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In-situ Oil Circulation Ratio Measurement using Separation Method in Systems Running Vapor Compression Cycle

Real-time in situ OCR measurement keeps HVAC systems efficient and compliant with ASHRAE standards without disturbing oil flow.

Researchers at Purdue University have developed non-invasive in situ to measure oil circulation ratio (OCR) in real-time for HVAC systems. There remains an unmet need to mitigate oil retention in vapor compression systems, as this can cause inefficiency and even shorten the lifetime of HVAC equipment, especially in lieu of new variable speed and tandem compressor technologies which implement repeated cycles. In addition, up-and-coming refrigerant-oil combinations involve circulation testing techniques that often inadvertently disturb oil flow. The cutting-edge approach for OCR quantification created by Purdue researchers allows otherwise immiscible refrigerant pairs to be separated and analyzed by a sensor in the suction line of HVAC systems. This accurate, autonomous method has been verified using the latest The American Society of Heating, Refrigerating, and Air-Conditioning Engineers standards, maintaining OCR between 0.54% to 0.68% in steady state conditions.

Advantages:

-Accurate

-Non-invasive

-Meets standards

Potential Applications:

-HVAC

-Refrigeration

-Building systems

Technology ID

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Category

Buildings, Infrastructure, & Construction/HVAC & Building Energy Efficiency

Buildings, Infrastructure, & Construction/Demand-Responsive Heating & Cooling Systems

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How has this technolog been validated? Testing with ASHRAE standards

TRL: 2

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