



CEN TEK  
MARINE

INSTALLATION & OPERATION MANUAL

DELTA-T SYSTEMS600-DCT2-24

## 24 Volt DC *Ventilation Control System*



# Introduction

## 24 Volt DC Ventilation Control System

The 600-DCT2-24 fan control system is designed to automatically control engine room ventilation in applications using Delta T Systems' 24 volt DC fans, as well as provide a high and low speed option for manual fan operation. In the Auto Mode, the unit senses engine room temperature and starts the fans at low speed as the space heats up. Running the fans at reduced speed lowers the noise levels and reduces the total current draw by roughly 25%, easing the load on the electrical system. If the temperature in the space continues to rise, the system will automatically increase the fans to full speed. As the space cools the fans switch back to low speed, and then turn off automatically. In the Manual Mode, the system allows the operator to set the fan speed to high, low or off.

**REQUIREMENTS:** The fans that are run by the DCT2 control system must be connected in even pairs of two or four fans. The controller cannot operate either one or three fans.

The fan pairs must be the same make, model, and size. A maximum of four, 11" diameter axial fans may be used with the DCT2-24 VDC fan control system.

### The DCT2-24 will operate the following fan combinations:



1 Pair of 9" Fans



1 Pair of 11" Fans



1 Pair of 4" Blowers



2 Pairs of 9" Fans



2 Pairs of 11" Fans



2 Pairs of 4" Blowers

All fan wires must terminate inside the Main Control Enclosure for proper operation. **DO NOT** attach the negative side of the fans to a common ground.

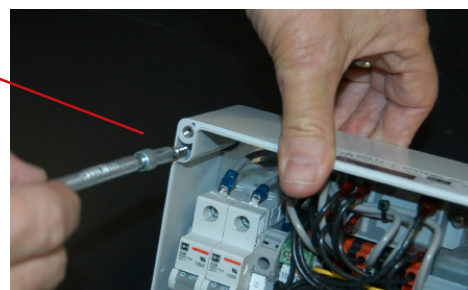
# Installation

## 24 Volt DC Ventilation Control System

**1. Mounting the Main Control Enclosure:** Position the DCT2 in the engine room in an area where it will not be subject to extreme temperatures, or moisture. To mount the Main Control Enclosure, use screws through the four holes in each corner, just inside the threaded inserts that hold the cover in place. The unit can be mounted in any orientation as long as there is enough clearance to remove the cover.



Mounting holes are located in each corner of the Main Control Enclosure as shown



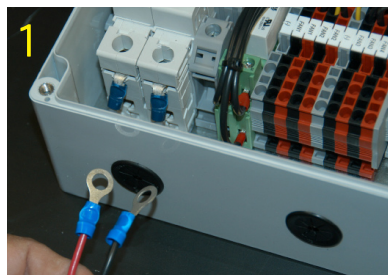
### 2. Mounting the Temperature Sensor

Mount the temperature sensor in a central location in the engine room, where it will not be subject to cool air from the intake fans blowing directly on it. It is advisable to not cut the temperature sensor cable. When the vessel undergoes sea trials, it may be necessary to relocate the sensor to a more suitable location for optimum system performance.

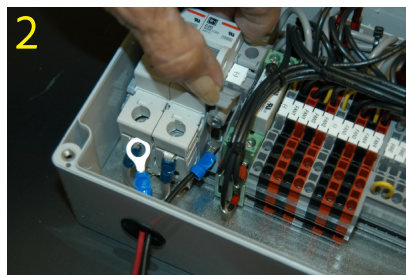
### 3. Wire Connections

Wire each connection as indicated in the steps below. Refer to the Block Wiring Diagram and photographs for details.

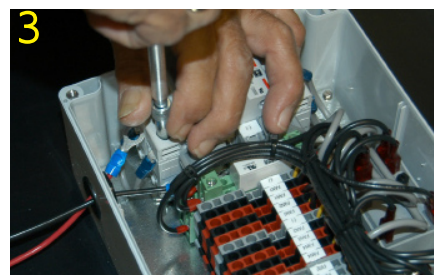
## DC Power Connections



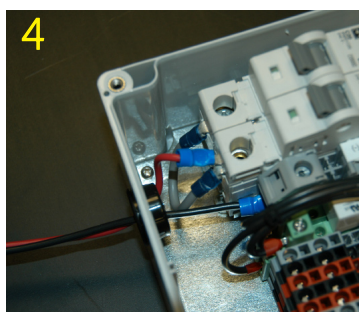
Run power leads into Main Control Enclosure **RED (+ Positive)** **BLACK (- Negative)**



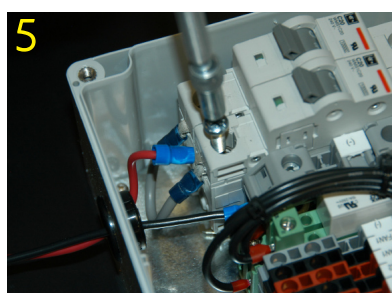
Open relay and run negative (BLACK) power lead to terminal, then close relay and secure by tightening screw



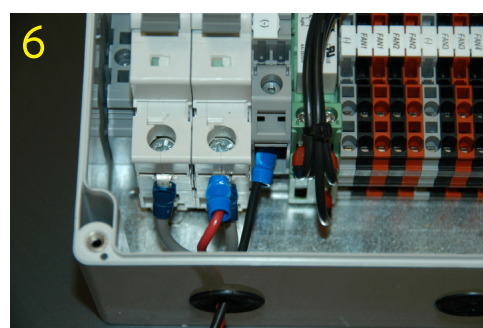
Remove terminal screw from one of the circuit breakers



Insert positive (RED) wire into terminal



Replace screw and tighten connection

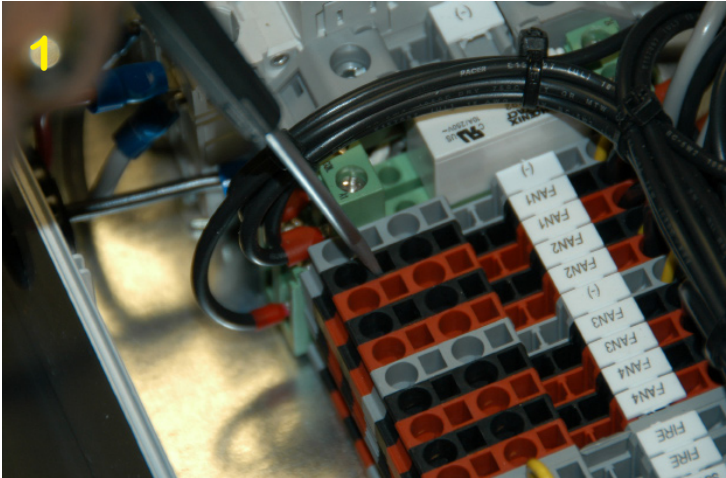


Power connections completed

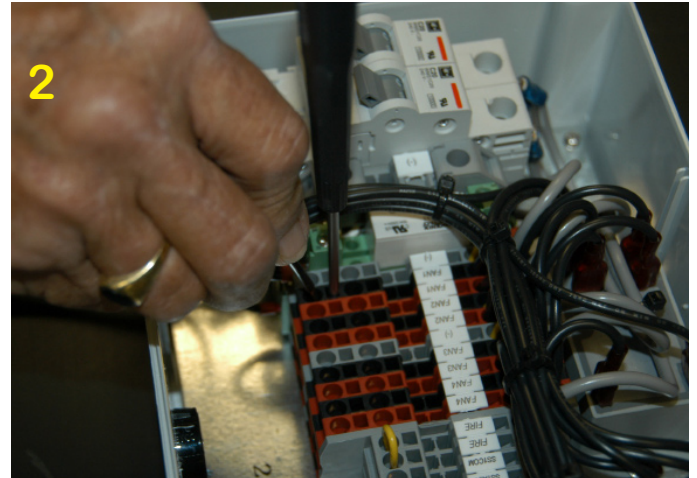


# Fan Connections

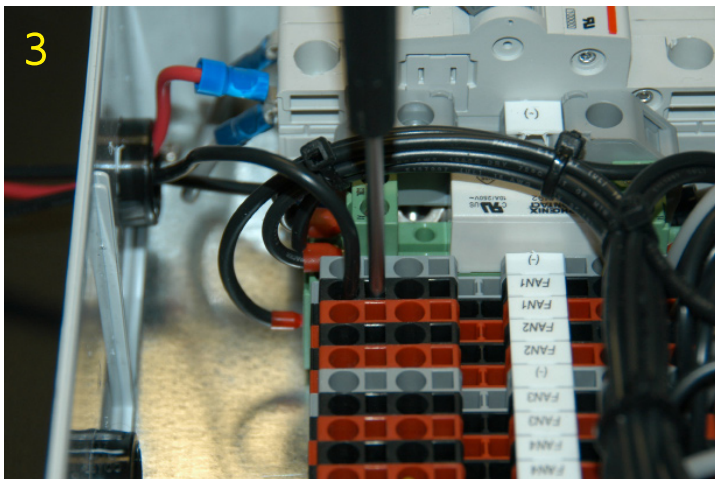
## 24 Volt DC Ventilation Control System



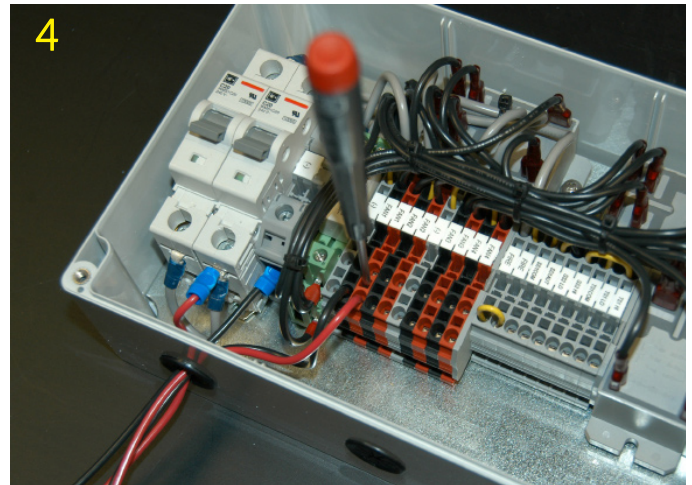
Insert a small flathead screwdriver into the terminal release slot as shown (Fan #1)



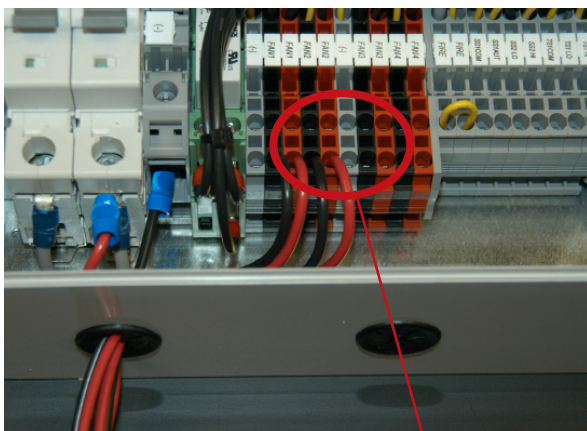
With the screwdriver in place, remove 1/4" of insulation from the negative wire and insert into the terminal hole



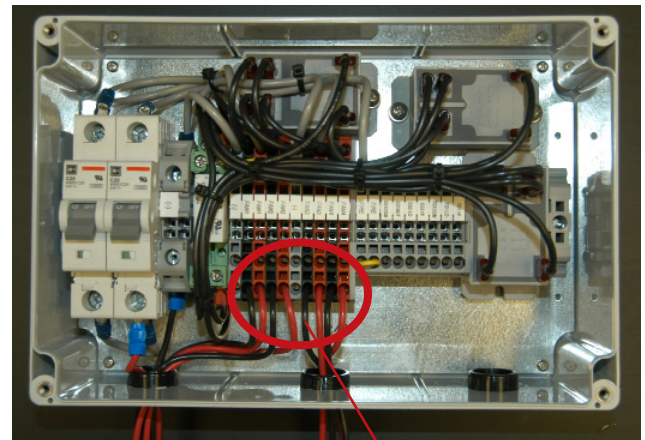
Fully seat the wire, then remove the screw driver to secure the wire in place.



Repeat this process for the positive wire of Fan #1, and for the rest of the fans that will be run by the DCT2 control system



Connections shown for a two fan system

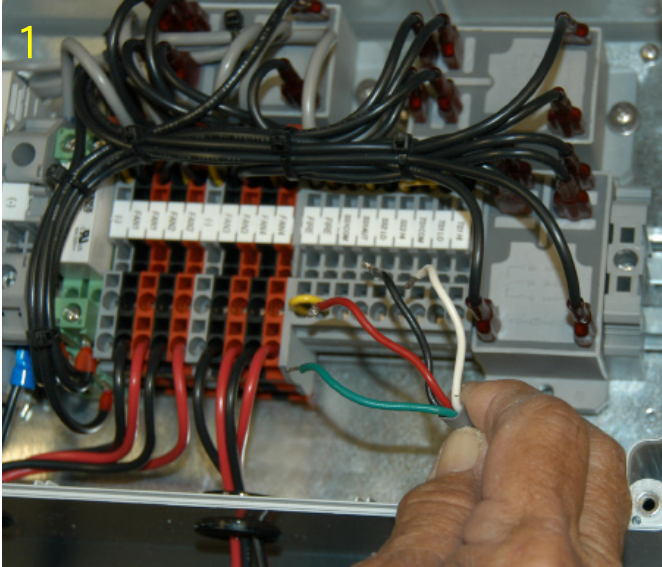


Connections shown for a four fan system

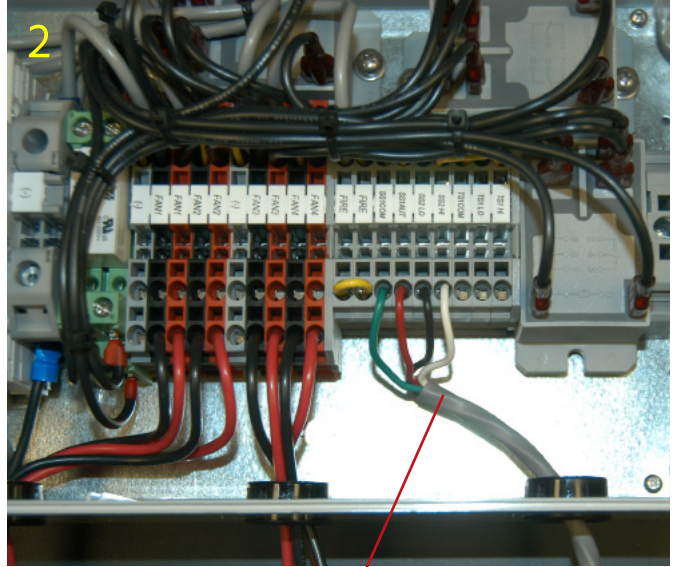


# Switch Connections

## 24 Volt DC Ventilation Control System



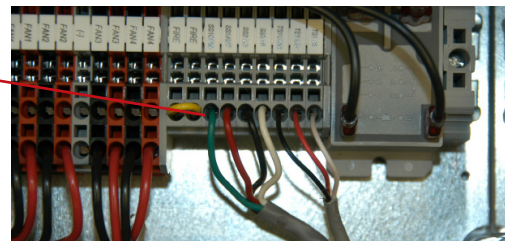
Run Green, Red, Black and White switch wires into the Main Control Enclosure



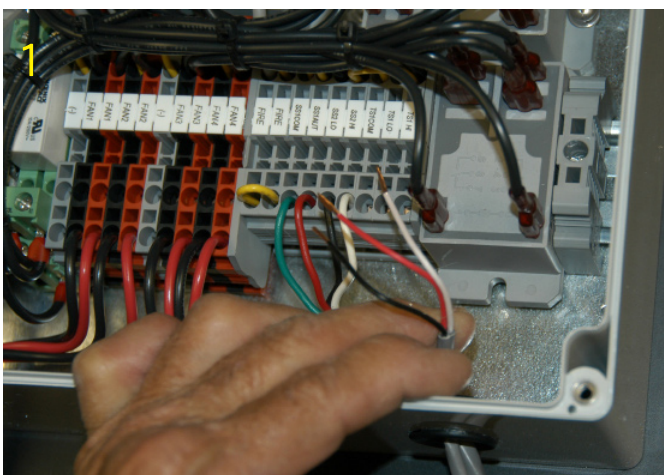
Secure switch wires in terminals as shown

### Optional Fire Shutdown Connections

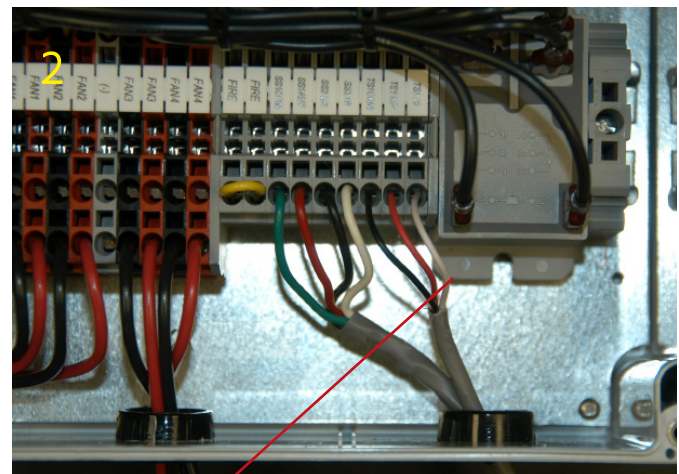
If you intend to use the optional fire shutdown capabilities of the DCT2, remove the factory installed yellow wire jumper and make the connections to the two fire terminals in the Main Control Enclosure as shown. Refer to the Block Wiring Diagram.



### Temperature Sensor Connections



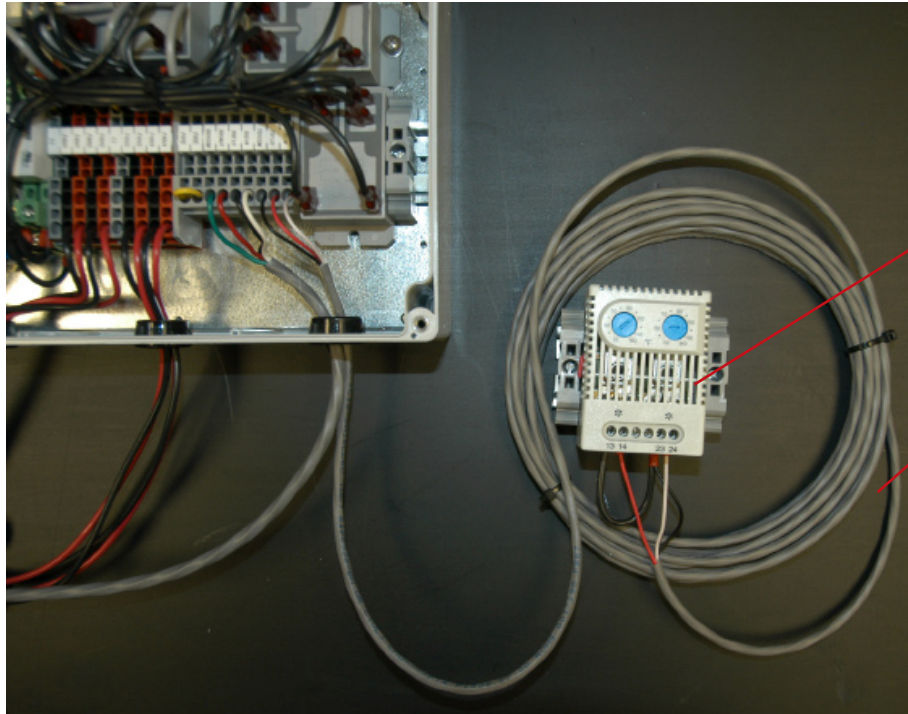
Run Red, Black and White temperature sensor wires into the Main Control Enclosure to terminals marked on Block Wiring Diagram.



Secure temperature sensor wires in terminals as shown

# Initial DCT2-24 System Start-Up

## 24 Volt DC Ventilation Control System



Engine Room  
Temperature Sensor

NOTE: It is recommended that the temperature sensor cable remain uncut until after the vessel undergoes sea trials. It may be necessary to relocate the sensor to a more suitable location for optimum system operation.

### 1. Powering

Turn on the main circuit breaker that feeds the control. Use a voltmeter to verify that there are 24 volts DC across the positive and negative terminals. The circuit breakers inside the Main Control Enclosure can be switched on once 24 volts DC is verified as the input voltage.

### 2. Testing Rotation

Turn Operation Mode Selection Switch to manual. Make sure that each fan is rotating according to the desired flow direction. Verify that the intake fans are actually blowing into, and the exhaust fans are blowing out of the engine room. If any of the fans are going the wrong way, correct the problem by reversing the polarity of the wires for that fan on the fan output terminal inside the Main Control Enclosure. You will also need to reverse the fan's hub/blade assembly by removing it from the fan motor shaft, flipping it over, and securing it with the clip.

### 3. Auto Mode Check

After the rotation has been tested, the unit should be checked to ensure that the Auto Run Mode functions properly. Use a heat source such as a heat gun or lamp to warm the sensor (**DO NOT** use an open flame), and observe fan operation. Try to warm the sensors up slowly at first. The fans should come on at low speed as the sensor reaches 105°F. At 115°F, the fans switch to full speed. Once the fans are at full speed, remove the heat source and allow the sensor to cool. The fans should return to low speed, then shut off completely once the space cools.

### 4. Dock Trials

At this point, the DCT2-24 system is working properly. Start the main engines, and let the space warm up naturally as it would under normal operating conditions. Monitor the temperature of the space to determine when the fans start. The fans should start on low speed, then go to high speed. If the engine room temperature is too high and the fans have not switched to high speed, it may be necessary to relocate the temperature sensor to a warmer area in the engine room. If everything operates as stated above, the system is ready for use.





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