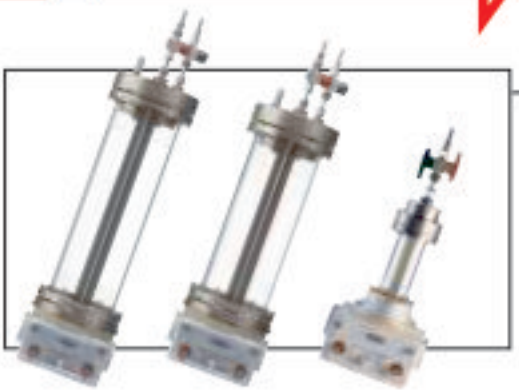
Specac

DATASHEET

Cyclone™ Series
Heatable Long Pathlength Gas Cells



The Cyclone™ series of fixed and variable long pathlength gas cells is the ultimate in sampling accessories for measuring the infrared spectra of gases and vapors. Designed for use at a wide range of temperatures and pressures, they are the ideal choice for the analyst who demands superior performance characteristics, high standard specifications and in-built upgradeability

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

- **Cyclone™ C2** - Fixed pathlengths ranging from 0.5m to 2.5m
- **Cyclone™ C5** - Fixed or variable pathlengths ranging from 1m to 8m
- **Cyclone™ C10** - Fixed or variable 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 p.s.i. 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 chemicals 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. Variable 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 p.s.i., and heating jackets / high stability temperature controllers allow operation at temperatures up to 200°C.

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. The 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.

Standard Features

- Fixed pathlength
- Borosilicate glass body
- Ambient temperature operation
- Vacuum to 15 p.s.i. 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

- Variable pathlength mirror carriage (Cyclone™ C5 & Cyclone™ C10)
- Additional fixed pathlength mirror carriages (all models)
- ZnSe or CaF_2 windows
- Nickel-plated aluminium body for high pressures operation (up to 125 p.s.i.)
- Heating jacket / controller for high temperature operation (up to 200°C)
- Pressure gauge kit
- Desiccant storage caps
- Purge bellows
- Laser alignment accessory

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.

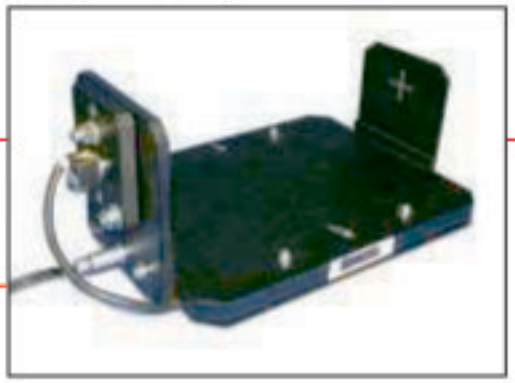
The accessory is based on a low power (0.8mW) visible continuous wave LED precisely located in position in a Benchmark™ accessory alignment housing. The gas cell simply slots into the alignment accessory. The 635nm Class II laser can be powered from a battery unit or by the dedicated mains transformer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

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

P/N 24500

Benchmark™ Series Laser Alignment Accessory

(Specify voltage and country).



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 p.s.i.) and high pressure operation (vacuum to 125 p.s.i). 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.

P/N 24160 Pressure Gauge Kit

(Specify High or Low pressure).

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.

P/N 24150 Desiccant Storage Caps

Cyclone™ Series – Specifications

Cyclone™ C2

Pathlength:	0.5m - 2.5m (fixed)
Pathlength steps:	0.5m
Volume:	0.19 liters
Cell body material:	Borosilicate glass (optional metal body)
Pressure range:	Vacuum to 15 p.s.i. (optional 125 p.s.i.)
Temperature range:	Ambient (optional heated systems available)
Mirrors:	Gold (protected)
Windows:	KBr (optional ZnSe or CaF_2)
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™ series baseplate
Dimensions (mm):	H384 W153 D120

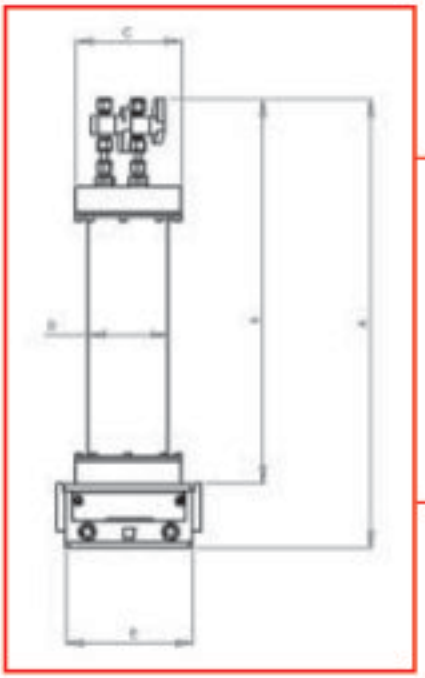
Cyclone™ C5

Pathlength:	1m - 8m (fixed or variable)
Pathlength steps:	1m
Volume:	1.33 litres
Cell body material:	Borosilicate glass (optional metal body)
Pressure range:	Vacuum to 15 p.s.i. (optional 125 p.s.i.)
Temperature range:	Ambient (optional heated systems available)
Mirrors:	Gold (protected)
Windows:	KBr (optional ZnSe or CaF_2)
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™ series baseplate
Dimensions (mm):	H536 W153 D130

Cyclone™ C10

Pathlength:	2.1m - 10.6m (fixed or variable)
Pathlength steps:	1.06m
Volume:	2.6 liters
Cell body material:	Borosilicate glass (optional metal body)
Pressure range:	Vacuum to 15 p.s.i. (optional 125 p.s.i.)
Temperature range:	Ambient (optional heated systems available)
Mirrors:	Gold (protected)
Windows:	KBr (optional ZnSe or CaF_2)
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™ series baseplate
Dimensions (mm):	H540 W153 D146

Cyclone™ Series – Key Dimensions

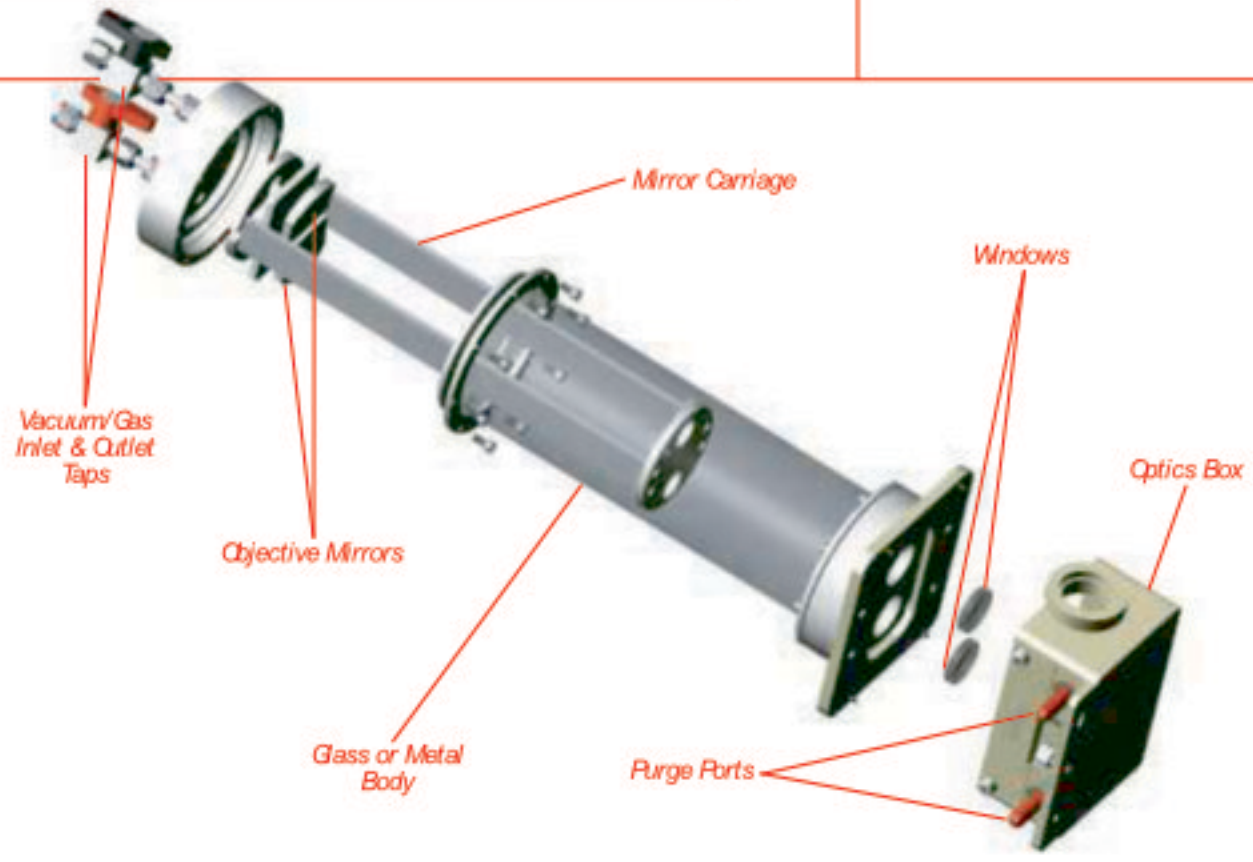


Cell	Base Pathlength	Pathlength Range	Volume
C 2	12.5cm	0.5m to 2.5m (in 0.5m steps)	0.19 liters
C 5	25cm	1m to 8m (in 1m steps)	1.33 liters
C 10	26.4cm	2.1m to 10.6m (in 1.06m steps)	2.60 liters

Cell	A	B	C	D	E
C 2	384	314	73	47	153
C 5	536	466	114	87	153
C 10	540	470	143	113	153

All dimensions in mm

Cyclone™ Series – Features of The Range



Cyclone™ Series 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 Benchmark™ sampling accessories.

P/N 10707 Purge Bellows (pair)

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 RS232 interface to allow independent control using a computer. 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.

P/N 24302 Heating Jacket / Controller for Cyclone™ C2
P/N 24305 Heating Jacket / Controller for Cyclone™ C5
P/N 24310 Heating Jacket / Controller for Cyclone™ C10

(Specify voltage and country).

Gas Cell Ordering Information *(Specify spectrometer make and model)*

P/N 24102 - Cyclone™C2

Long Pathlength Gas Cell 0.5m to 2.5m (supplied with KBr windows as standard)

Specify: Pathlength
Windows (KBr, ZnSe or CaF_2)
Body material (nickel-plated aluminium or glass)

P/N 24105 - Cyclone™C5

Long Pathlength Gas Cell 1m to 8m (supplied with KBr windows as standard)

Specify: Fixed or variable pathlength
Pathlength (for fixed pathlength version)
Windows (KBr, ZnSe or CaF_2)
Body material (nickel-plated aluminium or glass)

P/N 24110 - Cyclone™C10

Long Pathlength Gas Cell 2.1m to 10.6m (supplied with KBr windows as standard)

Specify: Fixed or variable pathlength
Pathlength (for fixed pathlength version)
Windows (KBr, ZnSe or CaF_2)
Body material (nickel-plated aluminium or glass)

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

Options

P/N 10707 Purge Bellows (pair)

P/N 24150 Desiccant Storage Caps

P/N 24152 Mirror Carriage Assembly for Cyclone™ series gas cells (specify model, variable or fixed pathlength, and pathlength where a fixed pathlength mirror carriage is required)

P/N 24160 Pressure Gauge Kit to fit Cyclone™ and Tornado™ series gas cells (specify High or Low Pressure)

P/N 24302 Heating Jacket / Controller for Cyclone™ C2 (specify voltage and country)

P/N 24305 Heating Jacket / Controller for Cyclone™ C5 (specify voltage and country)

P/N 24310 Heating Jacket / Controller for Cyclone™ C10 (specify voltage and country)

P/N 24500 Laser Alignment Accessory

Replacement Windows

P/N 24153 Replacement KBr windows for Cyclone™ and Tornado™ series gas cells (specify model)

P/N 24154 Replacement ZnSe windows for Cyclone™ and Tornado™ series gas cells (specify model)

P/N 24155 Replacement CaF_2 windows for Cyclone™ and Tornado™ series gas cells (specify model)

Specac

ISO 9001

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