

# Zone 2 certification by design

## Zone 1 certification by simple pressurization

### PGC5000 Series gas chromatographs



The PGC5000 Series process gas chromatographs

#### Introduction

For a classified Ex zone 1 area, the rationale behind this “Zone 2 by design” analyzer is that the analyzer must remain safe when operated in an abnormal condition. In the event of a fault, the PGC5000 provides continual protection:

- Should a failed component become ignition capable, the pressurization system prevents the components from being exposed to flammable gases or vapors.
- Should a failed pressurization system expose the internal components to flammable gases or vapors, the analyzer’s alarm provision will alert the user of the failure.

Neither of these single faults would present a hazard to the potentially explosive atmosphere; therefore, electrical power interlock is not required for this type of pressurization protection. Enclosure doors are not required to be interlocked so that the electrical supply is disconnected automatically when doors are opened. The requirement is simply an alarm provision since there are no hazards inside the enclosure when in normal operation.

The zone 1 certified PGC5000 analyzer offers simple pressurization protection, commonly referred to as Ex ‘py’ or “Y-purge”. This enclosure pressurizing technique is made possible by ensuring that the

internal components within the analyzer are not capable of causing an ignition in normal operation, thus allowing for a reduction in classification within the protected enclosures from zone 1 to zone 2.

#### PGC Certification

This simple pressurization technique for the PGC5000 is considered an improvement to the process gas chromatograph analyzer by allowing for a continual operation without possible disruption caused by interlocking the electrical power to the pressurization system. When operated in a zone 1 area, the user of the PGC5000 analyzer is simply responsible for:

- Operating the analyzer within the manufacturer’s established parameters, as described in the product manuals and the CE conformity declaration’s special conditions for safe use
- Providing a reliable supply of protected air for the enclosure purge and pressurization system
- Monitoring the alarm state of the pressurization system in normal operation
- Responding to the alarm condition of the pressurization system, which may require restoring the supply of protected air or the removal of electrical power and proper isolation of remaining hazardous live circuits if the area is potentially hazardous

#### **ATEX Directive 2014/34/EU, annex II**

The PGC5000 analyzer “must be so designed and constructed as to prevent ignition sources arising, even in the event of frequently occurring disturbances or equipment operating faults, which normally have to be taken into account”. The design of the analyzer is capable of functioning within the established operational parameters and of ensuring a high level of protection necessary for the intended classified Ex zone 1 area. The notified body LCIE examined the internal components of the PGC5000 and approved the analyzer as Ex ‘py’ for a zone 1 area:

- The EC-type examination of the PGC5000 series analyzer and the IEC Ex test report first evaluated the internal components to Part 15 of the harmonized conformity standard IEC60079 (Ex ‘n’) as either being non-sparking, energy limited or temperature limited to below the specified temperature class (ref: certificates EC-type LCIE 09ATEX 1017X and IECEX LCI09.0010X).
- The EC-type examination of the PGC5000 series analyzer and the IEC Ex test report then evaluated the pressurization protection of the enclosure to part 2 of the harmonized conformity standard IEC60079 (Ex ‘p’) as being suitable for zone 1 area without electrical power interlock to the pressurization system (ref: certificates EU-type LCIE 09ATEX 3006X and IECEX LCI09.0010X).