

Technical Note

1.Principal

Fig. 1 shows a structure of sensing element. The Zirconia disk has oxygen ion conductivity at high temperature. A pair of electrodes is provided for the disk and sensing voltage is applied to them. Oxygen gas is converted to ions at the electrode (Cathode), moving to the other electrode (Anode), then the ions are inverted to oxygen gas once again. The correlation between applied voltage and output current is shown in Fig. 2a. When the sensing voltage is fixed, correlation between oxygen purity and output current is shown in Fig. 2b.

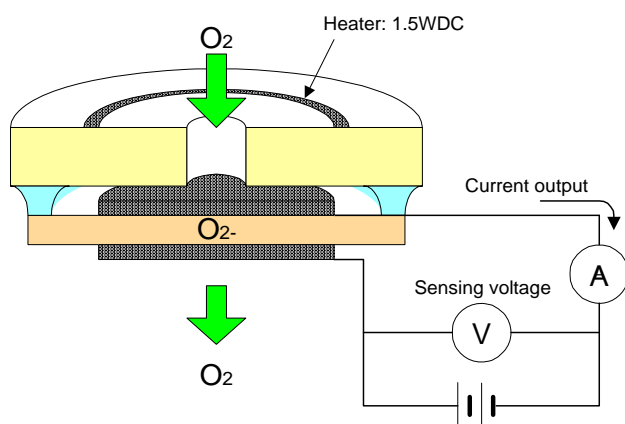


Fig.1 Cross section of sensing element

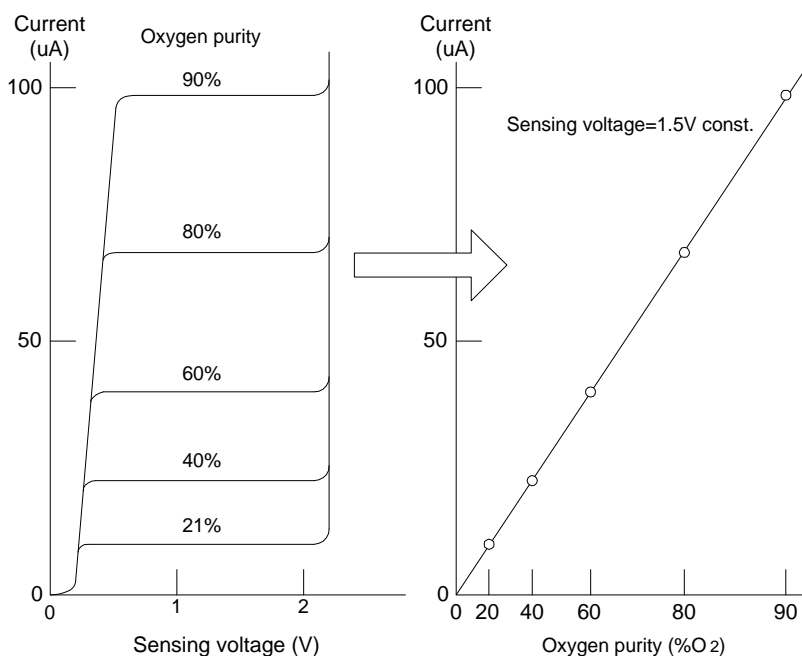


Fig. 2a Sensing voltage vs. output current

Fig. 2b Oxygen purity vs output current

2. Useful information

a) Gas flow rate

Applicable flow rate is 100cc/min ~ 5 liter/min.

b) Operation temperature

Sensor output is stable at $-10 \sim +60$ degC. See appendix for the detail.

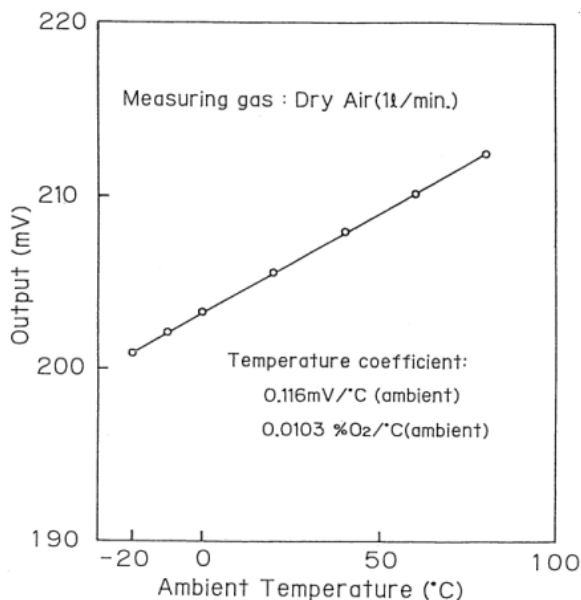
c) Operation pressure

Applicable pressure range is -40 kPa ~ $+500$ kPa gauge. Pressure (or flow rate) must be stabilized because the sensor's output is sensitive to sudden pressure changes, however, the output quickly recovers and becomes stable when the pressure is stable. Slow pressure drift, like atmospheric pressure change, does not affect to sensor output. See appendix for the detail.

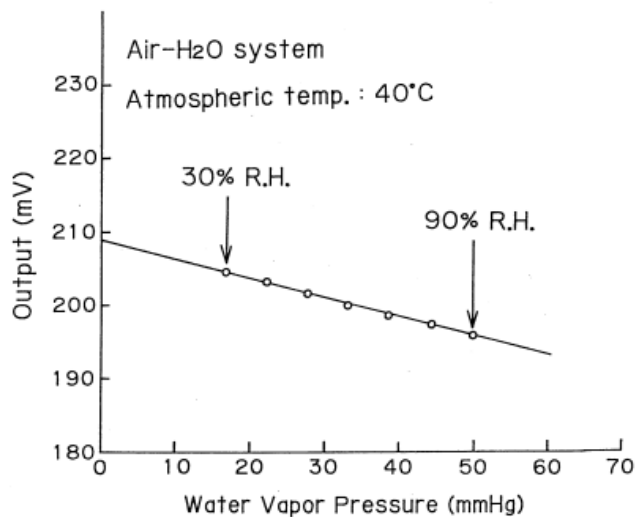
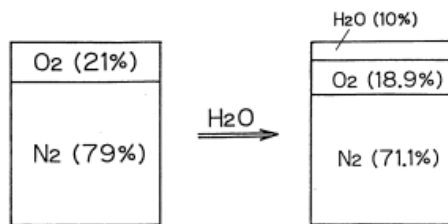
d) Sampling gas

Fujikura oxygen module/monitor is calibrated by O₂/N₂ mixture gas. If any other gases are contained in sampling gas in the field application, the calibrated accuracy may not be guaranteed. See appendix for the detail.

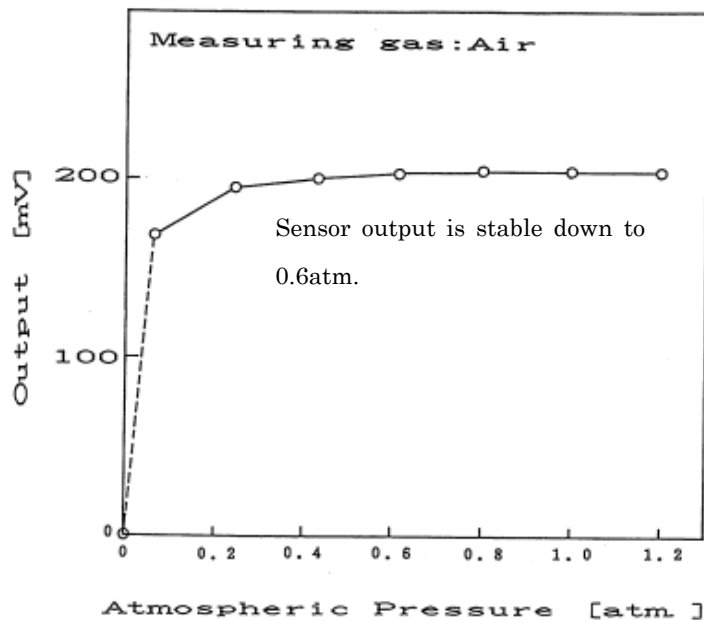
- Appendix -



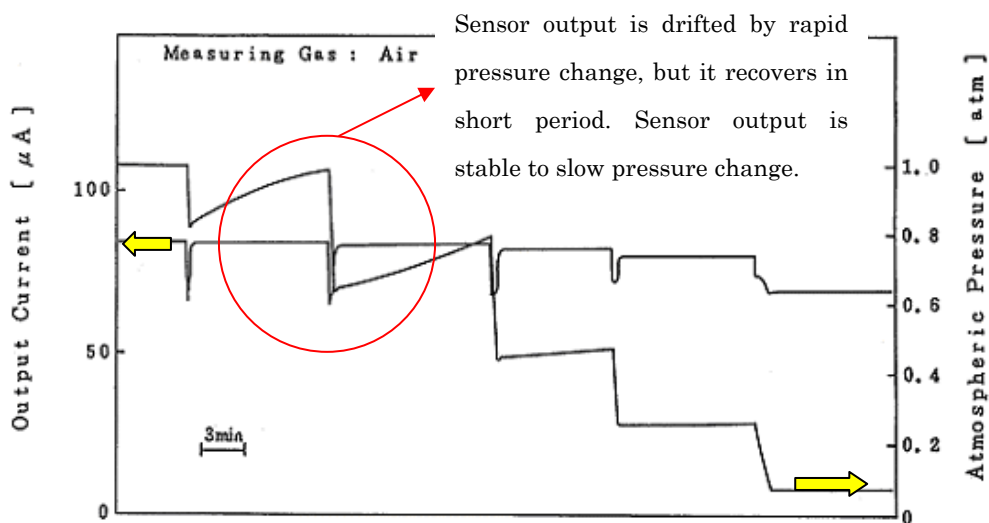
Influence of temperature on the output of a module



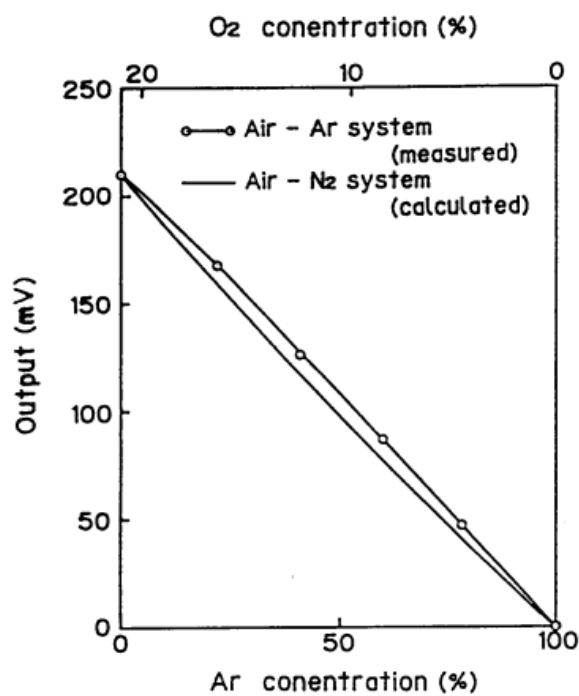
Influence of humidity on the output of a module



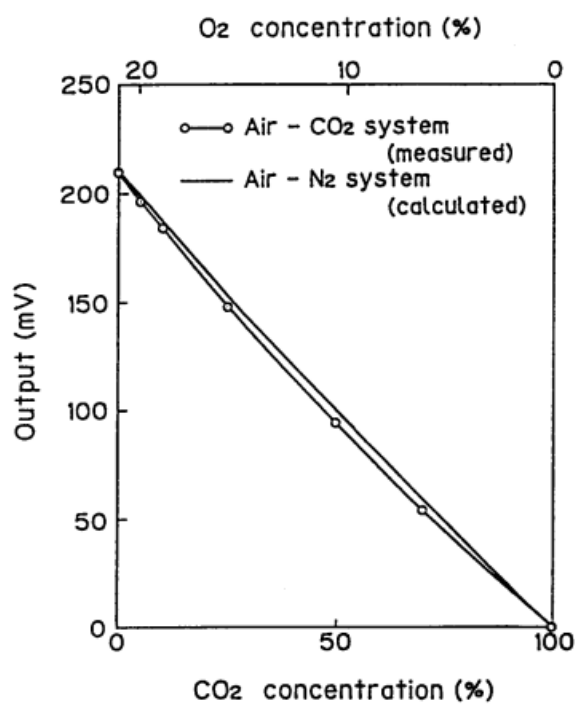
Pressure drift (Static) in free air



Pressure drift (Dynamic) in free air



Influence of Ar on the output of a module



Influence of CO₂ on the output of a module

1st October , 2011