W35/W50 – Pump & Thermostat Wiring Directions

NOTE: The following instructions for the pump wiring are appropriate only for a single W35 or W50 system using one pump. See separate instructions if two or three W35 or W50 systems are to be using one pump.

Pump Wiring

The raw water cooling pump must be connected via the relay that is supplied with the W35 & W50 condensing units. The pump must not be connected directly to the terminals that normally power a fan in an air-cooled unit.

The relay is a small, black, cube shaped object with four electrical terminals that will accept slip-on wire connectors. These terminals are numbered and the numbers are stamped in the plastic case close to their corresponding terminal. These numbers may be difficult to see and read, so the following may be a useful guide. Hold the relay so that the four terminals are pointing at you. Rotate the relay so that the three similar terminals are vertical and the odd terminal is horizontal and on the bottom. In this orientation the top terminal is number 86 and the remaining terminals are numbered 30, 87, and 85 respectively reading clockwise. See wiring diagram over.

- Terminal 86 must be connected to terminal “F” on the controller that is mounted on the compressor. The oil cooler fan is connected here also, so a terminal multiplier is added for convenience.
- Terminal 85 must be connected to the small “+” terminal on the controller on the compressor that is directly above the “F” terminal. The oil cooler fan is connected here also, so a terminal multiplier is added for convenience.
- Terminal 30 must be connected to the positive, red lead of the pump.
- Terminal 87 must be connected to a 12v or 24v positive (+) source. A terminal multiplier is installed on the “+” terminal of the controller for this purpose. An in-line fuse of a rating stipulated by the pump manufacturer must be installed in this lead using appropriately sized butt connectors.
- The negative (black) lead from the pump must be connected to a 12v or 24v negative (-) source. A terminal multiplier is installed on the “-“ terminal of the controller for this purpose.

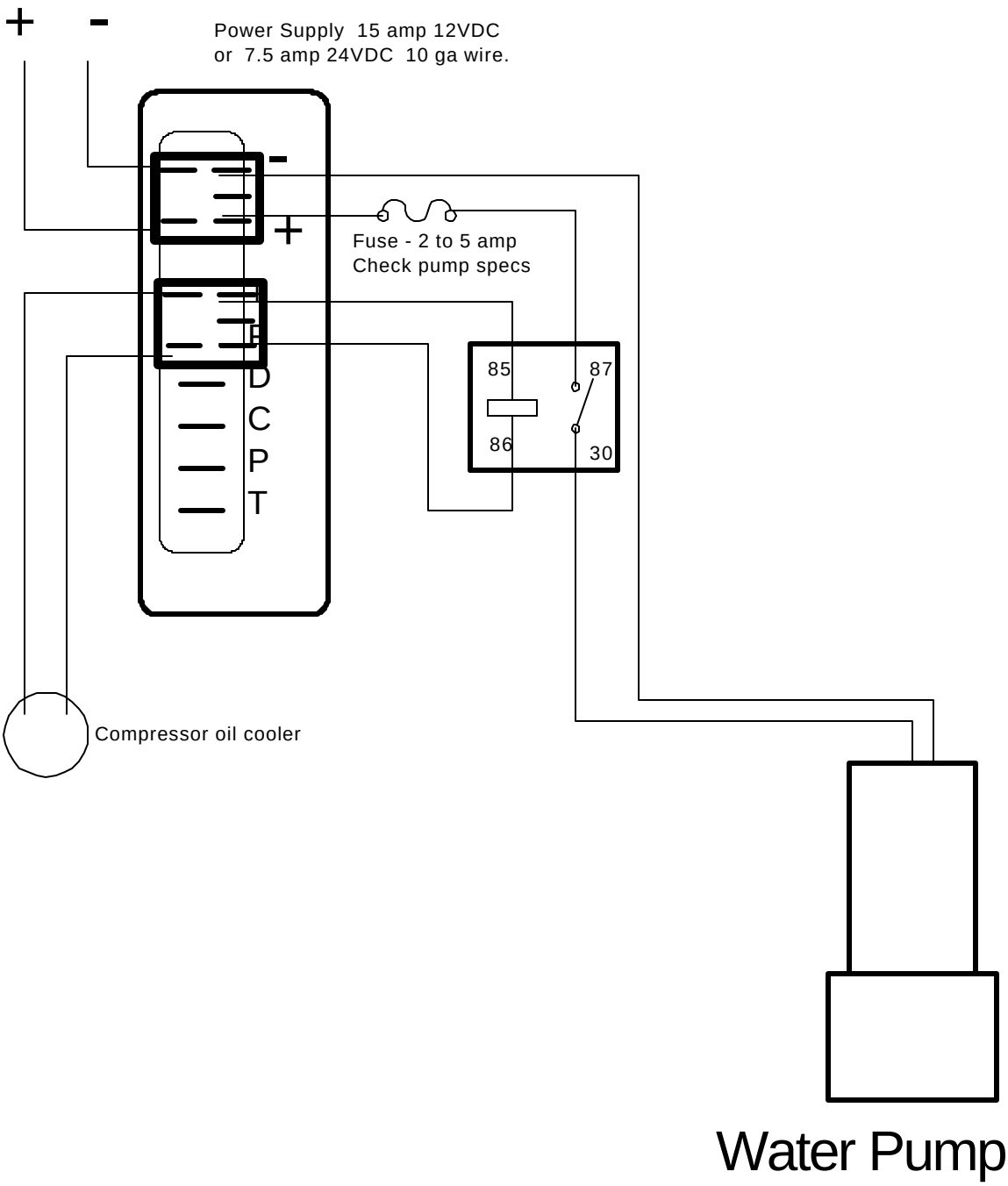
Insulated wire of appropriate gauge should be used for all wiring between relay, controller, and pump. Slip-on crimp connectors of the appropriate size should be used for all connections to the relay and controller.

Thermostat wiring

There will be two wires from the thermostat and these must have slip-on crimp connectors of appropriate size fitted, if not already installed. The two wires may be of different colors, but they are not polarity sensitive and it makes no difference which color goes where.

- One wire from the thermostat must be connected to the spare terminal on the water temperature sensor (“Klixon”) on the condenser tube. The temperature sensor is a small, round object that is held in place on the condenser tube with a mini U-clamp. This device will break the thermostat circuit and stop the system if it senses a temperature over 130°F (55°C), and this would indicate insufficient water flow. The other factory installed wire on the temperature sensor is connected to the upper terminal, marked “C”, on the speed regulation board that is installed on the controller.
- The remaining wire from the thermostat must be connected to the lower terminal on the speed regulation board, marked “T”. Make sure that the voltage selection switch on the speed regulation board is set to the appropriate voltage, and the rotary speed adjustment is set to the desired or recommended speed.

Frigoboat Water Cooled System Pump Wiring Diagram



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