

## Virtual Refrigerant Charge Level Gauge

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**Categories:**

- Mechanical Engineering

**Keywords:**

- Mechanical Engineering
- Refrigeration
- Sensors

Current systems for monitoring refrigerant charge while a system is in operation can be costly and difficult to use. Researchers at Purdue University have developed a device that determines the level of refrigerant charge using low-cost, non-invasive measurements obtained while the system is operating.

This technology could be included in original equipment controls as part of a permanently installed control or monitoring system to indicate charge level and/or to automatically detect and diagnose low or high levels of refrigerant charge. It could be used as a standalone tool by technicians on their handheld diagnostic device to determine existing charge during the process of adjusting refrigerant charge. Vapor compression cycle equipment could benefit from implementation of this technology, including air conditioners, heat pumps, chillers, refrigerators, and coolers. This technology has been theoretically proven and experimentally validated to be robust against variations in operating conditions and other system faults. This technology uses low cost sensors that are easily retrofitted and noninvasive; therefore, it does not increase the risk of refrigerant leakage while being significantly less expensive and faster to implement and easier to use on multiple types of systems compared to current testing methods.

**Advantages:**

- System can remain on during measurement
- Low cost and easily retrofitted
- Noninvasive; it does not cause leaks

**Potential Applications:**

- Refrigerator manufacturers
- Sensor manufacturers
- Consumer add-on

**People:**

- Braun, James Edward (Project leader)

- Li, Haorong

**Intellectual Property:**

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**Type:** Utility Patent

**Country of Filing:** United States

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