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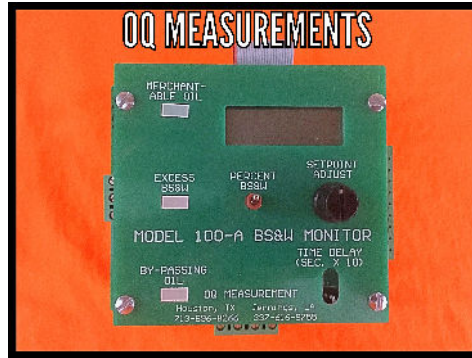
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OQ BS&W Monitor Model 100-A

Introduction

The 100-A S & W Monitor used in conjunction with a Model OQ Detector Card and Model OQ S&W Probe, provides continuous on-line monitoring of percent water in crude oil. The monitoring system measures changes in the product stream capacitance. The dielectric constant (Dk) (a key factor in capacitance measurement) of the product stream changes dramatically as water content varies. The change in capacitance is accurately measured and correlated to percent water by calibration against “shake out” data. The Model 100-A displays the percent water on a digital indicator and indicator status lights continuously display the conditions measured by the system. Alarm relays and a 4-20 mA output can be used to connect the system to other supervisory or control elements.

Features

- Real-Time Display and Retransmission of S&W Which Allows For Quick Response to Upset Conditions for Downstream Control
- Adjustable Delay of Relay Closure Prevents Nuisance Alarms and Shutdowns or Diverts
- Watch Dog Timer on Micro-Controller for Added Security
- Green Flashing LED in Upper Right Hand of Bottom Card Which Shows the Heartbeat of the Monitor to Confirm the Micro-Controller is Operating Properly.

Model 100-A

Specifications

Input Power

115 VAC +/- 15%, 50/60 Hz, 2 watts
24 Volts DC @ 130 mA

S&W Range

0-5%

S&W Alarm Setpoint

0-100% of S&W Range

Input Signal

0-5V DC from OQ Detector Card

Indicators

S&W / Setpoint LCD

Merchantable Oil LED, -Green

Excess S&W LED, -Red

Bypassing Oil LED, -Yellow

Outputs

4-20 mA analog

Relays

SPDT Relay, 12 Amp 250 VAC

1/2 Hp 250 VAC, 10A 120 VAC resistive

1/3 Hp 120 VAC, 10 A 24V DC resistive

Time Delay

0-90 seconds adjustable in 10 second steps.

Off delay approximately 10% of on delay time.

Percent Water Set Point

The Digital Indicator on the Model 100 – A displays percent BS&W. The setpoint (BS&W Limit) can be observed by moving the Percent BS&W switch to the lower or setpoint position. If it is desired to change the setpoint, rotate the setpoint adjust knob until the new limit value is displayed. The switch must be held in the lower position while performing this adjustment. When the switch is released the indicator will display return to the percent of water reading from the detector card.

Time Delay

The delay that occurs between excess BS&W indication and bypassing, relay transfer, is determined by the position of the time delay switch. The time is adjustable from 0-90 seconds in 10 second steps. The off delay, excess BS&W to merchantable oil, is approximately 10 % of the on delay (30 sec. on, 3 sec.off). The output relay is normally energized with merchantable oil and de-energized when in the bypass mode. Unit failure will de-energize the relay and cause the system to bypass.

Analog Output

The analog output is 4-20 milliamperes corresponding to 0-5%, range. The 4-20 mA output function is accomplished by the use of a precision integrated circuit. The 4 mA point may be adjusted slightly with the zero control on the Model 100 –A. The 20 mA point is factory preset. The Model 100-A utilizes a loop switch to determine whether the 4-20 mA loop will be self-powered or powered by a remote supply. In the internal mode the unit will drive 4-20 mA through a maximum loop resistance of 600 ohms. Loop resistance values of >600 ohms are possible with an external power source. In the external mode the current loop may be powered from an external power supply (40 volts max.) through a 3 wire circuit. Maximum loop resistance will be where V_p is the power supply voltage.

$$R_{loop} = \frac{V_p - 13.5}{.02}$$

Note: Under no condition should power be applied to the “+” or “-” 4-20 mA terminals. Circuit damage will occur.