

Pulsed Pirani Vacuum Gauge



Objectives

- reliability and long-term stability
- enhanced performance
- cost-effectiveness

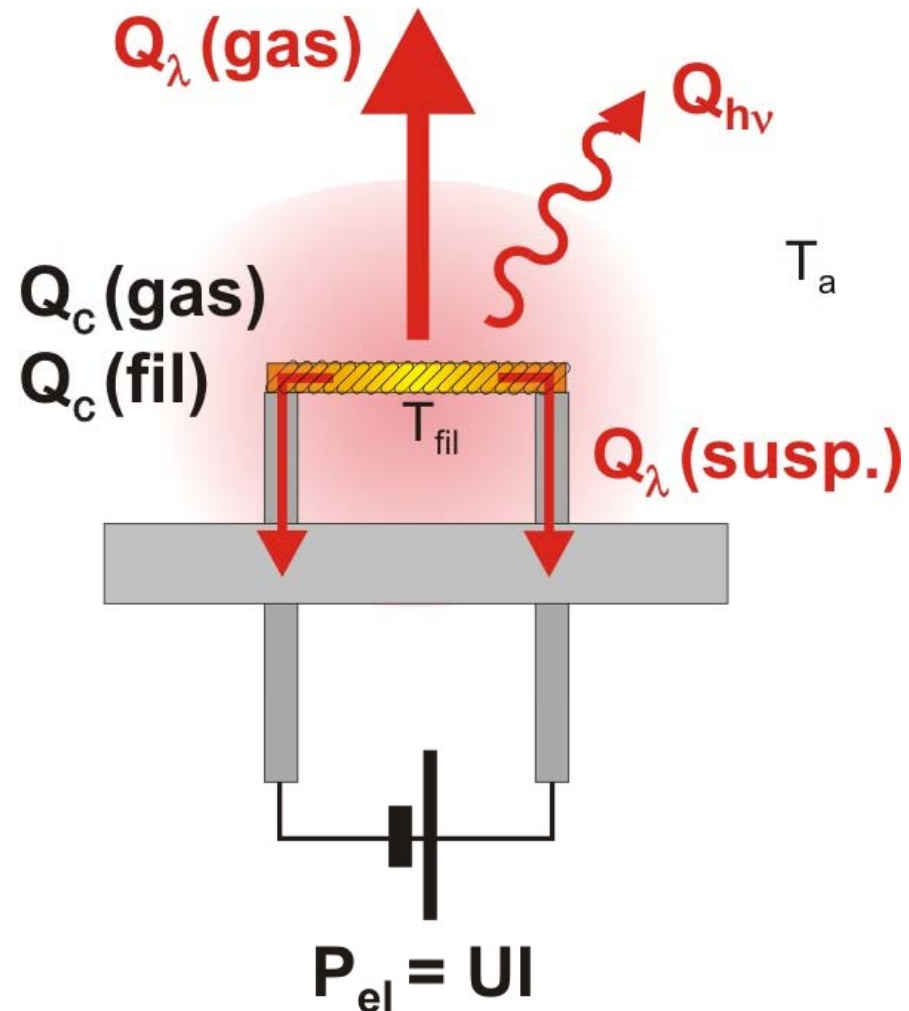
The Sensor

- approved downsized Pirani
- robust elastic helix filament
- protected against condensate by a stainless steel shield



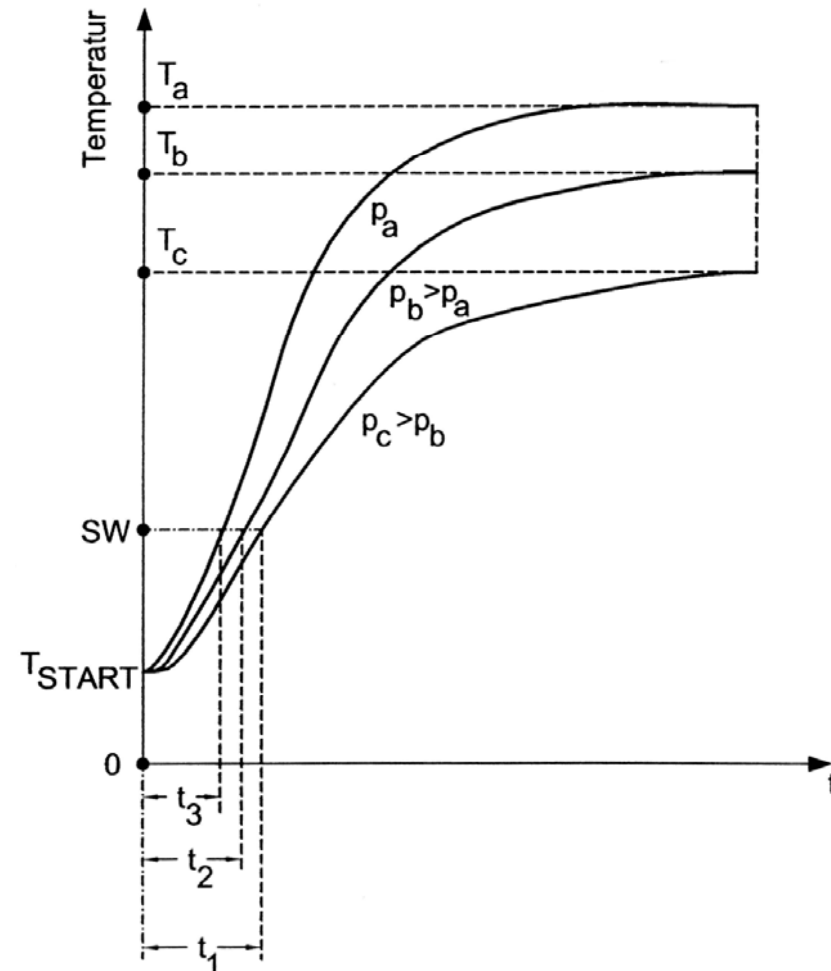
Principle – Energy Balance

- heat conduction by gas molecules
- offset effects
- heat capacity



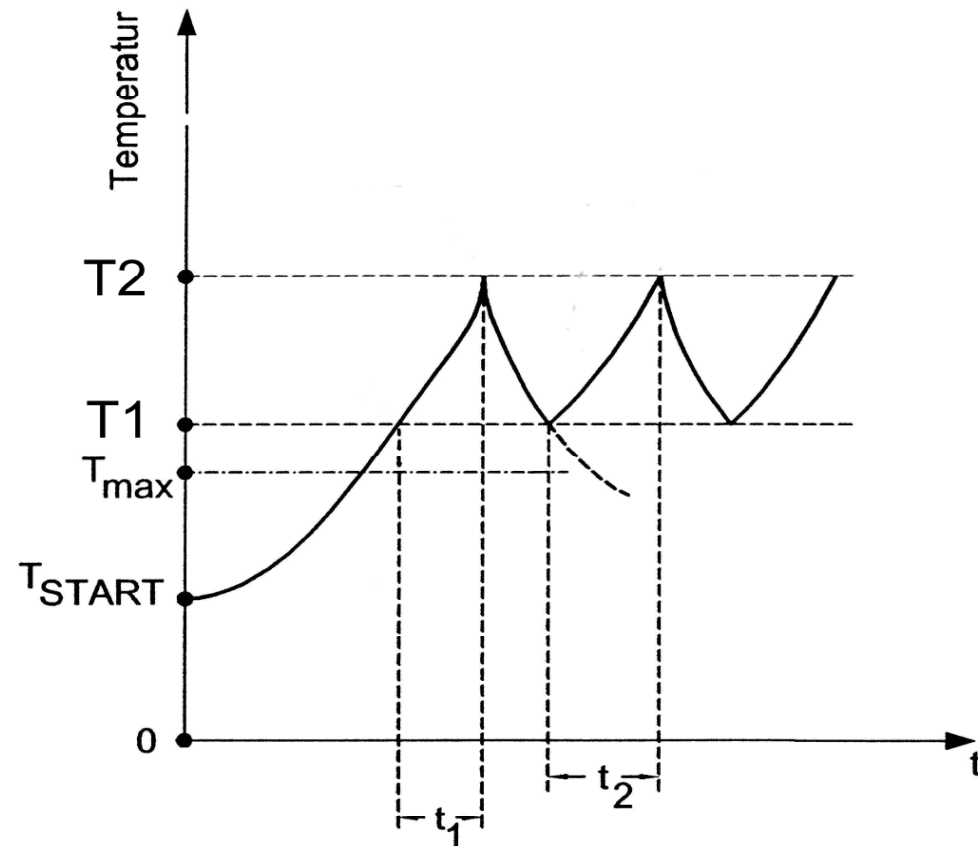
Principle - Starting Characteristics

- constant heating power
- increase of filament temperature
- $p_a > p_b > p_c$

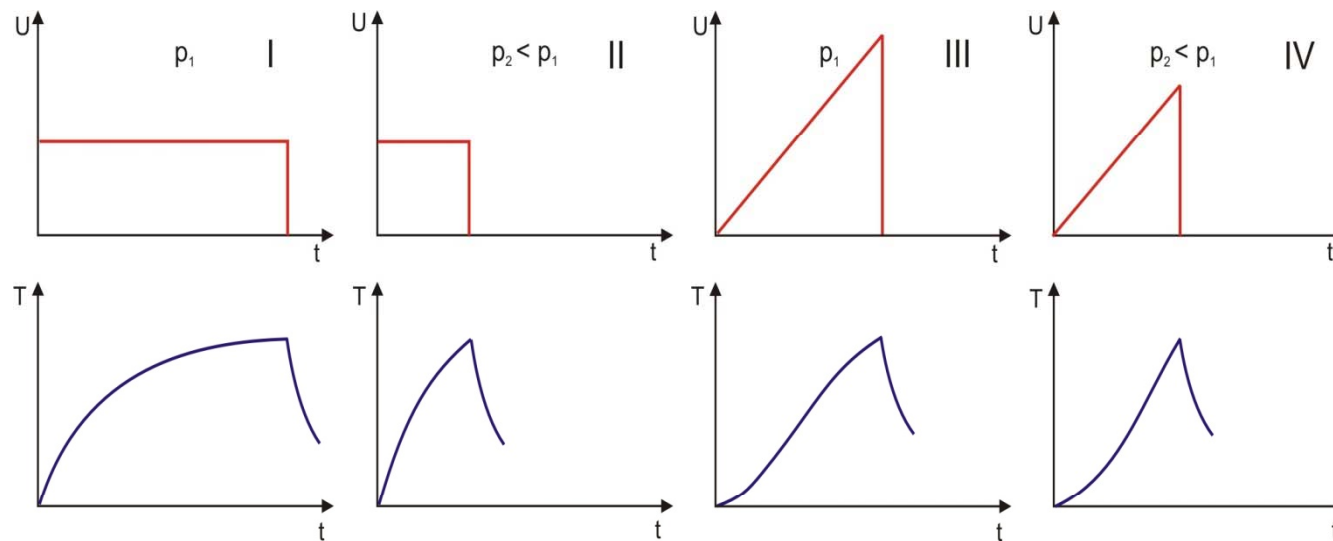


Principle – Cyclic Operation

- two-threshold-model
- well-defined starting conditions
- TDC (time-to-digital conversion)



Principle – Heating Ramp

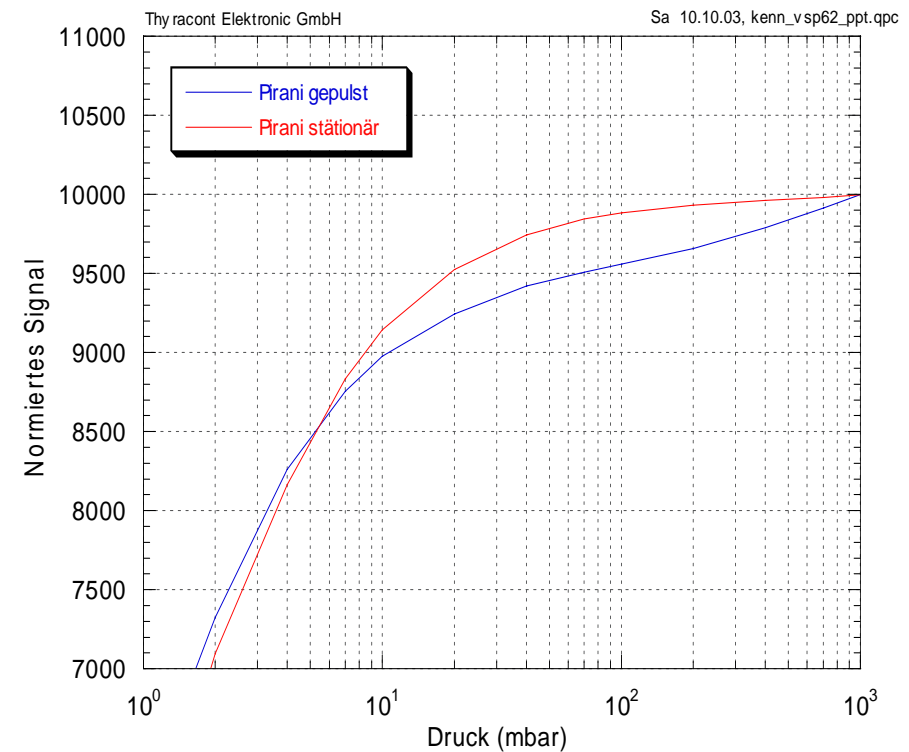


- high pressure, long puls duration \leftrightarrow high sampling rate
- low pressure, short puls duration \leftrightarrow signal resolution

Advantages in Performance

- low temperature: 80°C
- high signal resolution
- extended range:
 1×10^{-4} mbar
- extremely low power
consumption: 0.25 W

Const. Temp. vs. Pulsed Mode



Microcontroller Comfort

- time-to-digital conversion offers favorable cost
- exact signal-to-pressure calculation
- precise logarithmic output
1.5 – 8.5 V
- adjustment by the push of a button



Patented Pulsed Pirani - VSP62 *Smartline*

- successful application in freeze dryers
- remarkable durability
- excellent repeatability
- long-term stability
- compact assembly



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