Cyclone® Gas Cells

Heatable long pathlength Gas Cells

Cyclone® Gas Cells

Based on the White cell principle of multiple lightpasses between an arrangement of reflecting mirrors, Cyclone® gas cells are available in three sizes:

- **Cyclone® C2** - Fixed or adjustable pathlengths ranging from 0.5m to 2.5m
- **Cyclone® C5** - Fixed or adjustable pathlengths ranging from 1m to 8m
- **Cyclone® C10** - Fixed or adjustable pathlengths ranging from 2.1m to 10.6m

Cyclone® series gas cells are suitable for operation in all modern FT-IR spectrometers using the Specac Benchmark® baseplate provided as standard.

Cells are available as standard with a borosilicate glass body for operation at ambient temperatures and pressures ranging from vacuum to 15 psi Protected gold mirrors, internal and external components made from nickel-plated aluminium and stainless steel, and Viton® 'O' rings are combined to ensure the highest chemical compatibility and protection from leaks.

Vacuum/gas inlet and outlet taps, KBr windows and a purgeable transfer optics box further enhance this already highly featured range.

Unsurpassed Upgradeability

Cyclone's impressive list of optional features means that any analytical challenge can be met. Adjustable pathlength mirror carriages, and a range of fixed pathlength mirror carriages can be used within a single gas cell body to greatly enhance analytical flexibility and reduce costs.

Nickel-plated aluminium bodies can be specified for high pressure operation up to 125 psi, and heating jackets/high stability temperature controllers allow operation at temperatures up to 200°C.

CaF2 or ZnSe windows can be specified to replace the KBr windows offered as standard. There is also an option to replace the standard Viton seals with Kalrez O-rings for more challenging chemical environments.

Purge bellows allow the transfer optics to be used under inert gas atmospheres (e.g. nitrogen) in applications where the elimination of atmospheric H_2O and CO_2 absorbances is required.

Design Excellence

To ensure perfect operation and freedom from unwanted impurities, a number of unique features have been incorporated into the design and manufacture of the Cyclone® series.

Key features

- Fixed pathlength
- Borosilicate glass body
- Ambient temperature operation
- Vacuum to 15 psi operation
- Gold mirrors (protected)
- Viton® 'O' ring seals
- KBr windows
- Adhesive-free construction
- Nickel-plated aluminium components
- Vacuum/gas inlet & outlet taps
- Purgeable transfer optics box
- Benchmark® series baseplate mounting
- CE compliant

Optional features

- Adjustable pathlength mirror carriage
- Additional fixed pathlength mirror carriages (all models)
- ZnSe or CaF2 windows
- Nickel-plated aluminium body for high pressures operation (up to 125 psi)
- Heating jacket / controller for high temperature operation (up to 200°C)
- Pressure gauge kit
- Desiccant storage caps
- Purge bellows
- Laser alignment accessory
- Kalrez O-rings

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Cyclone® C2

- Pathlength: 0.5m - 2.5m (fixed or adjustable)
- Pathlength steps: 0.5m
- Volume: 0.19 litres
- Dimensions (mm): H384 W153 D120

Cyclone® C5

- Pathlength: 1m - 8m (fixed or adjustable)
- Pathlength steps: 1m
- Volume: 1.33 litres
- Dimensions (mm): H536 W153 D130

Cyclone® Gas Cells

Cyclone Gas Cells cells are completely free from adhesives and all of the Viton® 'O' ring seals are carefully pre-baked to eliminate any contamination from solvents or out-gassing.

Internal screws have small bleed holes drilled into them to prevent any trapped pockets of gas causing sample cross contamination.

CE Compliance

All Cyclone® series heated gas cell systems are CE compliant ensuring that they can be operated safely at all times under the recommended conditions.

General specifications

- Cell body material: Borosilicate glass (optional metal body)
- Pressure range: Vacuum to 15 psi (optional 125 psi)
- Temperature range: Ambient (optional heated systems available)
- Mirrors: Gold (protected)
- Windows: KBr (optional ZnSe or CaF2)
- Inlet/outlet fittings: Stainless steel taps 'O' rings: Viton®
- Internal components: Nickel-plated aluminium & stainless steel
- Transfer optics: Aluminium mirrors in purgeable optics box
- Cell mount: Benchmark® Baseplate series

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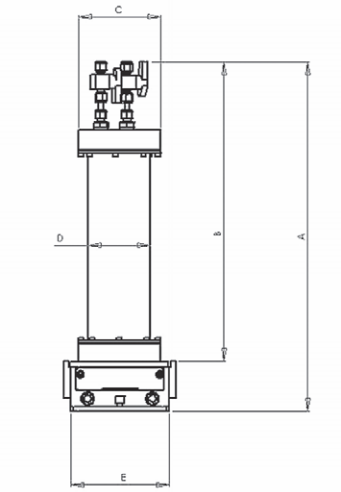
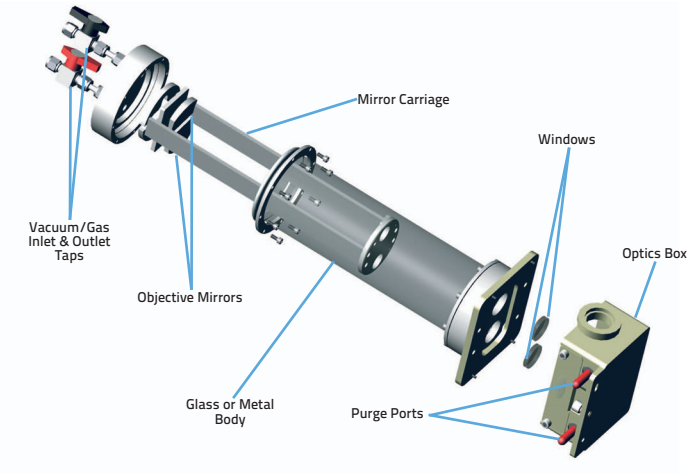
Cyclone® C10

- Pathlength: 2.1m - 10.6m (fixed or adjustable)
- Pathlength steps: 1.06m
- Volume: 2.61 litres
- Dimensions (mm): H540 W153 D1146

Cyclone® Gas Cells key dimensions below



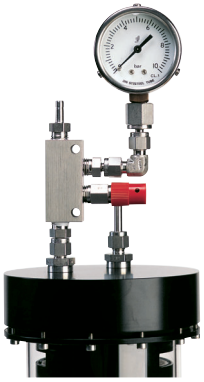


Cell	A	B	C	D	E
C2	384	314	73	47	153
C5	536	466	114	87	153
C10	540	470	143	113	153

All dimensions in mm

Cell	Base Pathlength	Pathlength Range	Volume
C2	12.5cm	0.5m to 2.5m (in 0.5m steps)	0.19 litres
C5	25cm	1m to 8m (in 1m steps)	1.33 litres
C10	26.4cm	2.1m to 10.6m (in 1.06m steps)	2.60 litres

Cyclone® Gas Cells



Optional features

Cyclone® series heatable long pathlength gas cells have been designed with the serious analyst in mind. These high performance, superior quality cells are backed by a comprehensive range of optional upgrades ensuring that they meet every analytical challenge.

Purge Bellows

A pair of purge bellows is available for the Cyclone® series gas cells. These fit between the optics box of the cell and the spectrometer to allow the purging of transfer optics with inert gases such as nitrogen. This feature allows absorbances due to atmospheric H_2O and CO_2 to be eliminated from spectral measurements. These bellows are designed to fit all Specac gas cells.

GS10707 Purge Bellows (pair)

Desiccant Storage Caps

These caps are designed to fit over the optical inlet and outlet ports of the Cyclone® series gas cells to seal the transfer optics when the cells are not in use.

One of the caps contains a desiccant material which maintains a dry atmosphere within the transfer optics box and extends the life of KBr windows.

GS24150 Desiccant Storage Caps

Pressure Gauge Kit

A pressure gauge kit is available to fit the Cyclone® series gas cells. Gauges can be specified for low pressure operation (vacuum to 15 psi) and high pressure operation (vacuum to 125 psi - metal bodied cell only). An integral pressure relief valve ensures that cells are automatically depressurised in the event of accidental over pressurisation.

Specac recommend the use of a pressure gauge when operating gas cells at elevated pressures.

GS24160 Pressure Gauge Kit (pair)
(Specify high or low pressure)

Cyclone® Gas Cells

Optional features

Heating Jacket / High Stability Temperature Controller

All of the Cyclone® series gas cells (glass and metal bodied versions) can be upgraded to heatable gas cells by the addition of the appropriate Heating Jacket and High Stability Temperature Controller. The heating jacket simply slides over the gas cell and it can be operated from ambient temperatures up to 200°C.

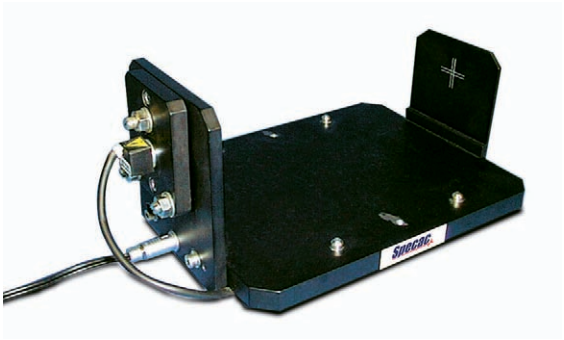
Low voltage (32V) heaters are used to ensure safe operation at all times and the temperature controller has a factory fitted option of RS232, RS485 or USB connectivity if ordered.

Temperature stability is +/-1°C and a key feature of the design is the uniformity of the heating across the whole cell, which prevents localised ˝cold spots˝ within the cell.

All of the Cyclone® series Heating Jacket / High Stability Temperature Controller systems are CE compliant ensuring that they can be operated safely at all times under the recommended conditions.

ordering information

GS24302 **Heating Jacket/Controller for Cyclone® C2**
GS24305 **Heating Jacket/Controller for Cyclone® C5**
GS24310 **Heating Jacket/Controller for Cyclone® C10**
(Specify voltage and country of usage)



Benchmark® Series Laser Alignment Accessory

This accessory allows the visual verification of the optical pathlength through Cyclone® series gas cells.

This is especially useful when different pathlengths are regularly used with variable pathlength cells.

The accessory is based on a low power (0.8mW) visible continuous wave LED precisely located in position in a Benchmark® accessory alignment housing. The gas cell simply slots into the alignment accessory. The 635nm Class II laser can be powered from a battery unit or by the dedicated mains transformer supplied.

Benchmark® Laser Alignment Accessory is CE compliant ensuring that it can be operated safely at all times under the recommended conditions.

ordering information

GS24500 **Benchmark® Series Laser Alignment Accessory**
(Specify voltage and country of usage)

Cyclone® Gas Cells compatibility chart

This guide shows which Cyclone® gas cell and respective heating jacket can be used within a range of spectrometer sample compartments.

Key: **FWJ** - Fits (and also) With Jacket
FNJ - Fits but No Jacket **DNF** - Does Not Fit

FT-IR Instrument	C2 Cell GS24102	C5 Cell GS24105	C10 Cell GS24110
Bomem M100	FWJ	FWJ	FWJ
Bomem MB100	FWJ	FWJ	FWJ
Bruker IFS66	FWJ	FWJ	FWJ
Bruker Tensor, Vertex, Vector Instruments	FWJ	FWJ	FWJ
Agilent Instruments	FWJ	FWJ	FWJ Close at rear
Mattson Genesis	FWJ	FWJ	FWJ Close at sides
Mattson Galaxy	FWJ	FWJ	FWJ Close at sides
Midac	FWJ	FWJ	FWJ
Nicolet 500, Avatar, Nexus, iS10 Instruments	FWJ	FWJ	FWJ Close at sides
Nicolet iS5	FWJ	FWJ	FNJ
Perkin Elmer 2000 (GX)	FWJ	FWJ	FWJ Close at sides
Perkin Elmer Spectrum One, 100, 400, Frontier Instruments	FWJ	FWJ	FWJ Close at sides
Perkin Elmer Spectrum Two	FWJ	FWJ	DNF
Jasco 400/600V, 5000/7000 instruments	FWJ	FWJ	FNJ
Shimadzu 8400, Prestige 21, IRAffinity Instruments	FWJ	FWJ	FNJ

Note: If your spectrometer is not listed, please contact Specac for further details

Cyclone® Gas Cells

ordering information

GS24102 **Cyclone® C2** Long Pathlength Gas Cell 0.5m to 2.5m

GS24105 **Cyclone® C5** Long Pathlength Gas Cell 1m to 8m

GS24110 **Cyclone® C10** Long Pathlength Gas Cell 2.1m to 10.6m

Fixed pathlengths available

Cyclone® C2 - 0.5, 1.0, 1.5, 2.0 & 2.5m
Cyclone® C5 - 1, 2, 3, 4, 5, 6, 7 & 8m
Cyclone® C10 - 2.1, 3.2, 4.2, 5.3, 6.3, 7.4, 8.5, 9.5 & 10.6m

Cyclone® gas cell configuration step by step

1) Choose the size of gas cell with its part number eg for a Cyclone C5 cell the P/N would be GS24105
2) Choose the type of body from Glass (G) or Metal (M)
3) Choose the window material from KBr (K), CaF2(C) or ZnSe (Z) (Note: KBr windows cannot be used with a metal bodied cell)
4) Choose between a Fixed (F) or Adjustable (A) pathlength cell - (if fixed specify the pathlength from those available for the cell size)
5) Choose Viton (V) or Kalrez (X) O-ring seals
6) If required choose a Low (L) or High (H) pressure gauge kit to be fitted

Example: P/N GS24105GCAV would be for a Cyclone C5 cell with a glass body, CaF2 windows, adjustable pathlength, Viton O-rings and no pressure gauge

For all Gas Cells please specify Spectrometer make and model to include provision of the appropriate Benchmark® baseplate for installation.

Options

GS10707 **Purge Bellows** (pair)
GS24150 **Desiccant Storage Caps**
GS24152 **Mirror Carriage Assembly** for Cyclone® series gas cells
(specify model, variable or fixed pathlength, and pathlength where a fixed pathlength mirror carriage is required)

GS24160 **Pressure Gauge Kit**
To fit Cyclone® and Tornado® gas cells
(specify High or Low Pressure)

GS24302 **Heating Jacket/Controller**
for Cyclone® C2
(Specify voltage and country of usage)

GS24305 **Heating Jacket/Controller**
for Cyclone® C5
(Specify voltage and country of usage)

GS24310 **Heating Jacket/Controller**
for Cyclone® C10
(Specify voltage and country of usage)

GS28000 **RS232 Connection kit**
GS28001 **USB Connection kit**
GS28002 **RS485 Connection kit**
GS24500 **Laser Alignment Accessory**
GS24153 **Replacement KBr windows**
for Cyclone® and Tornado® series gas cells
(specify model)
GS24154 **Replacement ZnSe windows**
for Cyclone® and Tornado® series gas cells
(specify model)
GS24155 **Replacement CaF2 windows**
for Cyclone® and Tornado® series gas cells
(specify model)
GS24103 **Cyclone Gas Cell C2 ESK**
GS24106 **Cyclone Gas Cell C5, C10, ESK**

Gas Cells

Heating Jackets & Laser Alignment Accessory