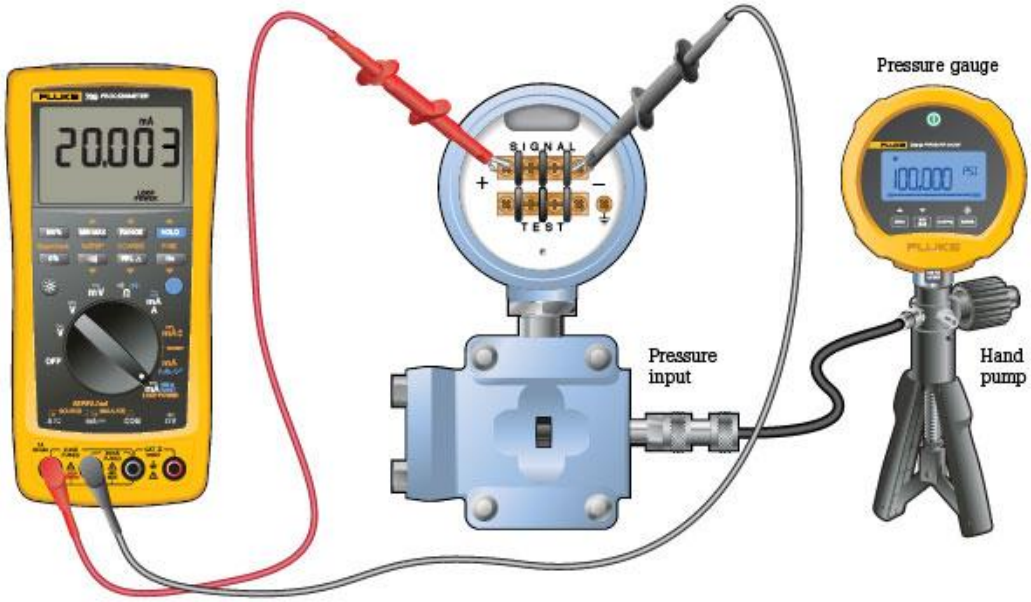

Using loop power for process instrument and 4-20 mA loop testing

Most loop calibrators have a 24V loop power supply for powering and testing process transmitters. This is useful for testing transmitter off line from the circuit they are installed if they need calibration or are suspected of being defective. In this operating mode most loop calibrators provide the 24V loop power and simultaneously measure the 4 to 20 mA signal drawn by the transmitter.

To test a transmitter in this mode, turn on loop power and select mA measure. Disconnect the transmitter from the loop and connect the test leads to the transmitter power supply terminals. Be careful to connect with the correct polarity (black to negative, red to positive).

The mA signal then measured by the loop calibrator drawn by the transmitter from the 24V loop power supply should represent the process signal applied to the input of the transmitter. For example, if connecting a pressure transmitter with a range of 0-100 psi, with the pressure input of the transmitter vented to atmosphere the transmitter should draw 4 mA from the power supply and be indicated on the loop calibrator. If a hand pump is connected to the transmitter and 100 psi is generated the transmitter should draw 20 mA and be indicated on the loop calibrator. By connecting a pressure standard to the transmitter’s input and measuring the current drawn from the transmitter you can test and determine the performance and calibration of the transmitter. For example, if you measure 100 psi on the input of the transmitter and are measuring 19.90 mA the transmitter has a 0.1 mA error. Most loop calibrators read out both the mA value and the

% of range or span. In the previous example, if the transmitter is drawing 19.9 mA with the 100% value applied (100 psi) the loop calibrator would display both the 19.9 mA value and 99.4%. The difference of expected 100% and found 99.4% measured mA value indicates the transmitter has a 0.6% adjustment error.

One other use for the 24V loop power supply is to use it for a power supply substitution test. If the 24V loop power supply in the circuit is suspect remove it from the circuit and connect the loop calibrator in its place (Take proper note of polarity). Turn the loop calibrator to the loop power position. If the loop operates correctly with this power supply substitution test and again operates erratically when reconnected to the power supply originally in the circuit, the power supply is either defective, overloaded or its' wiring or terminal block connections are compromised. Measure the voltage of the power supply with a DMM or loop calibrator. The voltage should be a stable 24V. The actual value can vary a few tenths of a volt and still be operating correctly but it is important that value measured is stable and not vary.