and adjust the sensor by loosening the mounting screw located at the bottom of the Unistrut, aligning the sensor (and base) with the benchmark, and tightening the mounting bolt. Lock the sensor in place and again raise the tower. Repeat this procedure until the vane is oriented to the benchmark.
3. With the tower in the lowered position, rotate the vane slowly through a full 360°, noting the reading on the LCD display. When the LCD display reads 90°, hold the vane still and visually verify that it is pointing approximately East. Continue rotating the sensor, pausing at each of the remaining cardinal directions (180°, 270°, and 360°) and visually verifying that the vane is pointing in the appropriate direction. As the vane is turned, the displayed values should change smoothly, with no sudden jumps or dropouts. Note, however, that there is a 10° dead band at North where suspicious readings are likely to be seen. This behavior is normal near North, but in any other direction indicates a potentiometer failure. If the sensor fails any part of this test, replace the potentiometer.
4. Verify that the vane's movement is free and smooth. If it is not, replace the bearings. The shaft should turn freely at all times.
5. Inspect all mounting hardware and cable assemblies for wear and damage. Replace as necessary.
6. Apply a thick coating of silicon lubricant to the connector shell after the connector is attached and in place. Use a noncorrosive lubricant such as bee's wax on all screws and fasteners whenever disassembly is required. The use of these lubricants will make future servicing easier.

Chapter 7

# 7. Model 2030 Anemometer

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Wind (2020/2030 or 2040) | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

*Systems including a wind sensor consist of either a Model 2020 Micro Response Wind Vane and Model 2030 Anemometer in combination or a Model 2040 Ultrasonic Wind sensor.*

## 7.1 Installation

This instrument is thoroughly tested and fully calibrated at the factory and is ready for installation.

*Note that it might not be possible to completely comply with the minimum distance requirements from large obstructions when installing the anemometer in an oil rig or rooftop environment. Consult All Weather Inc. for guidance if this appears to be an issue.*

### 7.1.1 Assembly

With the exception of installing the cup assembly, the Model 2030 Micro Response Anemometer is ready for mounting. Install the cup assembly as described in the steps below.

1. Loosen the two set screws with a 1/16" Allen wrench, and slide the cup assembly over the anemometer shaft. Be certain that the flat face of the shaft faces toward the set screws.
2. The cup assembly hub should slide down over the shaft and body and seat against the shaft ring. When correctly in place, there should be no drag between the skirt of the hub and the shoulder of the body. Tighten both set screws to 7 in. lbs.
3. Spin the cup wheel by hand to assure smooth operation. The cup wheel should coast to a smooth stop.

### 7.1.2 Mounting

The Model 2030 Anemometer must be completely assembled (Section 7.1.1) before it is mounted on the tower.

The Model 2020 Micro Response Wind Vane and Model 2030 Anemometer mount to the face of the tower using the M403256-01 mounting kit. The mounting kit includes a crossarm, mounting bolts, and all necessary hardware. The crossarm is assembled first, and is then mounted on the tower. The Model 2020 Micro Response Wind Vane and Model 2030 Anemometer are then mounted on the crossarm. The lower part of the anemometer body will slip over the pin on the sensor mount (M104866). When in place, tighten all mounting screws.

Refer to drawing M403256-01-003 during installation.

### 7.1.3 Orientation

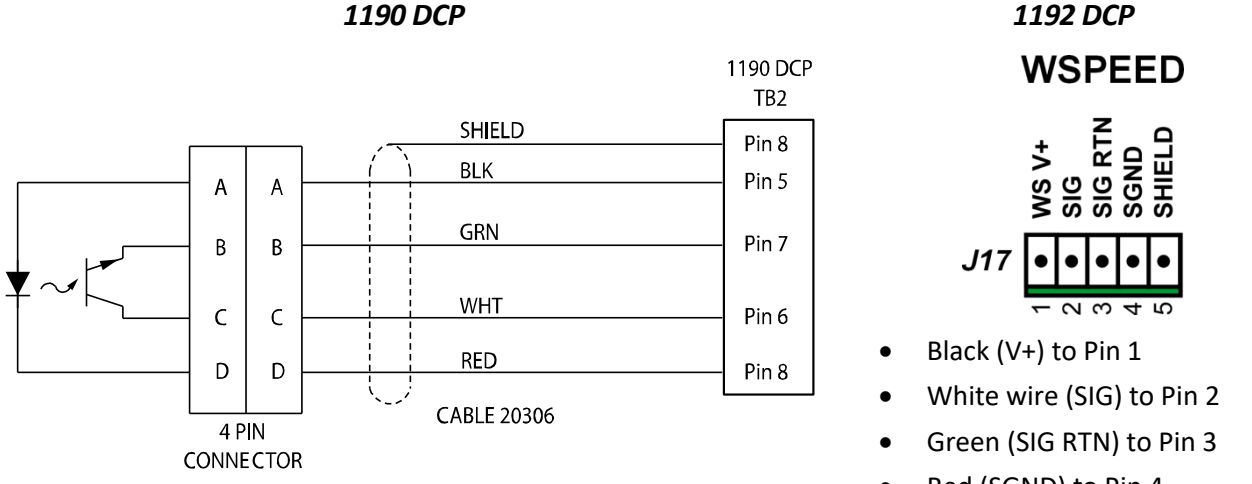
The anemometer should be mounted with its axis as close to vertical as possible to provide for the best measurement of horizontal wind movement. If the sensor must be removed from the sensor mount or crossarm, loosen only the Allen head screw on the sensor base and slide the sensor off the sensor mount. Do not remove the mounting pin from the crossarm or the sensor mount from the mast, since these serve to maintain sensor alignment.

### 7.1.4 Wiring

Connect the connector on the end of the cable (Part Number 20206) to the connector on the anemometer. The connector is a quick release type and requires only a quarter turn of the nut to lock it in place. Do not tighten with a wrench.

- **1190 DCP** — Connect the other end of the cable to terminal block TB2 on the DCP, and secure the cable to the tower with cable ties every 3 ft.
- **1192 DCP** — Connect the other end of the cable to the **WSPEED** terminal block (J17) on the DCP, and secure the cable to the tower with cable ties every 3 ft.

Figure 57 shows the connections.




- Black (V+) to Pin 1
- White wire (SIG) to Pin 2
- Green (SIG RTN) to Pin 3
- Red (SGND) to Pin 4
- SHIELD (if present) to Pin 5

**Figure 57. Model 2030 Wiring**

## 7.2 Checkout

1. Remove the anemometer cup assembly by loosening the two set screws on the cup assembly collar.
2. Connect a Model 1231 run-up motor to the anemometer shaft and power the motor on. The DCP's LCD display should read between 79 and 81 knots.
3. Replace the cup assembly.
4. Inspect the anemometer cups for damage, and replace if necessary.

The following test should be performed in windless conditions. If one person is performing the test alone, the anemometer will need to be removed from the tower and connected to a test cable (Part Number 20206) within sight of the DCP display. The test cable used may be the regular cable whose wire ties securing it to the tower are cut and then replaced when the anemometer is returned, or the regular cable may be disconnected with a separate cable used within sight of the DCP display; the regular cable is reconnected when the anemometer is returned to the tower.

5. With the cup assembly in place, spin the cups by hand until the DCP display reads greater than 5 knots. After releasing the cups, they will slow and the displayed speed will gradually decrease. If the display reads 2 knots or less while the cups are still turning, the bearings are good. If the cups stop before slowing to a speed of 2 knots or less, replace the bearings.
6. Inspect all mounting hardware and cable assemblies for wear and damage. Replace as necessary.
7. Apply a thick coating of silicon lubricant to the connector shell after the connector is attached and in place.

Sections6.2.1 and 6.2.2 describe the procedures to mount the crossarm with the Model 2020 Micro Response Wind Vane and Model 2030 Anemometer to either the stationary or the foldover tower.

Chapter 8

# 8. Model 2040 Ultrasonic Wind Sensor

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Wind (2020/2030 or 2040) | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

*Systems including a wind sensor consist of either a Model 2020 Micro Response Wind Vane and Model 2030 Anemometer in combination or a Model 2040 Ultrasonic Wind sensor.*

## 8.1 Installation Guidelines

- Always check the installation to ensure the Model 2040 Ultrasonic Wind sensor is not affected by other equipment operating locally that might not conform to current standards, e.g., radio/radar transmitters, boat engines, generators etc.
- Avoid mounting in the plane of any radar scanner — a vertical separation of at least 2 m should be achieved.
- The following minimum separations are suggested for radio transmitting antennas:
  - International Maritime Mobile (VHF IMM) – 1 m
  - Medium Frequency/High Frequency (MF/HF) – 5 m
  - Satcom – 5 m (avoid likely lines of sight)
- Ensure the product is correctly grounded in accordance with this manual
- Use cables recommended by AWI, keeping the length below the maximum allowed. Where the cables are cut and reconnected (junction boxes, plugs, and sockets), the integrity of the cable shield must be maintained to prevent the EMC performance being compromised.

## 8.2 Mounting

All three 2040 Ultrasonic Wind sensor models (2040, 2040H, and 2040HH and their connectorized versions) mount near the top of the tower using the M488270-01 mounting kit. The mounting kit includes a Unistrut crossarm, mounting bolts, and all necessary hardware.

The crossarm is assembled first, and is then mounted on the tower. Before installing the cross-arm, determine the best location for the sensor, keeping in mind that the sensor will need to be oriented to the direction benchmark. Note the red dot at the base of the sensor, and the label

above it that is half blue and half silver (see Figure 58). Align the blue/silver boundary with the red dot, which indicates the North side of the sensor. Mount the sensor to the crossarm while on the ground, before installing the crossarm on the tower.

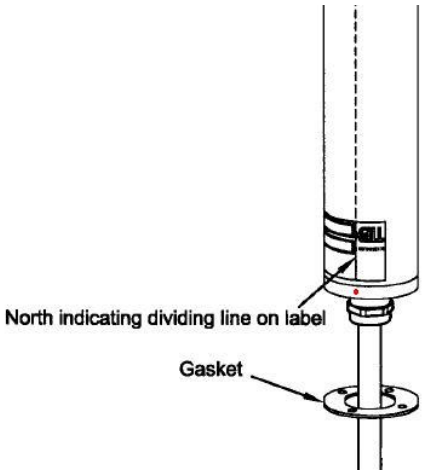



**Figure 58. Model 2040 North Alignment Mark**

Refer to drawing M488270-01-007 in in Appendix A during installation.

1. Unroll the cable at the bottom of the sensor.
2. Slide the round gasket up the cable to the bottom of the sensor.
3. Feed the cable through the "C" bracket and slide the bracket up the cable.
4. Mount the bracket to the base of the sensor with the open side of the bracket facing the tower. Insert four bolts through the bracket and rubber gasket into the base of the sensor and tighten.
5. Fasten the "C" bracket to the crossarm using the bolt, washers, and nut.
6. Loosely assemble the U-bolts to the crossarm, holding the assembly next to the tower to line up the bolts.
7. Lower the assembly onto the top of the tower, with the U-bolts about ¾" below the tops of the legs.
8. Level the assembly and tighten the U-bolts. If the tower legs are topped with plastic caps, do not clamp the crossarm against them; doing so will tilt the sensor.
9. Align the anemometer to the direction benchmark using the north arm as a guide. The north arm is the sensor arm aligned with the dividing line on the label separating the silver and blue portions.
10. Route the sensor cable down the tower, securing as necessary with cable ties.
11. Connect the sensor cable inside the DCP as described in the following sections. The wiring varies according to the specific model being installed.

## 8.3 1190 DCP Wiring

This section describes the wiring for the series of Model 2040 Ultrasonic Wind sensors. Drawing M488274-01-003 shows the heater DIN rail mounting and wiring connections, and the details of the wiring connections to the heater are shown in Figure 60 and in Drawing M488274-01-019 in Appendix A.

Figure 59 summarizes the signal and power wiring for the series of Model 2040 Ultrasonic Wind sensors to the M404806 Serial Sensor Interface Board, which plugs into header H4 of the 1190 DCP. The signal and power wiring is described in more detail in the sections below.

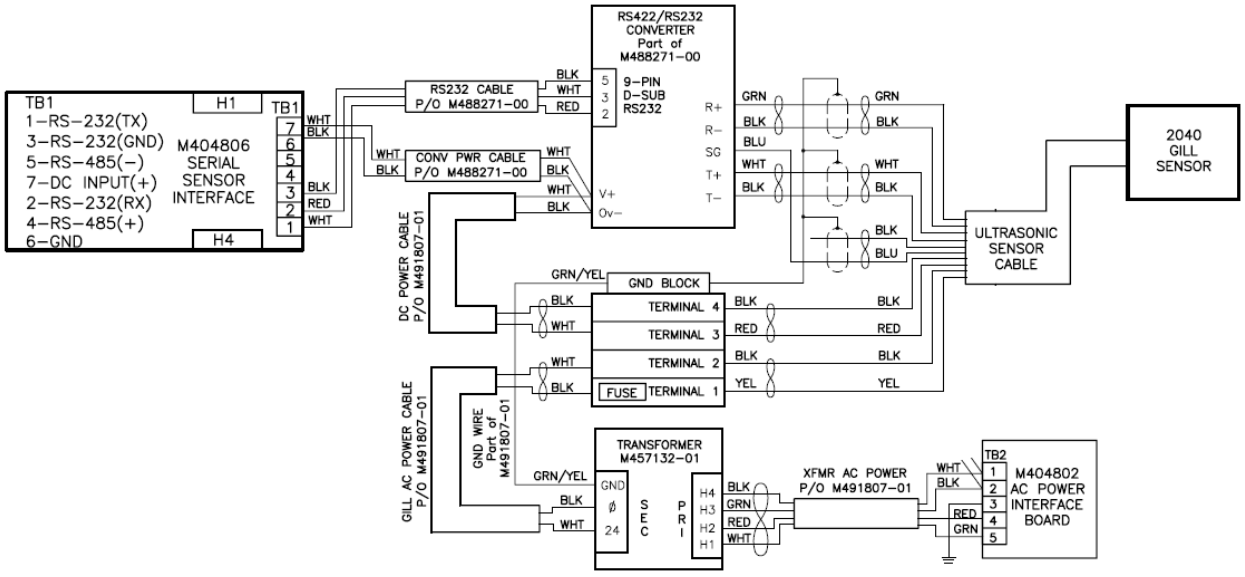



**Figure 59. Model 2040 Ultrasonic Wind Sensor Signal and Power Wiring to 1190 DCP**

## 8.3.1 Model 2040/2040C Wiring

The signal wires from the sensor connect to the RS-422/RS-232 converter installed inside the DCP. The sensor uses four twisted pairs of the cable coming from the sensor. Connect the cable according to the table below.

| Model 2040C Socket Pin | Sensor Wire | DCP Connection |
|---|---|---|
| P | GREEN | RS-422/RS-232 Converter, R+ |
| C | BLACK | RS-422/RS-232 Converter, R- |
| U | WHITE | RS-422/RS-232 Converter, T+ |
| V | BLACK | RS-422/RS-232 Converter, T- |
| M | BLUE | RS-422/RS-232 Converter, SG |
| N | BLACK | not connected |
| R | RED | Serial Sensor Interface, TB1, Pin 7 |
| D | BLACK | Serial Sensor Interface, TB1, Pin 6 |

Remaining wires not connected

## 8.3.2 Model 2040H/2040HC Wiring

The signal wires from the sensor connect to the RS-422/RS-232 converter installed inside the DCP. Power for the heated sensors is obtained from the UHF radio connector at P2 on the DCP

board. A terminal block and a transformer are installed on a DIN rail inside the 1190 DCP. The transformer is mounted so that the Barometric Pressure sensor is behind the transformer. The sensor uses five twisted pairs of the cable coming from the sensor. Connect the cable according to the table below.

| Model 2040HC Socket Pin | Sensor Wire | DCP Connection |
|---|---|---|
| P | GREEN | RS-422/RS-232 Converter, R+ |
| C | BLACK | RS-422/RS-232 Converter, R- |
| U | WHITE | RS-422/RS-232 Converter, T+ |
| V | BLACK | RS-422/RS-232 Converter, T- |
| M | BLUE | RS-422/RS-232 Converter, SG |
| N | BLACK | not connected |
| R | RED | Terminal block, Terminal 3 |
| D | BLACK | Terminal block, Terminal 4 |
| A | YELLOW | Terminal block, Terminal 1 |
| B | BLACK | Terminal block, Terminal 2 |

Remaining wires not connected

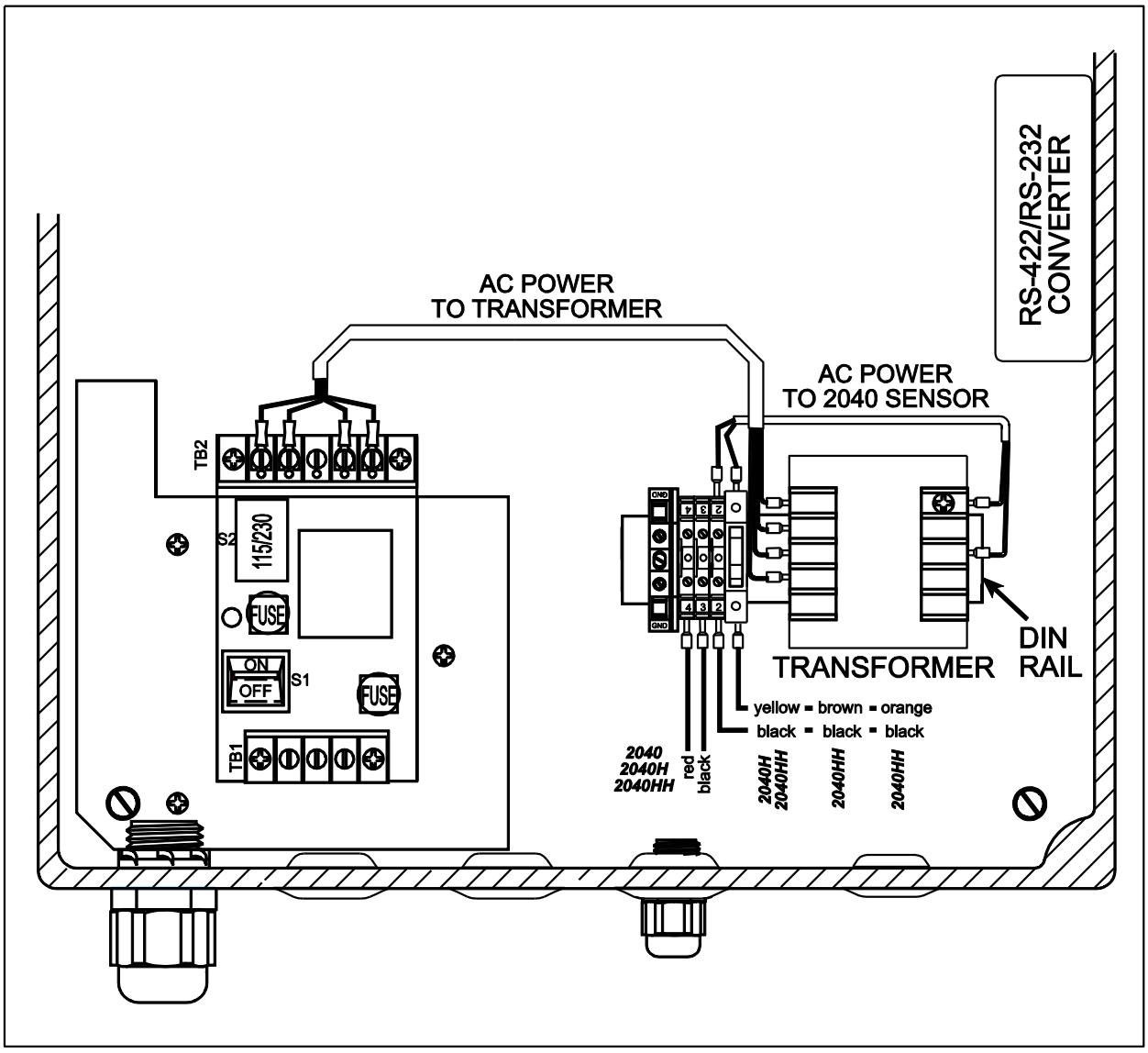



**Figure 60. Ultrasonic Wind Sensor Heater Connections Inside DCP**

Note that Figure 60 provides the wiring details for the transformer used to provide power to the heaters when using the 1190 DCP. The transformer is actually located so that the Barometric Pressure sensor is behind the transformer, as shown in drawing M488274-02-003 (Appendix A).

### 8.3.3 Model 2040HH/2040HHC Wiring

The signal wires from the sensor connect to the RS-422/RS-232 converter installed inside the DCP. Power for the heated sensors is obtained from the UHF radio connector at P2 on the DCP board. A terminal block and a transformer are installed on a DIN rail inside the 1190 DCP. The transformer is mounted so that the Barometric Pressure sensor is behind the transformer. A terminal block is installed on the DIN rail inside the DCP. The sensor uses seven twisted pairs of the cable coming from the sensor. Connect the sensor cable according to the table below.

| Model 2040HHC Socket Pin | Sensor Wire | DCP Connection |
|---|---|---|
| P | GREEN | RS-422/RS-232 Converter, R+ |
| C | BLACK | RS-422/RS-232 Converter, R- |
| U | WHITE | RS-422/RS-232 Converter, T+ |
| V | BLACK | RS-422/RS-232 Converter, T- |
| M | BLUE | RS-422/RS-232 Converter, SG |
| N | BLACK | not connected |
| R | RED | Terminal block, Terminal 3 |
| D | BLACK | Terminal block, Terminal 4 |
| A | YELLOW | Terminal block, Terminal 1 |
| B | BLACK | Terminal block, Terminal 2 |
| H | BROWN | Terminal block, Terminal 1 |
| G | BLACK | Terminal block, Terminal 2 |
| E | ORANGE | Terminal block, Terminal 1 |
| F | BLACK | Terminal block, Terminal 2 |

Remaining wires, if any, not connected

## 8.4 1192 DCP Wiring

The Model 1192 DCP has a built-in 24 VAC to provide power to the heated Model 2040 Ultrasonic Wind Sensors. Figure 61 shows the pinout for the **J5** and **J14** terminal blocks on the Serial Interface Board used for signal and power connections when using the 1192 DCP. The DIP switch settings reflect the RS-422 (full-duplex RS-485) configuration for the J5 terminal blocks.

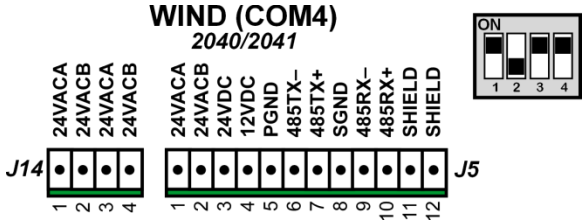



**Figure 61. COM4 Ultrasonic Wind Sensors Pinout**

Terminal Block **J14** and Pins 1 and 2 on Terminal Block **J5** provide the 24 V AC power for the heaters in the heated ultrasonic wind sensors such as the Model 2040H and 2040HH.

***Each twisted pair in a 2040 cable uses a black wire as power ground or RX–/TX–. The colored wire in the pair can be used to identify the pair's function. Make sure to dress the end of the cable so that it is clear which black conductor belongs with each pair.***

*Signals Terminal Block Wiring Summary*

- RED wire (+24 VDC) to Pin 4
- BLACK wire (PGND) to Pin 5
- BLACK wire (RS-485 Rx–) to Pin 6
- WHITE wire (RS-485 Rx+) to Pin 7
- BLUE wire (SGND) to Pin 8
- BLACK wire (RS-485 Tx–) to Pin 9
- GREEN wire (RS-485 Tx+) to Pin 10
- SHIELD to Pin 11

*Heaters Terminal Block Wiring Summary*

All the 24VACA pins are wired to the same 24 VAC-L power source, and all the 24VACB pins are wired to 24 VAC-N.

- YELLOW wire (all models) to **J5** Pin 1
- BLACK wire (all models) to **J5** Pin 2
- BROWN wire (2040HH) to **J14** Pin 1
- BLACK wire (2040HH) to **J14** Pin 2
- ORANGE wire (2040HH) to **J14** Pin 3
- BLACK wire (2040HH) to **J14** Pin 4

Figure 62 summarizes the signal and power wiring for the series of Model 2040 Ultrasonic Wind sensors to the Sensor Interface Board on the Model 1192 DCP.

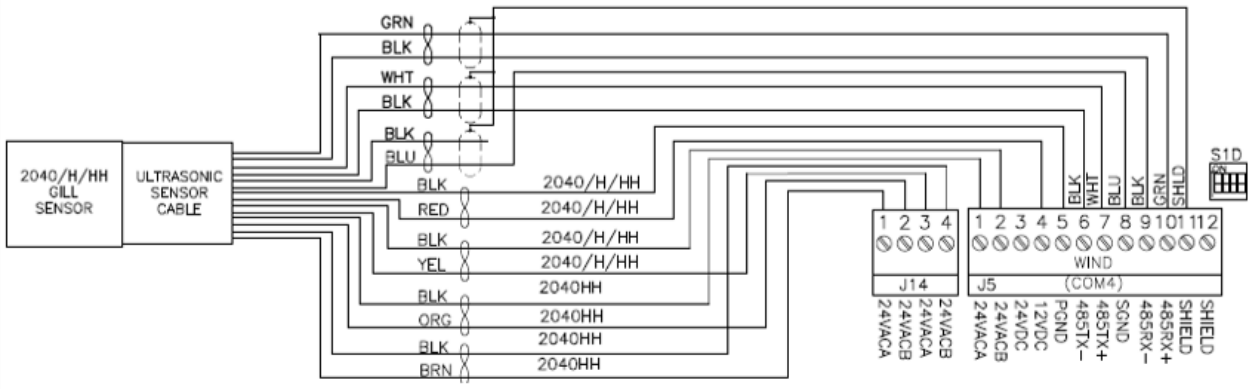



**Figure 62. Model 2040 Ultrasonic Wind Sensor Signal and Power Wiring to 1192 DCP**

## 8.5 Checkout

1. Ensure that the wind speed shown at the DCP is 3 knots or less.
2. Disconnect power to the heater transformer (Models 2040H and 2040HH and their connectorized versions).
3. Insert the flat piece that is provided with the Zero Wind Chamber into one of the two Wind Chamber halves are that are placed around the Model 2040 wind sensor.
4. Install the Zero Wind Chamber by inserting the two halves of the chamber onto the Model 2040 wind sensor. The chamber must be retained using the strips provided.
5. View the wind speed value displayed at the DCP. The value must not exceed 0 knots. If wind speed exceeds 0 knots, contact All Weather, Inc.
6. Reconnect power to the heater transformer (Models 2040H and 2040HH and their connectorized versions) and check the heaters for proper operation. The anemometer will radiate heat your hand can feel as it gets closer if the heaters are working.

**CAUTION**

**When heating is activated the bullet and transducer arms will get very hot and should not be handled.**

Chapter 9

# 9. Vaisala Wind Sensors

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Wind (WAC155 or WMT702) | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

*The Vaisala WAC155 Serial Wind Transmitter or WMT702 Ultrasonic Wind Sensor may be installed instead of the Model 2020/2030/2040 wind sensors. The WAC155 Serial Wind Transmitter provides a serial interface for mechanical wind sensors.*

## 9.1 Installation

Refer to the ***M211506EN-D-Installation Manual*** for complete details on the installation of these sensors.

- DRW230955-A provides the installation details for the WAC155 Serial Wind Transmitter.
- DRW247898-A, DRW247899-A, and DRW247900-A show the installation options for the WMT702 Ultrasonic Wind Sensor.

# 9.2 1192 DCP Wiring

The **J5** and **J14** terminals used to connect the Vaisala wind sensors to the Model 1192 DCP.

## 9.2.1 WAC155 Serial Wind Transmitter

Figure 63 shows the wiring for connecting the WAC155 Serial Wind Transmitter to the 1192 DCP. The DIP switches at position S1D are set up for *half duplex* RS-485 as shown in Figure 63. Refer to the ***Model 1192 Data Collection Platform User's Manual*** for additional information.

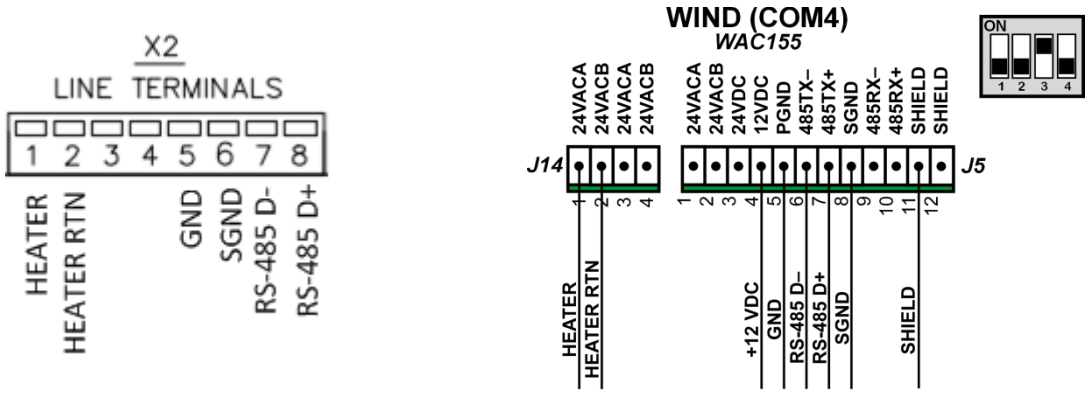



**Figure 63. WAC155 Serial Wind Transmitter Connections to 1192 DCP**

## 9.2.2 WMT702 Ultrasonic Wind Sensor

Figure 64 shows the wiring for connecting the WMT702 Ultrasonic Wind Sensor to the 1192 DCP. The DIP switches at position S1D are set up for *half duplex* RS-485 as shown in Figure 64. Refer to the ***Model 1192 Data Collection Platform User's Manual*** for additional information.

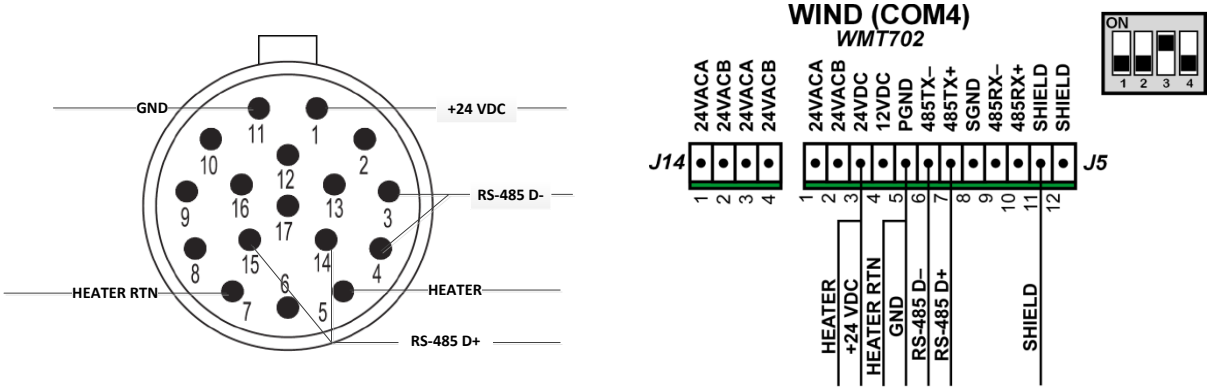



**Figure 64. WMT702 Ultrasonic Wind Sensor Connections to 1192 DCP**

Chapter 10

# 10. Model 5190 Temperature/RH Sensor

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Model 5190 Temp/RH | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## 10.1 Installation

1. The MARS should not be installed on the tower and power should not be connected. This is important to prevent electrical shock and to avoid damage to internal wiring, as well as to the fan blades.
2. Connect the probe cable to the probe.
3. To simplify routing the probe cable and installing the probe in the vent tube, feed a piece of string weighted at the end (with a nut, for example) through the horizontal tube and down through the vent tube.
4. Tie the string to the probe cable and pull the string from the opposite end to guide the cable up through the vent tube and into the horizontal tube.
5. Form a loose loop of cable at the base of the probe, and secure it with a cable tie so that the cable forms a U.
6. With the filter end of the probe pointing up, grasp the loop of cable at the base of the probe and raise the probe up into the vent tube.
7. When you feel the probe make contact with the mount, move it side to side as necessary until it slides into the mount opening.
8. Slide the probe into the mount until the bottom of the probe is 2–3 inches above the mouth of the MARS vent tube.
9. While holding the probe in place, tighten the mounting screws just enough to secure the probe, but **do not overtighten**. Over-tightening the screws will damage the probe.
10. Pull the remaining slack out of the cable, keeping the cable as straight as possible.
11. Tighten the strain relief until the cable is securely sealed.

12. Route the cable down the tower in the most convenient manner. Lace or strap the cable approximately every 12 inches. Loose cables will rub against the tower in high winds, and the cable insulation could be destroyed. Use ultraviolet-resistant cable ties, tape, or metal strapping. Use caution to avoid damaging the outer jacket of the cable.
13. Some slack should be left in the cable to allow for a drip loop and to facilitate access to the probe for cleaning and replacement, otherwise any excess length may be trimmed. When a longer cable is required, consider using an extension cable for distances up to 30 m (100 ft).

**1190 DCP**

Connect the sensor cable wires to the 1190 DCP as explained the table below.

| Wire | Color | TB2 Terminal Block |
|---|---|---|
| Ground / – | Gray, Shield and (Blue 5190-D) / (Yellow 5190-F) | 4 |
| Supply Voltage (+) | Green | 3 |
| RH | White | 2 |
| Temperature | Brown | 1 |

*Note: Cover and insulate all unused sensor wires so they do not make electrical contact.*

**1192 DCP**

Connect the sensor cable wires to the 1192 DCP as explained the table below.

| Wire | Color | TEMP/RH ANALOG Terminal Block |
|---|---|---|
| Shield | Shield | 6 |
| T/RH Signal Ground | Gray | 5 |
| 5190-F Power Ground | Yellow | 4 |
| Supply Voltage (+) | Green | 3 |
| RH | White | 2 |
| Temperature | Brown | 1 |

*Note: Cover and insulate all unused sensor wires so they do not make electrical contact.*

## 10.2 Checkout

Checkout of the Model 5190 consists of checking the accuracy of the 5190 against readings made using a reference sensor or psychrometer, as explained below. It is recommended that the MARS be installed on the tower as described in Chapter 11 before performing the checkout.

While performing the accuracy check, certain provisions should be kept in mind:

- For both temperature and dew point, it is important that the reference sensor be subject to the same conditions as the Model 5190 sensor. If the reference sensor is located in direct sunlight, near your body, or downwind from you, its data are greatly affected. This will result in the reference sensor and the 5190 delivering very different results. Even if the reference sensor is removed from direct sunlight, reflected light (from snow or sand, for example) can also affect the measurements.
- On cloudy, breezy days, there is usually no problem getting good reference readings. You only need to be sure to stay downwind of the MARS and the reference sensor.
- On sunny or calm days, it is often necessary to place the sensing element of the reference sensor inside the MARS intake. This ensures that both sensors are sampling the same air conditions. The reference sensor can be held in place in the MARS intake using a bungee cord, wire, string, or tape. The reference sensor should not touch the sides of the MARS tube or the 5190.

- The reference sensor can take up to ten minutes to stabilize, as the sensor body may have absorbed or lost heat from contact with your body or from storage conditions. As you observe the readings, the two sensors may start out several degrees apart, but will slowly approach each other. Do not take any official reading until after the temperatures have settled.
- Differences in response time between the two sensors can also make field temperature comparisons difficult. As wind changes direction, it can change humidity and temperature. One sensor will always react faster than the other. Taking measurements in changing conditions is not recommended.
- Use of a sling psychrometer as a field reference sensor is strongly discouraged for anyone except an experienced meteorologist. Electronic temperature/relative humidity sensors and motor aspirated sensors are recommended for field use.

    1. Position the reference sensor in close proximity to the intake of the MARS. Allow a minimum of 20 minutes for the sensor to stabilize before proceeding.
    2. Record the temperature and dew point temperatures from the reference sensor and the AWOS at 1 minute intervals.
    3. Individually average all readings of reference sensor temperature and 5190 temperature that are within ±1°F (±0.56°C). Subtract the average reference sensor temperature from the AWOS temperature. For AWOS installations, check the pass status on the data sheet if the result is within ±2°F (±1.1°C). If the 5190 sensor readings differ by more than the specified amounts, replace the sensor and return the failed sensor to All Weather, Inc. for calibration.
    4. Individually average all reference sensor and 5190 dew point temperature readings that are within ±0.5°F (±0.28°C) of each other. (If using a psychrometer, first calculate the dew point temperature using a psychrometric calculator.) Subtract the reference sensor dew point temperature from the AWOS dew point temperature. Check the pass status if the result is within ±3°F (±1.7°C). If the 5190 sensor readings differ by more than the specified amounts, replace the sensor and return the failed sensor to All Weather, Inc. for calibration.

Chapter 11

# 11. Model 8190 Motor Aspirated Radiation Shield

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Model 8190 MARS | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

*The Motor Aspirated Radiation Shield (MARS) is designed for tower installations. Mounting hardware, including mounting brackets and U-bolts, is provided.*

## 11.1 MARS Installation

The MARS should be installed with the intake vent tube on the right side, pointing down, approximately five ft above the ground. When installing the MARS on the Model 8518-A Foldover Tower, mount to the hinged side of the tower. Ensure that the sensor cable will reach the DCP connector. To install the MARS, follow the steps below:

1. Lift the MARS into position and attach the horizontal tube to the tower legs using the supplied mounting brackets and U-bolts.
2. Adjust the positions of the U-bolts to give a level installation. The vertical vent tube should be vertically level to prevent direct solar radiation from entering the tube.
3. Fasten the U-bolts securely, being careful not to overtighten the horizontal tube's U-bolt, which could cause deformation of the tube.
4. Wire the fan power cable to the DCP board as follows:
    a. 1190 DCP
        i. White wire to TB2 Pin 9.
        ii. Black wire to TB2 pin 10.
    b. 1192 DCP
        i. White wire to MARS (**J12**) terminal block Pin 1.
        ii. Black wire to to MARS (**J12**) terminal block Pin 2.
        iii. Shield to MARS (**J12**) terminal block Pin 5.

Refer to Drawing 8190-01-007 in Appendix A during installation.

## 11.2 Probe Installation

Chapter 10 describes the installation of the Temperature/RH sensor.

## 11.3 Checkout

1. Apply power to the MARS and check to see that the fan is rotating. Check to ensure that all mounting hardware is securely fastened. Verify sensor operation.
2. 1190 DCP:
    a. Remove the MARS fan fuse (F1) at the DCP and verify that the DCP indicates a fan failure.
    b. Replace fuse F1. Verify the fan failure indication changes to OK within a couple of minutes.

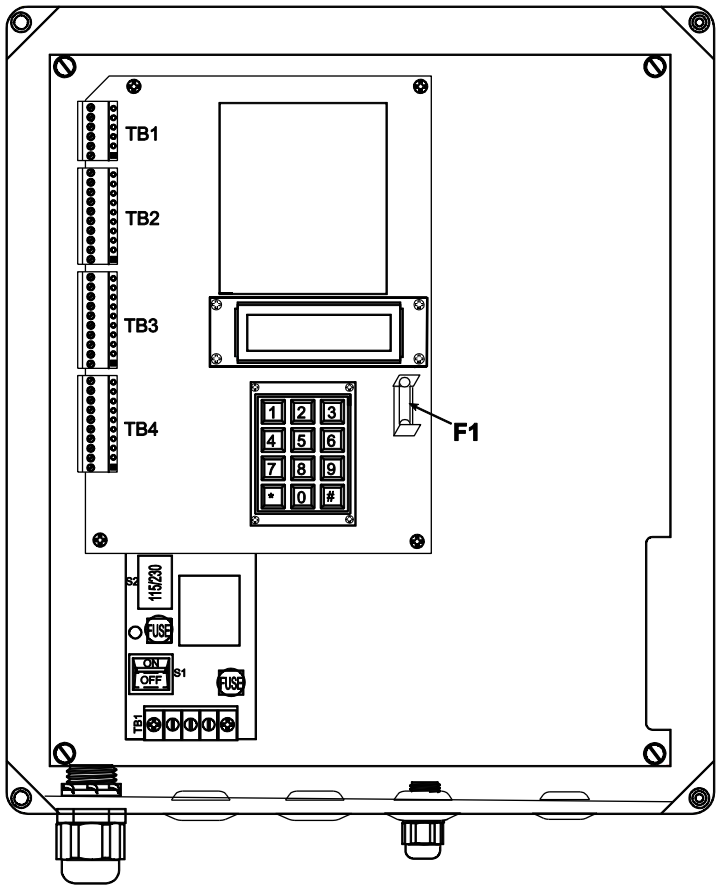



**Figure 65. Location of Fuse F1 in 1190 DCP**

3. 1192 DCP:

   a. Use the **MARS TEST** switch next to the MARS terminal block to turn the MARS fan off to simulate a fan failure. The switch is normally up, the ON position. Verify that the DCP **T/RH Information** screen indicates a MARS fan failure.

   b. Return the **MARS TEST** switch to the ON position (up). Verify that the DCP **T/RH Information** screen shows MARS OK.

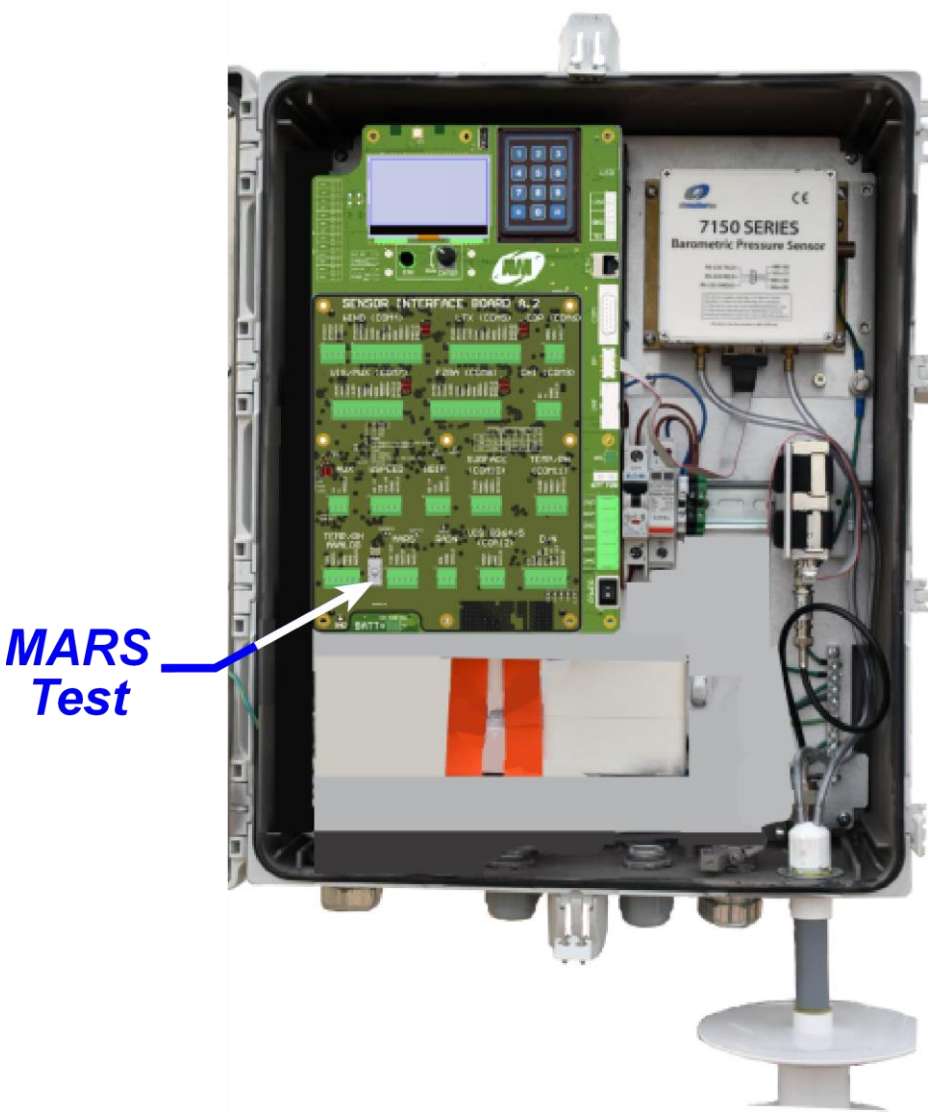



**Figure 66. Location of MARS TEST Switch in 1192 DCP**

Chapter 12

# 12. Vaisala Temperature/RH Probes

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| HMP155/HMP45 Temp/RH | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

*One of the Vaisala. Temperature/RH Probes may be used with the RM Young 43408F-4A MARS instead of a Model 5190 Temperature/RH sensor with the 8190 MARS.*

## 12.1 Installation

Refer to the ***M211506EN-D-Installation Manual*** for complete details on the installation of these sensors.

- DRW230691-C provides the installation details for the HMP155/HMP45 Temperature/RH Probes.
- DRW231714-A provides the installation details for the RM Young 43408F-4A MARS.

# 12.2 1192 DCP Wiring

## 12.2.1 Vaisala HMP155-CFG06 Temperature/Relative Humidity Probe

The **J9** terminal is used the serial Vaisala HMP155-CFG06 Temperature/Relative Humidity probe to the Model 1192 DCP.

Figure 67 shows the pinout for the HMP155-CFG-06 Temperature/Relative Humidity probe connector used to connect it to the **J22** (COM11) terminal block (Figure 68).

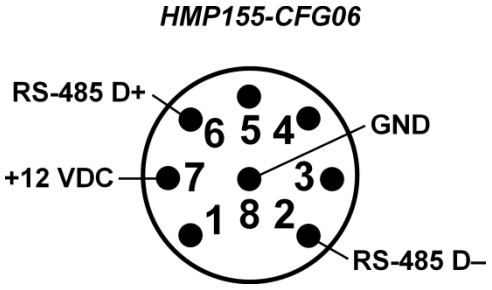



**Figure 67. HMP155-CFG-06 Connector Pinout**

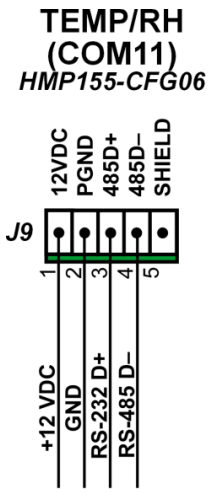



**Figure 68. COM11 Wiring for HMP155-CFG-06 Temperature/Relative Humidity Probe**

## 12.2.2 Vaisala HMP155-CFG04 and HMP45 Temperature/Relative Humidity

The **J11** terminal block is used the analog Vaisala HMP155-CFG04 and HMP45 Temperature/Relative Humidity probes to the Model 1192 DCP.

Figure 69 shows the pinout for the HMP155-CFG04 and HMP45 Temperature/Relative Humidity connectors used to connect them t to the **J22** (COM11) terminal block (Figure 70).

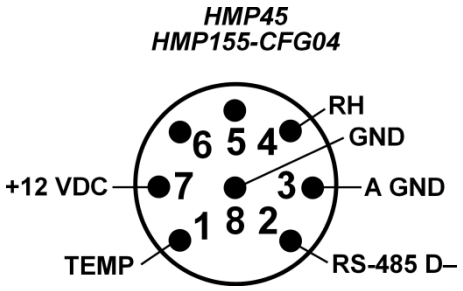



**Figure 69. HMP45/HMP155-CFG04 Connector Pinout**

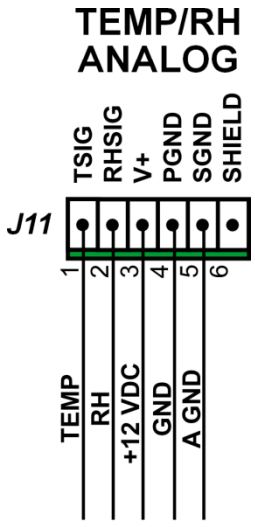



**Figure 70. Analog Wiring for HMP45/HMP155-CFG04 Temperature/RH Probe**

### 12.2.3 RM Young 43408F-4A MARS Radiation Shield

The **J12** terminal block is used to connect the RM Young 43408F-4A MARS Radiation Shield to the Model 1192 DCP. It provides power to the MARS.

Figure 71 shows the wiring from the 43408F-4A RM Young MARS to connect it to the **J12** terminal block.

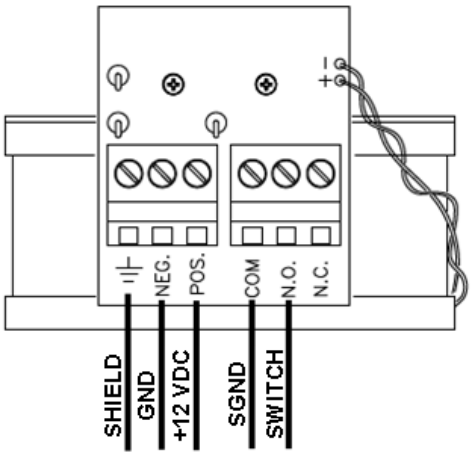



**Figure 71. 43408F-4A RM Young MARS Wiring**

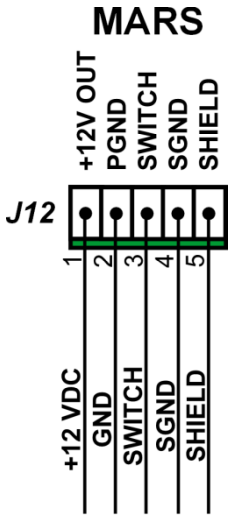



**Figure 72. 1192 DCP Wiring 43408F-4A RM Young MARS**

Chapter 13

# 13. Model 6021/6022 Tipping-Bucket Rain Gauges

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Model 6021/6022 Rain Gauges | | ✓ | | ✓ | ✓ | Option | ✓ | Option | Option |

## 13.1 Siting

- Site the gauge on a level base above the maximum seasonal snow depth.
- Locate the site in an area free from strong winds and large obstructions. Large open and level areas (i.e., meadows) are ideal but sometimes impractical.
- If no protection from wind is possible, a wind screen (Model 6410) should be used.
- If obstructions are inevitable, they must be located at a distance of 2-4 times their height away from the gauge. Otherwise they may prevent the precipitation from reaching the gauge.

## 13.2 Installation

Rain gauges used at AWOS installations can be mounted to a pad or to the sensor tower. Most AWOS installations have the rain gauge mounted to the sensor tower.

### 13.2.1 Pad Installation

To mount the sensor to a pad, construct the pad using a Ready-Form tube, rebar, and foundation bolts as described in the *AWOS 3000 Site Preparation Manual*, then proceed as follows:

1. Remove the collection funnel and check the bubble level on the base assembly before bolting the gauge to the foundation. If the bubble is not centered, add washers between the base and the base assembly's ft in such a way that the bubble is centered exactly when the bolts are tightened. This is of critical importance to the accuracy of the gauge.

2. (Model 6021 series) Connect the 60116 data cable's two wires to the two binding posts that terminate the reed switch.
3. Connect the other end of the cable to the DCP terminal block as follows:
    a. 1190 DCP
        i. SHIELD (Model 6021 series only) and BLACK or RED wires to TB3, Pin 8
        ii. WHITE wire to TB3, Pin 7
    b. 1192 DCP
        i. WHITE wire to RAIN (**J19**) terminal block Pin 1
        ii. BLACK or RED wires to to RAIN (**J19**) terminal block Pin 2
        iii. SHIELD (Model 6021 series only) to RAIN (**J19**) terminal block Pin 3
4. Replace the collection funnel, making sure that its heater cable is plugged into the heater terminal box.
5. Secure the two side screws.
6. (Model 6021 series) For AWOS installations, the 6021 rain gauges are shipped with all the power wire for the AWOS connected to the heater. Cut off the excess cable and use it to connect power to the other sensors.

    (Model 6022 series) Cut off the required length of power wire for the 6022 rain gauges. Use the cable gland and wire ties included with the 6022 rain gauges to route the power wire through the cable gland and connect it to the heater wires. Replace the cover on the heater service box.

### 13.2.2 Tower Installation

Using the M488169-01 tower mounting kit, the sensor mounts to a horizontal boom attached to the tower approximately 7 ft above the ground. To mount the rain gauge to a tower, refer to Drawing No. M488169-01-007 at the back of this manual, then proceed as follows.

1. Verify that the crossarm and mounting plate are level, adjust as necessary if not.
2. Remove the collection funnel. Check the bubble level on the base assembly before bolting the rain gauge to the foundation. If the bubble is not centered, add washers between the base and the base assembly's feet in such a way that the bubble is centered exactly when the bolts are tightened. This is of critical importance to the accuracy of the rain gauge.
3. (Model 6021 series) Connect the 60116 data cable's two wires to the two binding posts that terminate the reed switch.
4. Connect the other end of the cable to the DCP terminal block as follows:
    - 1190 DCP
        i. SHIELD (Model 6021 series only) and BLACK or RED wires to TB3, Pin 8
        ii. WHITE wire to TB3, Pin 7
    - 1192 DCP
        i. WHITE wire to RAIN (**J19**) terminal block Pin 1
        ii. BLACK or RED wires to to RAIN (**J19**) terminal block Pin 2
        iii. SHIELD (Model 6021 series only) to RAIN (**J19**) terminal block Pin 3

5. (Model 6021 series) Replace the collection funnel, making sure that its heater cable remains plugged into the heater terminal box.
6. Secure the two side screws.
7. (Model 6021 series) For AWOS installations, the 6021 rain gauges are shipped with all the power wire for the AWOS connected to the heater. Cut off the excess cable and use it to connect power to the other sensors.
8. (Model 6022 series) Cut off the required length of power wire for the 6022 rain gauges. Use the cable gland and wire ties included with the 6022 rain gauge to route the power wire through the cable gland and connect it to the heater wires. Replace the cover on the heater service box.

## 13.3 Checkout

1. Remove the outer cover by removing two 1/4" bolts (Model 6021 series) or collection funnel thumbscrews (Model 6022 series).
2. Check the sensor level using the bubble level provided on the base. Adjust if necessary.
3. (Model 6021 series) Verify that the heater cable has been plugged into the heater terminal box.

   (Model 6022 series) Verify that the heater wires have been connected to the AC power cable.
4. (Model 6021 series) Place your hand close to the outlet orifices and detect heat from the two orifice heaters. If these are operational, then the heater system is powered up.

   (Model 6022 series) Feel the rain gauge funnel and bottom to check the operation of the heaters. If they are working, the rain gauge funnel and bottom should be warm to the touch.
5. Note the precipitation quantity on the DCP's LCD display. Toggle the bucket assembly one cycle (2 tips). Again read the precipitation quantity on the LCD display. It must be 2 counts greater than before (equivalent to 0.02").
6. Replace the outer cover or collection funnel, bolts or thumbscrews, and screen.

Chapter 14

# 14. Model 6498 Present Weather and Visibility Sensor

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Model 6498-V Visibility Sensor | | ✓ | | ✓ | ✓ | | ✓ | | |
| Model 6498-PV Present Weather Sensor | | | | | | ✓ | | ✓ | ✓ |

The Model 6498 Present Weather and Visibility Sensor consists of a present weather and visibility sensor with a day/night sensor. The standalone models also have an electronics enclosure mounted below the sensor head. Signal and power connections using the *Direct Connect* models go directly to the Model 1192 DCP. The various 6498 Present Weather and Visibility Sensors use the same hardware.

**Standalone Sensors**

- The 6498-V is a Visibility Sensor.
- The 6498-P is a Present Weather Sensor.
- The 6498-PV is used when both Visibility and Present Weather functions are both needed in the AWOS.

***Direct Connect* Sensors**

- The 6498-DC-V is a Visibility Sensor.
- The 6498-DC-P is a Present Weather Sensor.
- The 6498-DC-PV is used when both Visibility and Present Weather functions are both needed in the AWOS.

Note that a Model 6490 Present Weather sensor cannot be used when one of the *Direct Connect* Present Weather/Visibility sensors is connected to the **J6** terminal block of the Model 1192 DCP. If a Model 6490 Present Weather sensor is used, then the Model 6498-V or the Model 8364-E Visibility sensor connected to the **J10** terminal block must be used.

## 14.1 Sensor Siting

*The following are guidelines for installing the Model 6498 Present Weather and Visibility sensor. Please consult FAA order 6560.20B, Siting Criteria for Automated Weather Observing Systems (AWOS), for specific requirements.*

Locate the sensor as far as practical from strobe lights and other modulated light sources. Do not locate it in an area that is subject to localized obstructions to vision (e.g., smoke, dust, etc.). At the same time, it should not be so isolated that it cannot detect more widespread obstructions when they affect visibility in the area of concern.

The sensor should be mounted so that the optics are 10 ft ± 2 ft (3 m ± 0.6 m) above ground or 6 ft (2 m) above the average maximum snow depth, whichever is higher.

*Note that it might not be possible to completely comply with the minimum distance requirements from large obstructions when installing the sensor in an oil rig or rooftop environment. Consult All Weather Inc. for guidance if this appears to be an issue.*

## 14.2 Sensor Installation

There are two stages to the sensor installation, first the sensor head and then for standalone sensors the electronics enclosure. The sensor head and electronics enclosure are mounted to a pole that is installed into a sturdy foundation. (Figure 73)

Only the sensor head is mounted for *Direct Connect* sensors.

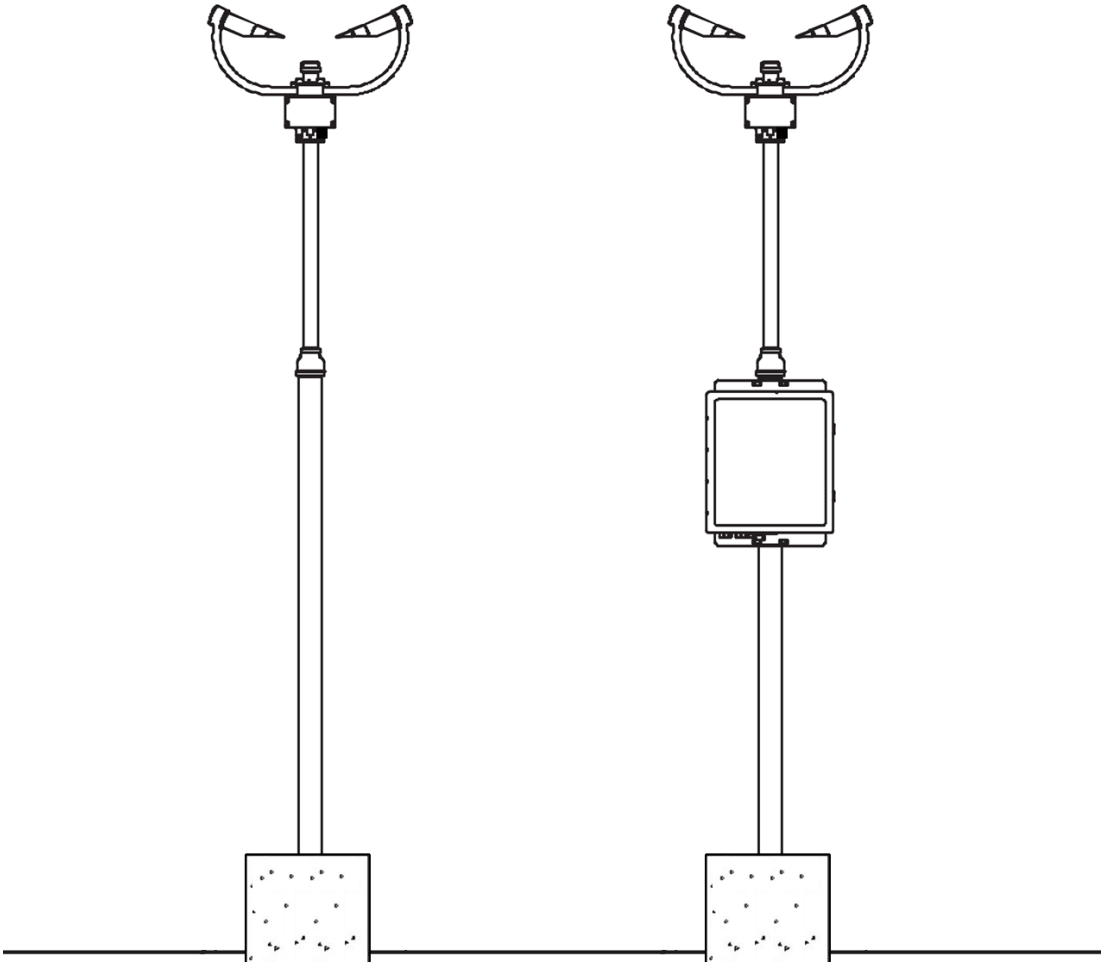


**Figure 73. Stages in Sensor Installation**

Follow the instructions below and refer to Drawing 6498-007 in Appendix A to assemble and install the sensor.

1. Attach the top sensor head clamp as shown in drawing 6498-007 page 1. Align the clamp so that the Sensor head day/night sensor window will face to the North in the Northern Hemisphere and South in the Southern Hemisphere. This is done by rotating the Sensor head as necessary so that the sensor's photoelectric eye faces North or South as required. Tighten the U bolt using the nuts and washers provided.

2. Hook the sensor head with the back plate on to the top bracket as shown. The sensor head will hang on the bracket. Attach and tighten the second U bolt using the nuts and washers provided to the bottom of the sensor head bracket.

   Take care not to overtighten the nuts on the bolts, as it may be possible to distort and/or damage the brackets or DSP plate by doing so, and/or the nuts may seize up. Only tighten the nuts to a degree necessary to hold the 6498 firmly in place.

   Do not reposition the Sensor by forcing the arms of the unit after it has been mounted, as this can cause damage. To reposition the sensor orientation: loosen the nuts for both the top and bottom U bolts, reposition the sensor orientation and then retighten the nuts for both the top and bottom U bolts.

3. Connect the sensor cables to the sensor head and feed the cables down the outside of the mast.

4. Secure the sensor cables to the mast using the cable ties provided. The free end of the cables will either be connected to the electronics enclosure when it is installed (standalone sensors) or they will be routed through the signal conduit to the Model 1192 DCP (*Direct Connect* sensors).

# 14.3 Standalone Sensors

## 14.3.1 Electronics Enclosure Installation

The electronics enclosure for standalone sensors mounts on the mast below the sensor head.

1. Mount the electronics enclosure on the mast with the top of the enclosure 5½ ft (167 cm) from ground level, or at least 3 ft (1 m) above maximum snow level.
2. Two strain reliefs on the bottom of the electronics enclosure must have the collar and the grommet removed to install the sensor head cables. Thread the cable through the collar and then the grommet. Reinstall the grommet and collar in the strain relief with the cable entering the enclosure through the strain relief.
3. Route the cables through the strain relief on the bottom of the electronics enclosure.
4. Connect the sensor cables to the corresponding connectors on the UPCM as shown in drawing 6498-007 page 2. Ensure that the cables are properly wired prior to connecting power to the sensor.
5. Connect the sensor power and data cable to the connection point in the electronics enclosure as shown in the drawing 6498-007 (P1 on UPCM Sensor Maintenance Interface Module):

   SCREEN wire to the point labeled (SHIELD)
   GREEN wire to the point labeled (SGND)
   BLUE wire to the point labeled (D+ / TX)
   WHITE wire to the point labeled (D-)
   BLACK wire to the point labeled (PGND)
   RED wire to the point labeled (12 / 24 VDC)

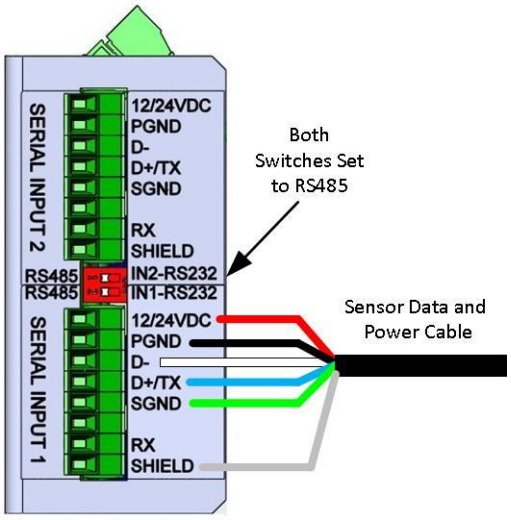



**Figure 74. 6498 Sensor Data and Power Cable Connection**

6. Verify or set the two switches on the UPCM Sensor Maintenance Interface Module to RS-485.

7. Connect the sensor hood heater cable to the connection point in the electronics enclosure as shown in the drawing 6498-007 (P2 24 VAC OUT on the UPCM):

   SCREEN wire to the point labeled (GND)
   BLACK wire to the point labeled (24 VAC OUT-N)
   RED wire to the point labeled (24 VAC OUT-L)

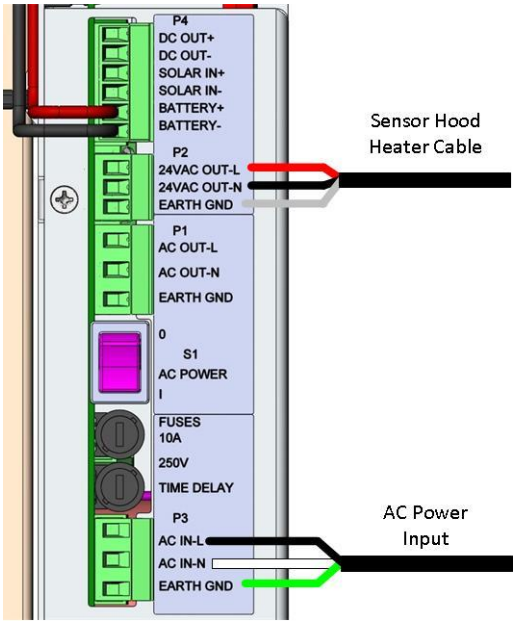



**Figure 75. 6498 Sensor Hood Heater Cable and AC Power Connection**

## 14.3.2 Power Connection

The following steps explain how to connect AC power to the UPCM in the Electronics Enclosure.

1. Route power for the sensor through a conduit or through a 3/8" strain relief installed in one of the two cutouts on the left side on the underside of the electronics enclosure.
2. Turn the AC power (S1) to the off position by pressing on the O side of the switch.
3. Terminate the AC power cable to the connector on P3 on the UPCM as shown in drawing 6498-007 page 2 and drawing 6498-019 page 1. The AC Power connector is supplied with the electronics enclosure.

## 14.4 Ground Cable Installation

In order for the sensor's built-in lightning protection to function properly, the sensor head and electronics enclosure (if present) must be grounded. To install grounding, follow the steps below.

1. Route a 10 ft length of ground cable (4 AWG multi-strand insulated wire, provided with the AWOS as Part Number T605000) from the ground connection on the bottom of the sensor head to the ground connection point at the bottom of the sensor mast.
2. Connect the ground cable to the ground lug on the bottom of the sensor head.
4. Cut the other end of the ground cable to length and connect this end to the ground clamp on the mast.
5. For the electronics enclosure used with standalone sensors, route another 10 ft length of ground cable (4 AWG multi-strand insulated wire, provided with the AWOS as Part Number T605000) from the ground lug on the bottom of the electronics enclosure to the ground clamp at the bottom of the sensor mast.
6. Connect the ground cable to the ground lug on the bottom of the electronics enclosure.
7. Cut the other end of the ground cable to length and connect this end to the ground clamp on the mast.
8. Secure the ground cable(s) to the mast using the cable ties provided.
9. Finally, connect a bare copper ground wire between the ground clamp on the mast and an installed ground rod.

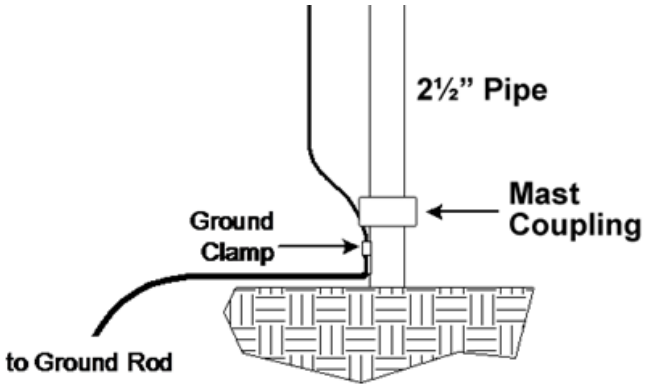



**Figure 76. Grounding**

# 14.5 DCP Signal Connections

## 14.5.1 1190 DCP

The Present Weather and Visibility sensors communicate with the 1190 DCP via an RS-485 serial connection.

1. Connect the data cable (T600503-00) to the Serial Output 1 serial connection point of the UPCM in the Electronics Enclosure as shown in Figure 77:

   BLACK wire to the point labeled (485 D-)
   WHITE wire to the point labeled (485 D+)
   RED wire to the point labeled (SIG GND)

2. Connect the other end of the data cable to the 1190 DCP TB4 terminal block in the DCP enclosure as follows:

   BLACK wire (RS-485 (-)) to TB4, Pin 4
   WHITE wire (RS-485 (+)) to TB4, Pin 3
   RED wire (GND) to TB4, Pin 7

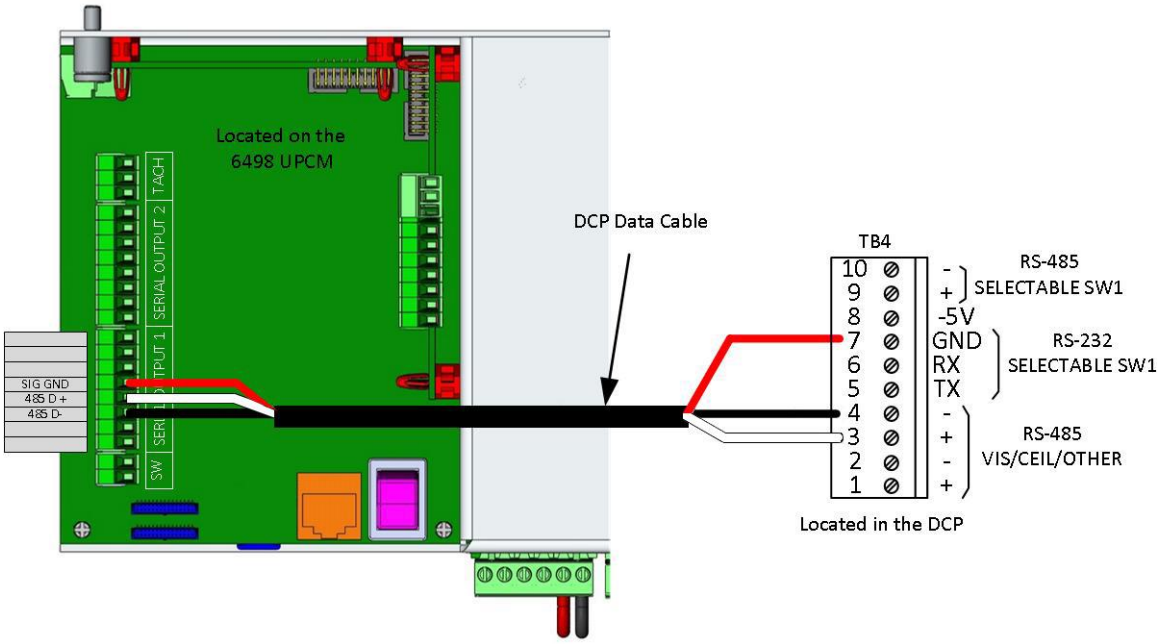



**Figure 77. 6498 Sensor Connection to 1190 DCP**

## 14.5.2 1192 DCP

The Present Weather and Visibility sensors communicate with the 1192 DCP via an RS-485 serial connection.

### *14.5.2.1 Model 6498-P Present Weather Sensor and Model 6498-PV Present Weather and Visibility Sensor*

1. Connect the data cable (T600503-00) to the Serial Output 1 serial connection point of the UPCM in the Electronics Enclosure as shown in 6498-007:

   BLACK wire to the point labeled (485 D-)
   WHITE wire to the point labeled (485 D+)
   RED wire to the point labeled (SIG GND)

2. Connect the other end of the data cable to the COM7 VIS/PWX terminal block (**J6**)on the DCP Sensor Interface Board as follows:

   BLACK wire (RS-485 D-) to Pin 6
   WHITE wire (RS-485 D+) to Pin 7
   RED wire (GND) to Pin 8

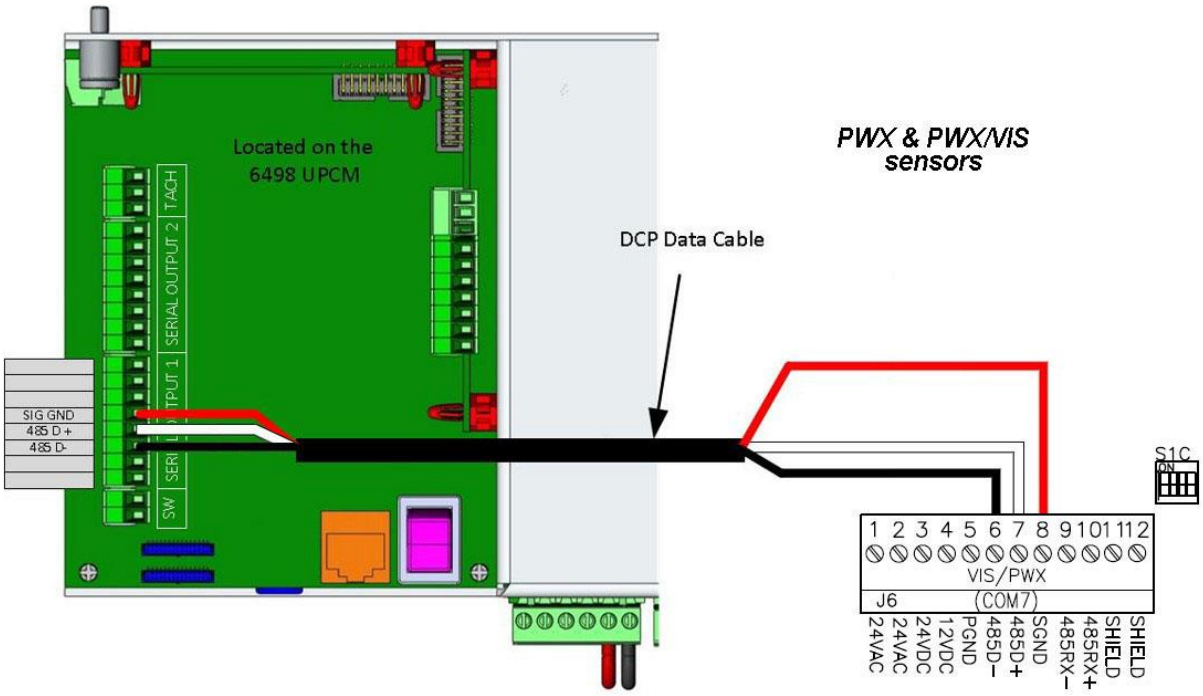



**Figure 78. 6498-P and 6498-PV Sensor Connection to 1192 DCP**

### *14.5.2.2 Model 6498-V Visibility Sensor*

1. Connect the data cable (T600503-00) to the Serial Output 1 serial connection point of the UPCM in the Electronics Enclosure as shown in 6498-007:

   BLACK wire to the point labeled (485 D-)
   WHITE wire to the point labeled (485 D+)
   RED wire to the point labeled (SIG GND)

2. Connect the other end of the data cable to the VIS 8364/5 terminal block (**J10**)on the DCP Sensor Interface Board as follows:

   BLACK wire (RS-485 D-) to Pin 2
   WHITE wire (RS-485 D+) to Pin 1
   RED wire (GND) to Pin 3

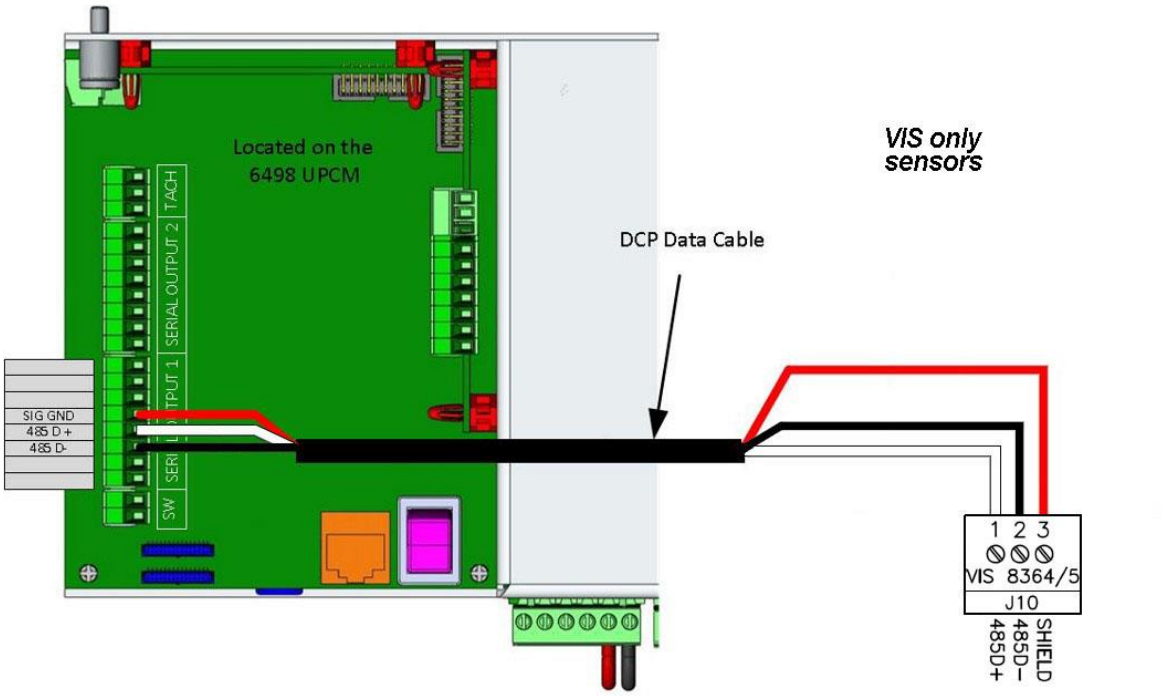



**Figure 79. 6498-V Sensor Connection to 1192 DCP**

### *14.5.2.3 Direct Connect Sensors*

Before proceeding, verify that the power switch on the DCP is turned "OFF."

Route the cables from the sensor to the junction box near the base of the mounting mast. Secure the cables to the mast using tie-wraps or other straps. If the cables are not long enough to route through the signal conduit to the DCP, run separate cables through the conduit and connect them to the cables from the sensor head in the junction box.

Figure 80 summarizes the connections to the Model 1192 DCP.

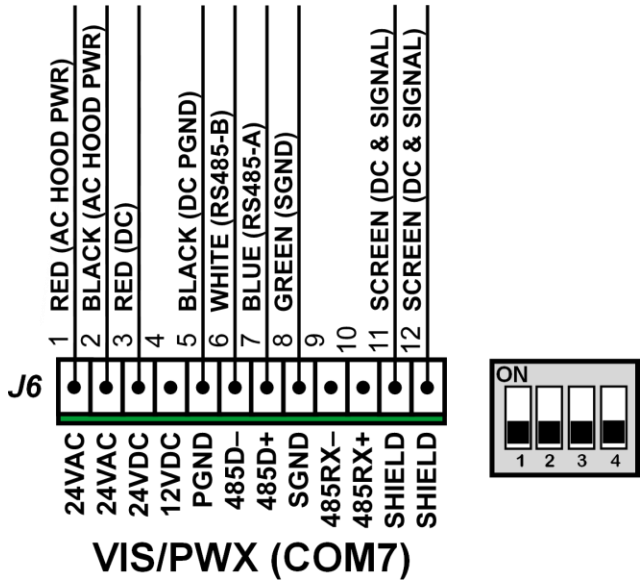



**Figure 80. Model 6498-DC Present Weather and Visibility Sensor Direct Connect Signal and Power Wiring**

# 14.6 Additional Kits

The following sections provide installation instructions for the additional kits available for the 6498.

## 14.6.1 Day/Night Sensor Kit (Part Number M403326-01) Installation

The Day/Night sensor is installed on the underside of the sensor head enclosure and is connected to a connector in the sensor head PCB (see Drawing 6498-003 in Appendix A). The Day/Night sensor is standard with the visibility part of the sensor. The Day/Night sensor is installed at the factory and the present weather and visibility sensor head board is calibrated to the Day/Night sensor.

Align the Day/Night sensor window to North in the Northern Hemisphere and South in the Southern Hemisphere by rotating the complete 6498 Sensor head as necessary so that the Day/Night sensor's photoelectric eye faces North or South as required, with an unobstructed field of view.

The Day/Night sensor is not a field replaceable unit. The sensor head board will require calibration any time the Day/Night sensor is replaced.

## 14.6.2 Battery Backup Kit (Part Number M438130-00) Installation

The Battery Backup Kit is only used to provide battery backup for standalone sensors. The Model 1192 DCP provides battery backup for the *Direct Connect* sensors.

The kit can provide up to 3 hours of operation at temperatures above 0°C. A charging circuit on the control board maintains a full charge on the battery when AC power is present. The battery attaches to the side of the UPCM in the Electronics Enclosure using tie straps.

1. Place the switch next to the Ethernet connector in the off position by pressing on the O side of the switch.
2. Remove the UPCM from the back panel in the electronics enclosure. The cable connectors may need to be disconnected to perform this step.
3. Place the battery on the side of the UPCM next to where the tie strap slots are located. Run the tie straps through the slots and tighten them on the battery.
4. Remove the battery connector P4 from the UPCM.
5. Connect the wires from the battery to battery connector P4 on the UPCM.
    a. RED wire to the point labeled (BATTERY+)
    b. BLACK wire to the point labeled (BATTERY-)
6. Reconnect the battery connector P4 to the UPCM.
7. Re-install the UPCM on the back panel in the electronics enclosure. Reconnect any cable connectors that were disconnected during removal of the UPCM.

**CAUTION**

**Be careful not to touch the battery leads together when connecting or handling the battery!**

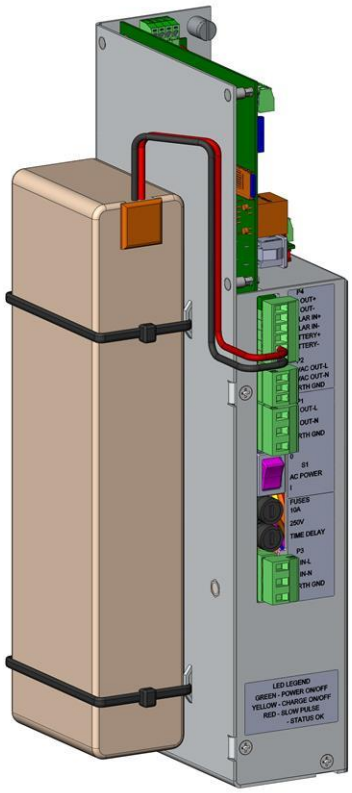



**Figure 81. 6498 Battery Installation**

8. To power the UPCM with the battery, place the switch next to the Ethernet connector in the on position by pressing on the I side of the switch. In the event of a loss of AC power, the backup battery will automatically become the sensor's power source.
9. The backup battery does not power the sensor head heaters, so the sensor performance will be somewhat degraded in cold weather conditions.
10. When moving the electronics enclosure, always disconnect the battery by unplugging the battery power connector from the UPCM.

# 14.7 Checkout

The sensor must be calibrated whenever a 6498 Visibility sensor is replaced. When calibrating, there must be at least 7 miles visibility, and winds should be calm. The calibration paddle is traceable to Air Force Geophysics Laboratory reference transmissometers.

The following resources are required to calibrate the Model 6498 Present Weather and Visibility Sensor.

- Calibration Paddle (Part number M482254-00)
- Calibration Bungs
- Computer with terminal emulation utility such as TeraTerm
- USB A/B cable

## 14.7.1 Visibility Calibration Setup

The 6498 Visibility Sensor is calibrated once it has been installed. This must be performed when there is at least 7 miles visibility with calm wind conditions.

### *14.7.1.1 Standalone Sensors*

This calibration is performed using a laptop with an USB cable connection to the maintenance port on the bottom of the electronics enclosure with an open terminal program.

If the computer being used to perform the calibration has not been used before for this purpose, you must download the USB drivers from https://www.ftdichip.com/Drivers/VCP.htm. Click on the Windows or Mac OS version, depending on the operating system, for the processor architecture on your computer; select the 64-bit architecture if you are unsure. Follow the instructions provided with the driver download to install the driver,

**Currently Supported VCP Drivers:**

| Operating System | Release Date | x86 (32-bit) | x64 (64-bit) |
|---|---|---|---|
| Windows* | 2017-08-30 | 2.12.28 | 2.12.28 |
| Linux | - | - | - |
| Mac OS X 10.3 to 10.8 | 2012-08-10 | 2.2.18 | 2.2.18 |
| Mac OS X 10.9 and above | 2020-08-13 | - | 2.4.4 |

1. Connect one of the computer's USB ports to the Sensor 1 maintenance port on the bottom side of the enclosure (see Figure 33).

2. Identify the COM port related to the USB cable connection on the computer. To identify the COM port related to a USB cable in a computer running Windows 7 or 10, open the Device Manager located in the Control Panel. Go to the Ports (COM & LPT) area and expand the tree. Unplug the USB cable, wait for 30 seconds or so, and then plug the USB cable back in. A communications port will appear in the device manager when the USB cable is connected. This is the communications port directly related to the USB cable.

3. Open a terminal emulation utility such as TeraTerm and select the serial COM port related to the USB cable.

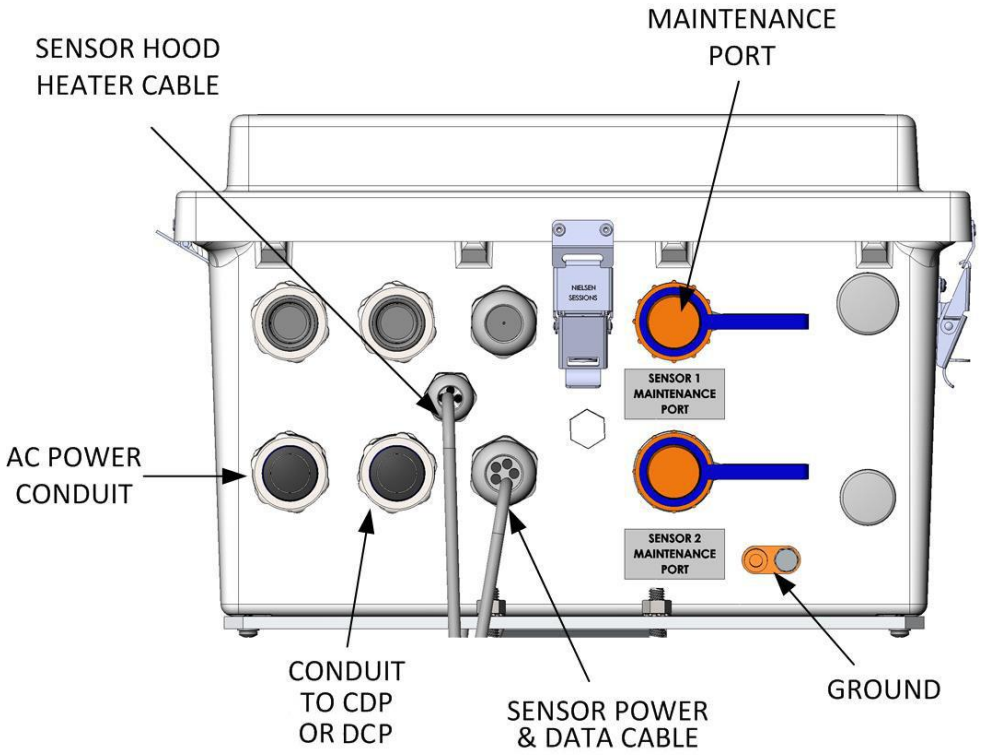
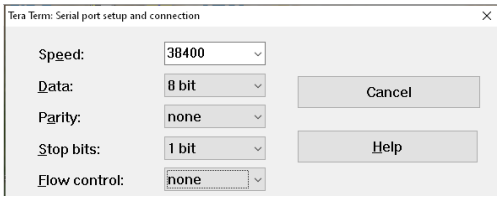



**Figure 82. External Connections at Enclosure Bottom for Standalone Sensors**

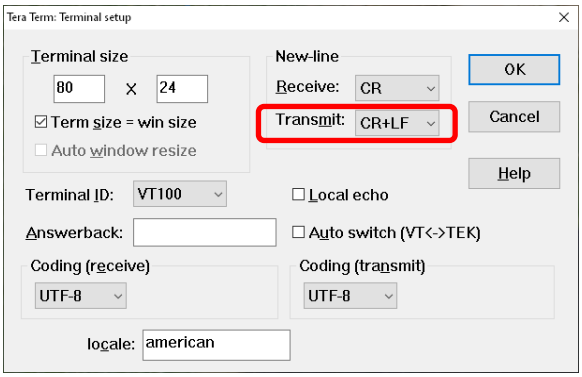
4. Set up the terminal emulation utility serial port as follows.

   Baud Rate: 38400
   Data Bits: 8
   Parity: None
   Stop Bits: 1
   Flow Control: None




5. Click **OK**.

6. Set Transmit in the Terminal Setup to CR+LF. Leave Local echo unchecked.



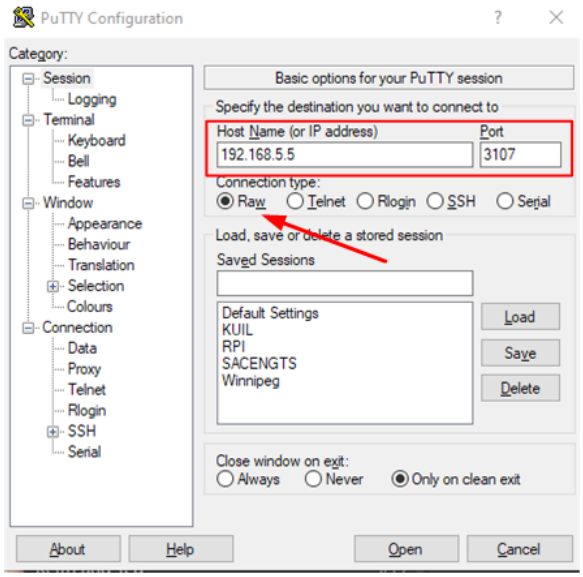

7. Click **OK**. The 6498 setup menu will appear.

### *14.7.1.2 Direct Connect Sensors*

This calibration is performed using a laptop with a CAT 5/6 cable connection to the Ethernet port on the Model 1192 DCP with an open terminal program.

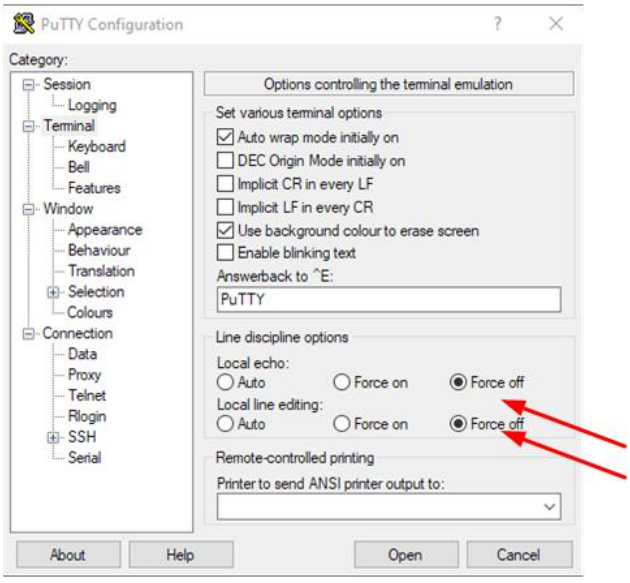
1. Connect a laptop to the DCP using a standard CAT5/6 cable. (Administrator access is required to perform the steps in this procedure.)
2. Navigate to the *Control Panel > Network and Sharing Center* and then click on **Change Adapter** settings.
3. Right-click on the network adapter connected to the DCP and click **Properties**.
4. Select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**.
5. Enter the information shown here.
   IP Address: 192.168.5.20
   Subnet mask: 255.255.255.0
   Default gateway: 192.168.5.1
   DNS information can be left blank.
   Click **OK**.
6. Click **Close**.
7. Open a terminal emulation utility such as Putty on the test computer.

8. Enter 192.168.5.5 for the host name and 3107 for the port. port.




The screenshots were obtained using Putty v 0.71 on a Windows 10 computer. Other terminal emulation utilities and operating systems may be used. Please contact AWI Customer Service for additional assistance if needed.

9. Click on Terminal in the list on the left and set Local echo to **Force off** and Local line editing to **Force off**.




10. Click **Open**. The 6498 setup menu will appear.

### 14.7.2 Visibility Calibration Procedure

The calibration is performed using a laptop with an USB connection.

1. Type the following command in the terminal emulation utility and click **Enter** to access the menus.

   open 0

   Note: The "*0"* corresponds to the Sensor ID number. The sensor ID is always 0 for the 6498 sensor.

2. The setup menu should now be displayed. If the menu does not appear, check the terminal emulation utility settings, then type the command again.

   Note: If the sensor does not answer to "*open 0*", poll all of the other sensor IDs. To poll the other IDs type "*open 1*" press enter, then type "*open 2*" and repeat until you reach "*open 9*". If the sensor answers to a sensor ID other than 0 the sensor ID should be changed to 0. If the sensor ID is set to the wrong ID it will not answer to *open 0*.

```
WELCOME TO THE AWI 6498 SETUP MENU
ID 0
S/N 1003
(1) Message output menu
(2) User alarm menu
(3) Calibrate AWI 6498
(4) Communications setup
(5) System configuration
(9) Exit and save
(0) Exit and don't save
->
```

3. If there is no record of the previous calibration values, and this is not the first calibration being done, type *4* to access the system information and write down the *Scale Change* and the *Offset Change*. Type *0* to return to the main menu.

4. Type *3* to access the calibration menu. The following text should now be displayed.

```
CALIBRATION - MENU 3
ID 0
S/N 1009
(1) Perform calibration
(2) Restore the factory calibration
(3) Perform dirty windows zero offset calibration
(4) Restore dirty windows factory calibration
(9) Refresh
(0) Return to main menu
```

5. Type *1* to start the calibration. You will then be asked to confirm that you would like to perform a calibration.

```
Do you want to perform a calibration Y/N?
```

6. Type *Y* to start the calibration. *You do not have to press return.* Once you have entered yes at this point, you will not be able to exit until the test is complete. However, power cycling the unit at this point will have no adverse effect on the sensor.

7. Once you have started the tests, you will be asked for the calibrator serial number and calibrator constant with a confirmation at each step giving you the chance to correct typing mistakes.

   If the ambient temperature at which the calibration is being performed is not between 0ºC and 50ºC, adjust the calibrator constant, σ, of the calibrator using the following equation, where *T* is the ambient temperature in degrees Celsius, to get $\sigma_T$, the calibrator constant at the current ambient temperature.

$$\sigma_T = \sigma - 0.001(20 - T)\sigma$$

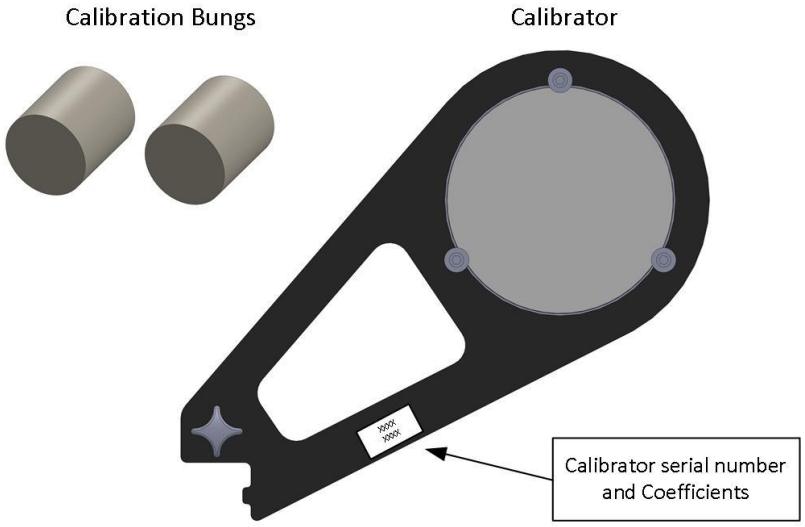



**Figure 83. 6498 Calibration Equipment**

```
CALIBRATION - MENU 3
Starting calibration.
Input the calibrator serial number ->12345
Is 12345 correct? (Y/N)?
Input the calibrator constant ->10000
Is 10000 correct? (Y/N)?
Place one calibration bung into each hood, then
press any key.
```

8. When you have entered the calibrator information, the sensor will wait for you to place the calibration bungs into the sensor hoods. The inserts are designed to block all light from the outside reaching inside the head. Place one insert into each hood. If either of the inserts is damaged or appears to have any gaps around the edge, please contact All Weather Inc.

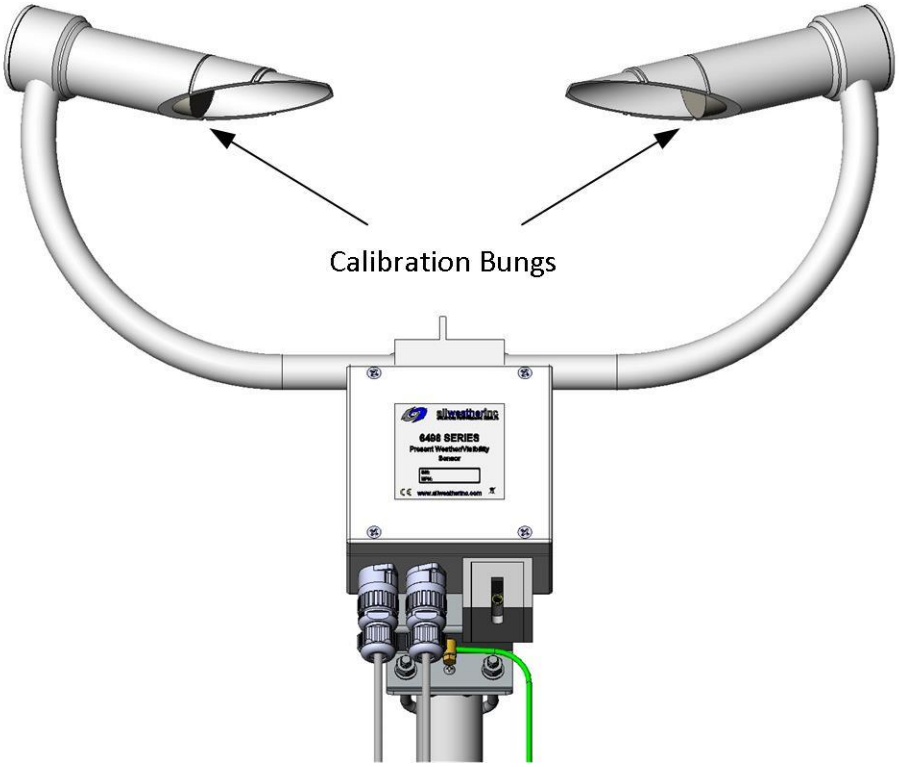



**Figure 84. 6498 with the Calibration Bungs Installed**

9. Press any key once the calibration bungs are in place.

```
Starting dark level calibration.
This test will take approximately two minutes
```

10. This part of the test will take approximately two minutes. Every ten seconds a dot should appear, indicating that the test is progressing as normal. The message below appears once this test has been completed.

```
Dark level test complete. Please remove the bungs.
Now place the calibrator into the sampling volume.
Press any key once this is done.
```

11. Remove the calibration bungs and install the calibrator into the sampling volume by fastening it to the central mounting point as shown in Figure 85.

    *Note that this is also a good time to clean the lenses or at least verify they are clean.*

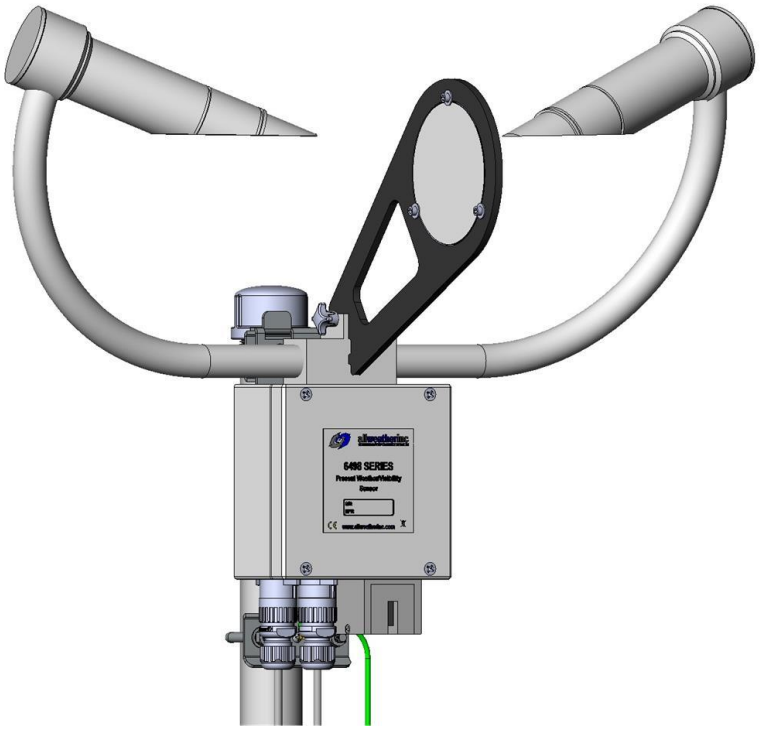



**Figure 85. 6498 with the Calibrator installed**

12. Press any key once the calibrator is in place and the lenses are clean.

```
Starting light level calibration.
This test will take approximately two minutes.
```

13. This part of the test will take approximately two minutes. Every ten seconds a dot should appear, indicating that the test is progressing as normal. The message below appears once this test has been completed.

```
Calibration is now complete.
Saving user settings
Press any key to exit.
```

14. Press any key to exit.

15. Once the test has been completed, the new calibration values are saved automatically. Both the factory and the saved calibration values can be viewed from menu item 4 from the main menu once the test is completed.

```
AWI 6498 INFORMATION - MENU 4
 ID 0
 S/N 3051
 OS version: 007648v3
                        Alarm   Value
- Last visibility reading:      -      63004M
- Overall system status:        0      No faults
.
.
.
- AWI 6498 Calibrator Serial No: -      2000
- AWI 6498 Calibrator Constant:  -      23.7
- Calibration value Fac offset:  -      -0.004
- Calibration value Fac scale:   -      0.02099
- Calibration value Cal offset:  -      -0.004
- Calibration value Cal scale:   -      0.02099
.
.
.
(8) Get debug
(9) Refresh
(0) Return to main menu
->
```

16. View and record the new saved calibration values if needed for analysis or for an inspection record.

17. Remove the calibrator, close the terminal emulation utility, and disconnect the computer. If you had to remove a cover to access the maintenance port, replace the cover.

### *14.7.2.1 Analyzing the Calibration Values*

Calibration values are analyzed by comparing them with the values recorded previously or with the factory values if the calibration is being done for the first time.

$$Scale\ Change = \frac{Old\ Scale\ Value - New\ Scale\ Value}{Old\ Scale\ Value} \times 100\%$$

$$Offset\ Change = New\ Offset\ Value - Old\ Offset\ Value$$

#### Validity

Determine whether the saved calibration values are valid.

1. The calibration is valid if the *Scale Change* is less than 3% and the *Offset Change* is less than 0.05.

2. Record the *Scale Change* and the *Offset Change* and repeat the calibration if either the *Scale Change* or the *Offset Change* is greater than these values.

3. Check the following before repeating the calibration.
    a. Verify the lenses have been cleaned
    b. Verify visibility is > 10 km
    c. Verify that the calibrator constant, σ, has been corrected for temperature if the outside temperature is not between 0ºC and 50ºC
4. Repeat the calibration and check whether the new calibration is valid using the *Scale Change* and the *Offset Change* recorded in Step 2 as the old values in the change equations.
5. Record the *Scale Change* and the *Offset Change* values used to determine validity if needed for an inspection record.

### 14.7.3 Day/Night Sensor Checkout

Check the Day/Night sensor operation.

1. During daytime, set the DCP's LCD display to show the Day/Night status.
2. Verify that the display shows the sensor is reading "Day."
3. Cover the Day/Night lens with an opaque material. Within 5 minutes, the Day/Night status should switch to the "Night" state.
4. Uncover the Day/Night lens, and verify that the Day/Night status switches back to the "Day" state.

## 14.7.4 Battery Backup Checkout for Standalone Sensors

Check the Battery Backup operation.

1. Turn the AC power switch off by pressing on the O side of the switch. The power switch is located on the UPCM as shown in Figure 86.
2. Verify that the "Status" LED continues to blink approximately once per second. The "Status" LED location is shown in Figure 87.
3. Turn the AC power switch back on by pressing on the I side of the switch.

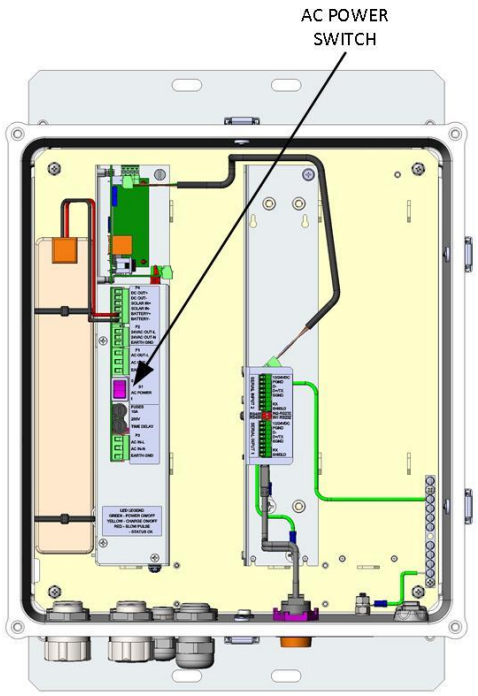



**Figure 86. Present Weather and Visibility Sensor AC Power Switch**

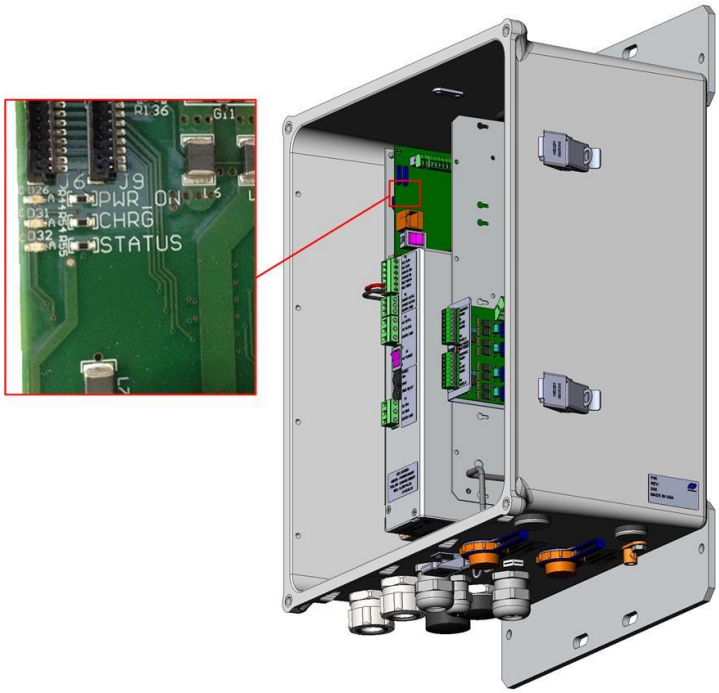



**Figure 87. Present Weather and Visibility Sensor Power and Status LEDs**

Chapter 15

# 15. Vaisala Present Weather and Visibility Sensor

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| PWD22 Present Weather Sensor | | | | | | ✓ | | ✓ | ✓ |

*The Vaisala. PWD22 Present Weather and Visibility Sensor may be used instead of the Model 6498-PV Present Weather and Visibility Sensor.*

## 15.1 Installation

Refer to the ***M211506EN-D-Installation Manual*** for complete details on the installation of this sensor.

- DRW239628-A and DRW239704 provide the installation details for the Vaisala. PWD22 Present Weather and Visibility Sensor.

## 15.2 1192 DCP Wiring

The **J6** terminal block is used to connect the PWD22-CFG06 Present Weather/Visibility sensor to the Model 1192 DCP. The DIP switches at position S1C are set up for RS-232 as shown in Figure 88. Refer to the ***Model 1192 Data Collection Platform User's Manual*** for additional information.

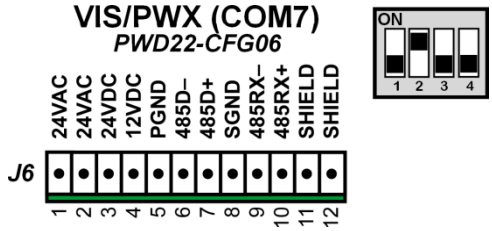



**Figure 88. COM7 PWD22 Visibility/ Present Weather Sensor Pinout**

*Terminal Block Wiring Summary*

- WHITE/GREEN and BROWN/GREEN wires (HEATER 24 VAC) to Pin 1
- WHITE/YELLOW and YELLOW/BROWN wires (HEATER RTN) to Pin 2
- RED wire (+24 VDC) to Pin 3
- BLACK wire (power GND) to Pin 5
- YELLOW wire (RS-232 Rx) to Pin 6
- GREEN wire (RS-232 Tx) to Pin 7
- GREY wire (RS-232 GND) to Pin 8
- SHIELD wire (SHIELD) to Pin 11

# 15.3 Day/Night Sensor

The Model M403572-00 Day/Night sensor must be used with the Vaisala PWD22 PWD22-CFG06 Present Weather/Visibility sensor and the Model 1192 DCP.

## 15.3.1 Installation

Mount the Model M403572-00 Day/Night to a Unistrut on the tower or H frame as shown in Figure 89. The sensor must be oriented so that the photodetector is facing North.

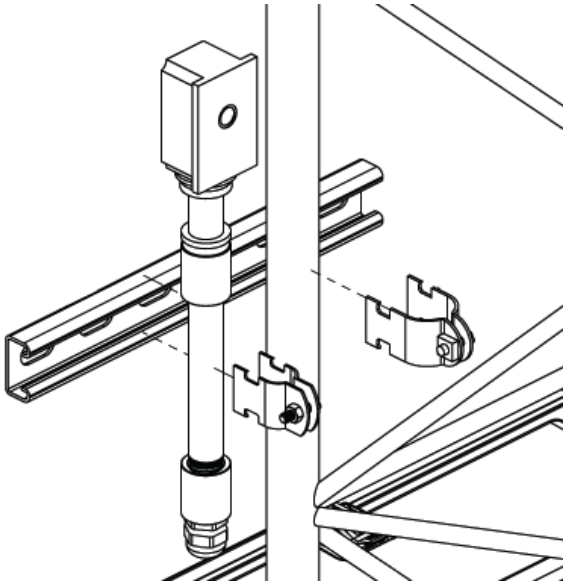


**Figure 89. Model M403572-00 Day/Night Sensor Installation**

## 15.3.2 1192 DCP Wiring

The **J15** terminal block is used to connect the M403572-00 Day/Night sensor to the Model 1192 DCP.

*Terminal Block Wiring Summary*

- RED wire (+24 VDC) to Pin 5
- BLACK (GND) wire to Pin 2
- GREEN wire (NTC GND) to Pin 4
- WHITE wire (NTC) to Pin 3
- BARE wire (SHIELD) to Pin 7

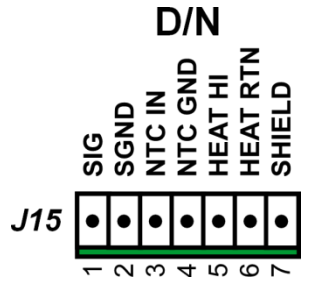



**Figure 90. Day/Night Pinout**

Chapter 16

# 16. Model 8339 Ceilometer

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Model 8339-FAA Ceilometer | | | | | ✓ | ✓ | ✓ | ✓ | ✓ |

## 16.1 Unpacking

The 8339 Ceilometer is a precision optical/electronic instrument and should be handled with extreme care at all times.

When the equipment is received, check that all parts listed on the packing slip are accounted for, and inspect the equipment for visible transport damage. Report any damage or discrepancies to All Weather, Inc. Customer Service.

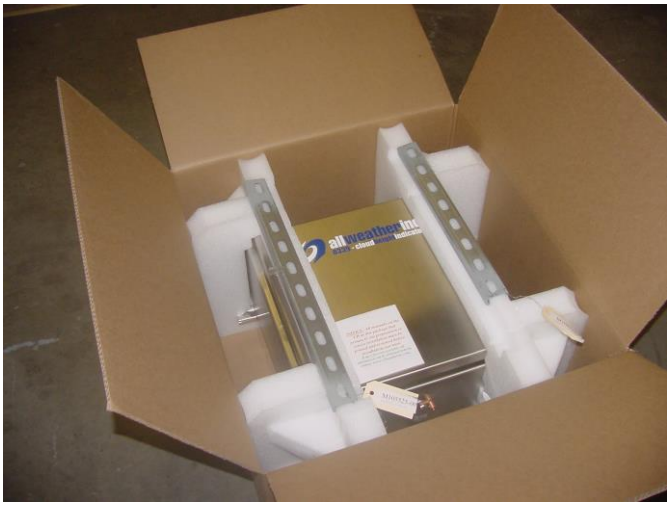



**Figure 91. Ceilometer in Shipping Container**

**CAUTION**

**The equipment must be kept dry and not exposed to temperatures below -50°C or above +70°C during shipment and storage.**

# 16.2 Installation

The 8339 must be firmly mounted to a vertical 2½" mast for proper operation. Any movement of the 8339 arising from wind or other causes will reduce the accuracy of the Ceilometer. The Ceilometer should be installed in an open area away from trees, buildings, or other obstructions. When installing the Ceilometer on its pole, orient it with the windows facing toward the North (South in the Southern Hemisphere) to reduce the amount of direct sunlight on the windows (see Figure 92).

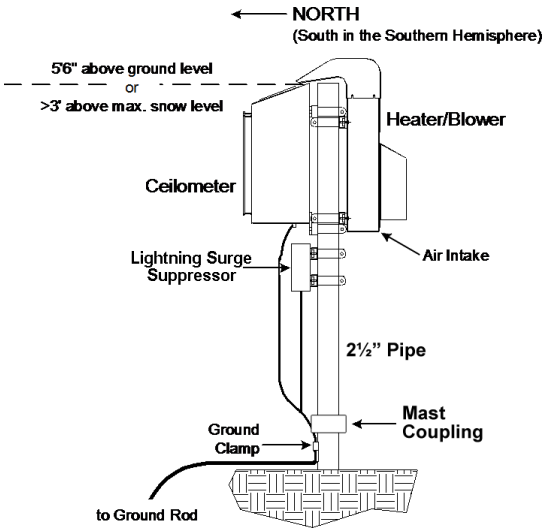



**Figure 92. Ceilometer Installation**

## 16.2.1 Mechanical Mounting

### *16.2.1.1 Ceilometer*

The Ceilometer mounts on the mast using the M488261-00 mounting kit. The pole should be of sufficient height that its top is 5'8" (170 cm) above the ground level, or to allow at least 3 ft (1 meter) clearance above the maximum snow level.

1. Install the Ceilometer DIN rails on the 2½" mast using the U clamps so the Ceilometer will be on the North side of the mast (South side of the mast in the Southern Hemisphere). The longer top rail should be about 2" (5 cm) below the top of the mast. The shorter bottom rail is about 16½" (42 cm) center to center below the top rail.
2. The bottom mounting tabs on the Ceilometer enclosure are slotted. Start installing the mounting nuts, bolts and washers in the bottom DIN rail until they are almost completely installed. Then position the Ceilometer enclosure over the bottom bolts and finish securing them loosely.
3. If necessary, adjust the top DIN rail, then secure the top mounting tabs of the Ceilometer enclosure with nuts, bolts, and washers.
4. The top of the Ceilometer should extend about 2" (5 cm) above the top of the mast. Once you are satisfied with the symmetry of the Ceilometer enclosure, tighten all the nuts and bolts securely.

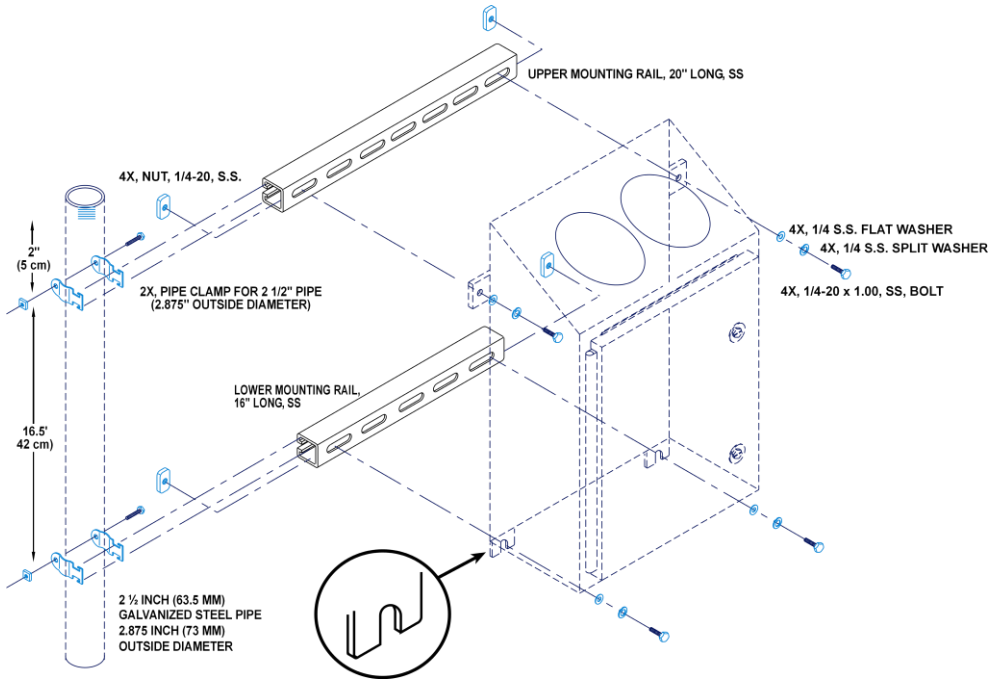


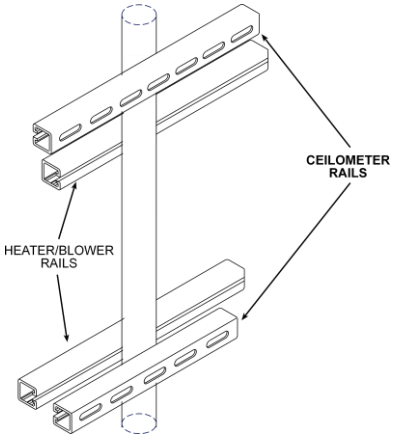

**Figure 93. Ceilometer Installation**

### *16.2.1.2 Ground Cable*

In order for the Ceilometer's built-in lightning protection to function properly, the ceilometer must be grounded. To install grounding, follow the steps below (see Figure 92).

1. Connect one end of a length of ground cable (4 AWG multi-strand insulated wire, available from All Weather, Inc. as Part Number T605000) to the grounding clamp on the mast.
2. Connect the other end of the ground cable to the ground clamp on the underside of the Ceilometer.
3. Secure the cable at 12" (30 cm) intervals with cable ties.

### *16.2.1.3 Heater/Blower*




The Heater/Blower mounts on the mast using the supplied Unistrut and clamps.

1. Mount the Heater/Blower on the mast as shown in installation drawing 83396-00-007 in Appendix A.
2. Note that the Heater/Blower installs so that its mounting brackets fit between the Ceilometer's mounting brackets. That is, the Heater/Blower's top bracket installs directly **beneath** the Ceilometer's top bracket, and its bottom bracket installs directly **above** the Ceilometer's bottom bracket.

3. Install the blower hood onto the blower unit: The screws are already installed into the blower unit; loosen the screws and slide the blower hood onto the screws. Tighten the screws.

### 16.2.2 Ceilometer Lightning Surge Suppressor (1190 DCP only)

1. Remove the cover from the Lightning Surge Suppressor.
2. Strip off about ¼" of insulation from one end of the ground wire included with the Lightning Surge Suppressor and route the green ground wire with an orange stripe through the gland to one of the ground terminal blocks as shown in Figure 94. Tighten the screw to hold the ground wire in place.

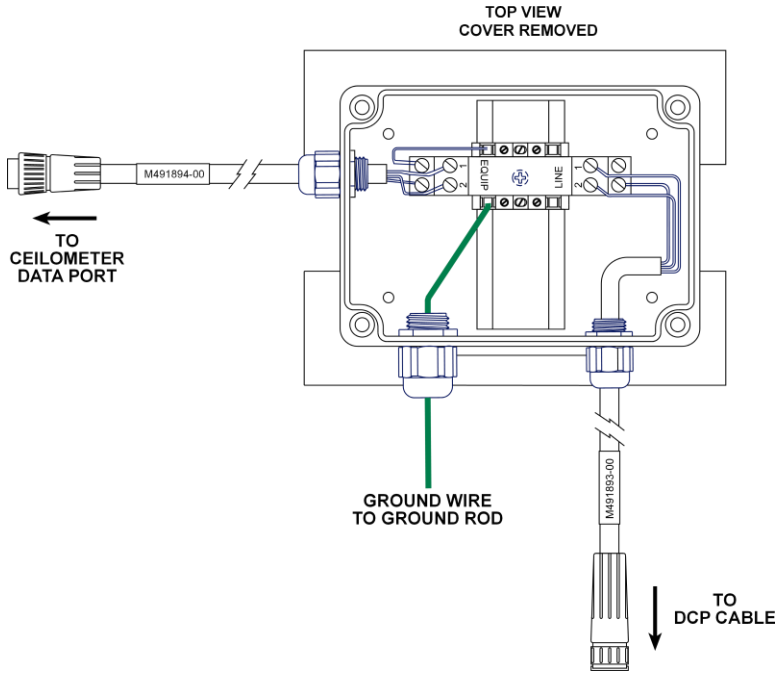



**Figure 94. Connect Ground Wire to Terminal Block Inside Lightning Surge Suppressor**

3. Replace the cover on the Lightning Surge Suppressor.
4. Mount the Lightning Surge Suppressor on the mounting pipe blow the Ceilometer using the mounting clamps to secure the Unistrut to the mounting pipe as shown in Figure 95.
5. Route the ground wire along the mounting pipe to the ground clamp near the bottom of the mounting pipe. Cut the end of the ground cable to length and connect this end to the ground clamp.

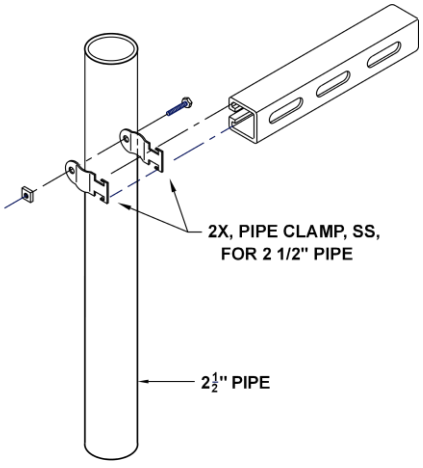



**Figure 95. Mount Lightning Surge Suppressor with Unistrut and Pipe Clamps**

### 16.2.3 Ceilometer Data Connection

1. Connect the M491894-00 cable from the Lightning Surge Suppressor (Figure 94) to the CEILOMETER DATA connector on the underside of the Ceilometer (see Figure 96).

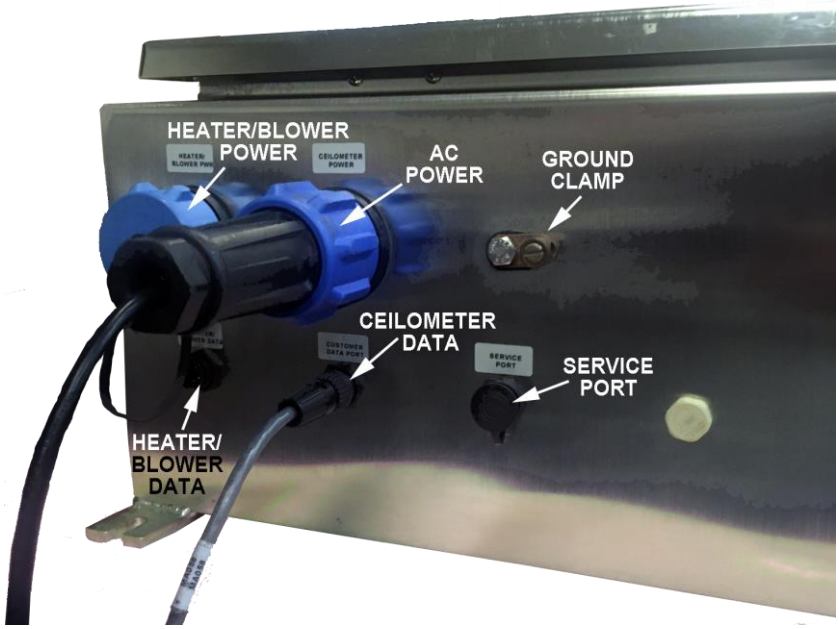



**Figure 96. Ceilometer Connectors**

2. Connect the data cable's circular connector to the M491893-00 cable connector from the Lightning Surge Suppressor (Figure 94).
3. Route the data cable neatly down the side of the mast to the signal junction box near the bottom of the mast. Secure the cable at 12" (30 cm) intervals with cable ties.
4. Insert the data cable through a compression fitting into the signal junction box and pull the data cable through the signal conduit to the Data Collection Platform (DCP).
5. Connect the other (unterminated) end of the cable inside the DCP as follows:
    a. 1190 DCP
        i. Connect the green wire to terminal block TB4, pin 3
        ii. Connect the brown wire to terminal block TB4, pin 4.
        iii. Connect the black wire to terminal block TB4, pin 7.
    b. 1192 DCP
        i. Connect the white wire to COM9 CHI (**J22**) terminal block Pin 1
        ii. Connect the black wire to COM9 CHI (**J22**) terminal block Pin 2.
        iii. Connect the green wire to COM9 CHI (**J22**) terminal block Pin 3.
        iv. Connect the shield to COM9 CHI (**J22**) terminal block Pin 4.
6. Connect one end of a length of ground cable (4 AWG multi-strand insulated wire, available from All Weather, Inc. as Part Number T605000), to the grounding clamp on the underside of the Ceilometer (Figure 96) and route the ground cable along the

mounting pipe to the ground clamp near the bottom of the mounting pipe. Cut the end of the ground cable to length and connect this end that ground clamp.

7. Secure the Lightning Surge Suppressor and the Ceilometer ground cables to the pipe using the cable ties provided.

8. Check that the contractor provided a ground connection from the pipe to the ground rod. If not, that will have to be done using de-ox grease on the below-ground connections.

#### *16.2.3.1 Heater/Blower Power Connection*

Connect the Heater/Blower's power cord to the HEATER/BLOWER POWER connector on the underside of the Ceilometer.

#### *16.2.3.2 Heater/Blower Data Connection*

Connect the Heater/Blower's data cable to the HEATER/BLOWER DATA connector on the underside of the Ceilometer.

#### *16.2.3.3 Desiccant*

The desiccant package (M028179-00) is secured inside the Ceilometer by tie-wraps. If the desiccant has not yet been removed from its plastic bag, remove and discard the plastic bag, then replace the desiccant package in its tie-wrap holder. Figure 97 shows the desiccant bag at the upper left corner near the optical module. The desiccant may also be placed in the lower right area of the Ceilometer enclosure with the indicator paper above the desiccant to be readily visible.

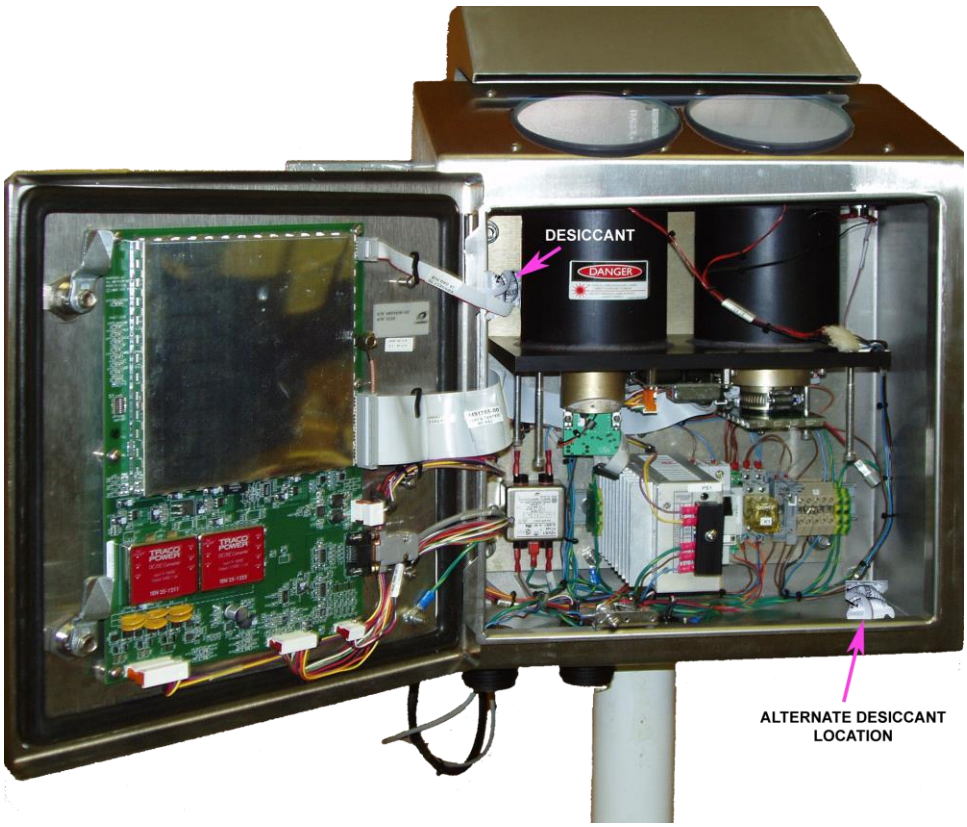



**Figure 97. Desiccant Installation**

### *16.2.3.4 Final Steps*

1. Ensure that the circuit breaker on the power supply is in the "ON" position.
2. Verify that the DIP options switch S1 on the data acquisition board is configured for **8339 Native Format** (Switches 1 and 2 ON).

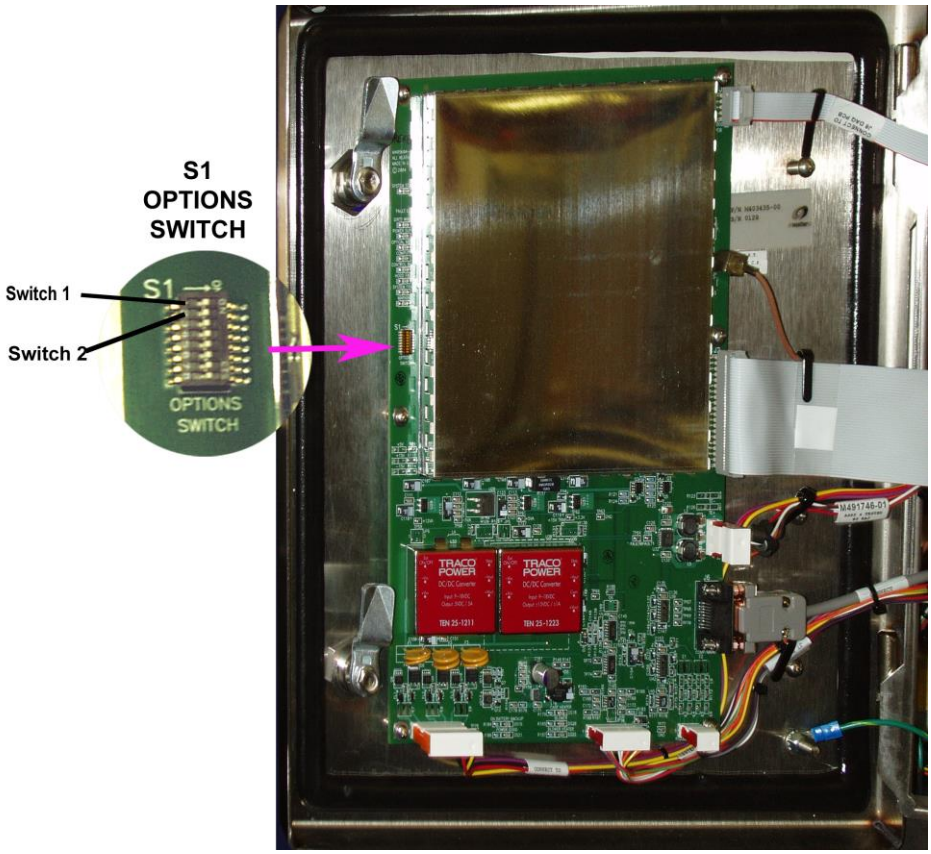



**Figure 98. Data Acquisition Board S1 DIP Options Switch**

3. Close and fasten the enclosure door.

### 16.2.4 Ceilometer Power Connection

**WARNING**

**Ensure that the circuit breaker for the Ceilometer in the main power distribution box is in the OFF position when making power connections.**

1. Set the main circuit breaker in the 8339 to the OFF position (see Figure 99).

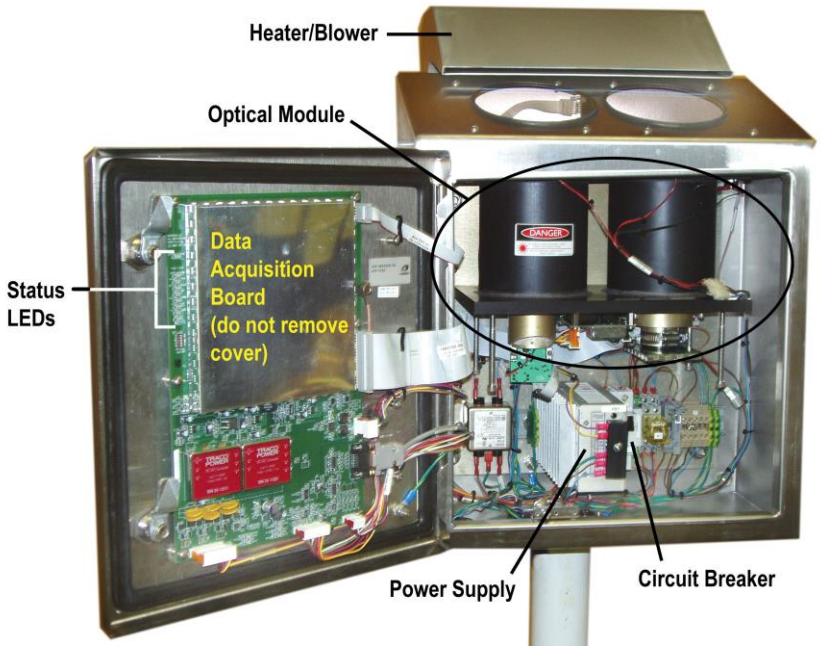



**Figure 99. Ceilometer Components**

2. Connect the power cord's circular connector to the INPUT POWER connector on the underside of the Ceilometer (see Figure 96).

3. Route the power cable neatly down the side of the mast to the electrical junction box near the bottom of the mast. Secure the cable at 12" (30 cm) intervals with cable ties.

   *Ensure the power cord is routed into the electrical junction box through a compression fitting to prevent water from getting inside the junction box.*

4. The site preparation contractor should already have installed electrical wiring from the breaker box to the junction box near the bottom of the mast. Connect the unterminated end of the cable to the AC source in the junction box according to the wiring diagram in Figure 100.

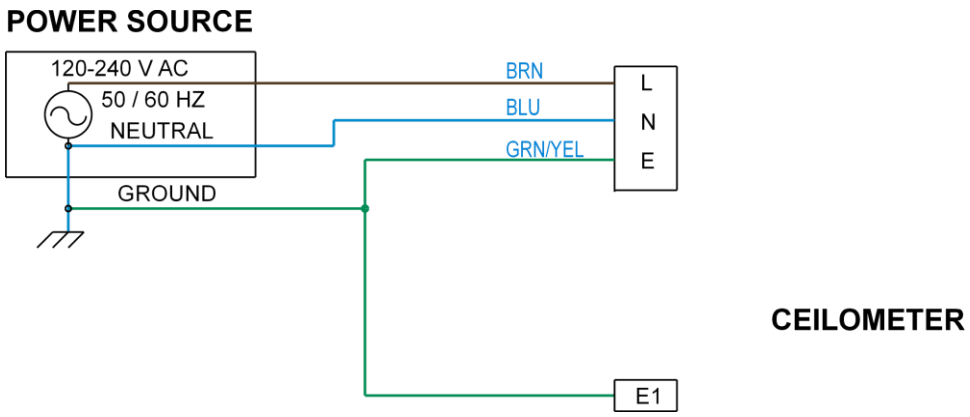



**Figure 100. Ceilometer External AC Power Connections**

## 16.3 Checkout

1. Check blower operation by covering the receiver window with an opaque object (such as a sheet of paper) and verifying that the blower turns on. This may take up to 30 seconds.
2. Verify that that the Ceilometer is communicating properly with the DCP and that there are no status errors. Using the keypad and LCD display screen located inside the DCP enclosure, use the * and # keys on the keypad to move through the screens—press the # key to move to a higher numbered screen, or press the * key to move to a lower numbered screen. Screens 20–22 provide Ceilometer data.

Chapter 17

# 17. Vaisala Ceilometers

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| CL31-CFG01/CT25K Ceilometers | | | | | ✓ | ✓ | ✓ | ✓ | ✓ |

*The Vaisala. CL31-CFG01 or CT25K Ceilometer may be used instead of the Model 8339-FAA Ceilometer.*

## 17.1 Installation

Refer to the ***M211506EN-D-Installation Manual*** for complete details on the installation of this sensor.

- DRW231012-A provide the installation details for the Vaisala. CL31-CFG01 and CT25K Ceilometers.

## 17.2 1192 DCP Wiring

The **J22** terminal block is used to connect the CL31-CFG01 and CT25K Ceilometers to the Model 1192 DCP using an RS-232 serial connection. Figure 102 shows the wiring for the Vaisala CL25K and CL31 Ceilometers used to connect them to **J22** (COM9).

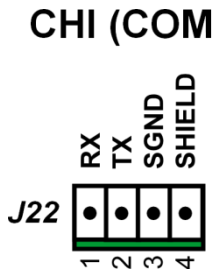



**Figure 101. COM9 Ceilometer Pinout**

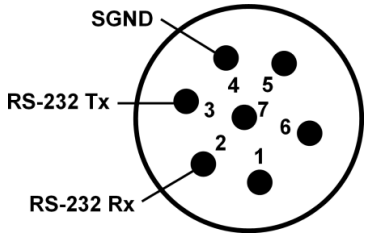



**Figure 102. CL25K and CL31 Ceilometer Wiring**

Chapter 18

# 18. Model 6500 Thunderstorm/Lightning Sensor

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Model 6500 Thunderstorm Detector | | | | | | | ✓ | ✓ | ✓ |

## 18.1 Overview

The Thunderstorm/Lightning sensor package (consisting of an antenna mounted to a 28" x 32" ground plane and a processor housed in a NEMA 4X enclosure) mounts to a 2½" mast (2.875" O.D.) using two U-bolts. A section of 2.5" (64 mm) I.D. standard galvanized steel mast can be used as a mast with no drawbacks or special adaptation. Refer to the site preparation instructions and applicable drawings for foundation, grounding, conduit, and junction box installation details.

**CAUTION** **The Thunderstorm/Lightning sensor's ground plane extends well beyond the edges of the sensor enclosure. Be aware of this hazard when working around the sensor.**

## 18.2 RFI/EMI Precautions

The Thunderstorm/Lightning sensor's antenna is sensitive to static charges, so exercise care to ensure that the antenna and ground plane are as far removed as possible from composite materials (e.g., plastic materials or fiberglass), since these materials have a tendency to build up static charge.

The sensor should be mounted as far as possible from devices that emit high levels of radio frequency interference (RFI) and electromagnetic interference (EMI), such as VHF and UHF radios, RF modems, fluorescent lamps, and ballasts, air conditioner and heater blowers, as well as any current-carrying cables. General clearance guidelines are:

- Strobe lamps and power supplies - 5 ft (1.5 m)
- Fluorescent lamps and ballasts - 5 ft. (1.5 m)
- Air conditioners and heater blowers - 5 ft. (1.5 m)
- Telephone antennas - 4 ft. (1.2 m)
- VHF communication antennas - 1 ft. (0.3 m)
- Any current-carrying cable - 2 ft. (0.6 m)

In addition to the above restrictions, certain site installations may have to be scrutinized more carefully from an RFI/EMI perspective. Finding locations to mount the ground plane and antenna that will minimize interference from RFI/EMI sources can be enhanced by the use of standard RFI measuring equipment. The recommended equipment for monitoring the proposed installation area is a typical spectrum analyzer with a broadband conical antenna. The spectrum analyzer should be set up to scan the frequencies of concern (100-500 MHz) for the typical VHF and UHF radio links near the installation.

Once it has been determined that there is significant interference, it is imperative that the lightning sensor be moved to a location as far from the interfering device as possible. *Under no circumstances should the lightning sensor antenna and ground plane be placed within one foot of either a VHF or UHF transmitting antenna*.

*Note that it might not be possible to completely comply with the minimum distance requirements from significant RFI sources when installing the sensor in an oil rig or rooftop environment. Consult All Weather Inc. for guidance if this appears to be an issue.*

## 18.3 Sensor Installation

The Thunderstorm/Lightning sensor is mounted on a mast that was installed during site preparation. All the mounting hardware comes with the Thunderstorm/Lightning sensor, and so there is no separate mounting kit.

1. If the signal and power cables have not already been installed between the signal and power distribution boxes and the sensor pad, pull the required lengths of cable through conduit to the junction boxes at the sensor pad.
2. The mounting bracket attaches to the underside of the 6500 enclosure with 4 bolts (see Figure 103). Position the bracket against the underside of the enclosure so that the mounting holes in the bracket and enclosure align.
3. Apply RTV 162 to the threads of the four 5/16" hex mounting bolts.
4. Fasten the bracket to the enclosure with the four 5/16" hex bolts, flat washers, and lock washers.
5. Tighten the bolts.

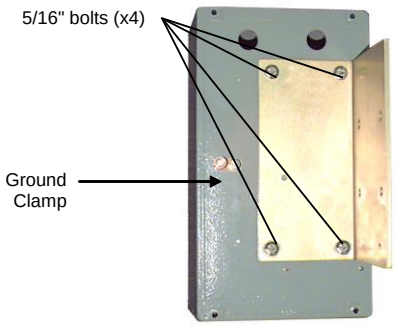



**Figure 103. Bracket Installation**

6. Set the sensor package (antenna, ground plane, enclosure, and bracket) on the mast, and fasten loosely with two U-bolts, lock washers, and flat washers as shown in Figure 104.

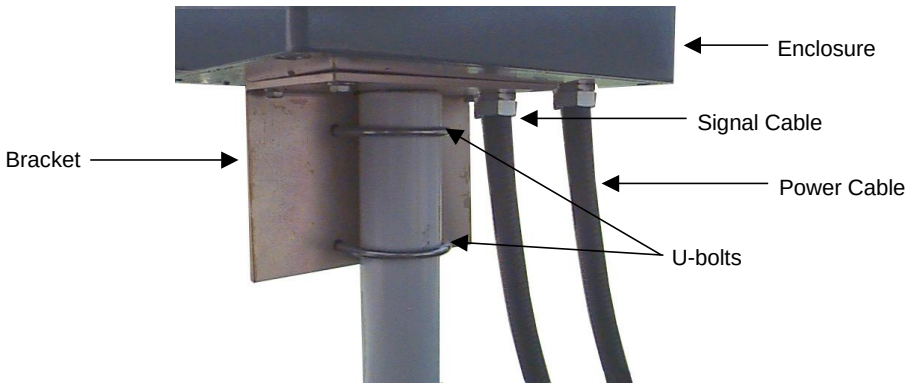



**Figure 104. Sensor Package Mounting**

*The power cable shown above is not used with the Model 6500-DC Thunderstorm/Lightning Detector where the low-voltage DC line shares the conduit with the signal line.*

7. Align the antenna to magnetic north by holding a straightedge compass against the ground plane (with the compass's North index oriented in the same direction as the **N** on the ground plane) and turning the entire sensor package until the compass indicates North.

   *Keep in mind that a magnetic compass can be influenced by the metal in the sensor and the mounting pipe, and should be held away from the sensor to minimize this influence.*

8. Tighten the two U-bolts.

9. Open the sensor enclosure by loosening the four countersunk bolts shown in Figure 105. ***Do not remove*** the six bolts holding the ground plane to the enclosure lid.

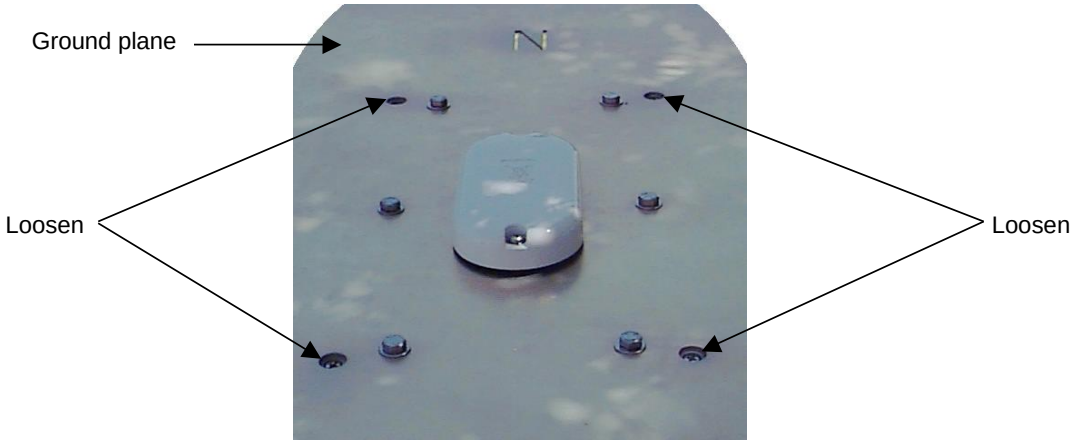



**Figure 105. Opening the Sensor Enclosure**

10. The sensor enclosure lid is equipped with hinged bolts (see Figure 106) to allow the box to be opened with the ground plane attached. Grasp both sides of the ground plane and lift straight up as far as possible (about 3"), then tilt the ground plane and lid over carefully to gain access to the enclosure interior. When fully open, the ground plane will rest against the side of the enclosure.

**Figure 106. Enclosure hinges**

11. Route the signal and power cables from their junction boxes through flex conduit(s) to the sensor.

### Model 6500 Thunderstorm/Lightning Sensor

12. Connect the signal wires to the interface board inside the enclosure (Figure 107) according to Table 7.
13. Connect the incoming AC power wires to the AC interface board inside the enclosure (Figure 107) according to Table 7.

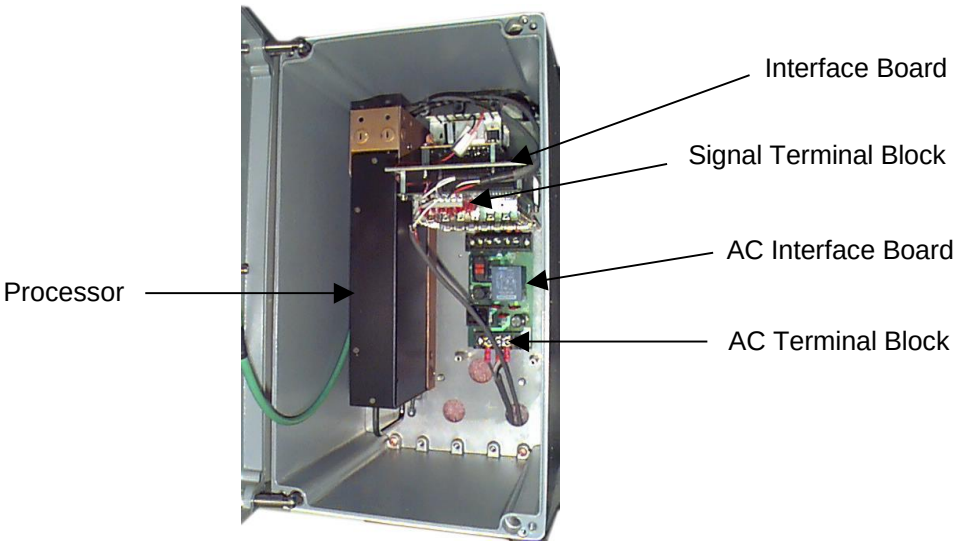



**Figure 107. Thunderstorm/Lightning Sensor AC Interface Board**

## Model 6500-DC Thunderstorm/Lightning Sensor

*The Model 6500-DC Thunderstorm/Lightning Detector was designed for* Direct Connection *to the Model 1192 DCP.*

14. Connect the power and signal wires to the terminal blocks inside the enclosure according to Figure 108.

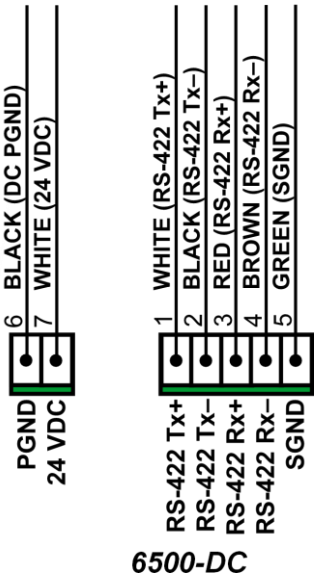



**Figure 108. Summary of Model 6500-DC Connections**

15. Close the enclosure lid and tighten the four countersunk bolts.
16. Fasten a ground wire between the ground cable installed during site preparation and the ground clamp on the underside of the enclosure (see Figure 103).

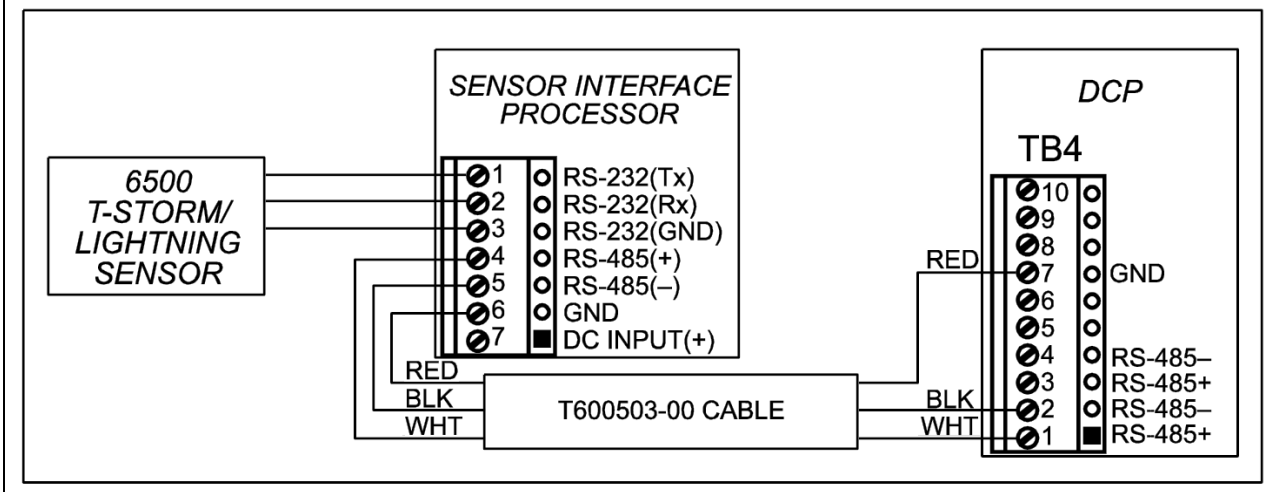
17. Connect the signal wires.

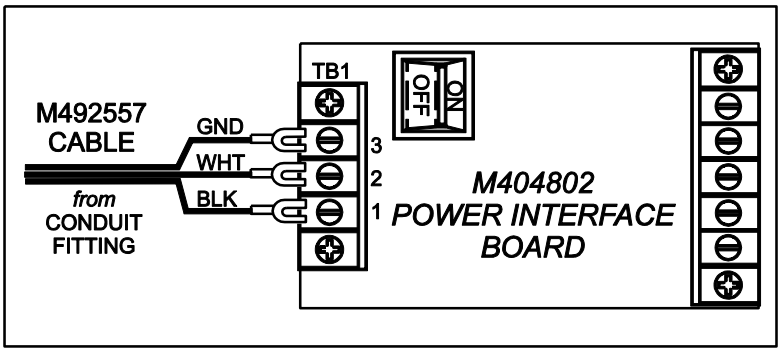
    a. For the 1190 DCP, connect the signal wires according to Table 7.

**Table 7. Thunderstorm/Lightning Sensor Signal and Power Wiring 1190 DCP**

| Sensor Interface Board TB1 Pin | Function | Color | DCP TB4 Pin |
|---|---|---|---|
| 4 | RS-485 (+) | WHITE | 1 |
| 5 | RS-485 (–) | BLACK | 2 |
| 6 | GROUND | RED | 7 |

| AC Interface Board TB1 Pin | Function | Color |
|---|---|---|
| 1 | HOT | BLACK |
| 2 | NEUTRAL | WHITE |
| 3 | GROUND | GREEN |



b. For the 1192 DCP, connect the Model 6500 Thunderstorm/Lightning Sensor signal wires according to Figure 109.

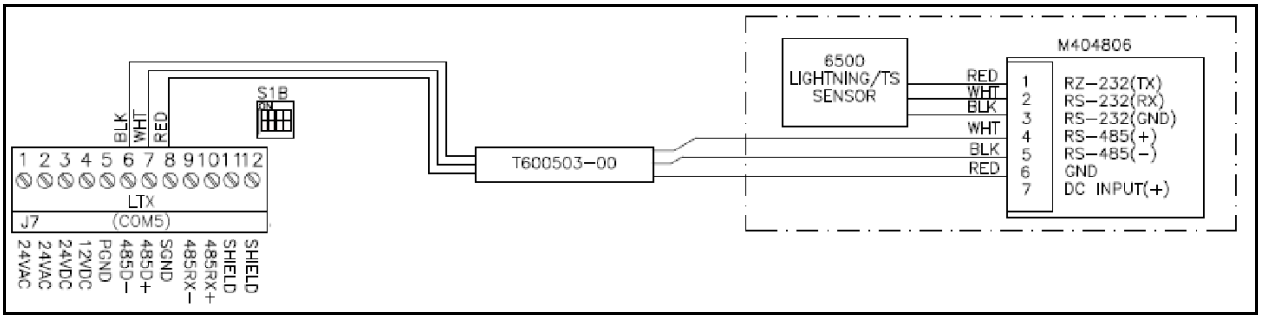



**Figure 109. Model 6500 Thunderstorm/Lightning Sensor Signal Wiring to Model 1192 DCP**

c. For the 1192 DCP, connect the Model 6500-DC Thunderstorm/Lightning Sensor signal wires according to Figure 110.

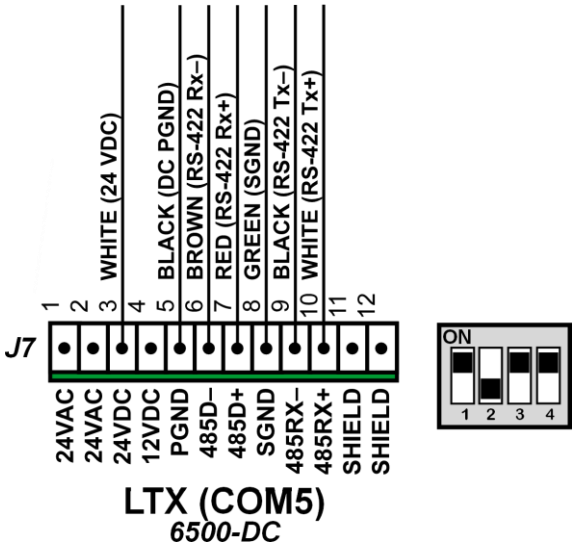



**Figure 110. Model 6500-DC Thunderstorm/Lightning Sensor Signal Wiring to Model 1192 DCP**

## 18.4 Checkout

1. Power the sensor and DCP up and verify that, after one minute of operation, data is reported from the sensor. (*Bear in mind that, in the absence of lightning in the measuring area, the data screens will report no strikes.*)
2. Check the status screens and verify that no errors are reported.

Chapter 19

# 19. Vaisala SA20 Lightning Detector

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| SA20 Lightning Detector | | | | | | | ✓ | ✓ | ✓ |

*The Vaisala. SA20 Lightning Detector may be used instead of the Model 6500 Thunderstorm/ Lightning Sensor.*

## 19.1 Installation

Refer to the ***M211506EN-D-Installation Manual*** for complete details on the installation of this sensor.

- DRW231015-A provides the installation details for the Vaisala. SA20 Lightning Detector.

## 19.2 1192 DCP Wiring

The **J7** terminal block is used to connect the Vaisala. SA20 Lightning Detector to the Model 1192 DCP using an RS-232 serial connection. The DIP switches at position S1B are set up for RS-232 as shown in Figure 111. Refer to the ***Model 1192 Data Collection Platform User's Manual*** for additional information.

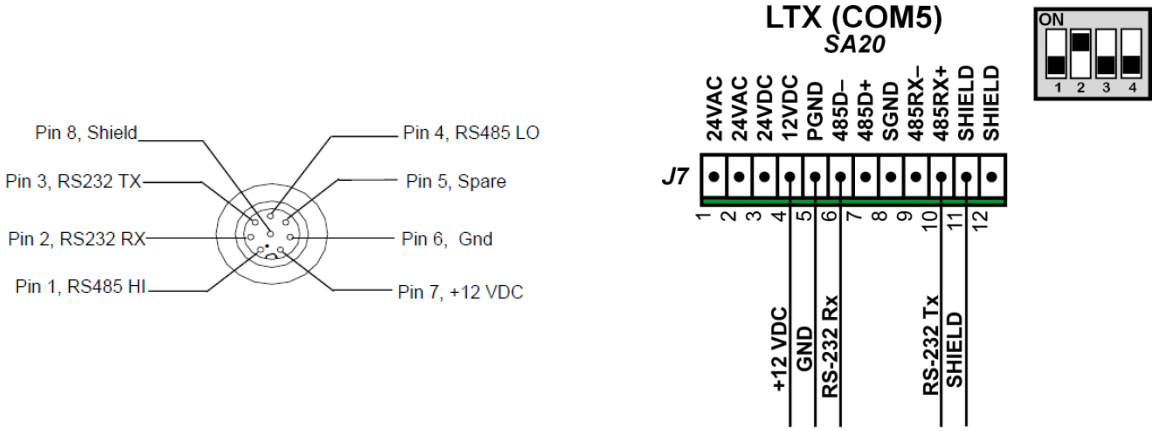



**Figure 111. SA20 Lightning Sensor Connections to 1192 DCP**

Chapter 20

# 20. Model 6495 Freezing Rain Sensor

| | AWOS A | AWOS AV | AWOS I | AWOS II | AWOS III | AWOS IIIP | AWOS IIIT | AWOS IIIPT | AWOS IIIPTZ |
|---|---|---|---|---|---|---|---|---|---|
| Model 6495 Freezing Rain Sensor | | | | | | | | | ✓ |

## 20.1 Mechanical Installation

The Freezing Rain Sensor comes pre-installed on a flat mounting plate, which in turn attaches to a standard 2 ½" mast using U-bolts (see Figure 112).

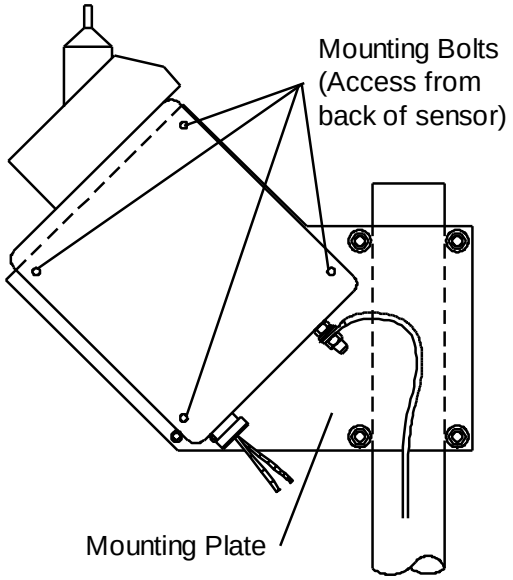



**Figure 112. Freezing Rain Sensor Mounting**

1. Set the sensor into position on the mounting pole, approximately 5½ ft above ground level.
2. Install one U-bolt from the back (pole side) of the mounting plate, so that the pole sits in the "U". Feed the bolt ends through the plate's top two mounting holes and fasten with flat washers, lock washers, and nuts.

3. Install the second U-bolt through the bottom two mounting holes and fasten with flat washers, lock washers, and nuts.
4. Tighten all hardware.

## 20.2 Power Connections

The power cable is pre-terminated internally. The cable external end of the power cable should be terminated in a junction box at the bottom of the freezing rain mounting pole.

## 20.3 Data Connections

### 20.3.1 1190 DCP

The freezing rain sensor communicates with the 1190 DCP via an RS-232 interface on a serial sensor interface daughter board mounted on the DCP's backplane. Run the M491740 data cable from header J2 on the sensor to its daughter board at terminal block TB1. The cable is already connected to the sensor, but may be disconnected if it needs to be replaced.

1. Connect the WHITE wire to TB1, pin 1
2. Connect the RED wire to TB1, pin 2.
3. Connect the BLACK and shield wires to TB1, pin 3.

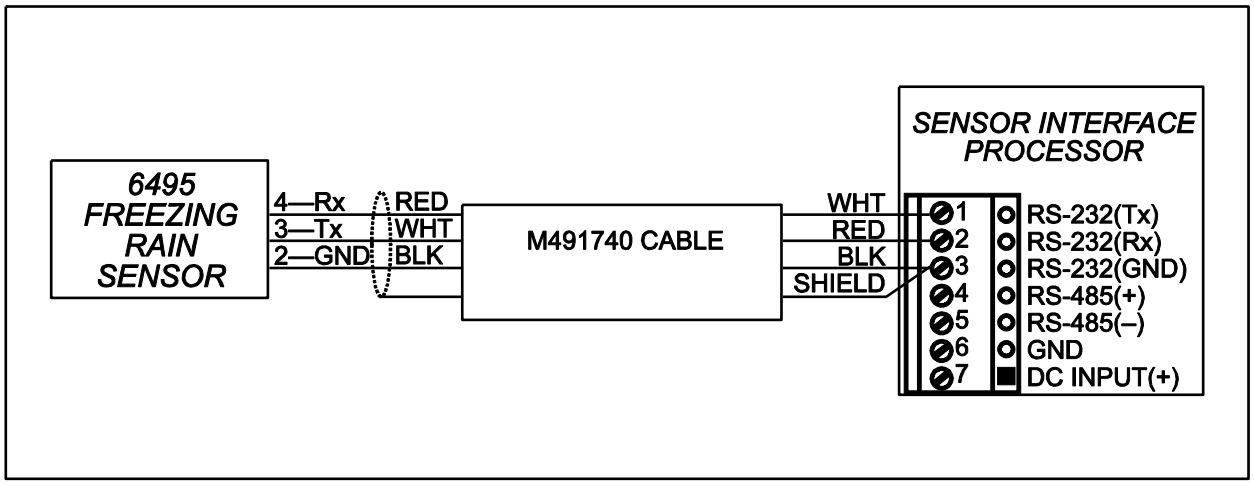



**Figure 113. Freezing Rain Sensor 1190 DCP Connections**

### 20.3.2 1192 DCP

The freezing rain sensor communicates with the 1192 DCP via an RS-232 interface. Run the M491740 data cable from header J2 on the sensor to the COM8 FZRA (**J8**) terminal block. The cable is already connected to the sensor, but may be disconnected if it needs to be replaced.

1. Connect the WHITE wire to Pin 6
2. Connect the BLACK wire to Pin 8.
3. Connect the RED wire to Pin 10.
4. Connect the SHIELD wire to Pin 12.

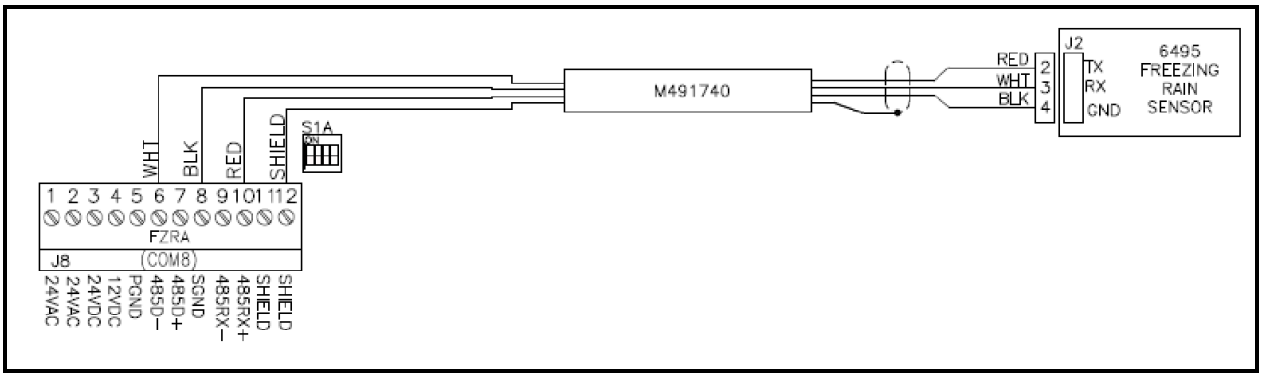



**Figure 114. Freezing Rain Sensor 1192 DCP Connections**

*Note that the silkscreen has RS-485 labels, but the DIP switches set at the factory are for an RS-232 serial port configuration.*

## 20.4 Checkout

1. Verify that no errors are displayed at the DCP.
2. Verify that the count at the DCP is 40000 ± 25.

Chapter 21

# 21. Foldover Tower Operations

## 21.1 Lowering the Tower

To lower the hinged section of the tower:

1. Remove and retain the four nuts from the bottom two U-bolt clamps. Remove the U-bolt clamps.
2. If a padlock is used to secure the leverage arm, remove the padlock.
3. Pull the bottom of the leverage arm outward from the tower.
4. Crank the winch cable counterclockwise to continue lowering the tower. Lower the tower slowly. If the tower begins bouncing during lowering, cease lowering and wait until the motion stops. Continue lowering slowly until the tower rests firmly on the cradle.

**WARNING**

**Icing can interfere with the proper operation of the winch and cable, and the weight of ice on the tower may exceed the capacity of the winch and cable, especially when the tower is in or near the down position or while it is being raised to the upright position.**

*Note: The tower should remain in the lowered position for no more than two days, with little or no lateral loads imposed.*

## 21.2 Raising the Tower

To return the tower to the normal position:

1. Crank the tower vertical with the hand winch.
2. While holding the leverage arm in place against the bottom section of the tower, replace the two bottom U-bolt clamps and install the four nuts on the clamps.
3. To lock the tower in place, insert a padlock through the lock tab at the base of the leverage arm and then through the tower face plate.

Appendix A

# Appendix A. Drawings

The following pages contain supplemental installation drawings and wiring diagrams. They are arranged in the same order as the chapters of this manual, according to the sensor or component to which they pertain.

| | |
|---|---|
| 3000-019 | AWOS 3000 CDP Wiring Diagram (Rev B) 1792 VHF |
| 3000-019 | AWOS 3000 CDP Wiring Diagram (Rev H) 1793 VHF |
| 3000-A-019 | AWOS 3000 2020/2030 Wind Sensor Wiring Diagram |
| 3000-B-019 | AWOS 3000 2040 Ultrasonic Wind Sensor Wiring Diagram |
| 1192-120-019 | AWOS 3000 Wiring Diagram for 1192 DCP |
| 1190-007 | Installation Drawing, 1190 DCP Tower Mounting |
| M403256-01-003 (2 sheets) | 2020/2030 Crossarm Assembly Mounting Drawing |
| M403316-003 (Sheet 3) | 11906 BP Sensor Mounting Kit for 1190 DCP |
| M403316-003 (Sheet 4) | M488679-00 DCP Radio Mounting Kit for 1190 DCP |
| M403566-00-003 (Sheet 10) | 11926, 11926-A/B BP Sensor Kit Installation |
| M403566-00-003 (Sheet 10A) | 11966-PTB, 11926-PTB-A/B BP Sensor Kit Installation |
| M403566-00-003 (Sheet 11) | M488679-01 DCP Radio Mounting Kit for 1192 DCP |
| M403322-003 (Sheet 5) | Day/Night Sensor Kit Installation Drawing |
| M488176-01-007 | Present Weather Sensor/DCP Installation Kit Mounting Drawing |
| M488270-01-007 (2 sheets) | 2040 Ultrasonic Wind Sensor Installation Drawing |
| M488274-02-003 (2 sheets) | 2040 Ultrasonic Wind Sensor Heater Power Kit Assembly Drawing |
| M488274-02-019 | 2040 Ultrasonic Wind Sensor Heater Power Wiring Diagram |
| 6498-003 | 6498 Present Weather and Visibility Assembly Drawing |
| 6498-007 | 6498 Present Weather and Visibility Installation Drawing |
| 6498-019 | 6498 Present Weather and Visibility Wiring Diagram |
| 6498-DC-007 | 6498 Present Weather and Visibility *Direct Connect* Installation Drawing |

| | |
|---|---|
| 6498-DC-019 | 6498 Present Weather and Visibility *Direct Connect* Wiring Diagram |
| 6500-DC-019 | 6500-DC Thunderstorm/Lightning Detector *Direct Connect* Wiring Diagram |
| 8190-01-007 | MARS Shield Installation Drawing |
| M488169-01-007 | 6021/6022 Rain Gauge Mounting Kit Installation Drawing |
| 8339-D-019 | 8339 Ceilometer Wiring Diagram |
| M488261-00-007 | 8339 Ceilometer Mounting Kit Installation Drawing |
| 83396-00-007 | Ceilometer Blower Mounting Kit Installation Drawing |
| M403582-00-007 | Standalone Day/Night Sensor Installation Drawing |
| — | UHF/VHF Antenna Assembly |

| REVISIONS | | | DWG NO. 3000-019 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 1535 | INITIAL RELEASE | 2-09-09 | PMK |
| B | 2648 | REPLACE RACK TOP FAN | 3-25-14 | TI |

M438222-00
ATX POWER SUPPLY

DRIVE POWER CABLE
DRIVE POWER CABLE
DRIVE POWER CABLE
DRIVE POWER CABLE

WHT (+12VDC)
BLK (GND)
M491847-00
WHT (+12VDC)
BLK (GND)
2
1

YEL (+12VDC)
BLK (GND)
M491848-00

YEL (+12VDC)
BLK (GND)
M491846-00
+12VDC
GND
DC POWER WAN1
M492615-00 PATCH CORD
M406188-00 VPN
M492634-00 TO VPN-ADAS RJ-45
VPN-ADAS

20980-A UHF RADIO
POWER
DATA PORT 1
BNC
M491852-00 TO ANTENNA BNC
UHF

YEL
BLK
V+
-0v
D+
D-
DB9F
GND
RED
GRN
BLK
M491851-00
3
4
2
TO DCP RJ-11
RS-485
M438205-00 RS-485 CONV

24 PIN CONNECTOR
POWER IN
20906 Microphone
MIC IN
M406186-00
MINI-ITX MOTHERBOARD
ETHERNET
COM4
COM1
COM2
COM3
AUDIO
M491855-00
TO NADIN DB9M
NADIN
M491860-00
M491860-00
M491867-00
DCP
TO DCP RS-232 (DB9M)

M491858-00
SATA PWR
M406170-00 HARD DRIVE
SATA SIGNAL CABLE M491857-00
SATA0
M491856-00
M491834-00
3 RED 4
5 GRN 5
DB9 to RJ-45 ADAPTER
M492616-00
4 RED 2
5 GRN 5
DB9 to RJ-45 ADAPTER
COM1
ETHERNET
2211 AWOS NET
POWER
1
5
M492634-00 TO NETWORK RJ-45
AWOS NET
BLK
YEL
M491849-00
YEL
BLK
1
2
3
4
OPTION

M491859-00
OPTICAL DRIVE M406190-00
SATA SIGNAL CABLE M491845-00
SATA2

PARALLEL PORT (LPT1)
USB
VIDEO
USB
AUDIO OUT
M491863-00
USB CABLE M491866-00
USB CABLE M491866-00
M491864-00
PRINTER
PRINTER CABLE 20912-A
DB25F
GPS
USB
GPS M406167-00
KEYBOARD
USB
KEYBOARD/MOUSE M406187-00
PART OF M482179-00

M406192-00
SIGNAL
M406159-00 MODEM
POWER
MIC
LINE
M491815-00
WHT
BLK
1
2
3
4
4 3 2 1
BLK (GND)
RED (+12VDC)
M491850-00

M491854-00
M491865-00
PHONE LINE
M491861-00
RJ11
MODEM

AC POWER CORD M492635-00
UPS 20913-F
20910-A PRINTER
EXTERNAL POWER
AC POWER CORD
VIDEO
AC POWER
AUDIO IN
M482179-00 17" MONITOR
AUDIO CABLE M491854-00

J4
J3
J1
M491856-00
J11
M491854-00
J7
J8
M404810 PERIPHERAL INTERFACE BOARD
J2
1 WHT
2 GRN
3 RED
4 BLK
J10
M491844-00
WHT
RED
GRN
BLK
1 RF OUT (VHF)
4
5 DB9F
9
Power 1 2
1792 VHF RADIO
TO ANTENNA BNC
M491853-00
VHF
M491862-00
M491862-00

M444040-00
80 mm FAN
M403526-00
120 mm FAN

EXTERNAL POWER

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TOLERANCES
XX=±.010 ANGLES ±1/2°
XXX=±.005 FRACTIONS=±.02
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| REVISED BY: T IWANOWSKI | 3-25-14 | |
| CHECKED BY: J PATTERSON | 2-09-09 | |
| DESIGN ENGINEER: B PERRIN | 2-09-09 | |
| PROJECT MANAGER: B PERRIN | 2-09-09 | |
| APPROVALS | DATE | |

TITLE: WIRING DIAGRAM AWOS 3000 CDP

allweatherinc

SIZE D | DWG NO. 3000-019

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| E | 4802 | REMOVE AUX FAN, CHG OPTICAL DRIVE CABLES | 10-19-17 | T IWANOWSKI |
| F | 4795 | REMOVE AWOS NET DETAILS | 12-19-17 | T IWANOWSKI |
| G | 5170 | UPDATED VOICE MODEM AND UHF DATA RADIO | 12-11-19 | T IWANOWSKI |
| H | 5479 | UPDATED TO M406186-02 MOTHERBOARD | 11-22-21 | K.YOUNG |
| J | 5510 | ADDED BRN OPTION TO WIRE COLOR FOR GND | 12-03-21 | T IWANOWSKI |

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DRIVE POWER CABLE

DRIVE POWER CABLE

M492720-00
YEL (+12 VDC)
BLK
BLK
RED (+5 VDC)

DRIVE POWER CABLE

M491862-00

TO COMMUNICATION POWER OPTIONS SHEET 2

SATA PWR

24 PIN CONNECTOR

POWER IN

NC AUDIO OUT

NC MIC IN

M406186-02
MINI-ITX COMPUTER

SATA DOM SSD
M406384-00

SATA1

SATA PWR/SIGNAL CABLE
M493099-00

SATA2

PART OF M493099-00

OPTICAL DRIVE
M406190-00

M493102-00

USB0 USB2 VIDEO USB3 USB1

USB CABLE M492607-00

USB CABLE M491866-00

USB CABLE M491866-00

PRINTER CABLE M492703-00

PRINTER (PANEL)

USB

20910-A PRINTER

GPS (PANEL)

USB

GPS M406167-00

KEYBOARD (PANEL)

USB

KEYBOARD/MOUSE M406187-00

PART OF M482179-00

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USB AUDIO ADAPTER
AUDIO OUT AUDIO IN

20906 MIC

M491854-00

AUDIO CABLE M491854-00

AC POWER CORD M492635-00

UPS 20913-F

EXTERNAL POWER

AC POWER CORD

VIDEO
AC POWER
AUDIO IN
M482179-00
17" MONITOR

EXTERNAL POWER

AC POWER CORD PART OF M406188-00C

TO VPN SHEET 2

ETHERNET

M492615-00 PATCH CORD

TO VPN-ADAS SHEET 2

COM4

PART OF M406186-02

M491867-00

TO NADIN DB9M

NADIN (PANEL)

COM1

M491867-00

DCP (PANEL)

TO COMMUNICATION OPTIONS SHEET 2

COM2

M491867-00

COM3

M491867-00

M491854-00

M491865-00

SIGNAL POWER
M406227-00
MODEM
MIC LINE SPEAKER

NC

M493140-00

WHT
BLK

1 2 3 4

PHONE LINE

M491861-00 RJ11

MODEM (PANEL)

VHF (PANEL)

TO ANTENNA BNC
M491853-01

RF OUT (VHF)

1793
VHF RADIO

DB9M

4 9 6 1 8 3 2 7 5

WHT
RED
GRN
BLK

BLK (GND)
RED (+12VDC)

4 3 2 1

J4 J3 J1

J11

J7

J8

J10

M404810
PERIPHERAL INTERFACE BOARD

J2

1 WHT
2 GRN
3 RED
4 BLK

M491844-01

M403526-00
120 mm FAN

M491862-00

M491858-00

M491862-00

TO AWOS NET POWER CONNECTOR

M491862-00

(SPLITTER CABLE FOR AWOS NET OPTION)

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| DESIGN ENGINEER: B PERRIN | 2-09-2009 |
| PROJECT MANAGER: B PERRIN | 2-09-2009 |
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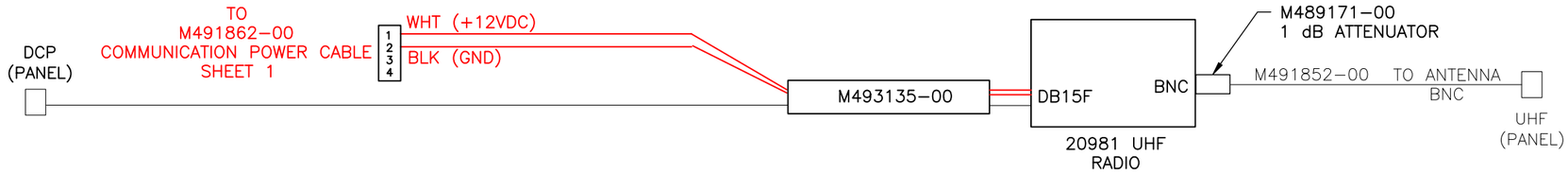
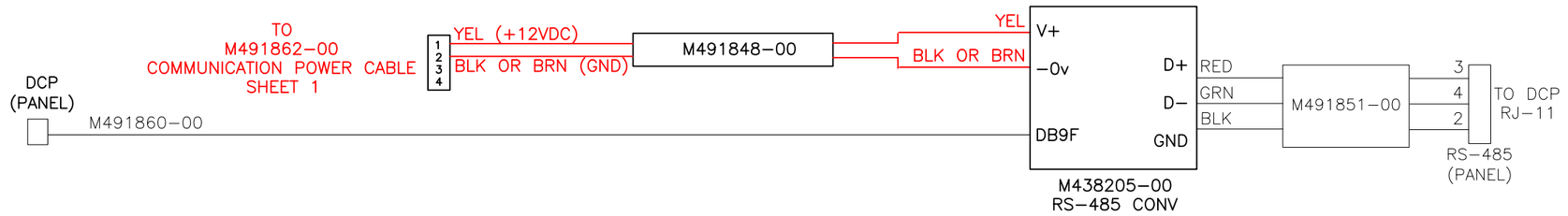
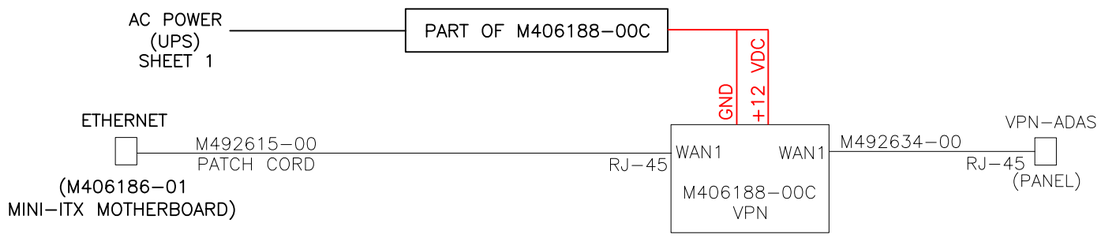
## UHF RADIO DCP COMMUNICATION OPTION




## RS-485 DCP COMMUNICATION OPTION




## VPN-ADAS OPTION



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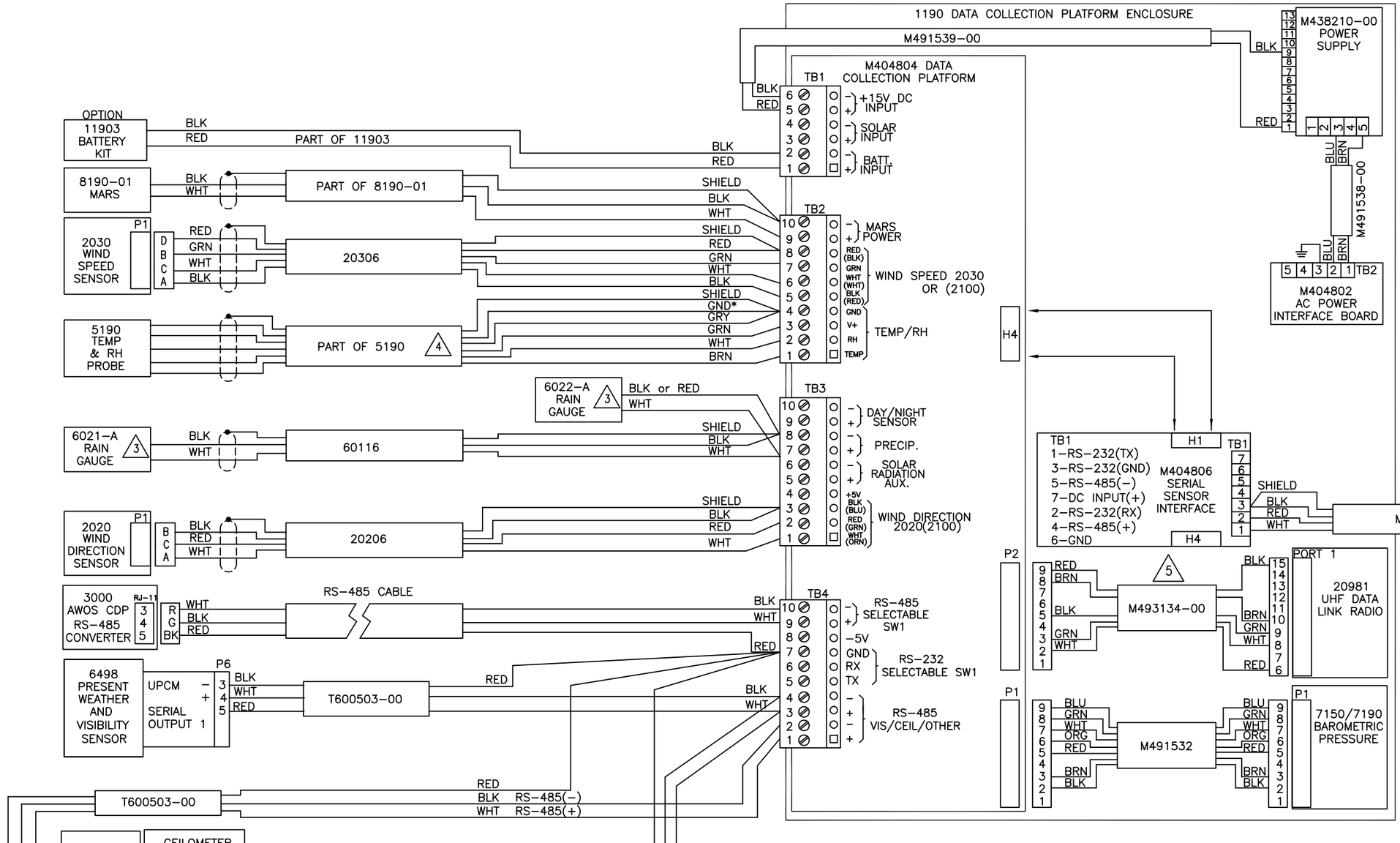
| A | 1535 | INITIAL RELEASE | 11-16-09 | JPATTERSON |
| B | 1888 | 5190-F UPDATE | 04-15-10 | SVANSANTEN |
| C | 1904 | SHOW RS-485 WIRING OF THE 8339/8340 CEILOMETER | 01-07-21 | BRG |
| D | 2155 | ADD 7150 BP SENSOR | 05-02-11 | T IWANOWSKI |
| E | 3188 | UPDATED 8190 MARS TO 8190-01 | 10-16-15 | T IWANOWSKI |
| F | 4433 | ADD WIRE COLORS FOR 6490 & 6500 TO M404806 | 02-12-16 | T IWANOWSKI |
| G | 4802 | REVERTED CEILOMETER TO RS-232 VIA SERIAL INTERFACE | 11-07-17 | T IWANOWSKI |
| H | 4880 | ADDED 6022-A RAIN GAUGE | 08-20-19 | T IWANOWSKI |
| J | 4410 | REPLACED 8464 & 6490 W/ 6498 | 12-15-19 | T IWANOWSKI |
| K | 5204 | REPLACED 20980-A UHF DATA RADIO WITH 20981 | 02-14-20 | T IWANOWSKI |
| L | 5215 | CORRECTED BATTERY WIRE COLOR TO TB1 | 04-30-20 | T IWANOWSKI |
| M | 5362 | CHANGED UPCM SERIAL PORT NUMBER TO MATCH PCB | 12-02-20 | T IWANOWSKI |
| P | 1904 | ADD SDURGE SUPRESSOR TO CEILOMETER RS-485 LINES | 01-07-21 | T IWANOWSKI |
| R | 5162 | REMOVED 3120 OPTION | 03-11-21 | T IWANOWSKI |
| S | 5477 | ADDED NOTE 5 RE M493134-00 WIRE COLORS | 02-28-22 | T IWANOWSKI |




NOTES: UNLESS OTHERWISE SPECIFIED;

1. DRAWING SHOWS ALL POSSIBLE SENSORS (OTHER THAN ULTRASONIC WIND) THAT CAN BE CONNECTED TO THE DCP FOR AN AWOS. SOME SENSORS MAY NOT BE PART OF SYSTEM CONFIGURATION. REFER TO THE CONFIGURATION MATRIX FOR ACTUAL SENSORS INSTALLED.
2. IF A RAIN GAUGE IS INSTALLED WITH THE PRESENT WEATHER SENSOR (6490), THE RAIN GAUGE IS USED TO MEASURE RAIN ACCUMULATION.

△3 IN AREAS NOT REQUIRING A HEATED RAIN GAUGE, AN UNHEATED RAIN GAUGE MAY BE USED IN LIEU OF THE HEATED RAIN GAUGE WITH FAA APPROVAL BY A WAIVER.

△4 5190-D GND* IS BLUE.
5190-F GND* IS YELLOW.

△5 GRN MAY BE GRN or ORG
WHT MAY BE WHT or YEL



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TOLERANCES
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XXX=±.005 CONCENTRICITY: .003 TIR
DO NOT SCALE DRAWING

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FINISH: AS ISSUED

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| REVISED BY: T. IWANOWSKI | 02-28-22 | |
| CHECKED BY: | | |
| DESIGN ENGINEER: J PATTERSON | 11-16-09 | |
| PROJECT MANAGER: | | |
| APPROVALS | DATE | |

TITLE: WIRING DIAGRAM AWOS 3000 WITH 2020/2030 WIND SENSORS

allweatherinc

SIZE D | DWG NO. 3000-A-019

SCALE NONE | RELEASE DATE | SHEET 1 OF 1

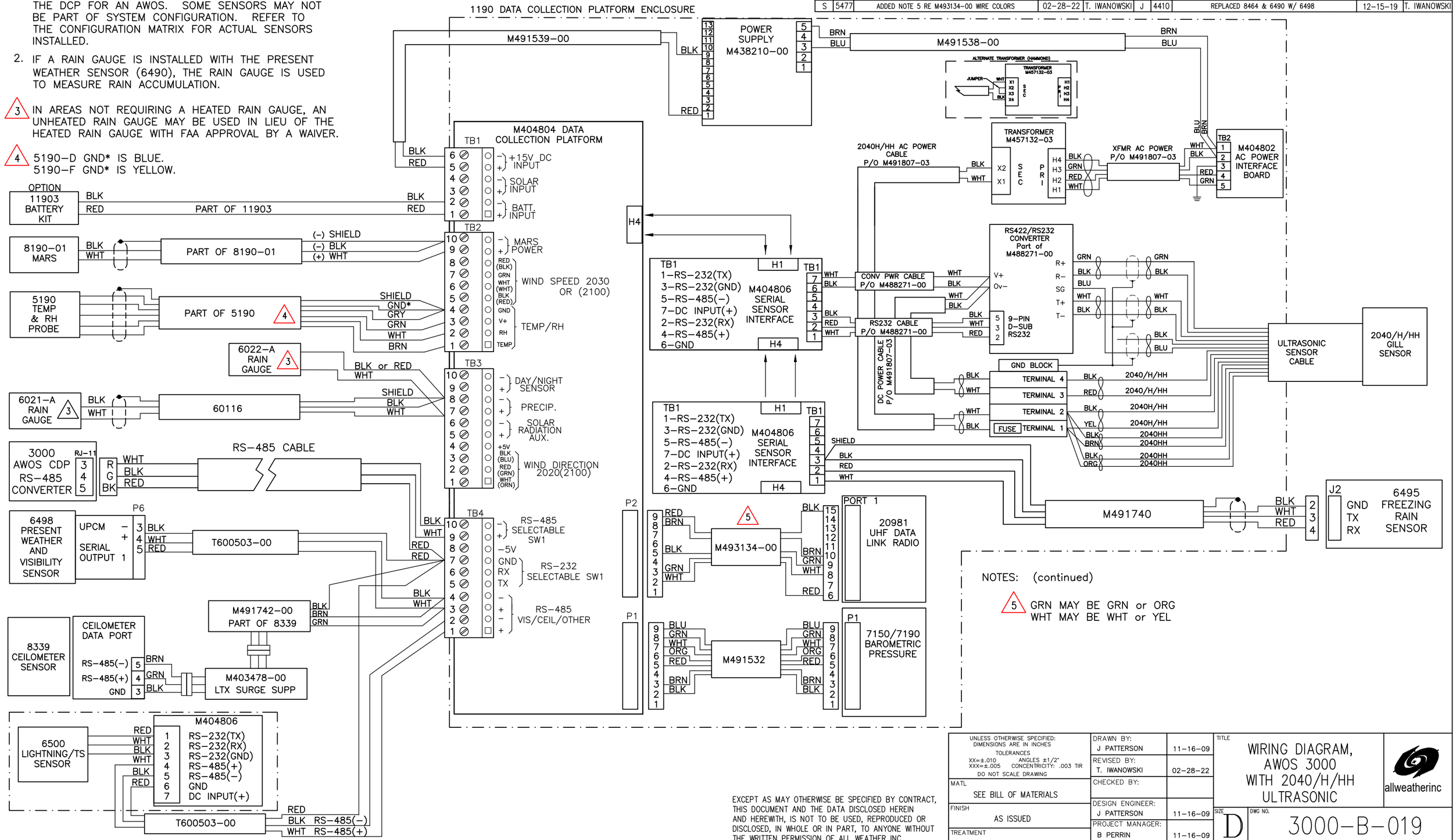
NOTES: UNLESS OTHERWISE SPECIFIED;

1. DRAWING SHOWS ALL POSSIBLE SENSORS (OTHER THAN 2020/2030 WIND) THAT CAN BE CONNECTED TO THE DCP FOR AN AWOS. SOME SENSORS MAY NOT BE PART OF SYSTEM CONFIGURATION. REFER TO THE CONFIGURATION MATRIX FOR ACTUAL SENSORS INSTALLED.
2. IF A RAIN GAUGE IS INSTALLED WITH THE PRESENT WEATHER SENSOR (6490), THE RAIN GAUGE IS USED TO MEASURE RAIN ACCUMULATION.

△3 IN AREAS NOT REQUIRING A HEATED RAIN GAUGE, AN UNHEATED RAIN GAUGE MAY BE USED IN LIEU OF THE HEATED RAIN GAUGE WITH FAA APPROVAL BY A WAIVER.

△4 5190-D GND* IS BLUE.
5190-F GND* IS YELLOW.

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| K | 5204 | REPLACED 20980-A UHF DATA RADIO WITH 20981 | 02-14-20 | T. IWANOWSKI | REVISIONS | | | | DWG NO. 3000-B-019 | |
| L | 5215 | CORRECTED BATTERY WIRE COLOR TO TB1 | 04-30-20 | T. IWANOWSKI | REV | ECO | DESCRIPTION | | DATE | APPROVED |
| M | 5215 | CHANGED UPCM SERIAL PORT NUMBER TO MATCH PCB | 12-02-20 | T. IWANOWSKI | F | 4408 | ADD WIRE COLORS FOR 6490 & 6500 | | 01-19-16 | T. IWANOWSKI |
| P | 1904 | ADDED SURGE SUPRESSOR TO CEILOMETER RS-485 LINES | 02-05-21 | T. IWANOWSKI | G | 4802 | REVERTED CEILOMETER TO RS-232 VIA SERIAL INTERFACE | | 11-07-17 | T. IWANOWSKI |
| R | 5162 | REMOVED 3120 OPTION | 03-11-21 | T. IWANOWSKI | H | 4880 | ADDED 6022-A RAIN GAUGE | | 08-20-19 | T. IWANOWSKI |
| S | 5477 | ADDED NOTE 5 RE M493134-00 WIRE COLORS | 02-28-22 | T. IWANOWSKI | J | 4410 | REPLACED 8464 & 6490 W/ 6498 | | 12-15-19 | T. IWANOWSKI |




NOTES: (continued)

△5 GRN MAY BE GRN or ORG
WHT MAY BE WHT or YEL



UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES
TOLERANCES
XX=±.010 ANGLES ±1/2°
XXX=±.005 CONCENTRICITY: .003 TIR
DO NOT SCALE DRAWING

MATL: SEE BILL OF MATERIALS
FINISH: AS ISSUED
TREATMENT:

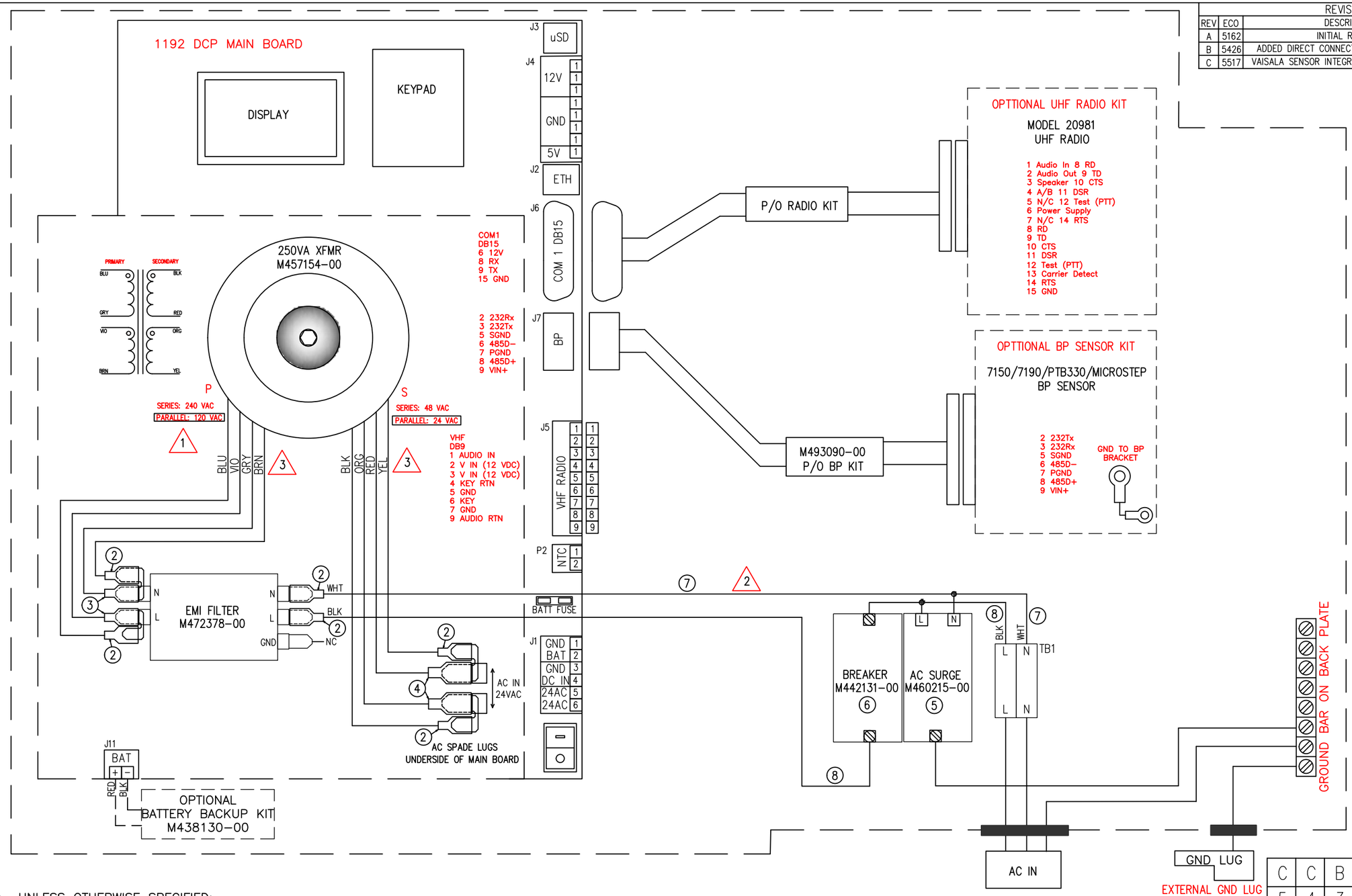
| | | |
|---|---|---|
| DRAWN BY: J PATTERSON | 11-16-09 | |
| REVISED BY: T. IWANOWSKI | 02-28-22 | |
| CHECKED BY: | | |
| DESIGN ENGINEER: J PATTERSON | 11-16-09 | |
| PROJECT MANAGER: B PERRIN | 11-16-09 | |
| APPROVALS | DATE | |

TITLE: WIRING DIAGRAM, AWOS 3000 WITH 2040/H/HH ULTRASONIC

allweatherinc

SIZE D | DWG NO. 3000-B-019 | SCALE NONE | RELEASE DATE | SHEET 1 OF 1

| REVISIONS | | | DWG NO. 1192-120-019 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 5162 | INITIAL RELEASE | 3-06-2021 | KSSY |
| B | 5426 | ADDED DIRECT CONNECT SENSORS (SHEET 3) | 7-06-2021 | T. IWANOWSKI |
| C | 5517 | VAISALA SENSOR INTEGRATION (SHEETS 4 & 5) | 11/30/2021 | K. YOUNG |




NOTES: UNLESS OTHERWISE SPECIFIED:

1. BLUNT CUT AND APPLY HEAT SHRINK TO WHT & GRN/YEL WIRES FROM XFMR IF PRESENT.
2. SECURE WHT & BLK WIRES (IT-07 & IT-08) WITH CABLE TIES TO CABLE TIE MOUNTS.
3. WRAP EACH SET OF XFMR WIRES WITH A CABLE TIE AFTER COMPLETING WIRING.

| C | C | B | B | C | REV | REV STATUS OF SHEETS |
|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 2 | 1 | SHEET | |



| APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT: | |
|---|---|
| | |

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
.XX=±.010 ANGLES ±1/2°
.XXX=±.005 CONCENTRICITY: .003 TIR
DO NOT SCALE DRAWING

MATL: SEE BILL OF MATERIALS

FINISH: AS ISSUED

TREATMENT: NONE

| | | |
|---|---|---|
| DRAWN BY: K. YOUNG | 4-14-20 | |
| REVISED BY: K.YOUNG | 11-30-21 | |
| CHECKED BY: T. IWANOWSKI | 11-30-21 | |
| DESIGN ENGINEER: K. YOUNG | 4-14-20 | |
| PROJECT MANAGER: AARON HUSTEAD | 4-14-20 | |
| APPROVALS | DATE | |

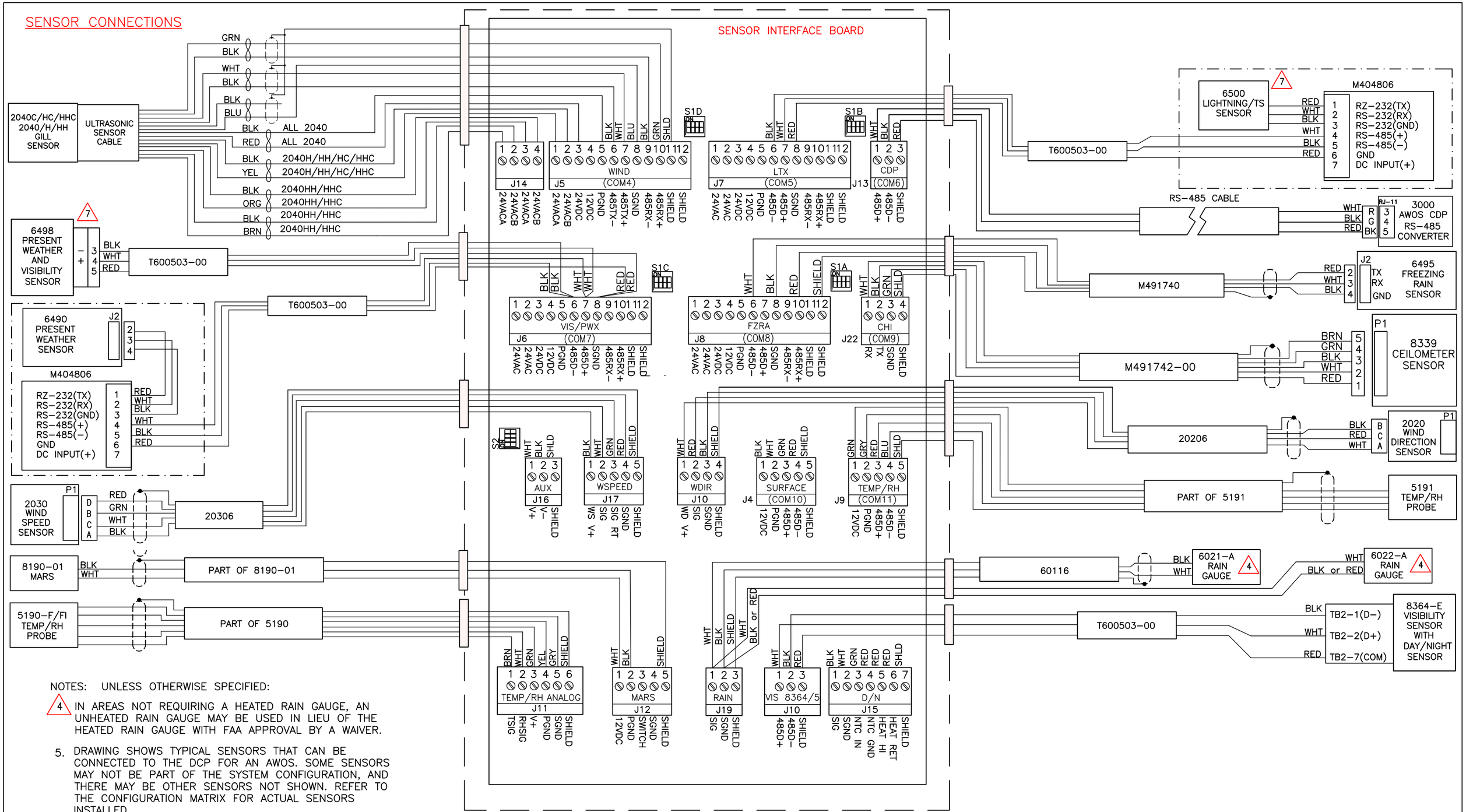
TITLE: WIRING DIAGRAM, ASSY 1192 DCP AWOS 120 VAC

allweatherinc

SIZE D | DWG NO. 1192-120-019

SCALE NONE | RELEASE DATE 04-14-2020 | SHEET 1 OF 5

# SENSOR CONNECTIONS




NOTES: UNLESS OTHERWISE SPECIFIED:

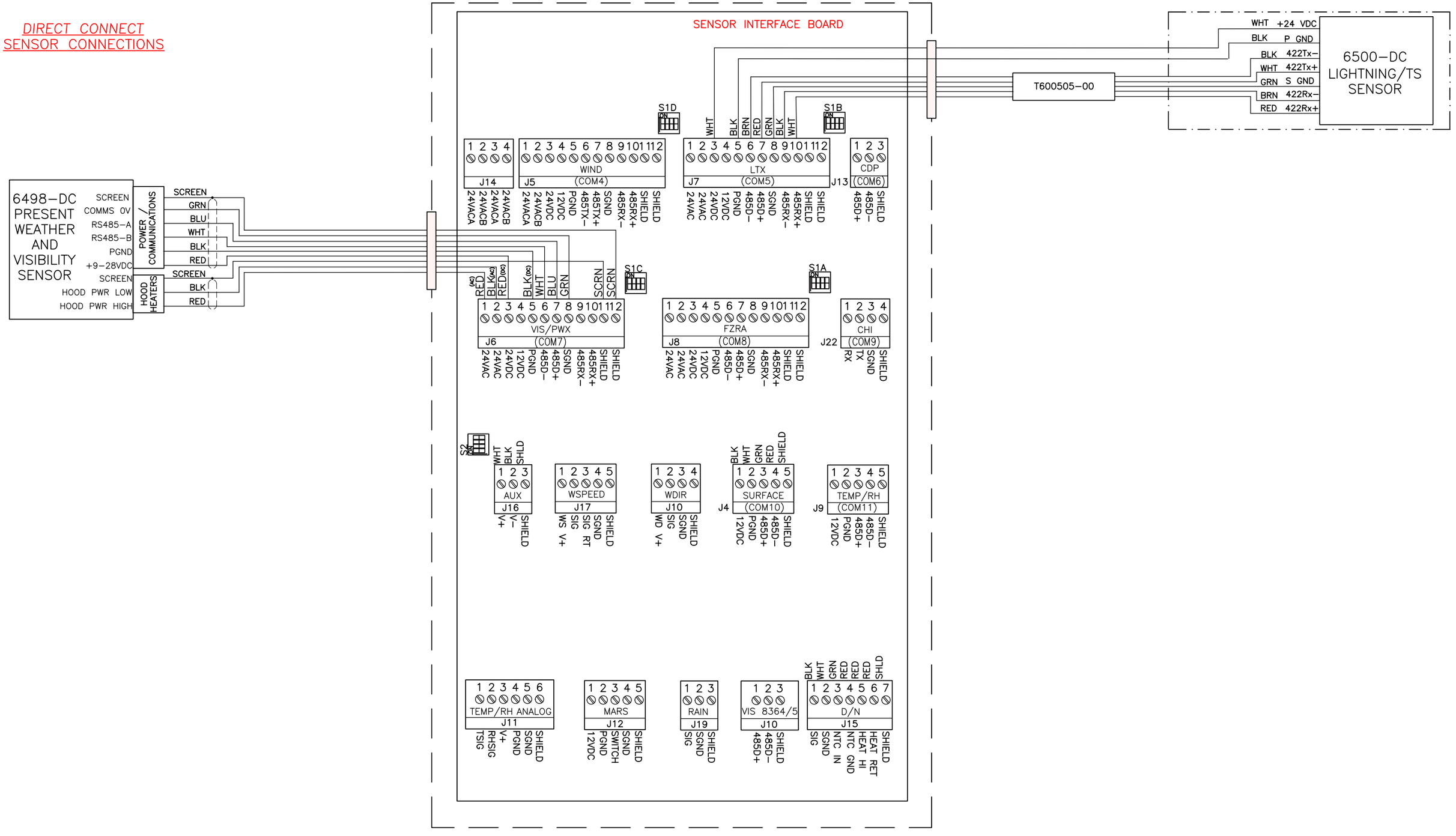
4. IN AREAS NOT REQUIRING A HEATED RAIN GAUGE, AN UNHEATED RAIN GAUGE MAY BE USED IN LIEU OF THE HEATED RAIN GAUGE WITH FAA APPROVAL BY A WAIVER.

5. DRAWING SHOWS TYPICAL SENSORS THAT CAN BE CONNECTED TO THE DCP FOR AN AWOS. SOME SENSORS MAY NOT BE PART OF THE SYSTEM CONFIGURATION, AND THERE MAY BE OTHER SENSORS NOT SHOWN. REFER TO THE CONFIGURATION MATRIX FOR ACTUAL SENSORS INSTALLED.

6. IF A RAIN GAUGE IS INSTALLED WITH THE PRESENT WEATHER SENSOR (6490/6498), THE RAIN GAUGE IS USED TO MEASURE RAIN ACCUMULATION.

7. REFER TO SHEET 3 FOR *DIRECT CONNECT* MODELS OF THESE SENSORS.

# DIRECT CONNECT SENSOR CONNECTIONS




EXCEPT AS MAY OTHERWISE BE SPECIFIED BY CONTRACT, THIS DOCUMENT AND THE DATA DISCLOSED HEREIN AND HEREWITH, IS NOT TO BE USED, REPRODUCED OR DISCLOSED, IN WHOLE OR IN PART, TO ANYONE WITHOUT THE WRITTEN PERMISSION OF ALL WEATHER, INC.

| SIZE | DWG NO. | |
|---|---|---|
| D | 1192–120–019 | |
| SCALE 1 : 1 | REV LTR B | SHEET 3 OF 5 |

# VAISALA SENSOR CONNECTIONS

SENSOR INTERFACE BOARD

WMT702 ULTRASONIC, WIND SENSOR, DIGITAL

| | | | |
|---|---|---|---|
| 1 | 1 | 24VDC | WHT |
| 3 | 3 | RS485 D– | GRN,YEL |
| 4 | 4 | RS485 D– | NC |
| 5 | 5 | HEATER | GRY,PNK |
| 7 | 11 | HEATER RTN | RED,BLU |
| 11 | 14 | GND | GRY/PNK |
| 14 | 15 | RS485 D+ | BRN/GRN WHT/YEL |
| 15 | | RS485 D+ | NC |

PART OF WMT702

PWD22–CFG06, VIS/PWX SENSOR, DIGITAL

| | |
|---|---|
| 24VDC | RED |
| GND | BLK |
| RS232 TX | GRN |
| RS232 RX | YEL |
| RS232 GND | GRY |
| HEATER | WHT/GRN |
| HEATER RTN | WHT/YEL |
| SHLD | |

PART OF PWD22

ASPIRATED SHIELD

| | | |
|---|---|---|
| NEG. | SHLD | SHLD |
| POS. | PGND | BLK/WHT |
| COM | 12VDC | WHT/BLK |
| N.O. | SGND | BLK/RED |
| N.C. | SWITCH | RED/BLK |
| | NC | |

PART OF ASPIRATED SHIELD

HMP155–CFG04 /HMP45A, TEMP/RH, ANALOG

| | | |
|---|---|---|
| 1 | TEMP | RED/BLK |
| 3 | A GND | SHLD |
| 4 | RH | BLK/RED |
| 7 | 12VDC | WHT/BLK |
| 8 | GND | BLK/WHT |

PART OF HMP155/HMP45A

J14 AUX: 24VACA, 24VACB, 24VACA, 24VACB

J5 WIND (COM4): 24VACA, 24VACB, 24VDC, 12VDC, PGND, TX–/D–, TX+/D+, SGND, 485RX–, 485RX+, SHIELD, SHIELD

J7 LTX (COM5): 24VAC, 24VAC, 24VDC, 12VDC, PGND, 485D–, 485D+, SGND, 485RX–, 485RX+, SHIELD, SHIELD

J13 CDP (COM6): 485D+, 485D–, SHIELD

J6 VIS/PWX (COM7): 24VAC, 24VAC, 24VDC, 12VDC, PGND, D–/TX, D+, SGND, RX–, RX+/RX, SHIELD, SHIELD

J8 FZRA (COM8): 24VAC, 24VAC, 24VDC, 12VDC, PGND, 485D–, 485D+, SGND, 485RX–, 485RX+, SHIELD, SHIELD

J22 CHI (COM9): RX, TX, SGND, SHIELD

J16 AUX: V+, V–, SHIELD

J17 WSPEED: WS V+, SIG, RT, SIG, SGND, SHIELD

J10 WDIR: WD V+, SIG, SGND, SHIELD

J4 SURFACE (COM10): 12VDC, PGND, 485D+, 485D–, SHIELD

J9 TEMP/RH (COM11): 12VDC, PGND, 485D+, 485D–, SHIELD

J11 TEMP/RH ANALOG: TSIG, RHSIG, V+, PGND, SGND, SHIELD

J12 MARS: 12VDC, PGND, SWITCH, SGND, SHIELD

J19 RAIN: SIG, SGND, SHIELD

J10 VIS 8364/5: 485D+, 485D–, SHIELD

J15 D/N: SIG, SGND, NTC IN, NTC GND, HEAT HI, HEAT RET, SHIELD

SERIAL COMMUNICATION SETTING

| | MODE | | 485 TERM. | |
|---|---|---|---|---|
| SW | 1 | 2 | 3 | 4 |
| ON | FULL | 232 | TX | RX |
| OFF | HALF | 485 | OFF | OFF |

PART OF SA20/6500–SA20

| | | | |
|---|---|---|---|
| | NC | RS485 D+ | 1 |
| BLK/GRN | | RS232 RX | 2 |
| GRN/BLK | | RS232 TX | 3 |
| | NC | RS485 D– | 4 |
| | NC | SPARE | 5 |
| BLK,BLK | | GND | 6 |
| RED,WHT | | 12VDC | 7 |
| SHLD | | SHLD | 8 |

SA20 /6500–SA20 LTX SENSOR, DIGITAL

PART OF CL31/CT25

| | | | |
|---|---|---|---|
| | NC | RS485 D– | 1 |
| WHT/BLK | | D+/RS232 RX | 2 |
| RED/BLK | | RS232 TX | 3 |
| BLK,BLK | | SGND | 4 |
| | NC | | 5 |
| | NC | 12VDC | 6 |
| SHLD | | GND | 7 |

CL31–CFG01 /CT25K, CEILOMETER, DIGITAL

PART OF HMP155–CFG06

| | | | |
|---|---|---|---|
| BRN | | RS485 D– | 2 |
| PNK | | RS485 D+ | 6 |
| BLU | | 12VDC | 7 |
| BLK | | PGND | 8 |

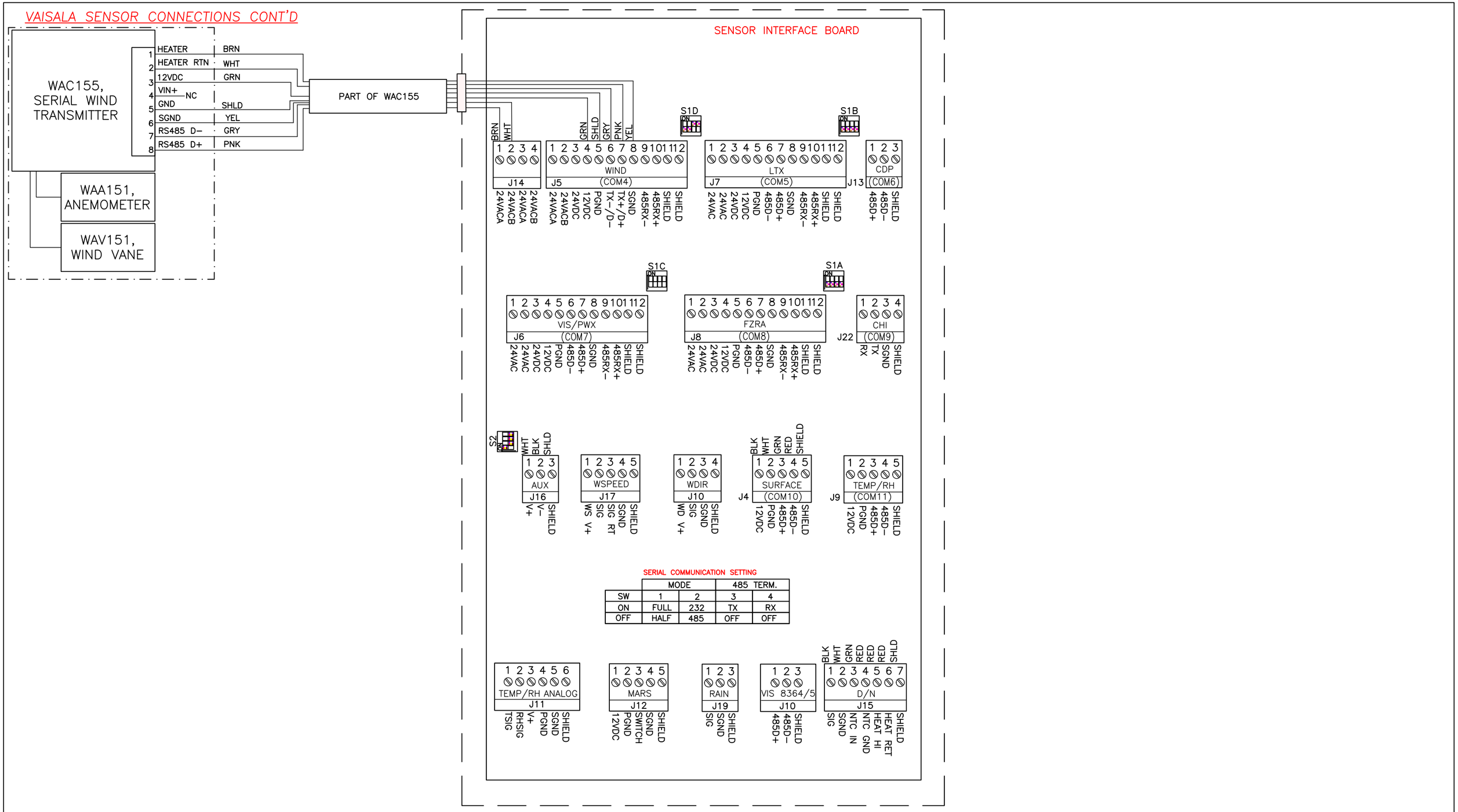
HMP155–CFG06, TEMP/RH, DIGITAL

PART OF M482297–00

| | | | |
|---|---|---|---|
| RED | | 24VDC | 1 |
| WHT | | NTC | 2 |
| GRN | | NTC GND | 3 |
| BLK | | GND | 4 |

M482297–00 DAY/NIGHT SENSOR, STANDALONE, DIGITAL

# VAISALA SENSOR CONNECTIONS CONT'D



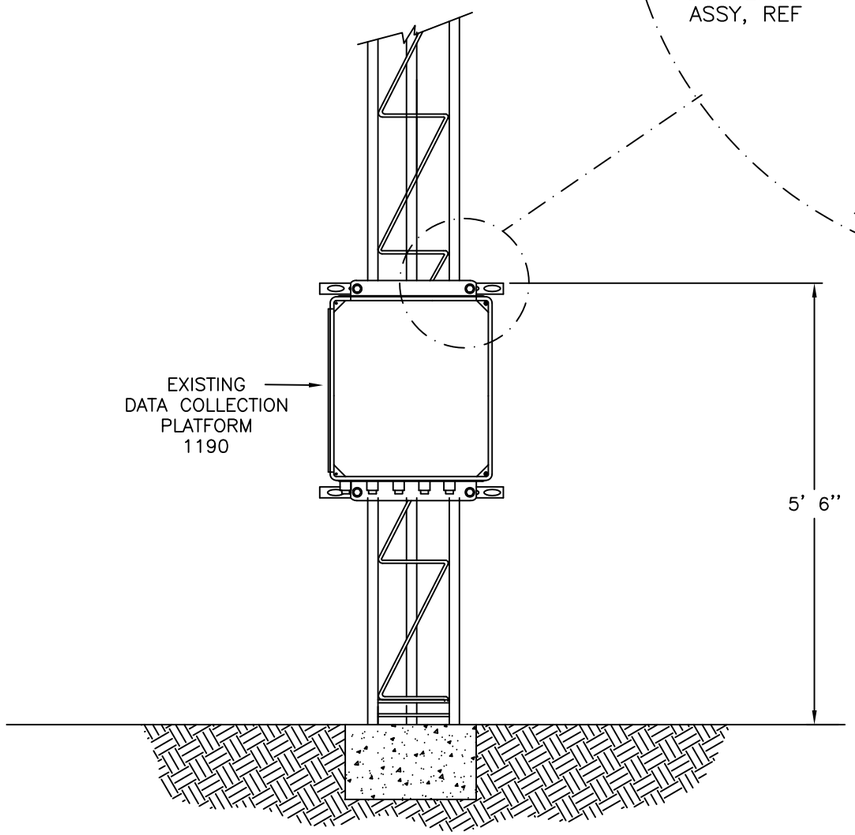

SERIAL COMMUNICATION SETTING

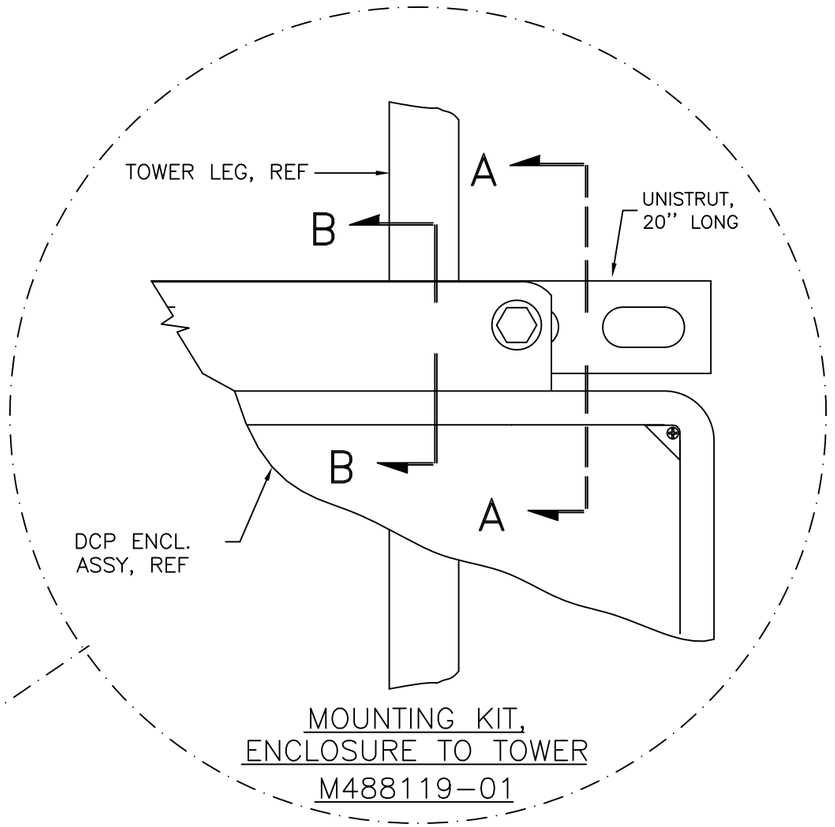
| | MODE | | 485 TERM. | |
|---|---|---|---|---|
| SW | 1 | 2 | 3 | 4 |
| ON | FULL | 232 | TX | RX |
| OFF | HALF | 485 | OFF | OFF |

NOTES: UNLESS OTHERWISE SPECIFIED;

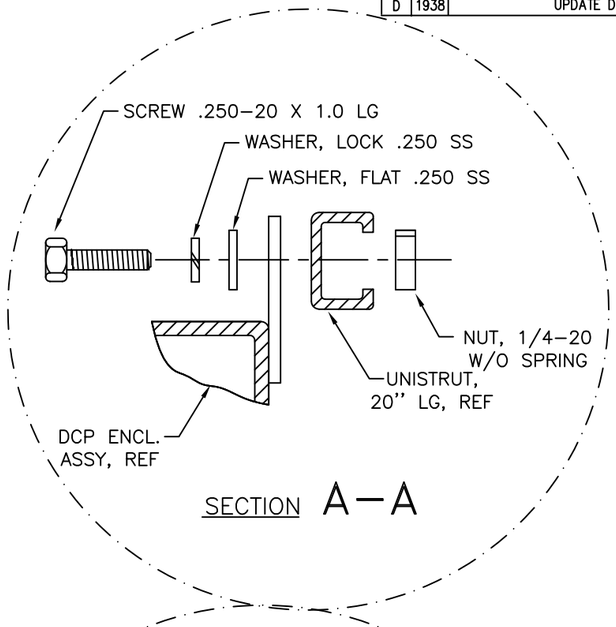
1. WHEN USING MODEL 8518–A FOLDOVER TOWER, MOUNT TO HINGED SIDE OF TOWER.

| REVISIONS | | | DWG NO. 1190–007 | |
|---|---|---|---|---|
| REV | ECN | DESCRIPTION | DATE | APPROVED |
| A | 4769 | INITIAL RELEASE | 2/23/98 | CSP |
| B | 4981 | ADD NOTE FOR FOLD OVER TOWER MOUNTING | | |
| C | 1400 | UPDATE DWG FOR CORROSION RESISTANT MTG KIT | 9/2/08 | BRG |
| D | 1938 | UPDATE DCP BOX | 03/24/10 | TI |

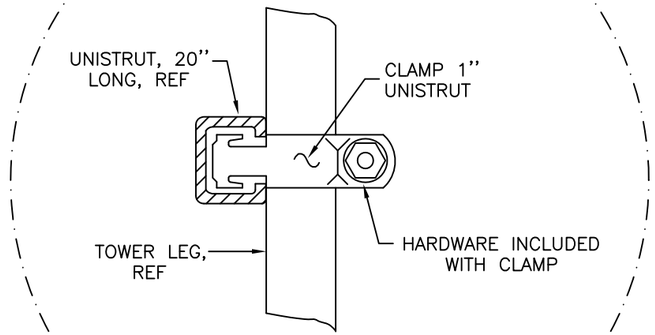



MOUNTING KIT,
ENCLOSURE TO TOWER
M488119–01




SECTION A–A

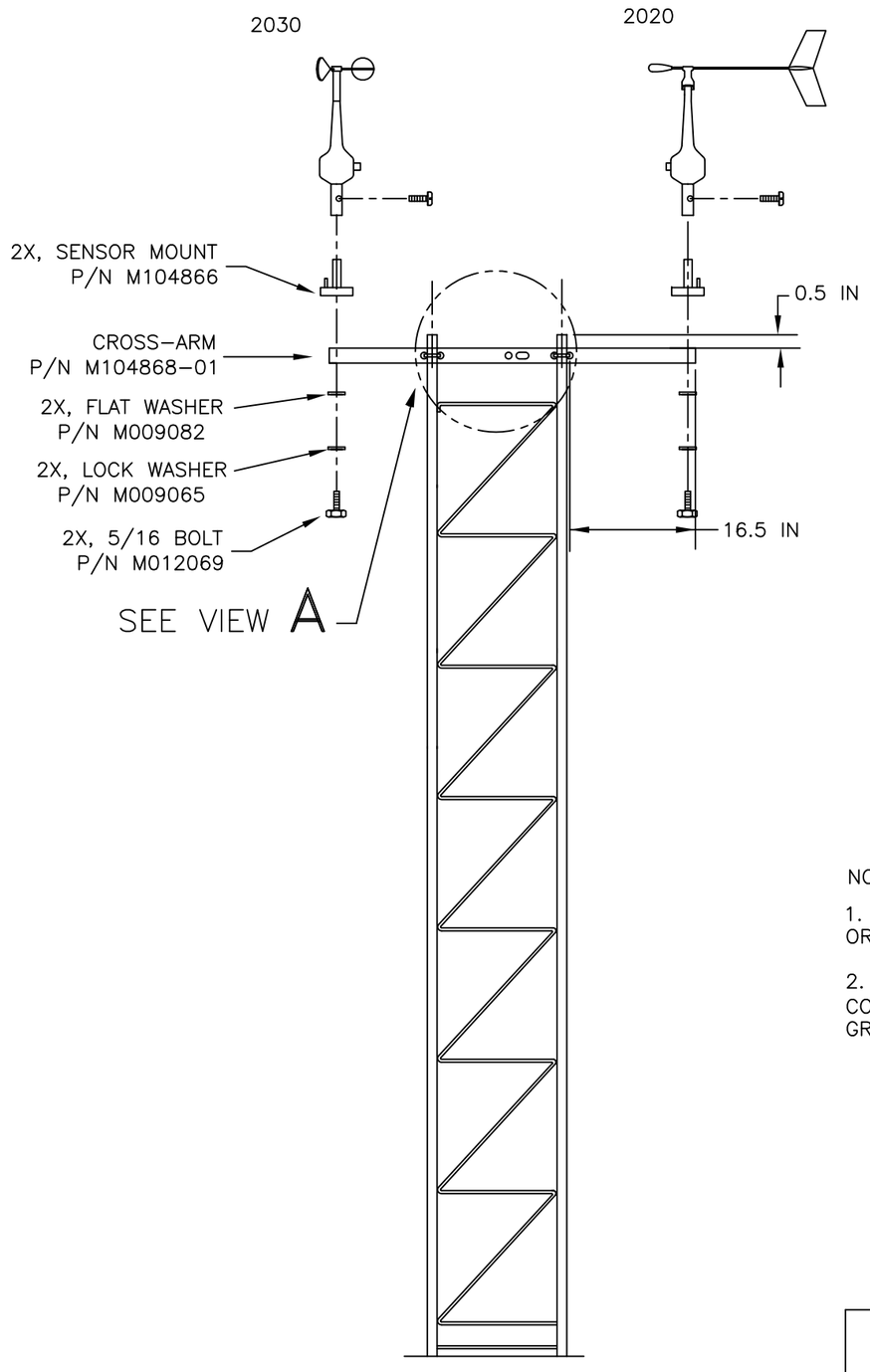



SECTION B–B

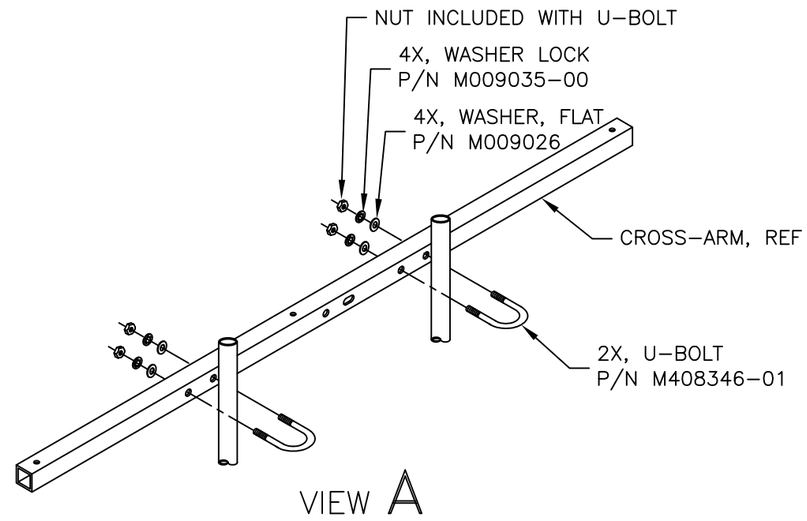


| | | | | | |
|---|---|---|---|---|---|
| APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT: | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES<br>TOLERANCES<br>XX=±.010 ANGLES ±1/2'<br>XXX=±.005 CONCENTRICITY: .003 TIR<br>DO NOT SCALE DRAWING | DRAWN BY: P Kooyman | 10FEB98 | TITLE: INSTALLATION DRAWING, 1190 DCP TOWER MOUNTING |
| | | MATL: SEE BILL OF MATERIALS | REVISED BY: T IWANOWSKI | 03/24/10 | allweatherinc |
| | | FINISH: AS ISSUED | CHECKED BY: | | SIZE D — DWG NO. 1190–007 |
| | | TREATMENT | DESIGN ENGINEER: | | |
| | | | PROJECT MANAGER: | | |
| | | | APPROVALS | DATE | SCALE NONE — RELEASE DATE — SHEET 1 OF 1 |

| REVISIONS | | | DWG NO M403256-01-003 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 1281 | INITIAL RELEASE | 10/24/07 | BRG |
| B | 3874 | ADDED ICE-FREE HUB TO 2020 WIND VANE | 12/31/14 | T. IWANOWSKI |




2020/2030
AWOS MOUNTING
(STACKED TOWER)




VIEW A

NOTES: UNLESS OTHERWISE SPECIFIED:

1. APPLY LOCTITE SILVER GRADE ANTI-SEIZE COMPOUND (M401065-00) OR EQUIVALENT TO ALL EXTERNAL THREADED CONNECTIONS.

2. AFTER INSTALLATION IS COMPLETE, APPLY A LIGHT SPRAY OF CORROSION BLOCK (M402010-00) TO ALL METALLIC CONNECTORS, GROUND LUGS AND THREADED FASTENERS.



| B | B | REV | REV STATUS OF SHEETS |
|---|---|---|---|
| 2 | 1 | SHEET | |

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
XX=±.010 ANGLES ±1/2°
XXX=±.005 FRACTIONS=±.02
DO NOT SCALE DRAWING

MATL: SEE PARTS LIST

FINISH: AS ISSUED

TREATMENT

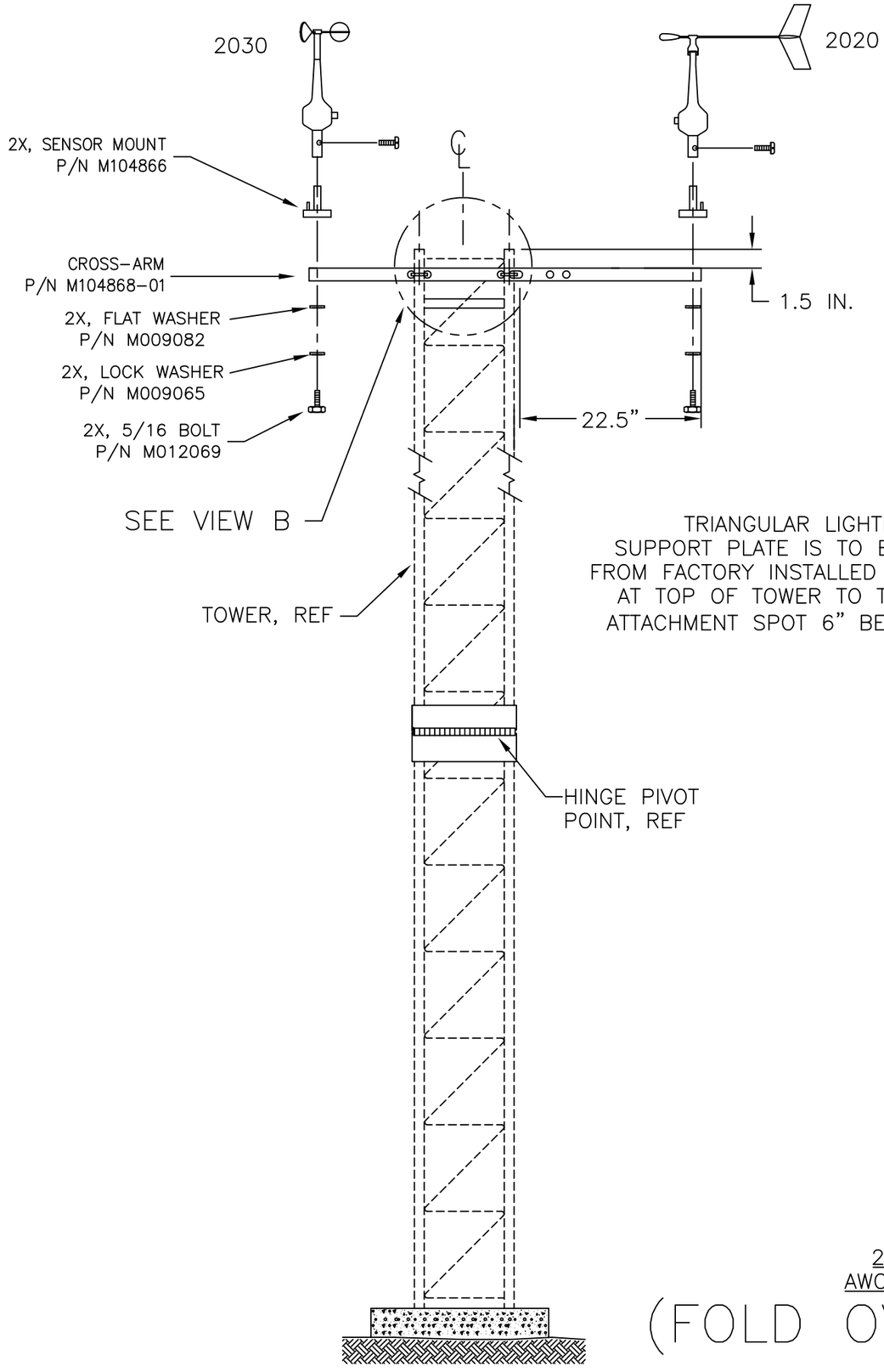
| | | |
|---|---|---|
| DRAWN BY: B. GALARPE | 10/24/07 |
| REVISED BY: | |
| CHECKED BY: – | – |
| DESIGN ENGINEER: J. CONNER | – |
| PROGRAM MANAGER: – | – |
| APPROVALS | DATE |

TITLE: ASSEMBLY DRAWING, CROSSARM, 2020, 2030, AWOS, CORROSION RESISTANT

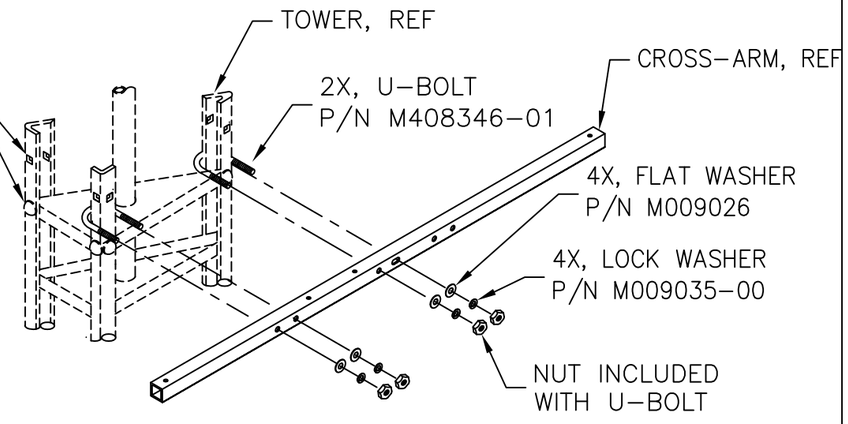
allweatherinc

SIZE C | DWG NO. M403256-01-003

SCALE NONE | RELEASE DATE – | SHEET 1 OF 2




*NOTE:
TRIANGULAR LIGHTNING ROD SUPPORT PLATE IS TO BE MOVED FROM FACTORY INSTALLED LOCATION AT TOP OF TOWER TO THIS NEXT ATTACHMENT SPOT 6" BELOW TOP.

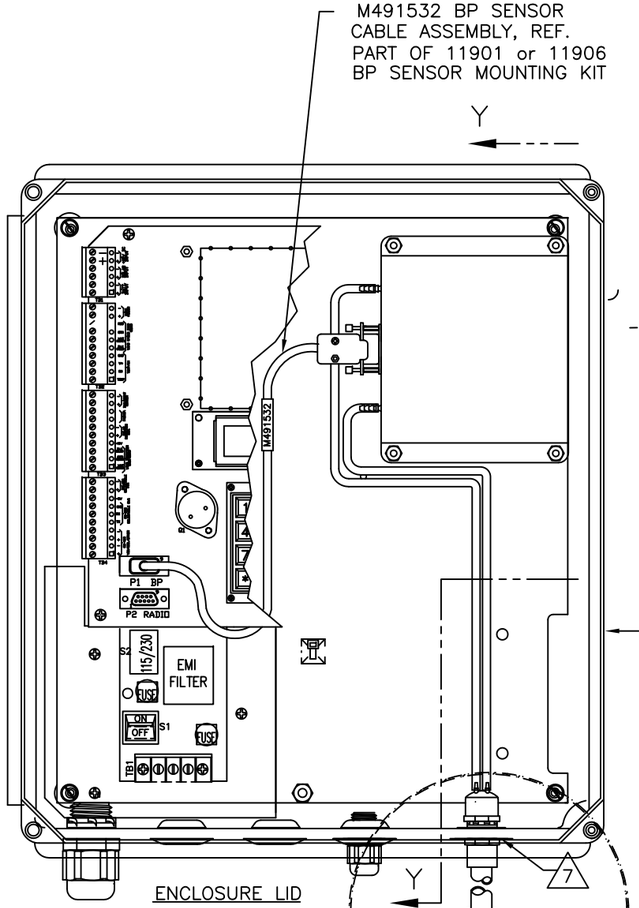


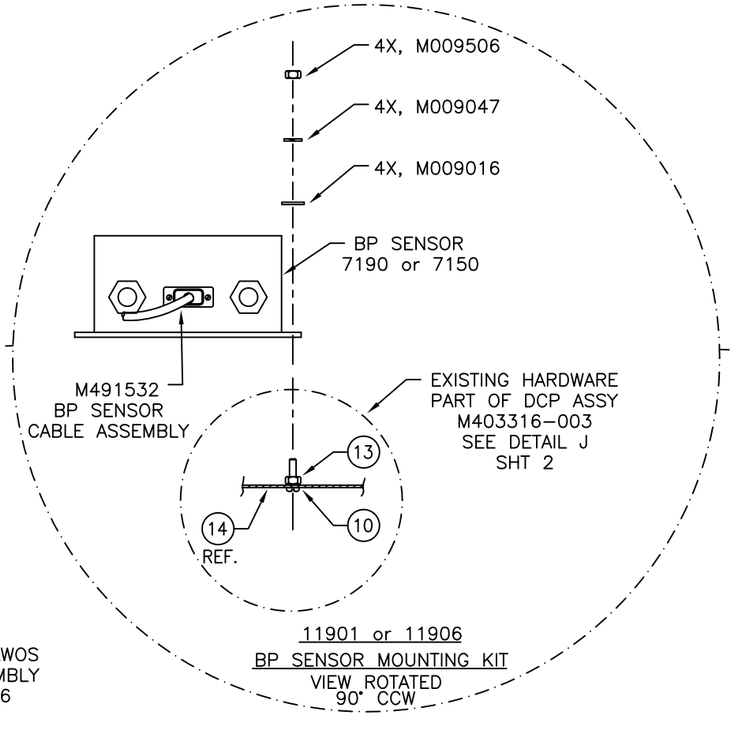

VIEW B

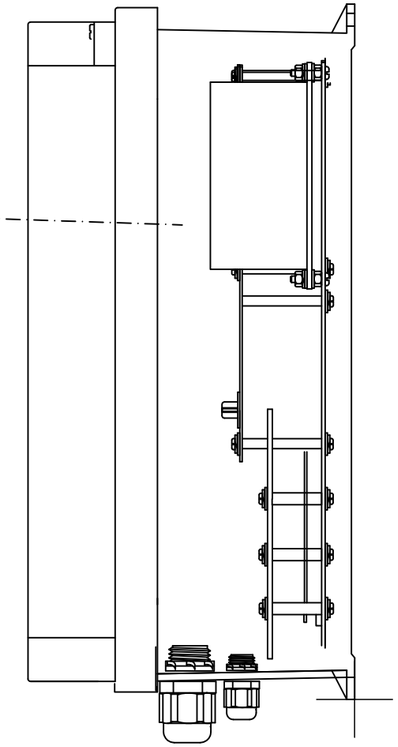


2020/2030
AWOS MOUNTING
(FOLD OVER TOWER)

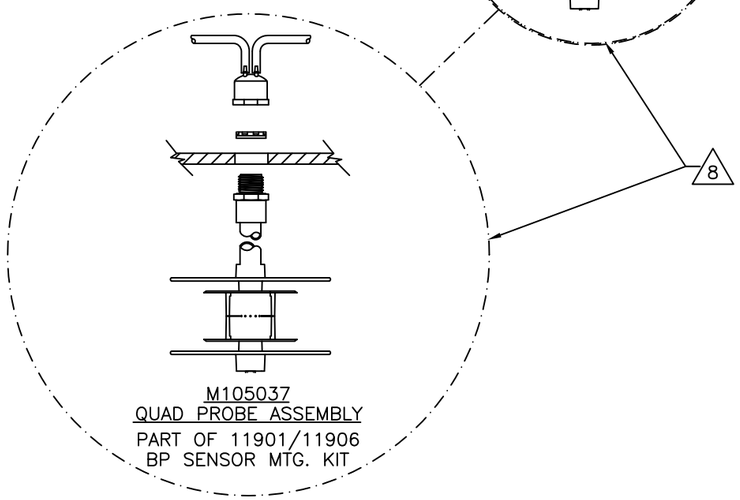
| SIZE | DWG NO. | |
|---|---|---|
| C | M403256-01-003 | |
| SCALE NONE | REV LTR A | SHEET 2 OF 2 |



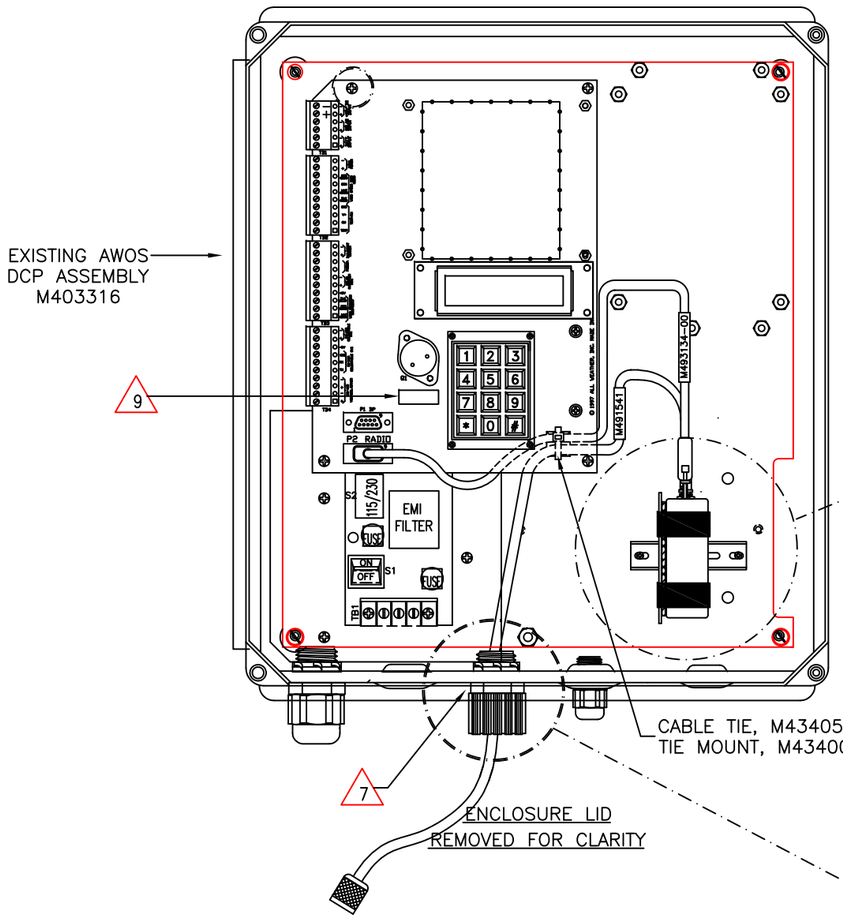
SECTION Y-Y

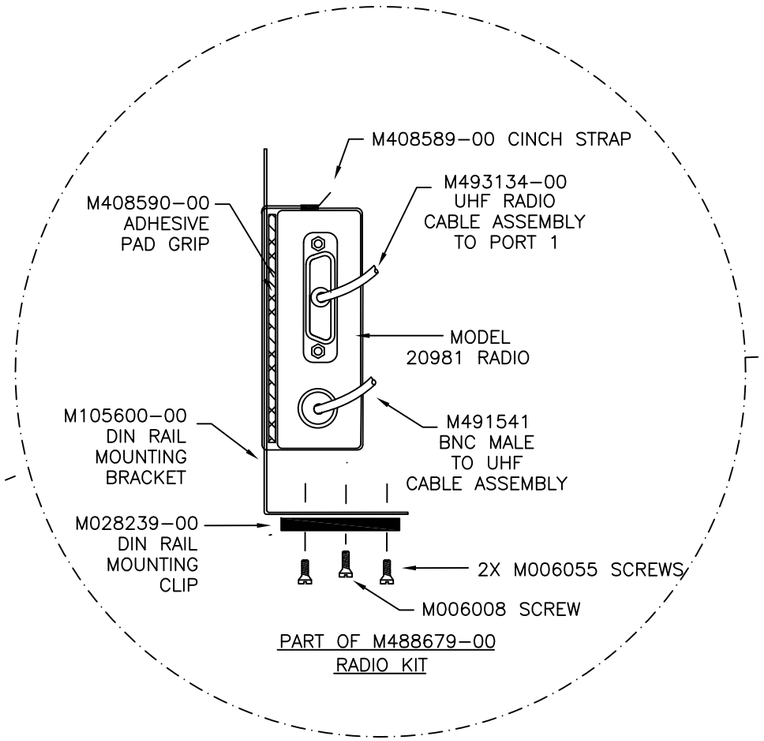


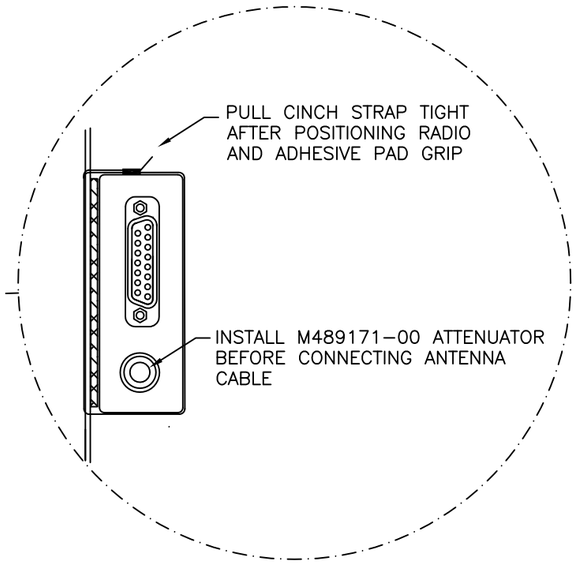

# MODEL 11901 or MODEL 11906
# BP SENSOR MOUNTING KIT

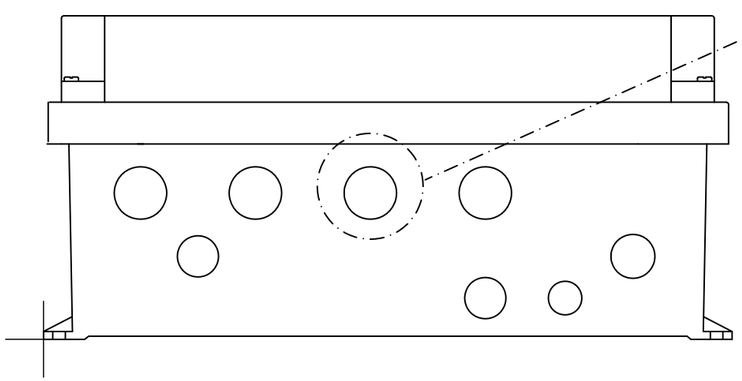


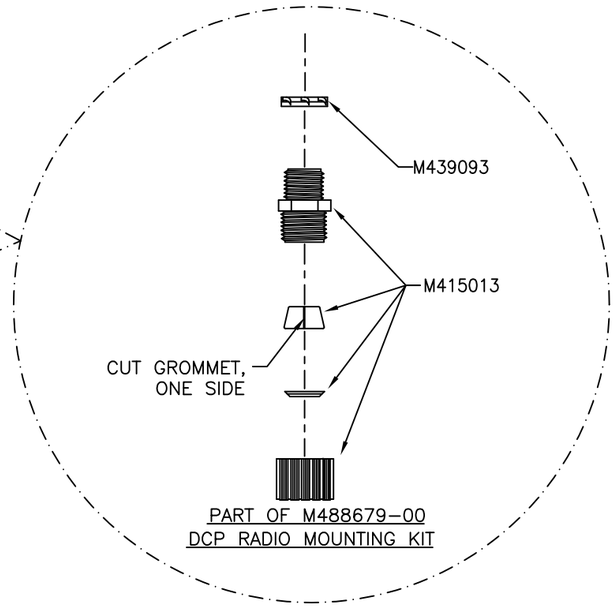
| SIZE | DWG NO. | |
|---|---|---|
| D | M403316-003 | |
| SCALE 1/2 | REV LTR X | SHEET 3 OF 8 |



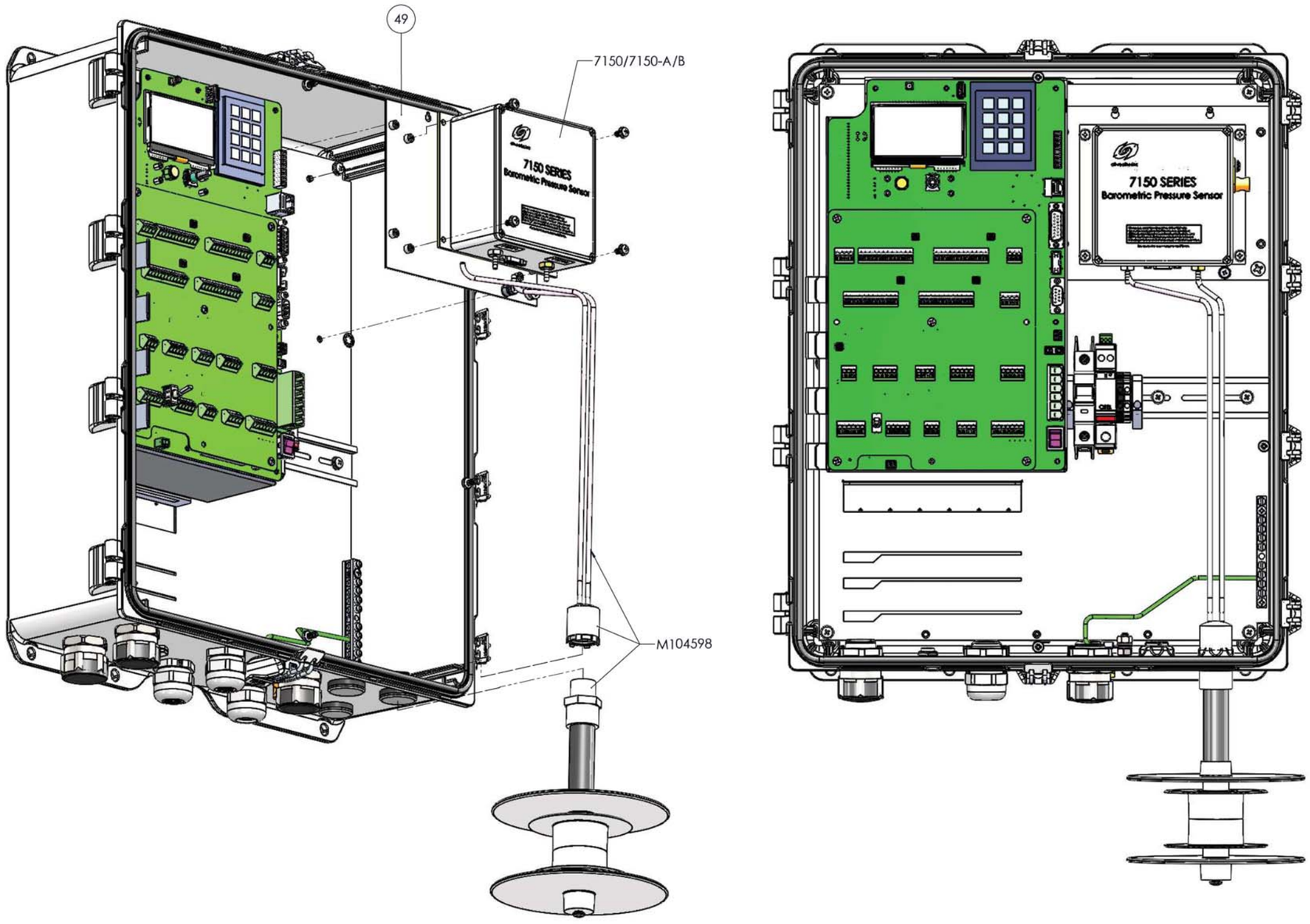






# MODEL 20981 UHF DATA RADIO
# M488679-00 DCP RADIO MOUNTING KIT



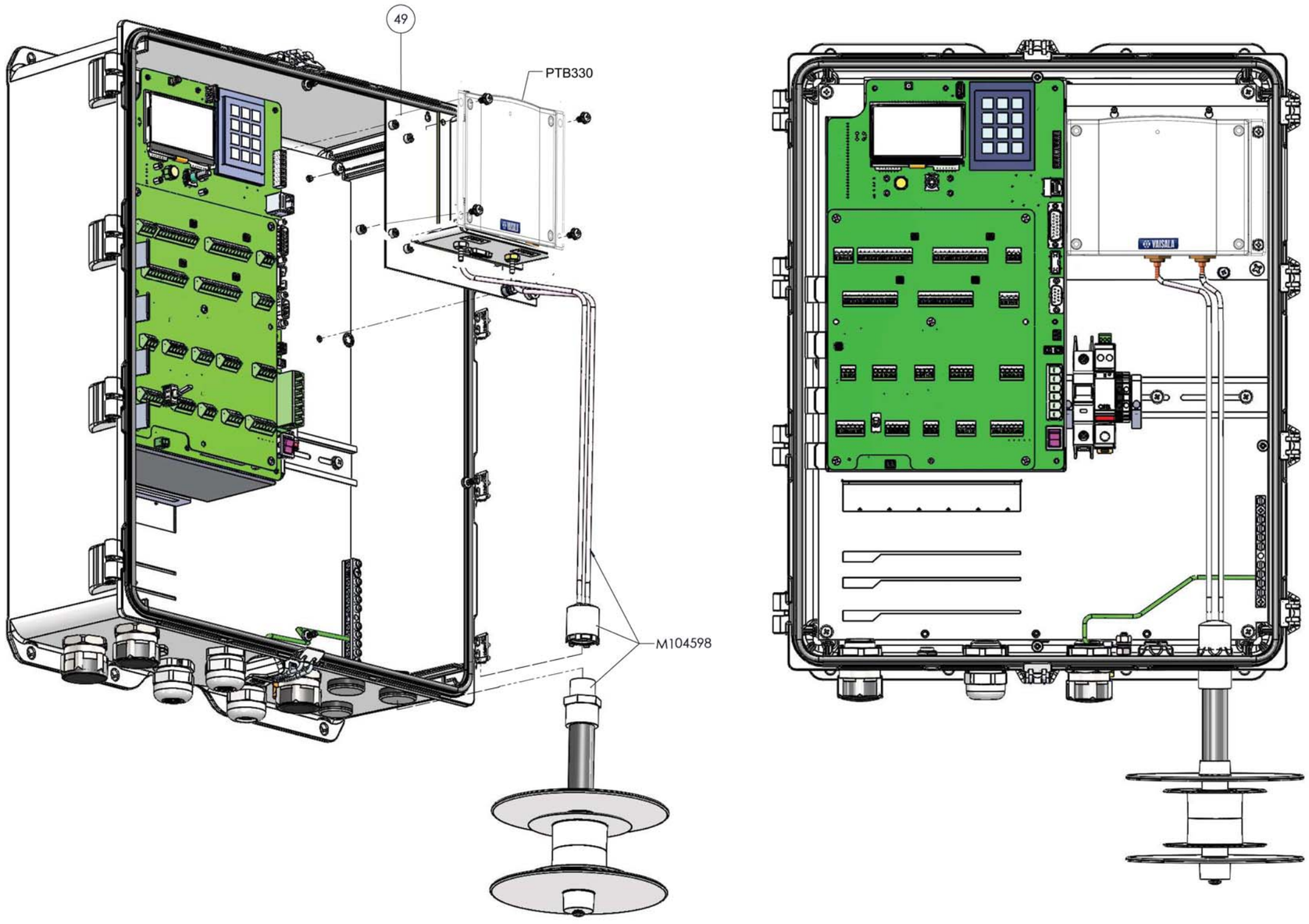
| SIZE | DWG NO. | |
|---|---|---|
| D | M403316-003 | |
| SCALE 1/2 | REV LTR AA | SHEET 4 OF 8 |




# 11926, 11926-A/B BP SENSOR KIT INSTALLATION



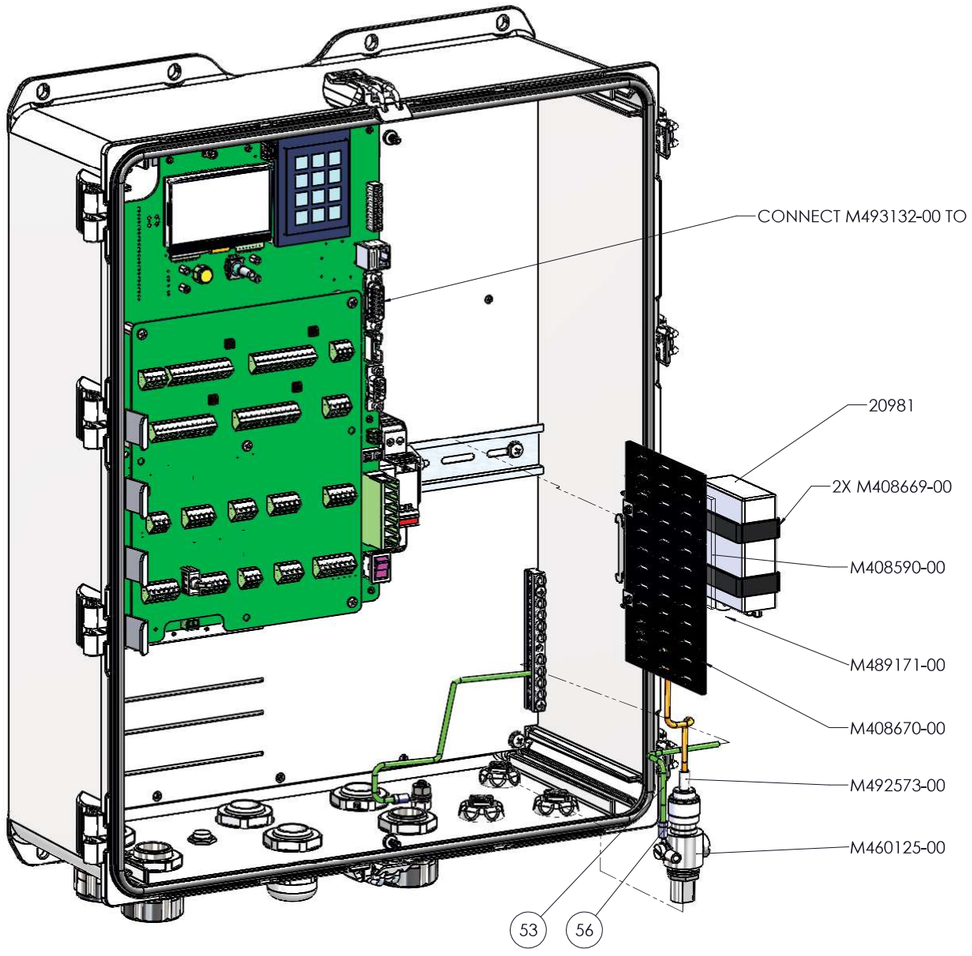
| SIZE | DWG. NO. | |
|---|---|---|
| D | M403566-00-003 | |
| SCALE: 1:5 | REV A | SHEET 10 OF 12 |

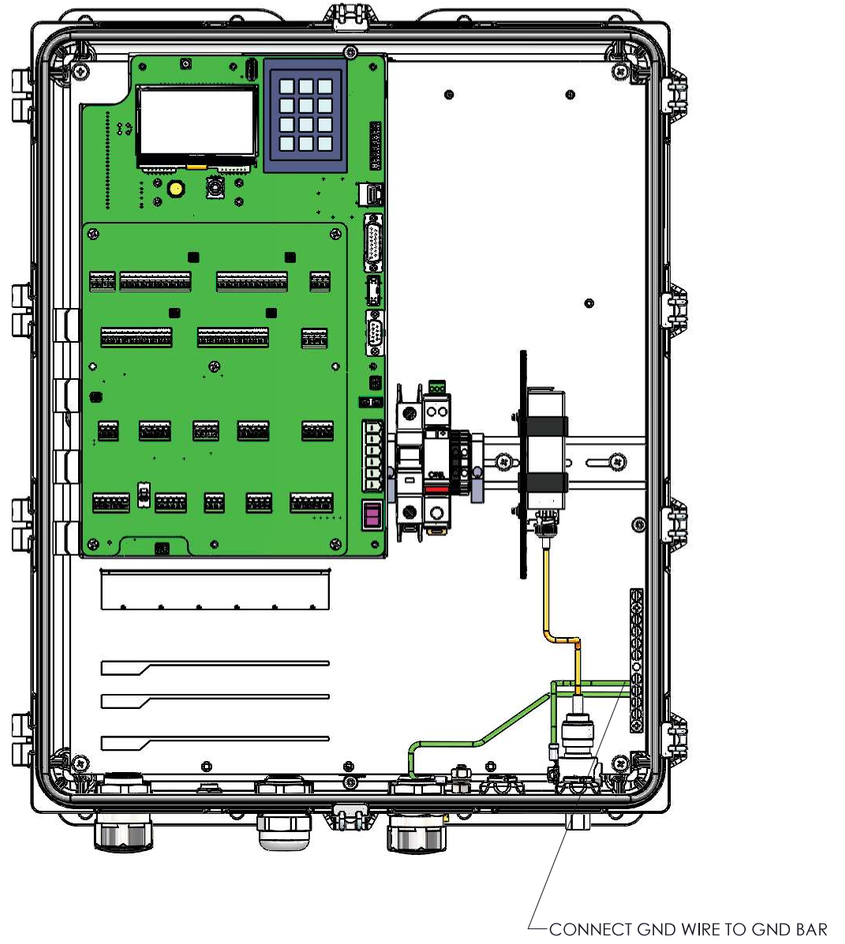



# 11926-PTB, 11926-PTB-A/B SENSOR KIT INSTALLATION



| SIZE | DWG. NO. | |
|---|---|---|
| D | M403566-00-003 | |
| SCALE: 1:5 | REV A | SHEET 10 OF 12 |



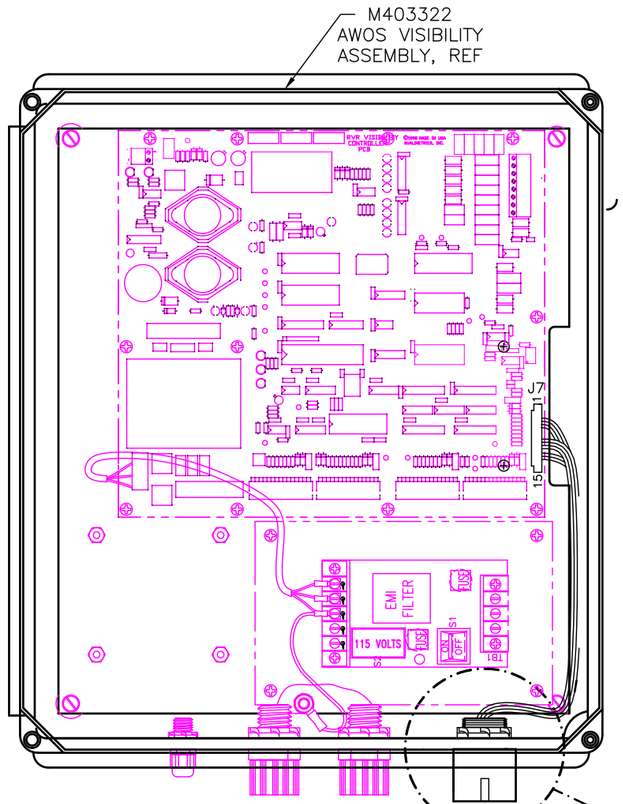

# M488679-01 DCP RADIO MOUNTING KIT



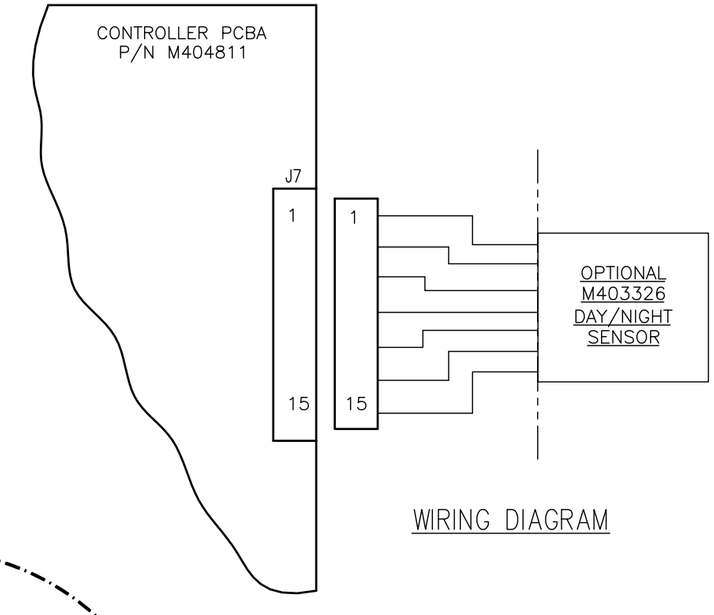
| SIZE | DWG. NO. | |
|---|---|---|
| D | M403566-00-003 | |
| SCALE: 1:5 | REV A | SHEET 11 OF 12 |

NOTES: CONTINUED FROM SHEET 4;

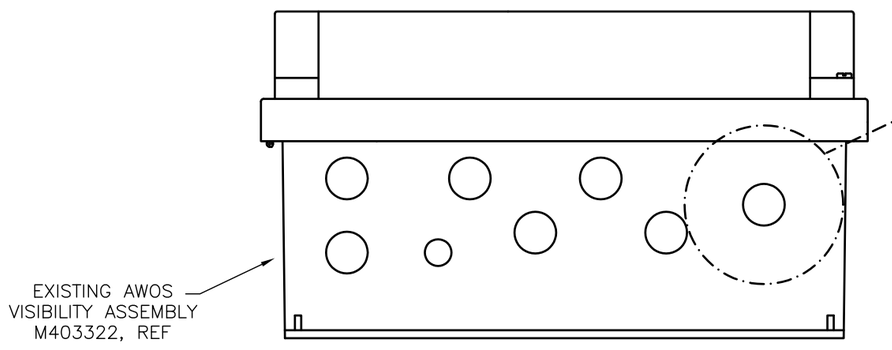
15 INSTALL SLOT FACING FORWARD. FINAL ADJUSTMENT MADE IN FIELD.



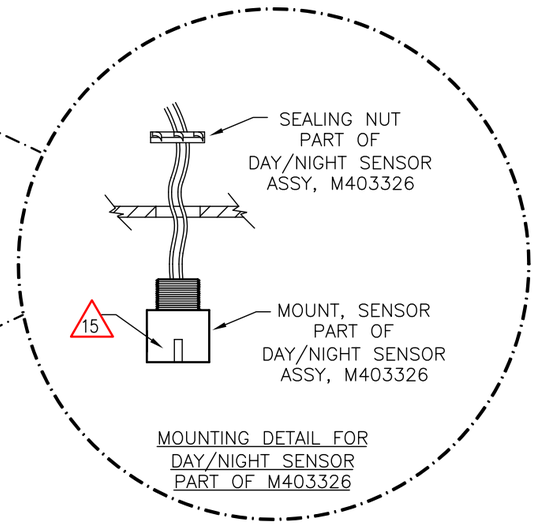

ENCLOSURE LID
REMOVED FOR CLARITY




WIRING DIAGRAM




ENCLOSURE BOTTOM VIEW




MOUNTING DETAIL FOR
DAY/NIGHT SENSOR
PART OF M403326

## INSTALLATION INSTRUCTIONS FOR OPTIONAL DAY/NIGHT SENSOR M403326



| SIZE | DWG NO. | |
|---|---|---|
| D | M403322-003 | |
| SCALE 1/2 | REV LTR G | SHEET 5 OF 6 |

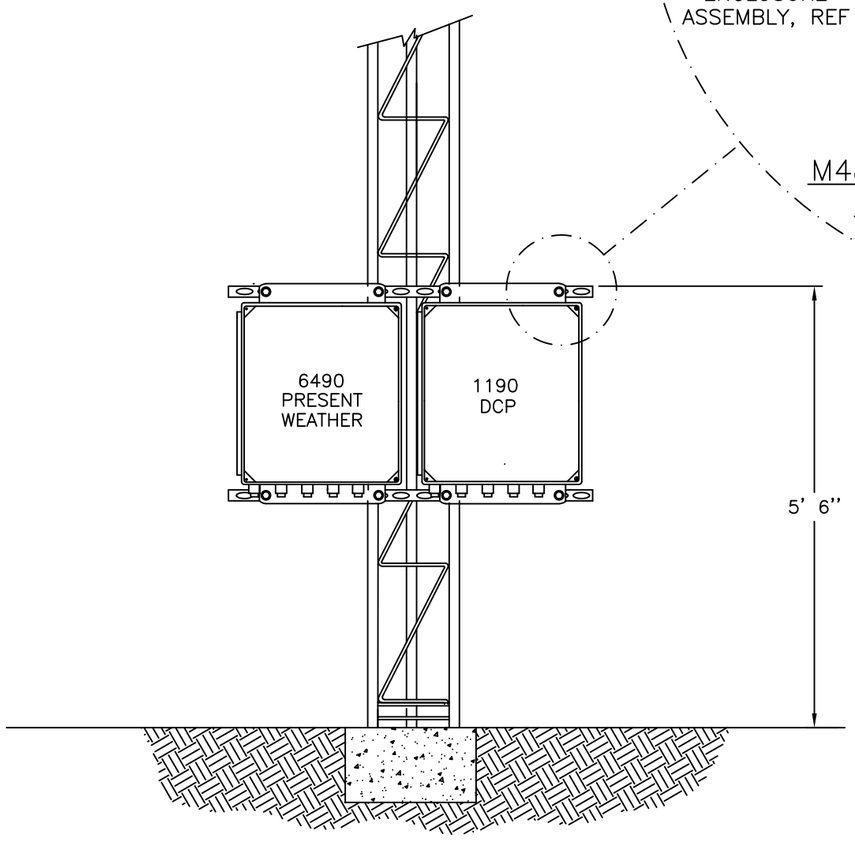
| REVISIONS | | | DWG NO M488176-01-007 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 1281 | INITIAL RELEASE | 10/25/07 | BRG |
| B | 1938 | UPDATE DCP BOX | 03/24/10 | TI |

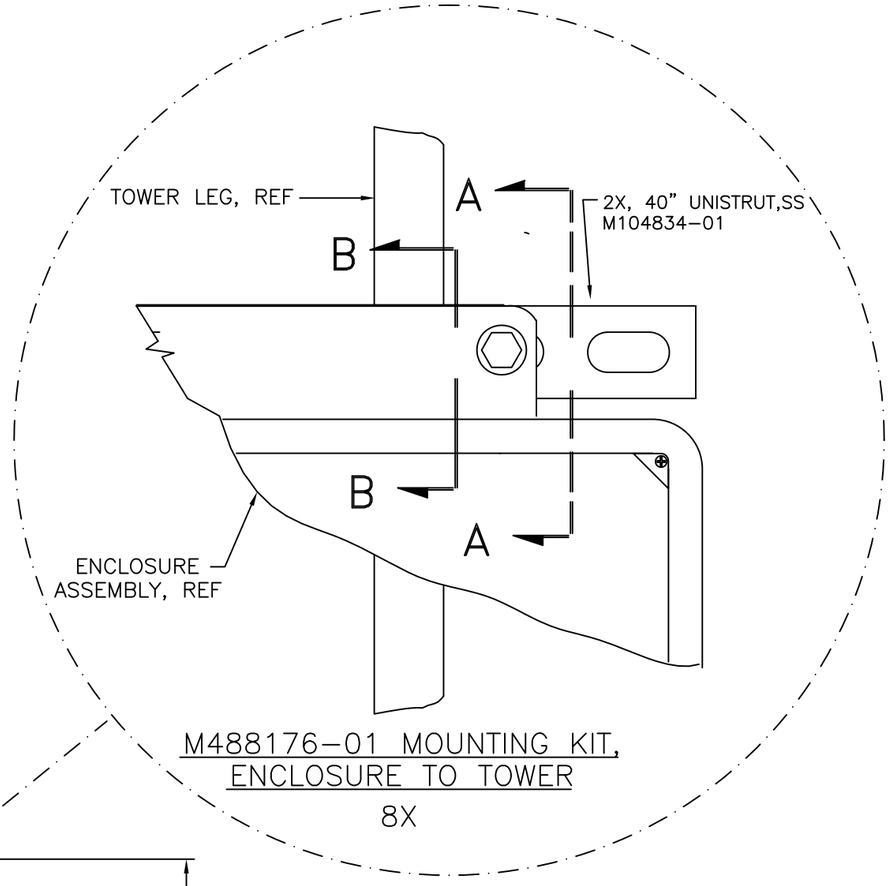
NOTES: UNLESS OTHERWISE SPECIFIED;

1. WHEN USING MODEL 8518-A FOLDOVER TOWER, MOUNT TO HINGED SIDE OF TOWER.

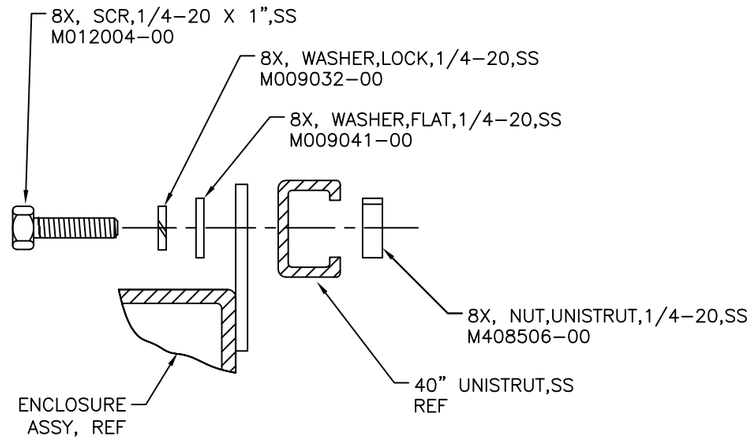
2. APPLY LOCTITE SILVER GRADE ANTI-SEIZE COMPOUND (M401065-00) OR EQUIVALENT TO ALL EXTERNAL THREADED CONNECTIONS.

3. AFTER INSTALLATION IS COMPLETE, APPLY A LIGHT SPRAY OF CORROSION BLOCK (M402010-00) TO ALL METALLIC CONNECTORS, GROUND LUGS AND THREADED FASTENERS.

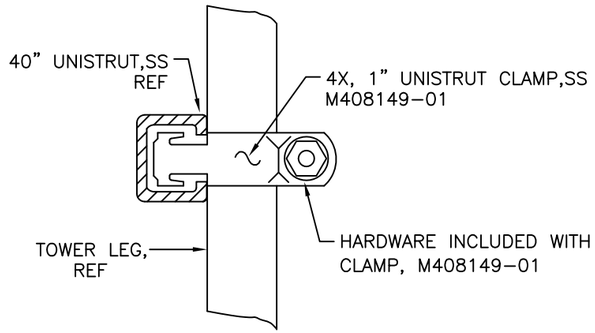



M488176-01 MOUNTING KIT, ENCLOSURE TO TOWER
8X




SECTION A-A




SECTION B-B



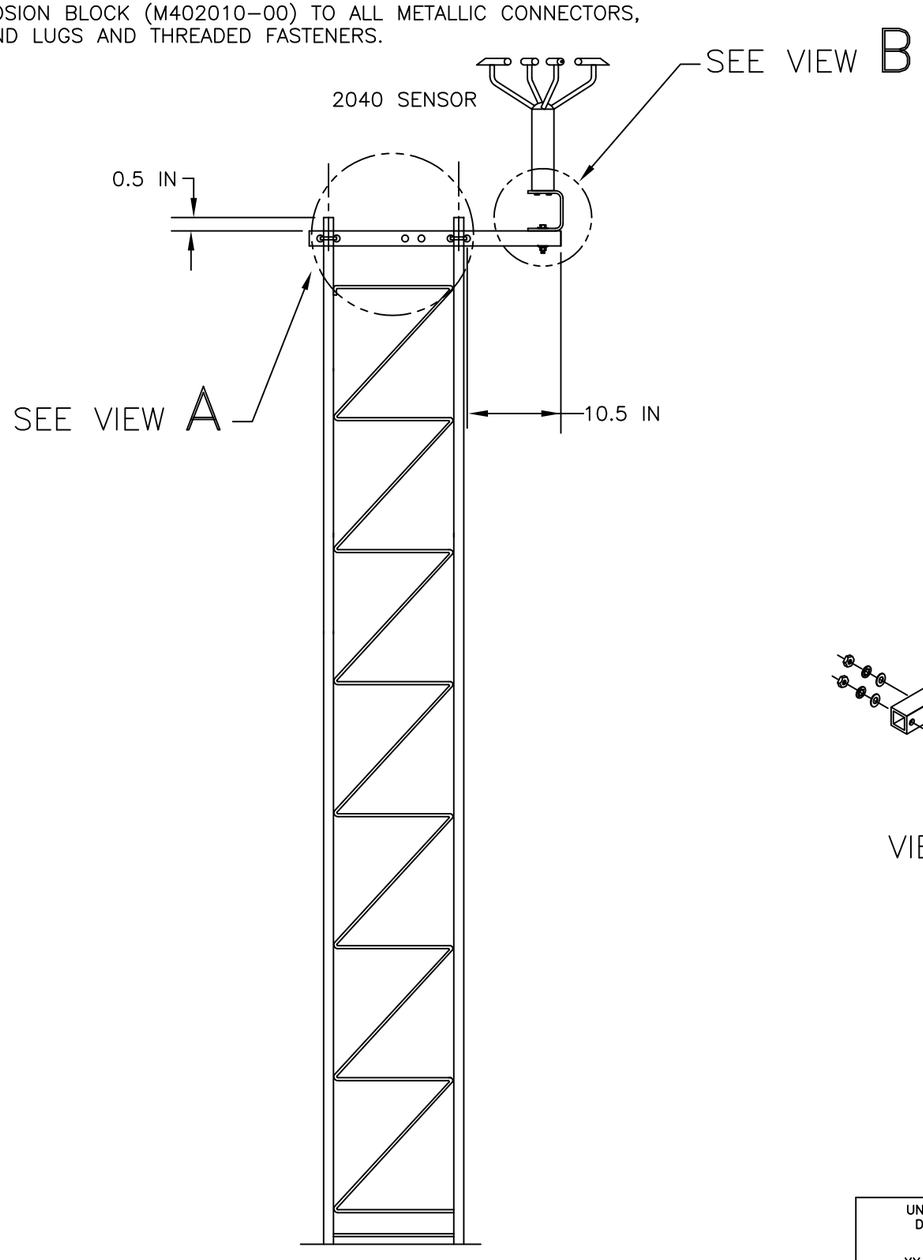
| | | | | | |
|---|---|---|---|---|---|
| APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT: | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES<br>TOLERANCES<br>XX=±.010 ANGLES ±1/2'<br>XXX=±.005 CONCENTRICITY: .003 TIR<br>DO NOT SCALE DRAWING | DRAWN BY: B. GALARPE | 10/25/07 | TITLE: INSTALLATION DRAWING, KIT, MTNG, PRESENT WEATHER/DCP, CORROSION RESISTANT |
| | | | REVISED BY: T IWANOWSKI | 03/24/10 | allweatherinc |
| | | MATL: SEE BILL OF MATERIALS | CHECKED BY: – | – | |
| | | FINISH: AS ISSUED | DESIGN ENGINEER: J. CONNER | – | SIZE D DWG NO. M488176-01-007 |
| | | TREATMENT | PROJECT MANAGER: | | |
| | | | APPROVALS | DATE | SCALE NONE RELEASE DATE SHEET 1 OF 1 |

NOTES: UNLESS OTHERWISE SPECIFIED:

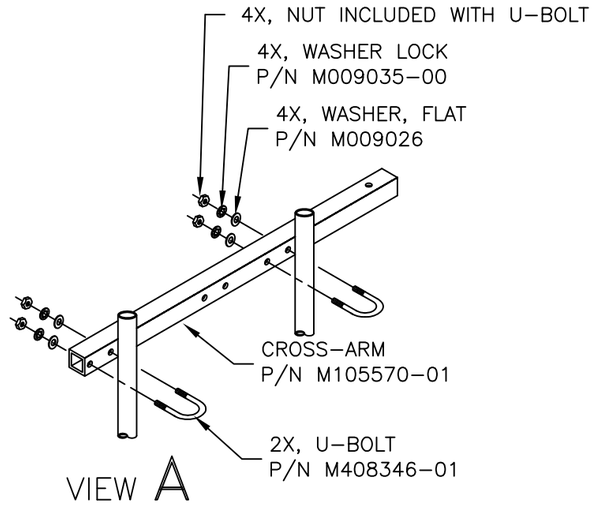
1. APPLY LOCTITE SILVER GRADE ANTI-SEIZE COMPOUND (M401065-00) OR EQUIVALENT TO ALL EXTERNAL THREADED CONNECTIONS.

2. AFTER INSTALLATION IS COMPLETE, APPLY A LIGHT SPRAY OF CORROSION BLOCK (M402010-00) TO ALL METALLIC CONNECTORS, GROUND LUGS AND THREADED FASTENERS.

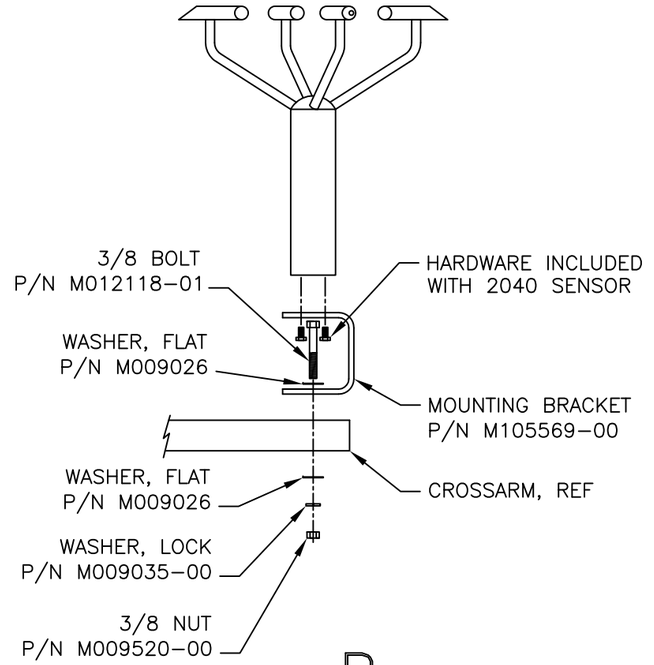
| REVISIONS | | | DWG NO. M488270-01-007 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 1281 | INITIAL RELEASE | 10/25/07 | BRG |
| B | 2143 | GILL SENSOR RENAMED 2040 | 10/06/10 | TI |




2040 ULTRASONIC WIND SENSOR
AWOS MOUNTING
(STACKED TOWER)




VIEW A




VIEW B



| B | B | REV | REV STATUS |
|---|---|---|---|
| 2 | 1 | SHEET | OF SHEETS |

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
XX=±.010 ANGLES ±1/2°
XXX=±.005 FRACTIONS=±.02
DO NOT SCALE DRAWING

MATL: SEE BILL OF MATERIALS

FINISH: AS ISSUED

TREATMENT

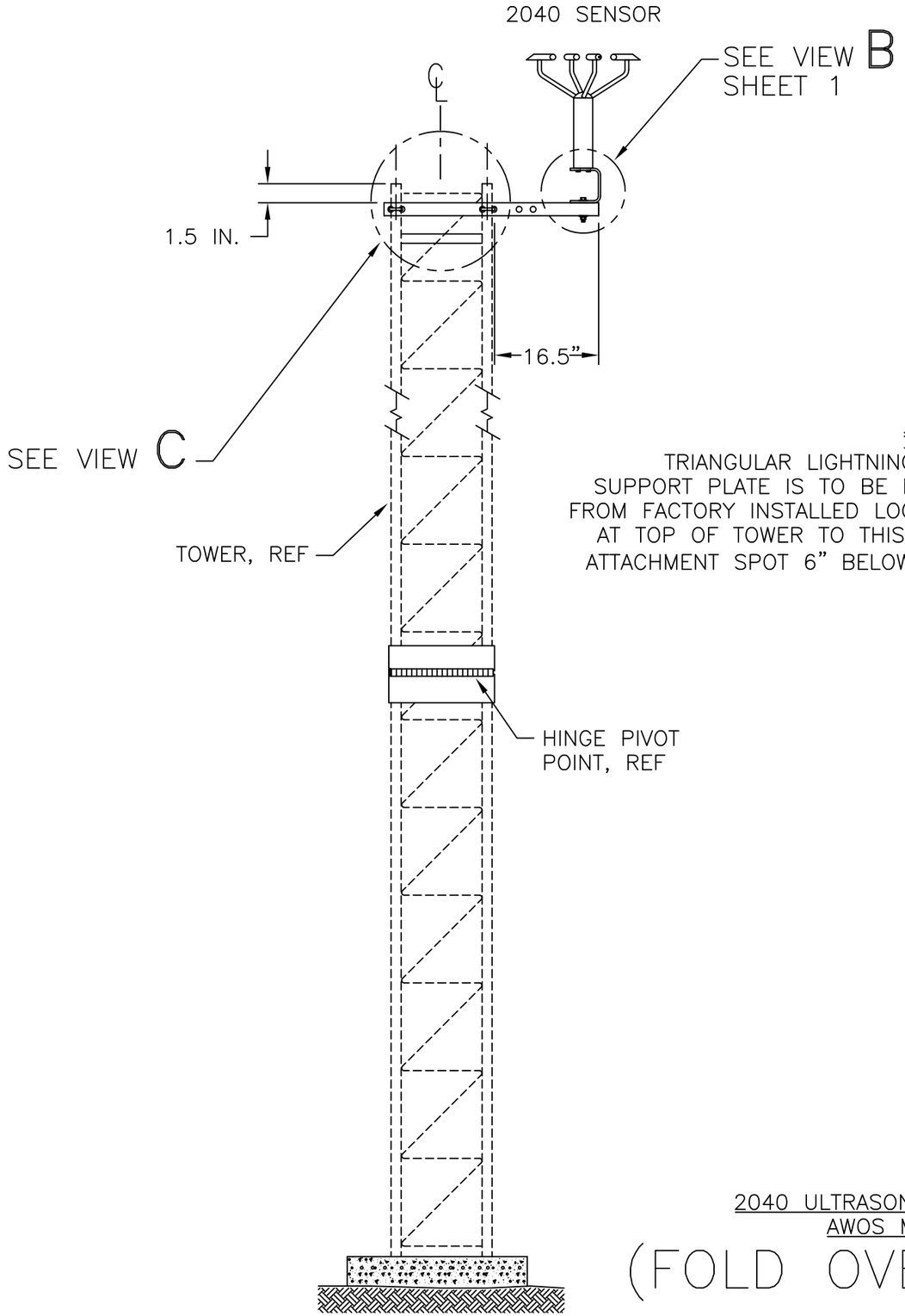
| | | |
|---|---|---|
| DRAWN BY: GALARPE | 26OCT05 | |
| REVISED BY: T IWANOWSKI | 6OCT10 | |
| CHECKED BY: | | |
| DESIGN ENGINEER: | | |
| PROGRAM MANAGER: | | |
| APPROVALS | DATE | |

TITLE
INSTALLATION DRAWING, KIT, MOUNTING, 2040 WIND SENSOR, CORROSION RESISTANT

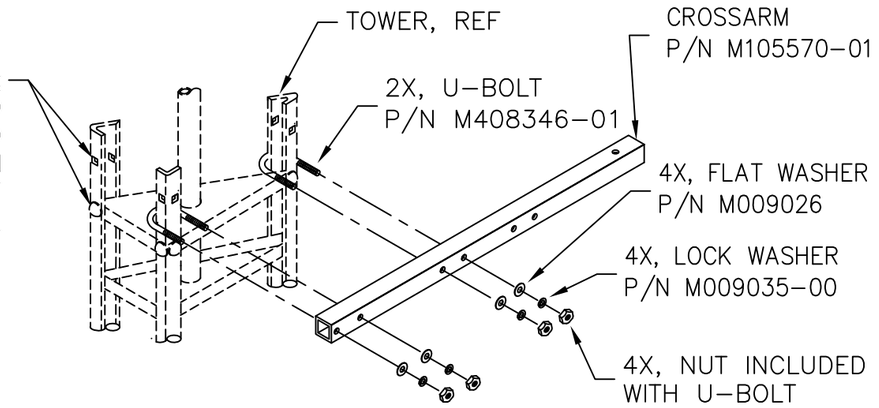
allweatherinc

SIZE C | DWG NO. M488270-01-007

SCALE NONE | RELEASE DATE | SHEET 1 OF 2




*NOTE:
TRIANGULAR LIGHTNING ROD SUPPORT PLATE IS TO BE MOVED FROM FACTORY INSTALLED LOCATION AT TOP OF TOWER TO THIS NEXT ATTACHMENT SPOT 6" BELOW TOP.




VIEW C

2040 ULTRASONIC WIND SENSOR
AWOS MOUNTING

# (FOLD OVER TOWER)



| SIZE | DWG NO. | |
|---|---|---|
| C | M488270-01-007 | |
| SCALE NONE | REV LTR B | SHEET 2 OF 2 |

NOTES: UNLESS OTHERWISE SPECIFIED;

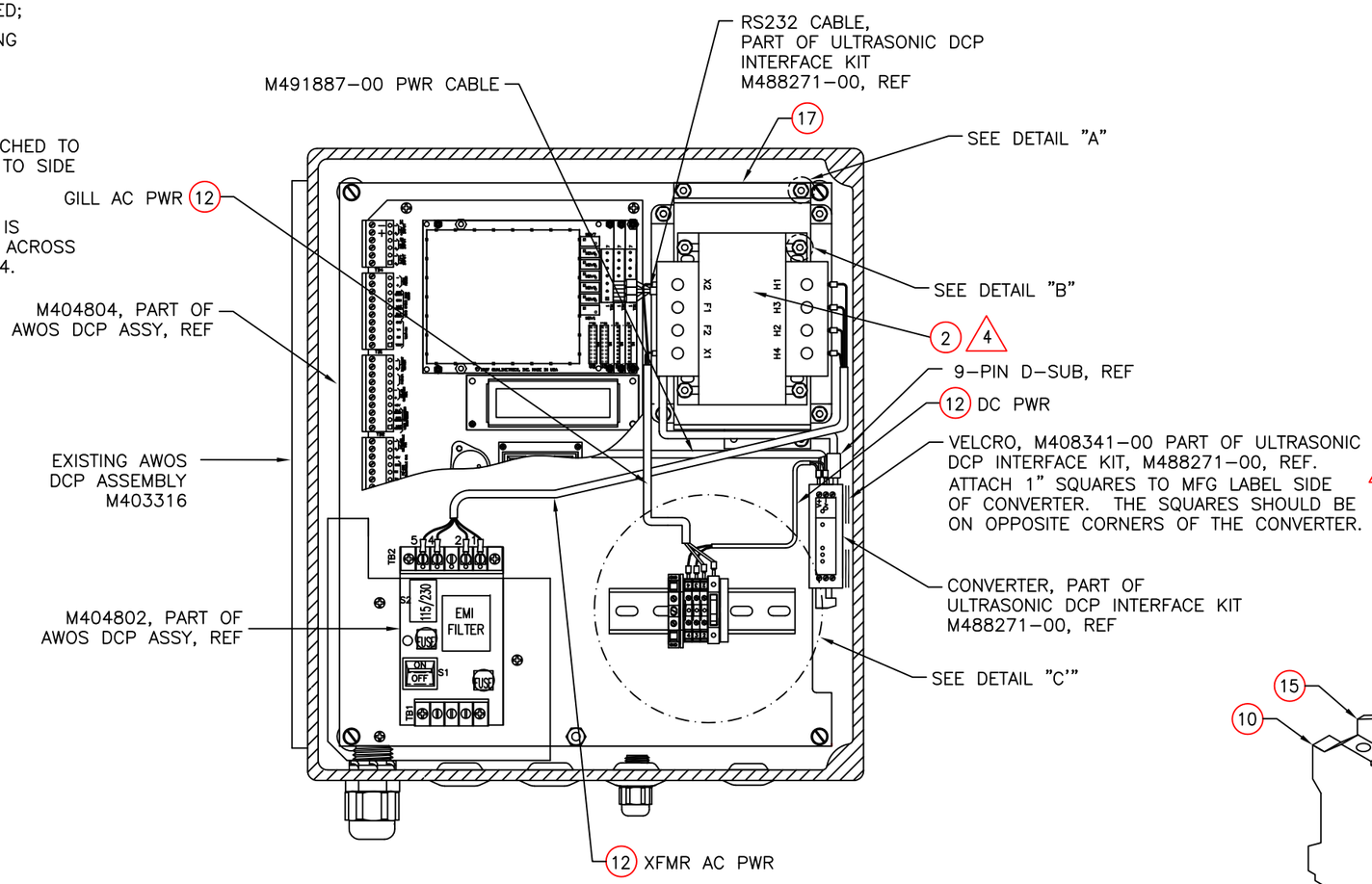
1. USE IN CONJUNCTION WITH WIRING DIAGRAM M488274-02-019.

△2 DELETED.

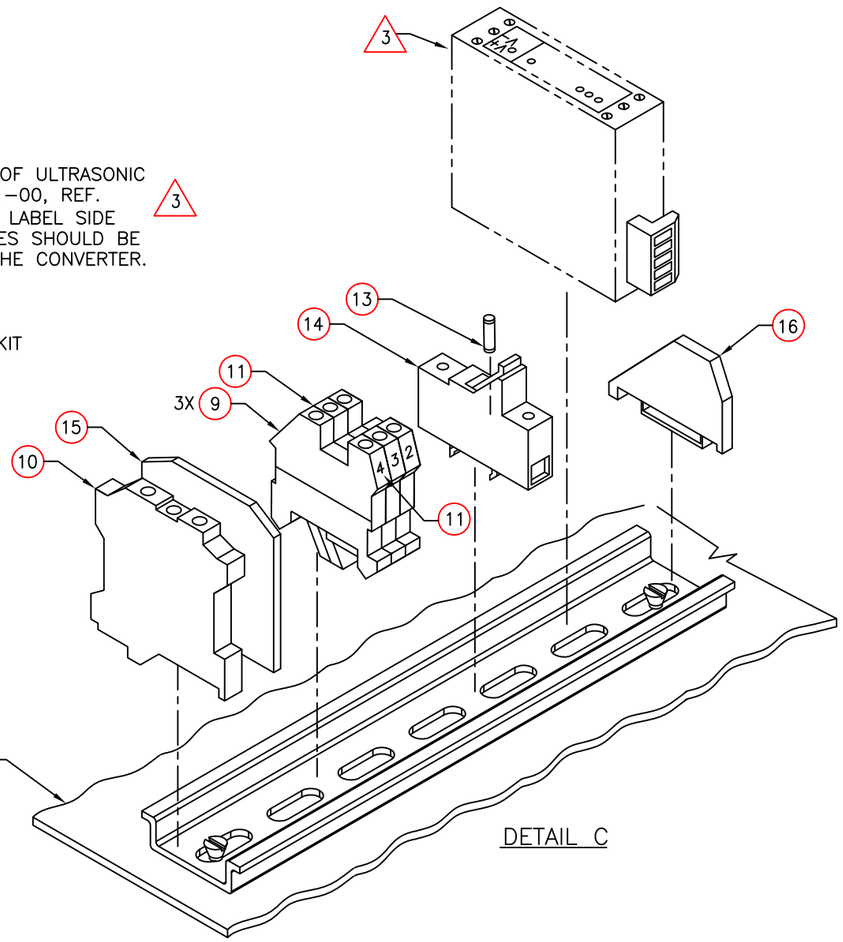
△3 RS485 CONVERTER MAY BE ATTACHED TO DIN RAIL IN LIEU OF ATTACHING TO SIDE OF ENCLOSURE WITH VELCRO.

△4 IF ALTERNATE XFMR (HAMMOND) IS USED,INSTALL SUPPLIED JUMPER ACROSS X2 & X3. CONNECT TO X1 & X4.

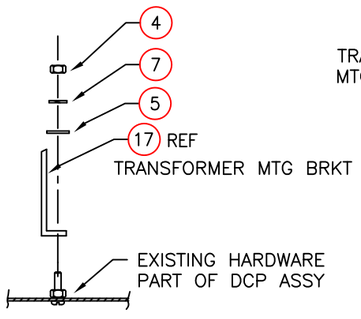
| REVISIONS | | | | DWG NO. M488274-02-003 |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 1745 | INITIAL RELEASE | 12-30-08 | J.CONNER |
| B | 2061 | SHOW NEW XFMR, DEL GND WIRE,ADD NOTE 4 | 09-23-10 | BRG |
| C | 3620 | MOVED DC PWR CBL, ADDED M491887-00 & SHT.2 | 08-27-14 | T.IWANOWSKI |
| D | 4765 | CORRECTED SHEET INFO ON SHEET 1 | 07-12-17 | T.IWANOWSKI |
| E | 5188 | SHOWED DIN RAIL ALREADY MOUNTED | 01-27-20 | T.IWANOWSKI |



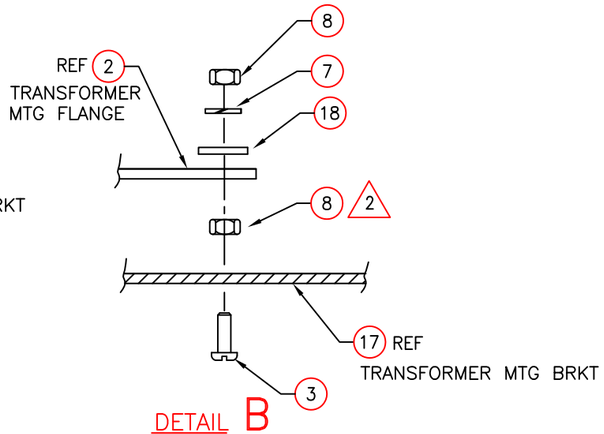

ENCLOSURE FRONT VIEW
COVER REMOVED




DETAIL C




DETAIL A
3 PLACES




DETAIL B
4 PLACES



| C | E | REV | REV STATUS OF SHEETS |
|---|---|---|---|
| 2 | 1 | SHEET | |

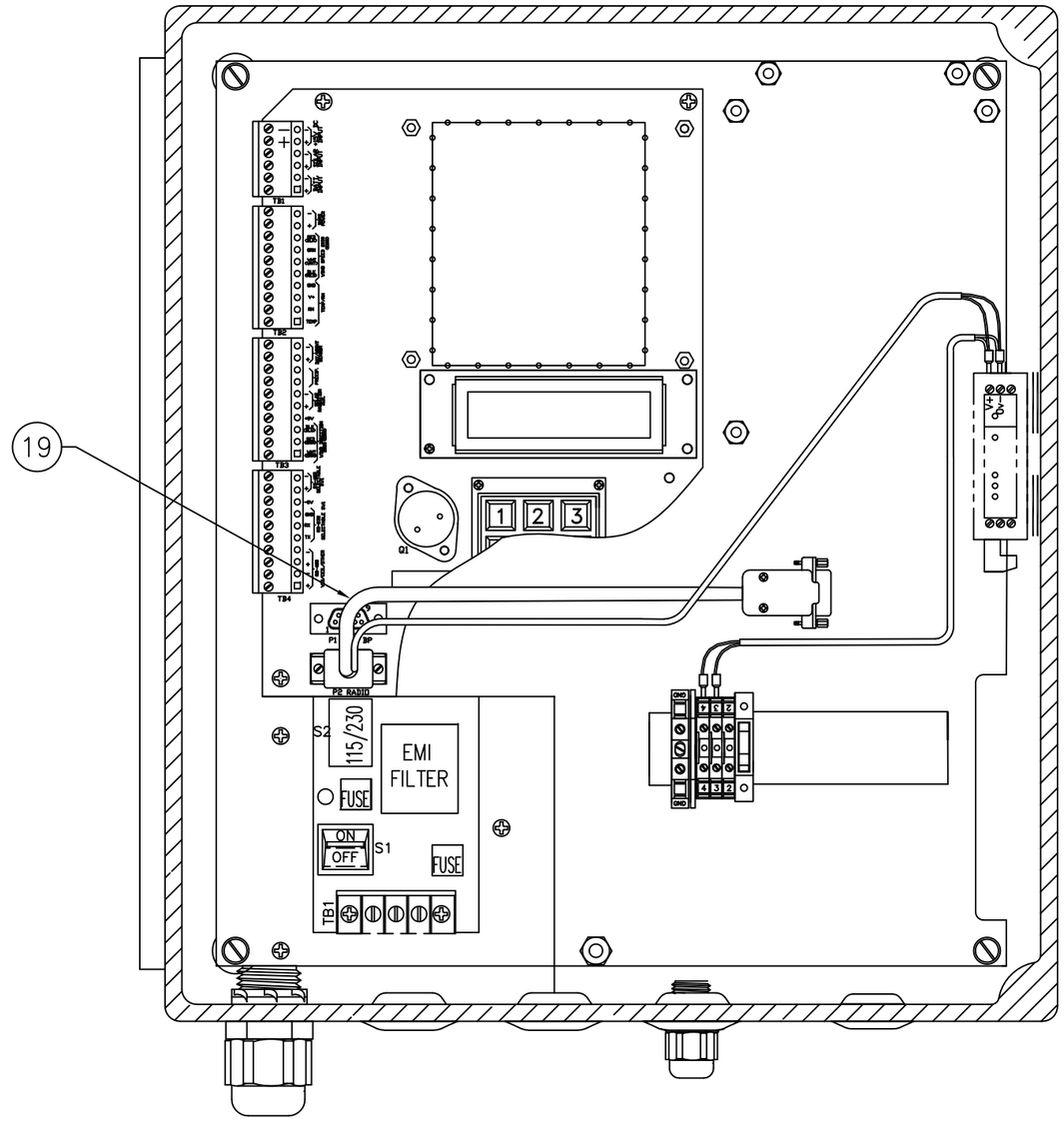
| | | |
|---|---|---|
| UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES XX=±.010 ANGLES ±1/2° XXX=±.005 FRACTIONS=±.02 DO NOT SCALE DRAWING | DRAWN BY: J.CONNER | 12-30-2008 |
| | REVISED BY: T. IWANOWSKI | 01-27-2020 |
| MATL: SEE BILL OF MATERIALS | CHECKED BY: J. PATTERSON | 1-13-2009 |
| FINISH: NONE | DESIGN ENGINEER: J. PATTERSON | 1-14-2009 |
| TREATMENT | PROJECT MANAGER: | |
| | APPROVALS | DATE |

TITLE: ASSEMBLY DRAWING, KIT, GILL HEATER 7 AMP POWER SUPPLY

allweatherinc

SIZE D | DWG NO. M488274-02-003

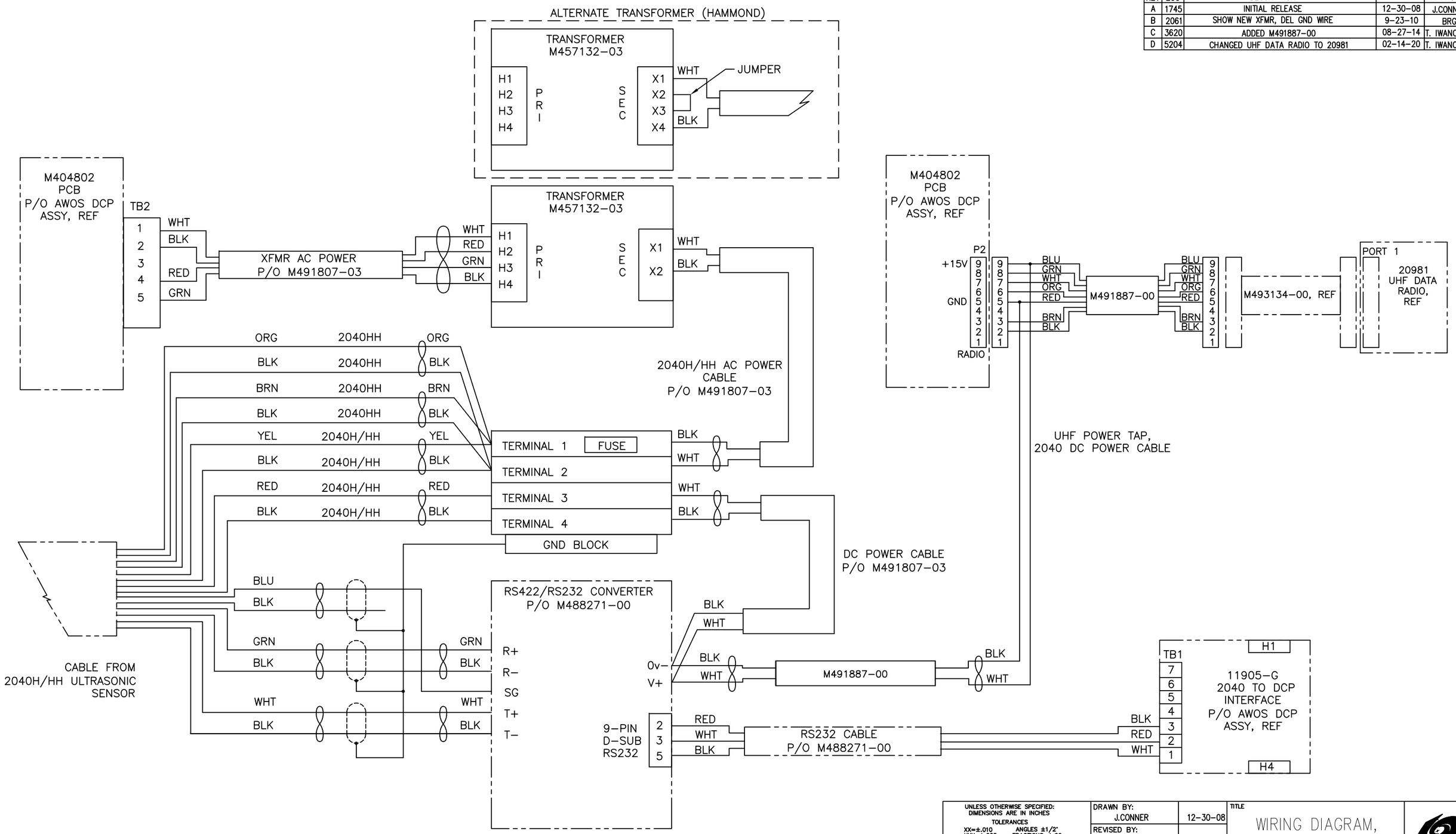
SCALE NONE | RELEASE DATE | SHEET 1 OF 2




ENCLOSURE FRONT VIEW LID REMOVED

| SIZE | DWG NO. | |
|---|---|---|
| D | M488274-02-003 | |
| SCALE NONE | REV LTR C | SHEET 2 OF 2 |

| REVISIONS | | | DWG NO. M488274-02-019 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 1745 | INITIAL RELEASE | 12-30-08 | J.CONNER |
| B | 2061 | SHOW NEW XFMR, DEL GND WIRE | 9-23-10 | BRG |
| C | 3620 | ADDED M491887-00 | 08-27-14 | T. IWANOWSKI |
| D | 5204 | CHANGED UHF DATA RADIO TO 20981 | 02-14-20 | T. IWANOWSKI |






UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
XX=±.010 ANGLES ±1/2'
XXX=±.005 FRACTIONS=±.02
DO NOT SCALE DRAWING

MATL: SEE BILL OF MATERIALS

FINISH: XXX

TREATMENT

| | | |
|---|---|---|
| DRAWN BY: J.CONNER | 12-30-08 | |
| REVISED BY: T. IWANOWSKI | 2-14-20 | |
| CHECKED BY: J. PATTERSON | 1-13-09 | |
| DESIGN ENGINEER: J. PATTERSON | 1-14-09 | |
| PROJECT MANAGER: | | |
| APPROVALS | DATE | |

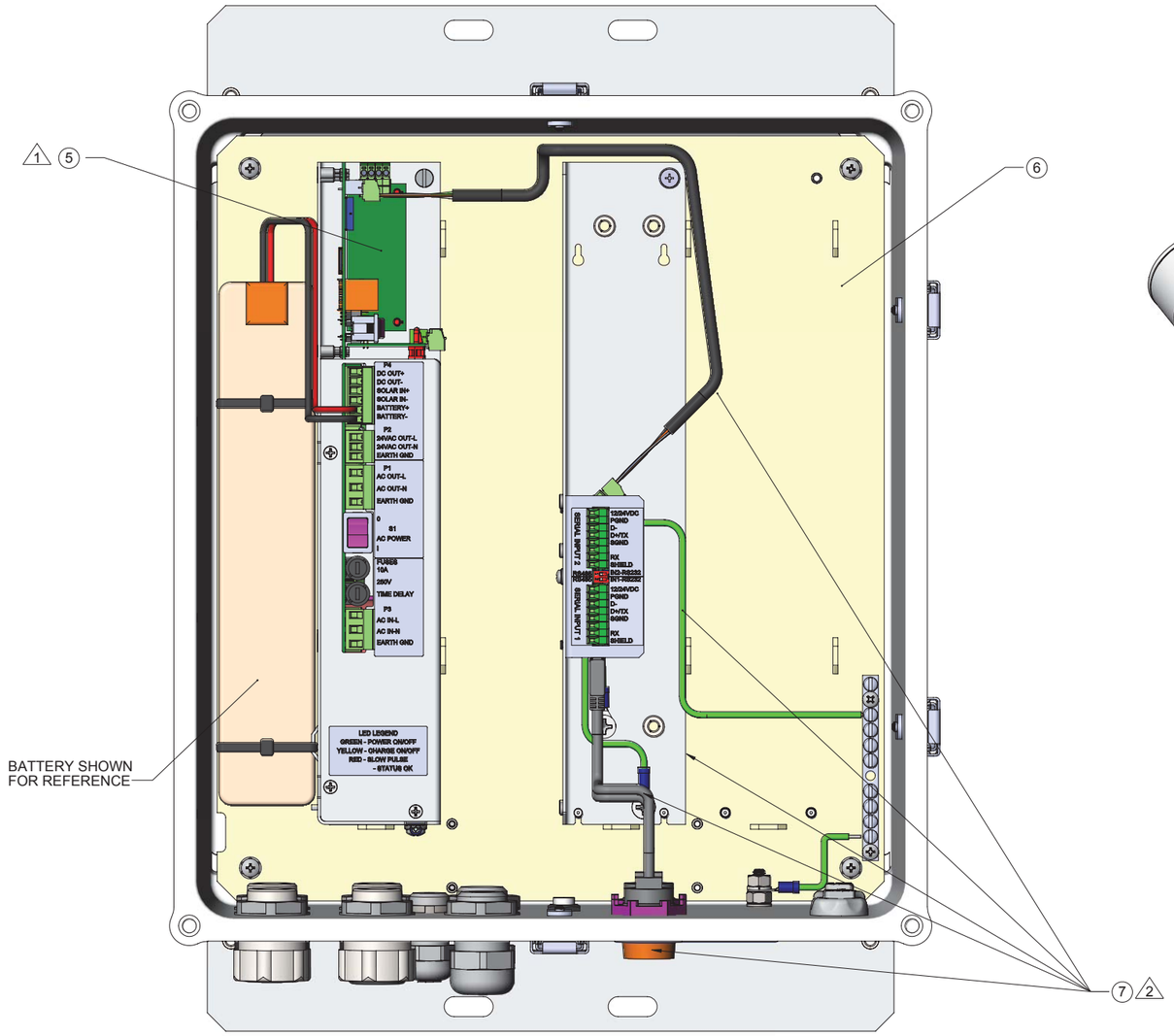
TITLE: WIRING DIAGRAM, KIT, GILL HEATER 7 AMP POWER SUPPLY

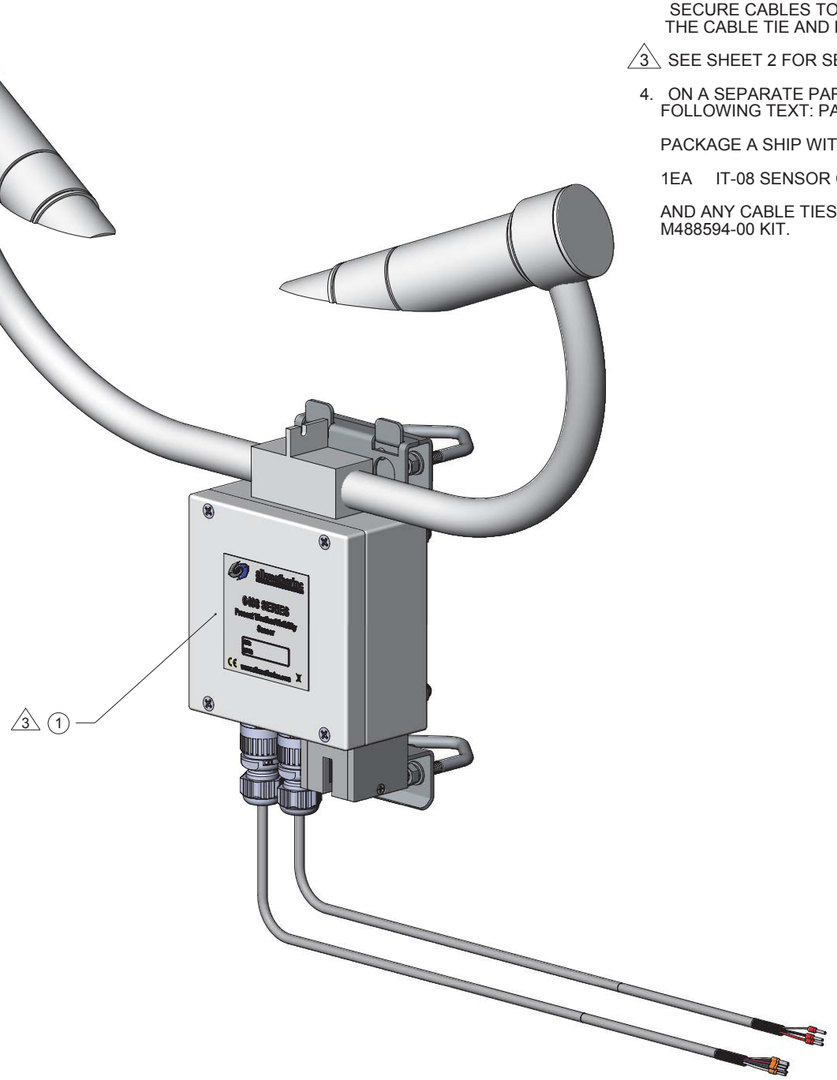
allweatherinc

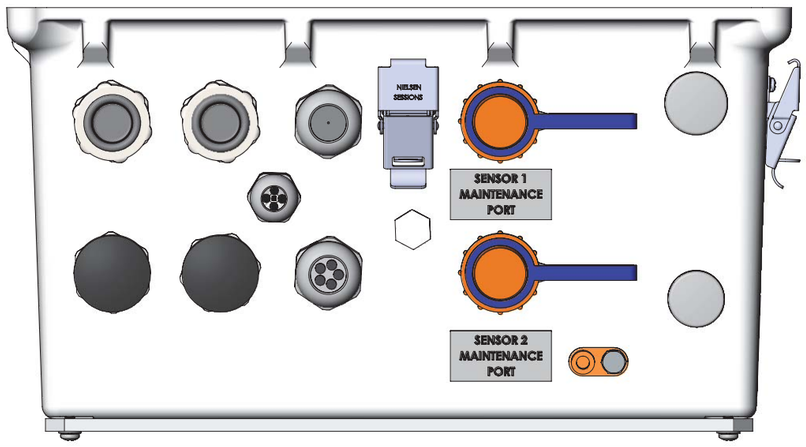
SIZE D | DWG NO. M488274-02-019

SCALE NONE | RELEASE DATE | SHEET 1 OF 1

| REVISIONS | | | 6498-003 | |
|---|---|---|---|---|
| REV | ECN | DESCRIPTION | DATE | APPROVED |
| A | 3716 | INITIAL RELEASE | 10-06-14 | KAH |
| B | 4661 | UPDATED DRAWING TO ACTUAL SENSOR | 11-09-17 | SLVS |




NOTES: UNLESS OTHERWISE SPECIFIED:

1. INSTALL 2715 UPCM PER M403515-01-003.
2. INSTALL THE M488594-00 SENSOR MAINTENANCE KIT PER INSTALLATION DRAWING M48594-00-007. SECURE CABLES TO ENCLOSURE AND SLED USING THE CABLE TIE AND BASES PROVIDED WITH KIT.
3. SEE SHEET 2 FOR SENSOR WIRING DETAIL.
4. ON A SEPARATE PARTS BAG, PLACE A LABEL WITH THE FOLLOWING TEXT: PARTS FOR 6498.

   PACKAGE A SHIP WITH THE 6498 THE FOLLOWING ITEMS.

   1EA IT-08 SENSOR GROUND WIRE

   AND ANY CABLE TIES AND BASES NOT USED FROM THE M488594-00 KIT.



UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES

TOLERANCES
XX = ± .010
.XXX = ± .005
ANGLES = ± 1/2°
CONCENTRICITY = .003 TIR

MATERIAL: SEE BILL OF MATERIALS

FINISH: AS ISSUED

TREATMENT: NONE

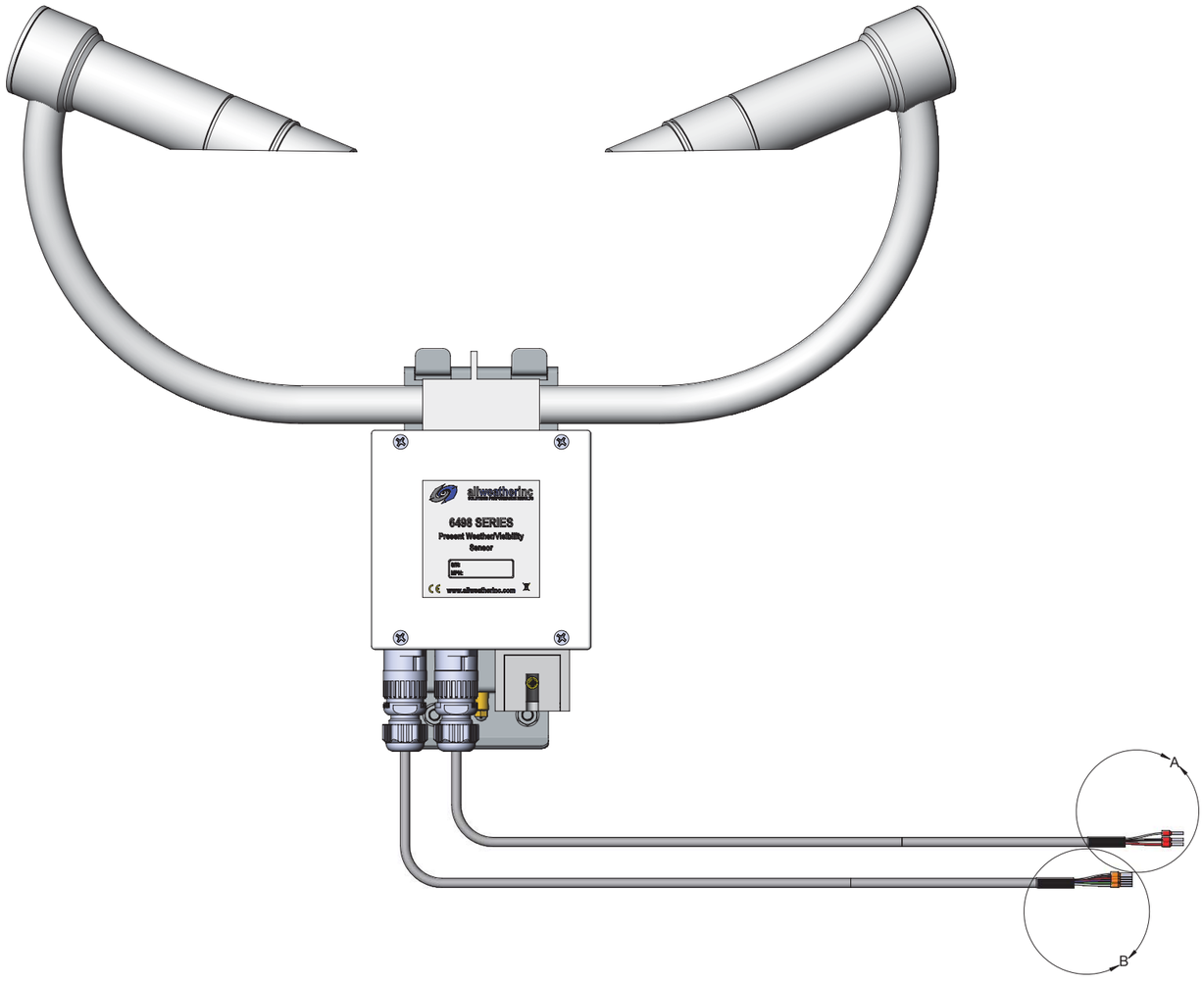
| | | |
|---|---|---|
| DRAWN BY: KEITH HOEK | 10-06-14 | |
| REVISED BY: KEITH HOEK | 12/8/2017 | |
| CHECKED BY: | | |
| DESIGN ENGINEER: KEITH HOEK | 10-06-14 | |
| PROJECT MANAGER: | | |
| APPROVALS | DATE | |

TITLE: **ASSEMBLY DRAWING PRESENT WEATHER / VISIBILITY SENSOR**

allweather inc

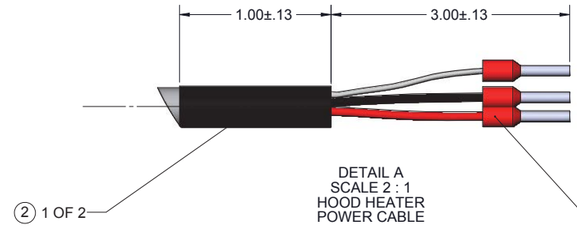
SIZE: D | DWG. NO.: 6498-003 | REV: A

SCALE: 2:3 | RELEASE DATE | SHEET 1 OF 3

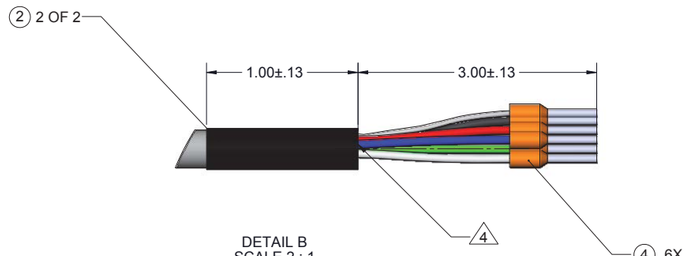



NOTES: CONTINUED

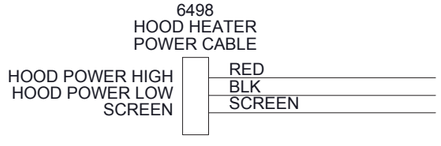
5. TRIM RED, BLACK AND SHIELD WIRES TO THE SAME LENGTH AS THE GRN, BLU, AND WHT. HEATSHRINK AS SHOWN.
6. CABLE LENGTH IS AS SUPPLIED FROM VENDOR AND IS NOT SHOWN TO SCALE.
7. COLORS OF COMPONENTS MAY BE DIFFERENT THAN SHOWN IN ILLUSTRATIONS.



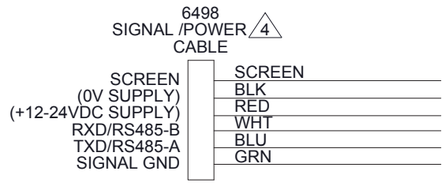

DETAIL A
SCALE 2 : 1
HOOD HEATER
POWER CABLE




DETAIL B
SCALE 2 : 1
SIGNAL / POWER
CABLE



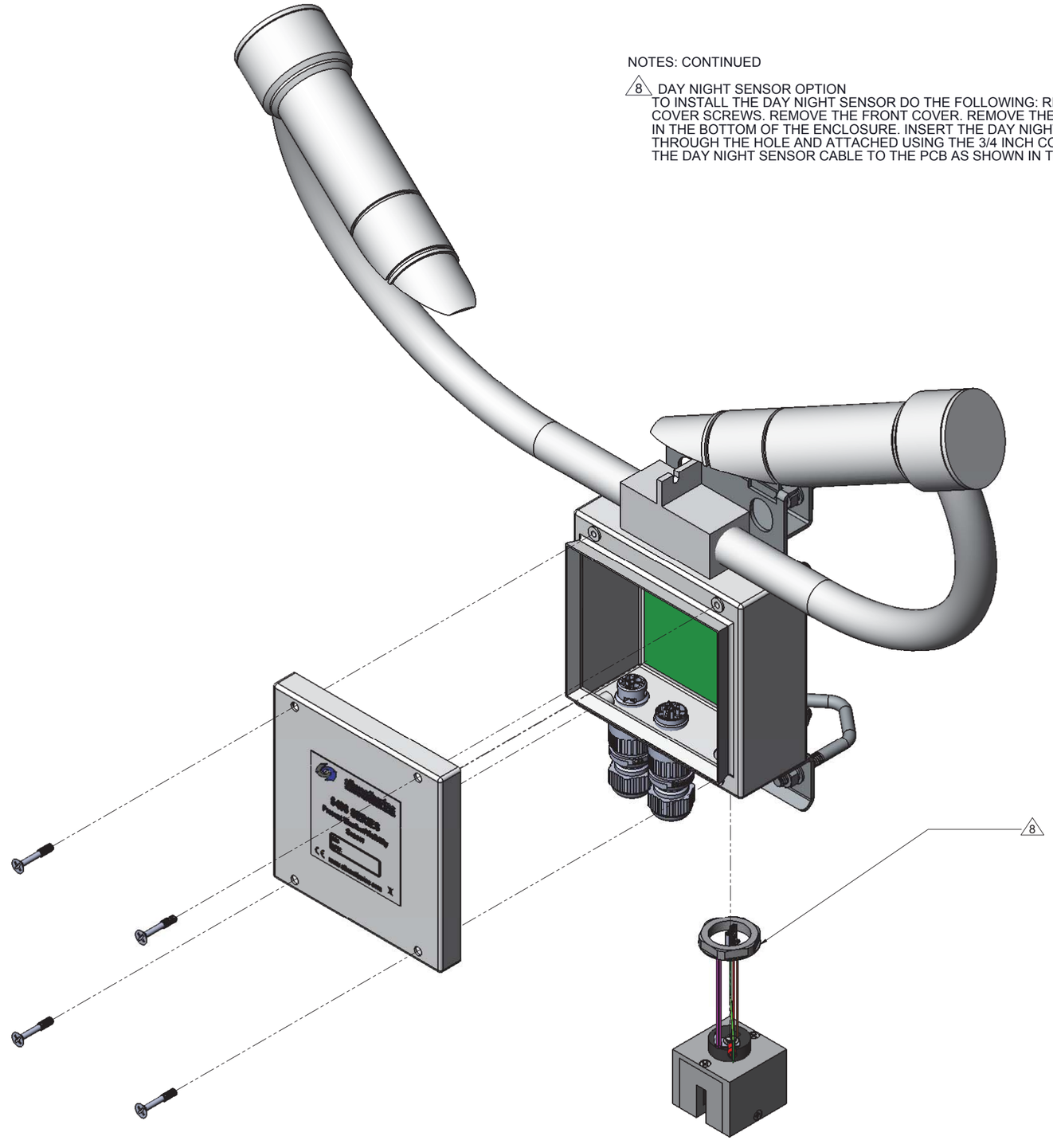

WIRING DIAGRAM




WIRING DIAGRAM

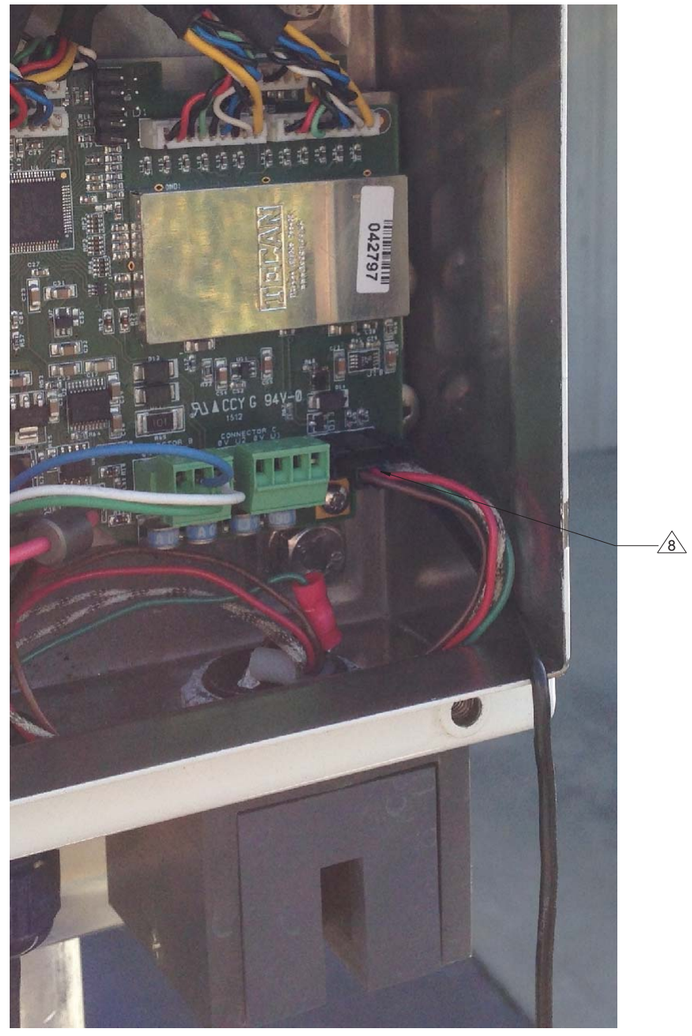


| SIZE | DWG. NO. | |
|---|---|---|
| D | 6498-003 | |
| SCALE: 2:3 | REV A | SHEET 2 OF 3 |




NOTES: CONTINUED

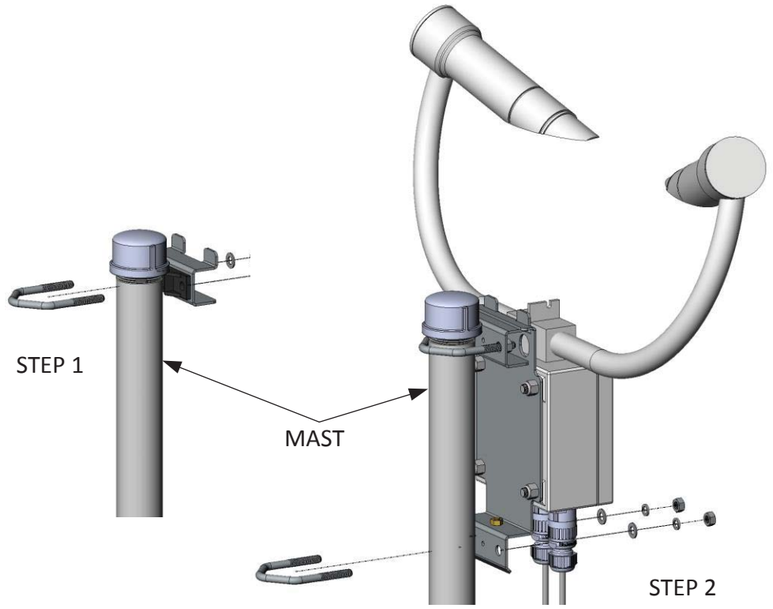
8 DAY NIGHT SENSOR OPTION
TO INSTALL THE DAY NIGHT SENSOR DO THE FOLLOWING: REMOVE THE FOUR COVER SCREWS. REMOVE THE FRONT COVER. REMOVE THE CAP OVER THE HOLE IN THE BOTTOM OF THE ENCLOSURE. INSERT THE DAY NIGHT SENSOR CABLE THROUGH THE HOLE AND ATTACHED USING THE 3/4 INCH CONDUIT NUT. CONNECT THE DAY NIGHT SENSOR CABLE TO THE PCB AS SHOWN IN THE PICTURE.






| SIZE | DWG. NO. | |
|---|---|---|
| D | 6498-003 | |
| SCALE: 2:3 | REV A | SHEET 3 OF 3 |

| REVISIONS | | | DWG. ON. 6498-007 | |
|---|---|---|---|---|
| REV | ECN | DESCRIPTION | DATE | APPROVED |
| A | 4410 | INITIAL RELEASE | 01/10/2018 | SLVS |




3. SENSOR HEAD INSTALLATION DETAIL


2. ELECTRONICS ENCLOSURE INSTALLATION DETAIL

NOTES: UNLES OTHERWISE SPECIFIED

1. VERIFY THE MAST IS ASSEMBLED PER THE MAST INSTALLATION DETAIL.

2. MOUNT ELECTRONICS ENCLOSURE ON THE MAST PER ELECTRONICS ENCLOSURE INSTALLATION DETAIL.

3. MOUNT SENSOR HEAD ON THE MAST PER SENSOR HEAD INSTALLATION DETAIL.

4. FEED THE SENSOR CABLES THROUGH THE CABLE GLANDS IN THE BOTTOM OF THE ELECTRONICS ENCLOSURE. CONNECT THE CABLES PER THE 6498-019 WIRING DIAGRAM.

5. INSTALL THE GROUND WIRE FROM THE SENSOR HEAD TO THE ELECTRONICS ENCLOSURE AND FROM THE ELECTRONICS ENCLOSURE TO THE FOUNDATION GROUND POINT. VERIFY THE FOUNDATION GROUND POINT IS CONNECTED TO THE GROUND ROD INSTALLED PER THE MAST INSTALLATION DETAIL.

6. INSTALL ALL EQUIPMENT PER THE LOCAL BUILDING CODES.

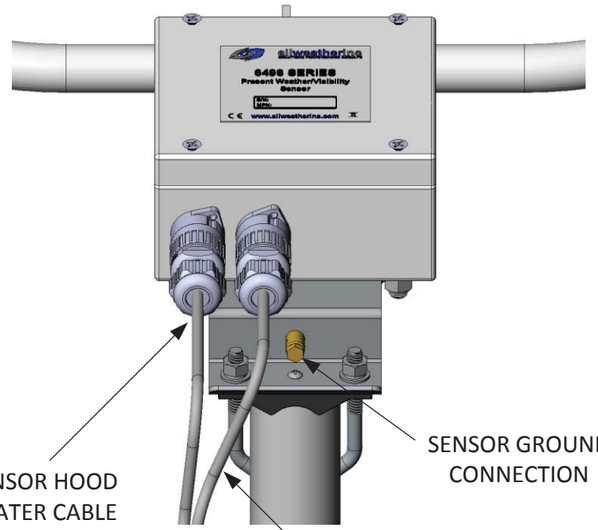
7. ATTACH THE CONDUIT TO THE CONCRETE FOUNDATION WITH RIGID COUNDUIT STRAPS IN 2 LOCATIONS. ATTACH THE SENSOR HEAD CABLES TO THE MAST WITH TIE STRAPS IN AT LEAST 4 LOCATIONS.

8. APPLY LOCTITE SILVER GRADE ANTI-SIEZE COMPOUND (M401065-00 OR EQUIVALENT) TO ALL EXTERNAL THREADED CONNECTIONS.

9. AFTER INSTALLATION IS COMPLETE APPLY A LIGHT SPRAY OF CORROSION BLOCK. (M402010-00 OR EQUIVALENT) TO ALL METALLIC CONNECTIONS, GROUND LUGS, AND THREADED FASTENERS.



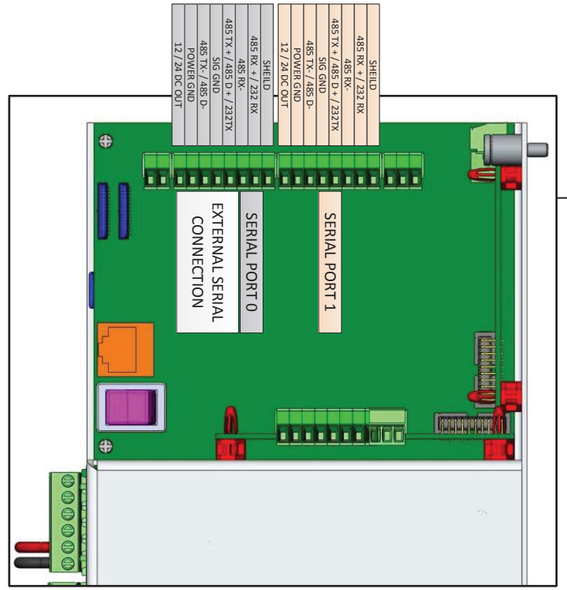
| | | | | |
|---|---|---|---|---|
| UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES<br><br>TOLERANCES<br>.XX = +/- .010<br>.XX = +/- .005<br>ANGLES = +/- ½°<br>CONCENTRICITY = .003 4TIR | DRAWN BY: S. VANSANTEN | 01/10/2018 | TITLE: INSTALLATION DRAWING, PRESENT WEATHER AND VISIBILITY SENSOR | allweatherinc |
| | REVISED BY: S. VANSANTEN | 01/10/2018 | | |
| | CHECKED BY: S. VANSANTEN | 01/10/2018 | | |
| MATERIAL | DESIGN ENGINEER S. VANSANTEN | 01/10/2018 | D — DWG. NO. 6498-007 — REV A | |
| FINISH | PROJECT MANAGER S. VANSANTEN | 01/10/2018 | | |
| TREATMENT | APPROVAL | DATE | SCALE NONE | SHEET 1 OF 4 |

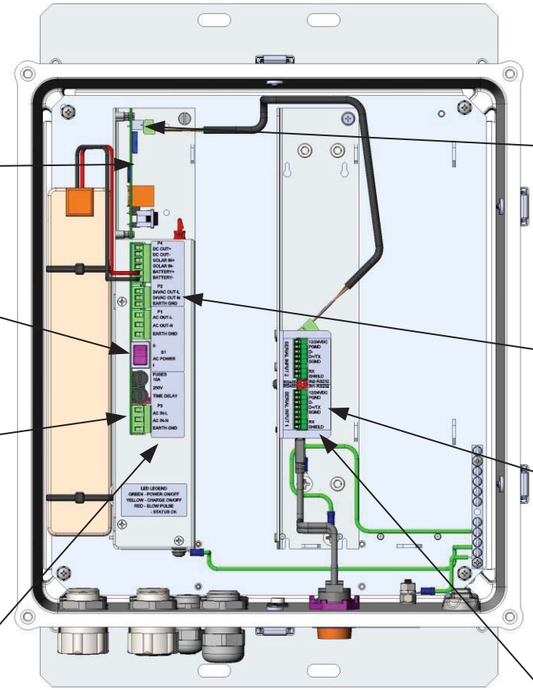



SENSOR HOOD HEATER CABLE

SENSOR GROUND CONNECTION 5.

SENSOR POWER AND DATA CABLE



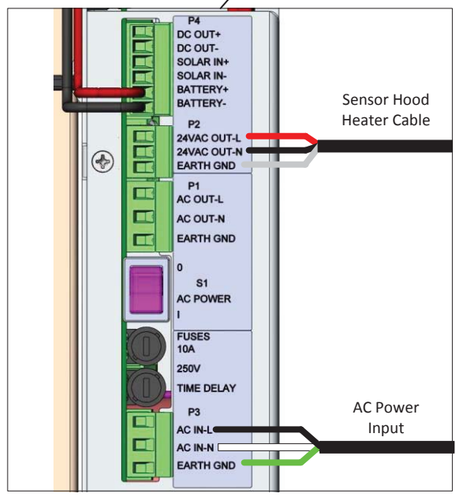
EXTERNAL SERIAL CONNECTION 4.

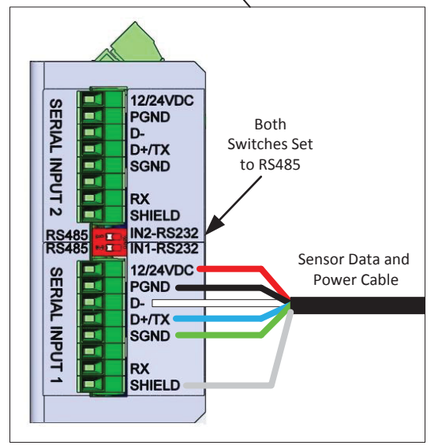
AC POWER SWITCH

SENSOR HOOD HEATER CONNECTION 4.

4. AC POWER CONNECTION

SENSOR POWER AND DATA CONNECTION 4.





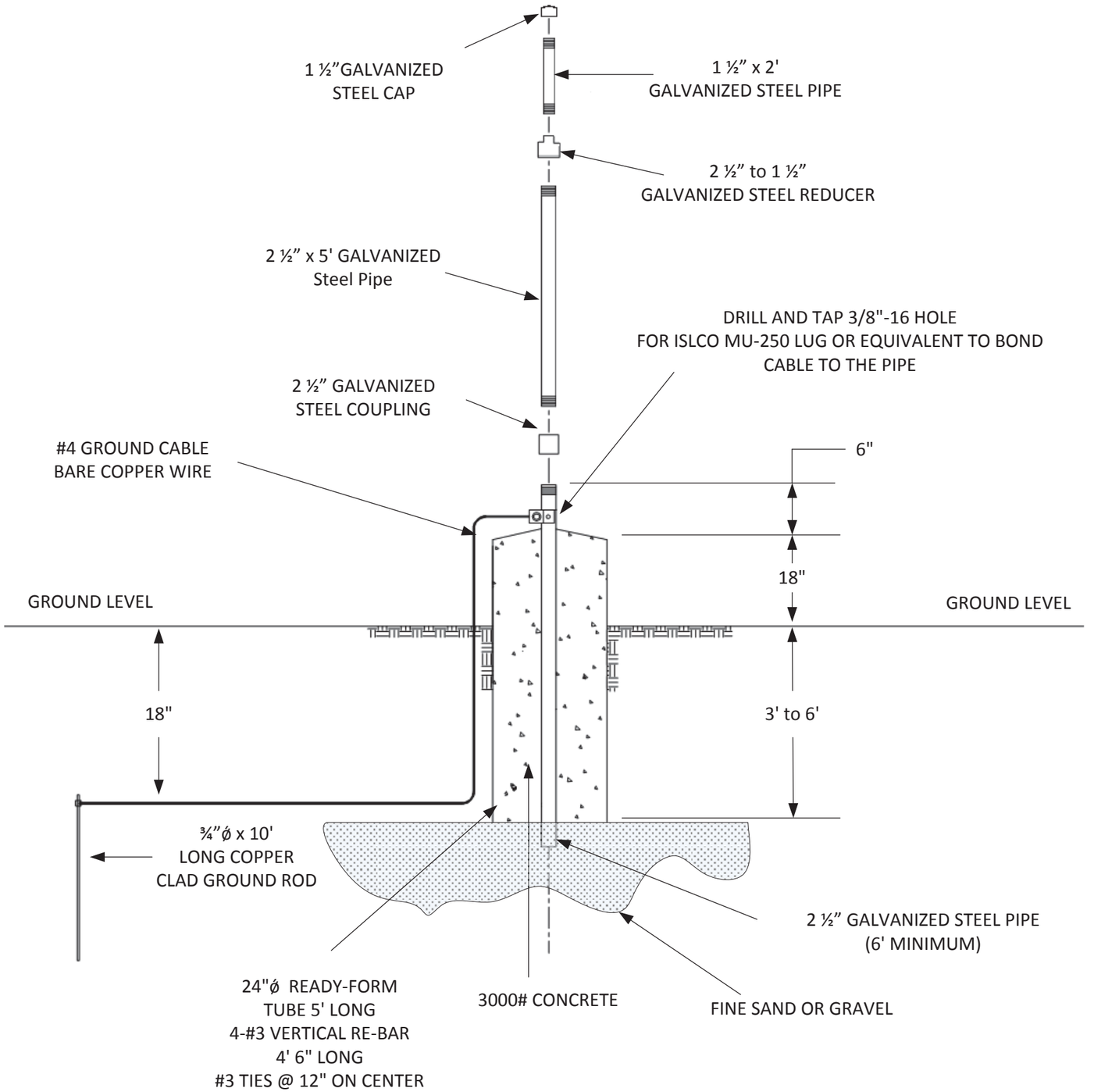
ELECTRONICS ENCLOSURE GROUND CONNECTION 5.

4. SENSOR HOOD HEATER CABLE

SENSOR POWER AND DATA CABLE 4.



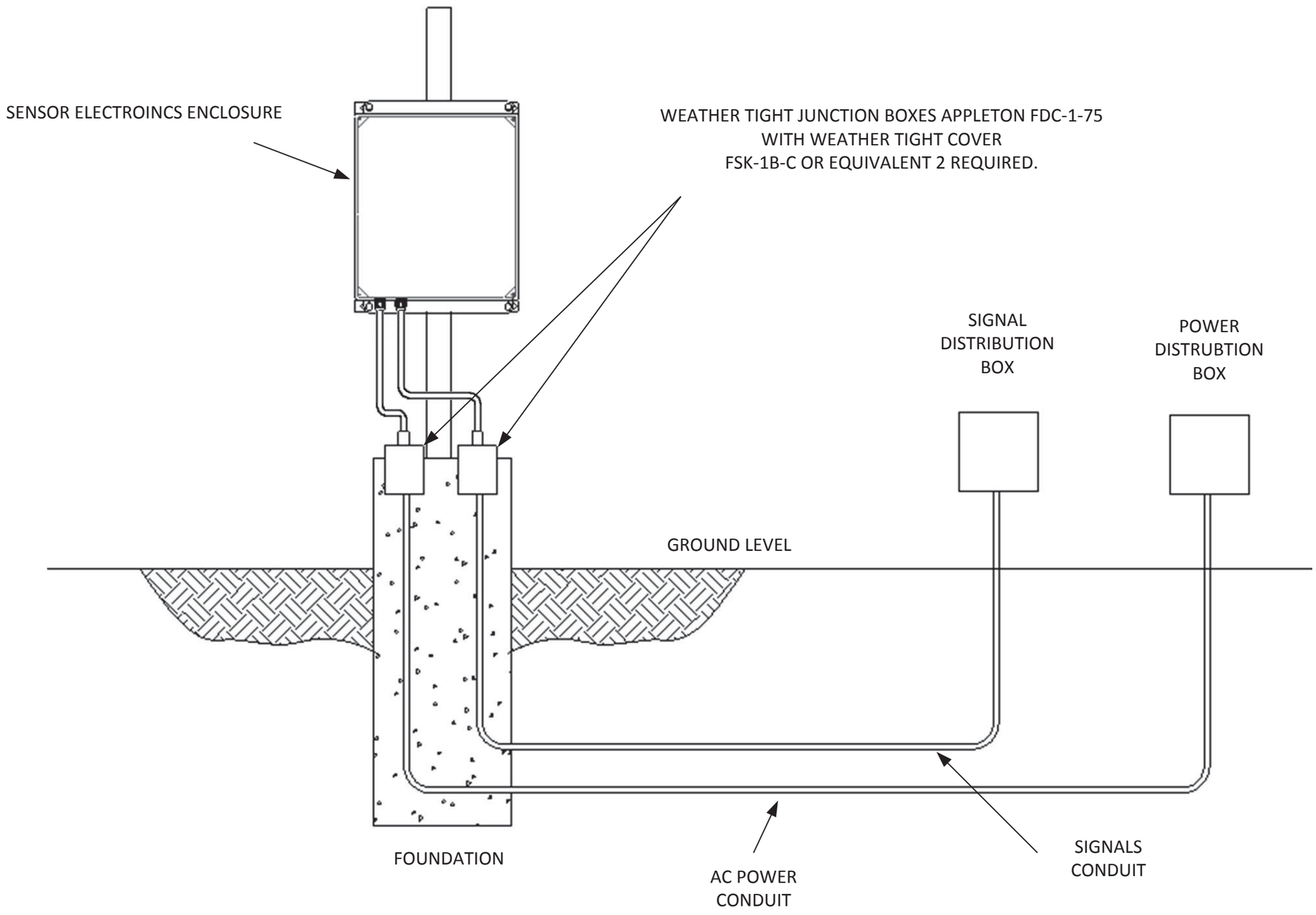
| | | |
|---|---|---|
| D | DWG. NO. 6498-007 | REV A |
| SCALE NONE | | SHEET 2 OF 4 |




1. MAST INSTALLATION DETAIL. THIS DETAIL IS TYPICALLY USED FOR DOMESTIC US INSTALLATIONS.



| | | |
|---|---|---|
| D | DWG. NO. 6498-007 | REV A |
| SCALE NONE | | SHEET 3 OF 4 |






| | | |
|---|---|---|
| D | DWG. NO. 6498-007 | REV A |
| SCALE NONE | | SHEET 4 OF 4 |

# SENSOR INTERFACE ENCLOSURE with 2715 UPCM

| REVISIONS | | | DWG NO. 6498-019 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 3716 | INITIAL RELEASE | 12-11-15 | KAH |
| B | 3902 | ADDED SHEET 2 FOR BKGD LUM SENSOR | 08-11-16 | T. IWANOWSKI |
| C | 4661 | UPDATED 2715 CONFIGURATION SETTINGS | 12-01-17 | SLVS |
| D | 4410 | ADDED OR DCP FOR UPCM OUTPUT | 12-15-19 | T. IWANOWSKI |
| E | 5372 | CORRECTED RS485 OUTPUTS ON M482243-00 | 07-02-21 | T. IWANOWSKI |
| F | 5500 | CLARFIED MAINTENANCE PORT NAMES | 01-14-22 | T. IWANOWSKI |
| G | 5434 | UPDATED WIRE COLORS | 01-14-22 | T. IWANOWSKI |

## 2 2715 CONFIGURATION FILE SETTINGS

SER0_PROT=2 (RS-485 1/2 PLEX)
SER0_BAUD=1 (4800 BPS)
SER0_DATA=8 (DATA BITS)
SER0_PAR=78 (NO PARITY)
SER0_STOP=1 (STOP BITS)
SER0_TE=0 (TERMINATION OFF)
SER1_PROT=2 (RS-485 1/2 PLEX)
SER1_BAUD=4 (38400 BPS)
SER1_DATA=8 (DATA BITS)
SER1_PAR=78 (NO PARITY)
SER1_STOP=1 (STOP BITS)
SER1_TE=1 (TERMINATION ON)
SER2_CONFIG=0
SER2_PROT=0 (RS-232)
SER2_BAUD=0 (2400 BPS)
SER2_DATA=8 (DATA BITS)
SER2_PAR=78 (NO PARITY)
SER2_STOP=1 (STOP BITS)
SER2_TE=0 (TERMINATION OFF)
PSU_ADDR_H=0
PSU_ADDR_L=0
EN_DCOUT=1
EN_ACOUT=2
EN_CHRGR=1
PORT1_MODE=10 (6498 SENSOR
PORT2_MODE=255
MIN_TEMP=0
MAX_TEMP=1
FORCE_220V=0 (110 VAC)

## 2715 Universal Power & Communication Module

J9 Expansion Port SPI/I2C — Data Interface Module
J6 Expansion Port SPI/I2C
J4 Ethernet
S3 12/24VDC Select (1)
J3 Micro-SD Card Interface
Add on Card Serial Port 2

P4 DC Power: 1 OUT+, 2 OUT−, 3 SOL+, 4 GND, 5 BAT+, 6 GND
OPTIONAL: M438130-00 Backup Battery (RED, BLK)
P1 AC Out: 1 L, 2 N, 3 GND — Enclosure Heater (WHT, BLK)
P3 AC In: 1 L, 2 N, 3 GND — AC Power In (BLK or BRN, WHT or BLU, GRN)
AC POWER IN THRU STRAIN RELIEF
GND WIRE p/o 2715 → GND

P10 Fan Tach: 3 GND, 2 COM, 1 IN
P2 24VAC Out: 1 L, 2 N, 3 GND
P9 SWITCH: 2 GND, 1 IN

AUX Card Interface J7 AUX Voltage Port
AUX Card Interface J8 UART Port 3

Serial Ports 1, 2, & 3
8 – Shield
7 – RS-422 (Rx+) RS-232 RX
6 – RS-422 (Rx−)
5 – GND
4 – RS-485 (D+) RS-422 (Tx+) RS-232 TX
3 – RS-485 (D−) RS-422 (Tx−)
2 – Power Gnd
1 – 12 or 24 VDC

TO CDP OR DCP

RED, BLK, SCREEN → RED, BLK, SCREEN

## UPCM Sensor Maintenance Intfc Module

P7 CONNECTION WITH P3 SHARED WITH P4 CONNECTION

P7 Serial Port 1: 8 SHLD, 7 ORG, 6 BLU, 5 BLK, 4 RED, 3 WHT, 2 GRN, 1 BRN
M493084-00
P3 SENSOR OUT-1: 8 SHLD, 7 ORG, 6 BLU, 5 BLK, 4 RED, 3 WHT, 2 GRN, 1 BRN

P6 Serial Port 0: 8, 7, 6, 5, 4, 3, 2, 1
M493084-00
P4 SENSOR OUT-2: 8, 7, 6, 5, 4, 3, 2, 1

Sensor IN/Out Ports
8 – Shield
7 – RS-422 (Rx+) RS-232 RX
6 – RS-422 (Rx−)
5 – GND
4 – RS-485 (D+) RS-422 (Tx+) RS-232 TX
3 – RS-485 (D−) RS-422 (Tx−)
2 – Power Gnd
1 – 12 or 24 VDC

SENSOR 1 RS485/RS232 Select (3) S1
SENSOR 2 RS485/RS232 Select (4) S2

P1 SENSOR IN-1: 8 SCREEN, 7 GRN, 6 BLU, 5 WHT, 4 BLK, 3 RED, 2, 1
P2 SENSOR IN-2: 8, 7, 6, 5, 4, 3, 2, 1

USB2 J2, USB1 J1

SLED BRACKET Mounted in Enclosure

GND WIRE p/o Maintenance Module
M493057-00
M493057-00

BLS MAINTENANCE PORT — USB-B
PW/VIS MAINTENANCE PORT — USB-B

EXTERNAL GND LUG
GND BAR ON BACKPLATE

GROUND CLAMP ON MAST
GROUND WIRE T605076

EXTERNAL GND LUG
HOOD PWR HIGH
HOOD PWR LOW
SCREEN
SCREEN
COMMS 0V
RS485-A
RS485-B
PGND
+9-28 VDC

HOOD HEATERS: RED 2, BLK 3, SCREEN E, SCREEN E
POWER / COMMUNICATIONS: GRN 3, BLU 6, WHT 5, BLK 4, RED 1

M482243-00 PRESENT WEATHER/ VISIBILITY SENSOR

NOTES: UNLESS OTHERWISE SPECIFIED;
1. SET S3 FOR 24 V DC OPERATION
2. SET THE 2715 PARAMETERS IN THE MICRO-SD CONFIGURATION FILE AS INDICTATED. DO NOT MODIFY OTHER SETTINGS WITHOUT UNDERSTANDING THE VALUES. THESE SETTINGS ARE FOR DOMESTIC U.S. AWOS 3000.
3. SET S1 FOR RS-485 OPERATION.
4. SET S2 FOR RS-485 OPERATION.
5. WHT MAY BE WHT OR YEL.



| G | G | REV | REV STATUS |
|---|---|---|---|
| 2 | 1 | SHEET | OF SHEETS |

APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT:

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES
TOLERANCES
.XX=±.010 ANGLES ±1/2°
.XXX=±.005 CONCENTRICITY: .003 TIR
DO NOT SCALE DRAWING

MATL: SEE BILL OF MATERIALS
FINISH: AS ISSUED
TREATMENT: NONE

| | | |
|---|---|---|
| DRAWN BY: KEITH HOEK | 01-29-15 | |
| REVISED BY: T. IWANOWSKI | 02-23-22 | |
| CHECKED BY: | | |
| DESIGN ENGINEER: KEITH HOEK | 01-29-15 | |
| PROJECT MANAGER: | | |
| APPROVALS | DATE | |

TITLE: WIRING DIAGRAM, 6498 PRESENT WEATHER/VISIBILITY SENSOR

allweatherinc

SIZE D | DWG NO. 6498-019 | SCALE NONE | RELEASE DATE | SHEET 1 OF 1

# SENSOR INTERFACE ENCLOSURE WITH M488600-00 BACKGROUND LUMINANCE KIT

## 2715 Universal Power & Communication Module

J9 Expansion Port SPI/I2C — Data Interface Module
J6 Expansion Port SPI/I2C
J4 Ethernet
J3 Micro-SD Card Interface
S3 12/24VDC Select (1)
P4 DC Power: 1 OUT+, 2 OUT−, 3 SOL+, 4 GND, 5 BAT+, 6 GND
P1 AC Out: 1 L, 2 N, 3 GND
P3 AC In: 1 L, 2 N, 3 GND
P10 Fan Tach: 3 GND, 2 COM, 1 IN
P2 24VAC Out: 1 L, 2 N, 3 GND
P9 SWITCH: 2 GND, 1 IN
J7 AUX Card Interface — AUX Voltage Port
J8 AUX Card Interface — UART Port 3

OPTIONAL
M438130-00 Backup Battery — RED, BLK
Enclosure Heater — WHT, BLK

AC Power In — BLK or BRN, WHT or BLU, GRN
AC POWER IN THRU STRAIN RELIEF
GND WIRE p/o 2715 — GND

Serial Ports 1, 2, & 3
8 – Shield
7 – RS-422 (Rx+) RS-232 RX
6 – RS-422 (Rx−)
5 – GND
4 – RS-485 (D+) RS-422 (Tx+) RS-232 TX
3 – RS-485 (D−) RS-422 (Tx−)
2 – Power Gnd
1 – 12 or 24 VDC

RED, BLK, SCREEN

P7 CONNECTION WITH P3 SHARED WITH P4 CONNECTION

P7 Serial Port 2: 8 SHLD, 7 ORG, 6 BLU, 5 BLK, 4 RED, 3 WHT, 2 GRN, 1 BRN
M493084-00 (5) (5)
P3 SENSOR OUT-1: 8 SHLD, 7 ORG, 6 BLU, 5 BLK, 4 RED, 3 WHT, 2 GRN, 1 BRN

P6 Serial Port 1: 8, 7, 6, 5, 4, 3, 2, 1
M493084-00
P4 SENSOR OUT-2: 8, 7, 6, 5, 4, 3, 2, 1

TO CDP

## UPCM Sensor Maintenance Intfc Module

Sensor IN/Out Ports
8 – Shield
7 – RS-422 (Rx+) RS-232 RX
6 – RS-422 (Rx−)
5 – GND
4 – RS-485 (D+) RS-422 (Tx+) RS-232 TX
3 – RS-485 (D−) RS-422 (Tx−)
2 – Power Gnd
1 – 12 or 24 VDC

SENSOR 1 RS485/RS232 Select (3) S1
SENSOR 2 RS485/RS232 Select (4) S2

USB2 J2, USB1 J1
SLED BRACKET Mounted in Enclosure

P1 SENSOR IN-1: 8, 7, 6, 5, 4, 3, 2, 1
P2 SENSOR IN-2: 8 SCREEN, 7 GRN, 6 BLU, 5 WHT, 4 BLK, 3 RED, 2 BLK, 1 RED

SCREEN (5) GRN, BLU, WHT, BLK, RED, RED, BLK, SCREEN
GROUND WIRE T600076

POWER / COMMUNICATIONS: SCREEN, COMMS 0V, RS485-A, RS485-B, PGND, +9–28 VDC
HOOD HEATERS: HOOD PWR HIGH, HOOD PWR LOW, SCREEN
EXTERNAL GND LUG

M482253-00 BACKGROUND LUMINANCE SENSOR

M488600-00

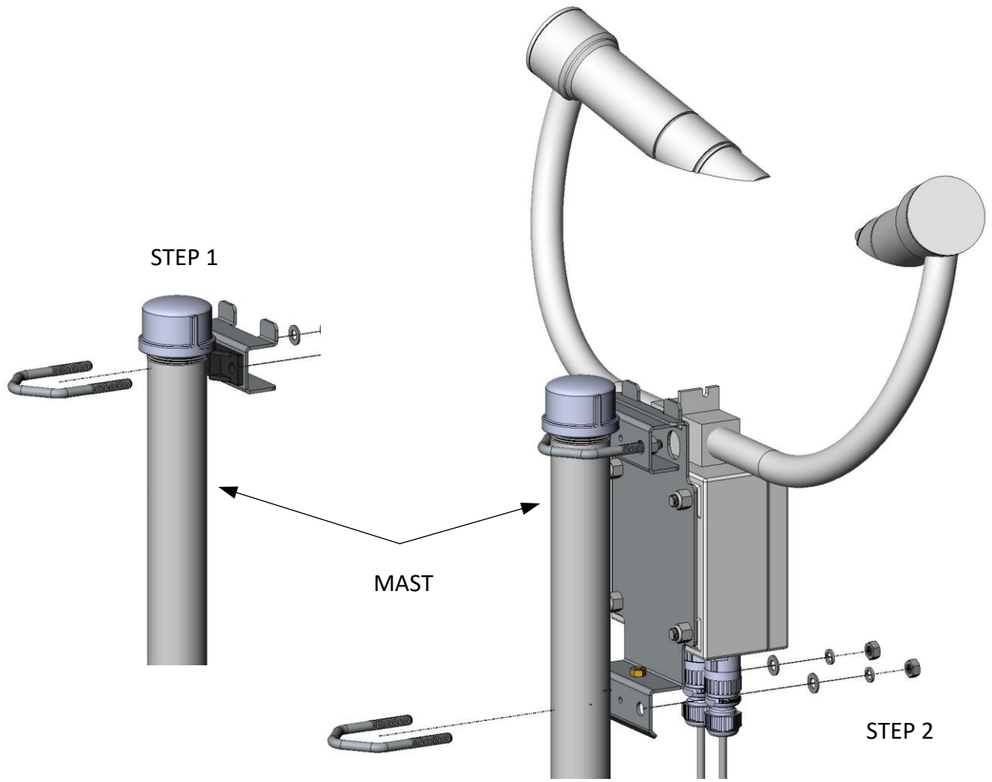
SENSOR 2 MAINTENANCE PORT — USB-B
SENSOR 1 MAINTENANCE PORT — USB-B
M493057-00

EXTERNAL GND LUG
GND BAR ON BACKPLATE



| SIZE | DWG NO. | |
|---|---|---|
| D | 6498-019 | |
| SCALE NONE | REV G | SHEET 2 OF 2 |

| REVISIONS | | | DWG. ON. 6498-DC-007 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 5512 | INITIAL RELEASE | 12-15-2021 | π |




2. SENSOR HEAD INSTALLATION DETAIL

NOTES: UNLES OTHERWISE SPECIFIED

1. VERIFY THE MAST IS ASSEMBLED PER THE MAST INSTALLATION DETAIL.

2. MOUNT SENSOR HEAD ON THE MAST PER SENSOR HEAD INSTALLATION DETAIL.

3. FEED THE SENSOR CABLES THROUGH THE JUNCTION BOX AND CONDUIT TO THE CABLE GLAND IN THE DCP. CONNECT THE CABLES PER THE 6498-DC-019 WIRING DIAGRAM.

4. INSTALL THE GROUND WIRE FROM THE SENSOR HEAD TO THE FOUNDATION GROUND POINT. VERIFY THE FOUNDATION GROUND POINT IS CONNECTED TO THE GROUND ROD INSTALLED PER THE MAST INSTALLATION DETAIL.

5. INSTALL ALL EQUIPMENT PER THE LOCAL BUILDING CODES.

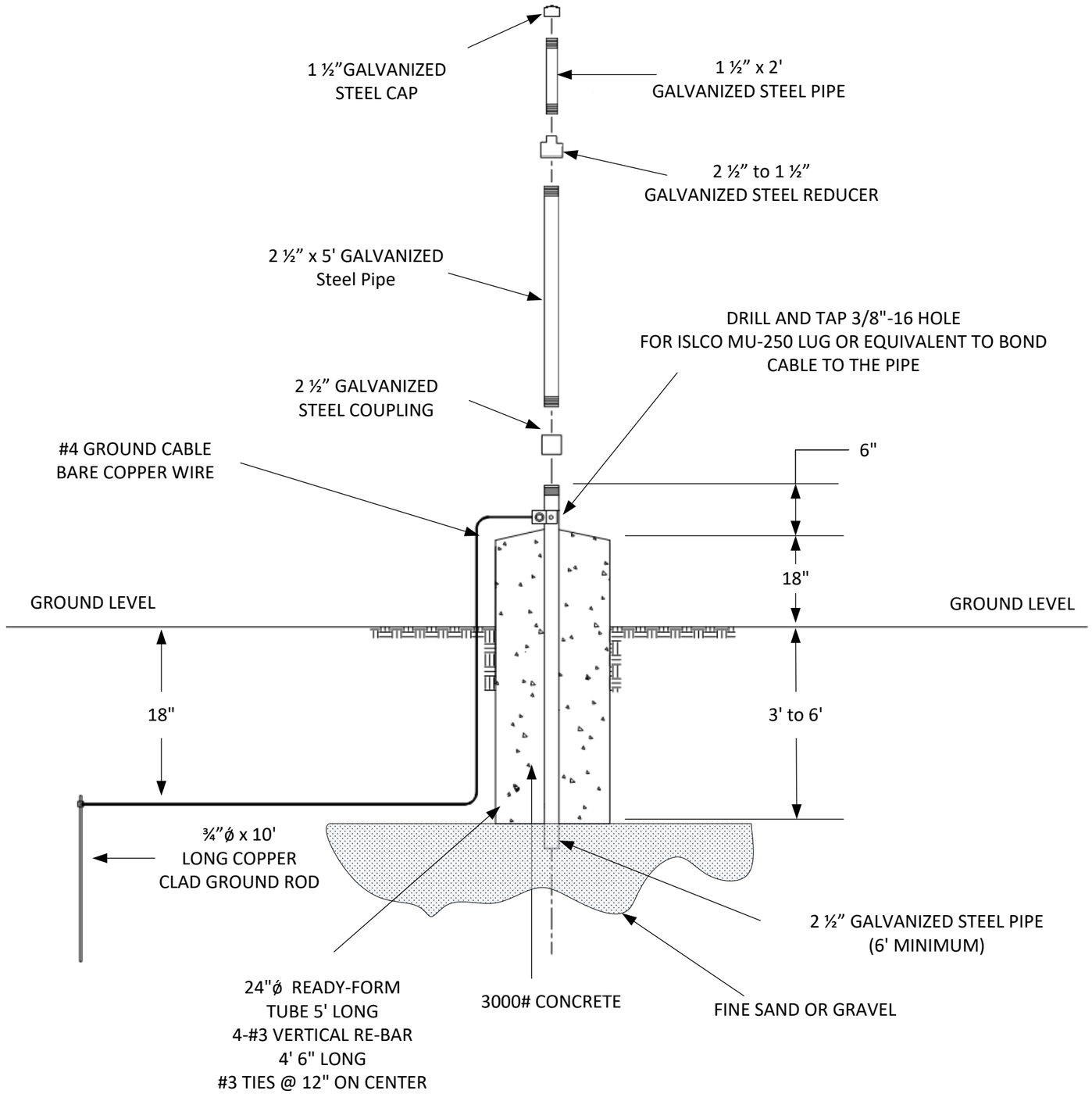
6. ATTACH THE CONDUIT TO THE CONCRETE FOUNDATION WITH RIGID CONDUIT STRAPS IN 2 LOCATIONS. ATTACH THE SENSOR HEAD CABLES TO THE MAST WITH TIE STRAPS IN AT LEAST 4 LOCATIONS.

7. APPLY LOCTITE SILVER GRADE ANTI-SIEZE COMPOUND (M401065-00 OR EQUIVALENT) TO ALL EXTERNAL THREADED CONNECTIONS.

8. AFTER INSTALLATION IS COMPLETE APPLY A LIGHT SPRAY OF CORROSION BLOCK. (M402010-00 OR EQUIVALENT) TO ALL METALLIC CONNECTIONS, GROUND LUGS, AND THREADED FASTENERS.



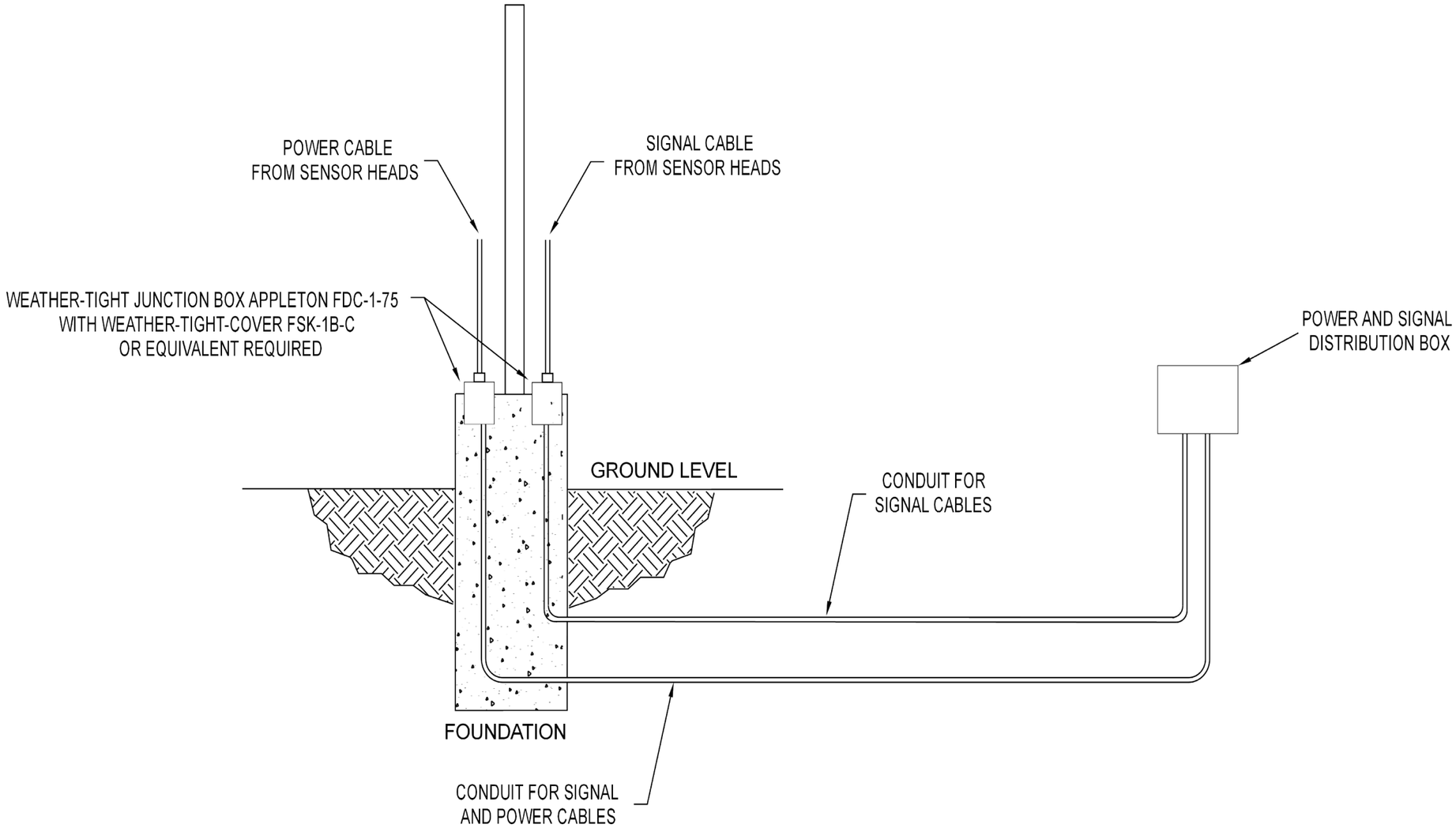
| | | | | |
|---|---|---|---|---|
| UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES<br><br>TOLERANCES<br>.XX = ± .010<br>.XX = ± .005<br>ANGLES = ± ½°<br>CONCENTRICITY = .003 4TIR | DRAWN BY: T. IWANOWSKI | 12-15-2021 | TITLE: INSTALLATION DRAWING, 6498-DC PRESENT WEATHER AND VISIBILITY SENSOR | allweatherinc |
| | REVISED BY: | | | |
| | CHECKED BY: | | | |
| MATERIAL | DESIGN ENGINEER T. IWANOWSKI | 12-15-2021 | D — DWG. NO. 6498-DC-007 | REV A |
| FINISH | PROJECT MANAGER A. HUSTEAD | 12-15-2021 | | |
| TREATMENT | APPROVAL | DATE | SCALE NONE | SHEET 1 OF 3 |




9. MAST INSTALLATION DETAIL. THIS DETAIL IS TYPICALLY USED FOR DOMESTIC US INSTALLATIONS.



| | | |
|---|---|---|
| D | DWG. NO. 6498-DC-007 | REV A |
| SCALE NONE | | SHEET 2 OF 3 |



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|---|---|---|
| D | DWG. NO. 6498-DC-007 | REV A |
| SCALE NONE | | SHEET 3 OF 3 |

| REVISIONS | | | DWG NO. 6498-DC-019 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 5512 | INITIAL RELEASE | 06-24-21 | T. IWANOWSKI |
| | | | | |
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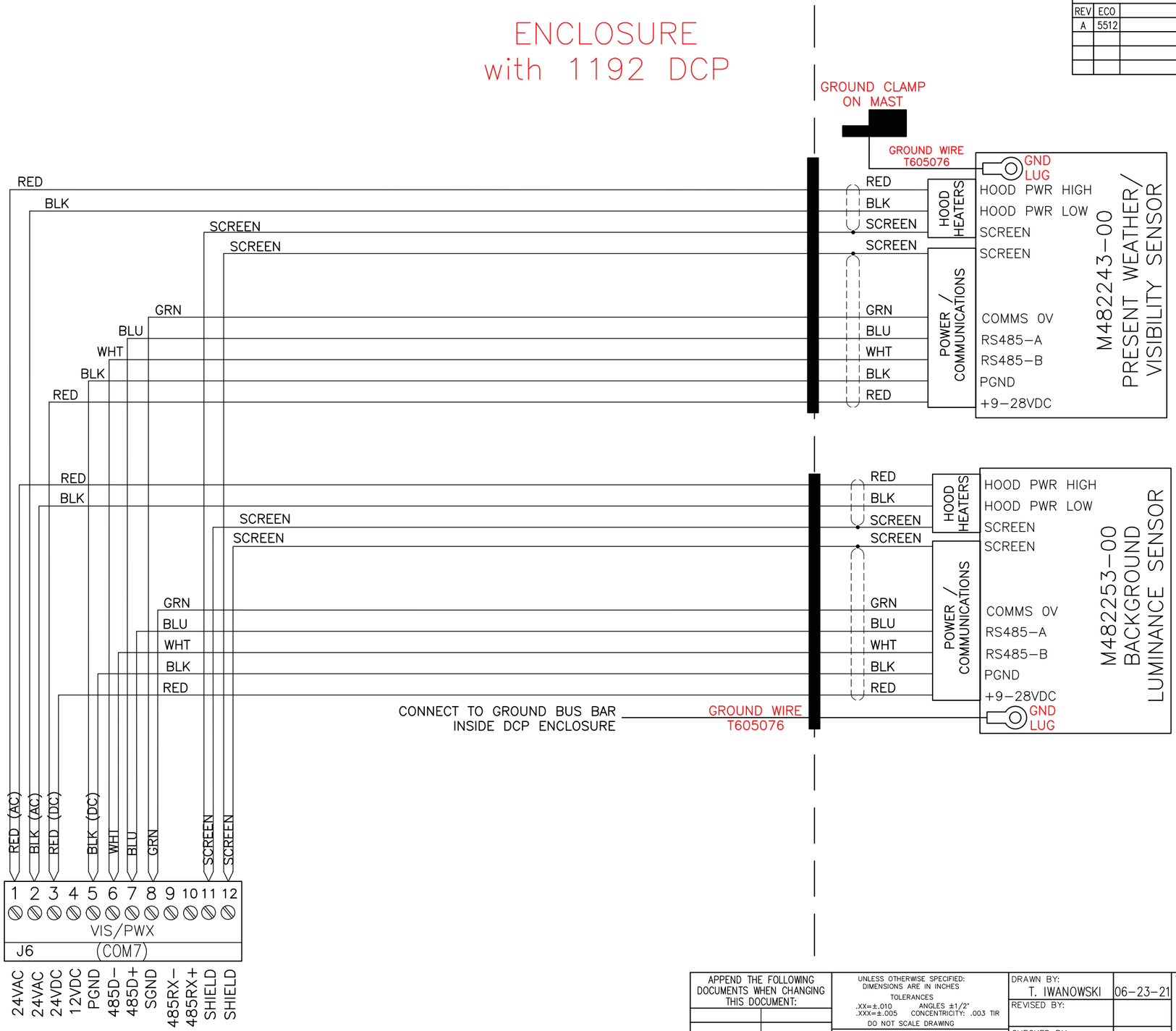
# ENCLOSURE with 1192 DCP






| APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT: | |
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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
.XX=±.010 ANGLES ±1/2°
.XXX=±.005 CONCENTRICITY: .003 TIR
DO NOT SCALE DRAWING

MATL: SEE BILL OF MATERIALS

FINISH: AS ISSUED

TREATMENT: NONE

| | | |
|---|---|---|
| DRAWN BY: T. IWANOWSKI | 06-23-21 | |
| REVISED BY: | | |
| CHECKED BY: | | |
| DESIGN ENGINEER: T. IWANOWSKI | 06-23-21 | |
| PROJECT MANAGER: A. HUSTEAD | 06-23-21 | |
| APPROVALS | DATE | |

TITLE: WIRING DIAGRAM, 6498-DC PRESENT WEATHER/VISIBILITY SENSOR

allweatherinc

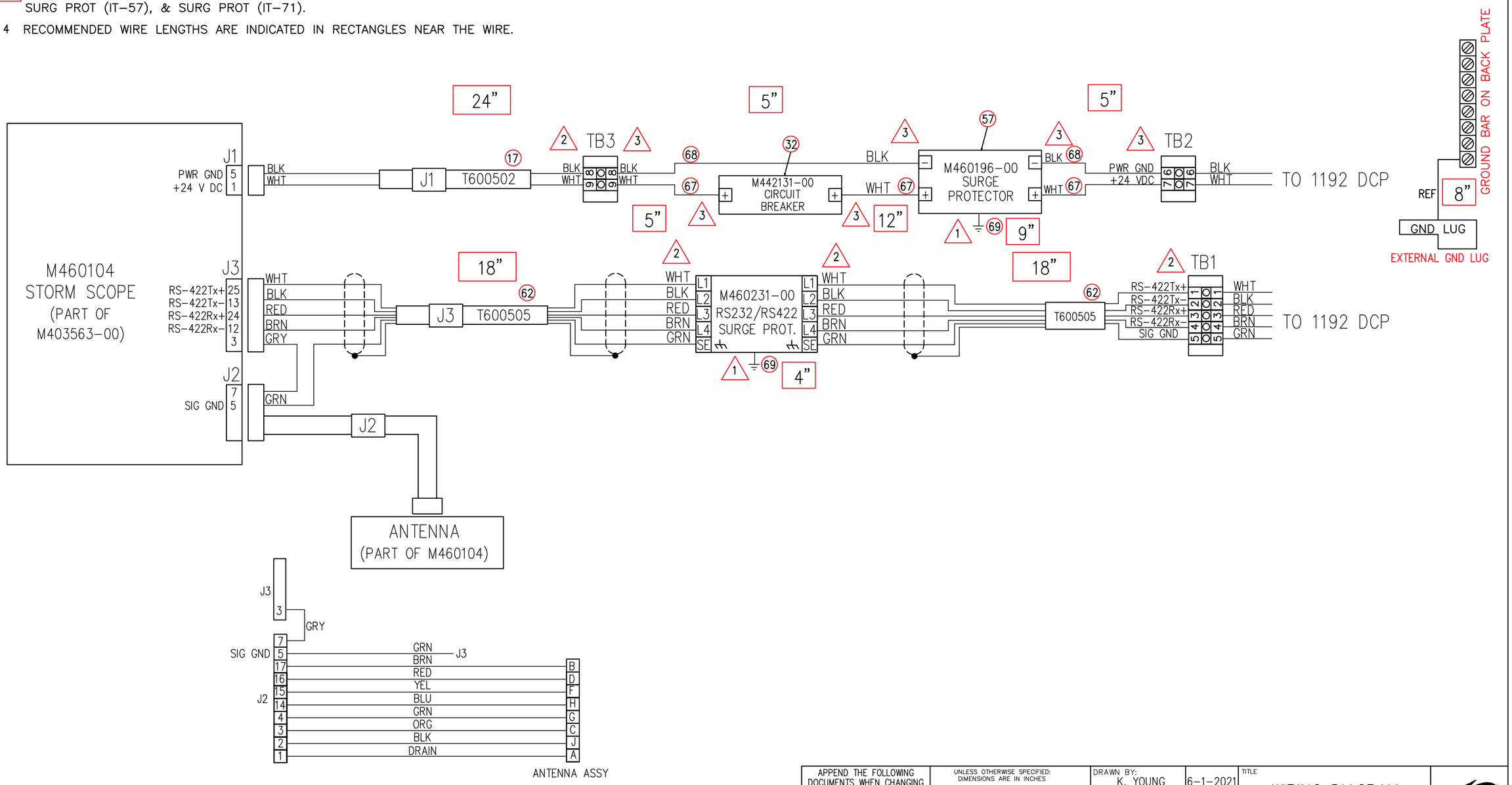
SIZE D | DWG NO. 6498-019

SCALE NONE | RELEASE DATE | SHEET 1 OF 1

| REVISIONS | | | DWG NO. 6500-DC-019 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 5442 | INITIAL RELEASE | 6-1-2021 | K. YOUNG |

NOTES: UNLESS OTHERWISE SPECIFIED:

1. CONNECT GND TERMINAL TO GROUND BAR USING GRN/YEL WIRE (IT-69).
2. PLACE FERRULES (IT-61) ON WIRE ENDS (IT-17 & IT-62) GOING TO TB1, TB3 & SURG PROTECTOR.
3. PLACE FERRULES (IT-70) ON WIRE ENDS (IT-67 & IT-68) GOING TO TB2 & TB3, CIRCUIT BREAKER (IT-32), SURG PROT (IT-57), & SURG PROT (IT-71).
4. RECOMMENDED WIRE LENGTHS ARE INDICATED IN RECTANGLES NEAR THE WIRE.






| APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT: | |
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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
.XX=±.010 ANGLES ±1/2°
.XXX=±.005 CONCENTRICITY: .003 TIR
DO NOT SCALE DRAWING

MATL: SEE BILL OF MATERIALS

FINISH: AS ISSUED

TREATMENT: NONE

| | | |
|---|---|---|
| DRAWN BY: K. YOUNG | 6-1-2021 | |
| REVISED BY: | | |
| CHECKED BY: | | |
| DESIGN ENGINEER: K. YOUNG | 6-1-2021 | |
| PROJECT MANAGER: A. HUSTEAD | 6-1-2021 | |
| APPROVALS | DATE | |

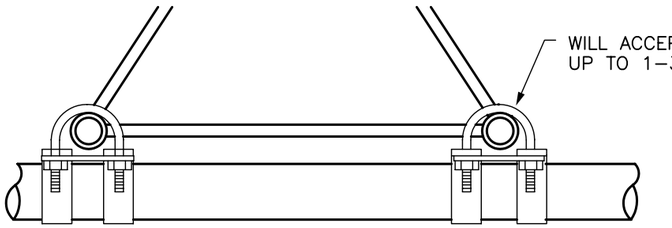
TITLE: WIRING DIAGRAM LIGHTNING SENSOR DIRECT CONNECT

allweatherinc

SIZE D | DWG NO. 6500-DC-019

SCALE NONE | RELEASE DATE 5-18-21 | SHEET 1 OF 1

| REVISIONS | | | DWG NO. 8190-01-007 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 1281 | INITIAL RELEASE | 10/24/07 | BRG |
| B | 1402 | ADDED LOCK AND FLAT WASHERS, T724403-01 WAS M408498-01 | 1-29-08 | J.CONNER |




TOP VIEW

NOTES: UNLESS OTHERWISE SPECIFIED;

1. WHEN USING MODEL 8518-A FOLDOVER TOWER, MOUNT TO HINGED SIDE OF TOWER.

2. INSTALL THE MOUNTING HARDWARE SO THE MOTOR ASPIRATED RADIATION SHIELD, MODEL 8190-01, IS 1.25-2M (4.1 FT-6.6 FT) ABOVE THE SURFACE. DO NOT OVER TIGHTEN NUTS ON U-BOLTS.

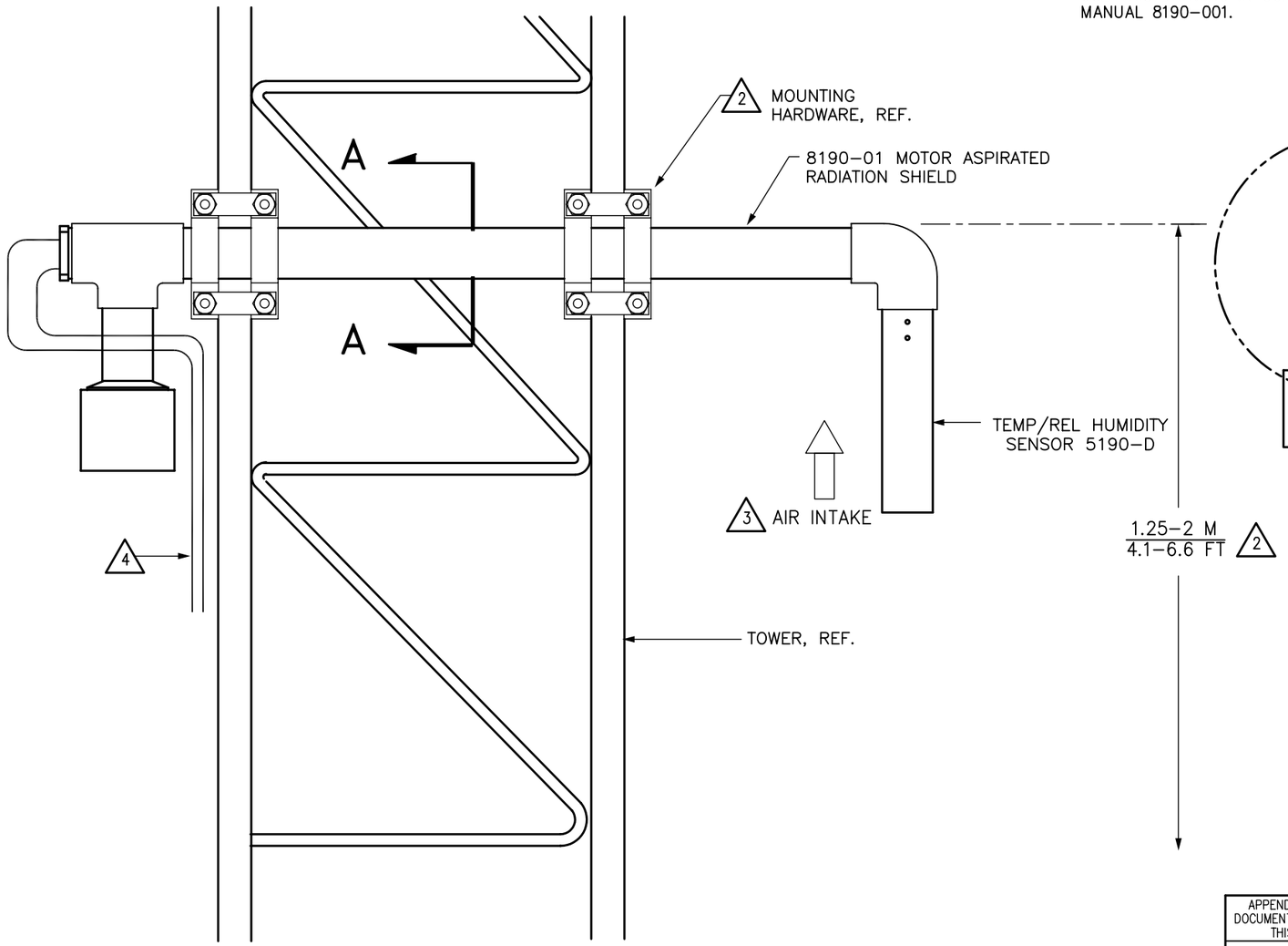
3. MOUNT UNIT WITH INTAKE AS FAR FROM THE TOWER AS POSSIBLE.

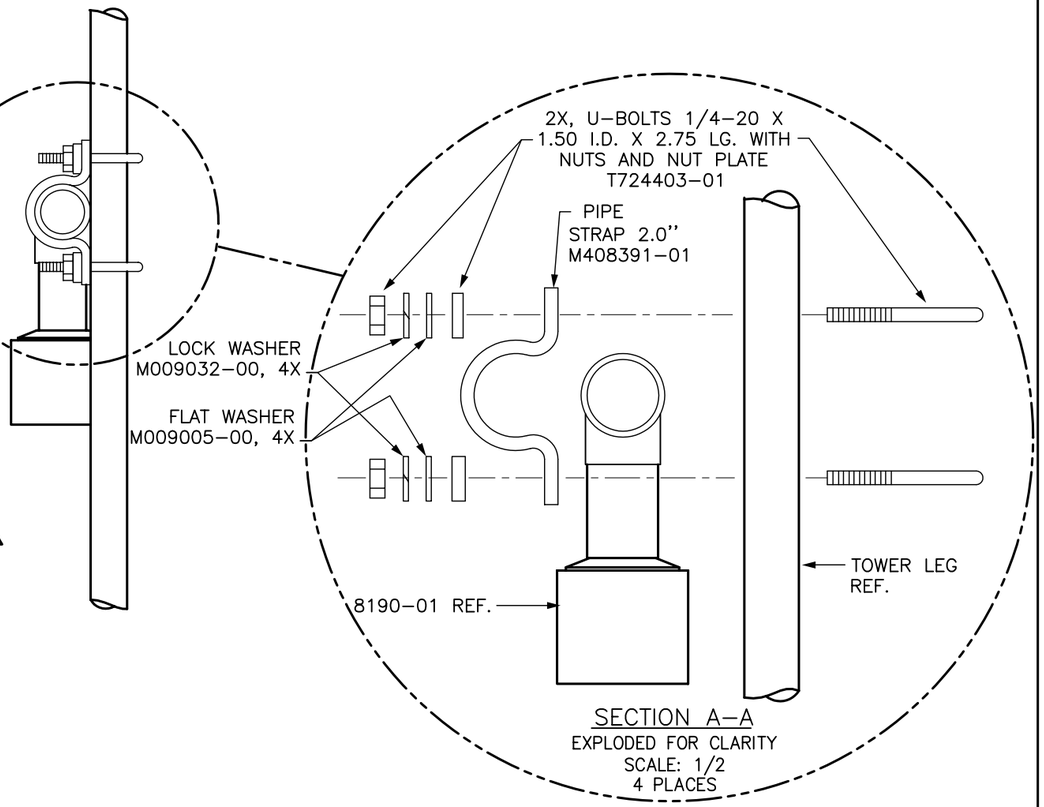
4. STRAP SENSOR CABLES TO THE TOWER WITH CABLE TIES OR DUCT TAPE. AT THE TOWER FACE, RUN THE CABLES DOWN THE TOWER LEG.

5. USE THIS DRAWING IN CONJUNCTION WITH MARS USERS MANUAL 8190-001.

6. APPLY LOCTITE SILVER GRADE ANTI-SEIZE COMPOUND (M401065-00) OR EQUIVALENT TO ALL EXTERNAL THREADED CONNECTIONS.

7. AFTER INSTALLATION IS COMPLETE, APPLY A LIGHT SPRAY OF CORROSION BLOCK (M402010-00) TO ALL METALLIC CONNECTORS, GROUND LUGS AND THREADED FASTENERS.




SECTION A-A
EXPLODED FOR CLARITY
SCALE: 1/2
4 PLACES

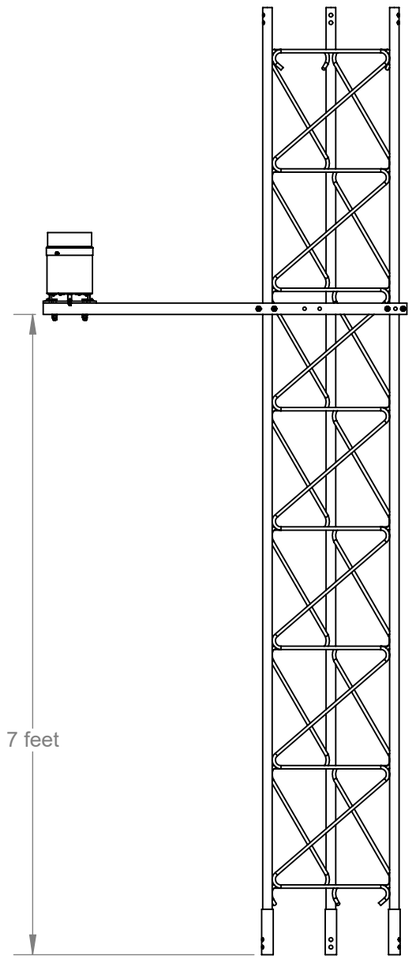


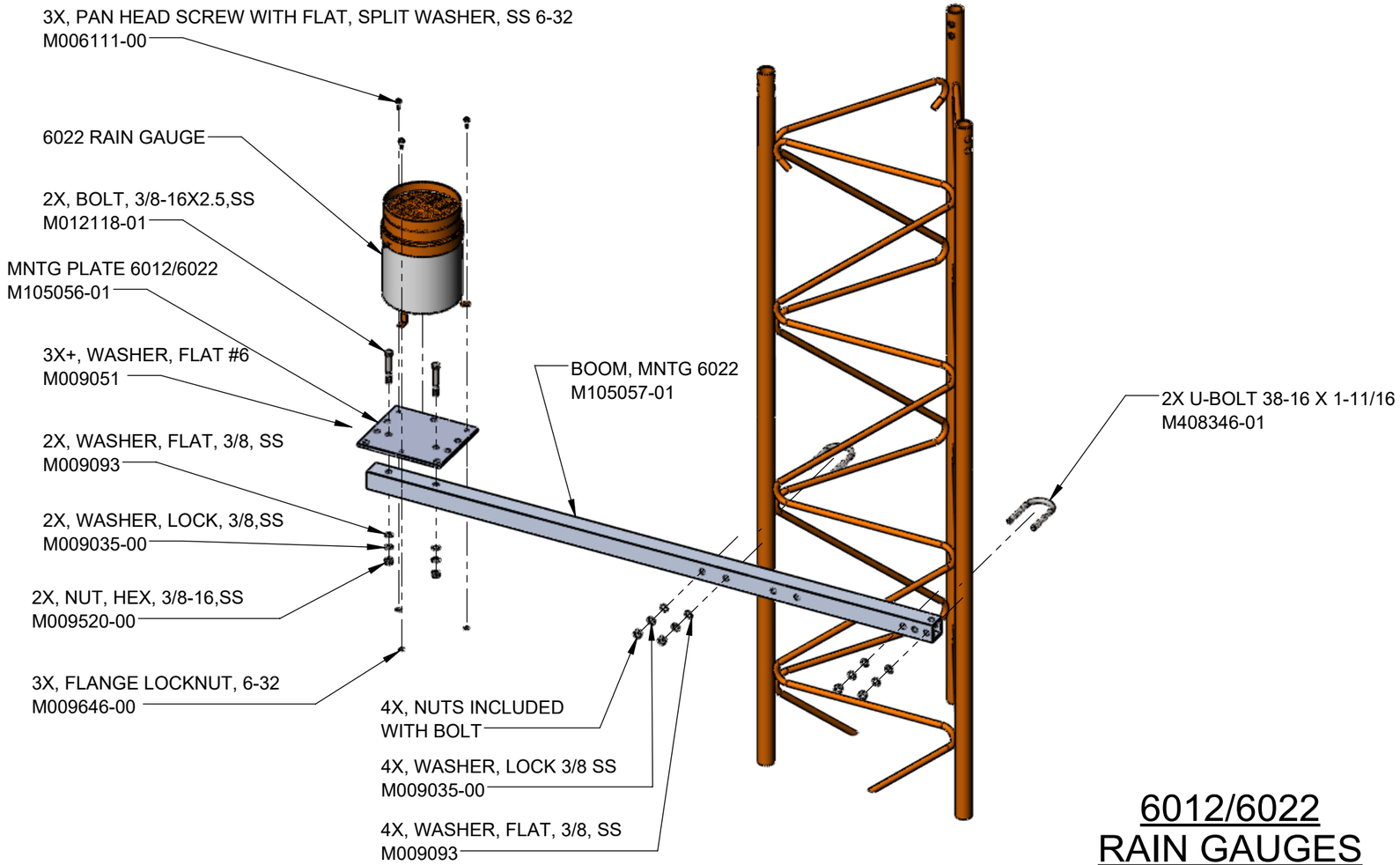
| | | | | | |
|---|---|---|---|---|---|
| APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT: | | UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES XX=±.010 ANGLES ±1/2° XXX=±.005 CONCENTRICITY: .003 TIR DO NOT SCALE DRAWING | DRAWN BY: B. GALARPE | 10/24/07 | TITLE: INSTALLATION DRAWING, MOTOR ASPIRATED RADIATION SHIELD, CORROSION RESISTANT |
| | | | REVISED BY: | | allweatherinc |
| | | MATL: SEE BILL OF MATERIALS | CHECKED BY: – | – | |
| | | FINISH: AS ISSUED | DESIGN ENGINEER: J. CONNER | – | SIZE D DWG NO. 8190-01-007 |
| | | TREATMENT | PROJECT MANAGER: | | |
| | | | APPROVALS | DATE | SCALE 1/3 RELEASE DATE – SHEET 1 OF 1 |

NOTES: UNLESS OTHERWISE SPECIFIED;

1. USE WASHERS AS REQUIRED TO LEVEL RAINGAUGE
2. WHEN USING MODEL 8518-A FOLDOVER TOWER, MOUNT TO HINGED SIDE OF TOWER USING HOLES SHOWN.
3. APPLY LOCTITE SILVER GRADE ANTI-SEIZE COMPOUND (M401065-00) OR EQUIVALENT TO ALL EXTERNAL THREADED CONNECTIONS.
4. AFTER INSTALLATION IS COMPLETE, APPLU A LIGHT SPRAY OF CORROSION BLOCK (M402010-00) TO ALL METALLIC CONNECTORS, GROUND LUGS AND THREADED FASTENERS.

| REVISIONS | | | M488169-01-007 | |
|---|---|---|---|---|
| REV | ECNO | DESCRIPTION | DATE | APPROVED |
| A | 1281 | INITIAL RELEASE | 10/25/07 | BRG |
| B | 4880 | ADDED 6012 & 6022 | 09/04/19 | SLVS |




# 6012/6022 RAIN GAUGES



APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT:

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES

TOLERANCES
.XX = ± .010
.XXX = ± .005
ANGLES = ± 1/2°
CONCENTRICITY = .003 TIR

MATERIAL: SEE BILL OF MATERIALS

FINISH: AS ISSUED

TREATMENT: NONE

| | | |
|---|---|---|
| DRAWN BY: S. VANSANTEN | 08/15/2019 | |
| REVISED BY: S. VANSANTEN | 2020-04-01 | |
| CHECKED BY: | | |
| DESIGN ENGINEER: S, VANSANTEN | 08/15/2019 | |
| PROJECT MANAGER: | | |
| APPROVALS | DATE | |

TITLE:
**INSTALLATION DRAWING KIT, MOUNTING, RAIN GAUGES 8509 TOWER**

allweatherinc

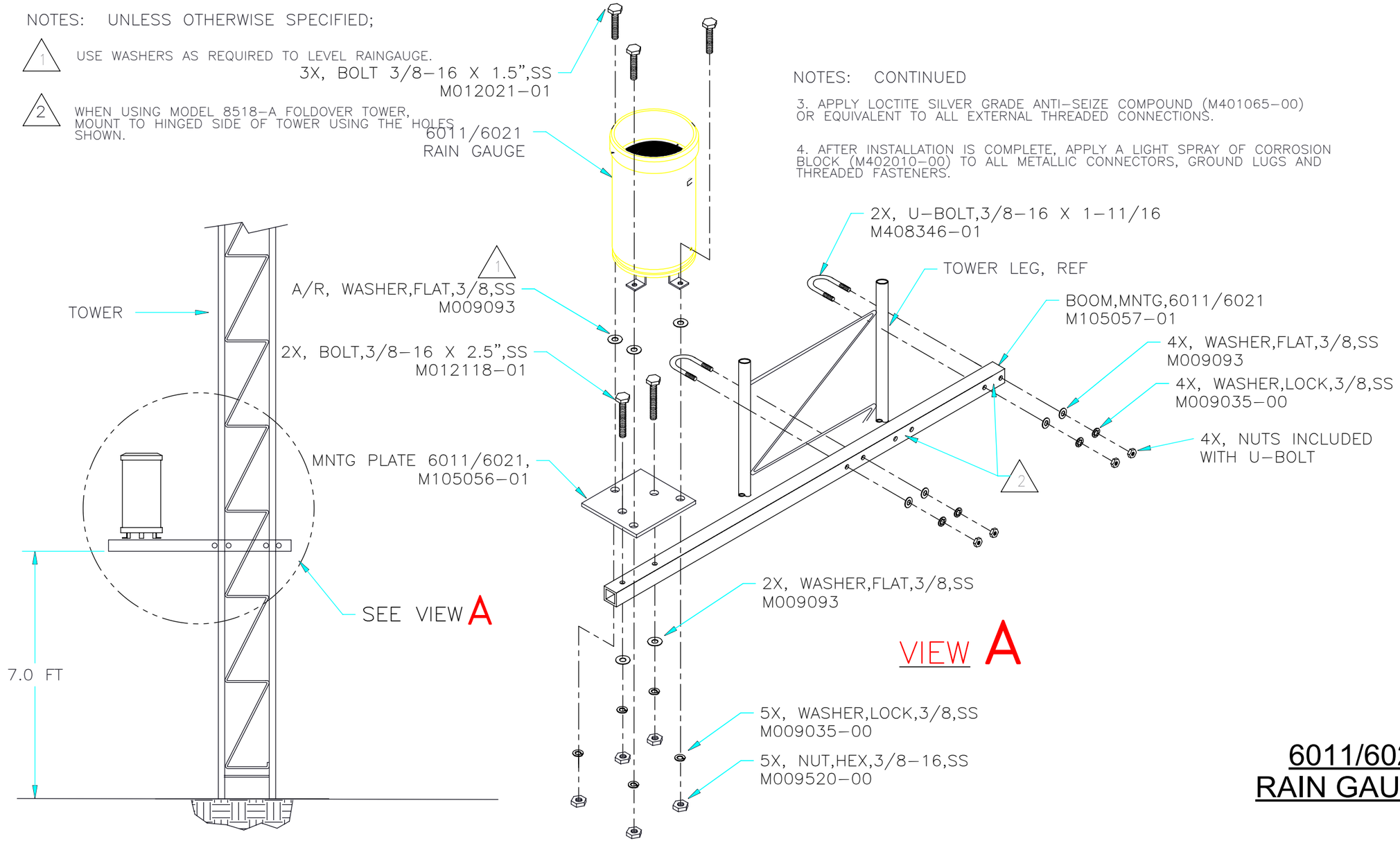
| SIZE | DWG. NO. | REV |
|---|---|---|
| B | M488169-01-007 | B |

SCALE: 1:20 | RELEASE DATE | SHEET 1 OF 2

NOTES: UNLESS OTHERWISE SPECIFIED;

1. USE WASHERS AS REQUIRED TO LEVEL RAINGAUGE.

2. WHEN USING MODEL 8518–A FOLDOVER TOWER, MOUNT TO HINGED SIDE OF TOWER USING THE HOLES SHOWN.




NOTES: CONTINUED

3. APPLY LOCTITE SILVER GRADE ANTI–SEIZE COMPOUND (M401065–00) OR EQUIVALENT TO ALL EXTERNAL THREADED CONNECTIONS.

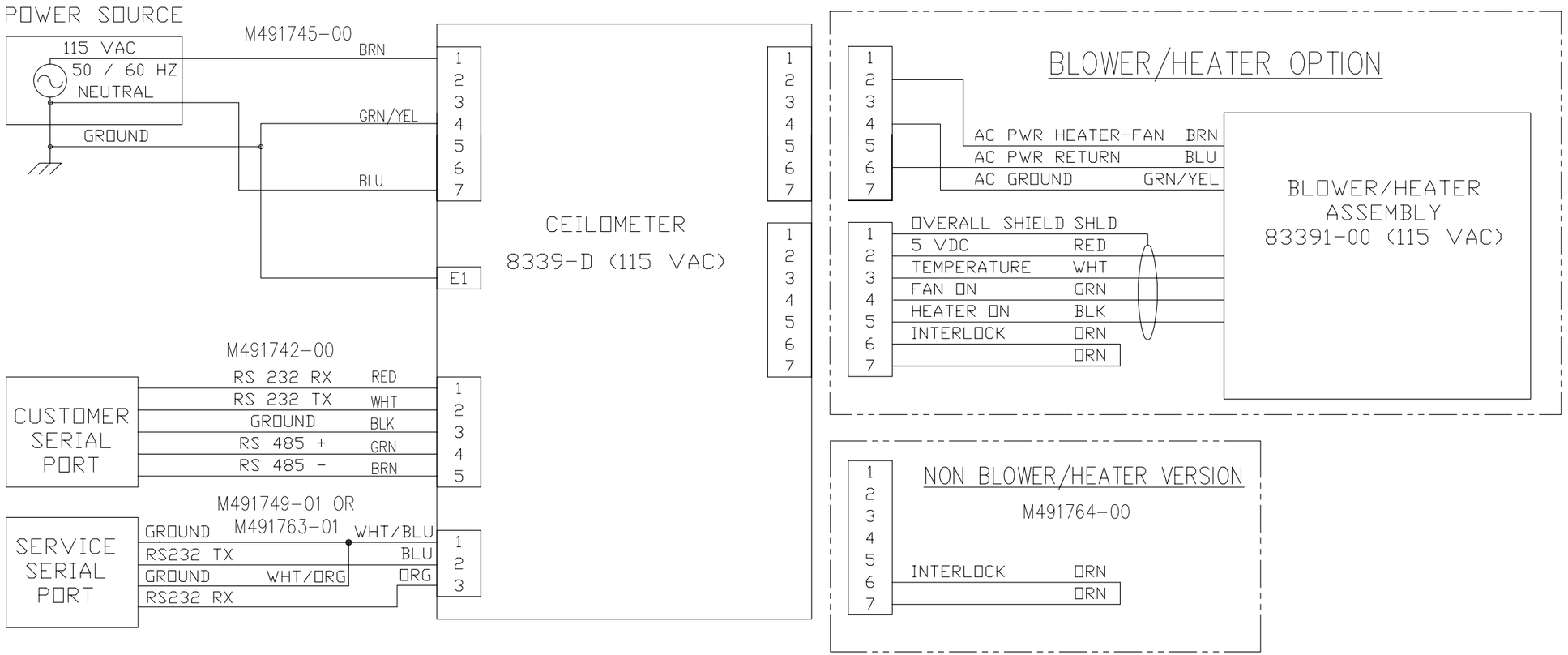
4. AFTER INSTALLATION IS COMPLETE, APPLY A LIGHT SPRAY OF CORROSION BLOCK (M402010–00) TO ALL METALLIC CONNECTORS, GROUND LUGS AND THREADED FASTENERS.

# 6011/6021 RAIN GAUGES



| SIZE | DWG. NO. | |
|---|---|---|
| B | M488169-01-007 | |
| SCALE: 1:20 | REV | SHEET 2 OF 2 |

| REVISIONS | | | DWG NO. 8339-D-019 | |
|---|---|---|---|---|
| REV | ECN | DESCRIPTION | DATE | APPROVED |
| A | 5030 | INITIAL RELEASE | 6-23-04 | JC |
| B | 1245 | "M491749-01 OR M491763-01" WAS: M491749-00 | 9-19-07 | PMK |






| APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT: | |
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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
.XX=±.010 ANGLES ±1/2°
.XXX=±.005 CONCENTRICITY: .003 TIR
DO NOT SCALE DRAWING

MATL

FINISH

TREATMENT

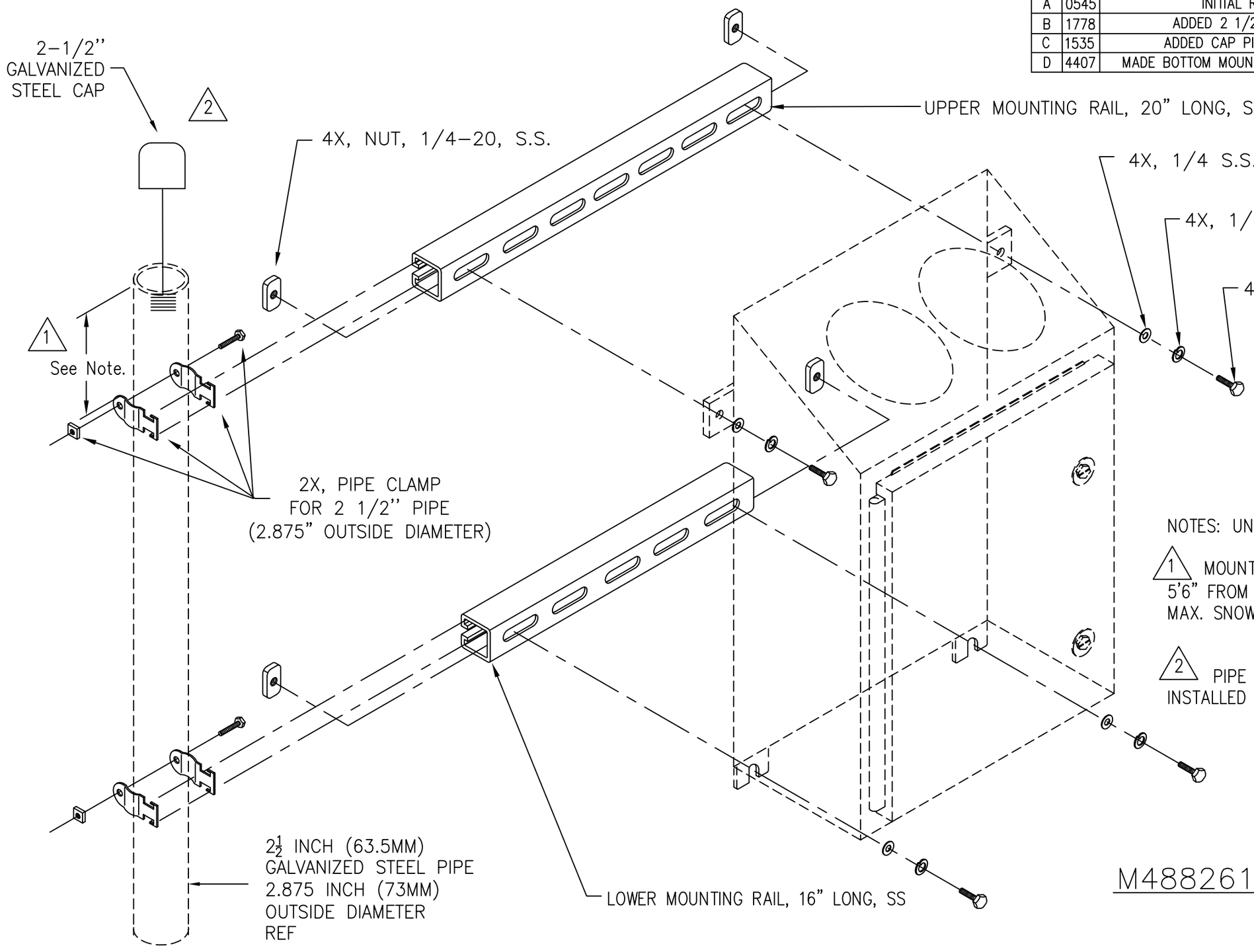
| | | |
|---|---|---|
| DRAWN BY: J.CONNER | 6-23-04 | TITLE: WIRING DIAGRAM, CEILOMETER ASSY, 8339-D, TOP LEVEL |
| REVISED BY: PMK | 9-19-07 | |
| CHECKED BY: | | |
| DESIGN ENGINEER: SLVS | 5-13-04 | |
| PROJECT MANAGER: | | |
| APPROVALS | DATE | |

allweatherinc

SIZE C | DWG NO. 8339-D-019

SCALE NONE | RELEASE DATE | SHEET 1 OF 1

| REVISIONS | | | DWG NO M488261-00-007 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 0545 | INITIAL RELEASE | 7-5-05 | J.CONNER |
| B | 1778 | ADDED 2 1/2" PIPE INFO | 2-3-09 | J.CONNER |
| C | 1535 | ADDED CAP PIPE PIPE INFO | 12-03-10 | T.IWANOWSKI |
| D | 4407 | MADE BOTTOM MOUNTING TABS SLOTTED | 01-19-16 | T.IWANOWSKI |




NOTES: UNLESS OTHERWISE SPECIFIED:

1. MOUNT THE TOP OF THE CEILOMETER ENCLOSURE 5'6" FROM GROUND LEVEL (OR AT LEAST 3' ABOVE MAX. SNOW LEVEL.

2. PIPE DOES NOT HAVE TO BE CAPPED IF INSTALLED ON A GRATED DECK OVER WATER.

# M488261-00 MOUNTING KIT



| APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT: | |
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UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
.XX=±.010 ANGLES ±1/2°
.XXX=±.005 CONCENTRICITY: .003 TIR
DO NOT SCALE DRAWING

MATL: AS ISSUED

FINISH: AS ISSUED

TREATMENT: NONE

| | | |
|---|---|---|
| DRAWN BY: J.CONNER | 7-5-05 | |
| REVISED BY: T. IWANOWSKI | 01-19-16 | |
| CHECKED BY: | | |
| DESIGN ENGINEER: | | |
| PROJECT MANAGER: | | |
| APPROVALS | DATE | |

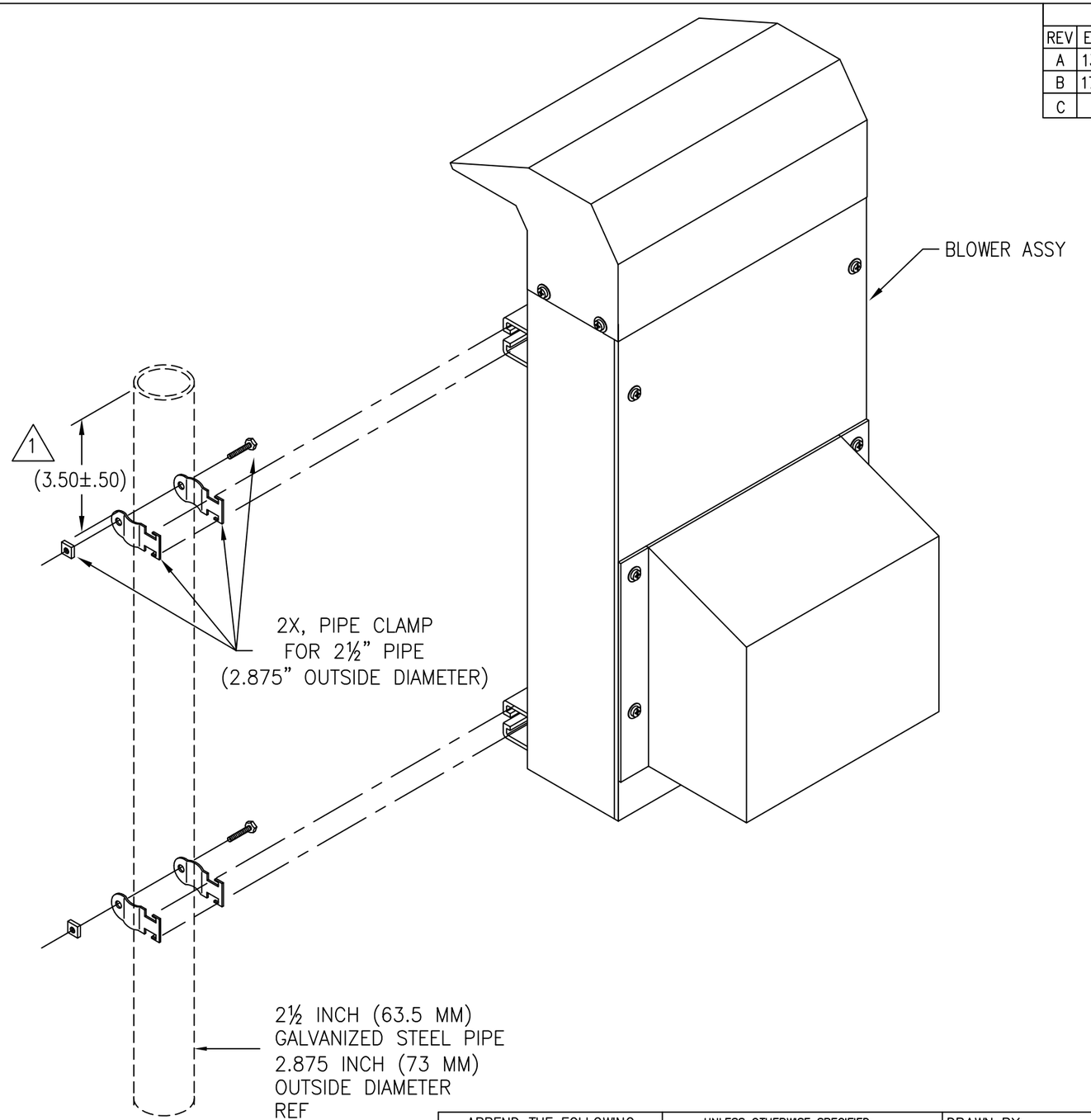
TITLE: INSTALLATION DWG, MOUNTING KIT, STAINLESS STEEL, 8339 CEILOMETER

allweatherinc

SIZE C | DWG NO. M488261-00-007

SCALE NONE | RELEASE DATE | SHEET 1 OF 1

| REVISIONS | | | DWG NO. 83396-00-007 | |
|---|---|---|---|---|
| REV | ECO | DESCRIPTION | DATE | APPROVED |
| A | 1317 | INITIAL RELEASE | 11-27-07 | PMK |
| B | 1778 | ADDED 2 1/2" PIPE INFO | 2-3-09 | J.CONNER |
| C | | ECP 180 ADDED VENT POSITION ABOVE LENSES | 9-28-10 | π |




NOTES: UNLESS OTHERWISE SPECIFIED:

1. MOUNT THE BLOWER ASSY UPPER PIPE CLAMP JUST BELOW THE CEILOMETER UPPER PIPE CLAMP (APPROX. 3½" FROM THE TOP OF THE MOUNTING PIPE) AND THE BLOWER LOWER PIPE CLAMP JUST ABOVE THE CEILOMETER LOWER PIPE CLAMP. THIS WILL POSITION THE BLOWER VENT APPROX. ¼" ABOVE THE CEILOMETER LENSES.



| APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT: | |
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DIMENSIONS ARE IN INCHES
TOLERANCES
.XX=±.010 ANGLES ±1/2°
.XXX=±.005 CONCENTRICITY: .003 TIR
DO NOT SCALE DRAWING

MATL: AS ISSUED

FINISH: AS ISSUED

TREATMENT: NONE

| | | |
|---|---|---|
| DRAWN BY: PMK | 11-27-07 | |
| REVISED BY: | | |
| CHECKED BY: J CONNER | 11-27-07 | |
| DESIGN ENGINEER: J CONNER | 11-27-07 | |
| PROJECT MANAGER: | | |
| APPROVALS | DATE | |

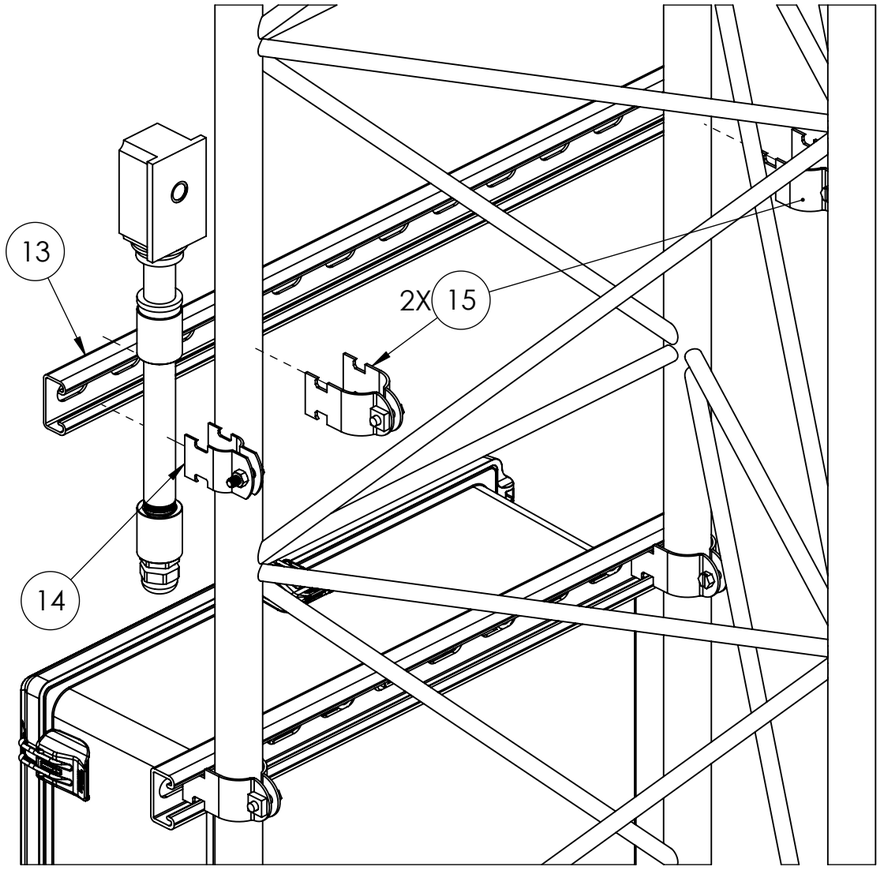
TITLE: INSTALLATION DWG, MOUNTING, BLOWER, SS, 8339 CEILOMETER

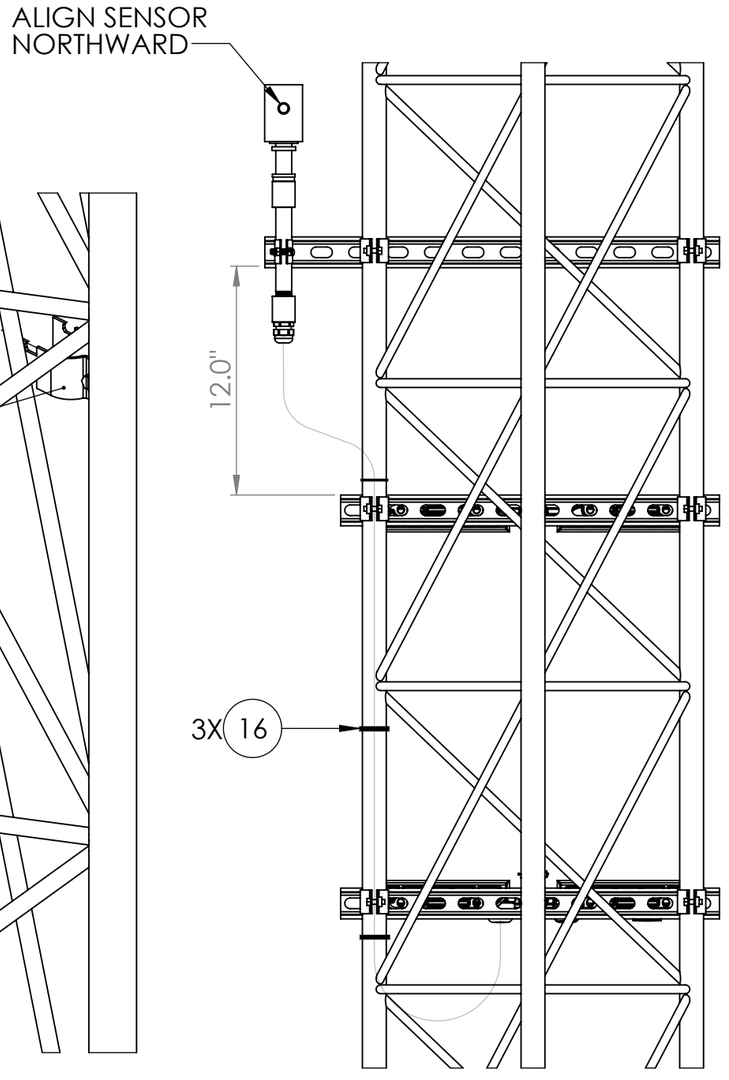
allweatherinc

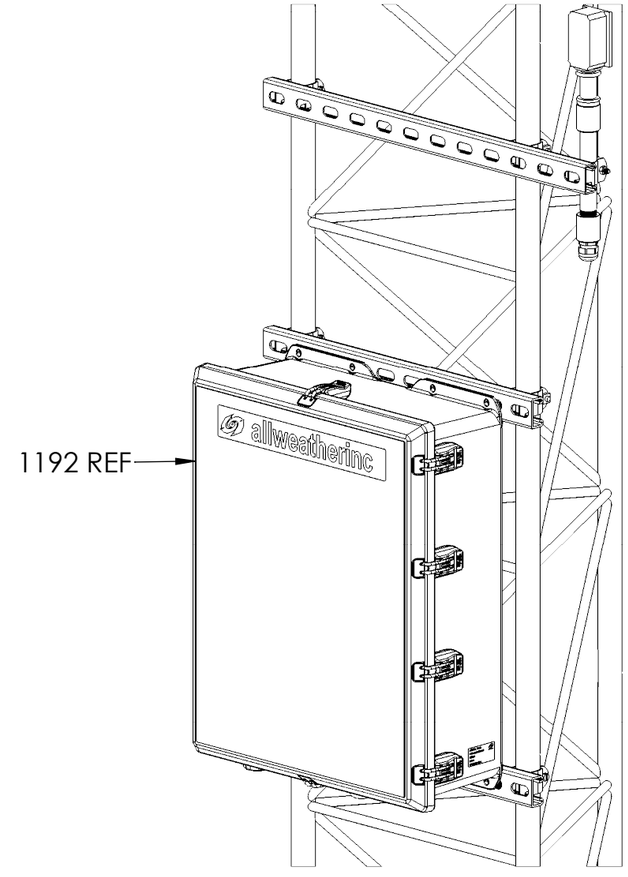
SIZE C | DWG NO. 83396-00-007

SCALE NONE | RELEASE DATE | SHEET 1 OF 1

| REVISION | | | M403582-00-007 | |
|---|---|---|---|---|
| REV | EC0 | DESCRIPTION | DATE | APPROVED |
| A | 5486 | INITIAL RELEASE | 12/13/2021 | K.YOUNG |
| | | | | |




# TOWER MOUNTING



APPEND THE FOLLOWING DOCUMENTS WHEN CHANGING THIS DOCUMENT:

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TOLERANCES
.XX = ± .010
.XXX = ± .005
ANGLES = ± 1/2°
CONCENTRICITY = .003 TIR

MATERIAL

FINISH

TREATMENT

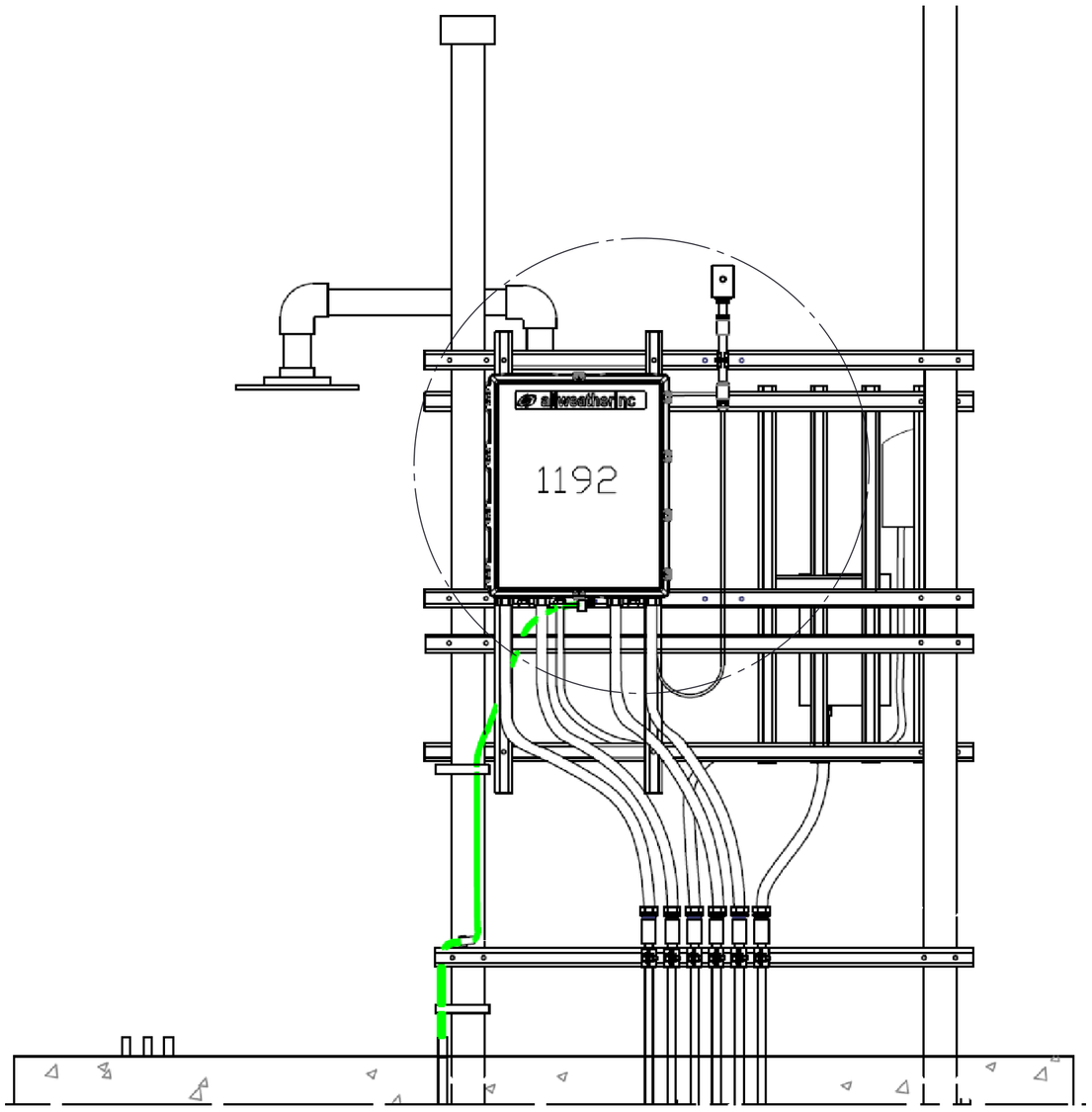
| | |
|---|---|
| DRAWN BY: K. YOUNG | 12/13/2021 |
| REVISED BY: K. YOUNG | 3/4/2022 |
| CHECKED BY: | |
| DESIGN ENGINEER: K. YOUNG | 12/13/2021 |
| PROJECT MANAGER: A. HUSTEAD | 12/13/2021 |
| APPROVALS | DATE |

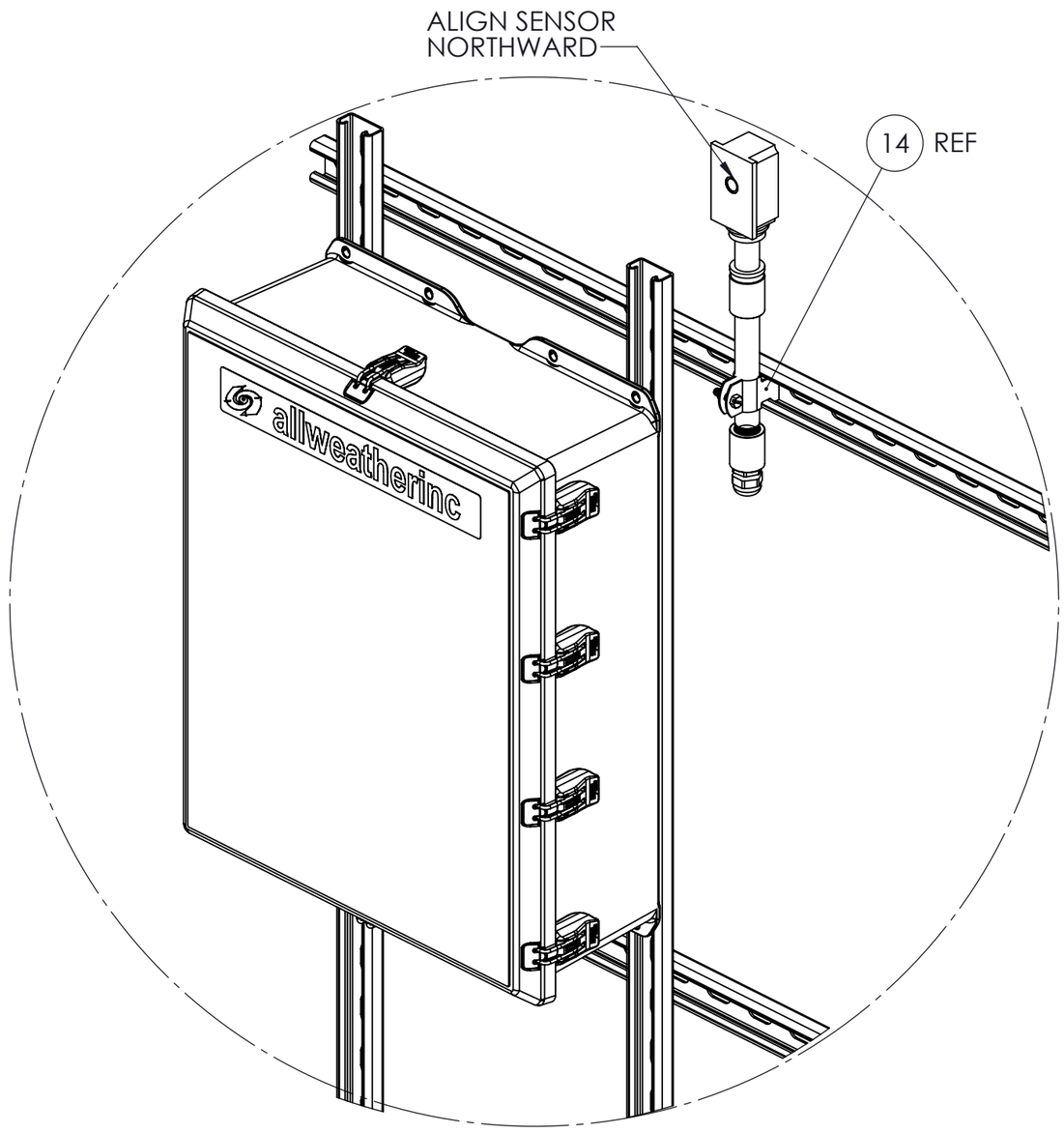
TITLE: **INSTALLATION DRAWING, DAY/NIGHT SENSOR, STANDALONE**

allweatherinc

SIZE B | DWG. NO. M403582-00-007 | REV A

SCALE: 1:5 | RELEASE DATE | SHEET 1 OF 2




# H FRAME MOUNTING



| SIZE | DWG. NO. | |
|---|---|---|
| B | M403582-00-007 | |
| SCALE: 1:5 | REV A | SHEET 2 OF 2 |

## ASSEMBLING THE ANTENNA

1) Select antenna location and route cable from set to antenna.

2) Loosen mounting nut and assemble radials to hub as shown in illustration. Tighten jam nuts and lockwashers against hub to secure the radials. Retighten mounting nut.

3) Connect cable to antenna (accepts PL-259).

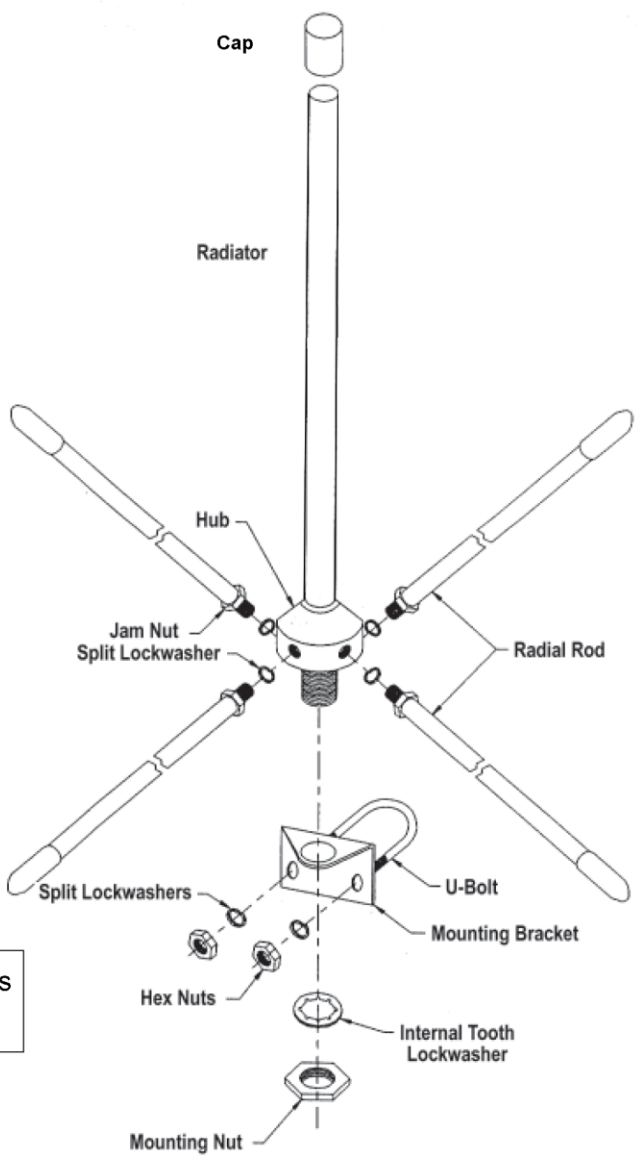
   Some models are supplied with cable and connector for the antenna end. Radio end connector is not supplied.

4) Mount antenna onto 1/2"-3/4" pipe, or up to 1-3/8" O.D. tubing (not supplied) with U-bolt, lockwashers and hex nuts provided.

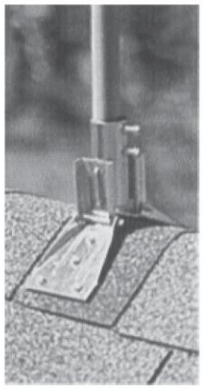
5) Secure cable to mounting pipe with straps or plastic tape to avoid strain on cable connections.

   The use of a PTFE or similar lubricant on the threaded portions of the antenna prior to assembly will provide protection from weather and ease future disassembly.

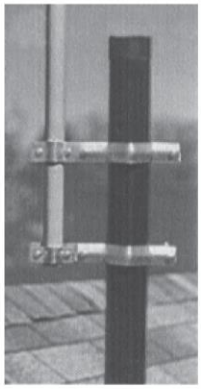
Note: VHF antenna radiators and radial rods are longer than their UHF counterparts.



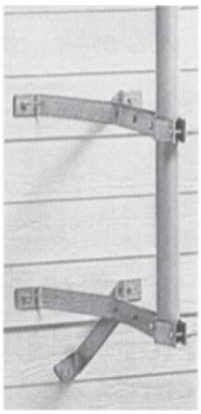

UHF/VHF ANTENNA ASSEMBLY



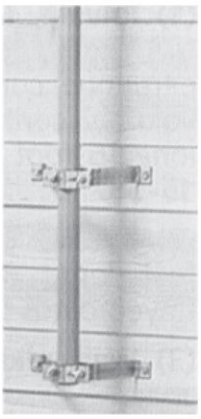
**Base and Roof Mount.**
**Heavy-gauge steel swivel base fits the slope of most roofs. 1¼" mast locks into U-bolt.**
**Radio Shack P/N 15-889**



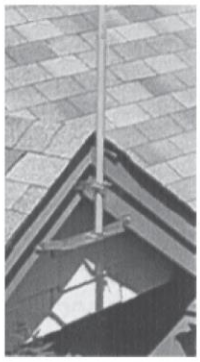
**Vent Pipe Mount.**
**Brackets attach to 2" to 5" vent pipes (GC model fits 2" to 4" vents). 1¼" mast clamps into place.**
**Radio Shack P/N 15-893**
**GC Electronics P/N 8802**



**12" Wall Mounts.**
**Secures 1¼" mast 12" from side of building.**
**Radio Shack P/N 15-885**
**GC Electronics P/N 8312**



**4" Wall Mounts.**
**Secures 1¼" mast 4" from side of building.**
**Radio Shack P/N 15-883**
**GC Electronics P/N 8304**



**Eaves Mount.**
**Secures 1¼" mast to hanging rafters or trim boards; fits most medium-pitch roofs. Includes 4 lag bolts.**
**Radio Shack P/N 15-891**

**3' Tripod Mount.**
**Designed for larger antennas and areas subject to strong winds. Fits slope of most roofs. Fits 1¼" mast.**
**Radio Shack P/N 15-516**
**GC Electronics P/N 9160**

**Masts:**
**Use with 1¼" diameter 5' steel mast (Radio Shack P/N 15-842, GC Electronics P/N 32-9013) or 10' steel mast (Radio Shack P/N 15-843, GC Electronics P/N 32-9014).**

Antenna Mast Options

Examples of Contractor-Made Antenna Masts and Mounting

**All Weather Inc.**
1065 National Drive, Suite 1
Sacramento, CA 95818
Fax: 916.928.1165
Phone: 916.928.1000
Toll Free: 800.824.5873

3000-017
Revision V
December, 2021