RheoVac®

Condenser Monitor

An innovative approach to condenser monitoring and performance improvement

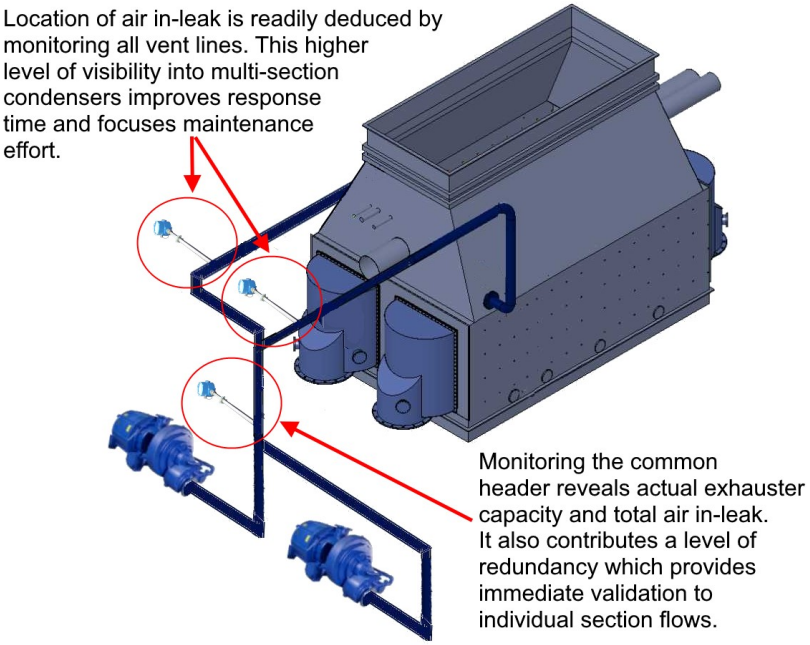
The *RheoVac* monitor is the only instrument capable of analyzing the complex and dynamic nature of the mixture of non-condensable gases and water vapor in the condenser vent line.

This instrument is a true condenser monitor and provides continuous information on the condenser and air removal system, allowing immediate and positive differentiation between condenser air in-leak and adequacy of the exhauster capacity, and identifying some condenser configuration deficiencies.

By measuring air in-leakage flow between the condenser and the exhauster(s), a true reading of condenser air in-leakage is made. A measurement made at the exhauster discharge is often inaccurate as it includes air in-leakage from exhauster seals and vent line valves. Exhauster outlet measurements generally require proper seating of a manually operated diverter valve, which can affect the reading.

Monitoring each condenser section vent line in addition to the common header provides an understanding of the interdependence of the air removal sections. This also helps to identify leak locations as described in the graphic in upper right of this page.

The *RheoVac* Monitor is a valuable tool for decision makers, providing accurate, real time data for more precise identification of air removal related causes of condenser problems. It reduces the man-hours spent in physical inspections and diagnostic analysis, permits more orderly maintenance scheduling, assists operations regarding venting equipment, and lowers the risk of untimely outages.



Features:

- Provides direct reading of condenser air in-leak
- Measures actual exhauster capacity
- Quantifies excess back pressure
- On-line insertion through leak-tight ball valve assembly
- On-board sensor diagnostics
- Real time data is stored locally and can be routed to DCS

Benefits:

Supports efforts to:

- Locate air in-leak
- Reduce heat rate
- Recapture lost load
- Increase availability
- Detect tube fouling
- Lower fuel costs
- Minimize chemical costs
- Decrease Corrosion

Output:

Local display, Ethernet, RS-422/232, OPC, Modbus, and 4/20mA (optional)

Displays air in-leakage, water vapor to air mass ratio, total mass flow, temperature, pressure, relative saturation, and actual volumetric flow rate.

All *Rheotherm*® and *RheoVac* instruments are manufactured under an ISO-9001:2015 Certified Quality Assurance program

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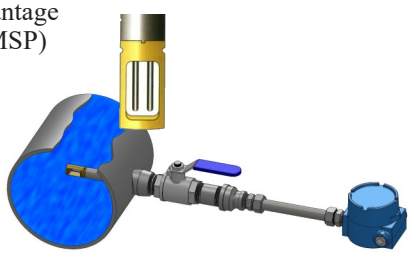
Unique sensing probe

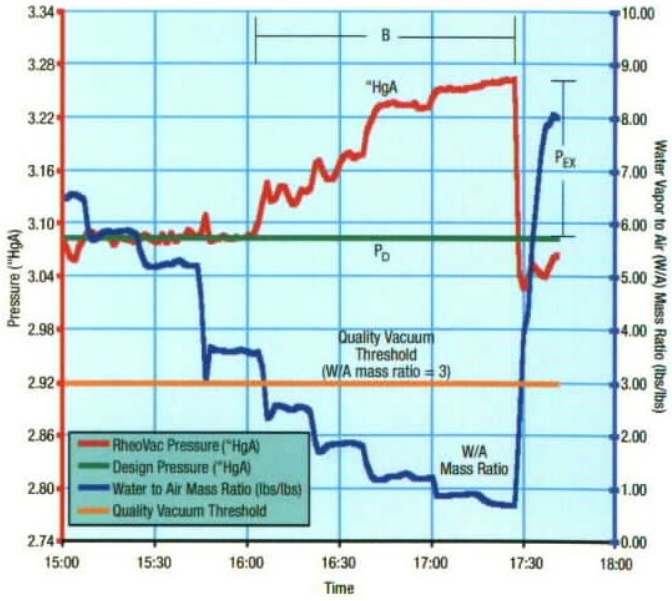
The *RheoVac* Monitor takes advantage of a unique multi-sensor probe (MSP) to reduce troubleshooting time and eliminate guesswork in the plant. The MSP incorporates an assembly of four primary sensors that measure flow, temperature, pressure, and relative saturation. Only *RheoVac* instruments utilize a relative saturation sensor to directly measure water vapor content within the fluid



The associated processor provides users with up to 10 performance parameters to monitor condenser efficiency. The information enables plant personnel to identify leaks, and take corrective action.

New control parameter

RheoVac technology is the first to assign a direct measurement of vacuum quality: **water vapor to air mass ratio**. This parameter provides an early warning of the onset of excess back pressure caused by air in-leakage. It precisely identifies the point at which a standby exhauster is required or existing leaks need to be repaired.



Water Vapor to Air Mass Ratio vs. Pressure

Water vapor to air mass ratio (W/A) and pressure ("HgA) are plotted versus time for one pump in service. P_D is the condenser design pressure for the operating conditions. P_{EX} is the range of excess back pressure. A second exhauster would have eliminated P_{EX} for the time period B.

Specifications

Accuracy:
±5% of total mass flow
Repeatability:
±1.5% of reading
Line Size:
3" through 18"
Probe Connection:
1 1/2" hot tap assembly
Wetted Surface:
316 SS
Engineered plastic
Temperature:
Probe Tip:
Operating: 40° to 160°F
Maximum: 210°F
(Higher temperature model optional)
Main and Probe Electronics:
Operating: 40° to 120°F
Maximum: 120°F
Storage Temperature:
–20° to 120°F
Operating Pressure:
0.5 -10"HgA
Input Power:
100-250 Vac, 50-60 Hz
(UPS recommended)
Signal Outputs/Data Access:
Ethernet
RS232/422
Modbus
Optional: Eight 4/20 mA signals per probe

Local Display:
Backlit LCD, selectable between metric and English units

For assistance with measuring condenser performance or any flow application, contact a Bionetics application engineer. Call 800-RheoVac (743-6822).

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