



# Automatic gas cylinder change-over unit

Operating manual

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# 1 Operating instructions

## 1.1 Using this manual

- ▶ Carefully read this operating manual before using the device for the first time.
- ▶ The operating manual should be considered as part of the product and stored in a location that is easily accessible.
- ▶ When passing the device on to third parties, be sure to include this operating manual.
- ▶ If this manual is lost, please request another one. The latest version can be found on our website [www.eppendorf.com](http://www.eppendorf.com) (international) or [www.eppendorfna.com](http://www.eppendorfna.com) (North America).

## 1.2 Danger symbols and danger levels

### 1.2.1 Hazard icons

	Biohazard		Explosion
	UV radiation		Toxic substances
	Electric shock		Crushing
	Hot surface		Hazard point
	Heavy loads		Material damage

### 1.2.2 Degrees of danger


The following danger levels are used in safety messages throughout this manual.

<b>DANGER</b>	<i>Will</i> lead to severe injuries or death.
<b>WARNING</b>	<i>May</i> lead to severe injuries or death.
<b>CAUTION</b>	May lead to light to moderate injuries.
<b>NOTICE</b>	May lead to material damage.

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### 1.3 Symbols used

Example	Meaning
▶	You are requested to perform an action.
1. 2.	Perform these actions in the sequence described.
•	List.
	References useful information.

## 2 Installation

The automatic gas cylinder change-over unit is designed for use with CO<sub>2</sub> incubators, and can either be free standing on a horizontal surface or mounted to a wall. The unit can be installed at any point in the gas supply lines, between the two-stage regulator at the gas bottle and the Galaxy incubator, most conveniently situated where the operator can monitor it's operation.

This unit will release small amounts of gas into the working area when the automatic change-over takes place and when the outlet regulator is adjusted. Suitable ventilation must be present at all times when the unit is in use.



Opening the unit will invalidate the warranty.

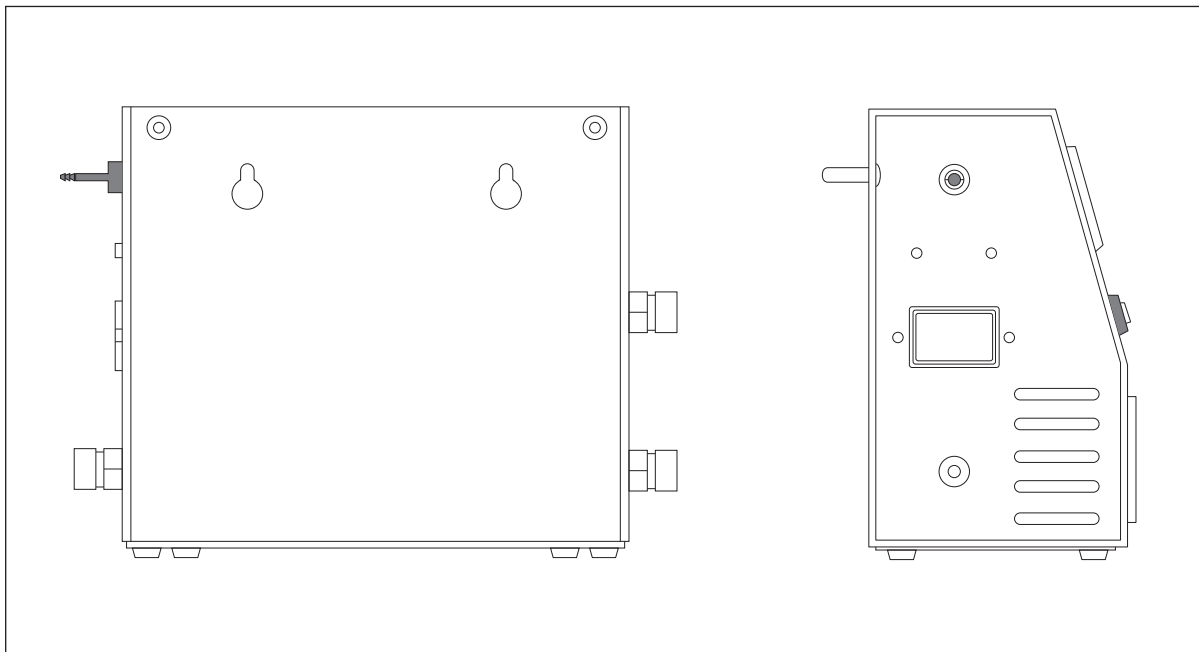


Fig. 2-1: Wall mounted gas cylinder change-over unit

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### 2.1 Connecting gas supplies

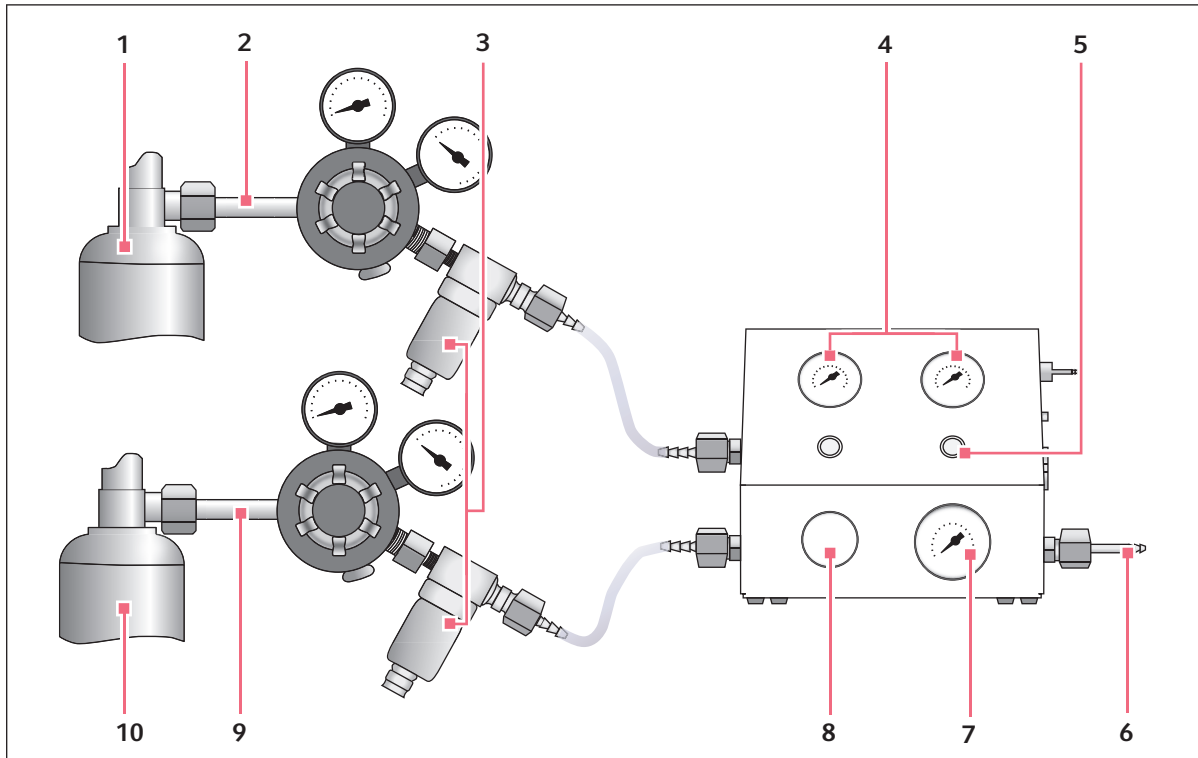


Fig. 2-2: Connecting gas supply to the change-over unit

- |                                    |                                    |
|------------------------------------|------------------------------------|
| <b>1</b> Cylinder B                | <b>6</b> Outlet                    |
| <b>2</b> Inlet B                   | <b>7</b> Outlet pressure gauge     |
| <b>3</b> Filters<br>Optional       | <b>8</b> Outlet pressure regulator |
| <b>4</b> Inlet pressure gauges     | <b>9</b> Inlet A                   |
| <b>5</b> Active cylinder indicator | <b>10</b> Cylinder A               |

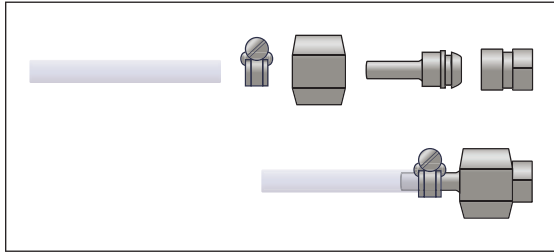
Gas cylinders feeding change-over units must be fitted with suitable regulators to reduce the supply pressure to less than 6.9bar (100psi).

The change-over unit is fitted with 3/8 in BSPP male hose coupler ports to which standard UK regulator hosetails can be fitted. Hosetails for 6.4mm (1/4 in) ID hose are supplied. For best results, filters (P0628-5020, pack of 2 gas supply line filters) should be fitted to the inlet ports to prevent gas borne particles fouling internal valves.

Hoses should be secured with Jubilee® or other suitable clips.



The 3/8 in BSPP port connectors are designed to seal between the faces of the convex hose coupler and the concave port without sealant. The use of sealant paste or PTFE tape is NOT necessary.



1. Connect supply pipework to inlet ports.
2. Clamp hose to hosetail using suitable hose clip.
3. Locate fitting into port.
4. Tighten nut until gas tight.

Fig. 2-3: Connecting gaslines



Do not use sealing paste or PTFE tape.



Do not overtighten.

To prevent internal damage, do not allow port to rotate when tightening hose coupler.

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### 3 Operation

Starting with 2 full cylinders regulated down to between 3.1 bar – 6.9 bar (45 psi – 100 psi), ensure the inlet gauges on the change-over indicate cylinder regulator outlet pressures. Set the unit's outlet pressure to that required by the incubator being served. The unit will feed from the first connected cylinder until this exhausts then the unit will automatically feed from the other cylinder.

On replacing the empty cylinder the unit will continue to feed from the currently active cylinder until this is exhausted and the sequence will then repeat. No manual resetting is required.

#### 3.1 Alarms

The automatic gas cylinder change-over unit is fitted with an audible changeover alarm operated from a 9 V PP3 type battery or equivalent. It is accessed via the battery drawer on the right hand side of the unit.

The alarm switch has 2 reset positions, one of which is constantly active.

- To use the alarm facility, set the alarm switch to the inactive reset position.
- When cylinder changeover occurs, the alarm will sound.
- Switching to the opposite reset position will silence the alarm and set the unit for the next changeover alarm signal.
- Replace the empty cylinder as detailed under operation as shown above.



Alarm may sound prior to changeover.

Setting the alarm to the Off position will remove the audible alarm facility, but the unit will continue to change cylinders as required.

The gas cylinder change-over alarm system detects differential pressure when Inlet B is active. The pressure switch requires minimum 1.4 bar [20 psi] rising pressure on side B to switch state before detecting 1.4 bar (20 psi) falling pressure as cylinder empties.



The alarm will not function if the unit inlet pressure is below 1.7 bar (25 psi).

When side B is active and supplied above 1.7 bar (25 psi) with the alarm switch in the upper reset position, the alarm will remain silent until the supply pressure to port B falls to below 1.7 bar (25 psi), at which point the audible alarm will sound.

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## 4 Technical data

### 4.1 Frequently asked questions

**Q:** Does the gas cylinder change-over unit require electrical power to work?

**A:** The unit does not require electrical power to operate. An on board 9 V PP3 battery (supplied) powers the integral alarm.

**Q:** Do you have a remote alarm for use with the gas cylinder change-over unit?

**A:** We do not currently have our own remote alarm.

**Q:** What is the maximum input pressure to a gas cylinder change-over unit?

**A:** 6.9 bar (100 psi)

**Q:** Do I need to use a pressure regulator on the gas cylinder?

**A:** Yes. As the maximum input pressure for a gas cylinder change-over unit is 100 psi, a regulator needs to be fitted to the gas cylinder. CO<sub>2</sub> cylinders are typically 50 – 60 bar (725 – 870 psi) and nitrogen is typically 250 bar (3625 psi).

**Q:** What are the input and output port connections?

**A:** The input and output port connections are 8/8 in BSPP with a 60 ° cone. However, gas cylinder change-over units are supplied with brass hositails to suit 6.4 mm (1/4 in) ID hose.

**Q:** What gases can I use the gas cylinder change-over unit with?

**A:** The gas cylinder change-over unit is designed for use with inert gases.

**Q:** Can I use the gas cylinder change-over unit with Oxygen?

**A:** No. The gas cylinder change-over unit is not suitable for use with oxygen.

**Q:** Can the gas cylinder change-over unit be used with CO<sub>2</sub>?

**A:** Yes. The gas cylinder change-over unit was specifically designed to be used with inert gases including CO<sub>2</sub>.

**Q:** When should I replace my gas cylinder change-over unit?

**A:** In line with BCGA recommendations, we recommend that all gas cylinder change-over units and associated gas control equipment is replaced every 5 years.

**Q:** Can you service/repair my broken gas cylinder change-over unit?

**A:** As the gas cylinder change-over units contain so many components, it is not cost effective for us to service the unit.

**Q:** Why are the needles in the pressure gauges bent?

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- A:** If a pressure supply of over 6.9 bar [100 psi] has been applied to the gas cylinder change-over unit, this will over pressurise the components including the gauges. The gas cylinder change-over unit must not be used and should be replaced.
- Q:** How is the alarm powered?
- A:** The integral alarm is powered by a 9V PP3 battery (supplied).
- Q:** Why will the integral alarm not sound?
- A:** Ensure that a fully charged battery is correctly fitted into the battery compartment. Also ensure that the alarm switch is in the correct position. (Center position turns alarm off). Consult manual for full details.
- Q:** How do I dispose of the battery once it has run out?
- A:** Batteries should be disposed of in accordance with WEEE directives if inside the EU. For advice, contact your waste disposal supplier.
- Q:** Can the gas cylinder change-over unit be used for medical applications?
- A:** The gas cylinder change-over unit is not designed for contact with patients.
- Q:** Does it matter which inlet port is utilized first?
- A:** No, the gas cylinder change-over unit will automatically feed from the first connected cylinder.



This equipment operates at a maximum altitude of 2000 m.

## 4.2 Disposal

In case the product is to be disposed of, the relevant legal regulations are to be observed.

### **Information on the disposal of electrical and electronic devices in the European Community:**

Within the European Community, the disposal of electrical devices is regulated by national regulations based on EU Directive 2012/19/EU pertaining to waste electrical and electronic equipment (WEEE).

According to these regulations, any devices supplied after August 13, 2005, in the business-to-business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. To document this, they have been marked with the following identification:



Because disposal regulations may differ from one country to another within the EU, please contact your supplier if necessary.

In Germany, this is mandatory from March 23, 2006. From this date, the manufacturer has to offer a suitable method of return for all devices supplied after August 13, 2005. For all devices supplied before August 13, 2005, the last user is responsible for the correct disposal.

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## 5 Ordering information

Part number	Description
P0628-5020	Inlet gas filter with 0.027 micrometer - pack of 2
P0628-5760	Gas tubing and hose clips
P0628-5010	Two stage CO <sub>2</sub> regulator
P0628-7220	Two stage N <sub>2</sub> regulator
P0628-5030	In line regulator for use at the CO <sub>2</sub> incubator gas inlet

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