



What characteristics or measurements can PT instruments display.

For as long as I can remember there has always been confusion regarding this question.

The answer is relatively simple but not well understood.

Historically digital strain gauge instruments used an A/D¹ to convert the analogue signal from the strain gauge measuring device into the display of a digital value, say between 0 and 65000.

During calibration you set the instrument to show 1000, 15000, to match the level of the characteristic to be measured by the strain gauge circuit.

The decimal point was just a bright dot that you could place anywhere along the bottom so that the displayed value was the correct magnitude. 15.000, 150.00, 15000 were all the same calibration of 15000 but with the decimal point positioned to give more meaning to the displayed value.

The value that you calibrated (e.g. 15000) may not have meant much to an uninformed observer, so a sticker (adhesive label) would usually be placed near the value so you knew the units. The sticker could be any unit of the characteristic that the strain gauge was measuring. Later the displays had pre-printed units and a bright dot could be set by the unit applicable to the measurement. The dot was only an annunciator and not integrally tied to the calibration.

Jump forward a few decades and things have not changed a great deal with most strain gauge digitizers. Some enhanced features have been added but the basics are the same.

You can calibrate the instrument so show a number that represents any characteristic the strain gauge device is set up to measure. It could be force (kg, t, oz, lb, N, kN, tael, carats, etc.), torque (ft-lb, N-m, etc.), acceleration (m/s², g, etc.), flow, volume, pressure, angle.

When an instrument is specified with a maximum capacity of 15000kg or 30000lb, that is with the built in annunciators. The 30000 could in fact represent 30000kN.

The list of units goes on and on but there are considerations in conveying to the viewer what units the measurement is in.

- If the instrument is to be used in an approved situation, the approval will determine what units can be displayed.
- If the instrument has unit switching (lb<->kg, g<->oz) switching may not function correctly in other units.
- If the instrument display is constructed with a limited range of pre-set unit annunciators, one of these may show regardless of the actual units of the displayed value.

The bottom line is that all PT digital instruments can be calibrated to show the measurement of any characteristic sensed by a compatible strain gauge bridge with the understanding that the units of the measurement may need to be displayed to the viewer by some means such as a label.

Examples:

A PT indicator and load cell can be configured to measure force, mass, weight, depth, elevation, pressure, torque, acceleration, displacement, volume and more.

A PT indicator and pressure transducer can be configured to measure pressure, depth, force, elevation, liquid volume, boat speed, flow rate and more.

¹ Analogue to Digital Converter.