Bench Testing the P55 Pressure Transducer

Introduction:

The Validyne P55 pressure transducer is a DC Power/DC Signal pressure transducer that is calibrated for a 0 to +/-5 Vdc or 4-20 mA signal. This discussion will describe how to power and test a P55 with a 0 to +/-5 Vdc output signal to determine if it is behaving normally.

Equipment Needed:

DC Power Supply – Any DC power source +9 to +55 Vdc capable of supplying 20 mA or more. Almost any kind of DC supply will work.

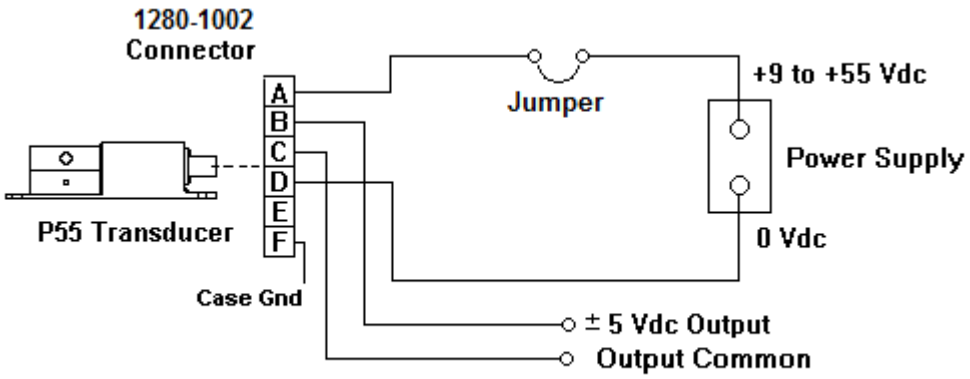
Multi-Meter – Capable of measuring voltages up to 50 Vdc, current to 500 mA, resistances from short to open circuit.

1280-1002 – The standard 6-pin mating connector for the P55.

Wire – to connect to P55 to the power source and signal output terminals of the 1280-1002.

Connections:

Make up a test wiring harness as shown in the diagram below.

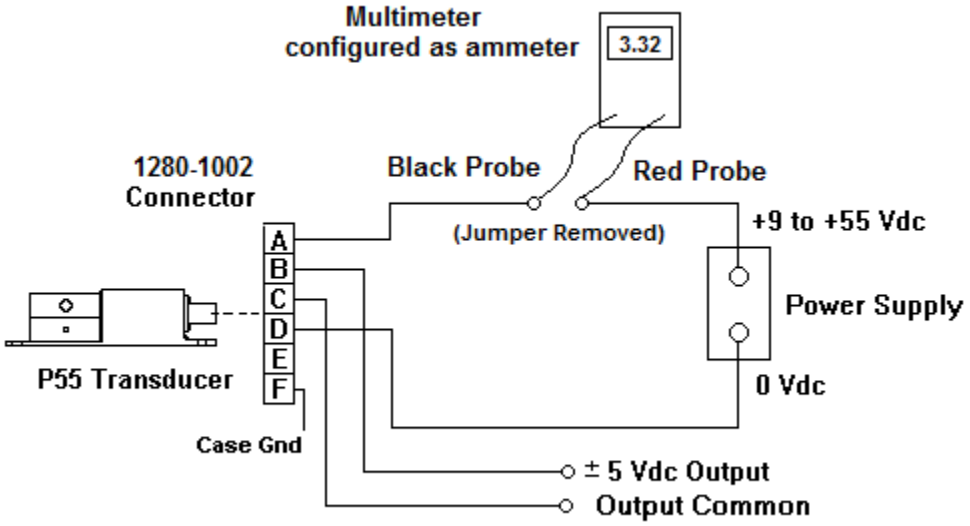


Current Draw Test:

The first test of the P55 is to determine if it is drawing the correct amount of current. This is done by measuring the current flow with the multimeter configured as an ammeter and inserted in series with the +Power connection, as shown below.

The current will flow from the power supply through the multimeter and to the transducer.

The correct current draw for the voltage output P55 is between 3 and 10 mA.



Note: Caution! Be sure to briefly touch the ammeter probe to the power terminal and observe the current reading to be sure there is not a short circuit. A dead short could damage the meter or the power supply.

Results:

Normal current draw is between 3 and 10 mA.

If a P55 is drawing 0 ma (no current) then re-check the wiring and make sure the power supply has been turned on. If the transducer does not draw any current it cannot produce a usable signal and should be returned for repair.

Transducers showing a dead short – very high current draw - cannot be repaired in the field and should also be returned.

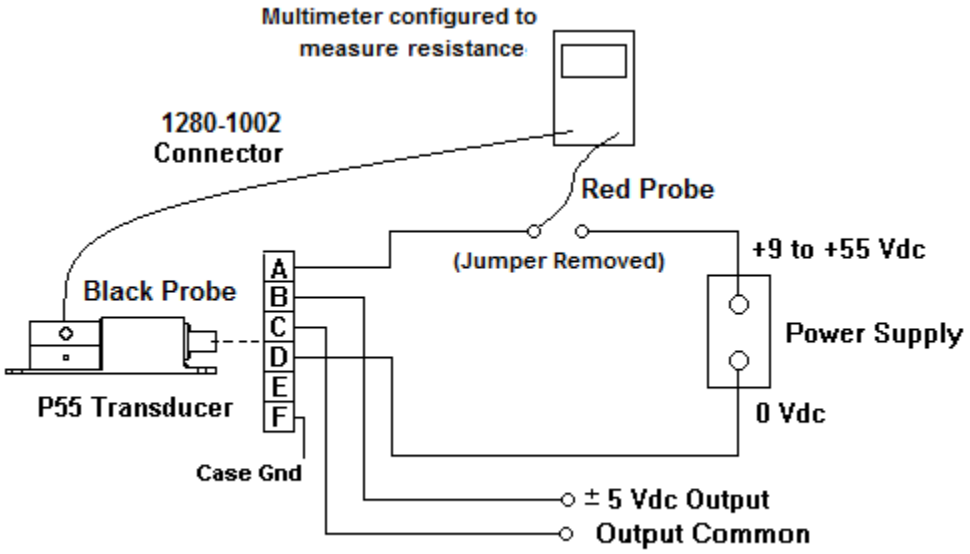
Electronics Isolation Test:

If a P55 transducer is drawing the correct amount of current, the next test is to verify the electrical isolation of the sensor body.

Note: The Power Supply must be OFF – unplug from AC mains.

The isolation is measured with the multimeter in the DC Resistance mode, as shown below.

Note that the Black Probe of the multimeter is touching the metal sensor body. The Red Probe is connected to pin A of the connector.



Results:

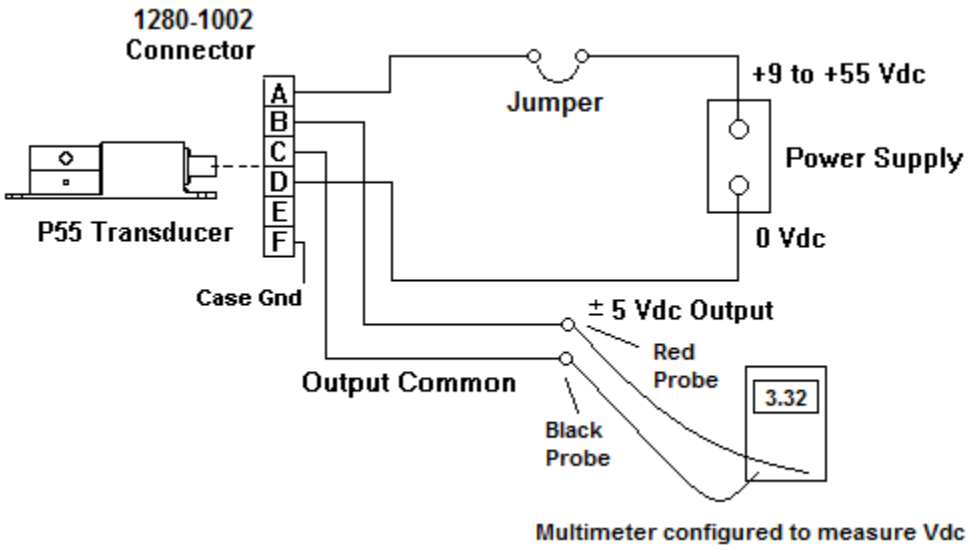
The correct isolation resistance is 100 MegOhm or higher. The actual reading may depend on the quality of your multimeter but any value above 10 MegOhms will provide usable performance. The multimeter may read Open Circuit – and this is an acceptable reading.

Isolation readings below 100 K Ohms can mean that the sensor will exhibit drift or an unstable output signal. This may be caused by corrosion inside the sensor cavity.

If corrosion inside the sensor is advanced it may attack the sensor's internal coil wires and cause the output signal to go off-scale, as determined by the next test.

Output Signal Check:

Connect the transducer to the DC power supply and check the output signal as shown below:



With zero pressure applied to the transducer – both ports open to atmosphere – the output signal should be near 0.000 Vdc.

Turn the **Zero Adjustment** (located near the electrical connector, marked **Z**) and the output signal should swing a few tenths of a volt.

If you have a fairly low range transducer (full scale less than 5 psi) try squeezing to + port with your finger to compress the air slightly inside the positive sensor cavity. If you have a higher range sensor and can obtain a pressure source, apply a mid-scale pressure to the + port of the sensor. The output signal voltage should increase in the positive direction.

Do the same with the - port and the signal should increase in the negative direction.

Results:

A P55 working normally will respond to the Zero Adjustment and to pressures applied to the sensor.

A transducer whose signal moves, but then stops as pressure increases may need cleaning.

An off-scale signal reading, greater than +6 or -6 Vdc, combined with a low isolation reading (see above) could indicate a corroded sensor – disassemble and inspect for corrosion, especially around the coil lids in the center of the sensor body.

A transducer with a steady signal of 0 Vdc cannot be repaired in the field.