Pressure Sensor

Product Manual

For assistance with the operation of this product,

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Pressure

In a pressure-volume (PV) diagram, a pressure sensor plays a crucial role in capturing and representing the pressure characteristics of a gas or fluid within a system throughout a thermodynamic cycle.

It is designed to detect and convert the applied pressure into an electrical signal that can be further analyzed and plotted on the PV diagram.

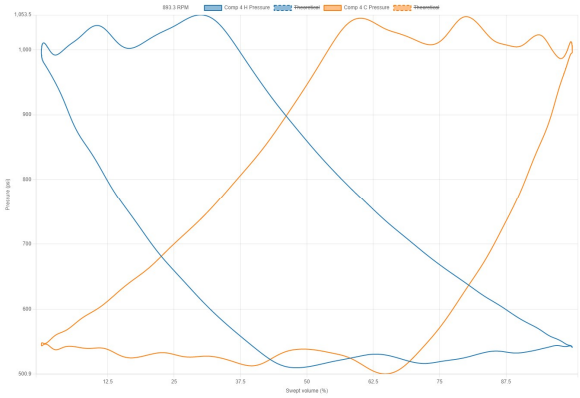
During the thermodynamic cycle, the pressure sensor records the pressure at various key points or intervals during critical events such as compression, expansion, or phase changes.

The pressure readings obtained from the sensor are then plotted on the PV diagram. The PV diagram is a graphical representation with pressure depicted on the vertical axis and volume on the horizontal axis. By plotting the pressure values at different volumes, a curve or path is formed, illustrating the system's pressure variations throughout the cycle.

Analyzing the PV diagram allows for a comprehensive understanding of the system's performance. It provides insights into processes such as compression work, expansion work, heat transfer, and the overall efficiency of the system. Additionally, the PV diagram aids in evaluating the system's energy exchange, including work done on or by the system and the heat absorbed or released.

The Resonance kit has Two types of sensors. High-temperature pressure readings are found in the combustion chamber of the engines. To have a more precise reading and long-lasting sensor a cooled pressure sensor was created.

The standard Pressure sensor is use for typical pressure readings in compressors, where the temperature reaches through the thermodynamic cycle does not affect either the quality of the data or the integrity of it.



Example. P-V diagram

A pressure sensor measures the force exerted by gas and converts it into an electrical signal.

At the core of a piezoresistive pressure sensor is a pressure-sensitive diaphragm. When pressure is applied to the sensor, the diaphragm deforms in response to the force exerted by the gas.

The diaphragm is typically equipped with piezoresistive elements, which are resistors that change their resistance when subjected to mechanical stress.

When pressure is applied and the diaphragm deforms, the resistance of the piezoresistive elements changes, and an electrical signal is generated. To measure this change, the piezoresistive elements are connected in a Wheatstone bridge circuit, resulting in a small differential voltage output. The magnitude of this output voltage is proportional to the applied pressure.

The output voltage is then sent to the output circuitry of the pressure sensor. This circuitry amplifies and processes the voltage signal to make it suitable for measurement or further use. The output can be in the form of an analog voltage or current signal.

Cooled Pressure Sensor

Standard Pressure Sensor 90° Connector

How to Section

This section will give information about how to use the Resonance Systems with the Pressure sensor.

Components needed

QTY	Description	Part Number
1	Pressure Sensor	CMP-PS-xxxx
1	Cool Pressure Sensor	RES-PS-xxxx
1	Cable	PS-CBL-6
1	Lenz	LNZ

Hands-on

Follow the next steps:

1. Connect the Amphenol connector by turning it to the 6-pin connector of the Pressure Sensor.

Connecting the Pressure Sensor to the cable

2. Connect the other end cable to Lenz. The fisher connector connects to either channel A or B of the Lenz. Check the channel that has been set up for Pressure readings in Rmonix.

Connecting the Pressure Sensor to the Lenz.

3. Turn on the Lenz.

Note
Be sure to add a calibration step in the Rmonix route before readings.

4. Connect the Pressure sensor to the Kiene Valve. Connect it by screwing it to the Kiene valve using the wrench 1¼" in size.

Connecting the Pressure Sensor to the Kiene Valve

5. Open the Kiene valve using the ⅝" wrench.

Tips
Before connecting the pressure sensor, vent the Kiene valve a little. Open it by 90 degrees only, then close it and connect the Pressure sensor.

When using the 1¼" wrench do not fasten too much, just enough to make sure no leaks.

Click the following link for a video showing the field use.