

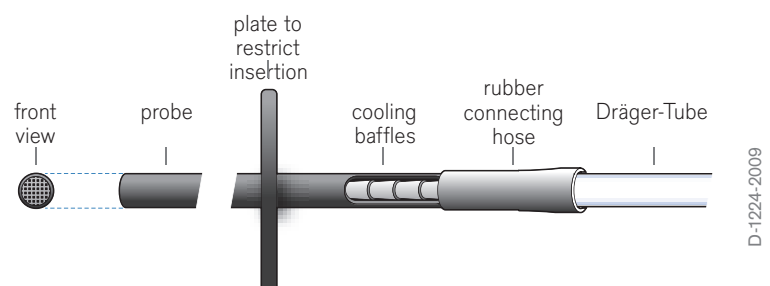
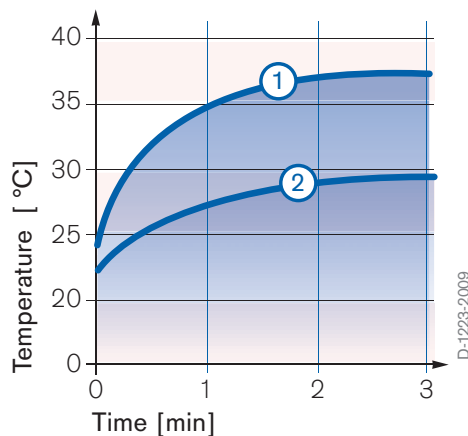
2.6 Hot Air Probe

The hot air probe was developed for the measurement of hot gases. This probe is required when the temperature limit (usually up to 40 °C / 104 °F) given in the operating instruction sheet is exceeded.

At a higher temperature the volume of air drawn with the Dräger-Tube pump changes. Normally, the volume is 100 mL per pump stroke at 20 °C. The temperature dependence of the volume can be explained with Gay-Lussac's law.

$$V_t = \frac{V_0}{T_0} T$$

The hot air probe is designed to cool down hot gases so they can be measured directly with the Dräger-Tube system. If it is ensured that the probe does not remain in the gas flow for more than half a minute, even gases at a temperature of e. g. 400 °C are cooled to below 50 °C. The dead air space of the probe is so small that it can be ignored while measuring.



Cooling effect of the hot air probe

gas temperature: 650 °C

ambient temperature: 20 °C

In 3 minutes 1 L of gas was drawn
and the temperature in the tube rose
according to the above curves

(1) with one hot air probe

(2) with two hot air probes

Sketch of the hot air probe