L-Probe EM 2020

Construction and Function:

The ceramic part of the Lambda-Probe (Solid electrolytes) has the design of a one-side-closed pipe. The surface, inside and outside, of the probe-ceramic is covered with a micro porous platinum layer (electrode). The catalyzing effect of the platinum influences the characteristic of the probe.

On the gas-measuring-side of the probe, porous ceramic is over the platinum layer. This protection layer prevents the erosive influence residue in the measuring gas and on the catalyzing effect from the platinum layer. The probe receives therefore a high longtime stability.
The ceramic heating element heats up the active probe ceramic (ZrO_2) inside, independent of the process temperature.

The ceramic heating element possess PTC-characteristic, and serve to rapid heating and mark off the performance consumption.
The heating elements connections are ease from the probe signal voltage.

Main applications:
- **Industrial process**
- **Heat treatment unit**
- **Gas analysis**
- **Environmental engineering**

Technical Data:

Sensor element:
Zirconium dioxide pipe

Fitting thread:
M 18

Measuring range:
100 $\%O_2$ ... 10^{-26} %O2

Reaction time for 220°C gas:
≤ 2s for rising from 25 mV to 44 mV

Measuring gas temperature:
≤ 200 °C

Measuring gas flow:
approx... 40 l/h

Connection (1m lead, can be also 2,3m):
Heating voltage: plug
Probe signal: socket

Necessary heating voltage:

12 V … 14 V, for continuous work
ca. 1,2 A (Power supply family NTV44)
Power 18 W for 12 V heating voltage
Insulation resistance between sensor and heater terminal > 30 MΩ

Climate:
Storage: -40...+100 °C

Operation: 0...+100 °C
5...95% relative humidity, noncondensing

measure – control – automate - measure – control – automate - measure – control – automate –.measure – control

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Operating temperature range:
Hexagon on sensor housing ≤ 500°C,
Cable lead through ≤ 200°C,
Connection cable ≤ 150°C,
Connection plug ≤ 120°C,
Permissible continuous temperature = 600°C.

Vibration level (in the hexagon):
Stochastic vibration ≤ 800 m/s^2
Sinusoidal vibration amplitude ≤ 0.3mm
Sinusoidal vibration acceleration ≤ 300m/s^2

Probe mV reproducibility and sensitivity:
At voltage 25 mV, reproducibility is ±0.6 mV

Sensitivity at 25 mV is $\frac{\Delta U_s}{\Delta \lambda} = \frac{0.65\,mV}{0.01}$

Influence of rising temperature on the sensor from 130°C to 230°C with flow velocity ≤ 0.7 m/s and voltage probe 25mV:
Maximum change in voltage is ≤ ± 0.5 mV

Influence of change in heating voltage ±10% of 12V supply and gas temperature of the 220°C:
For probe voltage 25 mV, probe voltage maximum difference is ≤ ± 0.5 mV.

Sensor aging in burner gas after 1000h and measuring temperature 220°C:
For probe voltage of 25 mV, probe voltage maximum difference is ≤ ± 0.6 mV.

Speeding up aging for a 500h work and temperature of 400°C with probe voltage of 30 mV:
Maximum probe voltage difference is ≤ ± 1.8 mV.

Service life at T_{GAS} < 300°C:
Guide value > 10.000 h

Mounting
Any position is permissible. Not protected against immersion. If probe is directly subjected to splashing or dirt, suitable protective measures must be provided.
Mounting in exhaust pipes at a location with representative exhaust gas composition include complying with the specified temperature limits. Sensor must be covered when the burner system is treated with paint, oil or something different. Sometimes it is needed to flashing L probe for a security measurement.
Tightening torque is in range 50 … 60 Nm, material properties and strength of mating thread must be selected accordingly.