

Making our world more productive



# ECO CYL<sup>®</sup>

When Portability Matters



# ECOCYL®. When Portability Matters.



Widespread use of gas monitoring systems increasingly calls for test gases in small portable cylinders for regular calibration procedures. Moreover, demand for portable analytical instruments is rising. This is being driven, on the one hand, by the need for tighter process control in industries such as petrochemicals. Here, operators use gas monitoring systems like micro-gas chromatography instruments to take remote measurements. And, on the other, it is being driven by increasingly strict regulatory requirements governing emissions. In the automotive industry, for instance, this is fuelling demand for Portable Emissions Measurement Systems (PEMS).

ECOCYL® is Linde's response to the rising need for more portable, robust and easy-to-use packages for bump testing gases as well as calibration and instrumentation gases. In addition, it is helping companies to meet their corporate responsibility targets. Unlike the disposable packages often used, ECOCYL is a more sustainable option as it can be reused.

## Integrated device

ECOCYL is a small, refillable aluminium cylinder with a valve and 200-bar pressure and flow regulator fully integrated in a specially designed protection cowling. The result is a safe, easy and ready-to-use system. The operator only needs to open the cylinder valve and choose from the flow range settings adjustable from 0.1 to 10 litre per minute. No additional equipment is needed to deliver gas at the point of use. ECOCYL represents the state of the art in integrated valves worldwide.

## New product range

Targeted at portable applications, the previous one-litre, 150-bar ECOCYL package has enjoyed considerable market success for several years. The product range has now been expanded to include the ECOCYL 201 and ECOCYL 202 packages. Available in one- and two-litre sizes, these upgraded devices work at filling pressures of up to 200 bar, offering more flexibility and up to 160% more gas content than the previous ECOCYL version. For even greater connectivity, ECOCYL comes with a standard barb outlet, a quick connector outlet or a ¼-inch compression fitting.



ECOCYL 201 and ECOCYL 202 packages.

## Robust valve protection

Devices like ECOCYL are also known as VIPRs, which stands for Valve with Integrated Pressure Regulator. The ECOCYL VIPR is always protected by a non-removable cowling that ensures safe storage, handling and use. This is especially important for portable packages, which are often used in remote areas and in rugged on-site settings. ECOCYL is tested and approved according to the applicable regulatory requirements for transportable pressure equipment.



The non-removable cowling protects the valve and improves handling.

## Typical application scenarios

- Calibration gases for bump testing of gas detection systems and gas sensors
- Calibration and instrumentation gases for remote emission monitoring systems, e.g. installed up a stack
- Calibration and instrumentation gases for PEMS used in Real Driving Emissions (RDE) and in-service tests within the automotive and Non-Road Mobile Machinery (NRMM) sectors
- Calibration and carrier gases for micro-gas chromatography used in process control in industries such as petrochemicals.



ECOCYL is portable, robust and easy to use - ideal for regular calibration procedures.

## Gas range (other products are available upon request)

### Pure gases:

- Helium
- Nitrogen
- Hydrogen
- Argon

All available at 5.0 (99.999% purity) and 6.0 (99.9999% purity).

### Binary gas mixtures:

- Synthetic air HC free
- 40% hydrogen in helium (FID gas)
- Methane/Propane/Hydrogen in synthetic air or nitrogen (% level e.g. for testing flammable gas monitoring systems)
- Hydrogen sulphide/Ammonia/Carbon monoxide in synthetic air or nitrogen (ppm level e.g. for testing toxic gas monitoring systems)

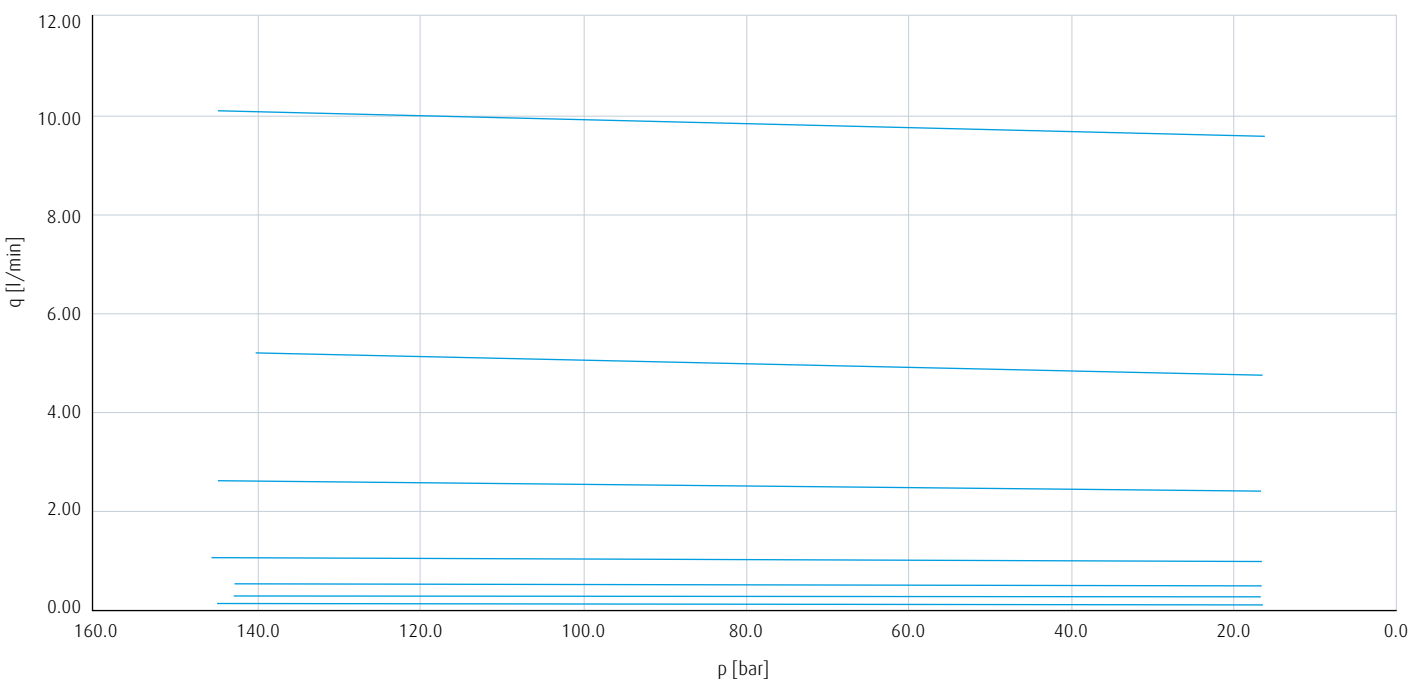
### Multicomponent gas mixtures:

- Carbon dioxide, carbon monoxide, propane in nitrogen (% and ppm levels, calibration gas for exhaust gas testing)
- QUAD mixtures

## ECOCYL benefits

- All-in-one cylinder plus valve with integrated regulator for the gas flow
- No additional equipment necessary (e.g. external pressure regulator, flow meter or fine control valve)
- High capacity with 50%+ more content than most disposable containers
- High flexibility offered by three different connection options
- Improved stability data for reactive gas mixtures
- Certificate of analysis available for mixtures (depending on the type of gas required)
- Valve permanently protected by a specially designed cowling
- Compact, portable, robust and easy-to-handle package
- No disposal or storage costs for empty containers
- No waste generated

## ECOCYL® flow calibration



Flow lines illustrating how ECOCYL minimises flow drift by maintaining a flat curve even as the cylinder pressure drops. Each line represents one of the pre-set flow settings (from 0.1 to 10 litres a minute).

### Technical specifications – ECOCYL 201\*

Maximum package diameter	9.5 cm (including protective guard)
Height	49 cm (including protective guard)
Weight (empty)	2.5 kg
Cylinder diameter	8.0 cm
Cylinder volume	1 litre
Cylinder material	Aluminium, AL6061
Valve material	Stainless steel and aluminium
Maximum filling pressure	200 bar g/2900 psi g
Gas volume	0.15 m <sup>3</sup> for mixtures and 0.2 m <sup>3</sup> for pure gases
Outlet pressure	3.8 bar (55 psi)
Manometer cylinder pressure	300 bar, 270° scale
Outlet flow (pre-set values)	0 / 0.10 / 0.25 / 0.50 / 1.00 / 2.50 and 10.0 l/min
3 outlet connections	Hose barb (standard), quick connector and ¼" compression fitting
Inlet connection (cylinder)	¾" x 16 UNF-2A
Inlet connection filling port	Customized



ECOCYL 201

### Technical specifications – ECOCYL 202\*

Maximum package diameter	10.2 cm (including protective guard)
Height	55 cm (including protective guard)
Weight (empty)	3.3 kg
Cylinder diameter	10.2 cm
Cylinder volume	2 litres
Cylinder material	Aluminium, AL6061
Valve material	Stainless steel and aluminium
Maximum filling pressure	200 bar g/2900 psi g
Gas volume	0.3 m <sup>3</sup> for mixtures and 0.4 m <sup>3</sup> for pure gases
Outlet pressure	3.8 bar (55 psi)
Manometer cylinder pressure	300 bar, 270° scale
Outlet flow (pre-set values)	0 / 0.10 / 0.25 / 0.50 / 1.00 / 2.50 and 10.0 l/min
3 outlet connections	Hose barb (standard), quick connector and ¼" compression fitting
Inlet connection (cylinder)	¾" x 16 UNF-2A
Inlet connection filling port	Customized



ECOCYL 202

**\*Gas compatibility**

ECOCYL is suited to non-corrosive pure gases as well as gas mixtures that might contain non-corrosive as well as corrosive components (e.g. ammonia, hydrogen chloride, sulphur dioxide). The unit does not comply with requirements for gases with oxidising potential higher than air. As a result, pure oxygen may not be supplied in ECOCYL packages.

# Getting ahead through innovation.

With its innovative concepts, Linde is playing a pioneering role in the global market. As a technology leader, it is our task to constantly raise the bar. Traditionally driven by entrepreneurship, we are working steadily on new high-quality products and innovative processes.

Linde offers more. We create added value, clearly discernible competitive advantages, and greater profitability. Each concept is tailored specifically to meet our customers' requirements – offering standardised as well as customised solutions. This applies to all industries and all companies regardless of their size.

If you want to keep pace with tomorrow's competition, you need a partner by your side for whom top quality, process optimisation, and enhanced productivity are part of daily business. However, we define partnership not merely as being there for you but being with you. After all, joint activities form the core of commercial success.

Linde – ideas become solutions.

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