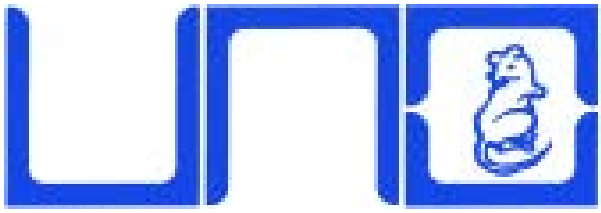


Your partner for advise on and delivery of Laboratory Animal Equipment!

ANAESTHESIA

General Information

The demand for anaesthesia equipment that can be used for small laboratory animals has increased substantially. Following this trend, UNO has been and still is actively involved in the design and manufacturing of complete anaesthesia systems even for the smallest animals. In addition to anaesthesia set-ups with effective evacuation of the anaesthesia gas mixture, we also have monitoring equipment available for Temperature, Capnography, Pulse Oximetry and ECG with Respiratory Monitoring available.

We aim not only to supply the products but make sure that once the products arrive at your facility, the know-how about setting up and using the system is also available! A wide range of products and services is provided to help you to obtain the most suitable set-up.

Pro's and Con's of the three most used type of anaesthesia:

Injectable agents: mostly i.p. or i.m.

PRO's
+ Quick and easy to apply (1 injection)
+ Choice between many products (rat/mouse)

CON's
- Due to variation (male/female/breed) or calculated time for procedure, it can be necessary to re-adjust the anaesthesia
- Injection anaesthesia is IN-FLEXIBLE;
  - extra injection agent if deeper or longer anaesthesia is required.
  - too deep/long anaesthesia when "over injected" or injecting antagonist.

Inhalation anaesthesia: face mask

PRO's
+ Flexible anaesthesia "depth" / better control
+ Also for short(er) procedures
+ Different gasses (mixtures) possible

CON's
- No respiratory control (or pressure control)
- Adjusting could be relatively slow (if long tubes are used)
- A gas exhaust system is required.

Inhalation anaesthesia: *endothracheal intubation and ventilator*

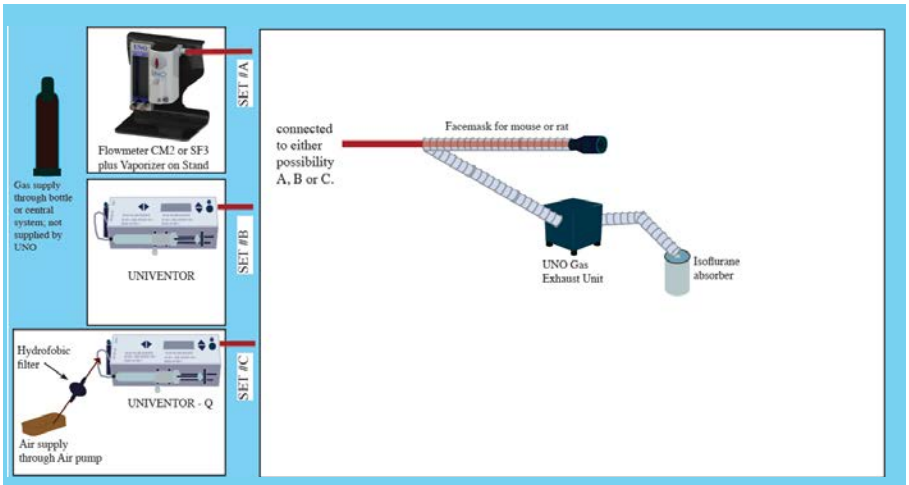
PRO's
+ For shorter and longer procedures
+ Different gasses (mixtures) possible
+ Full respiratory / -support possible
+ Quick adjusting when using a **pressure, volume and frequency** driven ventilator.
+ P.E.E.P. Setting possible (standard AND open thorax)
+ Economical use of anaesthetic gasses

CON's
- Intubation technique is considered to be "difficult" (but with the UNO Intubation Aid it is very easy.)

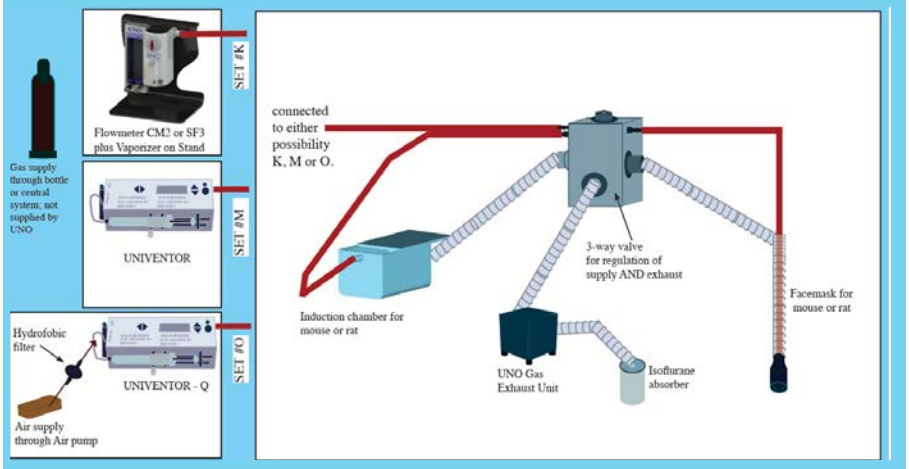
On the next pages we inform you about the mostly used set-ups available for Inhalation Anaesthesia. But please keep in mind that these are just examples. A large number of adjustments are possible and available.

Just contact us if you need assistance determining what is needed in your facility!

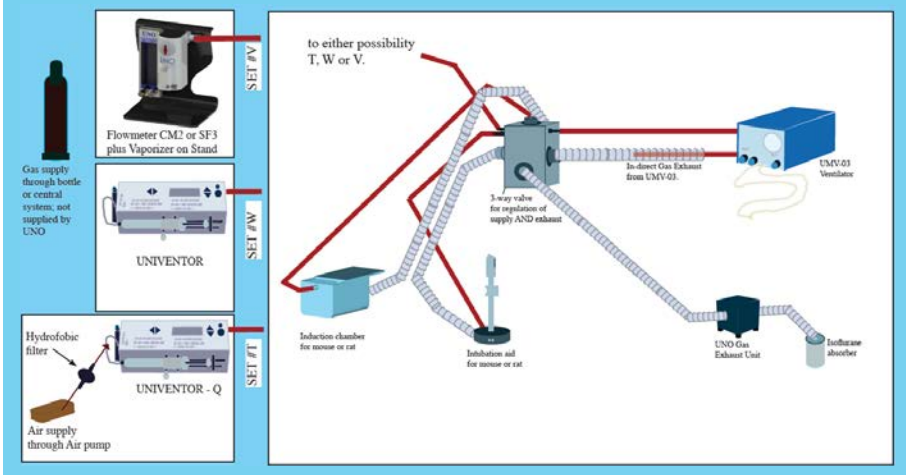
These schemes are just a sample of possible combinations of our anaesthesia products. The dimensions of the seperate parts drawn, bear no relation to the real dimensions of the products.



This scheme ABC is an indication of the parts needed to achieve a complete set-up with 1 face mask and 1 gas exhaust unit.



This scheme KMO is an indication of the parts needed to achieve a complete set-up with 1 face mask, 1 induction box and 1 gas exhaust unit.



This scheme TWV is an indication of the parts needed to achieve a complete set-up for controlled anaesthesia with ventilator and intubation aid.

Anaesthesia UNO

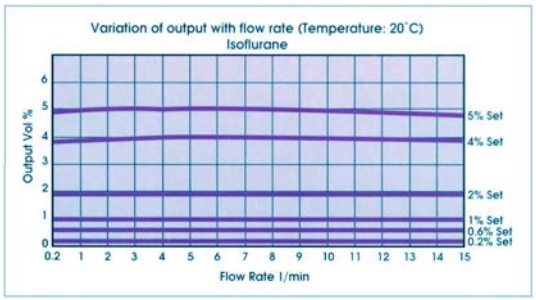
Vaporizers

The Sigma Delta Vaporizer is the latest product from Penlon in a distinguished line of vaporizers of the highest quality and reliability. It delivers accurate concentrations under varying conditions of flow rate and temperature, **particularly at low flows**.

- Selectatec®, Drager Plug-In®, North American Drager, Cagemount connection
- Superb performance over a wide range of vapour concentration and temperatures, particularly at **low flows.**
- Halothane, Enflurane, Isoflurane, Sevoflurane
- Keyed Filler, Quik Fil®, or Pour fill
- Efficient Selectatec®, Drager, and North American Drager compatible interlock systems
- Low Body Weight
- Service Free; *Presumes ten year life requiring no prevetative maintenance service. It is recommended that a service is carried out at ten years. Halothane vaporizers require a five year service.*

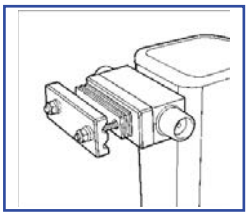
Technical Specification

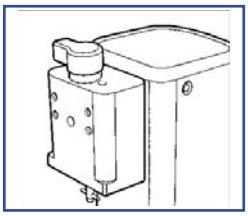
Capacity (ml)	Volume at MAX Mark	240+/- 10ml
	Volume at MIN mark	35 +/- 10ml
	* After draining approx. 60 +/- 10ml of liquid is retained by the wick.	
Operating Flow range	0,2 to 15 L/min	
Operating temperature range	15 to 35˚C	
Dimensions (wxdxh) in mm	Cagemount	133 x 158 x 219
	Selectatec Compatible with Interlock	120 x 190 x 242
	Dräger Plug-In compatible	100 x 190 x 242
Weight	5kg	

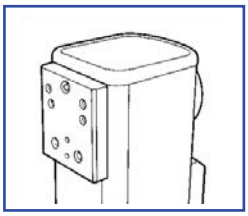


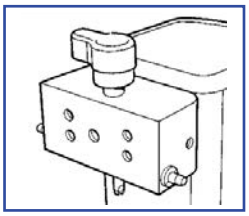
The Sigma DeltaVaporizer is available with different connection systems and gasses:

Vaporizer Type	Isoflurane		Sevoflurane			Enflurane		Halothane		
	5%		8%			5%	7%	4%	5%	8%
Filler Type	Pour	Keyed Filler	Pour	Keyed Filler	Quick Fil	Pour	Keyed Filler	Pour		Keyed Filler
Cagemount Taper mm	√	√	√	√	√	√	√	√	√	√
Selectatec Compatible with Interlock	√	√	√	√	√	√	√	√	√	√
Drager plug-In Interlock Compatible	√	√	√	√	√	√	√	√	√	√
North American Dräger	√	√	√	√	√	√	√	√	√	√
Selectatec Compatible	√	√	√	√	√	√	√	√	√	√


Cagemount Taper


Drager Plug-In Interlock Compatible


North American Dräger


Selectatec Compatible with Interlock

Ordering number	Product
180000002	Isoflurane vaporizer - Cagemount Taper
180000072	Sevoflurane vaporizer - Cagemount Taper
180000010	Key- Filler - Isoflurane
180000010-S	Key- Filler - Sevoflurane
180000005	ISO connector 23mm

The flowmeters type SF1, CM2 and SF3 are devices for the supply of medical gases with antistatic and graduated measure tubes and complete with a dosage unit. The body is made of anodized aluminium and the inlet connection at the bottom of the flowmeter is arranged to be connected to existing circuits of gases centralized feeding or to the cylinders complete with pressure regulators. At the outlet of the dosage unit, an anaesthesia vaporizer can be connected or the gas mixture can be supplied directly to the animal through the gas feeding unit. Different constructions can be made on request.

	SF1		CM2		SF3	
Ordering Code						
Dimensions						
Height	300 mm		300 mm		300 mm	
Width	73 mm		113 mm		132 mm	
Depth	117 mm		117 mm		113 mm	
Weight	1,00 Kg		1,45 Kg		1,9 Kg	
Dosage Range	O_2	0,1 - 1 L/min	O_2	0,1 - 2L / min	O_2	0,1 - 1L / min
			Air	0,1 - 2L / min	Air	0,2- 15L / min
					N_2O	0,1 - 1L / min
Accuracy	± 10% read value or ± 0,3 L/min.					
Inlet pressures	3,5 - 5 bar ± 20%					
Charge loss level, side under pressure (before the adjusting needle valve)	Less than 25ml/min in normal pressure conditions (ISO 5358)					
Charge loss level, low pressure side (after the adjusting needle valves, vaporizer excluded)	Less than 25ml/min. at 30cm H_2O.					
Gas Outlet connection	Connical connection* 23 mm F ISO DIN 5356/1		---		---	
Mixed Gas Outlet connection	---		Connical connection* 23 mm F ISO DIN 5356/1		Connical connection* 23 mm F ISO DIN 5356/1	
Gasses inlet connection	Tubing connector ø 6		Tubing connector ø 7		Tubing connector ø 6	

* Connical connection 23mm, F ISO DIN 5356/1
Ordering code: 180000005

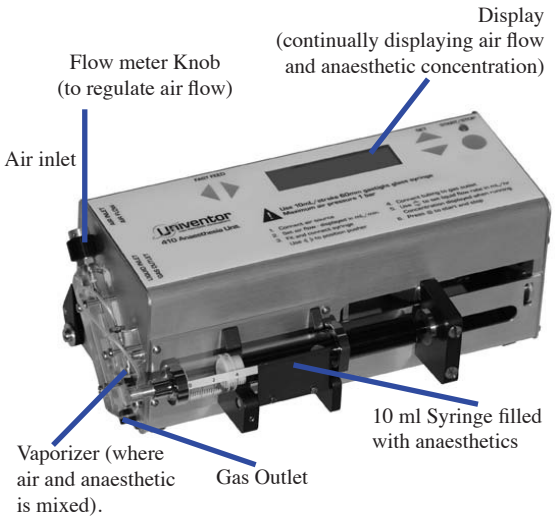
Univentor ; digital controlled anaesthesia unit - combined Flowmeter and Vaporizer

- **Designed for small rodents**
- **Precise control of anaesthetic and air**
- **Minimised anaesthetic consumption**
- **Air flow from 50 ml/min up to 999 ml/min**
- **Connects to mask, anaesthetic chamber or ventilator**
- **Pre-calibrated for Isoflurane**
- **Very small foot print and no fixed installation**
- **User, Animal and Environment friendly**
- **Audible alarm as end of syringe approaches**
- **Pusher reverses automatically when syringe is empty**
- **Easy to use**

The Univentor 410 Anaesthesia Unit is designed to control the mixture of liquid anaesthetic and air with the precision required to successfully operate on animals weighing from 20-500 grams.
The Univentor 410 is designed to operate with compressed air **reduced to not more than 1 bar** whereas the Univentor 410-Q has been adapted to work with a pulse-free airpump. Air and anaesthetic is mixed in the vaporizer according the setting and may be delivered into an anaesthetised box, through a mask or to a ventilator.
Even though pre-calibrated for Isoflurane, other anaesthetics may be used taking the various properties into consideration that the unit is calibrated for Isoflurane.

Technical Specification

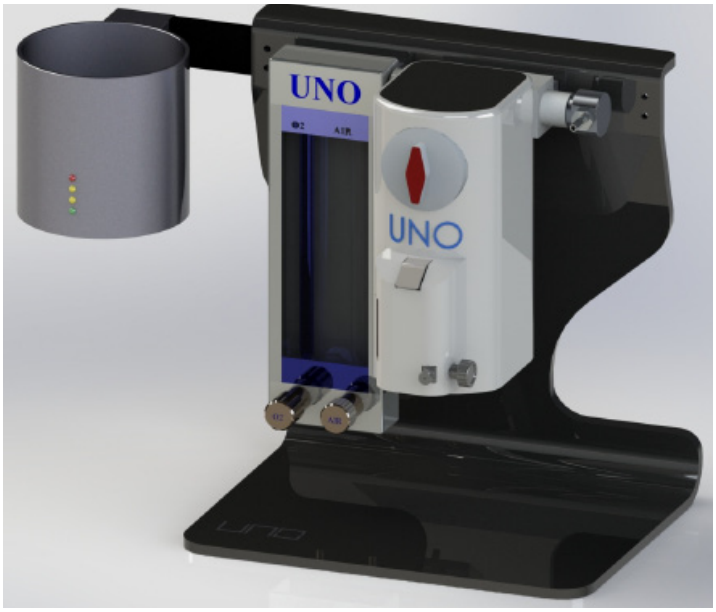
Dimensions	120 (W) x 285 (L) x 95 (H)mm	
Weight	1,8 kg	
Power supply	110-240 V, AC 50-60Hz, Battery 12V, 400mA	
Drive motor	Pulse free DC Motor with variable speed setting	
Fast feed	Pusher movements of 45 mm/min	
Pusher Movement tolerance	+/- 0,1mm or +/- 1% of total distance	
Max. Pusher Force	100 N	
Concentration tolerance	+/- 0,15% if displayed value	
Syringes	1 glass, gas-tight 10ml syringe with 60mm stroke	
Display	2 x 16 characters	
Safety features	Audible alarm and red LED	
Min. Liquid Flow rate	0,4 ml/ hr	
Max. Liquid Flow rate	10 ml/ hr	
Min. Air Flow rate	50 ml/ min	
Max. Air Flow rate	999 ml/ min.	
	Univentor 410 - Q	**Univentor 410**
Min. Air Pressure	0,3 bar	0,5 bar
Max. Air Pressure	0,5 bar	1,0 bar



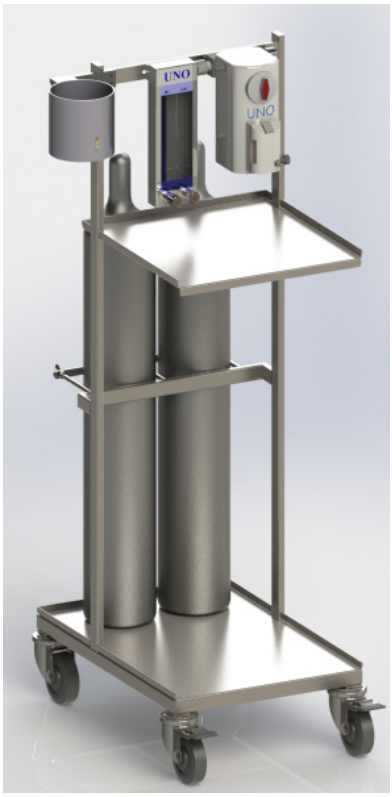
When using the Univentor 410-Q you need to have a hydrofobic filter between the pump and the Univentor!

Ordering number	Product
180000211 Q	Univentor 410-Q
180000211	Univentor 410
180000011-S	Replacement Glass Syringe
180000082	Pulse free Air Pump
180000080	Hydrofobic filter

Our standard **Stand** for mounting the vaporizer and flowmeter is made from black anodised aluminum.
Ordering Number: 180000206
Optionally it is available with a holder for the LED holder of the Contrafluran Adsorption filter.



A number of custommade mounts are available as well, like Trolleys or mounts to hang the vaporizer and flowmeter on the wall. Please, contact us if you have specific requirements.



Induction Box

The UNO Induction Box combined with the UNO Gas Exhaust Unit can be used for inducing inhalation anaesthesia with rats and mice. (An anaesthetic gas mixture from a flowmeter/vaporizer should be available.)

The Induction Box is made in 10mm thick red acrylic with an inlet hose connector at bottom level and at the oppossite side an outlet ø23mm (at the level of the lid).

The special designed lid can be opened by vertical sliding the lid of the Induction Box. When the Induction Box is connected to the UNO Gas Exhaust Unit and the lid is closed, very little air (anaesthetic gas mixture) is being exhausted from the Induction Box because of a relatively high internal resistance. Therefore the animal is optimally exposed to the anaesthetic gas mixture.

As soon as the animal is anaesthesized, the lid of the Induction Box can be slightly slided open. By sliding the lid only a little bit open (± 10mm), the internal resistance has gone and the UNO Gas Exhaust Unit is immediately exhausting at maximum capacity, thus preventing the anaesthetic gas mixture to escape from the Induction Box into the room/working area. The Induction Box is thus rapidly emptied from the anaesthetic gas mixture (10 - 15 seconds) and the lid can be taken off to get the anaesthesized animal (mouse or rat) out.

Finally it can be mentioned that the UNO Gas Exhaust Unit can also be connected to an Active Charcoal Filter (for adsorbing the isoflurane) or to an appropriate “in-house” exhaust system.

Ordering number	Product	Internal Dimensions (L x W x H)	External Dimensions (L x W x H)	Connection Supply hose	Connection Exhaust hose
180000232	Induction box for mouse	150 x 900 x 70mm	170 x 120 x 95mm	ø 5,4mm	ø 23mm
180000233	Induction box for rat	250 x 130 x 90mm	270 x 150 x 115mm	ø 5,4mm	ø 23mm
on request	Induction box for rabbit	410 x 205 x 268mm	430 x 225 x 293mm	ø 5,4mm	ø 23mm

Open Induction Box

This **OPEN INDUCTION BOX** is meant to be used for situations where a lot of animals have to be treated or handled for a short procedure (blood – or tissue sampling or other short procedures).

The upper part of the OPEN INDUCTION BOX is double walled with holes on the inside and the exhaust tube connections on the outside. The 3 tubes are brought together and all connected to the Exhaust Unit.

When the Exhaust Unit is turned on, an underpressure is created in the double wall.
The continuous anaesthetic gas mixture from a Flowmeter / Vaporizer combination enters the lower end of the round Open Induction Box just below the perforated s.s. floor on which the animals are placed.

The gas mixture slowly goes through the perforated floor and stays low because the gas mixture is heavier than air. Of course after building up more volume of the gas mixture, the level rises and finally will be exhausted through the double wall part where the underpressure is.

There is only one important matter: the mouse has to be placed in / taken out WITH A SLOW MOVEMENT in order to prevent too much turbulence.

Ordering number	Product	Internal Dimensions (Ø xH)	External Dimensions (Ø x H)	Connection Supply hose	Connection Exhaust hose
180000235	Induction box - Open	120 x 140mm	150 x 259mm	ø 23mm	ø 6mm

Face Masks

For inhalation anaesthesia without respiration support, UNO has Face masks available;

All models are to be connected to a supply system for an anaesthetic gasmixture (like vaporizer and flow-meter or univentor). The second connection is to a gas exhaust system which safely removes the exhaled/ non used anaesthetic gasses; like the UNO Gas Exhaust unit. The face masks are supplied with extendable exhasut tubes. (40cm - 120cm length).

Face mask for mouse.

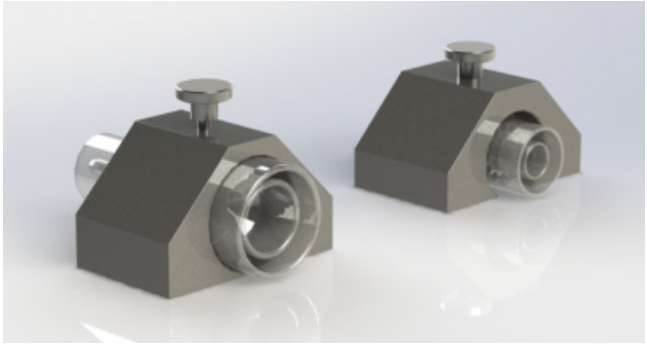
- with small nose “cone” specially designed for use with mice
- excellent gas exhaust*
- good cleanability

Face mask for rat.

- with larger nose “cone”
- to be used with rats (and mice depending on type of operation)*.
- gas exhaust and cleanability as for the mouse face mask.

* in combination with the UNO Gas Exhaust Unit.

Ordering number	Product	Details
180000265	Face mask Mouse	ID Supply: ø 10mm ID Exhaust: ø 20mm Overall dimensions: 60,5 x 28 x 25,25mm Connection Supply hose: ø 4mm Connection Exhaust hose: ø 22mm
180000237	Face mask Rat	ID Supply: ø 19mm ID Exhaust: ø 29mm Overall dimensions: 81 x 33 x 33mm Connection Supply hose: ø 4mm Connection Exhaust hose: ø 22mm

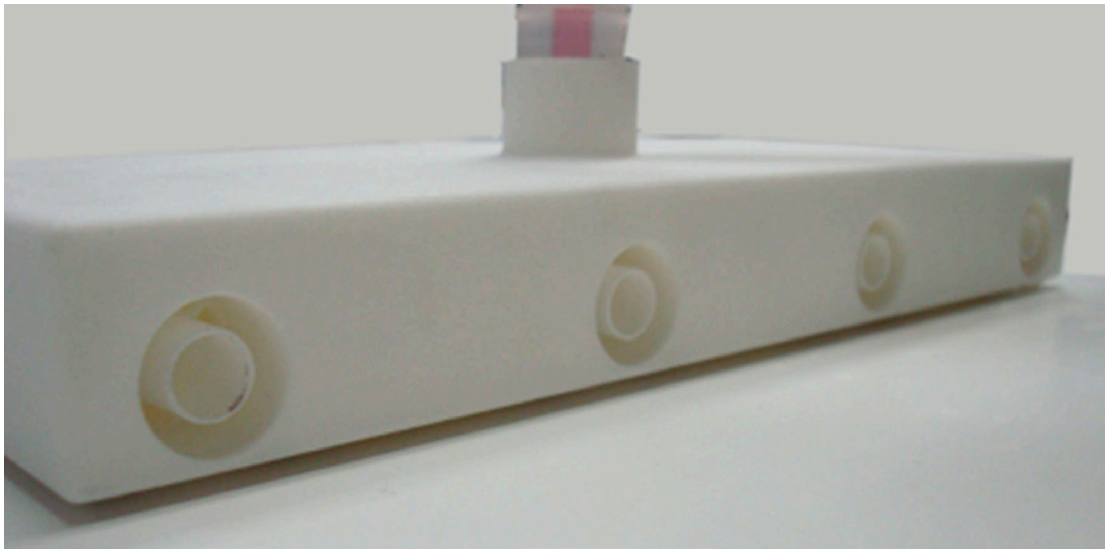


Fixator for face masks

The face masks are shaped with a flat bottom but sometimes you want to have it secured to a certain place. For this fixators are available.

- made in Stainless Steel
- to keep the face mask in place, f.i. on a heating plate.

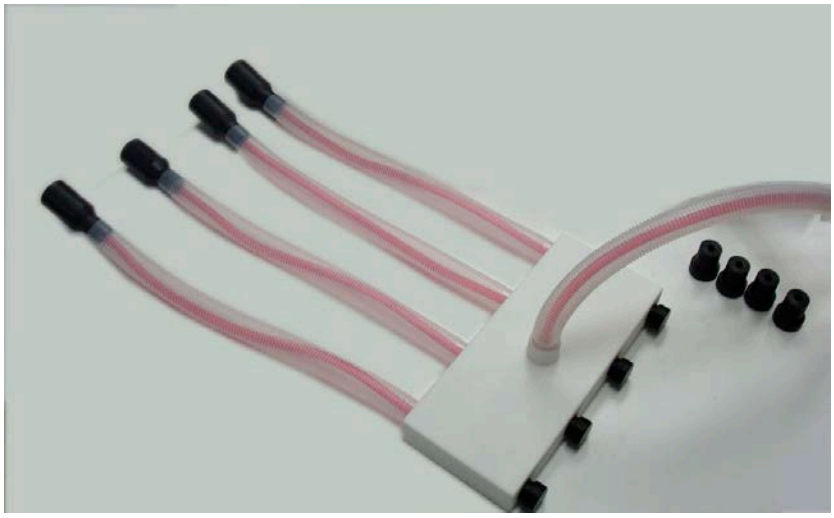
Face mask



Multi Face Mask.

- Allows to have 4 mice kept under anaesthesia simultaniously.
- Each mouse is placed with its snout directly into the face mask*[1].
- tThe multi face mask is delivered with stoppers that can seal the cones shut.
- On the opposite of the openings for the mouse, the Multi facemask has four (4) connections for face masks with tubing. Thus making it possible to connect 4 Rat face Masks with tubing. It is also possible to have 4 facemasks for Mouse connected if you want to place the animals a bit further apart from eachother.

Ordering number	Product	Details
180000136	Multi face mask	ID Supply: ø 10mm ID Exhaust: ø 20mm Overall dimensions: 264 x 115,5 x 33mm Connection Supply hose: ø 4mm Connection Exhaust hose: ø 22mm
180000136R	Multi face Mask - extended for 4 rats	See Multi face mask plus 4 facemask rat
180000136M	Multi face Mask - extended for 4 mice	See Multi face mask plus 4 facemask mouse



A face mask for rabbit is also available on request.

Multi face masks

UNO GAS EXHAUST UNIT

The UNO Gas Exhaust Unit can be used for the direct-exhaust of waste anaesthetic- and exhaled gas while using Face Masks or Induction Boxes for rat and mouse.

Further the UNO Gas Exhaust Unit can be used for the **indirect-exhaust** of the excessive anaesthetic gas from the circle system of f.i. the UNO Micro Ventilator (UMV) at various volume- and pressure settings of the UNO Micro Ventilator - UMV-03.

In order not to spill the anaesthetic gas mixtures into the working area, and for good functioning of the Gas Exhaust Unit, the supply of the gas mixture to the Face Masks should be set at a maximum of:

- **Face Mask - rat: - ± 350 ml/min***
- **Face Mask - mouse: -± 260ml/min****
- **UNO Micro Ventilator UMV-03**
  The supply of the anaesthetic gas mixture to the UNO Micro Ventilator (UMV) is set at a lower level than the Face Mask, because with the use of the UMV and the correct size intubation tube, there is only little waste of anaesthetic gas mixture***

*** Face Mask Rat**:
- tidal volume: ca. 2,5ml
- breathing frequency during anaesthesia: ± 60-70/min
- total breathing volume / min: 150 - 175 ml/min
- not all gas supplied is "used" by the rat and as a rule of thumb, the gas supply to the Face Mask is about twice the breathing volume/min, i.e. 300-350ml/min.

**** Face Mask Mouse:**
- tidal volume: ≤ 1ml
- breathing frequency during anaesthesia: ± 110 - 130/min
- total breathing volume / min: 110 - 130 ml/min
- not all gas supplied is "used" by the mouse and as a rule of thumb, the gas supply to the Face Mask is about twice the breathing volume/min, i.e. 220 - 260 ml/min.

***** Ventilator UMV-03** - The supply of the anaesthetic gas mixture to the UMV-03 is set at a lower level than the Face Mask rat or mouse because with the UMV-03 there is only little waste of the anaesthetic gas mixture. It should be slightly higher than the total breathing volume mentioned under Face Mask Rat and Face Mask Mouse plus some extra for maintaining a P.E.E.P. during the ventilation:
- Rat 250 - 300
- Mouse 200 - 230

Ordering number	
180000118	Gas Exhaust Unit
Dimensions	
Weight	
Power	
Inlet Connection	ø 23mm
Outlet Connection	ø 23mm

Gas Exhaust
UNO

Adsorbtion Filters

UNOSORB - FILTER

The UNOSORB Anaesthetic* Gas Filter consists of small grain activated charcoal for optimal adsorbtion of anaesthetic gasses. * Isoflurane, Halothane or Sevoflurane.

- The UNOSORB filter is suitable for Animal Anaesthesia gas removal.
- A disposable canister, containing activated charcoal.
- The UNOSORB canister can be connected directly to the scavenging tubing (f.i. UNO Gas Exhaust Unit).
- The charcoal absorbs organic anaesthetic gasses e.g. Sevoflurane, Isoflurane and Halothane.
- The weight of the canister must be monitored so that it can be replaced before it becomes saturated, once saturated any waste gasses will simply be exhausted into the working environment.

Adsorption volume 200grams

CONTRAfluran™- FILTER

The patented Contrafluran™ Anaesthetic Gas* Scavenging Filter consists of solid materials, distinguished by their rugged grain structure, extensive surface area and high micro-porosity.

This highly porous internal structure adsorbs efficiently and retains anaesthetic gas components selectively from the exhaled- or un-used anaesthetic gas as it passes through the filter.

The storage capacity of the CONTRAfluran Anaesthetic Gas Scavenging Filter is ca. 400gr and the flow resistance is with a ≤ 1,5mm wc, **VERY LOW!**

Adsorption volume 400grams

The filter can easily be attached to the flowmeter/vaporizer stand or on a seperate rail, with the help of the SENSOfluran™ , a mount integrated with a visual FILL-LEVEL-CONTROL-UNIT*.

The differently colored LEDs (green, yellow, red) of the Sensofluran Mount indicate the quality of the filtered expired gas and thus the fill level of the filter.

LED;
The filter adsorbs the expired gas and has still sufficient free capacity.

LED:
The capacity of the filter diminishes. A filter change is recommended when the second yellow LED lights up.

LED:
The capacity of the filter is exhausted and should not be used anymore. The used filter must be replaced by a new one.

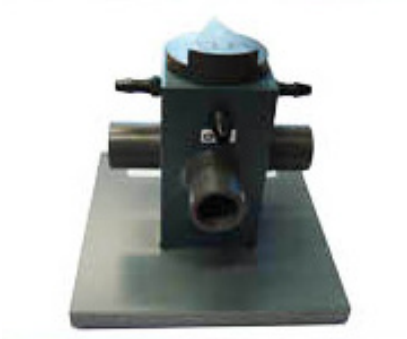
Ordering number	Product	Weight	Storage Capacity
180000140	UNO Sorb Filter	approx. 1.200gr	approx. 200gr
180000138	Contraflurane Filter	approx. 1.000gr	approx. 400gr
180000139	LED holder for contraflurane filter		

* Due to legal reasons the device must be sent to UNO in a period of 12 months for calibration.

Adsorbtion

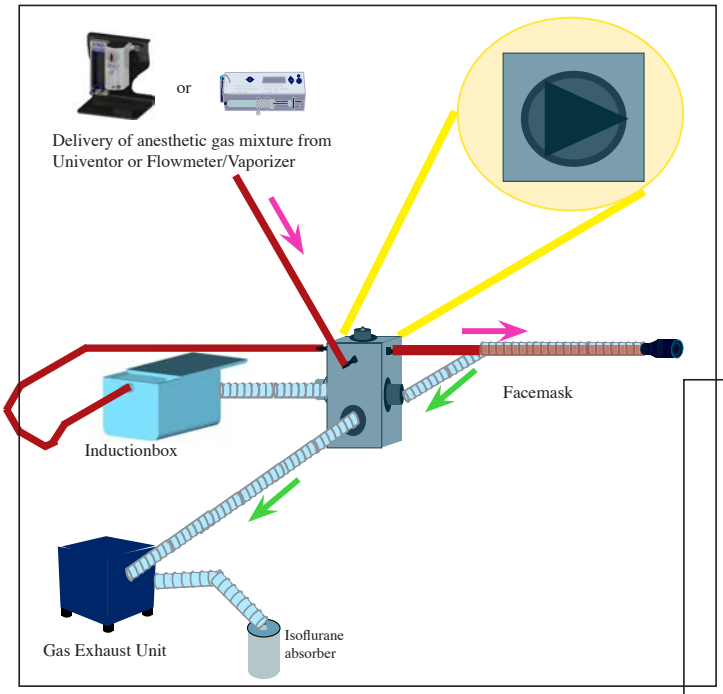
Double 3- and 4-way valves.

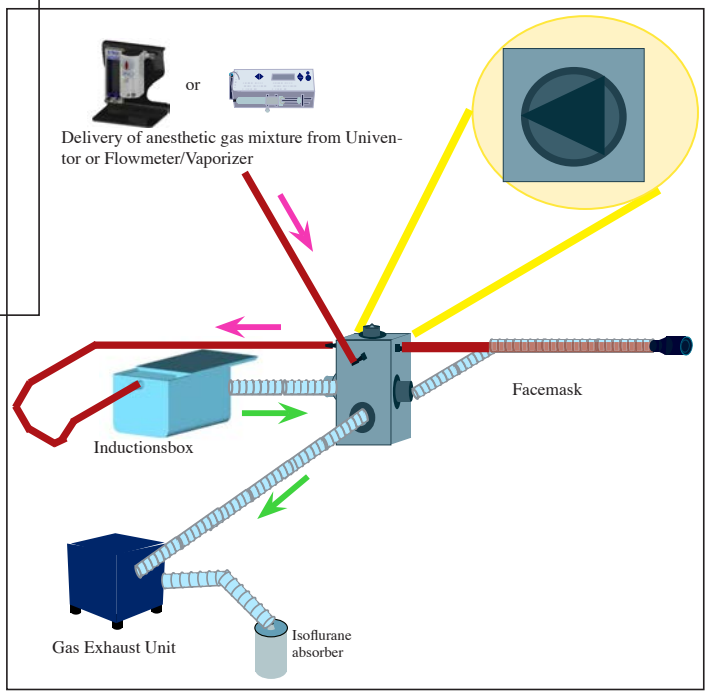
To be used for simultaneously changing the direction of both the **SUPPLY** of the anaesthetic gas mixture ***AND*** the **EXHAUST** of the anaesthetic gas mixture. The risk of making mistakes when the gas supply and gas exhaust have to be changed individually from f.i. the Induction box to the face mask, is reduced substantially by using these valves.

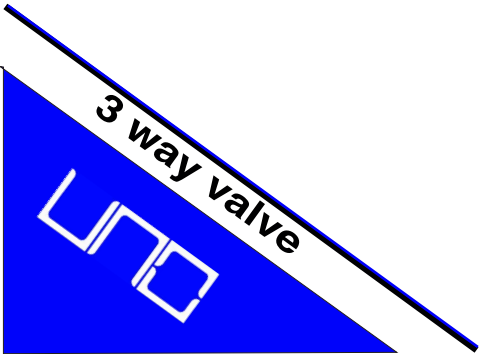


Ordering number	
180000159	Double 3-way valve
180000259	Double 4-way valve

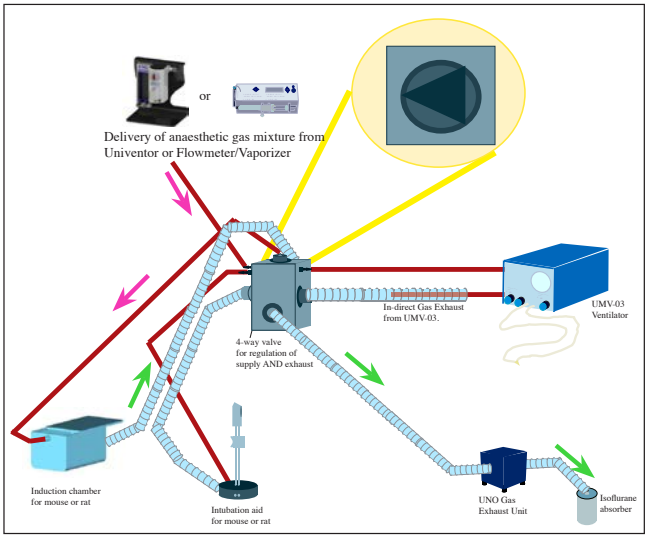
3-Way Valve:
By turning the knob from the right to the left, both supply and exhaust are being directed from the face-mask to/from the Induction box.



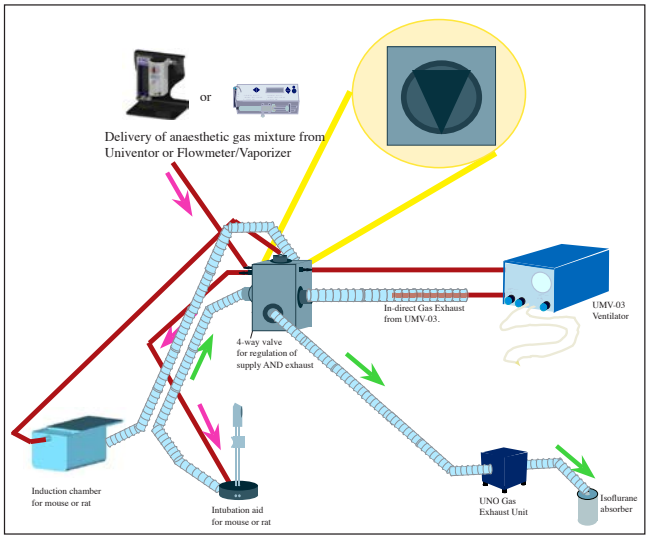




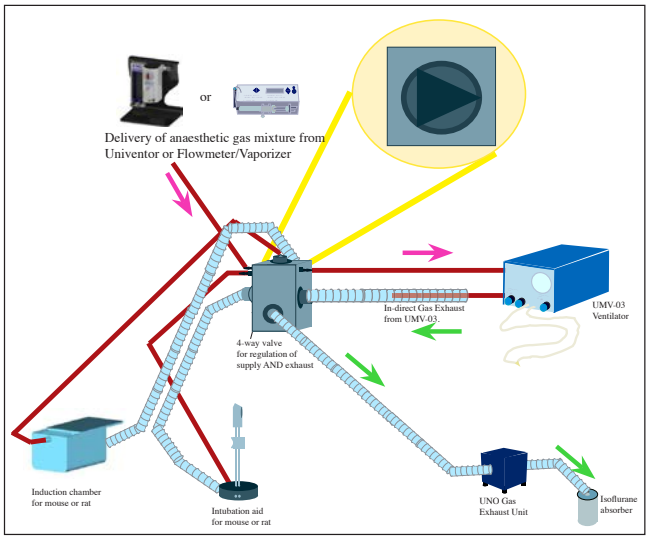
4-Way Valve:



A.. By turning the knob to the left, both supply and exhaust are being directed to/from the induction box.



B.. By turning the knob to the center, both supply and exhaust are being directed to/from the intubation aid.



C.. By turning the knob to the right, both supply and exhaust are being directed to/from the UMV-03.

UNO Micro Ventilator UMV-03

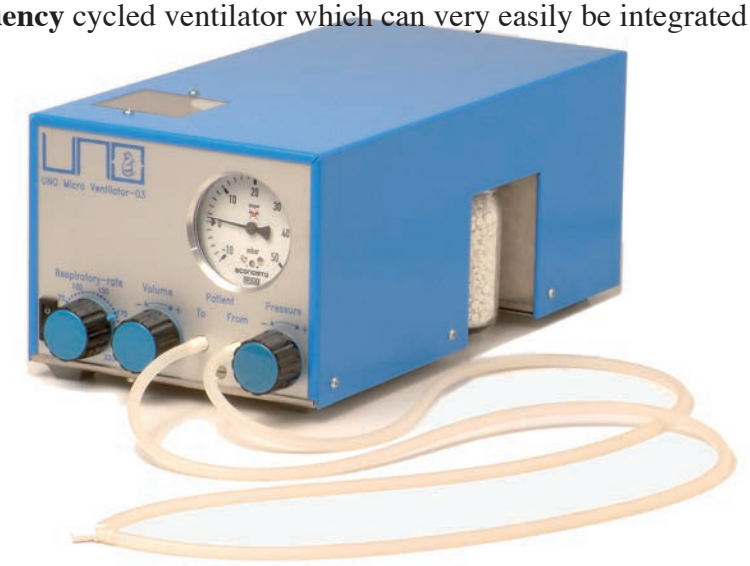
The UNO Micro Ventilator-03 is a mechanical ventilator uniquely designed for use with mice and rats for respiratoric support or totally controlled inhalation anaesthetic.

This revolutionary new concept of mechanical ventilation with an extreme small dead volume, has a proven performance, even with **mice of ≥ 12 gr. bodyweight.**

This unit has even been used for lung transplantation in mice!

The ventilation pattern of the UMV-03 is based on the natural, spontaneous respiratory pattern of rat and mouse, i.e. a **SINUS-form** without a plateau pressure.

The UMV-03 is a **pressure**-, **volume**- and **frequency** cycled ventilator which can very easily be integrated in a flowmeter / vaporizer set-up.



Characteristics of the UMV-03:

~~Tidal~~ Volume setting at the ventilator (without counter pressure).	0,1 - 24ml
Inspiratory to expiratory ratio	1 : 1 (= sinus form)
Effective volume (with counter pressure & endotracheal tube)	0,0ml - 12ml[1]
Frequency (respiratory rate)	15 - 220/min.
Minimum and Maximum pressure setting	
Pressure settings	≥ 0 mbar - up
External P.E.E.P.	possible
Circle system with CO_2 Absorber	
Easily to be connected to a flowmeter / vaporizer unit	
Distance between UMV and animal position	upto 1 meter[2]

Ordering number		Ordering number	
180000023	UMV-03 UNO Microventilator	180000009	Small Artificial Lung
Dimensions			- used for setting up to UMV-03
Weight			
Power		MX00001/1L	CO_2 Absorber - 1 liter
Inlet Connection	ID 5mm		
Outlet Connection	IS 5mm		

Micro Ventilator

[1] Depending on the size of endotracheal tube used.
[2] If distance is more than 1 meter the local situation has to be checked and an extra valve could be necessary.

Intubation Aid for Mice and Rats.

How does it work?

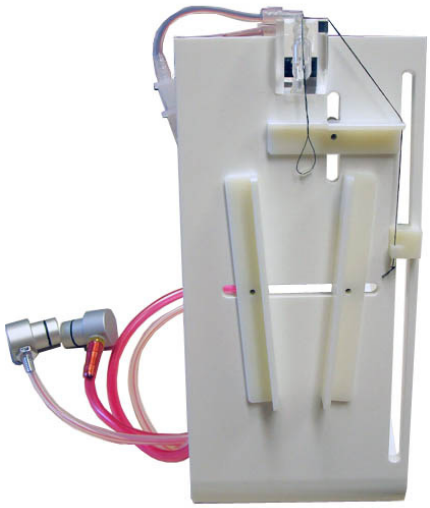
- expose animal to anaesthetics in the induction box for initial anaesthesia
- take animal out of induction box and place “cord” around its front teeth
- slowly pull the animal with its snout/nose into the nose cone with the cord
- secure “cord”
- because the Intubation Aid is connected to the Vaporizer, the animal is **exposed to anaesthetic gas constantly**
- the **“excessive /exhaled gas”** is being disposed off through the connected Gas Exhaust Unit
- after intubation the animal can be connected to the UNO Micro Ventilator.

Benefits:

- more time for intubation without the need of i.p. anaesthesia; no hurry!
- design forces animal in best pose for intubation
- lower jaw automatically opens therewith giving clear view on vocal cords
- animal can be connected to UMV for controlled anaesthesia immediately after intubation

Models

- This model is suitable for mice and small rats (± < 350gr)



- This model has an exchangable nose cone, either for mouse or for rats.
- Loose nose cones are available. The nose cone can easily replaced, thus making the intubation aid suitable to be used for mouse and rat.
- The design of the aid also makes it usable for bigger rats (extra support of animal.)

Ordering number	
180000014	Intubation Aid for mice and small rats(± ≤ 350gr)
180000314	Intubation Aid with Nose cone for Mouse included
180000414	Intubation Aid with Nose cone for Rat included
180000324	Nose cone for Mouse to be used with 180000314 and 180000414
180000424	Nose cone for Rat to be used with 180000314 and 180000414

Intubation UNO

Intubation Aid for Mice and Rats.


1.


2.

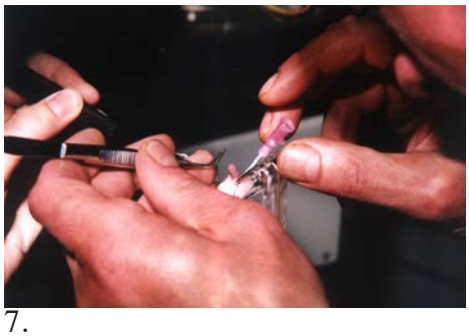

3.


4.

1. Top part of the intubation stand with tread through "nose-cone".
2. Mouse placed with snout in nose-cone. Mouse hanging by its front teeth on the tread supported by the back support.
3. Mouse hanging on intubation stand with anaesthetic gas supply- and gas exhaust tubes connected to the intubation stand.
4. Checking the length of the intubation tube (length should be before the bifurcation of the trachea).
5. **Light source** placed at animal below the vocal cords of the animal. (Do not use a too strong light source because of too much light spreading).
6. Pull the animals tongue a little bit thus enabling you to see the vocal cords (light coming through).
7. Place the intubation tube into the trachea in between the vocal cords.
8. Correct position of the intubation tube with regards to length of the tube and position of bifurcation in trachea.


5.


6.


7.


8.

The animal is now ready to be connected to the ventilator. Make sure that the tube maintains its position in the animal!

Intubation

The UNO Heating devices have been designed specially for the use with small laboratory animals, like mouse and rat during anaesthesia. The UNO Heating systems are powered by a Control Unit.
This Control Unit is available in 3 Versions: **A: Control Unit-01 / CU-01**
B: Control Unit-02 / CU-02
C: Control Unit-MS / CU-MS

Control Unit-MS / CU-MS **Control Unit-02 / CU-02** **Control Unit-01 / CU-01**

Control Unit-01 and Control Unit-02

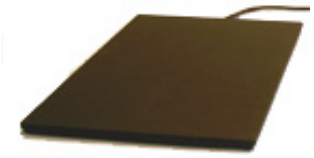
The Control Unit 01 has 1, as the Control Unit 02 has 2 connector sockets for one of the below shown heating plates/ units and/or a temperature probe. The temperature settings for the Control Unit range from 28˚C to 42˚C. The connected heating plates/units, heat up till the set temperature on the Control Unit is reached. Once the set temperature is reached the Control Unit maintains this temperature.

The Control Unit 02 does not have an interaction (feedback) between the temperature probe (measured rectal temperature of the animal) and the heating device (set temperature).

The Control Unit-MS does feature this interaction (feedback)!

The Control Unit-MS can like the Control Unit-02 be connected to a heating device and a temperature probe. However the interaction (feed back) between the 2 connections allows you **to set the required animals rectal temperature**. The rectal probe measures the animals temperature and feed back is given to the controles of the heating device to keep the animals temperature as constant as possible. A safety feature is built-in to prevent over-heating in case the rectal probe is not in the animal. The heating element will not heat up over 42˚C (also an acceptable norm for human skin).

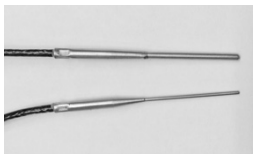
With the Control Unit-MS you have a **self-regulating system** and do not need to manually adjust the temperature settings during the procedure.



Flat Heating plate
34,5 x 23cm, 12mm thick
Closed surface for easy cleaning.

Half-Pipe Heating Unit
for rats during prolonged procedures like cardiac flow measurement.

Tail Heating Unit
for blood sampling. With or without the half pipe.



Temperature Probe
for rectal temperature measuring. Mouse or Rat.

Ordering number	
180000123	Control Unit -01
180000122	Control Unit -02
180000124	Control Unit -MS
180000028	Flat Plate / 34,5 * 23cm
180000128	Flat Plate / 18,5 x 11cm
180000027	Half-Pipe Heating Unit
180000029	Tail Heating Unit
180000066	Temperature Probe - Mouse
180000026	Temperature Probe - Rat

Controlled Heating

Warm Water Heating System

The Warm water Heating system contains a warmwaterpump HTP-1500 and a acrylate heating plate. The warm water is set at a certain temperature and is pumped through the canals in the plate. There is no control on the temperature of the animal, the display on the pump provides continous real-time temperature readings. The digital controller uses proprietary software to manage your preset set-pont temperature. Three temperature safety limits guard against possible over-heating.

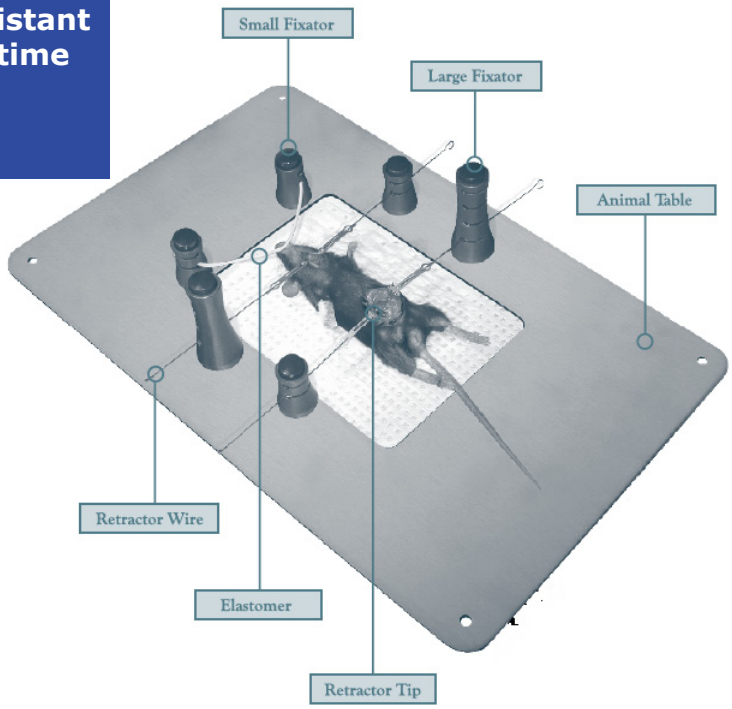
Ordering number	Warm Water Pump HTP-1500	
180000207	Water type	Tap water
	Reservoir Capacity	1500 ml
	Flow rate (min)	57 lph
	Accuracy watertemperature	+/- 1˚C at 42˚C
	Temperature Set Point Range	24 to 42˚C
	Weight	2,5kg (empty)
	Dimensions	25,5 x 17,8cm
	Alarms	Water flow alarm
Ordering Number	Heating Plate	
180000021	Acrylate Heating plate - large	40 x 30cm
Custom made	Acrylate Heating plate - small	10 x 7,8 20 x 15cm

Warm water Heating

Small Animal Retraction System

The UNO retraction systems are a new standard of procedural control. The fully integrated procedural and stabilization system provides precisely controlled retraction at the operative site. The retraction system allows researchers to operate independently, eleminating the requirement for an assitant or improvised assistive devices. The system removes the complexities and distractions of improvised set-ups, allowing the researcher to focus full attention on the surgical procedure.

- **Eliminates the need for an assistant**
- **Reduces setup and procedure time**
- **Provides superior control**
- **Improves visualization**



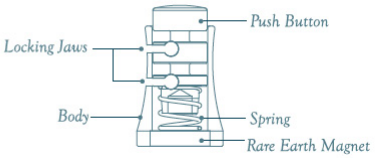
The UNO retraction system is unlike any other, providing glove-friendly, operative simplicity. With the touch of a finger, the system can be set, released and manipulated. This is made possible by patented mechanisms in the fixators which use rare earth magnets and push-button spring locks to form a fully integrated small-animal procedure system. All system components are compatible with standard lab instrument cleaning systems.

The System Components

Fixators- The Heart of the System; Fixators hold retractors. They contain rare earth magnets that attach anywhere on the animal table. A push-button top operates multi-level locking jaws that grip wires or elastomers firmly. They can be adjusted linearly of rotationally with finger-tip release. Complete depression of the push-button allows for insertion of the wires or elastomer while partial depression of the push-button allows for adjustment. Fixators can also lock onto other lab components that require stabilization in the surgical setting, such as neurological or rectal probes or anaesthesia delivery systems.

The magnetic field is well controlled within the fixator to minimize interference with sensitive instrumentation.

In fact, at a distance of just a few centimeters the effects of these small but powerful magnets are completely gone.

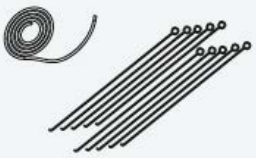


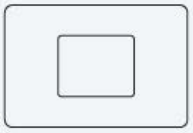
Retraction UNO

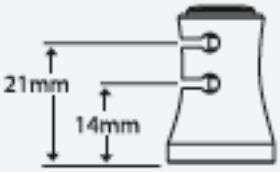
Small Animal Retraction System

UNO Retraction System - Mouse

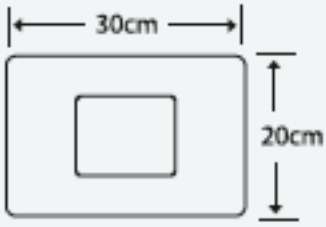
Contains:
1pcs, 20cm x 30cm table with window
6pcs, 3cm fixators
10pcs, 10cm wire retractor handles
10cs, 2 meter roll elastomer
10pcs, assorted retractor tipe, two of each style
User documentation (english)





Magnetic Fixator with Spring Lock
3cm tall, Two locking jaws
ACD-001



Mouse Table 20 x 30cm
With 13 x 10cm Window
ACD-003


Retractor tip Sharp - 1mm
(10 per pack) ACD-009


Retractor tip Blunt - 1mm
(10 per pack) ACD-010


Retractor tip Blunt - 2,5mm
(10 per pack) ACD-011


Retractor tip Blunt - 5mm
(10 per pack) ACD-012


Retractor tip Blunt - 7,5mm
(10 per pack) ACD-013


Retractor Wire- 10cm
(10 per pack) ACD-005

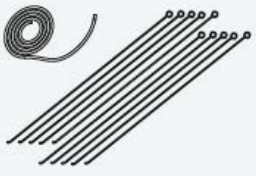

Retractor Wire- 14cm
(10 per pack) ACD-006

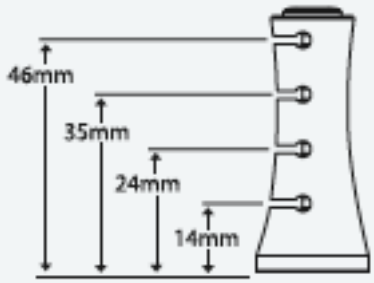

System Elastomer
(2 meter roll) ACD-007


Retractor Tip-
Sample Package
(2 each style, 5 sizes
per pack) ACD-008

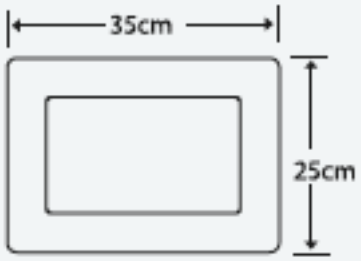
UNO Retraction System - Rat

Contains:
1pcs, 25cm x 35cm table with window
6pcs, 6cm fixators
10pcs, 14cm wire retractor handles
10cs, 2 meter roll elastomer
10pcs, assorted retractor tipe, two of each style
User documentation (english)



Magnetic Fixator with Spring Lock 6cm
tall, Four locking jaws
ACD-002



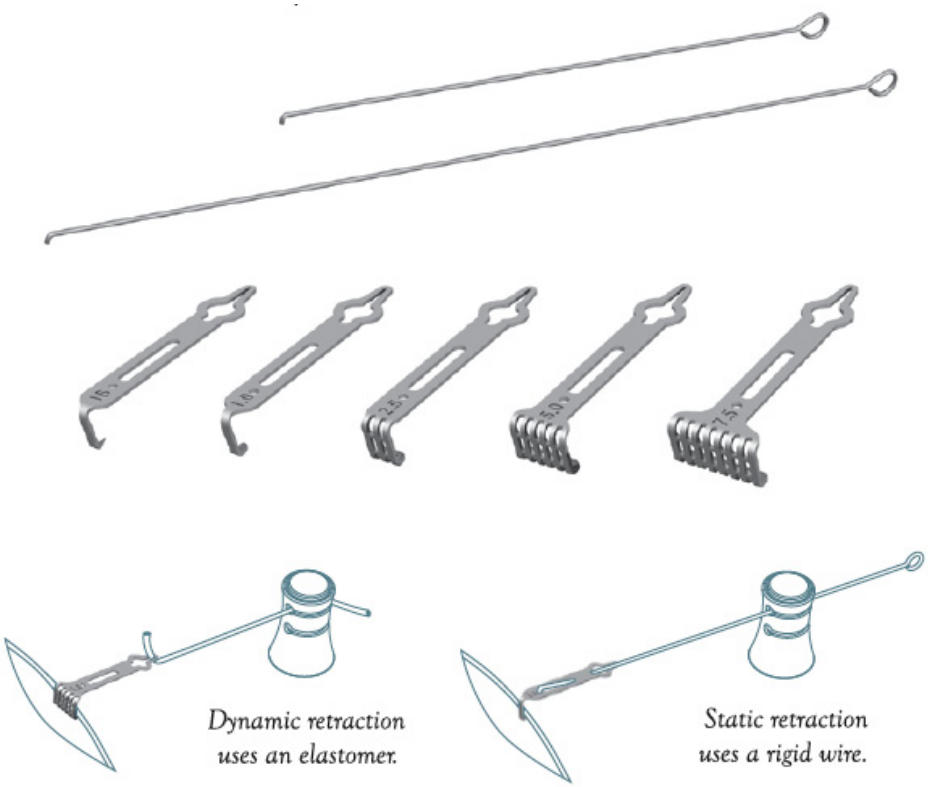
Rat Table 25 x 35cm
With 25 x 20cm Window
ACD-004

Retraction
UNO

Small Animal Retraction System

Animal Tables- Animal Tables are made of ferro-magnetic stainless steel and incorporate a window for compatibility with body temperature maintenance systems. Table are available in a variety of sizes and shapes to suit a range of animals.

Retractors- The retractor wires are formed from light, flexible stainless steel. This simple approach produces an economical instrument that performs its job with minimal clutter, while providing superb control and feel. Retractor wires can either be used on their own or retract or manipulate tissue or retractor tips can be fitted to provide a wide range of retractor styles. Retractor wires engage and lock into the fixator jaws at the desired elevation allowing both linear and retational adjustment over the entire length of the wire. One end of the wire is formed in a loop to provide grip for a gloved hand, and the business end is formed into a right angle hook that can retract on its own or lock to a range of retractor tips.



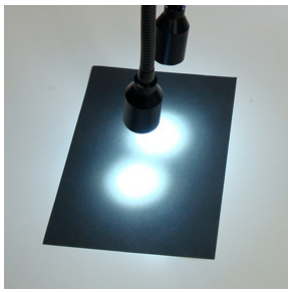
The wires can also be reformed to create restaints or engage other lab apparatus that need to be secured in the surgical field. Wires are available in 10 and 14cm lengths for mouse and rat procedures. Retractor tip widths range from 1mm to 7,5mm, plus a single point, sharp tissue hook. Each tip can be locked onto a wire for static retraction, or affixed to an elastomer to form a dynamic retractor.

Ordering number	
180000055	Retraction System RAT
180000056	Retraction System MOUSE

Retraction

Cold Light Source -CLS

The new **UNO Cold Light Source** is designed to meet the current requirements for a cold light source during surgical procedures.



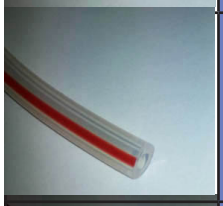
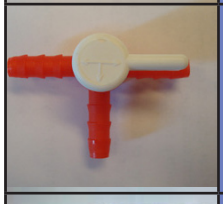
Advantages

- New power - LED technology
- Luminous flux max. 100lm - dimmable
- Colour temperature 6300˚K (Pure white)
- Power requirement 110 - 240V, 50/60Hz
- No cooling ventilator required
- Very long service life of Power LED'S
- Narrow beam lens: 13˚ View Angle
- Very small footprint (14 x 12 x 5cm (W x D x H))
- With rechargeable battery with up to 10 hours batterylife at maximal lightstrength.
- Power consumption: 700mA, Power max: 4 Watt

In order to maintain a distance between the CLS and the illuminated object, the CLS is equipped with two (2) flexible 60cm long arms (custom lengths available on request).

Ordering number	
180000901	Cold Light Source - CLS

Surgical Light

	Ordering Number	Description
	**180000024**	Silicone tubing Ø 4 x 7mm - sold per meter
	**180000025**	Silicone tubing Ø 6 x 12mm - sold per meter
	**180000040**	Red PVC Tubing Ø 6 x 8,6mm - sold per meter
	**180000234**	Corrugated extentable Tube ID 22mm, - sold per 40 -120cm
	**180000034**	Ribbed (Harmonica) Tubing - sold per 40cm
	**180000045**	Connector 22M / 22F - ID 22mm- sold per piece
	**180000046**	Connector 22M - 22M - sold per piece
	**180000052**	Tube valve - sold per piece
	**180000047**	3 way valve (PP/PE) - sold per piece
	**180000044**	Parallel Y-Connector - sold per piece

Pulse Oximeter VET Handheld Pulse Oximeter

The 2500A Veterinary Oximeter is a universal tool with unmatched versatility and cost-effectiveness for all veterinary monitoring and research applications. Compact and easy to use, this Pulse Oximeter is proven accurate for pulse rates up to 450 beats per minute (bpm) and is ideal for monitoring during surgeries.

The 2500A Pulse Oximeter has an audible pulse indicator and large LED displays that are visible in low-light situations. The tricolor perfusion indicator provides immediate feedback to assess pulse quality. This information is useful to determine if repositioning of the sensor is necessary and requires little training to interpret.

Sensors

Purelight Vet sensors produce the pure light spectrum which eliminates variations in readings from animal-to-animal and sensor-to-sensor.

2000SL - Clip-on sensor for tongue applications, paw pads, and well-vascularized areas.

2000T - For placement on the underside base of the tail or other well-vascularized surfaces.

2000SA - Wrap sensor for placement on the toe (large animal) or base of the tail or foot (small animal).

Key features

* Durable - extremely rugged construction
* Extensive Memory - 72 hours data storage
* Easy to Use - Simple two button operation
* Compact Size - 7 x 13,8 x 3,2cm
* Flexible Operation - operates on AA batteries and rechargeable batteries

Pulse Oximeter Specifications

Oxygen Saturation Display Range	: ($\%SpO_2$) 0 -100%
Pulse Range Display Range	: 18 - 450 beats per minute (BPM)
Accuracy	: Blood oxygen Saturation (%SpO2 ± 1 SD) 70 - 100% ± 2 digits.
	Pulse Rate: 18 - **450 bpm** ±3% ± 1 digit
Measurement Wavelengths	: Red 660 Nanometers
	Infrared 925 Nanometers
Dimensions	: 7 x 13,8 x 3,2cm (w x h x d)
Weight	: 213 gr with alkaline batteries, 233 grams with NiMH batteries
Temperature	: Operating -20˚C to +50˚C
	Storage -30˚C to +50˚C
Humidity	: Operating 10 - 95% noncondensing
	Storage 10 - 95% noncondensing
Power requirements	: Four 1,5V AA-size alkaline batteries

Pulse Oximeter

SENSOR PLACEMENT

The **2000SL LINGUAL CLIP SENSOR** is convenient for spotchecks and for monitoring during recovery while the animal is immobile. However the sensor is held in place by light spring pressure that could allow it to become dislodged with movement.
Further, over time even light spring compression may interfere with blood flow resulting in signal loss and need to reposition the sensor. The 2000SL is most easily applied to the rear foot, but the front foot and tail can also be used. For mice, the sensor can be best placed high into the groin.

The **2000T TRANSFLECTANCE SENSOR** also suitable for continous monitoring, the 2000T transflectance sensor is the smallest probe and can be applied to the rear of front feet, or to the ventral surface of the tail of the rat. Secured with adhesive tape.

Alternatively the sensor can be attached to the surface of an operating or imaging table and the foot simply taped into position over it.

The **2000SA SMALL ANIMAL WRAP SENSOR** can be easily secured and less prone to accidental displacement, making it an ideal option for continuous monitoring during long surgical or other procedures. Adhesive tape, cohesive bandage or a Posey Wrap can be used to assure that the sensor diodes are aligned directly opposite each other and that excessive pressure is avoided. The 2000SA should not be applied to hair-covered or highly pigmented areas.

Ordering number	
180000143	Pulse Oximeter 2500 VET incl 2000SL
2000SL	Sensor Lingual clip Sensor
2000T	Transflectance sensor
2000SA	Small Animal Wrap

* Above mentioned sensor placement recommendation are taken from the article Pulse Oximetry for Rodents by Dr. George A. Vogler, DVM. A copy is available on request.
* More detailed information on sensor placement and reported possible sensor sites are available on request.

Capnograph AMP for Rats and large Animals
(not suitable for use with Mice!)

CAPNOTRUE® AMP MAINSTREAM CO_2 /SPO_2 MONITORS

Advanced and reliable capnograph and pulse oximeter combined in a single monitor.

Key features of CapnoTrue® AMP

- Mainstream CO_2 measurement with the IRMA™ CO_2 analyzer
- Warm-up time: < 10s full specification
- Direct measurement without time delay
- Small, light-weight and shock-resistant: the IRMA™ CO_2 analyzer weighs less than 30 g
- Adult/paediatric, infant/neonatal, and a **for rat modified** IRMA™ airway adapter
- Plug and measure technology
- IRMA™ airway adapters with non-condensing light transmission XTP™ window
- No occlusion by water or mucus possible
- Maintenance and calibration-free technology
- Full range of key technology accessories
- Wide range of high-quality SpO_2 sensors

Delivery Package of CapnoTrue® AMP

- Mainstream device
- IRMA™ CO_2 analyzer
- Reusable SpO_2 sensor
- CapnoTrue® power supply (EU and UK plug)
- Silicone protective cover
- USB data cable
- IRMA™ airway adapter (adult/paediatric)
- Instruction manual
- 1 Li-ion rechargeable battery
- PC software
- 4 batteries (AA)

The CapnoTrue AMP Mainstream Monitor can be used in combination with the UNO MICROVENTILATOR - UMV-03.

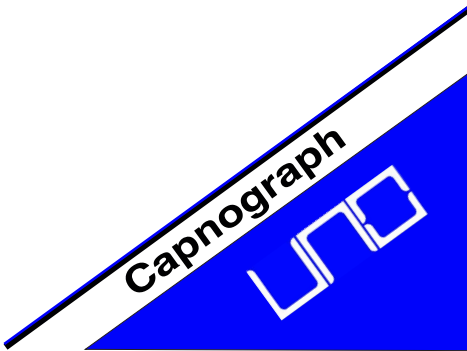
The CapnoTrue AMP and ASP - CO_2/SpO_2 monitors including the IRMA™ CO_2 analyzer, ISA™ CO_2 analyzer and SoftCap Sensors are classified and certified as class IIb products.

Capnograph

Capnograph AMP for Rats and large Animals
(not suitable for use with Mice!)

TECHNICAL DATA

Specification		
Measurement range	$EtCO_2$ and $FICO_2$	0-15%
	SpO_2	0-100%
	Respiration rate	0-150 breaths/min
	Pulse rate	20-300 beats/min
Accuracy	$EtCO_2$ and $FICO_2$	+/- (0.2 vol % + 2% of reading) +/- (0.3 vol % + 4% of reading) incl. interfering gases
	SpO_2	+/- 2% (70 - 100%)
	Respiration rate	+/-1 digit at 60 breaths/min
	Pulse rate	+/-1 digit (up to 100/min) or +/- 1% (> 100/min)
Display		
Characteristics	Active OLED colour graphic display, 262,000 colours, 240 x 320 dots	
Displayed data	End-tidal CO2 and inspired CO2 in vol %, kPa or mmHg, oxygen saturation, respiration rate, pulse rate, capnogram, plethysmogram and short term trend	
Indicators	Signal strength and signal quality, pulse amplitude, battery status, alarm mute, pulse tone mute, neonatal mode, time	
Trend information		
Long term trend	up to 400 hours	
Short term trend	15 min/1h/6h	
Language versions		
	English	(additional language versions on request)
Environmental conditions		
Operation	0 - 50°C, 15 - 95% r.H. (non-condensing), 60 - 120 kPa (excl. Li-ion battery)	
Storage	-30 - 70°C, 10 - 95% r.H. (non-condensing), 60 - 120 kPa (excl. Li-ion battery)	
Classification		
Product class	IIb (in accordance with MDD 93 / 42 / EEC)	
Safety	Class of protection II / type BF	
Construction	IPX1	
Standards	EN 60601-1:2006, EN 60601-1-1:2001, EN 60601-1-2:2007, EN 60601-1-8:2004, DIN EN 60529, EN ISO 21647:2004, EN ISO 9919:2005	
Miscellaneous		
Dimensions	(LxWxD) 150 mm x 75 mm x 35 mm	
Weight	< 400 g (complete device with batteries)	
Power supply	90-260 VAC/6 VDC, 50-60 Hz, 4 AA batteries, 2.5 Ah Li-ion battery	
Battery capacity	up to 6 hours continuous operation	
Communication interface	USB 2.0	



CapnoTrue MG for Rats and large Animals
(not suitable for use with Mice!)

CAPNOTRUE® MG-AA/CO_2/SPO_2 MONITORS

High-performance and versatile anaesthetic agent monitoring.

Key features of CapnoTrue® MG

- Innovative micro-optic technology
- Direct mainstream measurement without time delay
- Compact, robust and ultra-light multigas analyzer
- Warm-up time <20 seconds full specification
- Maintenance and calibration free technology
- Self-explanatory, ergonimic operating function facilitate intuitive operation
- The colour information display, as well as the simple information structure, support quick decisions and a rapid user reaction in critical situations
- Leading-edge power management with standard alkaline batteries or Li-Poly batteries or medical power supply (or combined)
- Two years warranty.

Delivery Package of CapnoTrue® MG

- CapnoTrue MG Multigas/SpO_2 Monitor
- IRMA™ AX+ Analyzer
- Instruction manual
- 1 Li-ion rechargeable battery
- PC software
- 4 batteries (AA)
- IRMA™ Airway Adapter
- Reusable SpO_2 sensor
- Silicone protective cover
- USB data cable
- Manual

The CapnoTrue MG Monitor can be used in combination with the UNO MICROVENTILATOR - UMV-03.

The CapnoTrue MG monitors including the IRMA™ CO_2 analyzer, ISA™ CO_2 analyzer and SoftCap Sensors are classified and certified as class IIb products.

Capnograph MG

TECHNICAL DATA

Display

Parameters displayed	Numerical	End-tidal (et) CO_2-, N_2O- and agent concentrations, inspired (Fi) CO_2-, N_2O- and agent concentrations, oxygen saturation (SpO_2), Respiration Rate (RR), Pulse Rate (PR)
	Graphical	Capnogram and trends of numerical data (15 min/1 h/6 h)
	Indicators	Signal Strength and signal quality, pulse amplitude, battery status, alarm mute, pulse tone mute, storage status, real-time mode, neonatal mode, time.
Characteristics	Active OLED colour graphic display, 262000 colours, 240 x 320pixel (42mm x 56mm)	

Capnography and anaesthetic agent measurement specifications

Measurement range	$etCO_2$ and $FICO_2$	0-15%
	FIN_2O	0-100%
	Hal, Iso, Enf	0-8%
	Sev	0-10%
	Des	0-22%
	Respiration rate	0-150 1/min
Accuracy	$EtCO_2$ and $FICO_2$	+/- (0.2 vol % + 2% of reading) +/- (0.3 vol % + 4% of reading) incl. interfering gasses
	N_2O	+/- (2 vol % + 2% of reading) +/- (3 vol % + 5% of reading) incl. interfering gasses
	Hal/Iso/Enf/Sev/Des	+/- (0,15 vol % + 5% of reading) +/- (0,2 vol % + 10% of reading) incl. interfering gasses
	Respiration rate	+/-1 digit
Warm-up time	< 20 seconds full specification	

Pulse Oximetry specifications

Measurement Range	SpO_2 Pulse Rate	1 -100% 20 -300 1/min
Accuracy	SpO_2 Pulse Rate	+/- 2% (70 bis 100%) +/- 1 digit (up to 100 1/min) or +/- 1% (> 100 1/min)

Trend Information

Long term trend	up to 150 hours
Short term trend	15 min/1h/6h

Alarms

Limits	Adjustable limits for all numerical parameters except for MAC
Alerts	Audible and visual alarms (complies with EN60601-1-8)

Storing Data

Communication interface	USB 2.0
Data memory capacity	up to 150 hours
Real-time mode	Visualisation and storage of numerical parameters on a computer every 4 seconds
Computer Software	CapnoTrue® MG PC Software for data download and real-time mode

Power supply

Battery	Working time with full functionality approx. 4,5 hours, 4 alkaline batteries (AA/LR6/AM3/MN1500/Mignon), 1,5V
Li-Poly battery	Working time with full functionality approx. 7 hours, Li-Poly battery, Model No CT-2500, 3.7V, 2500 mAh, charging time approx 5 hours
AC power supply	Model No. FW 7660M/06, medical power supply with option for country-specific input plug, input: 100-240 V AC/50-06Hz / 250 mA, output: 6 V DC/1,4A

CapnoTrue MG for Rats and large Animals
(not suitable for use with Mice!)

Specification	
Environmental conditions	
Operation	10 - 40°C, 15 - 95% r.H. (non-condensing), 60 - 120 kPa (excl. Li-poly battery)
Storage	-20 - 70°C, 10 - 95% r.H. (non-condensing), 60 - 120 kPa (excl. Li-poly battery)
Classification	
Product class	IIb (in accordance with MDD 93 / 42 / EEC)
Safety	Class of protection II / type BF - Type and degree of protection against shock
Construction	IPX1 (with silicone protective cover)
Standards	EN 60601-1:2006, IEC 60601-1-1:2001, IEC 60601-1-4-2000; IEC 60601-1-8:2006: ISO 21647:2004:ISO 9919:2005; ISO5356-1:2004; DIN EN 1789:2007, EN846:1996
Miscellaneous	
Dimensions	150 mm x 75 mm x 35 mm
Weight	< 400 g (complete device with batteries)

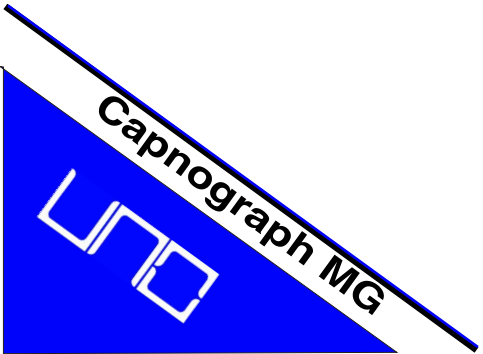
With its ultra-compact, light and easy to handle design, the CapnoTrue®MG is the perfect flexible and mobile monitor for identifying and quantifying the five most important anaesthetic agents as well as other gases and parameters:

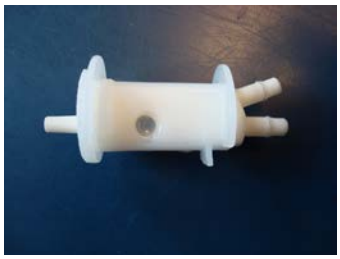
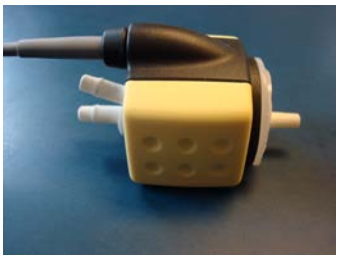
- Halothane, Isoflurane, Enflurane, Sevoflurane and Desflurane
- N_2O
- $etCO_2$, $FICO_2$
- Oxygen saturation
- Respiration and Pulse Rate

By direct measurement in the mainstream, there is no time delay in the measuring data.

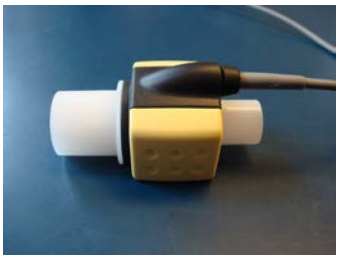
Reliable automatic agent identification and quantification

The IRMA AX+ Analyzer is equipped with state-of-the-art NDIR technology with up to 9-channel gas type analysis in the 4-10μm range and offers reliable agent identification and quantification even in gas mixtures. It weighs less than 25 g.



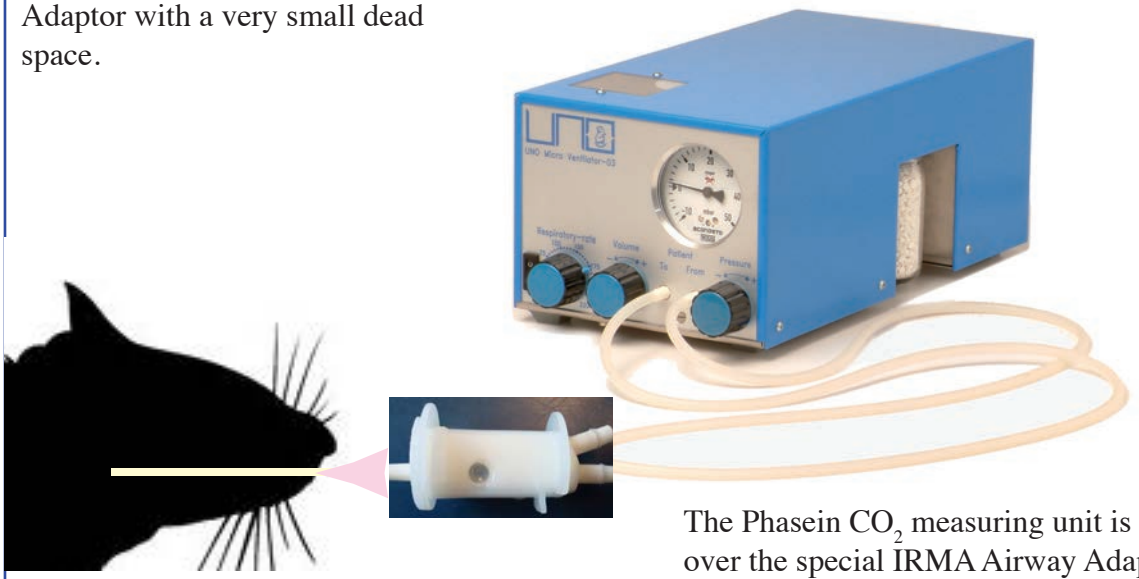
Probes to be used with rat

Probes to be used with larger animals

Special designed IRMA Airway Adaptor with a very small dead space.

UMV-03 - Ventilator



The Phasein CO_2 measuring unit is placed over the special IRMA Airway Adaptor. The mainstream measurements are taken through the small round window in the adaptor.

Ordering number	
180000170	Capnotrue AMP
180000171	Capnoture MG (Multigas)
180000172	Adjusted Probe to be used with Rats
180000173	Probe to be used with larger Animals

Capno Probes

MouseMonitor

Surgical Monitoring Mouse and Rat Made Easy

Available Expansion Modules
* ANALOG OUTPUT
* Pulse Oximetry + SpO2

Heart Rate * SpO2 * Temperature * ECG * Warming

Better Results
Get better study results while improving surgery quality & survival rate.

Superior Data
Ultra low-noise, high-resolution ECG, SpO2 & Respiration.

Easy to Use
Durable stainless steel surgical platform AND intuitive touch display.

Stable Prep
Maintain body temp. & monitor vital signs during surgery.

Physiological Parameters

ECG
- Ultra low-noise, high resolution
- Simultaneous Lead I, II & III
- 24-bit sigma-delta AD converters

Heart Rate
- Real-time numeric display
- Up to 999BPM
- Acquired from ECG waveform

Pulse Oximetry
- Ultra low-noise, high resolution
- Simultaneous SpO2 display
- 18-bit sigma-delta AD converters

Respiration
- Ultra low-noise, high resolution
- Based on thoracic impedance
- Signal acquired through ECG electrodes

Breath Rate
- Real-time numeric display
- Up to 300BrPM
- Acquired from respiration waveform

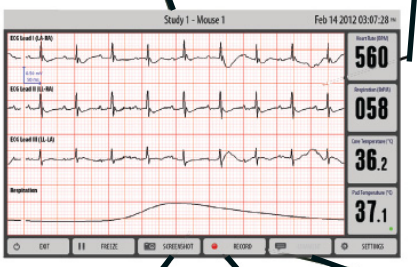
Core Temperature
- 0,1˚C monitoring accuracy
- Mouse-specific rectal probe

Warming
- Electronic closed-loop control
- Intelligent zone heating
- Platform temperature control with 0,1˚C resolution

Intuitive Touch Interface

25,5cm Touch screen
Capacitive touch screen works with surgical gloves

Ergonomic Display
Waveforms and numeric data presented in an easily readable format



Comments
Apply notes, tags, and observations to mark events

Screenshot
Take quick snapshots to capture interesting data

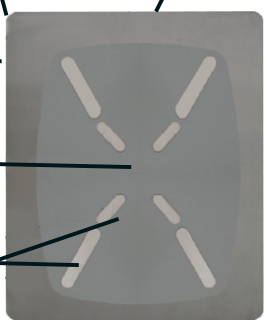
Record and Export
Supports many analysis packages through CSV export

Heated Surgical Platform

Accessories
Frame designed for magnetic accessories

Expansion Modules
Four expansion ports support analog output and SpO2 modules

Durable
Easy to clean stainless steel work surface and electrodes



Warming Zone
Homothermic heater maintains core temperature.

ECG Electrodes
Surface-mounted mouse & rat electrodes enable easy operation with low noise

MouseMonitor

MouseMonitor™ also suitable for RAT

The MouseMonitor™ is a compact tabletop vital signs monitor that displays ECG and respiration waveforms as well as heart rate, breath rate and core temperature. The unique integrated pad incorperates ultra-low noise, high resolution ECG electronics and a homothermic heating pad with a durable surgical steel operating surface that supports magnetic accessories. The included 10.1" touchscreen display ergonimically presents waveform and numeric data in an intuitive and legible layout, enabling you to quickly record and export your acquired data. The MouseMonitor™ is compatible with most DAQ systems when connected to the optional analog output module.

ECG

- Uses non-invasive pad mounted or externalECG electrodes
- Simultaneous Lead I, Lead II and Lead III ECG
- Works in supine or prone position, head in either direction
- Electrically isolated ECG bioamplifier
- High-resolution 24 bot sigma-delta AD converters

Respiration

- Uses non-invasive pad mounted ECG electrodes

Temperature Control and Monitoring

- Electronic colsed-loop control
- Efficient, electrically heated warming zones
- Pad temperature control with resolution of 0.1˚C
- Compact tabletop design without circulating water

Specifications

Heated Surgical Platform

ECG Electrodes	4 mouse limb electrodes 4 rat limb electrodes External electrodes with 1,5mm DIN jacks
Heater	Electronic heating with multiple zone controle
Temperature	Adjustable, 25-42 ˚C
Audible Alarm	Yes
Size	25,4 x 30,4cm
Weight	+/- 3 kg

Display Unit

Display	25cm color, LED backlit, capacitive touch
Resolution	1280 x 800 pixels
Storage	8GB
Power	100-240V AC adapter

Rectal Temperature Probe

Probe Type	Mouse rat or neonatal specific
Sensor Type	Copper-Constantan thermocouple
Accuracy	+/- 0,1˚C after calibration

Measurements

Numeric

• Heart Rate	60-999BPM
• Respiration Rate	15-400BrPM
• Core Temperature	25-50˚C
• Pad Temperature	25-42˚C

Waveform

- ECG Lead I
- ECG Lead II
- ECG Lead III
- Respiration

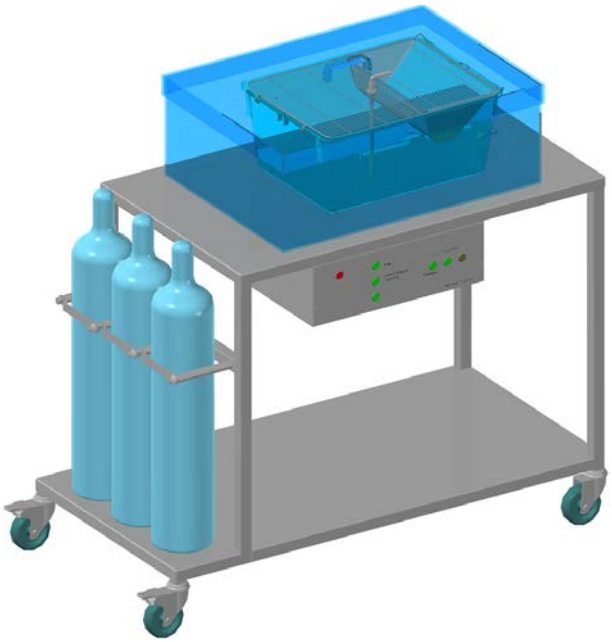
Ordering number	
180000300	Mousemonitor
180000301	Analog Output Mode
180000302	Pulse Oximetry/SPO2 Module
180000303	Platinum External Needle Electrodes
180000304	Stainless Steel External Needle Electrodes

MouseMonitor

UNO Euthanasia Unit

During euthanasia of rodents using the UNO Euthanasia Unit, the following benefits are achieved:

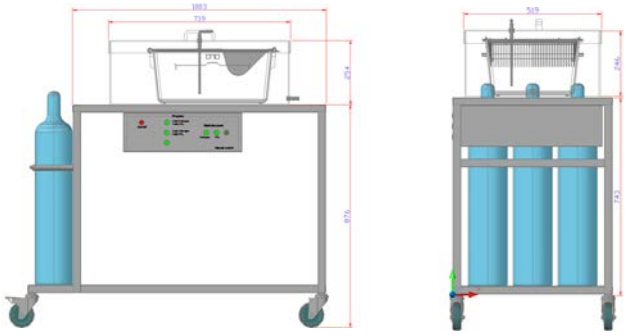
- The animals can stay in their cage, because the UNO Euthanasia Unit includes a transparant polycarbonate "container", in which the complete rat- or mousecage can be placed.
- First, Carbogen gas is introduced at the bottom of the cage, by means of a PLC controlled valve. Carbogen is a gas mixture of 95% O_2 + 5% CO_2 . This causes a high concentration O_2 in the cage and in the container, while the 5%-concentration CO_2 does not cause any reaction at the CO_2 reseptors in the animal lungs. The pO_2 level in the blood becomes maximal.
- After 1 min. the Carbogen flow is stopped and 100% CO_2 is introduced into the cage. In this way the high concentration O_2 is slowly replaced by CO_2. This relatively slow replacement of O_2 by CO_2 is responsable for the reduction of stress for the animal.



If mice and rats are being exposed directly to 100% CO_2, the stress level, measured according to EEG, EKG and proportionaly, is very high. The article "Carbon Dioxide euthanasia in rats; ....." handles about the 3 above mentioned criteria in detail. This article can be downloaded on our website: *http://www.unobv.com/afbeeldingen/Carbon%20Dioxide%20in%20rats.pdf*

The UNO Euthanasia Unit encludes:

- A polycarbonate box with lid, in which the mice and rat cages can be placed. Dimensions: 50 x 75 x 25cm (lxbxh) (other dimensions custom made available!)
- Tube for the gassupply. This tube can be put between the bars of the wirelids into the cage.
- A valve in the macrolon box to connect the unit to an exhaust system.
- The s.s. trolley has a tray on which the gas cylinders can be placed.
- A switchboard for the supply of the gas (mixure) O_2 and CO_2, according a PLC pre-set program.



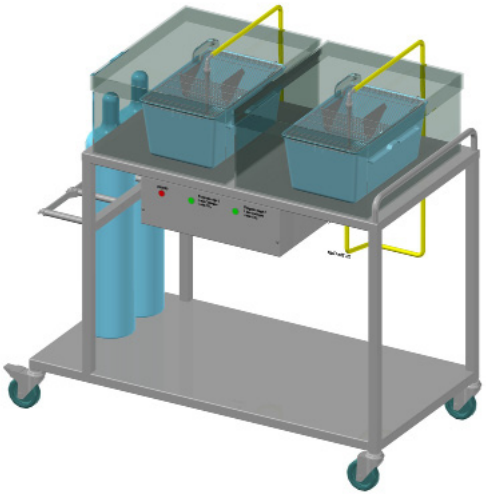
One of the advantages of the mentioned PLC pre-set programs is that the procedures for euthanasia in rats and mice can be easily described in a protocol for the users of the unit. The UNO Euthanasia Unit contains a program that uses 2 different gasses in order to, during euthanasing mice and rats, reduce the animal's stress to a minimum.

Ordering number	
180000100	Euthanasia Unit complete

Euthanasia UNO

UNO Euthanasia Unit - custommade options

Different configurations and set-ups for euthanasia units are available on special request. Below are some examples.



A Euthanasia Unit with two separate euthanasia boxes that can each hold a cage. This unit was equiped with two separate control with each just one program. Also a safety to prevent unauthorized changes made in the flowmeter settings was integrated.

A Euthanasia Unit to be placed on a table without the trolley is also possible.

Euthanasia cabinets in different configurations. For ordering information, please contact us.

Oxygen Concentrator 5.0

- Modular components set up
- Easily accessible filter and fuses
- USB – interface
- Modern design and simple operation
- New, innovative measuring sensor
- Integrated flow adjustment
- 30.000 hours warranty for all functional parts
- Whisper silent
- Microprocessor-controlled

Accessories

- Instructions for use
- Angular connector for humidifier
- Humidifier, refillable
- Nasal cannula 2m and 5m

Technical Data	
MDD classification	IIa
Operating Power	230 V 50Hz
Operating Temperature	operation +5° to +40°C storage -20° to +70°C
Sound level	< 40 dB (A)
Power consumption	295 W
Dust and Fine Filter	in the rear of the device
Fuses	mains T 3.15 A H 250V internal T 1.0 A L 250V
Weight	15kgs
Dimensions (HxLxW)	600 x 290 x 400mm
Warranty	30.000 operating hours (max. 5 years) according to terms of warranty
Flow adjustment	flowmeter 0 - 5 lpm
O_2-concentration	1 to 3 lpm 95% -3% 3 to 4 lpm 93% +/- 3% 4 to 5 lpm 85% +/- 3%

Ordering number	
180000099	Oxygen Concentrator 5.0

Oxygen Concentrator

Recovery / Nursery / Warming

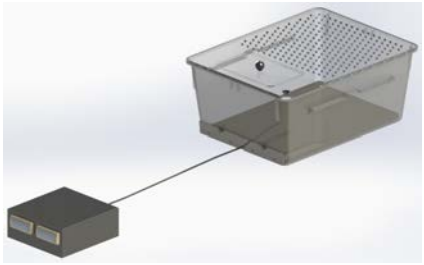
For improving the temperature of weak animals or animals recovering after a surgical procedures, we have a flexible recovery system available. The system is based on the cage type IVS and can be used as a compact system with one or two cages, placed on desk, table of other available space or delivered in a moveable rack.

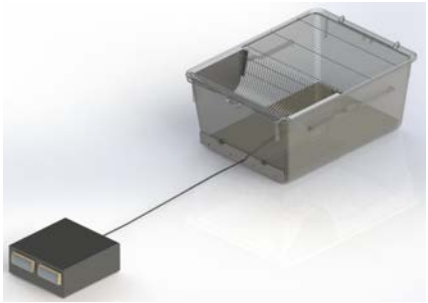
A silicone rubber mat is placed on the heating plate at the bottom of the cage. This mat can be changed easily in order to minimize contact with an other mouse or rat in the cage after a period of recovery/nursery.

The heating plate on the bottom of the cage can be taken out through a slot at the short side of the cage. This slot is closed and the closure keeps the heating plate in place. The heating system is controlled by a heating Control Unit which is positioned on the top of the rack. The temperature range is 28˚C- 42˚C and can be easily adjusted.

We have two options for the cover of the cage.

1. A perforated polycarbonate plate covering the total opening of the cage. In this perforated plate is a small lid that can be opened to be able to put the animal (or water and feed) into the cage. With this system the warmth will stay longer in the cage because the total openings are smaller.
2. A conventional wire lid. With this wire lid the animal is still in contact with the heating system via the silicone rubber mat. The warmth does not stay in the cage too long; it will go out through the wire lid.





Ordering number	
Please contact us.	

UNO Roestvaststaal BV
PO Box 15 - NL 6900AA Zevenaar
T: +31 316 524451
E: info@unobv.com - Http: www.unobv.com