

Underemission Faults on PGC1, PGC2 and PGC2D

APPLICATION NOTES

ISSUE 20210910

1. Underemission



IMPORTANT! If 'Underemission' occurs, do not adjust the filament current limit. Check the grid fuse.

PGC1, PGC2 and PGC2D include two features to protect gauges against misuse or faults elsewhere. These are the **Filament Current Limit** and the **Grid Fuse**.

1.2 Filament Current Limit

Instruments are shipped with the filament current limit control set to maximum. The correct setting must be found in order to protect the gauge under fault conditions. The control should be set so that enough filament power is available to support emission, with about a 20% margin to allow for aging of the filament. For AML AIG17 and most other gauges with tungsten filaments, the setting is 4 A. Thoriated and other coated filaments vary widely. The required setting can be found by running emission at 10 mA and turning the limit down until 'Underemission' is reported.

Thoriated iridium filaments adsorb water in air. Removal of this may require several attempts to start emission and a higher initial current limit. Other coated filaments may require initial activation at a higher temperature than normal. In both cases, once emission has been achieved the current limit should be reduced.

Once set, the current limit should not be changed, unless the gauge or filament type is changed.

1.3 Grid Fuse

It is not possible to blow the grid fuse in normal emission.

If the grid fuse has blown, 'Underemission' will be reported.

A blown grid fuse will cause the instrument to supply filament current equal to the limit current. If this has been set properly there will be no damage to the filament. If it is too high then the filament may blow the next time emission or degas is started.

Instruments manufactured since 2002 do not incorporate a grid fuse.

The grid fuse blows and protects the gauge if a plasma is produced in the gauge head during degas. This can happen in less than a second after starting degas. Gauges must not be degassed after exposure to air until they have been run for some time at 10 mA emission. Degas power should be increased slowly until a degassing rate is found which does not overload the pump capacity or produce a plasma.

1.4 Fan Failure

If the fan is not running, the filament supply will deteriorate and may not support emission. The instrument will need to be repaired if this has occurred. Instruments manufactured or repaired since 2001 incorporate a fan failure detector, which inhibits emission and prevents deterioration.

1.5 Other causes of 'Underemission'

Emission current can be diverted from BA gauges by electric or magnetic fields near the gauge head. Very long or high resistance leads or filament connections reduce the power available to support emission. An open-circuit grid lead or connection will prevent emission.