



# Gas Pack

---

## *User Manual*



2I-01170-5



# Gas Pack

---

## *User Manual*

2I-01170-5

# Gas Pack P/N GS01170

---

## CONTENTS

1. INTRODUCTION .....	3
2. CHECKLIST OF CONTENTS.....	4
3. USE OF GAS PACK ITEMS.....	5
4. SPARE PARTS FOR GAS PACK.....	9
5. DATASHEET INFORMATION FOR KBR WINDOWS.....	10

© April 2016 Specac Ltd. All rights reserved.

Brilliant Spectroscopy™ is a trademark of Specac Ltd.  
Other product names mentioned herein may be trademarks  
of their respective owners.

# 1. Introduction

---

Thank you for buying a product from Specac.

The Gas Pack P/N GS01170 consists of a Storm 10 Pyrex™ glass body 10cm pathlength gas cell (P/N GS05000) offered along with a pair of KBr windows (P/N GS05021), a cell mount (P/N GS05030) and a set of Neoprene gasket seals for the gas cell (P/N GS05040). These items have been combined together for the analysis of a wide range of gas/vapour sample types using IR spectroscopy.

The Gas Pack can be offered alone as a cost effective way to procure the specific items required for analysis of gases/vapours, but when combined with particular Liquid and Solid Pack offerings, forms a part offering for the analysis of gas samples from the individual Specac **Starter Kit** options that are available.

The Starter Kit options from the liquids, solids and gas pack combinations available are as follows:-

**Basic Starter Kit** P/N GS01180 (Consists of Liquid Pack P/N GS01140 and Basic Solid Pack P/N GS01150).

**Analyst Starter Kit** P/N GS01185 (Consists of Liquid Pack P/N GS01140 and Advanced Solid Pack P/N GS01160).

**Research Starter Kit** P/N GS01190 (Consists of Liquid Pack P/N GS01140, Basic Solid Pack P/N GS01150 and Quest ATR Accessory P/N GS10802).

**Advanced Starter Kit** P/N GS01195 (Consists of Liquid Pack P/N GS01140, Advanced Solid Pack P/N GS01160 and Quest ATR Accessory P/N GS10802).

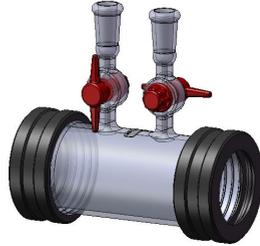
The Gas Pack P/N GS01170 can be offered for inclusion to any of the above Starter Kit offerings. Respectively, the Starter Kit part numbers become GS01181, GS01186, GS01191 and GS01196 with inclusion of the Gas Pack.

## 2. Checklist of Contents

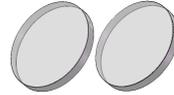
---

Check that the following items have been supplied in the Gas Pack packaging.

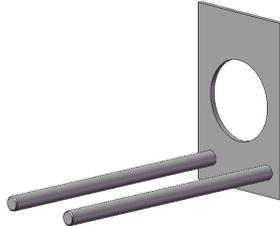
- P/N GS05000 Storm™ 10cm pathlength Pyrex™ glass body gas cell.



- P/N GS05021 Pair of circular KBr windows for Storm™ 10cm Pyrex™ glass body gas cell.



- P/N GS05030 3" x 2" slide mount plate holder for Storm™ 10cm Pyrex™ glass body gas cell.



- P/N GS05040 Set of 4 spare Neoprene Circular gasket seals for Storm™ 10cm Pyrex™ glass body gas cell.



Remove the Gas Pack parts carefully from their packaging and prepare the items for use.



**Note:** *The KBr windows P/N GS05021 are hygroscopic by nature and should be retained in their protective packing to keep them dry and free of moisture for as long as possible before use.*

### 3. Use of the Gas Pack Items

---

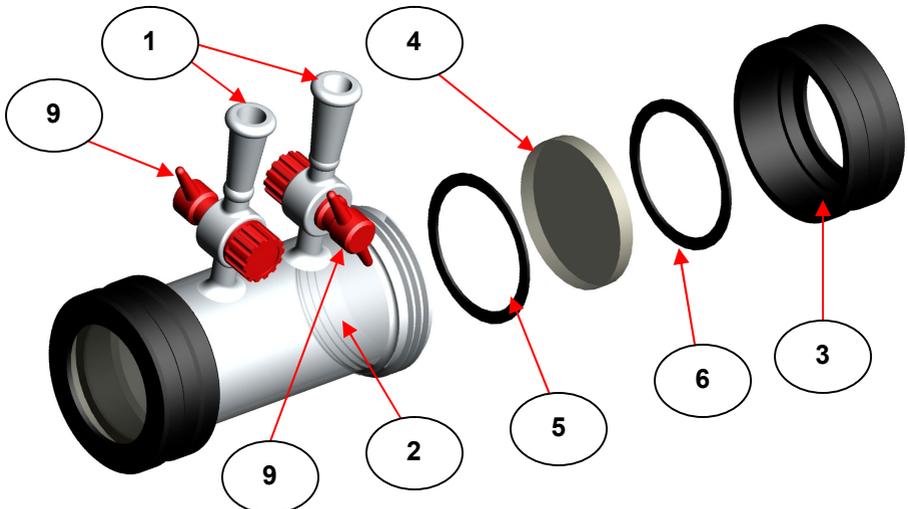
#### The Storm™ 10 Gas Cell

The Storm™ 10 Pyrex™ glass body 10cm pathlength gas cell can be used with a variety of different window materials for the study of high concentrations of gases. (A pair of circular KBr windows P/N GS05021 has been provided as standard for use with the Gas Pack offering P/N GS01170.)

The 10cm Pyrex™ glass body gas cell allows for introduction of the gas by glass inlet tubes (1) (cone size 10/19) with closeable tapered PTFE taps on these glass inlet tubes. (See Fig 1.)

#### Fitting of Windows

The pair of KBr windows supplied are fitted into the Storm 10 gas cell as seen from Fig 1.



**Fig 1. Sequence of Neoprene Circular Gasket Seals and Window Fitting in Storm™ 10 Pyrex™ Gas Cell**

## User Manual

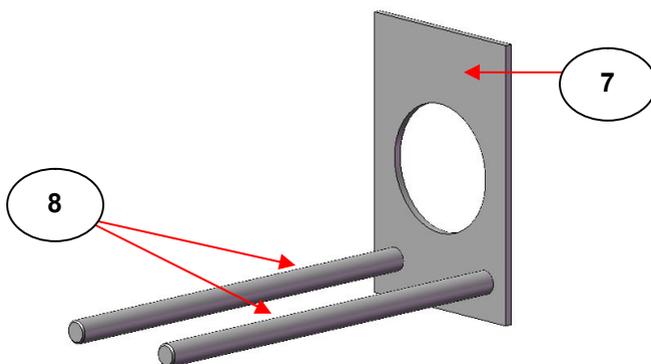
The Pyrex™ glass body (2) carries two end caps (3) which are screw threaded to the body (2). Any window (4) to be fitted is held between one of the Neoprene circular gasket seals (5) that fits against the cell body (1) end face and the second circular gasket seal (6) that fits inside the end cap (3). Use the following procedure to fit a window into the Storm™ 10 gas cell.

- 1) Take the Storm™ 10 gas cell and unscrew an end cap (3) from the body (2). (Turn end cap (3) anticlockwise.) From new there will be two of the Neoprene gaskets (5 and 6) supplied inside each of the two end caps (3).
- 2) Ensure that the face of the Pyrex™ body (2) and the screw threads (body (2) and end cap (3)) are clean and free from foreign matter.
- 3) Open the container containing the two KBr windows (4) – (P/N GS05021) - and carefully remove the windows from their internal protective wrappings. **(Always use gloves when handling the window materials.)**
- 4) Insert a Neoprene gasket (6) onto the inner flange face of the end cap (3) and then carefully insert a window (4).
- 5) Place the second neoprene gasket (5) onto the window (3) and Neoprene gasket (6) assembly now located in the end cap (2).
- 6) Hold the end cap assembly of parts (3, 4, 5 and 6) vertically (to centralize the window) and offer up the end face of the cell body (2) to the window end cap (3) and screw the parts together. (Turn end cap (3) clockwise.)
- 7) Ensure that the end cap (3) and internal window assembly of parts is firmly clamped to the cell body (2) to seal the window, but it is not too tight whereby damage could occur to the windows.

Repeat the procedure from steps 1 to 7 for the other end cap and window assembly.

## Installation of Storm™ 10 Gas Cell into Spectrometer

When windows have been fitted, the Storm™ 10 gas cell is placed into the sample compartment of an infra red spectrometer system using the gas cell mount P/N GS05030. This is a 3" x 2" metal plate (7) with two elongated support prongs (8). (See Fig 2.)



**Fig 2. Gas Cell Mount P/N GS05030**

The metal plate (7) slides into a standard 3" x 2" mount and the gas cells sit horizontally on the metal prongs (8).

## Filling With Gas

Either of the gas inlet ports (1) (See Fig 1.) can be used to fill the cell with gas. The cone size for any connecting glassware (tubing or stoppers) are 10/19. Ensure that both taps (9) are open (tap handle is in parallel line to the inlet stem) when filling to maintain a flow. Close both taps as quickly as possible after filling to contain the gas in the cell.

The Storm™ 10 gas cell is now ready to be used in the spectrometer.

## Cleaning the Storm™ 10 Gas Cell

Depending on the particular type of gas that has been analysed within the Storm™ 10 gas cell, before storage, Specac would recommend purging the gas cell with a supply of nitrogen gas after use. Nitrogen gas can be flowed through (with both gas taps (9) open) and then the gas taps (9) are closed to contain nitrogen gas within.

The gas cell can be stored fully constructed with windows in position and containing nitrogen gas. Specac recommends use of a dry cabinet for storage. However, if the windows and maybe the inside of the gas cell body need to be cleaned, then it is easier to do so by removal of the windows (4) and gaskets (5 and 6) from their end cap (3) assemblies. Removal of the windows is reversal of steps 4) to 6) from the fitting of a window procedure on page 6.

Choice of solvent for cleaning depends upon the particular window material being used. For the standard KBr window supplied avoid use of water and lower order alcohols such as methanol, ethanol and propanol as the KBr material will be dissolved. Suitable solvents are acetone and/or a halogenated solvent such as chloroform. The windows can be gently and carefully cleaned using a lens grade quality tissue moistened with a suitable solvent.

When the windows have been cleaned they can be re-installed into the gas cell, or placed for safe storage back into the container from which they were supplied.

Water, alcohols, acetone and chloroform as solvents can be used on all other parts of the Pyrex™ gas cell for cleaning as and when necessary.

## 4. Spare Parts for Gas Pack

---

- P/N GS05000 Storm™ 10 gas cell.
- P/N GS05021 Pair of circular KBr windows (47mm diameter) for Storm™ 10 gas cell.
- P/N GS05020 Pair of circular NaCl windows (47mm diameter) for Storm™ 10 gas cell.
- P/N GS05022 Pair of circular CaF<sub>2</sub> windows (47mm diameter) for Storm™ 10 gas cell.
- P/N GS05023 Pair of circular BaF<sub>2</sub> windows (47mm diameter) for Storm™ 10 gas cell.
- P/N GS05096 Pair of circular ZnSe windows (47mm diameter) for Storm™ 10 gas cell.
- P/N GS05030 3" x 2" slide mount plate holder for Storm™ 10 gas cell.
- P/N GS05040 Set of 4 spare Neoprene circular gasket seals for Storm™ 10 gas cell.

## 5. Datasheet Information for KBr Windows Used in Gas Pack

---

### Potassium Bromide (KBr)

#### General

Medium for making Potassium Bromide pellets for IR spectroscopy. When fused together as a solid can be polished and used as a transmission window material. Hygroscopic material similar to Sodium Chloride (NaCl). Soluble in water, glycerine and alcohols. Slightly soluble in ether. Fairly good resistance to mechanical and thermal shock. Molecular formula: KBr. Chemical Abstracts Service (CAS) No: 7758-02-3.

#### Physical Data

Appearance: Odourless, white or colourless crystalline solid.  
Melting point: 730°C.  
Boiling point: 1380°C.  
Vapour pressure: 1mm Hg at 795°C.  
Specific gravity: 2.75 g cm<sup>-3</sup>  
Solubility in water: 53.48g/100g at 0°C.  
Hardness: 6 Kg/mm<sup>2</sup>.  
Refractive Index: 1.54 (at 2000cm<sup>-1</sup> - wavenumbers).  
Spectroscopic transmission range: 43,500 to 400 cm<sup>-1</sup> (wavenumbers).

#### Stability

Stable.  
Incompatible with strong oxidising agents, strong acids, bromine trifluoride and bromine trichloride.

#### Toxicology



Harmful if ingested in large amounts, if inhaled, or if in repeated contact with the skin.

#### Personal Protection

Always wear safety spectacles and gloves when handling the powder or window material.  
Allow for adequate ventilation.

#### Storage

Keep powder or windows stored in a cool, dry container.





# Worldwide Distribution

## **France**

Eurolabo - Paris.  
Tel.01 42 08 01 28  
Fax 01 42 08 13 65  
email: [contact@eurolabo.fr](mailto:contact@eurolabo.fr)

## **Germany**

L.O.T. - Oriel GmbH & Co,  
KG - Darmstadt  
Tel: 06151 88060  
Fax: 06151 880689  
email:[info@LOT-Oriel.de](mailto:info@LOT-Oriel.de)  
Website: [www.LOT-Oriel.com/de](http://www.LOT-Oriel.com/de)

## **Japan**

Systems Engineering Inc. -Tokyo  
Tel: 03 3946 4993  
Fax: 03 3946 4983  
email:[systems-eng@systems-eng.co.jp](mailto:systems-eng@systems-eng.co.jp)  
Website: [www.systems-eng.co.jp](http://www.systems-eng.co.jp)

## **Spain**

Teknokroma S.Coop C. Ltda  
Barcelona  
Tel: 93 674 8800  
Fax: 93 675 2405  
email: [comercial@teknokroma.es](mailto:comercial@teknokroma.es)

## **Switzerland**

Portmann InstrumentsAG  
Biel-Benken  
Tel: 061 726 6555  
Fax: 061 726 6550  
email: [info@portmann-instruments.ch](mailto:info@portmann-instruments.ch)  
Website:[www.portmann-instruments.ch](http://www.portmann-instruments.ch)

## **USA**

SPECAC INC.  
414 Commerce Drive  
Suite 175,  
Fort Washington,  
PA 19034, USA  
Tel: 215 793 4044  
Fax: 215 793 4011

## **United Kingdom**

Specac Ltd. - London  
Unit 12, Science & Innovation Centre  
Halo Business Park  
Orpington  
Kent BR5 3FQ  
Tel:+44 (0) 1689 873134  
Registered No. 1008689 England

# Brilliant Spectroscopy™

*[www.specac.com](http://www.specac.com)*

**SPECAC INC.**

414 Commerce Drive  
Suite 175,  
Fort Washington,  
PA 19034, USA  
Tel: 215 793 4044  
Fax: 215 793 4011

**SPECAC LTD.**

Unit 12, Science & Innovation Centre  
Halo Business Park  
Orpington  
Kent BR5 3FQ  
Tel: +44 (0) 1689 873134  
Registered No. 1008689 England