

## Fabius<sup>®</sup> - CE



Inhalation Anesthesia Machine  
Software 4.n  
Instructions for Use

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## For Your Safety and that of Your Patients

### Strictly follow the Instructions for Use

Any use of the apparatus requires full understanding and strict observation of these instructions.

The apparatus is only to be used for purposes specified here.

### Observe the Instructions for Use of the supplementary equipment used!

### Maintenance

The apparatus must be inspected and serviced by trained service personnel at six month intervals.

Repair and general overhaul of the apparatus may only be carried out by trained service personnel.

We recommend that a service contract be obtained with DrägerService and that all repairs also be carried out by them.

Only authentic Dräger spare parts may be used for maintenance.

Observe chapter "Maintenance Intervals".

### Accessories

Do not use accessory parts other than those in the order list (86 06 304, revision index 00).

Even reusable accessories (e.g. parts which can be cleaned and/or sterilized) have a limited useful life. Wear and tear may be increased and the service life reduced considerably as a result of various factors when handling and conditioning such parts (e.g. disinfectant residues left behind after autoclaving may corrode the material). Such parts must be replaced immediately if external signs of wear become evident, such as cracks, deformation, discoloration, peeling, etc.

### Not for Use in Areas of Explosion Hazard

This apparatus is neither approved nor certified for use in areas where combustible or explosive gas mixtures are likely to occur.

### Safe connection with other electrical equipment

Electrical connections to equipment which is not listed in these Instructions for Use should only be made following consultations with the respective manufacturers or an expert.

### Liability for proper function or damage

The liability for the proper function of the apparatus is irrevocably transferred to the owner or operator to the extent that the apparatus is serviced or repaired by personnel not employed or authorized by DrägerService or if the apparatus is used in a manner not conforming to its intended use

Dräger cannot be held responsible for damage caused by non-compliance with the recommendations given above.

The warranty and liability provisions of the terms of sale and delivery of Dräger are likewise not modified by the recommendations given above.

Dräger Medical AG & Co. KG

## Intended Use

**Fabius is an inhalation anesthesia machine with continuous fresh gas flow for patients with a body weight of at least 5 kg.**

Fabius is intended for use in operating, induction and recovery rooms.

It may be used with O<sub>2</sub>, N<sub>2</sub>O, and AIR supplied by a medical gas pipeline system or by externally mounted gas cylinders.

Fabius can be equipped with a compact breathing system, providing fresh gas decoupling, PEEP, and pressure limitation.

The following ventilation options are available:

- Automatic Ventilation (IPPV),
- Pressure limited ventilation (IPPV/PLV),
- Manual Ventilation (MAN),
- Spontaneous Breathing (SPONT).

The Fabius can be equipped with an electrically operated and electronically controlled ventilator, which monitors the airway pressure (Paw), the volume (V) and the inspiratory oxygen concentration (FiO<sub>2</sub>).

According to EN 740 (Anaesthesia Workstations and Their Modules - Particular Requirements) the airway pressure (Paw), the volume (V) and the oxygen concentration (FiO<sub>2</sub>) must be additionally monitored in the case of a Fabius not equipped with the ventilator.

As per EN 740 (Anesthetic Workstations and their Modules – Special Requirements), additional monitoring of the concentrations of CO<sub>2</sub> and anesthetic agent is required.

EN 740 requires that a manual ventilation bag must be available for emergency use.

Fresh gas enrichment is provided by the Dräger-Vapor<sup>®</sup> anesthetic vaporizer.

**Do not use readily flammable anesthetic agents such as ether, cyclopropane, etc.**

## Safety Features

- Monitoring of P, V, FiO<sub>2</sub>
- Automatic O<sub>2</sub> shortage alarm and N<sub>2</sub>O cut-off
- Integrated S-ORC = Sensitive Oxygen Ratio Controller (control device to ensure minimum O<sub>2</sub> concentration of 21 vol.%).

Burns may occur if antistatic or electrically conductive ventilation tubes are used in combination with high-frequency electrical surgery equipment. Therefore, these types of breathing tubes are not recommended.

Caution: Do not use Fabius in the environment of NMR tomography equipment. Malfunctions may result, thereby endangering the patient.

Caution: Do not use mobile phones within a distance of 10 meters from the machine. Mobile phones can cause malfunctions in electrical medical equipment, thereby endangering the patient.

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- Fabius<sup>®</sup>
- Dräger-Vapor<sup>®</sup>
- Drägersorb<sup>®</sup> 800 Plus

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- Selectatec<sup>®</sup>

is a registered trade mark of Datex-Ohmeda.

## Typical Fabius Configurations

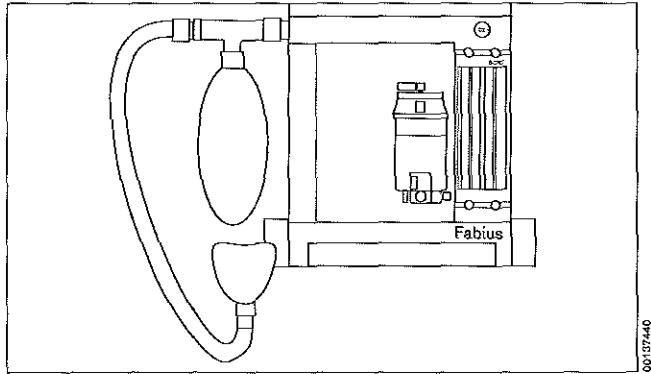
### General Description

The Fabius Inhalation Anesthesia Machine is a modular system consisting of a basic gas-delivery module with a variety of components and configuration designs to meet the requirements of various anesthesia delivery applications.

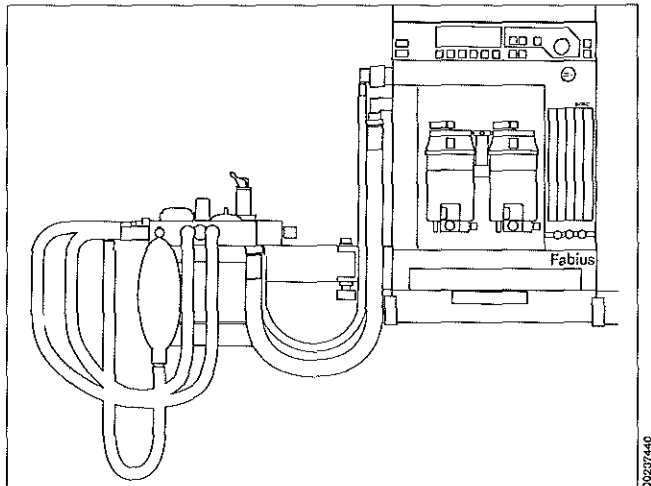
### Versions

- 2-gas version: O<sub>2</sub>, N<sub>2</sub>O
- 3-gas version: O<sub>2</sub>, N<sub>2</sub>O, Air
- Optionally available with two cylinder connections: O<sub>2</sub>, N<sub>2</sub>O

Wall mounted Fabius with single vaporizer and Magill breathing system (2-gas version), (illustrated with vaporizer holder).



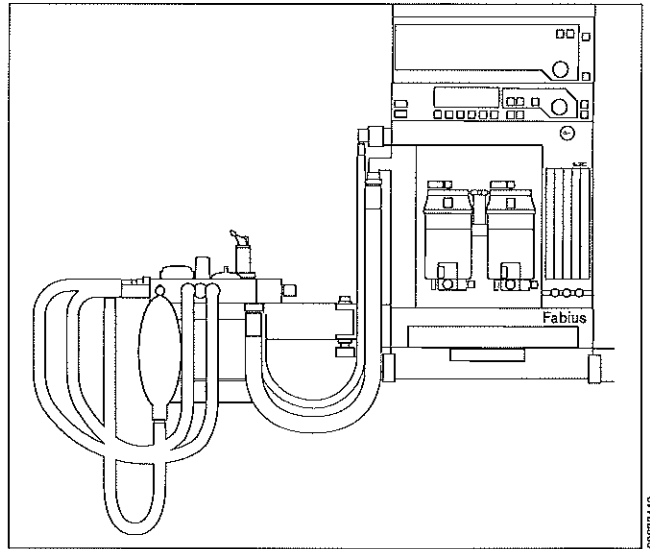
Wall mounted Fabius with dual vaporizers, compact breathing system, ventilator, and control box (3-gas version).



Alternatively: mounted on CE trolley (not illustrated).

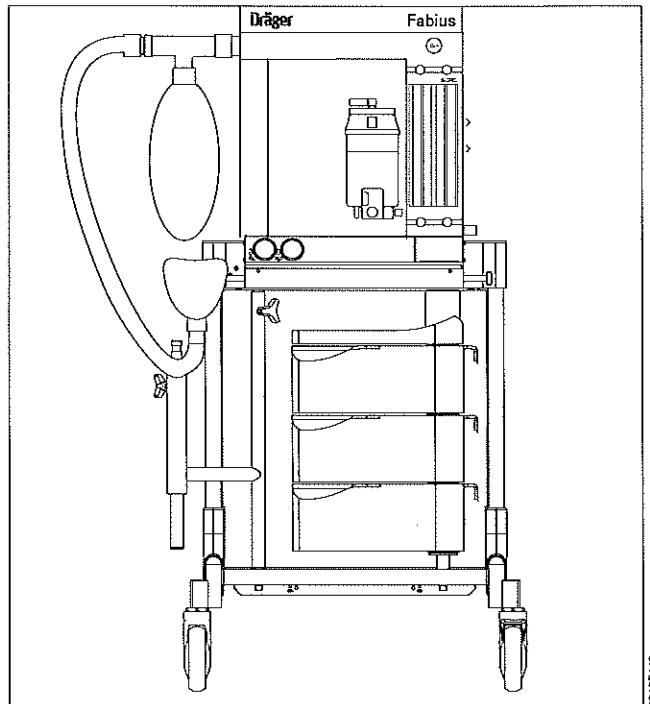
Wall mounted Fabius with dual vaporizers, compact breathing system, ventilator, control box, and PM 8050 gas monitor (3-gas version).

Alternatively: mounted on CE trolley (not illustrated).



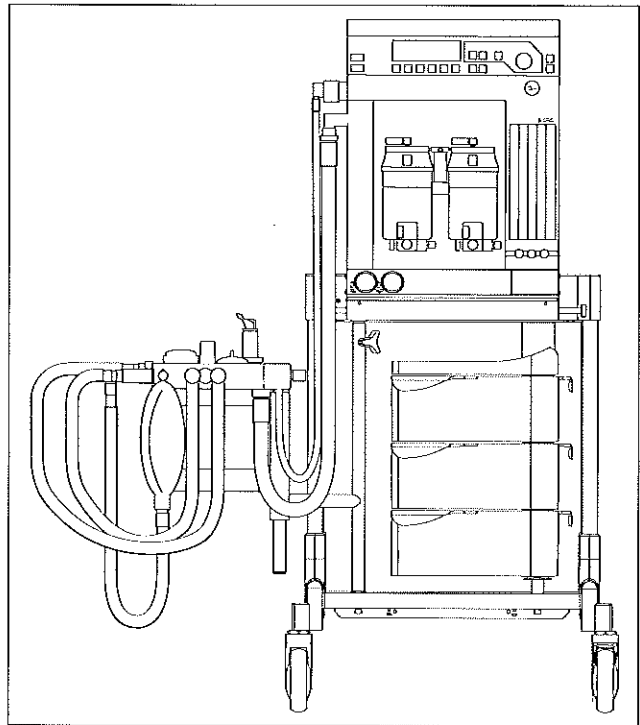
0037440

Pin index trolley mounted Fabius with single vaporizer and Magill breathing system (2-gas version).



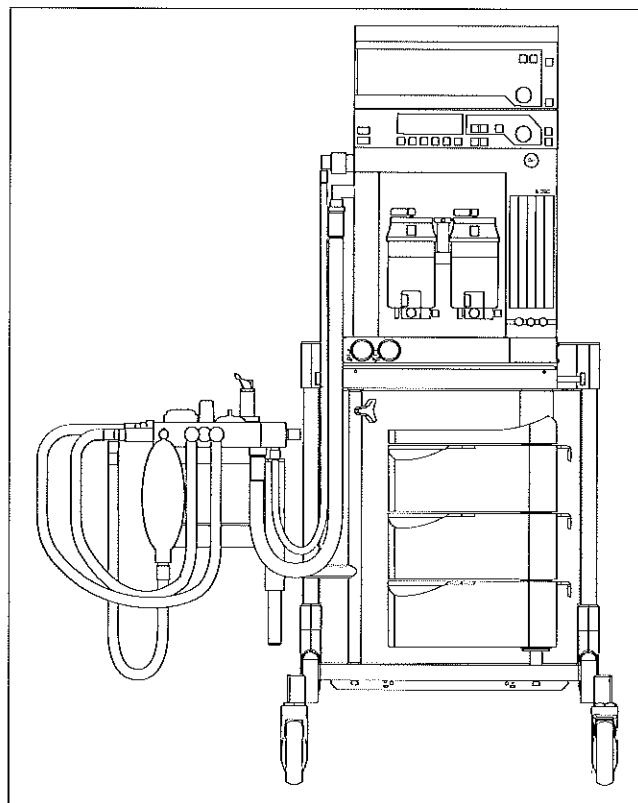
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Pin index trolley mounted Fabius with dual vaporizers, compact breathing system, ventilator, and control box (3-gas version).



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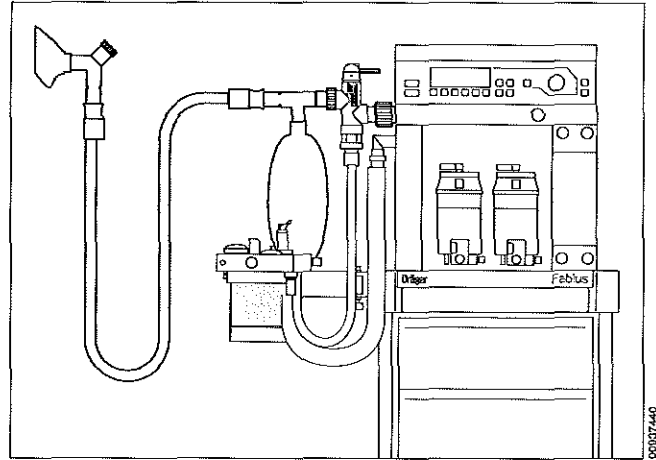
Pin index trolley mounted Fabius with dual vaporizers, compact breathing system, ventilator, control box, and PM 8050 gas monitor (3-gas version).



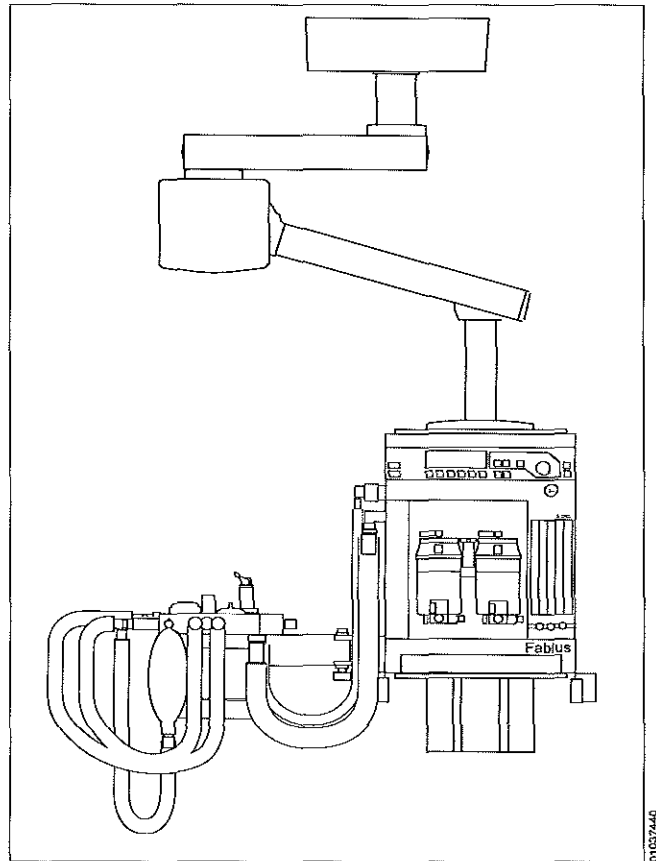
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CE trolley mounted Fabius with dual vaporizers, compact breathing system, ventilator, control box, A-cone switch, and Magill breathing system (2-gas version).



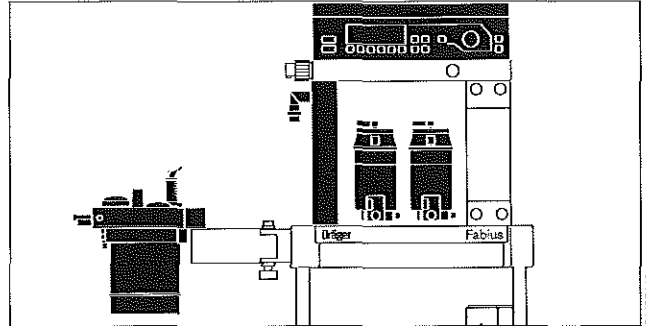
Ceiling mounted Fabius with compact breathing system, dual vaporizers, ventilator, and control box (3-gas version).



## Components

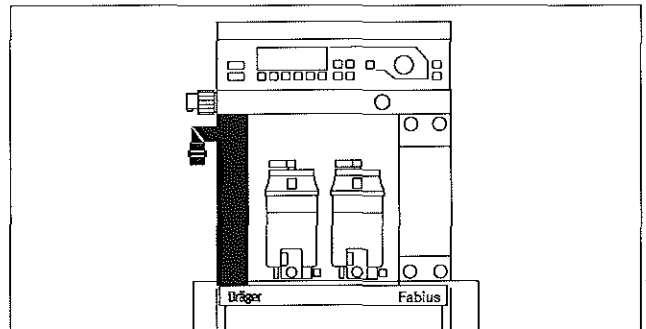
### Fabius Inhalation Anesthesia Machine Configurations

- anesthesia ventilator
- compact breathing system
- Dräger-Vapor® anesthetic agent vaporizers
- airway monitor, complete with control unit



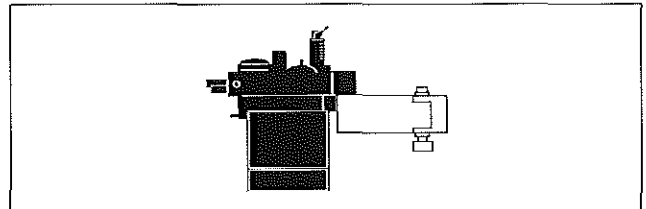
### Anesthesia Ventilator

The Fabius can be equipped with a ventilator for controlled ventilation of adults and children during anesthesia. The ventilator is electrically-powered, time-controlled, and volume-constant.



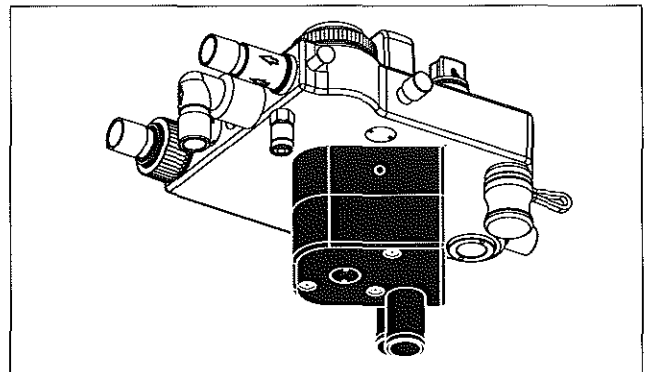
### Compact Breathing System

Re-breathing system with CO<sub>2</sub> absorption, optimized for a reduced fresh gas flow, with direct switchover from spontaneous breathing mode to manual mode at the pressure limiting valve. Maximum pressure limiting is possible during automatically controlled ventilation and manual ventilation. A PEEP function is available for automatically controlled ventilation. The inspiratory volume is independent of the fresh gas flow since the system is fresh gas decoupled.



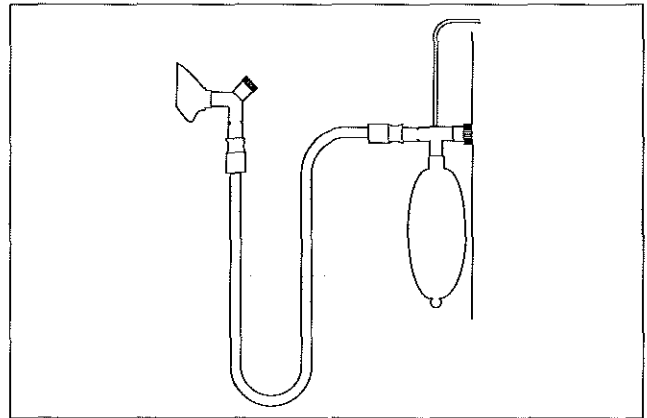
### Semi-Open Adapter

The semi-open compact breathing system is configured with a semi-open adapter to perform as a semi-open system with no rebreathing. The breathing system is used in the same way as the compact breathing system except that the CO<sub>2</sub> absorbent is not used. The fresh gas flow rate must be adjusted higher than the patient's minute volume.



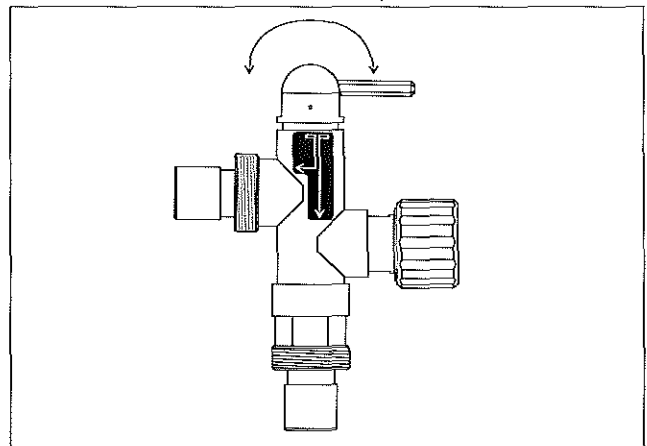
### Magill Breathing Circuit

The Magill Circuit is a semi-open breathing system and can be used in combination with a semi-closed breathing system or instead of a semi-closed breathing system. The Magill breathing system makes no allowances for pressure or O<sub>2</sub> monitoring.



### A-Cone Switch

The A-Cone switch provides a means for switching the fresh gas flow between two separate patient breathing circuits without changing fresh-gas hose connections. Switching the flow is accomplished by moving the lever, located on top of the A-cone switch, to the desired flow position. This lever controls a spring loaded switch that has a positive set position in either the right-hand or the left-hand side of the A-cone switch. This spring loaded feature ensures positive sealing for the fresh gas flow to the breathing circuit selected.



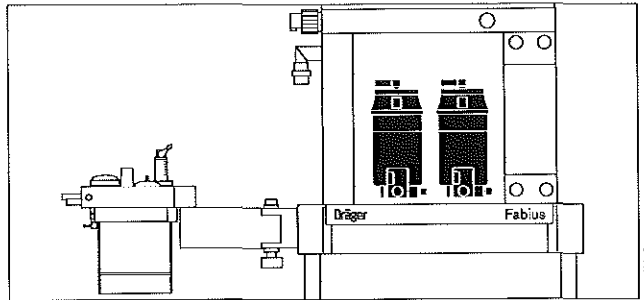
**Dräger-Vapor® Anesthetic Agent Vaporizer**

The Dräger-Vapor® is used to enrich the fresh gas with a precisely metered quantity of vapor from the liquid anesthetic agent being used, i.e. Isoflurane, Halothane, Enflurane, or Sevoflurane.

When using Desflurane:

230 V Mains	Devapor*, D-Vapor
110 V Mains	D-Tec*, D-Vapor

\* Devapor and D-Tec are available through your local Desflurane representative.



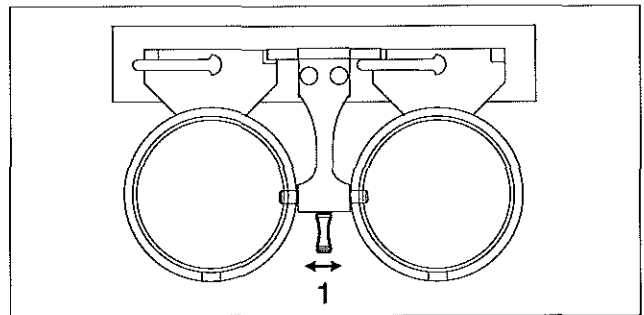
**Vapor Interlock System**

If the mounting for two separate vaporizers is used, an interlock system is provided to ensure that only one vaporizer can be used at a time.

**Dräger-Vapor®**

Note that the selector lever is shown in the center position. This ensures that both vaporizers are in the locked position. Also, this is the recommended position for the selector lever when moving the Fabius.

- 1 Moving the selector lever away from the desired vaporizer allows that vaporizer to be utilized and the other to be locked out of use.



**Selectatec®**

The interlock system for the Selectatec® is built into the vaporizers. When a vaporizer is selected for use, the interlocking index pins will protrude from the sides of the vaporizer thereby not allowing the neighboring vaporizer to be opened. For more specific information on the Selectatec®, refer to the Selectatec® Vaporizer's Instructions for Use.

### Airway Monitor with Control Units

Measuring and monitoring device for ventilation parameters during anesthesia.

The following parameters are displayed:

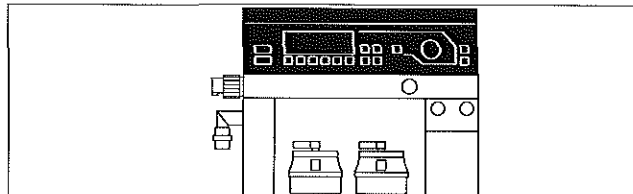
- Airway pressure ( $P_{aw}$ ), Peak, PEEP,  $P_{mean}$
- Expiratory minute volume (MV), tidal volume ( $V_T$ ), breathing frequency (f)
- Inspiratory oxygen concentration ( $FiO_2$ )

The following parameters are used for monitoring:

- Airway pressure ( $P_{aw}$ )
- Inspiratory oxygen concentration ( $FiO_2$ )
- Expiratory minute volume (MV)

The monitor comes with a control unit for setting and adjusting all ventilation parameters as outlined in the table below.

Maximum pressure ( $P_{max}$ )	10 to 70 hPa
Tidal volume ( $V_T$ )	50 to 1400 mL
Breathing frequency (fIPPV)	6 to 60 L/min
Insp./Exp. time ratio ( $T_I : T_E$ )	1 : 3 to 2 : 1
Inspiratory pause ( $T_{IP} : T_I$ )	5 to 50 %
Positive end expiratory pressure (PEEP)	0 to 15 hPa



## Ventilation and Monitor Operating Concept

### User Interface

Both the monitor and the ventilator provide a user interface by way of

- buttons
- rotary controls
- displays, and
- warning tones.

### Rotary Control

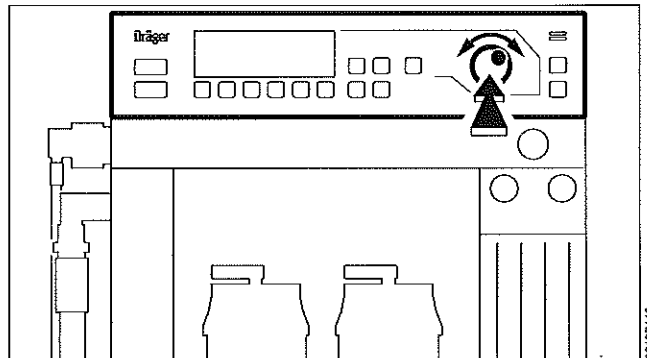
The rotary control is used to select functions by:

#### ... turning

Turning the rotary control moves the cursor (on the screen) or changes the value displayed on the screen.

#### ... pressing

By pressing the rotary control, the selected value is confirmed, or a selection process is started or ended.



### Displays

All necessary information is displayed on the screen. Additional LED indicators within buttons display the operating mode or status.

LED lamps in the upper right corner of the control panel indicate the highest degree of urgency of currently active alarms.



- Warning – Red Blinking
- Caution – Yellow Blinking
- Advisory – Yellow Steady

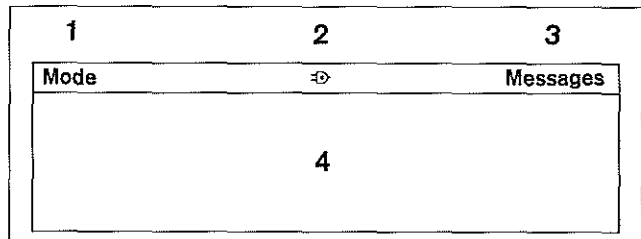
### Warning Tones

The warning tones provide an audible alert to the message displays. Each message is assigned a tone or sequence of tones to indicate its degree of urgency.

- 🔊 - - - - - warning (continuous)
- 🔊 - - - - - caution (every 30 seconds)
- 🔊 - advisory (single signal)



**Screen Display Configuration**

- 1 Mode: STANDBY  
IPPV  
MAN/SPONT  
SELFTEST
- 2 Power source:  mains  
 battery
- 3 Messages: Warning  
Caution  
Advisory
- 4 Specific screen menus




**Mode Selection Buttons**

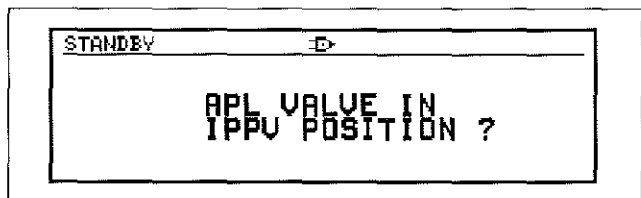
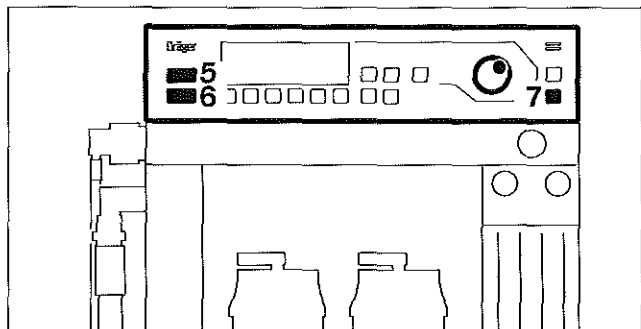
The mode is selected by one of these buttons and confirmed by pressing the rotary control.

- 5  For switching to manual ventilation or spontaneous breathing.
- 6  Button for IPPV.

When the user selects the IPPV mode, by pressing the IPPV button on the front panel, an additional screen appears after the mode change has been confirmed. It questions the user if the APL valve is in the IPPV position. The APL valve must be switched to the IPPV position and this question must be confirmed before the ventilator begins running.







If the user fails to confirm that the APL valve is in the IPPV position, the mode remains as it was before the user pushed the IPPV button on the front panel. This action to select the IPPV mode is treated as a CAUTION, therefore yellow LEDs are momentarily lit and an audible caution is heard.

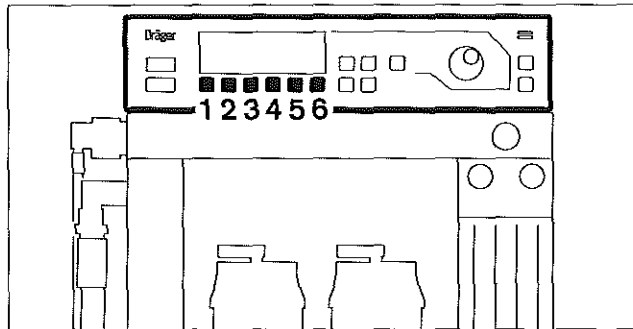
- 7  Standby button.



### Ventilation Parameter Buttons


Buttons located below the display window:

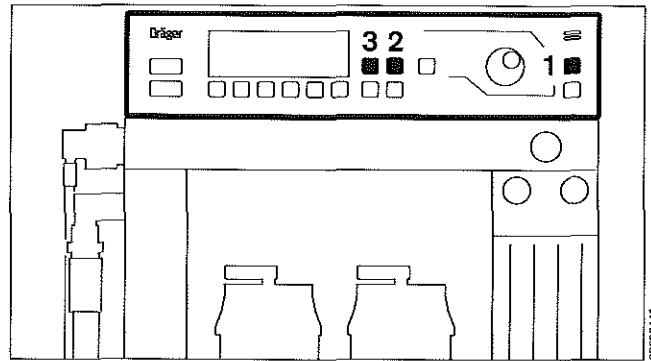
- 1  Button for setting the maximum pressure for ventilation (IPPV).
- 2  Button for setting the tidal volume.
- 3  Button for setting the ventilation frequency.
- 4  Button for setting the time ratio between inspiration and expiration phases.
- 5  Button for setting the relative inspiratory pause.
- 6  Button for setting a positive end expiratory pressure (PEEP) during automatic ventilation in the IPPV mode.




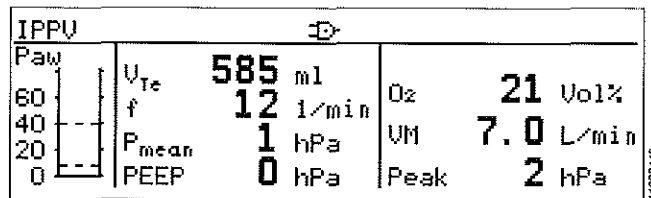



**Function Buttons**

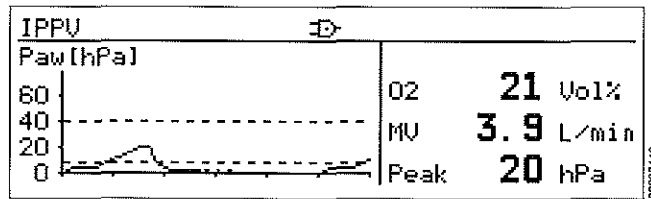
- 1  **Alarm Silence Button**  
 For muting the alarm beep for two minutes.  
 The yellow LED in this button lights up while the audible alarms are suspended.  
 Any new messages are signalled by the appropriate tone sequence.



- 2  **Standard Screen Button**  
 Selects the standard screen. The ventilation pressure is graphically indicated in a bar graph format, complete with alarm limits.



- 3  **Additional Screens Button**  
 Selects additional screens.  
 Paw curve and measured values screen

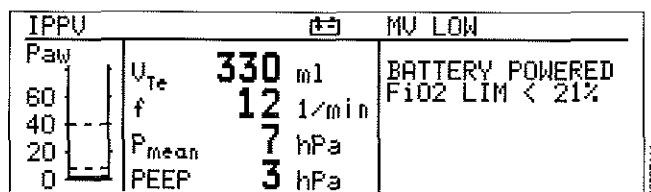


Ventilator settings screen

IPPV		ID			
$P_{max}$	$V_T$	$f_{IPPV}$	$T_I:T_E$	$T_{IP}:T_I$	PEEP
[hPa]	[ml]	[1/min]		[%]	[hPa]
25	600	12	1:2.0	10	0

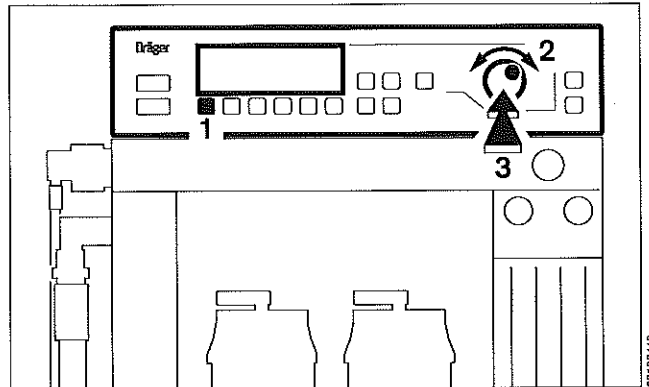
Ventilator Settings

Currently active alarms screen



Example: Setting Ventilator Parameter Values Using Pmax as an Example.

1 Press  button.



The current setting in this example is »25«. This unchanged value is displayed in the bottom line.

IPPU					
$P_{max}$ [hPa]	$V_T$ [ml]	$f_{IPPU}$ [l/min]	$T_I:T_E$	$T_{IP}:T_I$ [%]	PEEP [hPa]
25	600	12	1:2.0	10	0
Ventilator Settings Pmax = 25					

2 Set the new value by turning the rotary control. In this example, the new value is »30«. The unchanged original value of 25 is still displayed in the bottom line.

IPPU					
$P_{max}$ [hPa]	$V_T$ [ml]	$f_{IPPU}$ [l/min]	$T_I:T_E$	$T_{IP}:T_I$ [%]	PEEP [hPa]
30	600	12	1:2.0	10	0
Ventilator Settings Pmax = 25					


3 Confirm the new setting by pressing the rotary control.

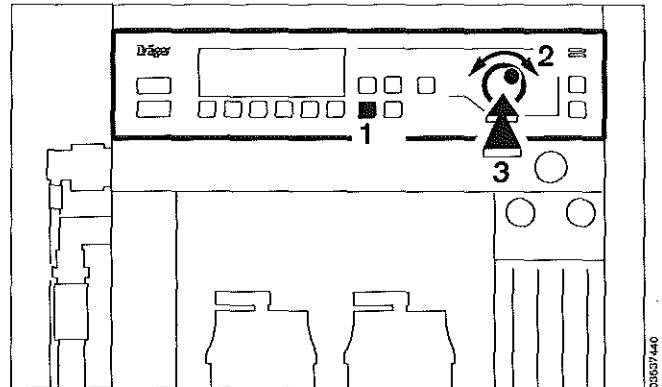
The previous value disappears from the bottom line and the new value in the Pmax box immediately becomes valid.

IPPU					
$P_{max}$ [hPa]	$V_T$ [ml]	$f_{IPPU}$ [l/min]	$T_I:T_E$	$T_{IP}:T_I$ [%]	PEEP [hPa]
30	600	12	1:2.0	10	0
Ventilator Settings					

If the rotary control is neither pressed nor turned within 10 seconds, the device quits the setting mode and the original settings remain unchanged.

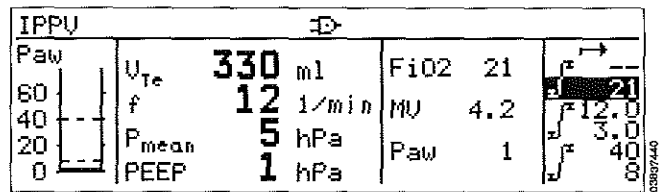
**Setting Alarm Limits**

- 1 Press  Alarm Limit button.
- 2 Select the required limit by turning the rotary control.
- 3 Confirm by pressing the rotary control.




**Example:**

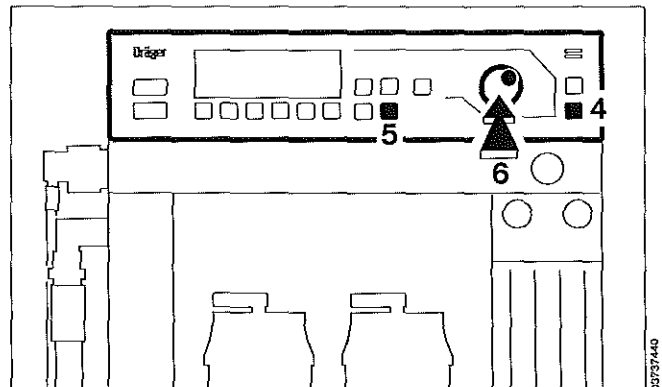
- Lower alarm limit for inspiratory O<sub>2</sub> concentration.
- 2 To modify the setting, turn the rotary control.
  - 3 To confirm the new setting, press the rotary control.



**Calibrating the Oxygen Sensor**

The oxygen sensor can be calibrated with 21 % O<sub>2</sub> or with 100 % O<sub>2</sub>.

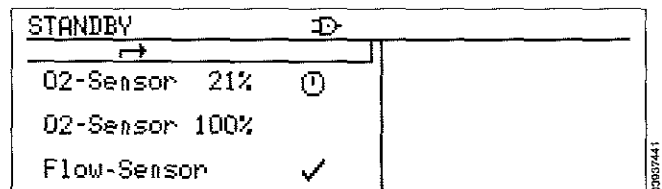
- 4 Switch the control unit to standby.
- 5 Press  Sensor Calibration Button and select the required calibration.
- 6 Confirm the selected mode by pressing the rotary control.



To calibrate the O<sub>2</sub> sensor, expose it to the appropriate calibration gas.

- Calibrating at 21 vol.% – expose the sensor to the ambient air.
- Calibrating at 100 vol.% – expose the sensor for at least 2 minutes to 100 vol.% oxygen.

**Note:** Sensor calibration takes approximately 2 minutes.



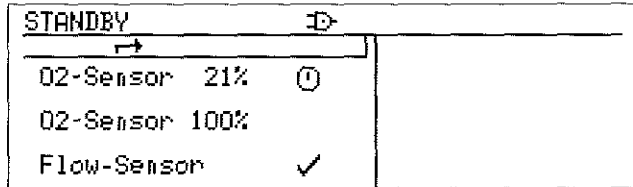
### Calibrating The Flow Sensor

(only in Standby)

When calibrating the flow sensor, make sure that no flow is present at the sensor. Flow sensor calibration takes 1 second.

#### Symbols for Status of Calibration:

- ✓ calibrated
- ⌚ calibration running
- ⓪ calibration failed, no measurement
- no symbol measurement uses old calibration



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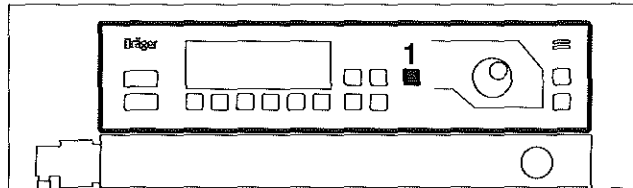
**Note:** If the optional PM 8050 gas monitor (SW 2.05) is attached to the Fabius, the buttons for setting the alarm limits and for calibrating the O2 and flow sensor are no longer used. These functions are now controlled by the PM 8050 gas monitor. For more information on the PM 8050 gas monitor, please refer to the specific instructions for Use.

### Menu Display Button

1 Menu Button

#### Battery Status Indications:

- FULL: Battery is fully charged.
- CHARGING: Battery is charging from mains power.
- POWERING: Fabius is operating on battery.
- TESTING: Battery test in progress.
- LOW: Battery is discharged.



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The Menu Display screen shows the last warning.

#### Configuration

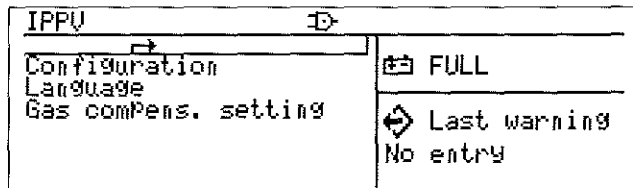
Configures machine (select and confirm by turning and pressing the rotary control).

#### Language

Select language (select and confirm by turning and pressing the rotary control).

#### Gas Compensation Setting

Select nearest fresh-gas mixture ranges.



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### Configuration Menu

**Key Code:** For DrägerService only

**Display timeout:** After this time, the standard screen is automatically set.

**Power on setting:** LAST (last setting used) or STRD (standard defaults)

In standard mode (STRD), the following parameter settings are active when the machine is switched on:

- Pmax = 25 hPa
- V<sub>T</sub> = 600 mL
- f<sub>IPPV</sub> = 12/min
- T<sub>i</sub>:T<sub>E</sub> = 1:2
- T<sub>i</sub>P:T<sub>i</sub> = 10 %
- PEEP = 0 hPa
- FiO<sub>2</sub> high = ---
- FiO<sub>2</sub> low = 21 %
- MV high = 12 L/min
- MV low = 3 L/min
- Paw high = 40 hPa
- Paw low = 8 hPa

**Curve IPPV:** The pressure curve may be free running (FREE) or synchronized (SYNC) with the breathing cycle.

**Display invert:** toggles the screen background between light and dark (activation in standby mode).

### Language Selection Menu

**Main language:** Alphabetic languages for displaying messages and on-screen information.

**Add. language:** Messages in non alphabetic languages (alarm messages).

### Gas Compensation Setting Menu

- To adapt flow measurement to the gas mixture currently in use, select »Gas compens. setting« and confirm.
- With »Gas mix. O<sub>2</sub>/N<sub>2</sub>O«, select the gas composition that comes closest to the fresh gas setting.
- Confirm the selected mixture. If the selected gas composition is not close to the actual gas composition, flow measurement data will be inaccurate.

IPPV		⏏
Keycode	0	⏏ FULL
Display timeout	-- s	
Power on setting	Last	⏏ Last Warning
Curve IPPV	Free	
Invert Display	No	APNEA VOLUME

04237441

IPPV		⏏
Configuration		⏏ FULL
Language		
Gas compens. setting		⏏ Last warning
		No entry

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IPPV		⏏
Gas mix. O <sub>2</sub> /N <sub>2</sub> O	70/30	⏏ FULL
		⏏ Last warning
		No entry

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## Preparation

### Caution During Transport

Prior to moving the Fabius, remove monitors and extraneous equipment from the top of the unit that is not permanently fastened to the unit. Take care when rolling the machine over door thresholds and similar obstacles.

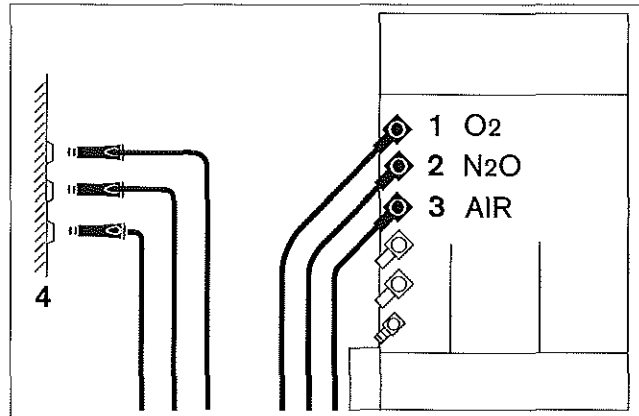
### Gas supply

Medical gases must be dry and free from dust and oil.

- Rear view of a 3-gas CE trolley version with five gas connections.

### Medical Gas Pipeline Supply of O<sub>2</sub>, N<sub>2</sub>O, and AIR

- 1 Connect O<sub>2</sub> hose to connector on Fabius and  
4 to wall terminal unit of medical gas pipeline system.
- 2 Connect N<sub>2</sub>O hose to connector on Fabius and  
4 to wall terminal unit of medical gas pipeline system.
- 3 Connect AIR hose to connector on the Fabius and  
4 to wall terminal unit of medical gas pipeline system.



### Caution When Handling O<sub>2</sub> Cylinders

- Do not oil or grease the O<sub>2</sub> cylinder valves and O<sub>2</sub> pressure regulator. Do not touch these areas with greasy fingers. There is a risk of explosion.
- If cylinder valves are leaky or difficult to open or close, they must be repaired in accordance with the manufacturer's specifications.

Even if the gas supply is connected to a medical gas pipeline, the cylinders should remain on the device in reserve.

### Cylinders with Threaded Connectors

On the back of the unit:

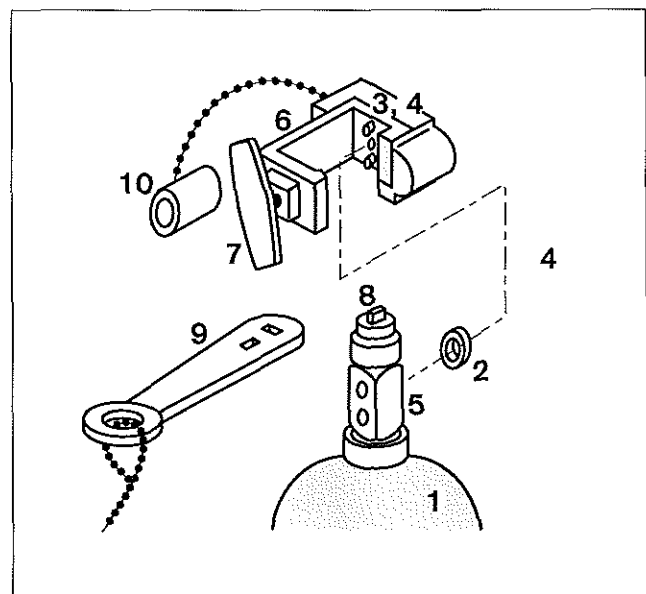
- Place the full cylinders in the cylinder holders and secure them in position.
- Screw the pressure regulators on to the cylinder valves.
- Screw the compressed gas hoses to the pressure regulators and to the lower connections of the gas inlet block.
- Open the cylinder valves.

The cylinder valves must only be opened or closed manually. Never use tools.

### Cylinders with Pin-index Mounting

When attaching a cylinder, ensure that only one washer is installed between the cylinder and the yoke gas inlet. The use of multiple washers will inhibit the pin-index safety system. Be sure to verify the presence of the index pins each time a cylinder is installed. Never attempt to override the pin-index safety system.

- 1 To connect a gas cylinder to its yoke:
- 2 Remove the old washer and install a new washer on the seat of the yoke gas inlet connection.
- 3 Verify that the two index pins below the
- 4 gas inlet are present.
- 5 Insert the head of the gas cylinder into the yoke from below.
- Ensure that the gas outlet and indexing holes on the cylinder head align with the gas inlet and index pins of the yoke assembly.
- Engage the indexing holes with the index pins.
- 7 Turn the yoke handle clockwise against the cylinder head, so that the point of the yoke handle bolt is aligned with the indent on the back of the cylinder head.
- Verify that the washer is in place, the index pins are engaged, and the cylinder hangs vertically. Tighten the yoke firmly.
- 8 When required, the cylinder valve
- 9 is opened using the cylinder wrench that is provided.
- 10 When a cylinder is removed, place the yoke plug in the yoke assembly and tighten.

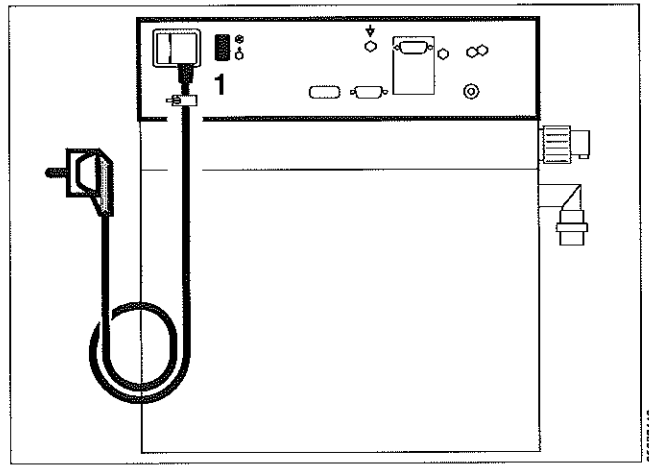


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### Electrical Supply

Fabius can be operated at mains voltages from 100 V to 127 V. Observe the label beside the mains voltage input socket!

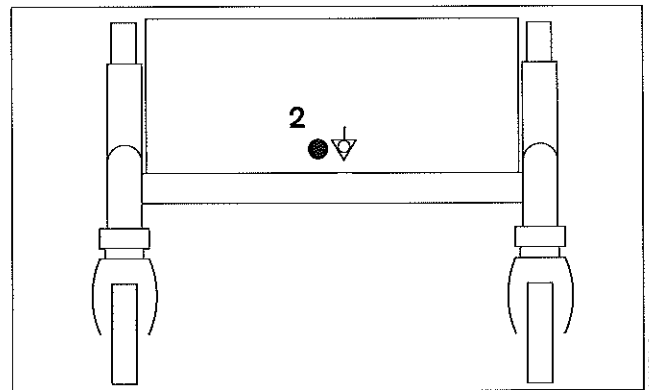
- Push power plug into main supply socket.
- 1 Switch on the machine. The on/off switch is on the rear of the machine.



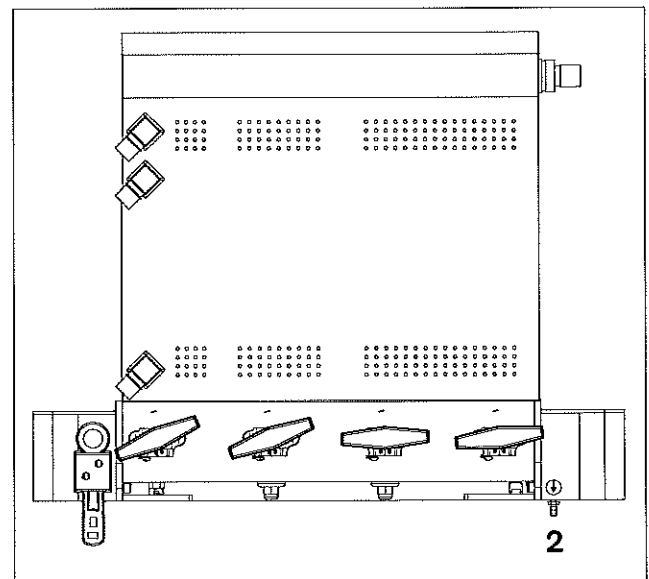
### Equipotential Bonding

For intra-cranial and intra-cardiac operations  
Trolley-mounted anesthesia machines:

- 2 Use cable ref. 83 01 349 cable.
- Connect the terminal on the back of the trolley to an equipotential bonding point in the operating room.



### Pin Index version

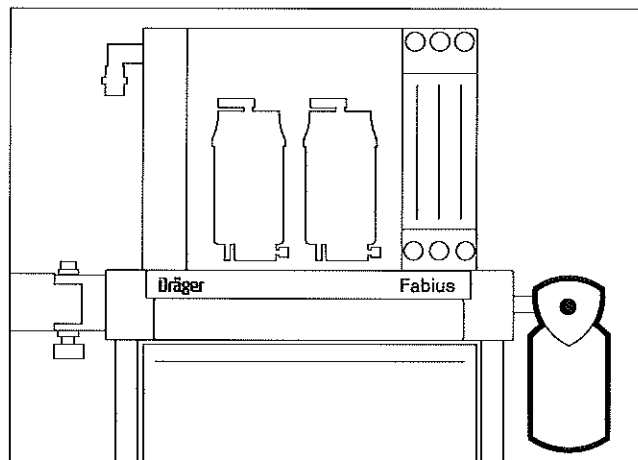




**Attaching Manual Ventilation Bag**

e.g., Resutator 2000 for emergency ventilation

- Hang the fully prepared and tested bag on the rail at the right.



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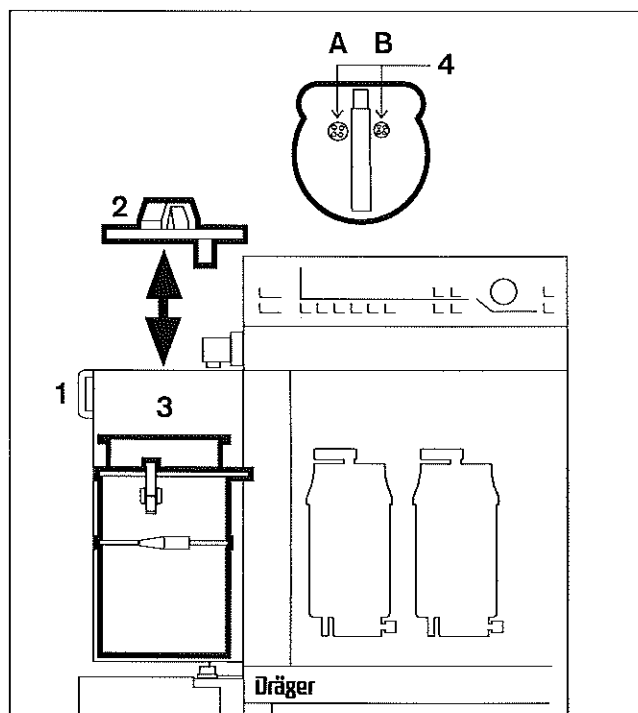
**Preparing the Ventilator**

Use only disinfected/sterilized components.

- 1 Swing out the ventilator door.
- Unlock the clasps to
- 2 remove the cover.
- 3 Insert the diaphragm.
- 2 Fit the cover and
- 4 lock both locking screws.
- 1 Swing the ventilator unit back into position.

**Ventilator Safety Feature**

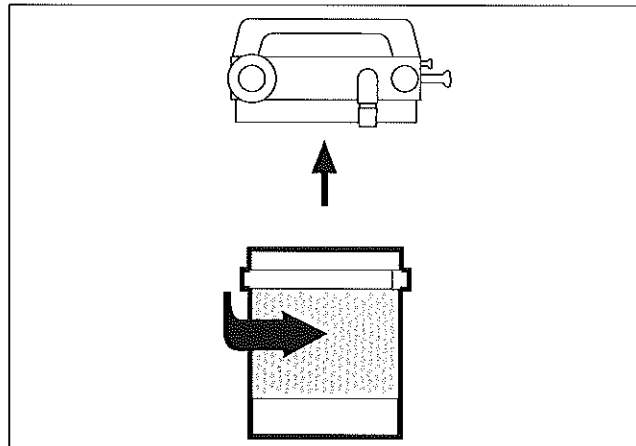
- A Over pressure valve
- B Additional air valve



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### Fitting the CO<sub>2</sub> Absorber on the Compact Breathing System

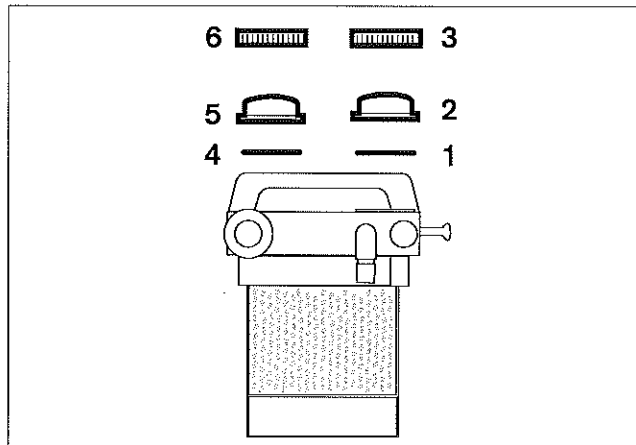
- Fill the absorber with fresh CO<sub>2</sub> absorbent. Dräger recommends the use of Drägerisorb® 800 Plus.
- Tighten the absorber by turning it to the right into the compact breathing system.
- Ensure that no CO<sub>2</sub> absorbent dust/particles have been deposited between the gaskets and the sealing surfaces. Such dust and particles can cause leaks in the system.



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### Fitting the Inspiratory Valve

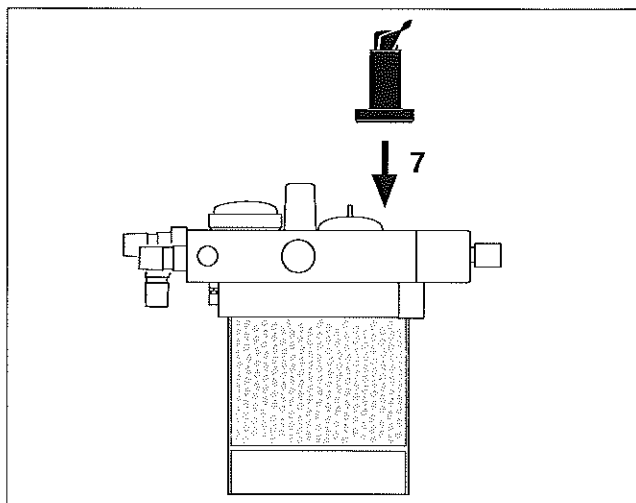
- 1 Place the valve disc in the valve seat.
- 2 Fit the inspection cap (with port).
- 3 Tighten the retaining nut securely.



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### Fitting the Expiratory Valve

- 4 Place the valve disc in the valve seat.
- 5 Fit the inspection cap.
- 6 Tighten the retaining nut securely.



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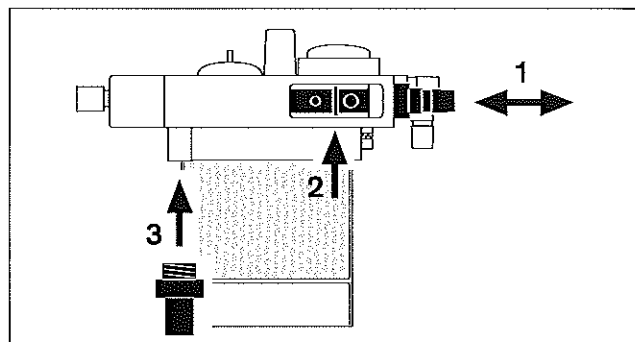
### Fitting the Pressure-limiting Valve

- 7 Tighten the pressure-limiting valve securely into place with the retaining nut.

Only use a valve marked with "SPONT/IPPV" and "MAN".

**Inserting the Flow Sensor**

- 1 Unscrew and remove the expiration port.
- 2 Insert the flow sensor, observing the indicated direction of flow.



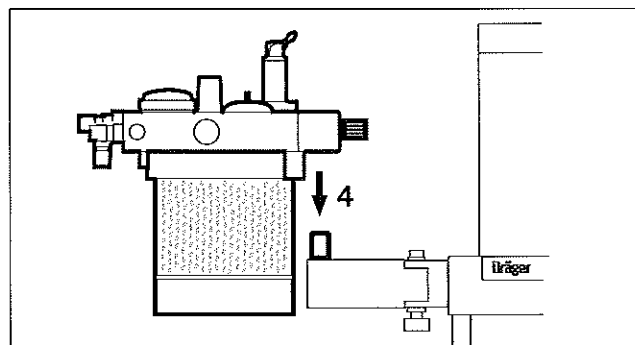
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**Fitting the Waste Gas Outlet Port**

- 3 Screw the waste gas port into the compact breathing system from underneath.

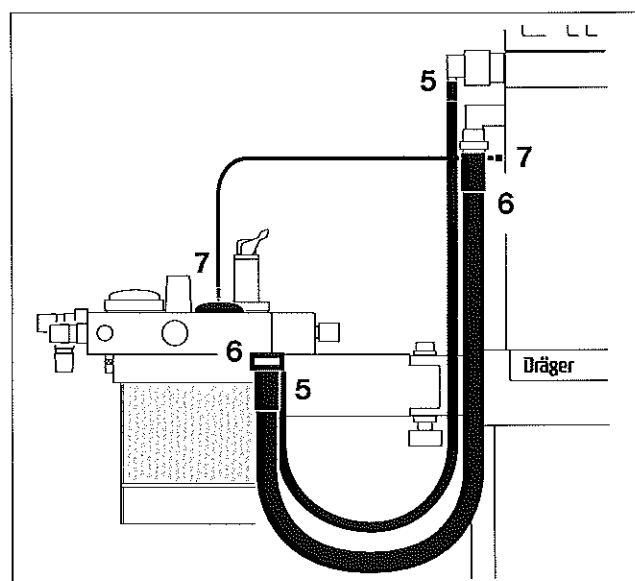
**Connecting the Compact Breathing System**

- The sealing rings on the threaded and conical connectors must be undamaged and clean.
  - Only hand-tighten the threaded connectors. Do not use tools.
  - Slightly loosen the knurled screw on the compact breathing system.
- 4 Fit the compact breathing system to the pin on the anesthesia machine.
  - Tighten the knurled screw.



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- 5 Screw the fresh gas hose to the Fabius and to the compact breathing system.
- 6 Screw the ventilation hose to the ventilator and to the compact breathing system.
- 7 Plug the control hose to the connection port on the expiration valve and the connection port on the ventilator.



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### Fitting Microbial Filters

- Push the microbial filters into the inspiratory port and expiratory port, until they noticeably click into place.

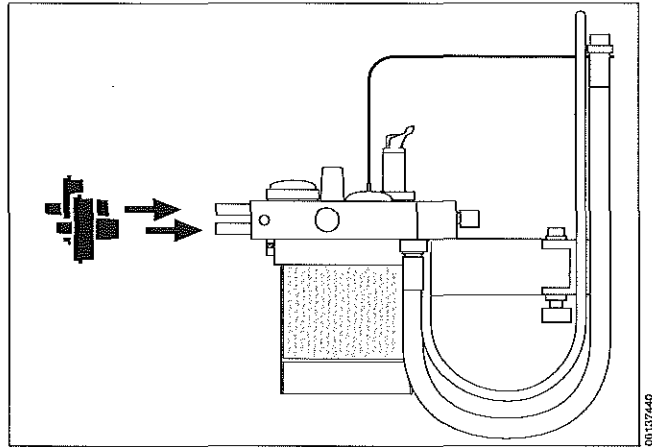
### Dismantling instructions:

- Squeeze at the points marked "PRESS" and simultaneously pull the filter off the port.

Condensation may increase the flow resistance of the filters, making breathing more difficult.

Carefully monitor the airway pressure.

Observe the specific Instructions for Use for the microbial filter.

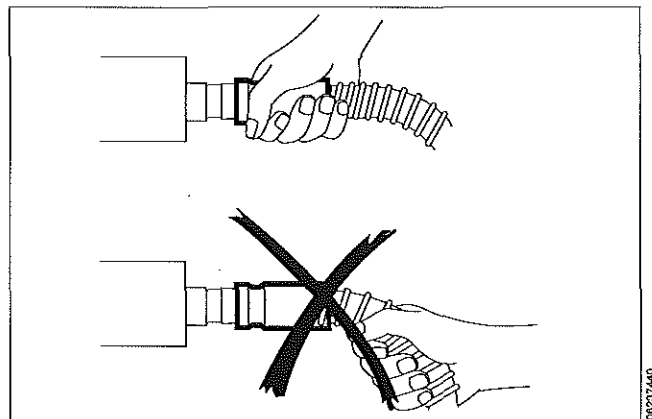


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### Connecting the Breathing Hoses

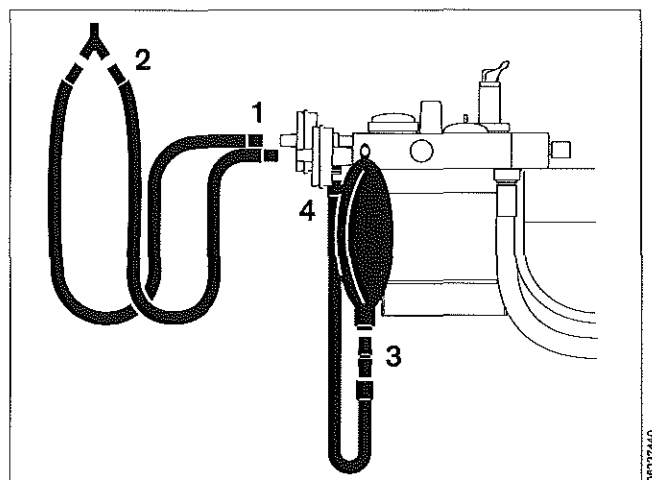
#### Note:

- Take care not to damage the breathing hoses.
- When connecting and disconnecting, always hold the breathing hoses by the end sleeve, not by the spiral reinforcement. Otherwise, the spiral reinforcement may be torn loose, e.g. at the end-sleeve.
- Breathing hoses with damaged spiral reinforcement can kink, thereby interrupting breathing.
- Before each use, check the breathing hoses for damage.



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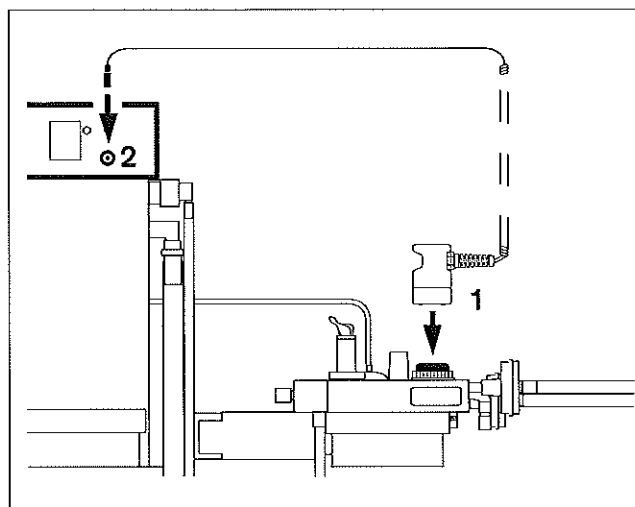
- 1 Push a patient breathing hose on to both the inspiratory cone and the expiratory cone or on to the microbial filters.
- 2 Connect both patient breathing hoses to the Y-piece.
- 3 Connect the manual breathing bag to the bag breathing hose via the double port.
- 4 Connect the bag hose to the elbow port on the compact breathing system.



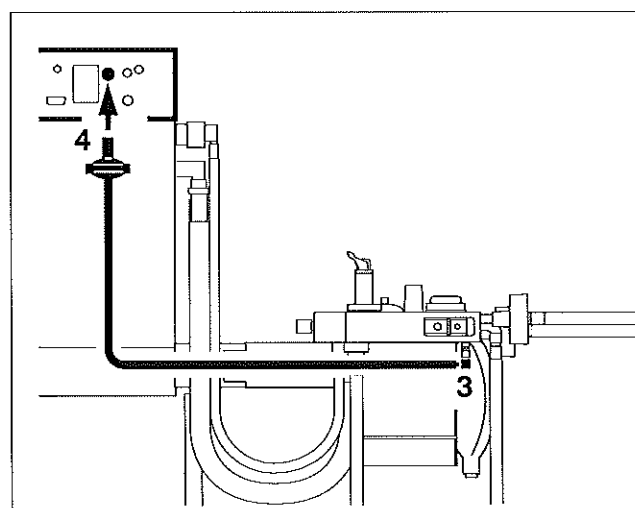
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**Connecting the O<sub>2</sub> Sensor Capsule**

- 1 Push the O<sub>2</sub> sensor into the port of the inspiratory valve, and
- 2 plug in the connector on the back of the control unit.

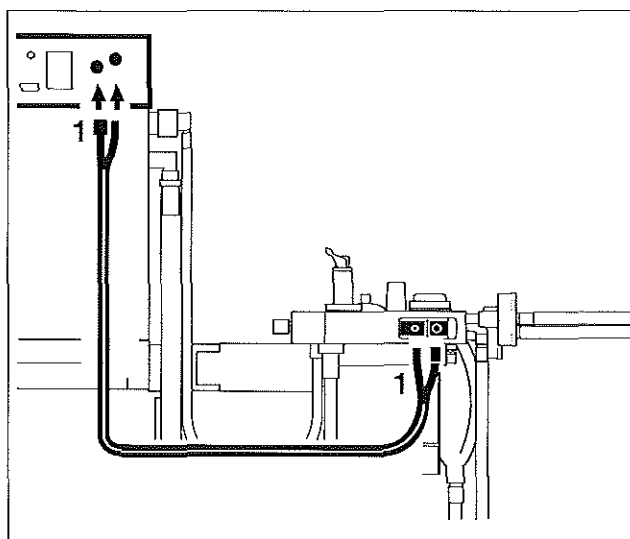
**Connecting the Pressure Sensor**

- 3 Press the probe of the pressure measuring line into the socket on the underside of the compact breathing system until it engages.
- 4 Connect the hose of the pressure measuring line to the bacterial filter and plug it firmly into the port on the back of the control unit.



**Connecting the Flow Sensor**

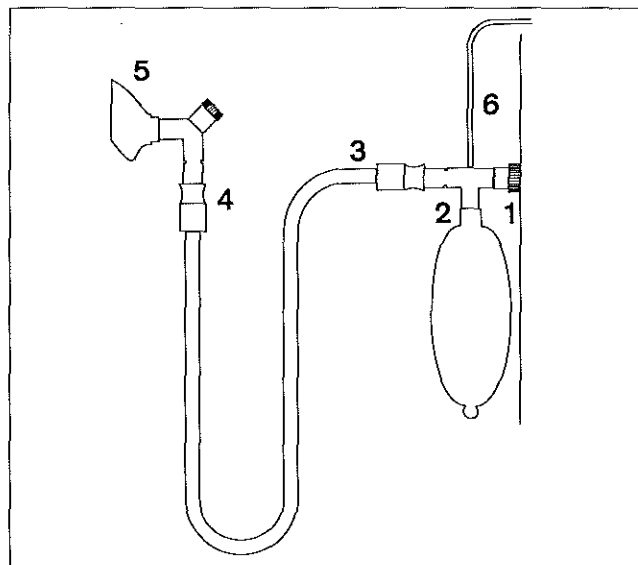
- 1 Push the measuring hoses on to the connection ports on the flow sensor and at the back of the unit. Please note the connections are different.



**Connect the Magill Inhalation Device**

For use with mask:

- 1 Screw Magill connector onto the freshgas outlet.
- 2 Connect breathing bag.
- 3 Connect breathing hose E (110 cm).
- 4 Plug ISO mask connector into breathing hose.
- 5 Connect mask to ISO mask connector.
- 6 Connect sampling hose for monitoring to the Magill connector.

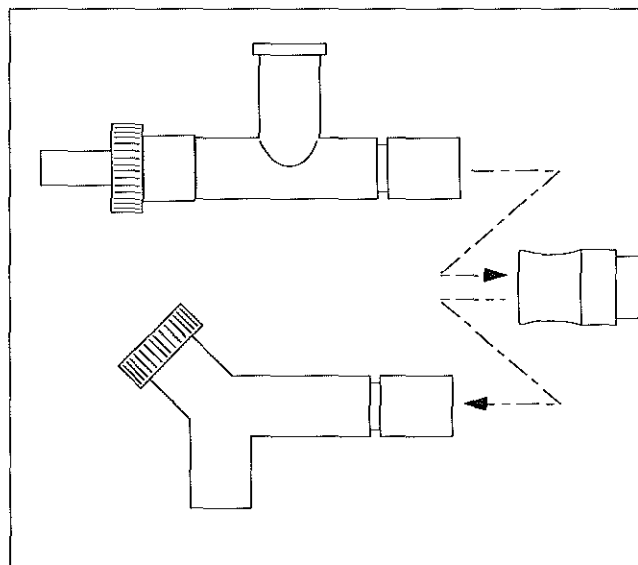


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For use with tube:

- Remove ISO mask connector.
- Use ISO connector.
- Plug connector for tracheal tube into ISO connector.

**Caution:** The Magill Circuit shall not be connected to the Fabius ventilator.

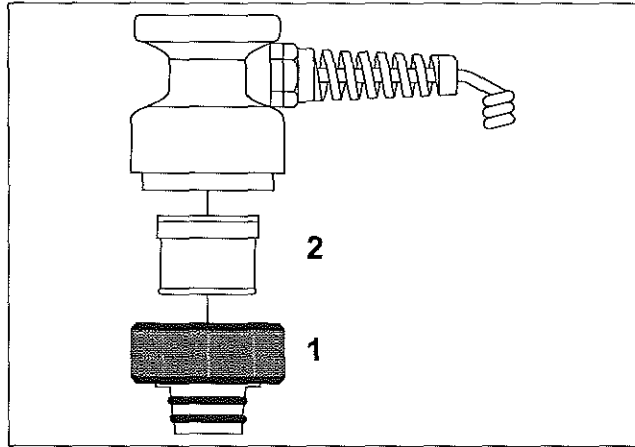


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### Connecting the O<sub>2</sub> Sensor

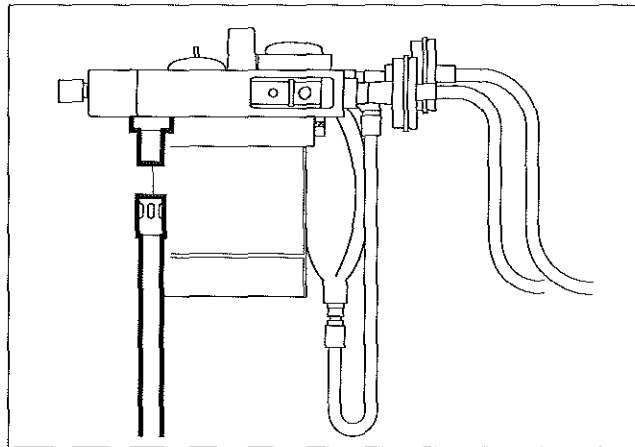
Inserting a new O<sub>2</sub> sensor capsule:

- 1 Unscrew the screw cap from the sensor housing.
- Remove the new sensor capsule from its packaging, or use a disinfected sensor capsule.
- 2 Insert the capsule in the housing, with the ring-shaped conductor against the contacts in the housing.
- 1 Screw the screw cap on firmly by hand.



### Installing Anesthetic Gas Scavenging Hose to the Compact Breathing System

- Connect the transfer hose to the waste gas port of the Compact Breathing System and to the anesthetic gas scavenging line or an anesthetic agent filter.
- A second transfer hose is required for the Semi-open compact breathing system.

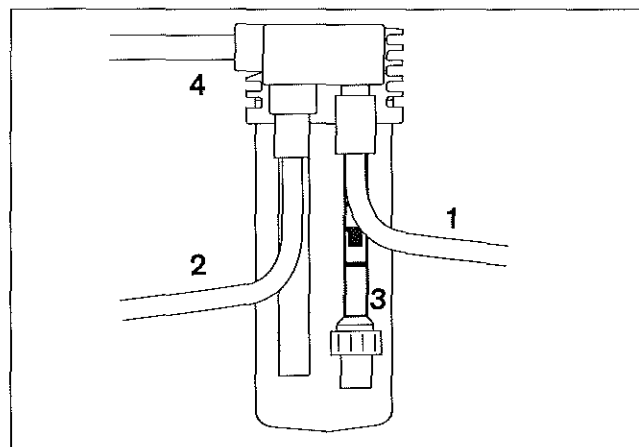




**Anesthetic Gas Scavenging System AGS**

- 1 Output connection from the scavenging system.
- 2 Connection to scavenger system from Fabius waste gas outlet port.
- 3 Flow indicator. During use, the flow indicator must be between the upper and lower marks on the tube.
- 4 Connection for Semi-open breathing system.

For more detailed information on the scavenging system, refer to the specific Instructions for Use.



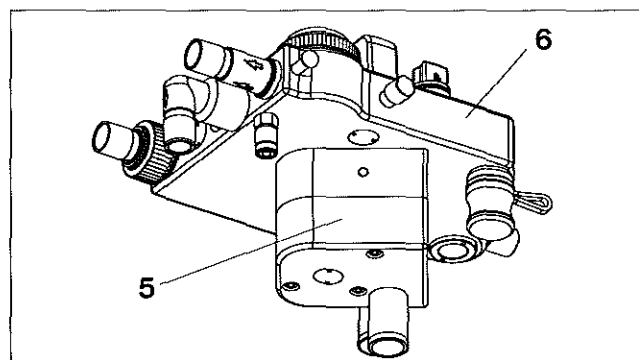
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**Scavenger System Connections for the Semi-open Compact Breathing System**

Both exhaust ports

- 5 one on the semi-open adapter and
- 6 the other on the Compact Breathing System housing must be connected to the AGS scavenger.

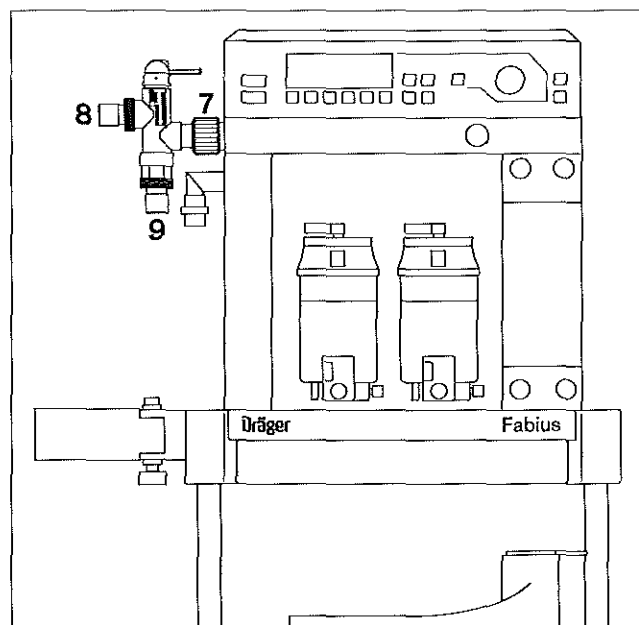
Remove the existing scavenger plug if necessary.



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**A-Cone Switch**

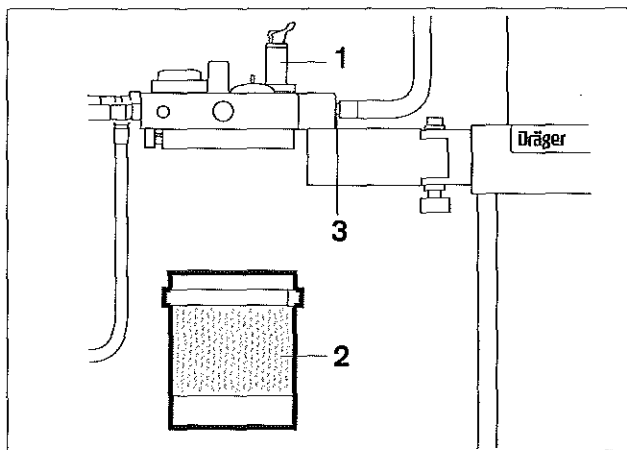
- 7 The A-Cone switch is connected to the fresh gas outlet via the conical fitting. It must be mounted parallel to the front of the Fabius.
- 8 The horizontal port of the A-Cone switch is connected to the alternate breathing system.
- 9 The lower vertical port of the A-Cone switch is connected to the Compact or Semi-open Compact breathing system on the Fabius.



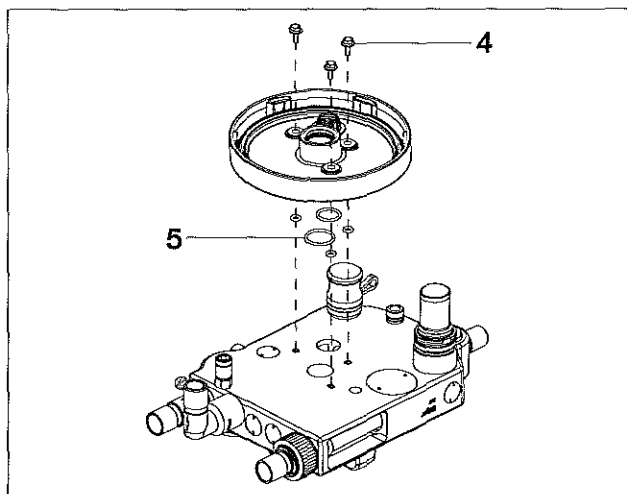
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### Installation of the Semi-Open Adapter

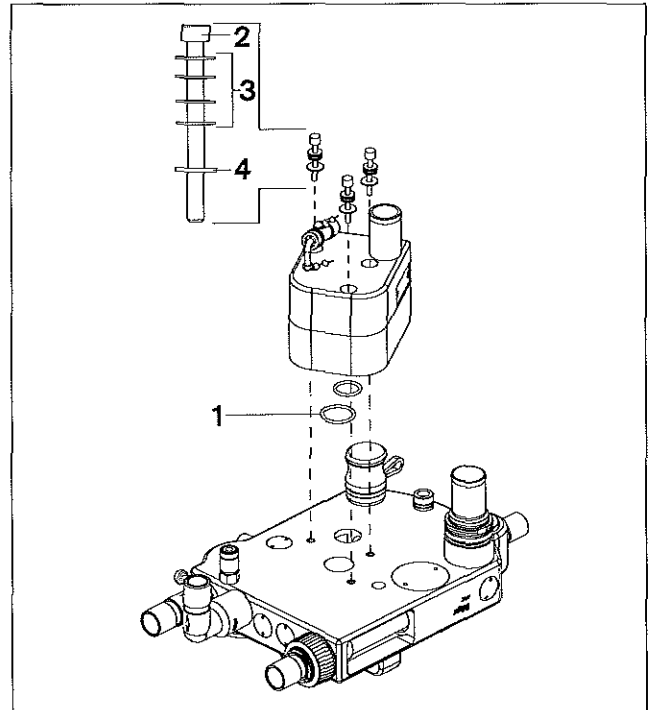
- Disconnect the Fabius from the mains power supply.
  - Disconnect the Fabius from the central pipeline gas supply.
  - Close all gas cylinders (if applicable).
  - Remove all hoses, sensors, and control lines from the Compact Breathing System.
- 1 Remove the APL valve.
  - 2 Remove the absorbent canister and store properly.
  - 3 Loosen the locking screw that secures the Compact Breathing System to the mounting stud.
- Gently lift the breathing system and place upside down on a firm surface. It is recommended that it be placed on a soft surface such as a towel to prevent marring of the unit.



- 4 Remove the three mounting screws (M 5 x 16 mm) and washers that hold the canister mount to the compact breathing system housing.
- 5 Ensure that all "O" rings are removed with the canister mount. Store this mount assembly, hardware, and "O" rings with the absorbent canister.

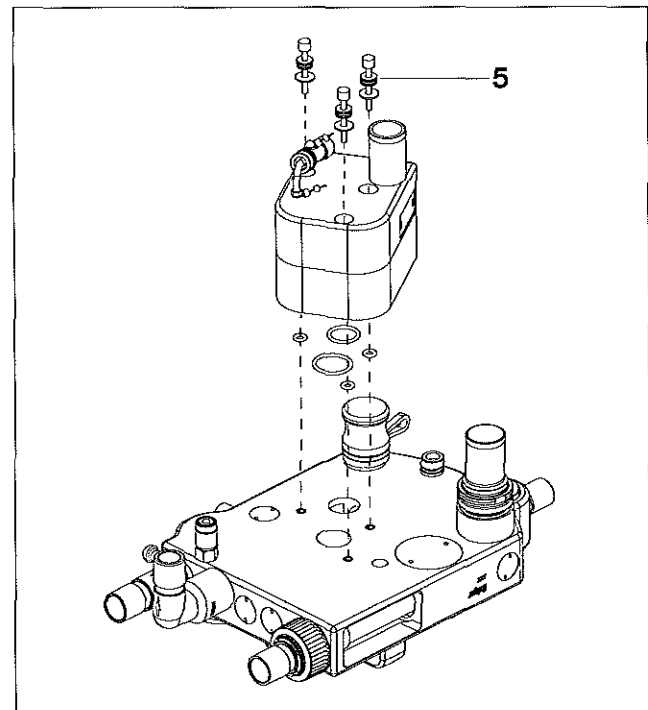


- Prepare the semi-open adapter.
- 1 Ensure that the "O" rings are in the proper position. These "O" rings are provided with the adapter. Do not use the "O" rings from the compact canister mount, as they are not interchangeable.
- Place the adapter onto the compact breathing assembly and
- 2 secure with the three screws provided (M 5 x 80 mm) with the adapter.
- 4 These screws each come with a flat washer and
- 3 and four Belleville washers. The Belleville washers go on first followed by the flat washer. Please note that the Belleville style washer is a curved spring washer and must be installed by opposing each other. Do not over tighten these screws.
- Place the semi-open adapter back on the mounting pole of the Fabius and secure the locking screw.
- Connect all hoses, sensors, and control lines.
- Install the APL valve.
- Connect Fabius to the mains power supply, and central pipeline gas supply.



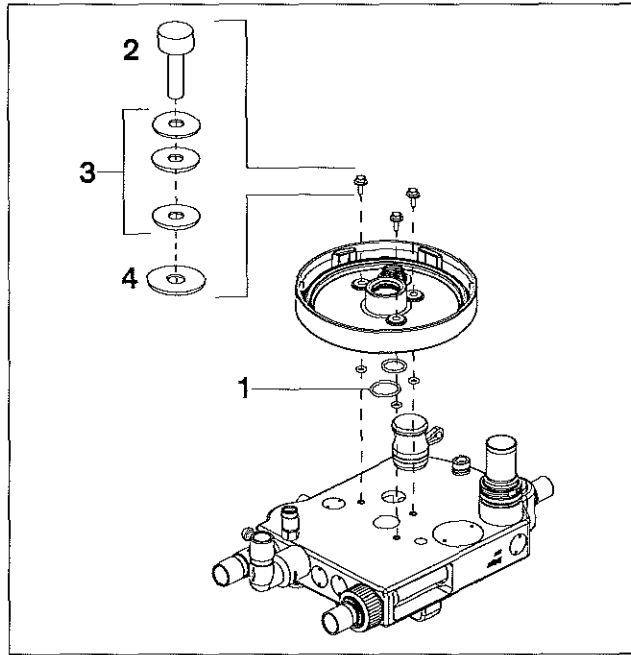
#### Removing the Semi-Open Adapter and Installing the CO<sub>2</sub> Absorber

- Disconnect the Fabius from the mains power supply.
- Disconnect the Fabius from the central pipeline gas supply. Close all gas cylinders (if applicable).
- Remove all hoses, sensors, and control lines from the Compact Breathing System.
- Remove the APL valve.
- Loosen the locking screw that secures the Compact Breathing System to the mounting stud.
- Gently lift the breathing system and place upside down on a firm surface. It is recommended that it be placed on a soft surface such as a towel to prevent marring of the unit.
- 5 Remove the three mounting screws (M 5 x 80 mm) and washers that hold the semi-open breathing system adapter to the compact breathing system housing.

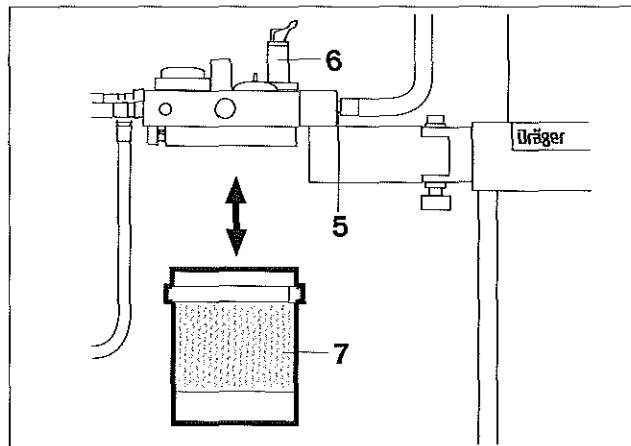


## Preparation

- 1 Ensure that all five "O" rings are in the proper position of the canister mount.
- 2 Install the three mounting screws (M 5 x 16 mm) and washers that hold the canister mount to the compact breathing system housing.
- 3 There are three belleville washers and
- 4 a flat washer for each mounting screw. Please note that the belleville style washer is a curved spring washer and must be installed by opposing each other. The flat washer is installed next. Do not over tighten these screws.



- 5 Gently lift the breathing system and place it on the mounting stud. Tighten the mounting screw.
- Connect all hoses, sensors, and control lines.
- 6 Install the APL valve.
- Connect Fabius to the mains powers supply, and central pipeline gas supply.
- 7 Install the absorbent canister. Ensure it is filled with fresh CO<sub>2</sub> absorbent.



## Additional Equipment

Prepare additional equipment as specified in the specific Instructions for Use.

**Caution:** If monitors and other equipment are placed on top of Fabius, the risk of tipping over the unit is increased, especially when rolling over thresholds etc. Remove all monitors and other equipment from the top of the Fabius before moving the unit.

**Caution:** Remove all monitors and other equipment from the top of the Fabius before moving the unit.

## Operation

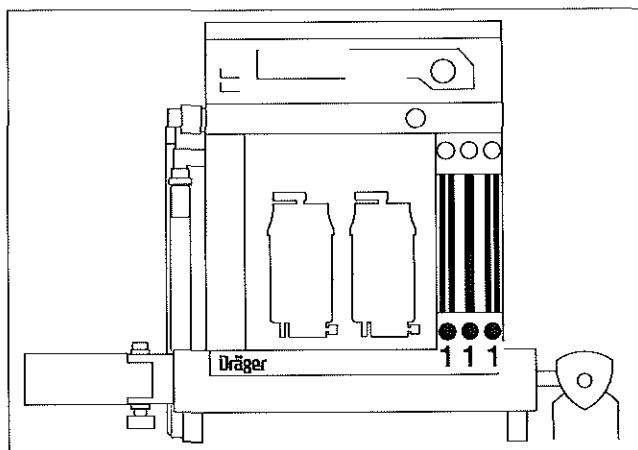
### Nitrogen Wash-out (when Required)

During anesthesia induction, air containing about 79 % nitrogen (N<sub>2</sub>) remains in the compact breathing system (and in the patient's lungs).

When the next intended use of the unit may be for a low-flow anesthesia case, the nitrogen content should first be flushed with a time-limited high flow of fresh gas (O<sub>2</sub>/N<sub>2</sub>O) in order to ensure correct denitrogenization.

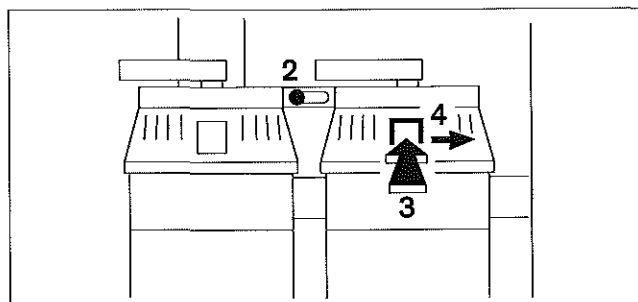
### Adjusting the Fresh Gas Composition

- 1 With the metering valves:  
Set fresh gas flow for O<sub>2</sub>, N<sub>2</sub>O and AIR.



### Setting the Vapor

- 2 Lock the unused Vapor by pushing the lever as far as it will go in the direction of the unused Vapor (in this example left hand Vapor is locked).
  - 3 On the Vapor to be used, press and hold down the 0 button and at the same time
  - 4 Turn the handwheel counter-clockwise to the desired anesthetic agent concentration.
- Regularly check the filling level on the sight glass. When reaching the minimum mark, fill the Vapor with anesthetic agent.
  - Please refer to the specific Instructions for Use for Dräger-Vapor®.



### Ventilation Modes with the Compact and Semi-open Compact Breathing System

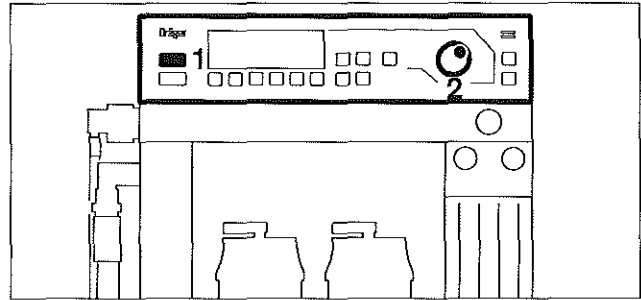
There are three ventilation modes available in the Fabius:

- Spontaneous
- Manual and
- Automatic

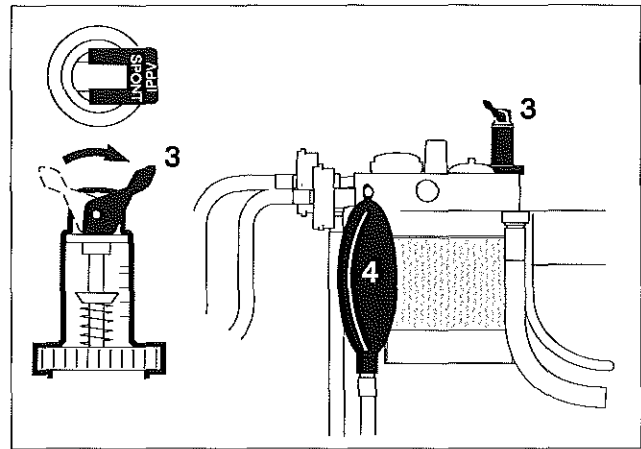
#### Spontaneous Breathing

On the control unit

- 1 Press the **MAN SPONT** button.
- 2 Confirm by pressing the rotary control.



- 3 Set the lever on the pressure-limiting valve to **SPONT/IPPV**. The valve is now open, regardless of the set pressure limit. Pressure cannot build up in the compact breathing system.
- 4 Administer enough fresh gas to fill the manual ventilation bag on the compact breathing system.



To prevent false alarms, the monitoring function during spontaneous breathing can be reduced to the following parameters:

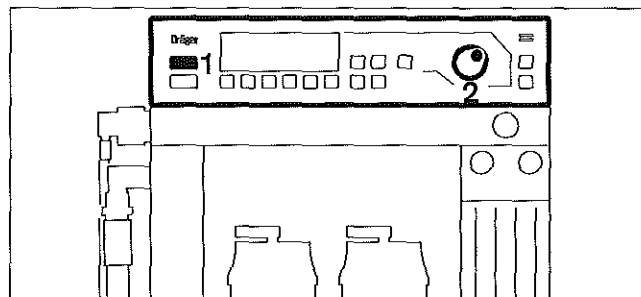
- Lower alarm limit for O<sub>2</sub>
- Upper alarm limit for P<sub>aw</sub>

If other alarm limits are required, see "Setting Alarm Limits" on page 19.

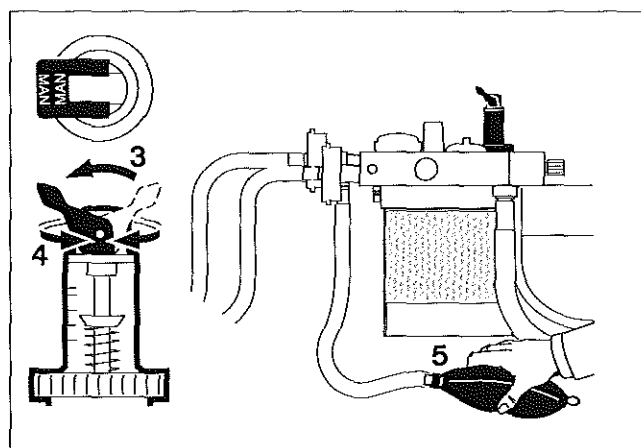
### Manual Ventilation

On the control unit

- 1 Press the **MAN** button.
- 2 Confirm by pressing the rotary control.



- 3 Set the lever on the pressure-limiting valve to **MAN**.
- 4 Set the desired pressure limit by rotating the lever until the desired value is indicated on the scale.
- Administer sufficient fresh gas.
- 5 Ventilate manually with the manual ventilation bag.



To prevent false alarms, the monitoring function during manual ventilation can be reduced to the following parameters:

- Lower alarm limit for O<sub>2</sub>
- Upper alarm limit for P<sub>aw</sub>


If other alarm limits are required, see "Setting Alarm Limits" on page 19.

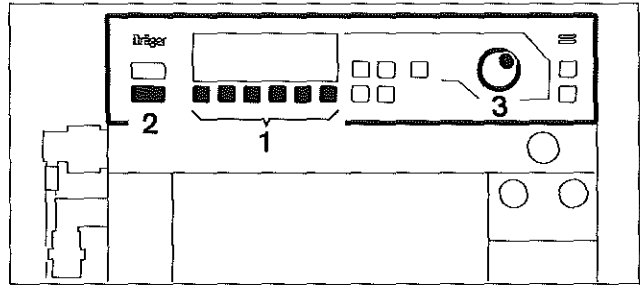
### Automatic Ventilation

On the control unit set the following controls to the desired values:

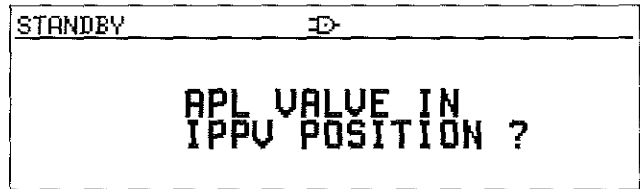
- 1 P<sub>max</sub>; V<sub>T</sub>; f; T<sub>I</sub>:T<sub>E</sub>; T<sub>I</sub>:T<sub>I</sub> and PEEP

Then

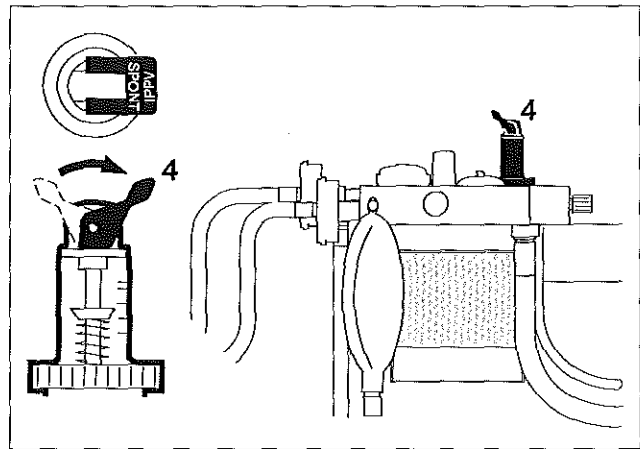
- 2 Press the  button.
- 3 Confirm by pressing the rotary control.



- The IPPV Confirmation Request screen appears.



- 4 Set the pressure-limiting valve to **SPONT/IPPV**.
- 3 Confirm by pressing the rotary control.



### Note:

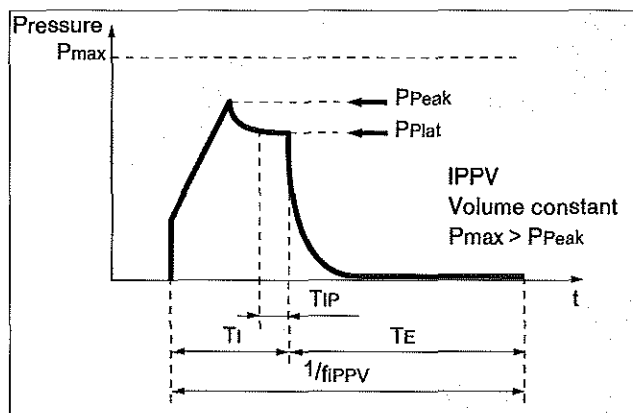
If the user fails to confirm that the APL valve is in the IPPV position, the mode remains as it was before the user pushed the IPPV button on the front panel. This action to select the IPPV mode is treated as a **CAUTION**, therefore yellow LEDs are momentarily lit and an audible caution is heard.

- Administer sufficient fresh gas.



**Pressure limited ventilation  
(PLV – Pressure Limited Ventilation)**

The Fabius CE features an adjustable pressure limit. The adjustable pressure limit  $P_{max}$  applies for the expiration valve. At  $P_{max}$ , pressure limited ventilation is possible in IPPV mode. Ventilation is then volume inconstant.

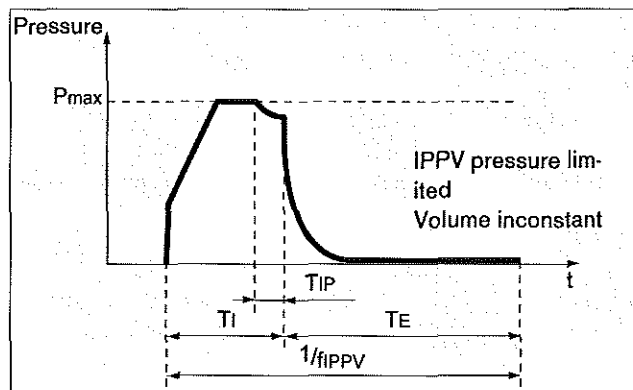


At  $P_{max}$ , pressure limited ventilation is possible (PLV).

- Set  $P_{max}$  to the required inspiration pressure, e.g. 15 mbar.
- Set the tidal volume  $V_T$  to a value higher than the  $V_T$  corresponding to the patient's weight.

**Recommendation:** Set the  $V_T$  to e.g. double the value of the tidal volume actually applied.

As soon as  $P_{max}$  is reached in the active flow phase ( $T_i - T_{IP}$ ), the pressure remains constant and leaks, e.g. due to an unblocked tube are compensated. At the same time, volume still present in the ventilator is directed into the ventilation bag. When making the settings, ensure that the inspiration flow is not excessively high, resulting in a dynamic overshoot of  $P_{max}$ . The inspiration flow is influenced by the parameters  $V_T$ ;  $f$ ;  $T_i$ ;  $T_E$ ;  $T_i$ ;  $T_i$ .



Only one setting for  $T_{IP}:T_i$  is allowed in the range from 5 to 10 %!

**Recommended parameter settings**

Compliance patient (mL/mbar)	fIPPV	$T_i:T_E$	$T_{IP}:T_i$ (%)	Set $P_{max}$ (mbar)	PEEP (hPa)	Set $V_T$ (mL)	Effective $P_{max}$ (mbar)	Exp. volume (mL)
50	10	1:2	10	15	5	1000	19	440
50	10	1:2	5	15	5	1000	19	440
50	10	1:1	10	15	5	1000	17	390
50	10	1:1	5	15	5	1000	17	390
5	25	1:2	10	15	5	100 to 150	15	40
5	25	1:2	5	15	5	100 to 150	15	40
5	25	1:1	10	15	5	100 to 150	15	40
5	25	1:1	5	15	5	100 to 150	15	40

Depending on the ventilator settings (VT; f; Ti;TE) and patient compliance, a significant overshoot of the set Pmax limit is possible at the expiration valve.

- Set the alarm limit "Paw High" to Pmax + 5 mbar !

### Using the Magill Breathing System

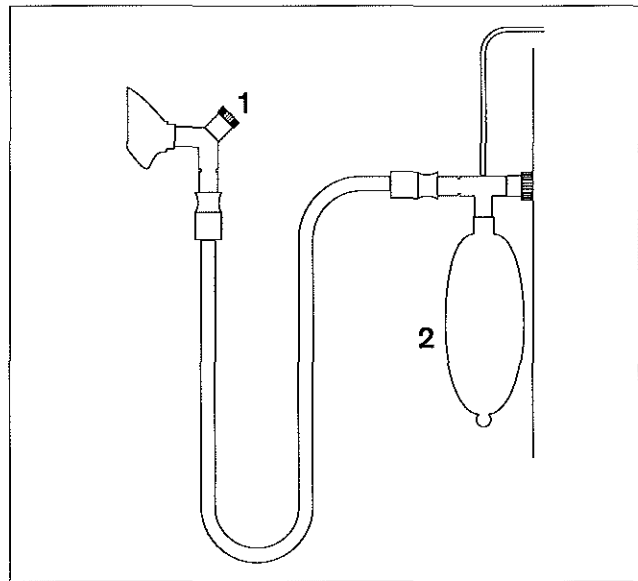
#### Note:

With the Magill system, anesthetic gases escape via

- 1 the relief valve.

This can be a health hazard!

- Ensure adequate ventilation.
- Set the O<sub>2</sub>/N<sub>2</sub>O fresh gas flow on the metering valves on the Fabius.  
The fresh gas flow must be equal to at least 2.5 to 3 times the minute volume in order to exclude the risk of rebreathing and the associated accumulation of CO<sub>2</sub> in the inspiratory gas.  
A lower fresh gas flow could result in a partial rebreathing or shortage of breathing gas.
- 2 The breathing bag could deflate and suffocate the patient.
- Switch on the vaporizer. Press and hold down the release button and select the desired concentration on the handwheel. Refer to the Instructions for Use of the Dräger Vapor®.



### For Spontaneous Breathing

- 1 Turn the relief valve counterclockwise (fully open). This will result in *minimum ventilation pressure*.
- 2 Observe movement of the breathing bag to check for spontaneous breathing.

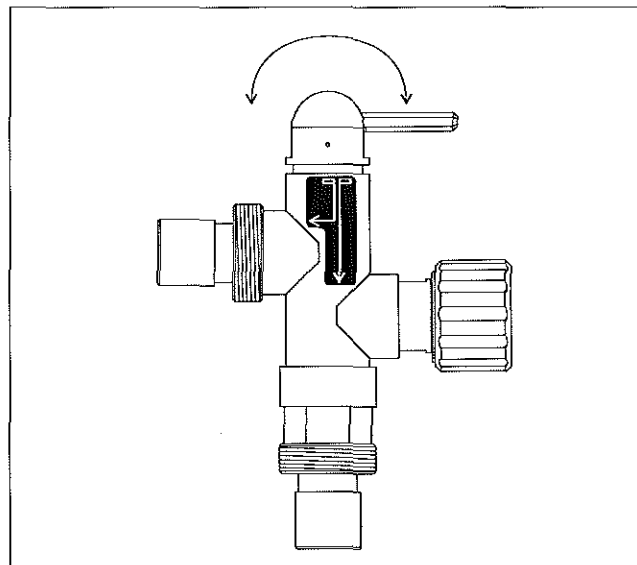
### For Manual Ventilation

- 1 Set the relief valve.
- Set a correspondingly high fresh gas flow in order to minimize the amount of rebreathed expiratory gas.
- 2 Ventilate via the breathing bag.

**Caution:** The Magill Breathing System shall not be connected to the Fabius ventilator.

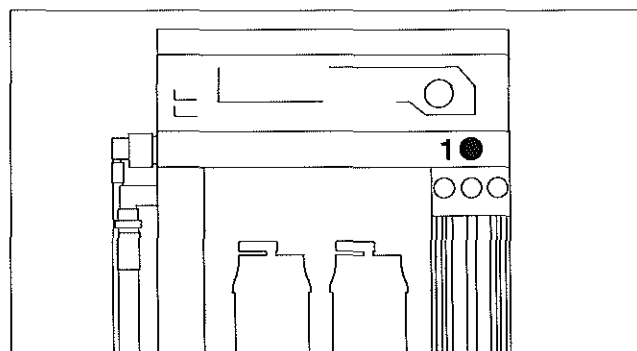
### A-Cone Lever Selection

- Facing the A-Cone switch, when the lever (located on the top of the A-Cone switch) is to the right, the fresh-gas flow is towards the lower vertical port.
- When the lever is moved to the left position, the fresh-gas flow is towards the horizontal port.
- The selector lever for the A-Cone is spring loaded and ensures that the switch is either in the right or left position thereby ensuring the flow of fresh gas to only one port at a time.



### O<sub>2</sub> Flush

- 1 Press the O<sub>2</sub> Flush button.
- About 50 L/min O<sub>2</sub> flows into the compact breathing system and to the patient. The flowmeter block and the anesthetic agent vaporizer (Vapor) are bypassed.
  - Make sure that the airway pressure does not rise unacceptably high.



### Replacing CO<sub>2</sub> Absorbent

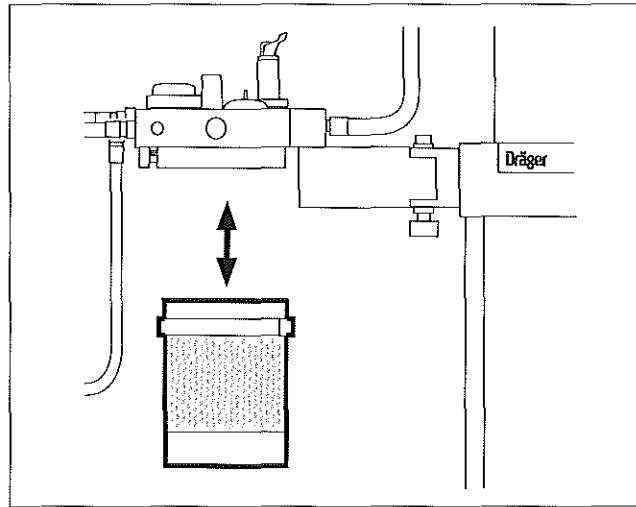
- The CO<sub>2</sub> absorbent on the compact breathing system must be replaced before two-thirds of the CO<sub>2</sub> absorbent has changed color.
- Dräger recommends the use of Drägersorb® 800 Plus. The color change indicates that the CO<sub>2</sub> absorbent can no longer absorb CO<sub>2</sub> (Drägersorb® 800 Plus changes from white to violet).
- Do not flush CO<sub>2</sub> absorbent for long periods with dry gas because the CO<sub>2</sub> absorbent will dry out.

When the moisture content falls below a specified minimum level, the following undesirable reactions can occur, regardless of the type of CO<sub>2</sub> absorbent and the anesthetic agent used, e.g. Halothane, Enflurane, Isoflurane, Sevoflurane or Desflurane:

- reduced CO<sub>2</sub> absorption
- formation of CO
- absorption and/or decomposition of the inhalation anesthetic agent
- increased heat generation in the absorber, leading to higher breathing gas temperatures.

These reactions can result in danger to the patient in the form of CO intoxication, insufficient depth of anesthesia and airway burns.

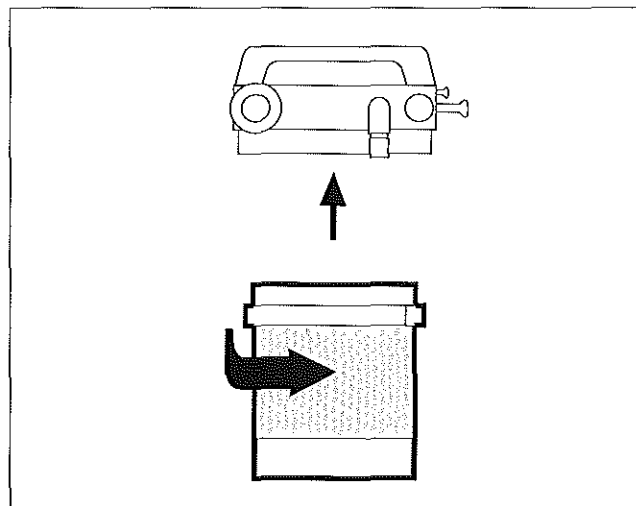
Please refer to the specific Instructions for Use for Drägersorb® 800 Plus.



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### Replacing Used Absorbent (Compact System)

- Empty the spent CO<sub>2</sub> absorbent in the absorber. Dispose of spent soda lime (CO<sub>2</sub>) in accordance with the local waste disposal regulations.
- Fill the absorber with fresh CO<sub>2</sub> absorbent.
- Ensure that no CO<sub>2</sub> absorbent dust/particles have been deposited between the gaskets and sealing surfaces. Such dust and particles can cause leaks in the system.
- Dräger recommends the use of Drägersorb® 800 Plus.

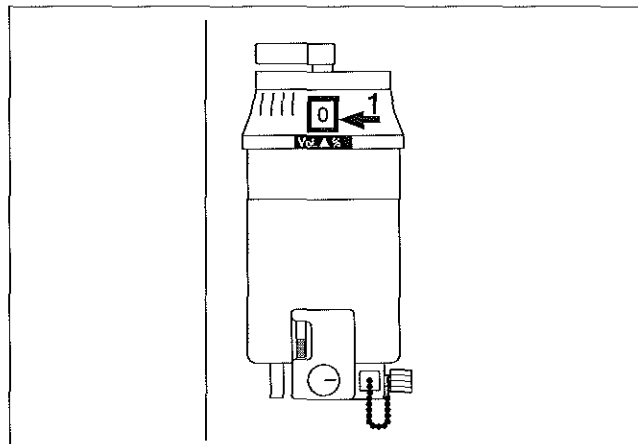


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## Shut-down

### Switch Off the Anesthetic Agent Vaporizer (Dräger-Vapor®)

- 1 Turn the handwheel to 0.  
The button engages.

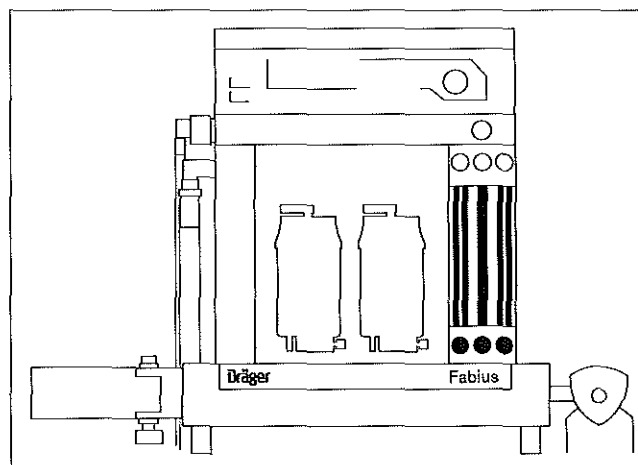


### Close the Metering Valves


- Close the N<sub>2</sub>O valve.
- Close the O<sub>2</sub> valve and AIR valve.

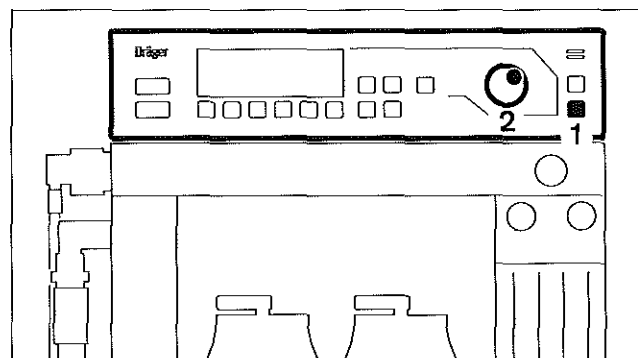
### N<sub>2</sub>O Pollutes the Environment

Dry fresh gas reduces the moisture content of the CO<sub>2</sub> absorbent. Therefore, avoid unnecessary fresh gas flow.



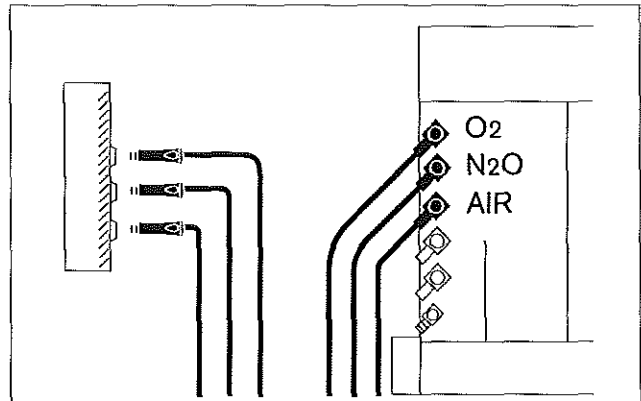
### Switch off anesthesia ventilator

- 1 Switch the anesthesia ventilator to standby by pressing the »  « button.
- 2 Confirm by pressing the rotary control.  
Fabius is now in standby mode.



**Disconnect the Fresh-gas Supply**

- Remove all plug-in couplings from the wall terminal units.
- Close gas cylinders.

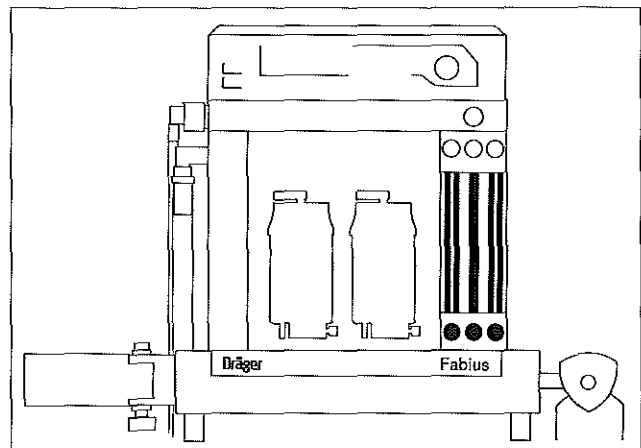


**De-pressurizing the Anesthesia Machine**

Open the metering valves in the order listed below and hold them open until the floats in the flowmeter tubes have dropped to zero.

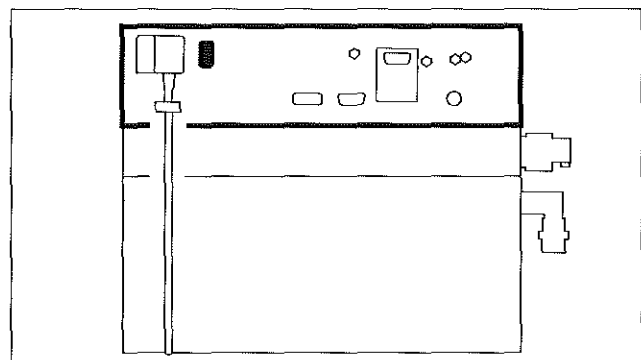
Proceed as follows:

- open N2O valve
- open O2 valve
- open AIR valve
- close all the metering valves.



**Switch Off the Control Unit**

- Switch off the unit using the switch at the back and disconnect the power plug.



**Remove the O2 Sensor**

- Remove the O2 sensor from the inspiratory valve and leave exposed to air. This precaution prolongs the service life of the O2 sensor.

## Fault – Cause – Remedy

Display	Cause	Remedy
APNEA PRESSURE	Inadequate fresh-gas supply. Breathing/ventilation stops. Leak in hose system. Permanent high pressure.	Ensure adequate fresh-gas supply. Check ventilator. Check hose system. Push lever on APL-valve to release the gas.
APNEA VOLUME	<i>Breathing/ventilation stops – no expired volume for 15 seconds.</i> Inadequate fresh-gas supply. Blocked/kinked hose. Leak in hose system.	Check ventilator. Ensure adequate fresh-gas supply. Check hose system. Check hose system.
APNEA PRESS OFF	Lower limit Paw off in IPPV.	Set adequate lower limit.
BATTERY LOW	Battery is flat.	Connect mains.
BATTERY POWERED	Mains not connected.	Connect mains.
CHECK BATTERY	Backup Battery not functional.	Replace fuse. Inform Dräger Service.
CHECK VENTILATOR	Ventilator not assembled correctly.	Check diaphragm and close cover. Select Standby Mode and switch back to IPPV.
CONT HIGH PRESS	APL-Valve in Position MAN during IPPV.	Set APL-valve to IPPV/SPONT.
DEVICE TEMP HIGH	Temperature of electronic circuit too high.	Check for external heat sources. Check fan. Inform Dräger Service.
EX-VALVE LEAKAGE	Expiratory valve does not correctly close.	Check tubing of expiration control line. Calibrate Flow sensor. Inform Dräger Service.
FiO <sub>2</sub> HIGH	O <sub>2</sub> flush in use. <i>Inspiratory O<sub>2</sub> concentration exceeds the upper alarm limit.</i>	Check O <sub>2</sub> setting on flowmeter.
FiO <sub>2</sub> INOP	O <sub>2</sub> sensor has not been correctly calibrated. O <sub>2</sub> sensor replaced and/or not calibrated. O <sub>2</sub> sensor used up. O <sub>2</sub> sensor disconnected.  Faulty sensor cable.	Calibrate O <sub>2</sub> sensor. Calibrate O <sub>2</sub> sensor. Replace sensor capsule and calibrate. Replace O <sub>2</sub> sensor housing assembly.  Replace sensor cable.
FiO <sub>2</sub> LIMIT < 21%	Lower limit FiO <sub>2</sub> between 18 vol.% and 20 vol.%.	Set adequate lower limit.
FiO <sub>2</sub> LOW	Inspiratory O <sub>2</sub> concentration is below lower alarm limit.	Check O <sub>2</sub> supply. Check setting on flowmeter.
FLOW INOP	Sensor has not been calibrated. Sensor faulty.	Calibrate sensor. Replace sensor and calibrate. Inform Dräger Service.
MEMORY ERROR	Internal data loss.	Switch machine off and on. Inform DrägerService.

Display	Cause	Remedy
MV HIGH	Upper alarm limit for minute volume has been exceeded. Flow sensor not calibrated or faulty.	Calibrate flow sensor. Replace if necessary.
MV LOW	Minute volume has fallen below lower alarm limit. Blocked/kinked hose. Leak in breathing system. Reduced volume due to pressure limitation. Reduced lung compliance. Flow sensor not calibrated or faulty.	Check hose system. Make breathing system leak proof. Correct the breathing pattern. Calibrate flow sensor. Replace if necessary.
Paw HIGH	Upper alarm limit for airway pressure has been exceeded, ventilation hose is kinked, stenosis. Pressure limit has been set too high.	Check hose system on anesthesia machine. Correct Pmax or alarm limit value.
Paw NEGATIVE	Insufficient fresh gas supply.	Increase fresh gas flow.
POWER SUPPLY INOP	Machine fault.	Inform DrägerService.
PRESSURE INOP	Faulty sensor.	Inform DrägerService.
PRESSURE LIMIT	Set tidal volume is not completely applied.	Increase Pmax.
SET APL TO IPPV	IPPV mode has been selected.	Set APL-valve to SPONT/IPPV.
SETTINGS LOST	Setting values and calibration values lost.	Check sensor calibrations and ventilator settings.
VENTILATOR INOP	Internal machine fault. IPPV mode not operational.	Switch machine off and on. Inform DrägerService.
VOL ALARM OFF	Lower limit MV off in IPPV.	Set adequate lower limit.
Only continual audible alarm without display	Mains not connected. Battery flat. Machine fault.	Connect mains. Recharge Battery. Inform DrägerService.



## Dismantling Down

### Dismantling the Compact Breathing System for Cleaning

- Leave the Dräger-Vapor® on the machine.
- Remove all breathing hoses.
- Remove the breathing bag and hose.
- Remove both microbial filters and prepare in accordance with the specific Instructions for Use.
- Remove the ventilation hose.
- Remove the fresh gas hose from the breathing system. The fresh gas hose can remain on the machine.
- Remove the anesthetic scavenging hose.
- Detach the pressure measuring hose from the breathing system. Pull back the coupling sleeve and remove the hose and filter from the back of the control unit.
- Remove the flow measuring hoses from the back of the control unit. The measuring hoses remain on the flow sensor.
- Remove the O<sub>2</sub> sensor lead.
- Remove the compact breathing system.

### Dismantling the Inspiratory Valve

- Unscrew the retaining nut.
- Remove the inspection cap.
- Extract the valve disc.

### Dismantling the Expiratory Valve

- Unscrew the retaining nut.
- Remove the inspection cap.
- Extract the valve disc.

### Dismantling the Flow Sensor

- Loosen fitting on the expiration port.
- Extract the flow sensor.

### Dismantling the Pressure-limiting Valve

- Unscrew the retaining nut.
- Remove the pressure-limiting valve.
- Unscrew the waste gas outlet port.

### Dismantling the Absorbent Canister

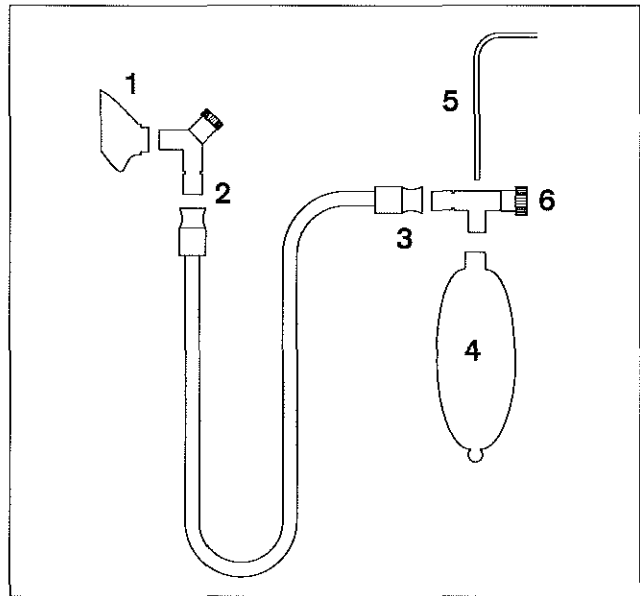
- Turn the absorber counter-clockwise and remove by pulling down.
- Remove spent CO<sub>2</sub> absorbent. Dispose of spent soda lime (CO<sub>2</sub>) in accordance with the local waste disposal regulations.

### Minimum Flow of Anesthesia

When long-term flow of anesthesia is below 0.5 L/min, increased humidity in the freshgas hose is a natural occurrence. Disconnect the freshgas hose and clean before and after long term procedures.

### Magill Breathing Device

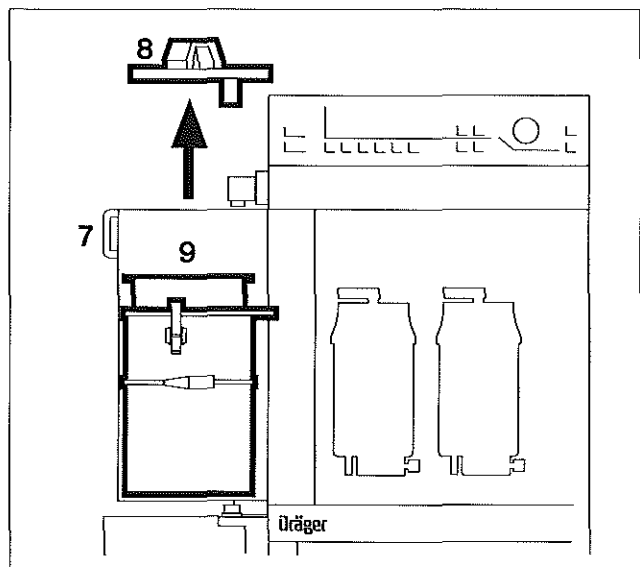
- 1 Stripping Down the Magill Inhalation Device.
- 2 Remove mask from ISO mask connector.
- 3 Disconnect ISO mask connector from the breathing hose.
- 4 Disconnect breathing hose from ISO connector.
- 5 Remove sampling hose.
- 6 Unscrew ISO connector from fresh gas outlet of the anesthesia machine.



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### Dismantling Parts of the Ventilator

- 7 Swing out the ventilator door.
- 8 Unlock the clasps to remove the cover.
- 9 Remove the diaphragm.



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## Disinfecting/Cleaning

Disinfect and clean the unit daily.

If using microbial filters:

- Daily disinfecting/cleaning is required for the following components: breathing hoses, breathing bag, Y-piece.
- Weekly disinfecting/cleaning is required for the following components: compact breathing system and its components, and ventilator components.

Wipe off impurities with a disposable cloth.

### Wipe Disinfecting

The following components should be wipe-disinfected:

- Fabius basic unit and trolley
- Dräger-Vapor®
- Pressure hoses
- Fresh gas hose

### Disinfecting and Cleaning

Use surface disinfectants for disinfecting. For reasons of material compatibility, preparations based on the following active agents are suitable:

- aldehydes
- alcohols
- quaternary ammonium compounds.

Due to possible material damage, preparations based on the following active agents are not suitable:

- compounds containing alkylamine phenols
- compounds that release halogen
- strong organic acids
- compounds that release oxygen.

For users in the Federal Republic of Germany we recommend that only disinfectants on the current DGHM list are used (DGHM: German Society for Hygiene and Microbiology). The DGHM list (published by mph-Verlag GmbH, Wiesbaden) also classifies each disinfectant by its active agents. Note the manufacturers' directions for use.

For countries in which the DGHM list is not available, we recommend the types of disinfectant given above.

All removable parts can also be disinfected with steam (93 °C/10 minutes).

- Do not disinfect microbial filters.
- Do not disinfect or sterilize the O<sub>2</sub> sensor.

### **Automatic Cleaning/Disinfecting Machine**

Only with detergent (93 °C/10 minutes).

The following components may be disinfected with moist heat:

- ventilation hose
- all parts of the compact, semi-open compact breathing systems, except for the O<sub>2</sub> sensor
- ventilator cover
- diaphragm
- flow sensor with measuring hoses
- fresh gas hoses
- Magill System Components  
(Pressure gauge must be removed)

Do not add disinfectant, because these parts may corrode.

### **Sterilizing**

The following components can be sterilized at 134 °C in hot steam:

- ventilation hose
- all parts of the compact breathing systems except for the O<sub>2</sub> sensor
- ventilator cover
- diaphragm
- flow sensor with measuring hoses.

## **Checking Readiness for Operation**

Refer to "Preparation" on page 22 and "Daily Pre-Use Check for Fabius" on page 66 for reassemble and pre-use checkout prior to operating the Fabius.

## Maintenance Intervals

Clean and disinfect the machine and components before each service (and also when returning for repair).

### When Required:

- Replace the O<sub>2</sub> sensor as soon as calibration is no longer possible.
- Replace the pressure-measuring line (silicone rubber hose and sleeve), flow sensor or flow sensor plug-in probe if damaged.

### Every 6 Months:

Inspection and service by trained service personnel.  
Dräger recommends DrägerService.

- Fabius
- Breathing systems
- Dräger-Vapor<sup>®</sup>
- Sensors

Dräger-Vapor<sup>®</sup> with report, in connection with Fabius.

### Annually:

- Replace the bacterial filter on the pressure-measuring line.
- Replace the measuring line for pressure and flow.
- Replace the diaphragm in the ventilator.

Inspect and verify proper working order:

- Magill Circuit

### After 3 Years:

By trained service personnel:

- Replace the lead gel rechargeable battery for the back-up power supply.
- Replace the O-rings and diaphragm of the ventilator.

### After 6 Years:

Fabius anesthesia machine:

- General overhaul of the pressure regulator (pressure reducer) by trained service personnel.

## Disposal

This device is subject to EU Directive 2002/96/EC (WEEE). It is not registered for use in private households, and may not be disposed of at municipal collection points for waste electrical and electronic equipment.

Dräger Medical has authorized a firm to dispose of this device in the proper manner: for more detailed information, please contact your local Dräger Medical organization.

### Batteries and O<sub>2</sub> sensors

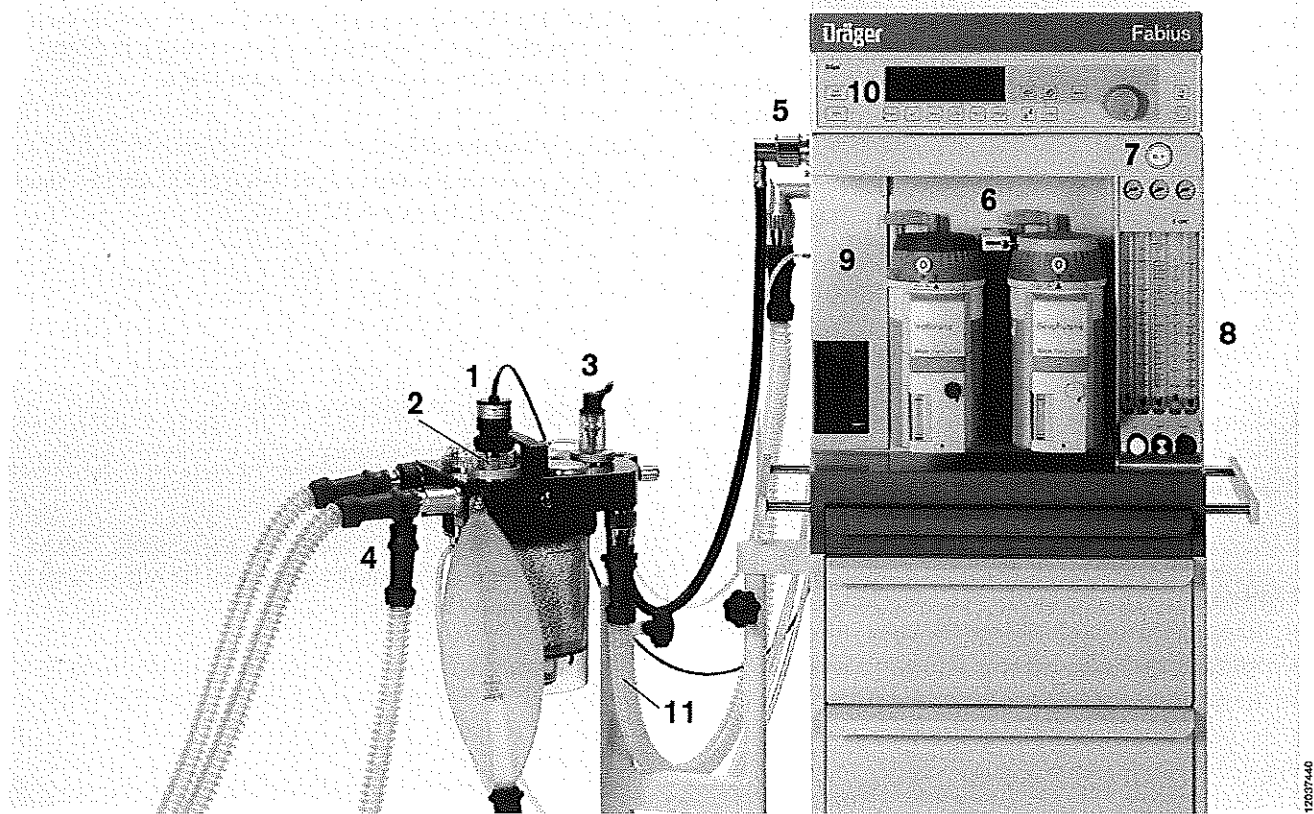
- Batteries must be disposed of in conformity with the local waste disposal regulations.
- Spent O<sub>2</sub> sensors can be returned to  
Dräger Medical AG & Co. KG  
Moislinger Allee 53–55  
23542 Lübeck
- Do not open forcibly: danger of chemical burns.
- Do not incinerate: danger of explosion.

### Bacterial filters

- Must be disposed of as infectious special waste. Can be incinerated at temperatures above 800 °C with minimal environmental pollution.

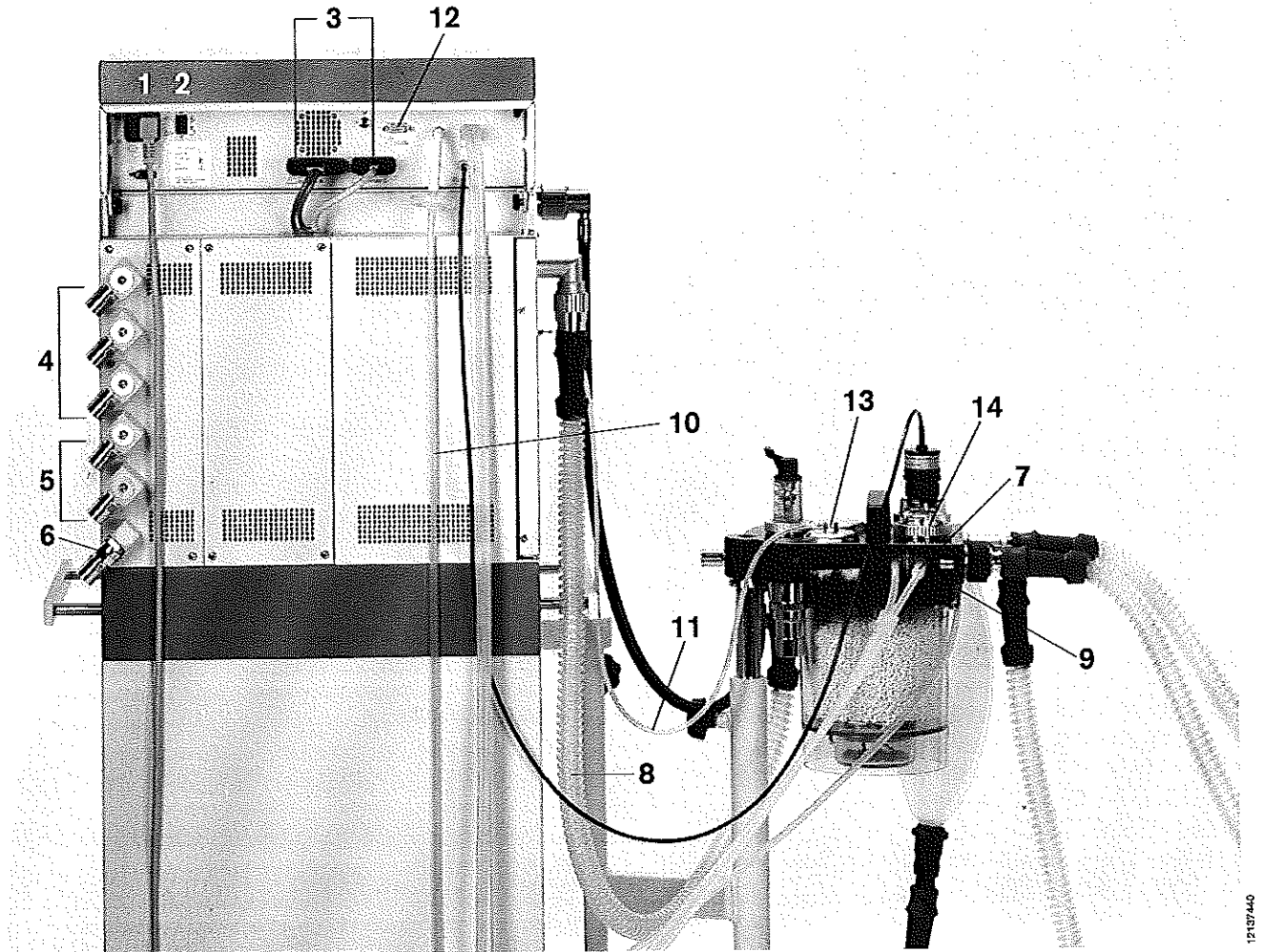
## What's what

### Compact Breathing System, Front



- 1 O<sub>2</sub> sensor on inspiratory valve
- 2 Inspiratory valve
- 3 Switching lever **MAN** and **SPONT/IPPV** on pressure limiting valve
- 4 Connector for breathing bag
- 5 Fresh gas outlet
- 6 Dräger-Vapor<sup>®</sup> anesthetic agent vaporizer
- 7 Oxygen flush
- 8 Flowmeter tube block (2-gas or 3-gas)
- 9 Anesthesia ventilator
- 10 Control box (settings for ventilation parameters and airway monitoring)
- 11 Ventilator hose

Compact Breathing System, Back



- 1 Power cable
- 2 On/off switch
- 3 Internal interface
- 4 Connectors for medical gas pipeline supply
- 5 Connectors for gas cylinder supply
- 6 Oxygen outlet port (for secretion aspirator)
- 7 Flow sensor
- 8 Ventilator hose
- 9 Connector for pressure-measuring hose
- 10 Pressure-measuring hose
- 11 Control line PEEP/Pmax
- 12 COM Medibus interface/RS 232
- 13 Connection for PEEP/Pmax control line
- 14 Expiratory valve

12137440

## Technical Data

### Ambient Conditions

#### During operation

Temperature	15 to 35 °C (machine should be at ambient temperature)
Atmospheric pressure	700 to 1060 hPa
Relative humidity	20 to 80 %

#### During storage

Temperature	-10 to 60 °C
Atmospheric pressure	500 to 1060 hPa
Relative humidity	0 to 80 %

### Machine data

#### Gas inlet from medical gas pipeline system

Pressure at machine connector	O <sub>2</sub> , N <sub>2</sub> O, Air	270 to 550 kPa
Gas supply connectors		NIST or DISS (where required)
Gas quality:		
Dew point		>5 °C below ambient temperature
Oil content		<0.1 mg/m <sup>3</sup>
Particle content		Dust-free air (filtered with pore size <1 µm)

#### Gas supply from supplementary O<sub>2</sub> and N<sub>2</sub>O cylinders (with threaded connections)

Pressure at machine connector	
O <sub>2</sub> , N <sub>2</sub> O	500 kPa
Each inlet is fitted with a non-return valve	

#### Gas supply from supplementary O<sub>2</sub> and N<sub>2</sub>O cylinders (with pin-index connections)

Cylinder Connections	Pin-indexed hanger yokes (CGA V-1-1994)
Cylinder Gas Pressure	O <sub>2</sub> , AIR 1900 PSI (13100 kPa)
(typical full loads at 21 °C)	N <sub>2</sub> O 745 PSI (5130 kPa)

#### Fresh-gas outlet

Male cone 22 ISO, Female cone 15 ISO,  
(with thread to secure)

#### Equipment Class

⚡ Class 1, Type B, IXPO

#### Dimensions and weight

Weight (without vaporizers)	app. 90 kg (depending on trolley version)
Dimensions	app. 960 x 1320 x 670 mm (WxHxD)(depending on trolley version)

#### Power supply

Rating Non-configurable

230 to 240 V (±10 %), 50/60 Hz, 0.7 A or  
100 to 127 V (+10 %, -15 %), 50/60 Hz, 1.4 A

#### Rechargeable battery

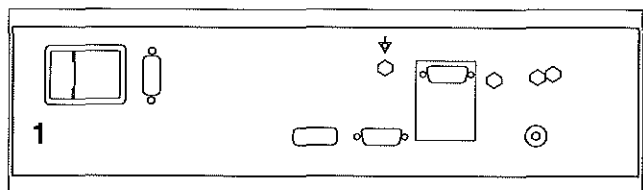
	24 V; 3.5 Ah
Operation time with fully charged battery	1.5 hours
Recharging time at least 4 hours on the mains (power switch ON) for full operation time.	
Never allow the battery to completely discharge. If the battery does discharge completely, recharge immediately.	
In case of power failure, the machine will continue without interruption.	
A "BATTERY POWERED" caution message is signalled every five minutes.	



**Fuses**

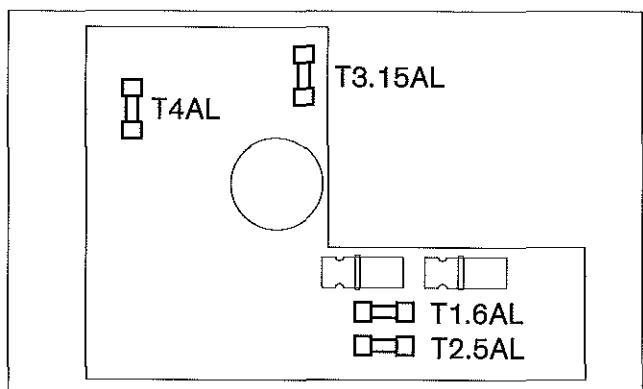
**1 Mains fuse at the rear:**

- For 230 to 240 V supply voltage:  
2 x T1AL 250 V IEC 127/III
- For 100 to 127 V supply voltage:  
2 x T2AL 250 V IEC 127/III



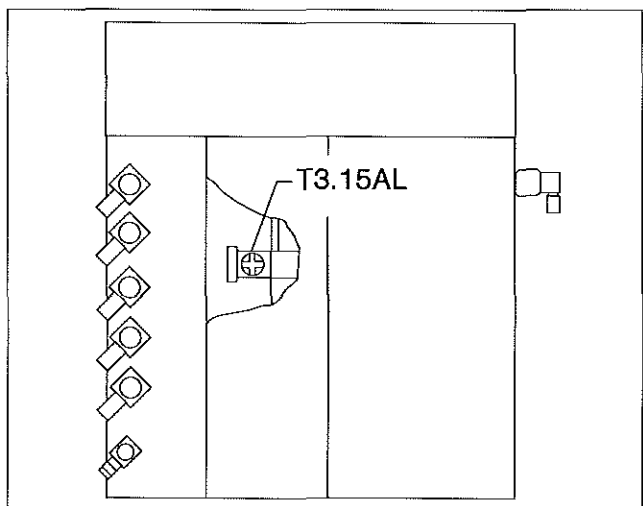
**Fuses located on circuit board:**

- 1 x T4AL 250 V IEC 127/III
- 1 x T3.15AL 250 V IEC 127/III
- 1 x T2.5AL 250 V IEC 127/III
- 1 x T1.6AL 250 V IEC 127/III



**Internal battery fuse:**

- 1 x T3.15AL 250 V IEC 127/III



**Electromagnetic Compatibility (EMC)**

Conforming to EN 60601-1-2 (1993)

The operation of this anesthetic workstation or module may be adversely affected by electromagnetic interference exceeding the levels specified in EN 60601-1-2 (1993).

**Technical Data of the Ventilator**

(electronically controlled, electrically driven, without drive gas consumption)

P <sub>max</sub>	Pressure limiting	10 to 70 hPa* ±5 hPa
V <sub>T</sub>	Tidal volume	50 to 1400 mL ±max {5 %; 20 mL}
		No compliance correction
f	Breathing frequency	6 to 60 breath/min (±1 breath/min)
T <sub>I</sub> : T <sub>E</sub>	Inspiration/expiration ratio	1 : 3 to 2 : 1 ±100 ms
T <sub>I</sub> P/T <sub>I</sub>	Inspiration pause	5 % to 50 % ±100 ms
PEEP	End-expiratory pressure	0.2 to 15 hPa ±2 hPa or ±20 %
Pressure-limiting valve	MAN mode	5 to 70 hPa ±15 %
	SPONT/IPPV mode	1.5 ±1 hPa ±15 %

**Performance Characteristics**

**Fresh gas metering** Low-flow flowmeters (calibrated for 20 °C, 1013 hPa)

O <sub>2</sub> :	0.02 to 0.5 L/min ±10 %
O <sub>2</sub> :	0.55 to 10.0 L/min ±10 %
N <sub>2</sub> O:	0.02 to 0.5 L/min ±10 %
N <sub>2</sub> O:	0.55 to 10.0 L/min ±10 %

Air: 0.2 to 12 L/min ±10 %

O <sub>2</sub> flush (bypass)	Volume supplied at 500 kPa: max. 70 L/min at 270 kPa: min. 28 L/min
Pressure limiting O <sub>2</sub> outlet:	80 kPa ±5 kPa at the gas outlet for secretion aspirator 300 to 500 kPa, self-closing max. 20 L/min

**Anesthetic Agent Flow Control**

Dräger-Vapor® quick-change plug-in system for two anesthetic agent vaporizers.

The connections are automatically closed and sealed against the atmosphere as soon as the Vapor is removed.

- Halothane vapor
- Enflurane vapor
- Isoflurane vapor
- Sevoflurane vapor
- Devapor, D-Vapor or D-Tec for
- Desflurane

Technical data of anesthetic agent vaporizers – see specific Instructions for Use.

Note conditions for use of supplementary equipment. This may limit the range of use of the overall system.

\* hPa = mbar

Monitoring and Measurement	Range	in steps of	Accuracy	Condition
Paw     Airway pressure	-9 to 99 hPa	1 hPa	±4 % of the measured value or ±2 hPa, whichever is greater	
Ve     Expiratory minute volume	0 to 99.9 L/min	0.1 L/min	±20 %	ATPS
	Expiratory tidal volume	40 to 9995 mL	5 mL	±20 %
f     Breathing frequency	0 to 60 breath/min	±1 breath/min	±1 breath/min	
FiO <sub>2</sub> O <sub>2</sub> measurement in the main gas flow	5 to 100 vol.%	1 vol.%	±3 vol.%	with reference to ambient pressure during calibration
Reaction time	Less than 15 s			
Service life of sensor cell	300.00 vol.% h			

Use adequate monitoring for CO<sub>2</sub> and anesthetic agent.  
 Sampling rate max. 250 mL/min.  
 Connect the sampling line to the Y-piece with an adapter or insert a T-piece in the patient connection of the Y-piece.

**Breathing System**

	Semi-Open Compact Breathing System			Compact Breathing System		
	Volume: 0.2 L + bag Compliance: 0.22 mL/hPa in automatic mode (IPPV)			Volume: 2.8 L + bag Compliance: 0.22 mL/hPa in automatic mode (IPPV) Absorber volume: 1500 mL		
	Resistance of Breathing System			Resistance of Breathing System		
	5 L/min	30 L/min	60 L/min	5 L/min	30 L/min	60 L/min
Inspiratory Resistance	0.4 hPa	1.1 hPa	3.0 hPa	0.5 hPa	1.3 hPa	2.8 hPa
Expiratory Resistance	1.3 hPa	3.9 hPa	7.1 hPa	0.7 hPa	2.4 hPa	5.3 hPa

**Classification**                    IIb  
 In accordance Directive  
 93/42/EEC  
 Annex IX

**UMDNS Code**                    10-134  
 Universal Medical Device  
 Nomenclature System

**Interface**

Serial interface  
COM

Protocol	MEDIBUS
Connector	9-pin sub-D (socket/female), galvanic isolation 1.5 kV

Pin assignment

1	Not used
2	TX, transmit
3	RX, receive
4	Not used
5	GND, ground
6	Not used
7	Not used
8	Not used
9	Not used

Settings	9600 Baud Even parity 8 data bits 1 start bit 1 stop bit
----------	--

Device identification

ID Number	8085
Name	Fabius

Refer to Instructions for Use of  
Medibus for Fabius CE 90 37 975

### Safety Features

The Fabius inhalation anesthesia machine is equipped with the following safety features:

- Positive ventilation pressure limiting  $75 \pm 5$  hPa
- Negative pressure safety valve (additional air valve)  
–  $4 \pm 2$  hPa

### O<sub>2</sub> Shortage Signal/N<sub>2</sub>O Cut-off

Alarm limit	Warning signal as soon as the pressure drops below 1.8 bar
Alarm signal	High priority alarm, duration at least 7 seconds. Cannot be deactivated.
During O <sub>2</sub> failure	N <sub>2</sub> O is cut off.

### S-ORC (Sensitive Oxygen Ratio Controller; control device to ensure a minimum oxygen concentration)

S-ORC is a control element which guarantees a minimum O<sub>2</sub> concentration in the fresh gas flow.

As from a flow rate of approx. 300 mL/min, the N<sub>2</sub>O concentration in the fresh gas can be freely set between 0 and 75 %.

During O<sub>2</sub> shortage S-ORC limits the N<sub>2</sub>O concentration in the fresh gas, so that the O<sub>2</sub> concentration does not drop below 21 vol.%.

N<sub>2</sub>O metering valve open and O<sub>2</sub> metering valve closed or O<sub>2</sub> flow 0.2 L/min: S-ORC prevents N<sub>2</sub>O flow.

During N<sub>2</sub>O failure O<sub>2</sub> may still be administered. No alarm. The float in the N<sub>2</sub>O measuring tube drops to zero.

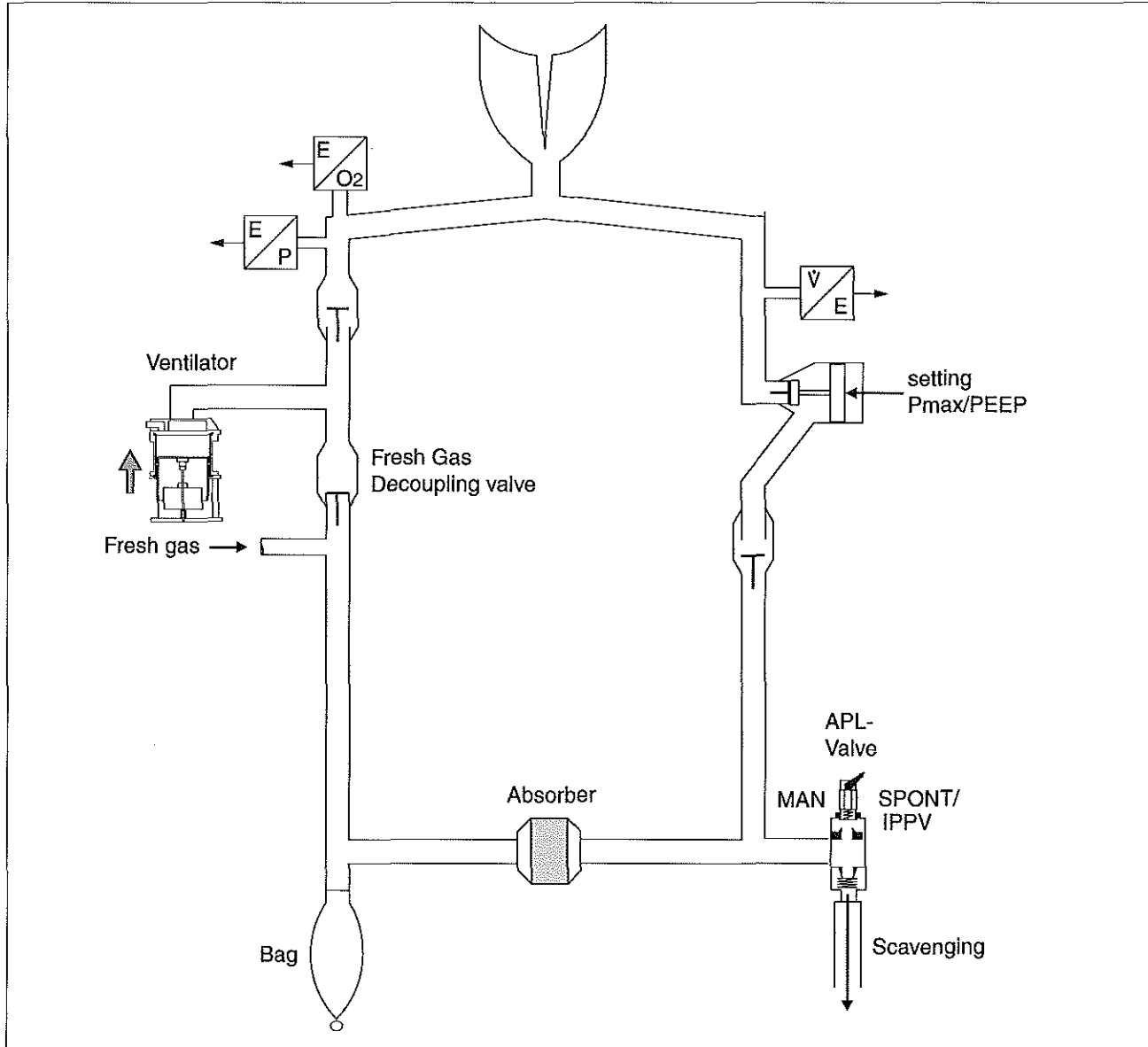
**Reactivate the O<sub>2</sub> Shortage Alarm:** after each O<sub>2</sub> supply failure. After the O<sub>2</sub> supply has been restored, a supply pressure of at least 2.7 bar must be applied for at least 20 seconds before another O<sub>2</sub> shortage signal can be emitted. During this period, do not activate any devices that consume O<sub>2</sub> (e.g. O<sub>2</sub> flush, O<sub>2</sub> fresh gas flow or secretion aspiration).

However, S-ORC is not an oxygen-specific monitoring device and therefore cannot provide any protection against the effects of accidental use of the wrong gas.

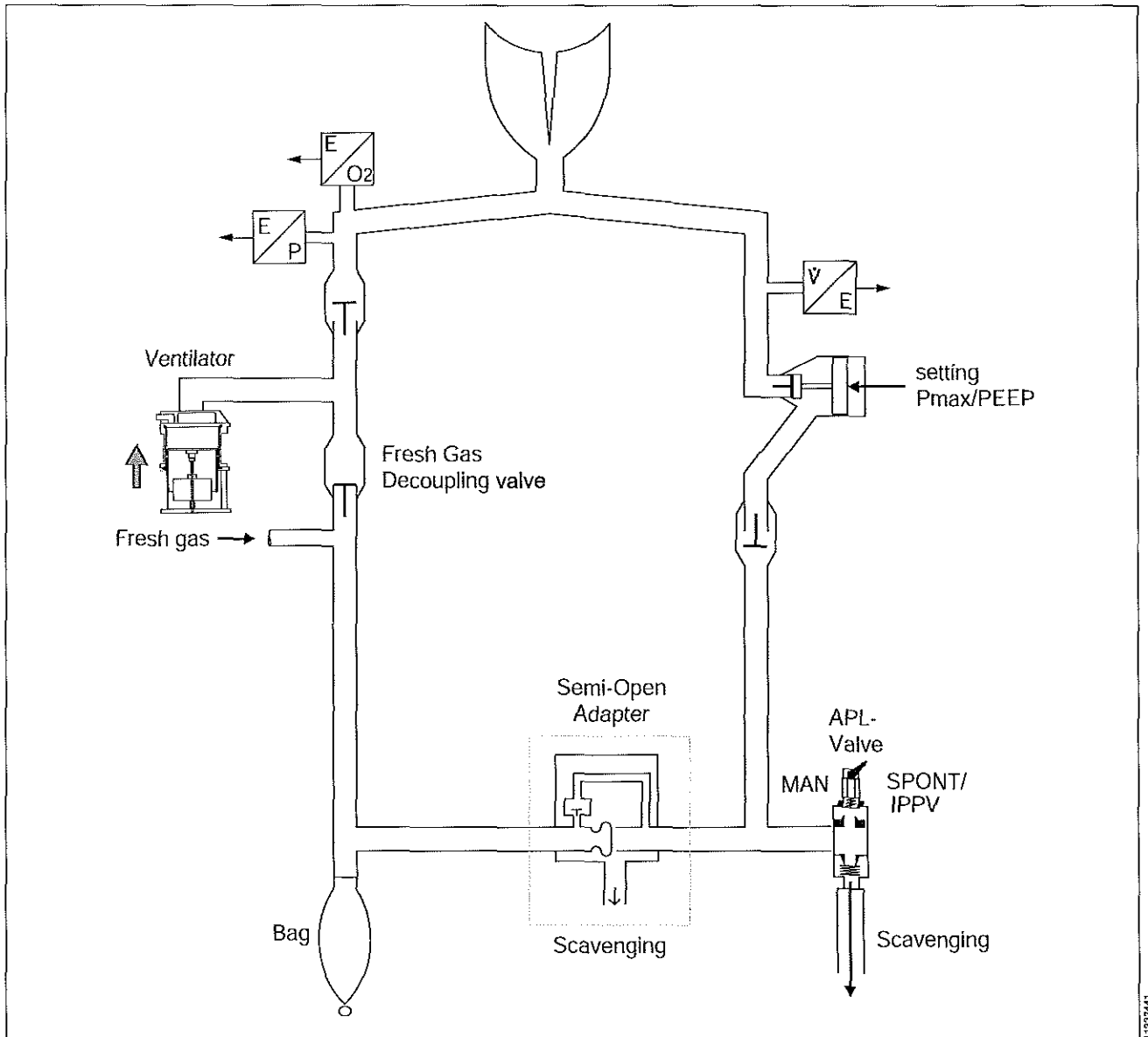
Therefore: **always monitor the O<sub>2</sub> concentration.**

# Diagrams

## Compact Breathing System

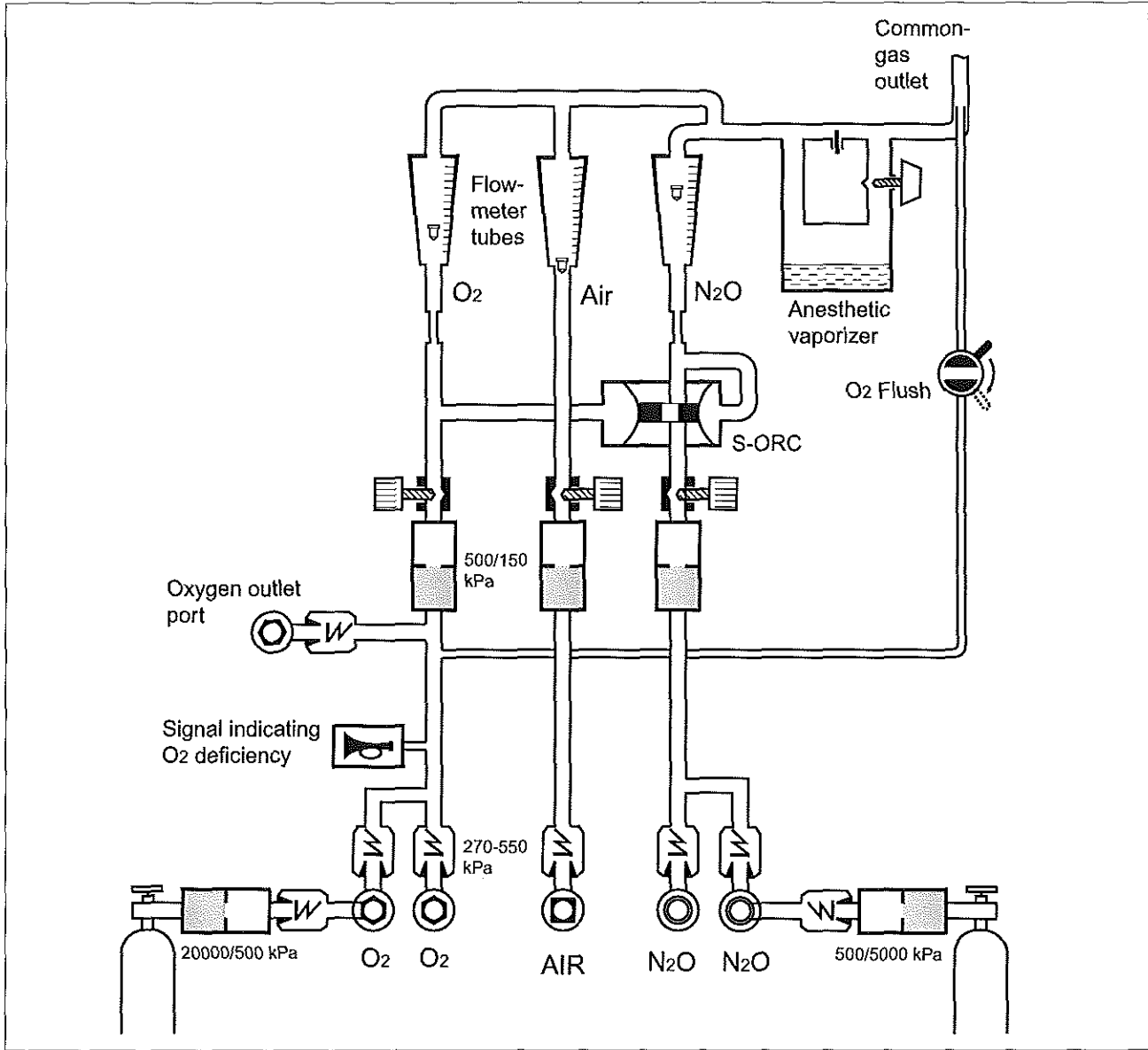


Semi-Open Compact Breathing System



T1837441

Gas Delivery Unit (3-Gas version)



11437441



## Abbreviations Used

Abbreviation	Description	Unit
f <sub>IPPV</sub>	Ventilation frequency	1/min
F <sub>IO<sub>2</sub></sub>	Inspiratory oxygen concentration	vol.%
FGE	Fresh Gas Decoupling	----
MV	Expiratory minute volume	L/min
P <sub>aw</sub>	Airway pressure	hPa
Peak	Peak pressure	hPa
PEEP	Positive ventilation pressure in the end-expiratory phase	hPa
P <sub>mean</sub>	Mean pressure	hPa
V <sub>T</sub>	Tidal volume	mL

## Daily Pre-Use Check for Fabius

Please note that this Daily Pre-use check list takes into consideration all possible configurations of the Fabius. The clinician need only use those areas that apply to their specific Fabius configuration.

All checks must be carried out daily before equipment is used. The person who carries out the checks must be fully conversant with the Instruction for Use. Checks marked with a **P** must be carried out before each patient use.

These pages should be removed and copied to establish a daily record of machines checks. Mark each function when checks have been satisfactorily completed.

Fabius  
Serial Number

### Pre-conditions

- Inspection intervals for machine and accessories are current.
- P**  Machine fully assembled and connected
- Monitors (O<sub>2</sub>, P, V, CO<sub>2</sub> anesthetic agent) switched on, self test carried out satisfactorily.
- P**  Sampling line for gas monitoring connected to Luer lock on the Y-piece, correct anesthetic agent selected
- P**  Devapor (when being used) switched on

### Checking Reserve Power

- P**  Verify that battery is fully charged. (If the battery does not show full a charge, the battery operation time is not guaranteed to be 1.5 hours.)

### Checking the Medical Gas Connections

- Visually inspect all supply hoses from the medical gas pipeline system to make sure that they fit tightly and perfectly and have no leaks.
- Verify that all medical gas pipeline supplies are within acceptable pressure ranges.
- Open reserve gas cylinders (when present).
- O<sub>2</sub> pressure more than 70 bar.
- N<sub>2</sub>O pressure greater than 43 bar.  
Close reserve gas cylinders.

### O<sub>2</sub> Flush Function

- Press O<sub>2</sub> flush: A strong flow of gas should be emitted from the patient connection.

### A-Cone Switch Function (If present)

- Toggle the A-cone switch to alternate positions
- Press O<sub>2</sub> flush. A strong flow of gas should emit from the alternate patient connection.

### Checking the Flow Control/Metering System

- Fully open the O<sub>2</sub> metering valve. O<sub>2</sub> flow of at least 10 L/min present.
- Fully open the N<sub>2</sub>O metering valve. N<sub>2</sub>O flow of at least 10 L/min present.
- Cut off the O<sub>2</sub> supply. Remove the O<sub>2</sub> connector or close the O<sub>2</sub> cylinder valve. The O<sub>2</sub> shortage alarm signal must be activated\*. N<sub>2</sub>O must not flow.
- Restore the O<sub>2</sub> supply. N<sub>2</sub>O must flow again.

### Checking the Flow Control/Metering System

- Set O<sub>2</sub> metering valve to 1.5 L/min.  
N<sub>2</sub>O flow = 3 L/min to 5 L/min.
- Close the O<sub>2</sub> metering valve: No N<sub>2</sub>O flow.
- Open the AIR flow control valve. Air flow of at least 10 L/min present.
- Close all metering valves.

### Sensor Calibration

Before calibrating the O<sub>2</sub> and flow sensors, wait at least 5 minutes after switching on for the control unit to warm up to its normal operating temperature.

- Calibrate O<sub>2</sub> Sensor.
- Calibrate flow sensor.

### Checking the Gas Type

- Unscrew the fresh gas hose from the Fabius.
- Set the O<sub>2</sub> metering valve to approx. 3 L/min.
- Remove the O<sub>2</sub> sensor from the inspiratory valve; hold it under the fresh gas outlet and allow fresh gas to flow over it. The control unit must indicate an O<sub>2</sub> concentration of approx. 100 vol.%.
- Set the N<sub>2</sub>O metering valve to approx. 3 L/min. The displayed O<sub>2</sub> concentration must now be approx. 50 vol.% O<sub>2</sub>.
- Reclose the metering valves for O<sub>2</sub> and N<sub>2</sub>O.
- Replace the O<sub>2</sub> sensor on the inspiratory valve.
- Reconnect the fresh gas hose to the Fabius.

\* The O<sub>2</sub> shortage alarm is ready to operate again after an operating pressure of at least 2.7 bar has been present for 20 seconds, provided that no O<sub>2</sub> has been used during this time.

**Vapor 19.n, Vapor 2000 (Tec 5)**

- P  Fastening; Latched down firmly and set vertically.
- P  Handwheel; In zero position and engaged.
- P  Filling level between min. and max.
- P  Interlock; Locking function OK (when present).
- P  Key-indexed filling system; Sealing key or pin inserted and closed tight (when present).
- P  Quik Fil or Funnel filling system; Locking screw tight (when present).

**Devapor, D-Vapor (if fitted)**

- P  Fastening; Latched down firmly and set vertically.
- P  Handwheel; In zero position and engaged.
- P  Filling level between min. and max.
- P  Mains cable plugged in, LED »Operational« on.

**Key-indexed filling system**

- P  Filling opening locked shut and pointing downward.

**Selectatec®**

- P  Fastening; Latched down firmly and set vertically.
- P  Handwheel; In zero position and engaged.
- P  Filling level between min. and max.
- P  Interlock; Locking function OK (when present).

**Checking the Condition of CO<sub>2</sub> Absorbent  
(Compact Breathing Systems)**

- P  Color change is no more than half the column of CO<sub>2</sub> absorbent.

**Checking Non-Rebreathing of Semi-Open  
(Compact Breathing System)**

- Disconnect the fresh gas hose.
- Put the test adapter on the fresh gas hose and connect to the patient Y-piece.
- Occlude the semi-open exhaust port.
- Set the APL to 70 mbar.
- Set the O<sub>2</sub> metering valve to 0.25 L/min.
- With the O<sub>2</sub> flush, build up a pressure of 60 mbar.
- Airway pressure must rise or remain constant.

If the system fails, locate and correct any external leaks by performing the leak test of the compact breathing system and repeat this test. If necessary, call DrägerService.

**Leak Testing the Compact (Semi-Open) Breathing Systems**

Test once without Dräger-Vapor® – after removing the vaporizer and once with each Dräger-Vapor® with the handwheel set to zero.

In the following check list, please note that there are three boxes for each item to be checked.

Box A = Fabius, No Vaporizers

Box B = Fabius, Single Vaporizer

Box C = Fabius with Dual Vaporizers

- |   | A                        | B                        | C                        |  |
|---|--------------------------|--------------------------|--------------------------|--|
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Press the <input type="checkbox"/> <small>MAN</small> <input type="checkbox"/> <small>SPONT</small> key on the control unit. |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Remove the breathing bag and connector.  |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Fit the free end of the breathing hose to the Y-piece.   |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Set the pressure-limiting valve to MAN and set to 70 hPa.  |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | With O <sub>2</sub> flush, build up a pressure of 25 to 30 hPa, while monitoring the airway pressure.                        |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Set the O <sub>2</sub> metering valve to 0.12 L/min: The airway pressure must rise or remain constant.                       |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Switch pressure-limiting valve to SPONT. Pressure drops.   |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Switch pressure-limiting valve to MAN.   |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Set Vapor to lowest concentration shown on handwheel.  |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Press O <sub>2</sub> flush; let pressure build to 30 mbar; pressure remains constant or rises                                |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Reset Vapor to zero.   |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Release pressure.  |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Push lever on pressure-limiting valve.   |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Reopen the patient connection and reconnect the manual ventilation bag.  |

If the system is not perfectly leak-proof (i.e. pressure is reduced):

- Check that all plug-in, push-fit and screw connectors fit tightly.
- Replace any missing or damaged seals.
- If necessary, call DrägerService.

### Leak Testing Magill Circuit

(when present)

Test once without Dräger-Vapor® – after removing the vaporizer and once with each Dräger-Vapor® with the handwheel set to zero.

In the following check list, please note that there are three boxes for each item to be checked.

Box A = Fabius, No Vaporizers

Box B = Fabius, Single Vaporizer

Box C = Fabius with Dual Vaporizers

- |   | A                        | B                        | C                        |  |
|---|--------------------------|--------------------------|--------------------------|--|
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Close off relief valve and seal patient connection.  |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Gently pinch off the sampling hose (if present).   |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Open O <sub>2</sub> metering valve on anesthesia unit, fill breathing bag, and then close the O <sub>2</sub> metering valve. |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | The breathing bag must not deflate. If the bag deflates, determine where the leak is coming from and take corrective action. |
| P | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Open relief valve and sampling hose.   |

### Inspiratory and Expiratory Valves (Compact Breathing System)

Set pressure-limiting valve to 30 mbar in manual mode.

Press O<sub>2</sub> flush; let pressure build up to 30 mbar.

- P  Breathing bag for manual ventilation fills.
- P  O<sub>2</sub> on monitor greater than 80 vol.%.
- P  Valve disc in inspiratory valve moves when breathing bag is squeezed during manual ventilation.
- P  Valve disc in expiratory valve moves when breathing bag is released.
- P  Test lung on patient connection fills and empties rhythmically during manual ventilation.
- P  No resistance during manual ventilation which might indicate stenosis.

### Pressure-Limiting Valve (Compact Breathing System)

- P  Set APL valve to MAN and 30 mbar.  
Set O<sub>2</sub> flow-control valve to 5 L/min.  
Display on monitor; 26 to 35 mbar.

### Checking Ventilator Operation

- P  Press the  key on the control unit.
- P  Connect another breathing bag to the Y-piece to act as test lung.
- P  Check that ventilation pressure is available.
- P  Check that the ventilator piston is working correctly.
- P  Monitor the functions of the inspiratory and expiratory valves only on Compact and semi-open Compact breathing systems.
- P  Check that the breathing bag (test lung) on the Y-piece is ventilated.

### Airway Monitor

The alarm function can be tested by setting alarm limits to levels that are certain to trigger an alarm.

- Test the FiO<sub>2</sub> monitor and alarm module.
- Test the flow monitor and alarm module.
- Test the airway monitor and alarm module.

### Additional Measuring Units (when present)

- Check the CO<sub>2</sub> monitor and alarm module.
- Check the anesthetic agent monitor and alarm module.

### Anesthetic Gas Scavenging Line

- P  Float in AGS flowmeter between minimum and maximum.
- P  Check the hose connections.
- P  Press and hold O<sub>2</sub> Flush: airway pressure <10 cm/H<sub>2</sub>O with Y piece occluded.

**Manual Ventilation Bag for Emergency Ventilation**  
(when present)

- Check that the bag is functioning correctly by pumping manually.
  - When the bag is squeezed, air must audibly and tangibly flow out of the mask cone; when the bag is released, it must rapidly recover its original shape.
  - Block off the mask connector (cone) with the ball of your thumb; you should only be able to squeeze the bag a little.
- P**  Before Connecting to Patient
- Pre-set tidal volume and frequency to suit patient's needs.
  - Set alarm limits for O<sub>2</sub>, P, V, CO<sub>2</sub>, and anesthetic agent to suit patient's needs.
  - Adjust the pressure-limiting valve to meet the patient's requirements (Compact) or adjust the pressure-relief valve if the Magill breathing circuit is being used.
  - Set monitor to anesthetic agent being used.
  - When there is electrical contact to the patient, establish potential equalization between machines.
  - For monitors with sidestream gas measurement, empty water trap.

**If any check can not be carried out satisfactorily, the machine must not be used.**

**Machine check carried out**

Name	
Date	



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These Instructions for Use apply only to  
**Fabius**  
with Serial No.:

If no Serial No. has been filled in by Dräger  
these Instructions for Use are provided for  
general information only and are not intended  
for use with any specific machine or device.



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