

Thermal conductivity measurement with "free floating" molecule detector

Heinz Plöchinger

Thyracont Vacuum Instruments GmbH

Max-Emanuel-Straße 10, 94036 Passau, Germany

ABSTRACT

“Zero-pressure” elimination with Pirani principle for vacuum measurement and increase of the measurement range limit of thermal gas-sensors and flow sensors

Measurement of pressure in the medium vacuum range has been done via thermal conductivity. The literature on the Pirani principle has defined a lower range limit - the so-called “zero pressure” until now [1]. The minimum power needed to hold a sensor up to operating temperature exceeds the useful signal, due to the conductivity of the sensor mounting and the resulting heat loss through the suspension.

The author was able to eliminate the “zero pressure”, thereby expanding the measurement range of Pirani sensors significantly downwards.

Measurement results confirmed an extension of the measurement range of two decades downwards with the coiled Pirani.

Also with other sensors that use thermal conductivity and heat - entrainment effects, e.g. gas sensors and sensors for flow measurement , the new principle can be applied and thus lower the lower range limit.

References

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