

## Pump Life Expectancy

Question: "How long will the CM-15 reference air pump last?"

The life of a CM-15 pump can vary greatly from site to site. If the analyser is located in an air conditioned control room then several years would be the expected life, if it were located in a hot and dirty heat treat shop then the life could be as short as six months.

There are three factors that reduce the life of the CM-15 pump.

- 1) Operating ambient temperature. As this increases the pump life decreases. If the internal temperature exceed 35°C the analyser will turn off the backlight display and cycle the pump on and off to assist reducing the temperature and extending the life of the pump.
- 2) Particulate loading of the air being pumped. This is mainly a problem on heat treatment sites; the grit in these places gets lodged in the diaphragm increasing the load on the pump. The analysers are fitted with a filter on the reference air inlet to the analyser to extend the pump's life.
- 3) The amount of restriction in the reference air line to the probe. The greater the restriction the greater the load is on the pump's phosphor bronze bearings.

The normal flow range from a CM-15 pump connected to an oxygen probe is 100 to 120 cc per minute. The zirconia sensor will work properly with a reference air flow rate as low as 10 cc per minute.

The common mode of failure for the CM-15 is a worn phosphor bronze bearing eventually causing the motor to "pole out" thereby greatly increasing the current drain. The 1632 analyser monitors the current consumption of the pump and will raise a "Reference Air Fail" alarm if the current consumption exceeds a set level (250mA). The alarm is also raised if the current falls below a set level (15mA) if the pump goes open circuit or is unplugged.