PFEIFFER VACUUM

Application note CCT, CMR, CCR, CLR

Capacitance vacuum gauges

Capacitance vacuum gauges are very precise sensors. In order to achieve the specified technical data, some application recommendations need to be considered.

Behavior of the zero point after venting to atmosphere

After venting the capacitive vacuum gauge to atmosphere (or values greater than full scale) regeneration of the measuring membrane under vacuum is necessary. Only after a regeneration time under stable conditions the specified accuracy is reached.

The regeneration time depends on …
- the time under higher pressure
- the measuring range (the smaller the longer)
- the sensor temperature (the higher the longer)

For precision measurements the sensor must be in stable and balanced operating condition for > 2 hours.

Zero point adjustment (offset adjustment)

The membrane and thus the measuring result is permanently affected by external influences. Therefore a zero point adjustment is necessary in regular intervals (recommendation every 6 months or if the zero point deviation is > 15 mV).

The zero point adjustment must be done at a vacuum that is better than 0.005 % of the full scale range (0.5 mV). The adjustment must be carried out in the mounting position.

Accuracy of the measuring result

The capacitive vacuum gauges measure the pressure regardless of the gas type. The measuring accuracy of the capacitive gauge depends on many factors. Therefore the technical specification must be observed.

Changes of the installation orientation, vibrations, ground potentials, ground loops, ambient temperature fluctuations, contamination and process chemistry can lead to a measuring error.

For low pressure thermal transpiration must be considered. For precision measurements stable operating conditions and differential signal measurement and a previous zero point adjustment are necessary.

The measuring range of the capacitive vacuum gauges usually goes over four decades. In the third, but especially in the fourth measuring decade, the measuring accuracy is reduced for technical reasons. For control applications the control signal should be in the first 2.5 decades (50 mV to 10 V). Below that noise and ground potentials lead to large measuring errors.

If a wide measuring range is to be measured with a sufficiently high accuracy, the use of several gauges with different measuring ranges is necessary.

Are you looking for a perfect vacuum solution? Please contact us:

Pfeiffer Vacuum GmbH
Germany
T +49 6441 802-0

www.pfeiffer-vacuum.com