CIVACON OVERFILL ONBOARD MONITOR COMPATIBLE OPTICAL 5 WIRE

INSTALLATION AND WIRING INSTRUCTIONS

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CIVACON

4304 MATTOX RD.

KANSAS CITY, MO 64150

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1 PRODUCT DESCRIPTION

The CIVACON Onboard Monitor is a truck mounted monitoring and control system which will enable a tank trailer truck to load at optic, thermistor or float petroleum loading rack monitors while using only optic sensors. If all of the optic sensors do not detect any liquids, the monitor provides the necessary signal information to the appropriate API sockets to enable loading of the tank trailer truck.

CAUTION!: *DO NOT apply power to this monitor without thoroughly reading this manual and checking all connections. DO NOT connect a battery charger or other pulsed power supply to this monitor as this may permanently damage the monitor.*

1.1 EUROPEAN VERSIONS

There are versions of this monitor that are used in European applications. The only difference between these models and the standard (US) Model 3100 is that the units operate off of a 12 Volt battery pack or a 17 to 26 Volt DC source, and are configured for 8 compartment applications.

This specific European model for use with the 12 Volt battery pack is called a 3100E1. Operation of this unit above 16 Volts will damage the unit and void the warranty.

This specific European model for use on a 17 to 26 Volt source is called a 3100E. Operation of this unit below 17 Volts may damage the unit and void the warranty.

SAFETY NOTE: Since power for the monitor comes from the truck battery, the monitor location must be classified as a Class I, Division 2, Group D or safer location.

2 MOUNTING INSTRUCTIONS

The CIVACON Onboard Monitor has four (4) flanges with holes, at the base of its cast aluminum housing, used for mounting the enclosure. These are provided so that it may be securely bolted to a grounded metal portion of the trailer that will provide an excellent physical support to the monitor. These holes are 5/16 inch diameter. Refer to Figure 1 for dimensional mounting information. Mounting dimensions are given in inches.

To protect the electronics in the housing, keep the monitor lid on the enclosure until you are ready to wire the monitor. The housing provides seven (7) 1/2" NPT conduit holes (refer to Figure 1). These holes provide for easy wiring access to the desired locations of the monitor. The three (3) holes on the right side of the monitor are used for wiring to the sockets. The two (2) located on the left side of the monitor are used for wiring the 12 volt power and an optic sensor signal format to the monitor. The holes along the bottom are not used. Any holes that are not used should be properly sealed with pipe plugs, provided with the enclosure. Once the housing is installed, you are ready to remove the cover frame and window, and begin the wiring procedure.

Note: There is only one NPT hole provided to bring the NON-intrinsically safe power wiring into the enclosure. The remaining six (6) NPT holes are used for intrinsically safe signals and wiring. It is imperative this convention be adhered to !

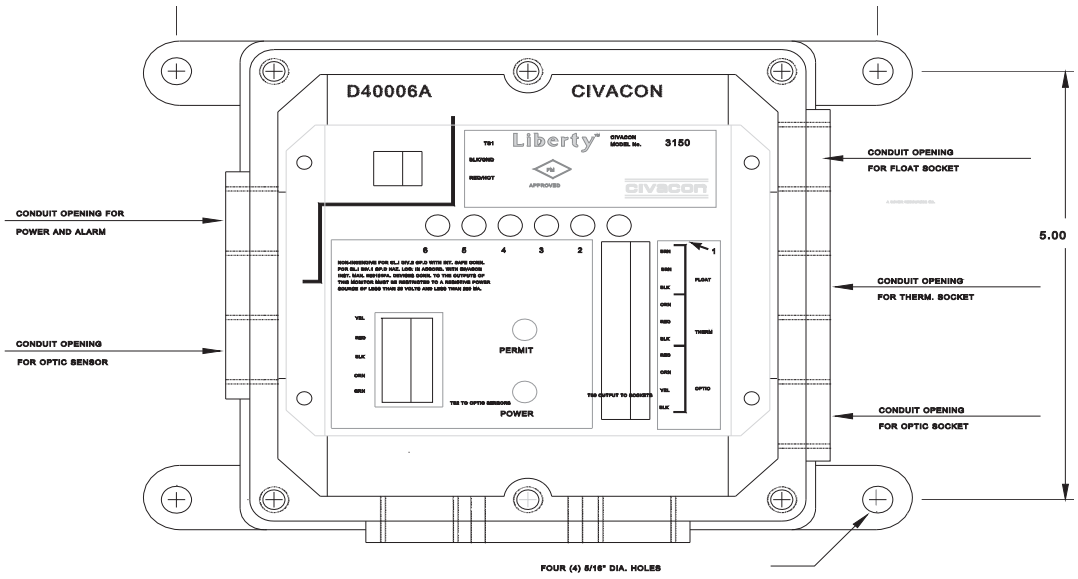


FIGURE 1 – MONITOR MOUNTING

3 WIRING INSTRUCTIONS - THE WIRE

All wiring entering the monitor must enter through the conduit openings shown in Figure 1. Use weathertight strain reliefs or conduit fittings to keep out external moisture. We strongly suggest the use of a high quality stranded and tinned copper wire with a minimum thickness of 20 gage for all electrical connections to the monitor. Trim about 3/8" of the insulation off the end of each wire that will be connected to the terminal strips of the monitor. Insert the trimmed wire into its appropriate slot on the terminal strip and tighten the screw on top of that slot. Due to the vibrations that can occur on a trailer, it is extremely important to double check all wiring connections for good mechanical integrity. The proper color code of the wires will save time and money on the installation and on any troubleshooting which may be required in the future. CIVACON Model 2100 cable (Ident code 97750) is a five (5) conductor color coded cable which is highly recommended for use with the installation of CIVACON overfill prevention equipment.

4 WIRING INSTRUCTIONS - POWER

SAFETY FIRST!! ***POWER MUST BE OFF WHEN INSTALLING OR REMOVING POWER LEADS TO THE MONITOR. THE WIRES FOR THE POWER FROM THE BATTERY MUST BE KEPT SEPARATE FROM THE SENSOR AND SOCKET WIRING! THEY CANNOT BE RUN TOGETHER IN THE SAME CONDUIT!*** This is important to maintain safe current levels in the intrinsically safe sensor and socket wiring.

Do not apply power to the monitor without reading this manual and thoroughly checking all connections. Measure the trailer system voltage. The monitor is designed to operate from 11 to 16 Volts DC, negative ground systems, supplied by a battery. If your voltage measurement is not within this range, contact CIVACON before installing the monitor. Power from battery chargers or other pulsed power supplies may permanently damage the monitor. If the power wires pass through a Class I, Division 2, Group D area, the conduit and wire type must be suitable for this use. The power supply circuit should contain a switch and an inline fuse with a maximum current rating of 1/4 Amp. It is recommended that the power be switched off when not in use (i.e. when servicing the electrical system or when driving the vehicle). The wires from the power source should only enter the enclosure via the proper conduit opening, the upper left hand opening (refer to Figure 1).

5 WIRING INSTRUCTIONS - SENSORS

The sensors must be wired according to Figure 2. The wires from the sensors should enter the enclosure via the proper conduit opening (refer to Figure 1). Any 5 wire sensor, which follows the five wire "OPTIC" signal format, may be used. CIVACON Instruction Sheet H50280PA may also be used as a reference in wiring the sensors. See Figure 2 for a complete sensor wiring diagram.

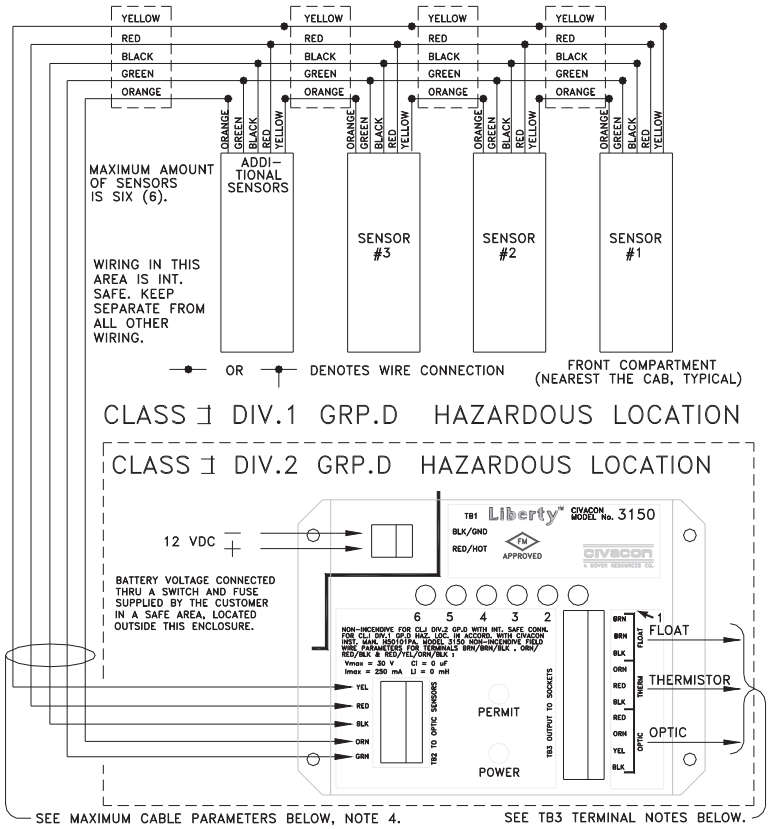


FIGURE 2 - POWER AND SENSOR WIRING

CONTROL DIAGRAM

Additional Notes:

1 - Electrical Apparatus connected to the Onboard Monitors should not use or generate more than 250 Volts.

2 - Installation should be in accordance with NEC ANSI/NFPA 70 and ANSI/ISA RP12.6 . In Canada, the system must be installed in accordance with the Canadian Electrical Code.

3 - Maximum ambient temperature is 60° C (140° F) .

4 - Maximum cable capacitance of 10.1 uF and cable inductance of 4.7 mH must not be exceeded. (FMRC Only Parameters)

5 - Onboard Monitors covered by this control diagram are: Model 3100 and 3150.

6 - Model 3100 and 3150 Non-Incendive Field Wire parameters (FMRC Only Parameters) for TB3 Terminals BRN/BRN/BLK, ORN/RED/BLK, and RED/ORN/YEL/BLK are :

Vmax. = 30 V. Vmax. ≥ Voc or Vt; Ci = 0 uF. Ca ≥ Ci + Ccable;

Imax. = 250 mA. Imax. ≥ Isc or It; Li = 0 mH. La ≥ Li + Lcable.

7 - CIVACON devices connected to TB2 are sensor Models 1110, 1200, 1300, 1400 series, and 1400R series; plus special length versions of the same models with an "S" suffix.

8 - CIVACON devices connected to TB3 are rack monitor Models 8100 series, 8300 series, and 8400 series, which are resistive loads only.

6 WIRING INSTRUCTIONS - SOCKETS

Conduit openings are provided so that each type of socket used may have its own conduit connection (refer to Figure 1). This convention is not required but will help in troubleshooting and tracing the system output if a problem should occur. Cross reference the CIVACON part number of the socket to its proper wiring diagram and connect accordingly (refer to Figures 3, 4, and 5). Please use the CIVACON Instruction Sheet H50200PA, which is packaged with each socket, for additional reference information on the sockets.

Note that pipe plugs are required to be installed in all of the openings which are not used. A thread sealant is also recommended to be used with each pipe plug.

Suitable for connection to the non-incendive outputs from Civacon Rack Monitors, Models 8100 Series, 8300 Series, 8400 Series.

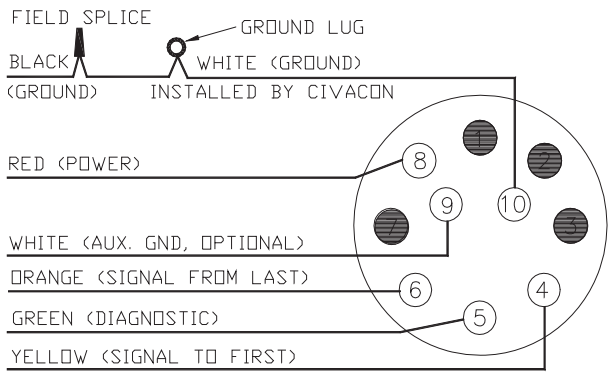
CIVACON OPTIC SOCKETS

Match your socket model number with the model numbers below.

Connect the shown wires below to the OPTIC section of the terminal strip on the monitor.

CAUTION: The OPTIC RED and ORANGE wires are NOT the same wires as the THERMISTOR wires.

MODEL No.'s 4100 & 4200



MODEL No. 4300

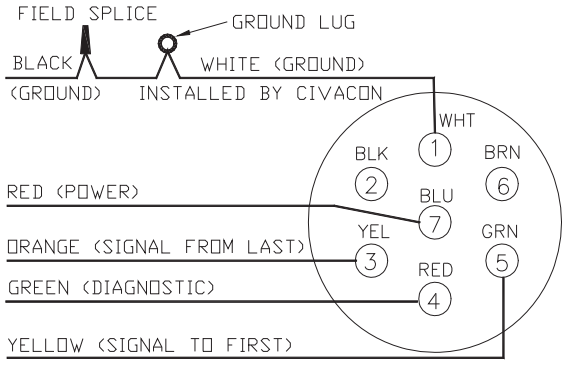


FIGURE 3

VIEWED FROM WIRE CONNECTION SIDE

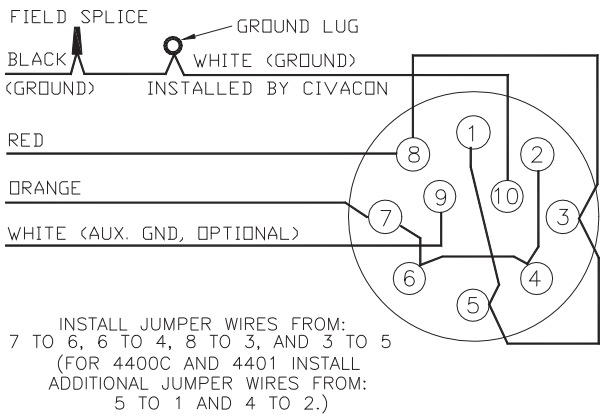
CIVACON THERMISTOR SOCKETS

Match your socket model number with the model numbers below.

Connect the shown wires below to the THERM section of the terminal strip on the monitor.

CAUTION: The THERMISTOR RED and ORANGE wires are NOT the same wires as the OPTIC wires.

MODEL No.'s 4400, 4400C, & 4401



MODEL No. 4500

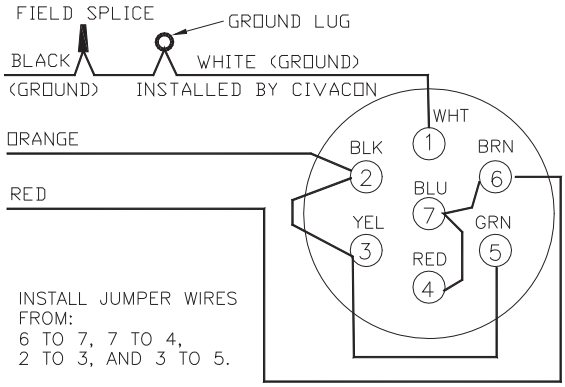


FIGURE 4

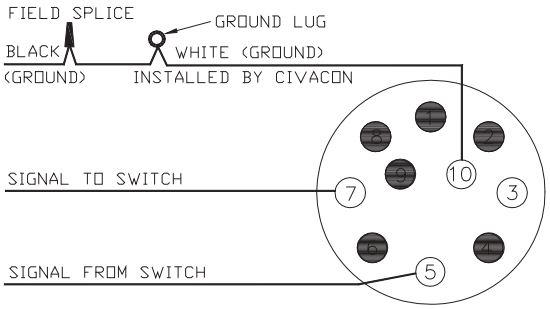
VIEWED FROM WIRE CONNECTION SIDE

CIVACON FLOAT SOCKETS

Match your socket model number with the model numbers below.

Connect the shown wires below to the FLOAT section of the terminal strip on the monitor.

MODEL NO. 4700



MODEL NO.4600

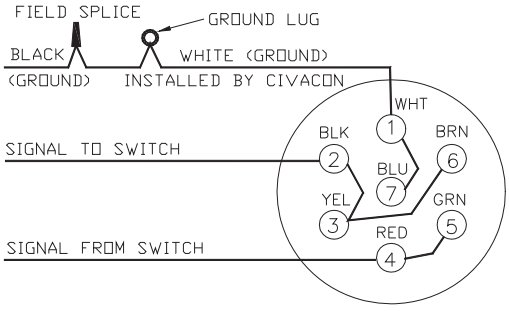


FIGURE 5

VIEWED FROM WIRE CONNECTION SIDE

7 CONTROL INDICATORS

The power light is the YELLOW LED at the bottom of the monitor. When this light is on, it is indicating that power is being applied to the power terminals of the monitor (refer to Figure 2), and that the internal main fuse is intact.

The permit light is the GREEN LED in the center of the monitor. When this light is on, it is indicating that the sensor is operating and NOT detecting an overfill situation. This is a "PERMISSIVE" condition. Any RED LED **ON** should cause this GREEN LED to be turned **OFF**.

The diagnostic lights are the RED LED's located horizontally on the upper half of the monitor. The functions of these RED LED's are to indicate which compartment is in an overfill condition, and to assist in the troubleshooting of the overfill system in case of a mechanical or electrical problem. When less than 6 compartments are present (8 on European Versions) on a trailer, the diagnostic LED's for the unused compartments are covered with small black plastic covers, which are supplied with a new monitor.

The sensor or compartment that is causing a problem or is "wetted" should light it's corresponding RED LED. The LED designated as NUMBER ONE is for the sensor nearest the cab. So if the NUMBER TWO LED is lit, this means the second sensor from the cab is either wet or faulty. This condition must be troubleshot before loading may continue. Corrective actions include draining the compartment if the sensor is wet, repairing faulty wiring, or replacing the defective sensor if required.

Please note that depending on the vintage of the onboard monitor you are using, the numbering orientation of the RED LED's may be from right to left (current version), or from left to right (old version). Observe the numbering on the label of the module to get the correct order of LED's to the sensors.

8 SYSTEM OPERATION

The monitor electronics are internally fused, and these fuses are not replaceable. The average power consumption of the electronics in the monitor is less than 1/4 Amp. It is recommended that a 1/4 Amp fuse be installed in the power supply line. The voltage being run to the TB1 power terminals is not intrinsically safe. The wire from the power terminals (TB1) must not be run with intrinsically safe

wiring. All power input connections are made at TB1.

Check to make sure that all of the above procedures have been followed and that all of the wiring is correct. Apply power to the monitor. If the system is wired correctly and all of the components are operating properly, the YELLOW power light should be on, and the GREEN permit light should be on.

If no lights are on, check to make sure that at least 11 volts DC is present at the power input terminals. Also insure that the proper polarity is connected. If there is sufficient voltage present and the YELLOW light remains off, contact CIVACON. If the monitor is operating as described in the above paragraph, you may securely replace the cover frame, nameplate, window, and the gasket.

9 REPLACEMENT MODULES

SAFETY FIRST!! POWER MUST BE OFF WHEN INSTALLING OR REMOVING POWER LEADS TO THE MONITOR. THE WIRES FOR THE POWER FROM THE BATTERY MUST BE KEPT SEPARATE FROM THE SENSOR AND SOCKET WIRING! USE CAUTION WHEN REPLACING THE MODULE. ENSURE ALL WIRING IS PROPERLY RECONNECTED TO THE CORRECT TERMINALS ON THE MODULE.

The monitor electronics are replaced as a module. There are **NO** replaceable or repairable parts inside the module. The replacement module is a slightly different part number that the original unit because you normally don't need to replace the aluminum enclosure that the module is mounted in.

The standard US version replacement module is a Model 3150. This is a 12 Volt, 6 channel (compartment) version. This unit comes with a metallic label to be placed on the nameplates of older Civacon or OPW Compatible Onboard Monitors. To determine if you have an older monitor, look at the external nameplate on the monitor. If the LED numbering starts with the number 1 on the left-hand side, and progresses to the number 6 on the right-hand side, this is an older monitor. The new versions of the monitor and replacement module have there numbering reversed. The number 6 is on the left-hand side, with the number 1 on the right-hand side. The new version works just fine in the older enclosure units, you just have to pay attention to the color code of the wiring as you rewire the module. Just pay attention to the wire colors next to the terminal strips on the label on the module.

If you are placing a new module in an older unit, check the external nameplate for the LED numbering order. If your nameplate on the unit needs to be updated, clean the area of grime and grease on the nameplate around and over the LED numbers. Take the label packaged with the replacement module and place it over the existing numbers on the cleaned nameplate, after removing its protective paper. Press this label into place for a permanent installation.

If you already have a new nameplate or an updated nameplate, with the numbers in the proper sequence to match the module, then disregard the above instructions and discard the label packaged in the module. European replacement modules come in two versions. Both are configured for 8 compartment applications. The only differences are in the input voltage range. Be sure to order the correct replacement module.

This specific European model for use on a 11 to 16 Volt source is called a 3150E1.
Operation of this unit above 16 Volts will damage the unit and void the warranty.

This specific European model for use on a 17 to 26 Volt source is called a 3150E.
Operation of this unit below 17 Volts may damage the unit and void the warranty.

It is imperative that the four mounting screws (with lockwashers) be re-installed on the module to secure it to the enclosure.

10 WARRANTY

All parts and products are thoroughly inspected and tested from the time raw material is received at our plant, until the product is completed. We guarantee that all products are free from defects in materials and workmanship for a period of one year from the date of shipment. Any product that may prove defective within said one year period will, at our option, be promptly repaired, or replaced, or credit given for future orders. This warranty shall not apply to any product which has been altered in any way, which has been repaired by any party other than an authorized service representative, or when such a failure is due to misuse or conditions of use. We shall have no liability for labor costs, freight costs, or any other cost or charges in excess of the amount of invoice for the products.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND SPECIFICALLY THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

WARNING:

CIVACON products should be used in compliance with applicable federal, state, and local laws and regulations. Product selection should be based on physical specifications and limitations, compatibility with the environment, and the material to be handled.

CIVACON MAKES NO WARRANTY OF FITNESS FOR A PARTICULAR USE.

10.1 TECHNICAL ASSISTANCE

If at any time during the installation a question arises that is not covered in this Installation Instruction, or with any other applicable documents referenced, feel free to call the **CIVACON TECHNICAL ASSISTANCE LINE :**

In the U.S.A., Call 1-800-5 CIVACON . (800-524-8226)

For the **CUSTOMER SERVICE DEPARTMENT :**

In the U.S.A., Call 1-888-526-5657; In other countries, call your local agent.

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4304 MATTOX RD. * KANSAS CITY, MO 64150

PH: (816) 741-6600 * FAX: (816) 741-1061

(888) 526-5657 (888) 634-1433