

# O-Two Self-Study Guide

## Equinox® Relieve



## PRODUCT DESCRIPTION/PRINCIPLES OF OPERATION

The Equinox® Relieve provides spontaneously breathing patients with a preset mixture of oxygen and nitrous oxide for analgesia during painful procedures or to relieve the pain of trauma. The device has two input connectors for connection to hospital piped medical gas systems or nitrous oxide and oxygen cylinders through pressure regulators. The device has only one control for turning ON or OFF the device.



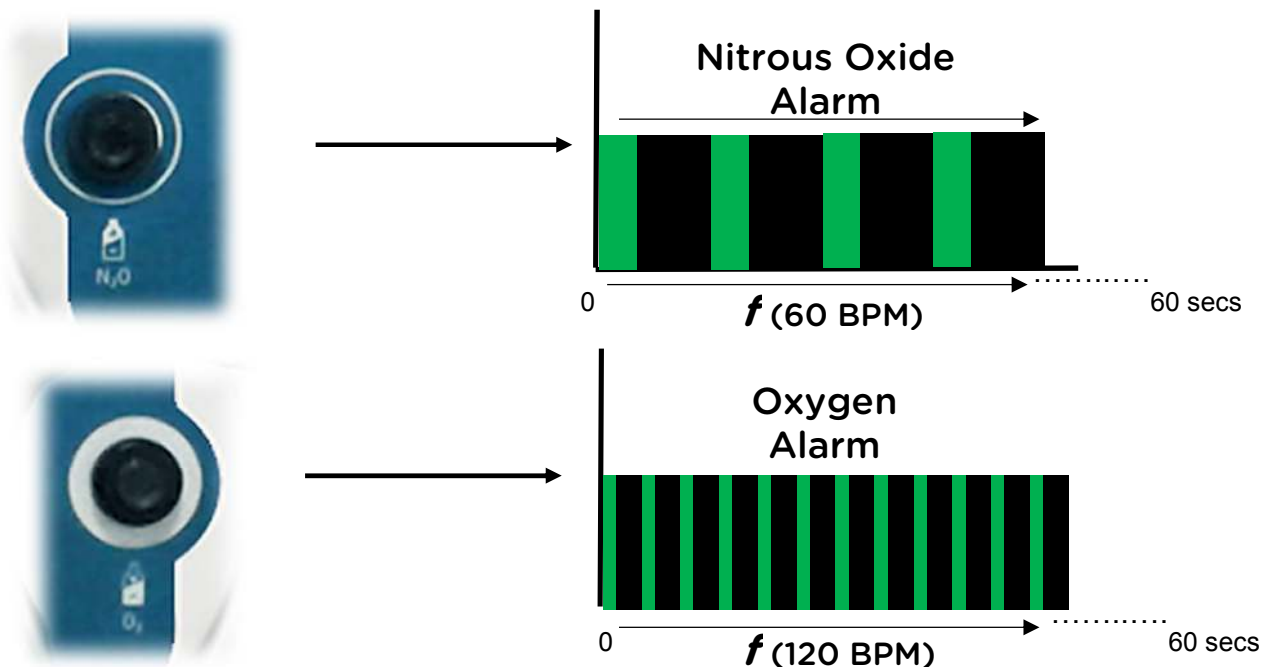
**Fig 1. On/Off Control**

When it is turned ON, the output of N<sub>2</sub>O/O<sub>2</sub> gas mixture will only be activated by an inspiratory effort by the patient. The output of N<sub>2</sub>O/O<sub>2</sub> gas mixture is pre-set at 50/50%. Neither the patient nor medical personnel are able to adjust, eliminating the risk of delivering a hypoxic mixture.

The device is equipped with a Demand System enabling spontaneously breathing patients to demand the preset mixture of nitrous oxide and oxygen. An inspiratory effort by the patient will open the demand valve and gas will flow to the patient at a rate in line with their inspiratory effort.

## ALARMS

The built-in, gas specific, alarm systems will generate both visual and audible alarms should either the nitrous oxide or oxygen input fall below 40 PSI, and the device will be automatically shut off should the oxygen input fall below 35 PSI. Both visual indicator and audible alarm circuits for both gases are powered by oxygen only. This is to prevent the dumping of nitrous oxide gas into atmosphere during alarm cycling.



**Fig 2. Visual alarm indicators and alarm frequencies**

**NOTE:**

If the Oxygen Supply runs out or shuts off, the device will automatically shut off; however, the device will allow the patient to breath atmospheric room air on demand.

**OXYGEN ENRICHMENT (01EQ1000F only)**

An optional Oxygen Enrichment function on the Equinox® Relieve (01EQ1000F) allows the healthcare professional to provide a constant flow of 100% oxygen to the patient. Depressing the oxygen enrichment button provides a 30 L/min flow of 100% oxygen.



**Fig 3. O<sub>2</sub> Enrichment button**

**Warning**

The Oxygen Enrichment function should never be used to provide positive pressure ventilation to non-breathing patients.

**AREAS OF USE**

This device is suitable for use in:

Pre-hospital (emergency medical) use and In-hospital (ER, Labor and Delivery etc.) environments

**INDICATIONS FOR USE**

The Equinox® Relieve N<sub>2</sub>O/O<sub>2</sub> Analgesic Gas Mixing and Delivery System is intended to administer a preset mixture of Nitrous Oxide analgesic gas and Oxygen, on demand, to a conscious, spontaneously breathing patient.

**CONTRAINDICATIONS**

The contraindications for this device include, but may not be limited to:

- Hypersensitivity to the medication
- Head injuries with impaired consciousness
- Maxillofacial injuries
- Artificial, traumatic or spontaneous pneumothorax
- Air embolism
- Middle ear occlusion, ear infection
- Decompression sickness
- Abdominal distension / intestinal obstruction

**NOTE:**

Nitrous Oxide/Oxygen (N<sub>2</sub>O/O<sub>2</sub>) mixtures must never be used in any condition where air is trapped in the body and expansion (up to 3x original size) would be dangerous. For example, it will exacerbate pneumothorax and increase pressure from any intracranial air. Air in any other cavities such as the sinuses, middle ear and abdomen may also expand.

## PERFORMANCE SPECIFICATIONS

Minimum Flow rate	120 L/min
Exhalation Resistance	0 to 6 cmH <sub>2</sub> O
Inhalation Resistance	0 to -6 cmH <sub>2</sub> O
Oxygen Concentration	42.5 to 57.5%
Input Pressure	50 to 70 PSI
Demand Valve Triggering Pressure	-1.5 to -2.5 cmH <sub>2</sub> O
Operating Temp	41 <sup>o</sup> F to 104 <sup>o</sup> F
Storage Temp	-40 <sup>o</sup> F to 140 <sup>o</sup> F
Nitrous Oxide Input Connection	CGA1040 DISS
Oxygen Input Connection	CGA1240 DISS
Patient Connector	15/22 mm
Patient Circuit	Single use, dual limb circuit c/w 30 mm connector on the expiratory limb
Patient Valve Dead Space	8 ml

**Fig 4. Performance Specifications**

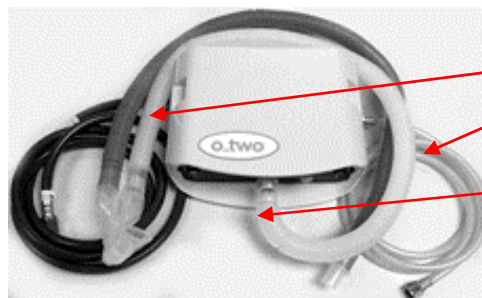
## OPERATING INSTRUCTIONS

### Connection of hoses

The **Equinox® Relieve** System is designed to operate on medical nitrous oxide and oxygen from either pressure regulated medical gas cylinders or “piped-in” systems. The inlet fittings on the device are non-interchangeable.

In case of failure in gas input systems, the **Equinox® Relieve** is equipped with internal pressure regulators that can handle input pressure up to 1.5 times the design input pressure without having damage to internal components.

The nitrous oxide supply hose provided shall be attached to the N<sub>2</sub>O input connection on the left side of the device when facing it. The oxygen supply hose provided shall be attached to the O<sub>2</sub> input connection on the right side of the device. Tighten the supply hoses **“Finger tight” only – DO NOT USE A WRENCH** (Fig 7.).



1) Attach the input hoses to the device.

2) Attach a new patient circuit to the device.

### **Fig 7. Connecting the Supply hoses and Patient Circuit**

NOTE: Refer to the product manual for further definitions and descriptions of function.

Rev 0. 24\_09\_2017

**WARNING:**

Using a wrench or excessive force in tightening the supply hose may damage the seal or the thread of the connection.

**PATIENT CIRCUIT**

The patient circuit is attached to the gas outlet on the front panel of the control module by simply pushing the 22 mm taper over the outlet.

**ON/OFF SELECTOR**

The ON/OFF SELECTOR controls the device in either normal operating function or shut off. With the gas supply turned on simply rotate the control to the ON position and the patient can then breathe, “on demand” on 50/50 N<sub>2</sub>O/O<sub>2</sub>

**CLEANING**

Routine cleaning of the device shall be undertaken to maintain the device in a clean condition.

Patient circuit with mouth piece of the device is intended for single use and shall be discarded after each patient use in accordance with local protocols and replaced with a new circuit.

All other components should be wiped clean with a mild soap solution or hard surface disinfectant suitable for the materials of manufacture of the device. Under no circumstances should the complete unit be allowed to be soaked or immersed in cleaning solutions.

**Detailed cleaning procedures are as follows:**

1. Turn the device OFF.
2. Ensure that the device is disconnected from the gas supply source.
3. Remove N<sub>2</sub>O and O<sub>2</sub> input hoses and wipe clean with a mild soap or hard surface disinfectant. Ensure no cleaning solution enters the hoses.
4. Remove the single patient use circuit from the device and dispose of safely in accordance with local protocols.
5. The enclosure of the device can be wiped over with a soft cloth and mild soap solution or hard surface disinfectant. Ensure no cleaning solution enters the input fittings.
6. If there is ingrained contamination a soft bristled brush may be used.
7. Dry all components thoroughly.
8. Attach a new patient circuit and connect the unit to gas supply to check function prior to packaging for emergency use.

**WARNING:** Do not attempt to clean and sterilize any components that are designated as disposable.

**O-Two Medical Technologies Inc.**

45A, Armthorpe Road, Brampton, Ontario, Canada L6T 5M4

Toll Free: **(800) 387 3405** Tel: **(905) 792 OTWO (6896)** Fax: **(905) 799 1339**

E-mail: [resuscitation@otwo.com](mailto:resuscitation@otwo.com) Website: [www.otwo.com](http://www.otwo.com)

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