

Gas Analysis | HPR-20 R&D  
Application Note AN-10002.1

## Gas Analysis Special Inlet

### The HPR-20 R&D for Glovebox Monitoring



**HPR-20 R&D**

#### Introduction

The Hidden **HPR-20 R&D** gas analysis system is a flexible and powerful mass spectrometer instrument system. Hidden offers customisable solutions, such as this application for measurement and monitoring of glovebox environment.

Gloveboxes are frequently used in a variety of research, production and quality control

applications. The requirement of this equipment is to maintain a completely separate environment from the ambient conditions. Glovebox construction consists of a sealed compartment with ports fitted with gloves. A load lock ensures that the materials or inert atmosphere are contained within the compartment. Typically an impermeable, but flexible rubber or plastic glove forms part of the construction so that manipulation tasks are possible.

A key aspect is for the inert atmosphere inside the glovebox to remain isolated from the ambient atmosphere. A quadrupole mass spectrometer is a convenient and powerful method of measuring and monitoring both the compartment integrity and also the chemical composition of the atmosphere. Any leaks, changes in gas from sample introduction or evolved gases from user experiments can all be tracked.

## Introduction

The application solution features an **HPR-20 R&D** quadrupole mass spectrometer system, with a pulse ion counting (PIC) detector installed along with a custom sampling inlet.

The sampling inlet comprises of the standard QIC inlet which is low volume and heated to ensure no condensation and rapid gas transfer to the detector. This is extended, inside the protective flexible steel hose with a custom bulkhead adaptor partway along (to seal the glovebox integrity). The sampling end of the capillary has a filter fitted and is covered by an adjustable hand grip. The sampling end and flexible steel hose are inside the glovebox, whilst the QIC and mass spectrometer system reside outside the glovebox.

As the glovebox internal pressure is typically slightly above atmospheric, the sample inlet is designed to accept this and the vacuum system of the mass spectrometer remains standard.



***Glovebox sample inlet and DN-40-KF Bulkhead Adaptor***

The flexible hose allows positioning of the sample point within the glovebox, to cater for the active sampling regime. The tactile

hand grip allows for easy manipulation of the sample inlet when using the glovebox gloves, and protects the capillary if being clamped in place.

The standard triple filter quadrupole mass spectrometer is upgraded to include a PIC detector. The high sensitivity and fast data acquisition of the PIC allows measurement and tracking of rapid events within the glovebox environment.

The desired specific gas sampling can be easily set up using the Hiden software (MASsoft) and configured to include alarm levels of gases of interest, e.g. water vapour for a glovebox which needs a dry environment, oxygen for a glovebox requiring an oxygen-free environment, etc.

## Summary

This instrument provides an effective solution for the glovebox application, allowing fast response and stable measurement.



***Detail: Sampling capillary featuring adjustable hand grip and flexible metal hose***