

The Probe Guide

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What does the probe system do?

The TC-1 probe system controls the water level in a CBM well using fixed position stainless steel probes inside a durable, perforated, PVC sheath. It is designed to eliminate all dry starts, give reliable level control and pump cycling. A relay inside the control panel switches the pump on when the water makes contact with the upper probe, and shuts the pump off when the water level drops just below the lower probe. When the water level rises again and touches the upper probe, the cycle begins again.

Simple proven technology

Our TC-1 water level control probe system is based on a proven technology. It has been in use for many years in the oil, food and beverage, and water treatment industries. There are no electronic components down hole that might fail. The relay that controls the system is simple and durable. The probe is made of stainless steel and plastic for a long service life.

Installation

The probe should be installed on the first piece of tubing above the pump. The probe is about 15 feet long. It should be taped to the tubing with durable tape approximately every two feet. The end of the probe should be left open to allow water to drain out, and solids to flush as the water level drops. Leave as many of the holes along the sheath open to allow for easy water flow.

Trouble shooting and testing the probe

The probe can be tested with a regular multimeter or an insulation resistance tester (Megger) when it is disconnected from the control panel.

To check your probe with a multimeter, when the probe is OUT of the well and completely dry, set your meter on Ω ohms and connect one lead to the bare wire and the other lead to the blue wire. Your meter should read OL. Then twist the bare and blue wires together. Connect one lead to the blue and bare wires and the other lead to your red wire. Your meter should read OL. Connect one lead to the bare and blue wires and the other lead to your black wire. Your meter should read OL. Finally, connect one lead to the red wire and the other lead to the black wire, your meter should read OL. There should be no continuity between the wires when the probe is out of the well and dry. If

you do have continuity between the wires, the cable is probably damaged. You may also test the probe and cable assembly in this manner with an insulation tester at 500 VDC.

Use the following chart when the probe is OUT of the well and dry.

<u>Connection</u>	<u>Meter Reading</u>
Blue to Bare	OL
Blue and bare to Black	OL
Blue and bare to Red	OL
Black to Red	OL

To check your probe with a multimeter when the probe is IN of the well and completely submersed in water, set your meter on Ω ohms and connect one lead to the bare and blue wires twisted together and the other lead to the black wire. You should expect to see a reading of about 2 k Ω or more. Then connect one lead to the bare and blue wires and the other lead to the red wire. You should expect to see a reading of 2 k Ω or more. You can also test between the red and black wires. If you have a resistance close to your meter reading between the bare and blue wires and the black wire, your probe is probably completely submersed in water. If the meter reading is very high between the red and black wires, e.g. OL, or several M Ω , the water level is probably somewhere in-between the upper and lower probes (red and black wires). Resistance varies a great deal depending on the water quality in each well. This makes these readings very subjective. If your meter shows continuity, or very little resistance between the wires, your cable may be damaged.

Make sure all your control connections are tight, especially on wiring on the back side of the panel. Poor electrical connections and miswiring are the most common causes of control failure in the gas fields.

Testing the Relay

Testing the relay is dangerous without proper training. Do not attempt to test it unless you are qualified. Open the control vent-box on the back side of our panel. With the probe disconnected from the panel, jumper between the black and red wires on the terminal strip. This should pick up the relay, which would allow the pump to operate. When you take out the jumper the relay should drop out. Then put a jumper between the blue wire and the black wire. Briefly place the jumper between the black and the red wires again. The relay should pick up again. Remove the jumper between the black and the red wires and the relay should stay picked up until the jumper between the black and blue wires is removed.

Electric West Inc.

Electric West is a Wyoming electrical contractor. Our President, Jim West, has 40 years of oil and gas experience. We take pride in safe, high quality work. We are also a U.L. panel shop. We can custom build your control panels, set them in the field, and provide a

turn key electrical installation if you wish. We strive to be flexible, and work quickly to respond to your needs. If you have any questions, feel free to contact us.

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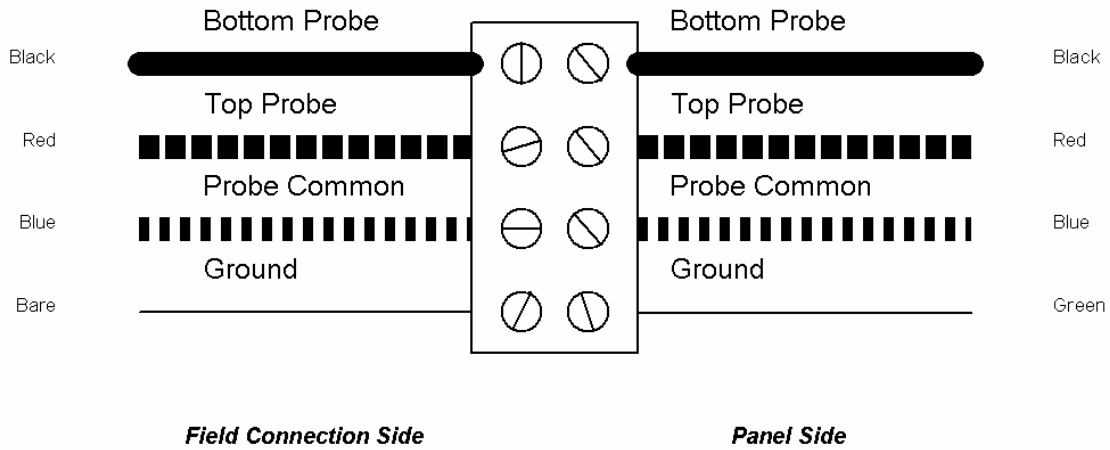
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TC-1 Probe Connections



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