



The specialist  
for every environment

DRÄGER  
FABIUS® TIRO

### HIGH-PERFORMANCE VENTILATION

At its core, the Fabius Tiro features our powerful and accurate E-vent piston ventilator, which requires no drive gas and delivers ICU-like ventilation performance. This gives you the ability to handle a wide range of acuity levels.

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The accuracy of the electrically driven E-vent piston ventilator means that you can also treat pediatric patients with confidence. Optional pressure controlled and pressure support (PS) modes, including SIMV/PS, can expand your ventilation therapy repertoire even further. The combination of its high-precision ventilator and compact, heated breathing system makes the Fabius Tiro a natural choice for low-flow anesthesia.

In spite of its compact size, the Fabius Tiro comes complete with advanced features such as fresh gas decoupling, which maintains constant tidal volumes regardless of fresh gas flow changes. Dynamic compliance compensation and backup ventilation for PS modes let you ventilate with enhanced safety, confidence, and control. In emergency situations, the quick-start feature allows manual ventilation when the device is off, on, or in standby mode for rapid support. Even in the unlikely event of a gas supply failure, automatic ventilation can be temporarily continued.

### KEEPING YOU INFORMED

The Fabius Tiro features an integrated, high-contrast monitor which displays relevant ventilation information as parameters and a pressure curve. Fresh gas flow is monitored via high-visibility digital displays as well as a single mechanical flow tube which shows total gas flow. It is also possible to export all parameters as data, e.g. for enhanced ventilation monitoring or further analysis.

If you've used a Dräger workstation before, then you're familiar with Dräger's standard user interface, which features our established select-adjust-confirm concept. This means you'll be up and running on the Fabius Tiro in just a short time.

### ENHANCED ERGONOMICS AND ECONOMICS

The Fabius Tiro was specifically designed for use in confined conditions. For example, you can choose from a wall-mounted version or a cart version which makes positioning both safe and simple. Up to three drawers provide storage space for additional equipment and consumables, and a stowaway table provides extra space for other instruments or documentation.



## Dräger Fabius® Tiro

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### TECHNICAL DATA

#### BASE UNIT

##### Dimensions (W x H x D)

Trolley Version (Cart) with COSY	Approx. 30.4 x 53.6 x 33.0 in (77.2 x 136.1 x 83.8 cm)
Wall / Ceiling Version with COSY	Approx. 28.4 x 21.9 x 30.5 in (72.1 x 55.6 x 77.5 cm)

##### Weight and load

Fabius Tiro Trolley (with COSY) without supplementary cylinders and vaporizers	256.0 lb (116.0 kg)
Wall and Ceiling Mount (with mounting bracket)	107.4 lb (48.7 kg)

##### Power and battery backup

Power Input	100 to 240 VAC, 50/60 Hz, 70 VA
Operation time with fully charged batteries	45 minutes minimum (up to 120 minutes)

#### ANESTHESIA GAS SUPPLY MODULE

Range of fresh gas flow indicators	0.0 to 12.0 L/min
Total fresh gas flowmeter	0 to 10 L/min. calibrated with 50% O <sub>2</sub> / 50% N <sub>2</sub> O gas mixture
O <sub>2</sub> flush	max. 75 L/min at 87 psi (6 kPa x 100):
Vaporizer	Single Dräger or Selectatec®, optional vaporizer standby holder Dräger or Selectatec

#### VENTILATOR OPERATING SPECIFICATIONS

Ventilator E-vent®	Electronically controlled, electrically driven
Operating modes	<b>Volume Controlled Ventilation</b> Pressure Controlled Ventilation Pressure Support (Optional) SIMV/PS (Optional) <b>Manual Ventilation</b> <b>Spontaneous Breathing</b>

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Dräger Fabius® Tiro

**Control input ranges**

Breathing Frequency (rate)	4 to 60 bpm (1/min)
Positive End Expiratory Pressure (PEEP)	0 to 20 cmH <sub>2</sub> O (hPa)
Inspiration/expiration ratio (Ti:Te)	4:1 to 1:4
Pressure limiting (Pmax)	15 to 70 cmH <sub>2</sub> O (hPa)
Tidal Volume (Vt)	20 to 1400 mL in Volume Control 20 to 1100 mL in SIMV/PS
Inspiration pause (Tip:Ti)	0 to 50 %
SIMV Inspiratory time	0.3 - 4.0 sec
Inspiratory pressure (Pinsp)	PEEP + 5 to 65 cm H <sub>2</sub> O (hPa)
Inspiratory Flow (InspFlow)	10 to 75 L/min in Volume and Pressure Control modes 10 to 85 L/min in Pressure Support and SIMV/PS modes
Pressure Support Level (PPS)	PEEP + 3 to 20 cmH <sub>2</sub> O (hPa)
Min. frequency for apnoe-ventilation (Freq. Min.)	3 to 20 bpm and "OFF"
Trigger level	2 to 15 L/min
Integrated Safety Functions	Sensitive Oxygen Ratio Controller (S-ORC) guarantees a minimum O <sub>2</sub> concentration of 23% in an O <sub>2</sub> /N <sub>2</sub> O mixture. N <sub>2</sub> O cut-off if O <sub>2</sub> fresh gas valve is closed or if O <sub>2</sub> flow is less than 0.2 L/min. Audible and visual (flashing red LED) indication in case O <sub>2</sub> pressure drops below 1.38 bar (20 psi) ± 0.27 bar (4 psi). In case of electricity and battery failure, manual ventilation, gas delivery and agent delivery are possible. High Pressure Safety Relief Valve opens at 75 ± 5 cmH <sub>2</sub> O (hPa). Negative Pressure Safety Relief Valve opens at -7.5 to -9 cmH <sub>2</sub> O (hPa).

**Ventilator monitoring**

Monitoring	Continuous monitoring of inspiratory O <sub>2</sub> concentration (optional), breathing frequency, tidal volume expiratory, expiration, minute volume, peak airway pressure, PEEP, and selection of mean or plateau pressure. In addition, all fresh gas flow information is displayed as virtual flow tubes.
Expiratory Minute Volume range	0 to 99 L/min
Control Screen	6.5 in (16.5 cm); black/amber (color mode option)

**BREATHING SYSTEM**

Optional breathing system heater	yes
Volume of entire compact breathing system, with absorber, excl. hoses, excl. bag	1.7 L
Volume of CO <sub>2</sub> absorber	Standard: 1.5 L reusable canister, Option: 1.2 L prefilled Drägerorb CLIC absorber
Mounting	on swivel arm, left or right, height adjustable

**GAS SUPPLY AND CONNECTION**

Gas Supply	O <sub>2</sub> , N <sub>2</sub> O, Air / O <sub>2</sub> , Air
Cylinder Yokes (optional)	O <sub>2</sub> , O <sub>2</sub> Air / O <sub>2</sub> , N <sub>2</sub> O - pin-index hanger yokes

**OTHER**

Communication Interface	1 RS-232 standard, additional RS-232 optional
Protocols	Vitalink and MEDIBUS
Data available for Export	All alarms, pressure, O <sub>2</sub> , volume and fresh gas flow data, ventilation settings, flow curve, and pressure curve
Writing surfaces	Pull-out tray (standard), Flip-up tray (optional)
Additional accessories	Anesthetic gas scavenging system (AGSS), endotracheal suction unit, integrated auxiliary oxygen flowmeter, auxiliary fresh-gas outlet (A-Cone), low flow kit, power outlet strip

**CORPORATE HEADQUARTERS**

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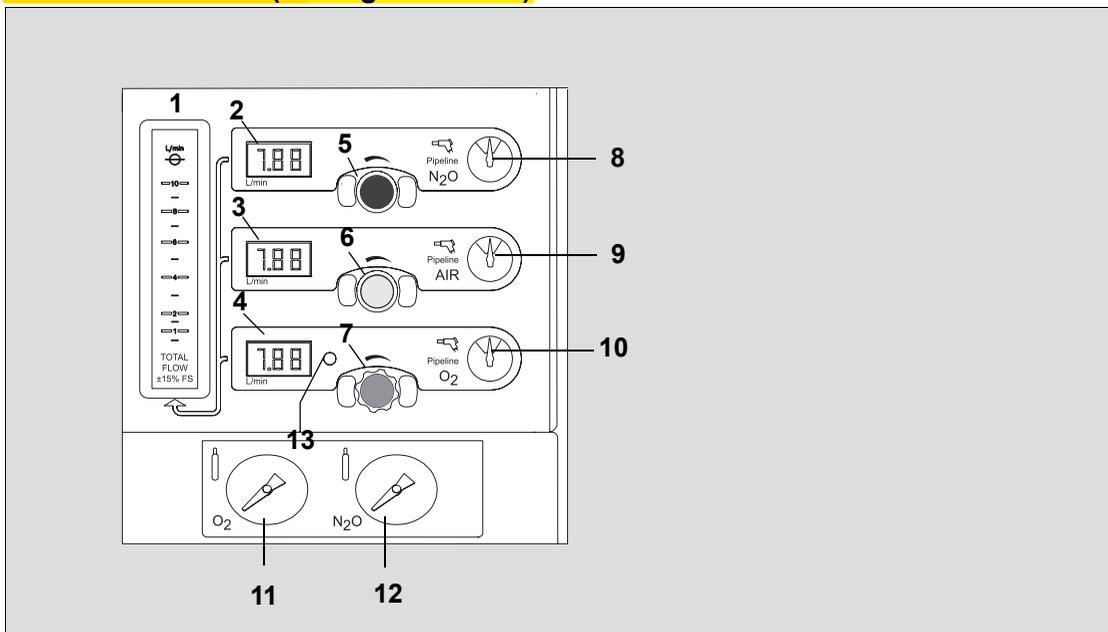
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The quality management system at Dräger Medical GmbH is certified according to ISO 13485, ISO 9001 and Annex II.3 of Directive 93/42/EEC (Medical devices).

## Fresh-Gas Control (three gas version)



The Flow Meter and Pressure Gauge assembly is located on the front panel of the machine below the screen. **There are three control knobs (three gas version) for the adjustment of N<sub>2</sub>O, AIR, and O<sub>2</sub> or two control knobs (two gas version) for the adjustment of AIR and O<sub>2</sub>.** The knobs are labeled and color-coded, see page 46. The O<sub>2</sub> control is also touch-coded with a fluted knob.

- **To increase flow, turn the appropriate flow control knob counterclockwise**
- **To decrease flow, turn the appropriate flow control knob clockwise**

- 1 Total flow meter which displays the flow measurement of all applied gases combined
- 2 N<sub>2</sub>O electronic fresh-gas flow indicator
- 3 AIR electronic fresh-gas flow indicator
- 4 O<sub>2</sub> electronic fresh-gas flow indicator
- 5 N<sub>2</sub>O flow control valve
- 6 AIR flow control valve
- 7 O<sub>2</sub> flow control valve
- 8 N<sub>2</sub>O central supply pressure gauge
- 9 AIR central supply pressure gauge
- 10 O<sub>2</sub> central supply pressure gauge

- 11 O<sub>2</sub> cylinder pressure gauge (trolley mount only)\*
- 12 N<sub>2</sub>O cylinder pressure gauge (trolley mount only)\*
- 13 O<sub>2</sub> Low Supply Pressure Alarm LED which flashes when the supply is below the factory set minimum pressure, nominally 20 psi (1.4 kPa x 100).

The displayed fresh-gas flow ranges from 0 L/min to 12 L/min. In case of a greater fresh-gas flow, the electronic fresh-gas flow indicator (2, 3, 4) is blinking and in the flow meter monitor window appears the sign "+" above the graphical display of the flow rates.

### NOTE

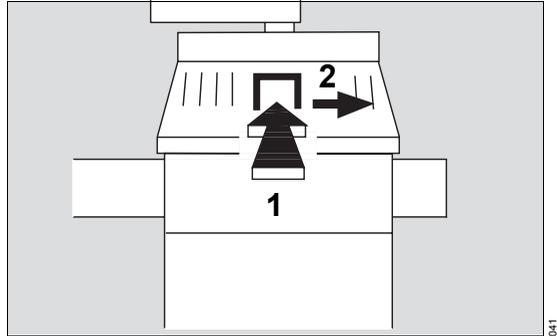
The electronic fresh-gas flow meter is altitude-corrected.

\* Only used with Pin-Index connectors (not present with threaded connectors).

## Setting Vaporizer Concentration

Refer to the appropriate Instructions for Use for the vaporizer being used. Vapor 2000 is shown and described below.

- Ensure that the vaporizer is properly seated and locked.
- 1 With the handwheel set to »T« position on the unlocked vaporizer, press the button and engage the handwheel at »0«. Wait five seconds for the pressure to balance.
- 2 Press the button and turn the handwheel counterclockwise to set the required anesthetic gas concentration.
- Regularly check the filling level on the sight glass. When reaching the minimum mark, fill the vaporizer with anesthetic agent.

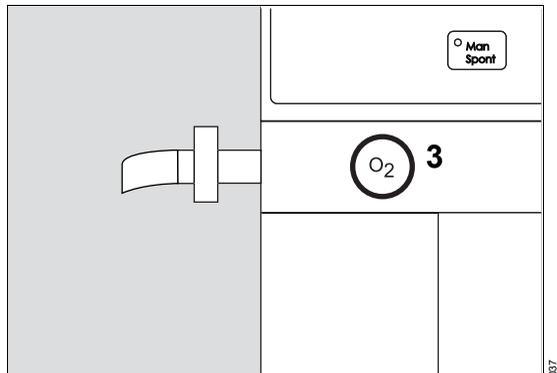


## O<sub>2</sub> Flush

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A manually operated O<sub>2</sub> flush valve is located on the front of the machine. When actuated, the valve delivers an unmeted flow of at least 35 L/min to the breathing system and breathing bag while bypassing the ventilator. The Fabius Tiro does not need to be switched on in order to use the O<sub>2</sub> flush.

- 3 Press the O<sub>2</sub> flush button. Additional O<sub>2</sub> flows into the compact breathing system as long as the button is pushed in. The flow control elements and the anesthetic agent vaporizer (Vapor) are bypassed.

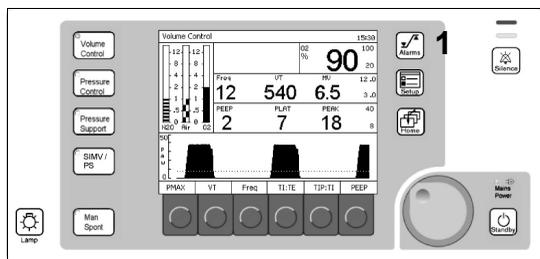


### NOTE

In ManSpont mode, pressure may rise rapidly up to the setting of the APL valve.

## Setting Alarm Limits

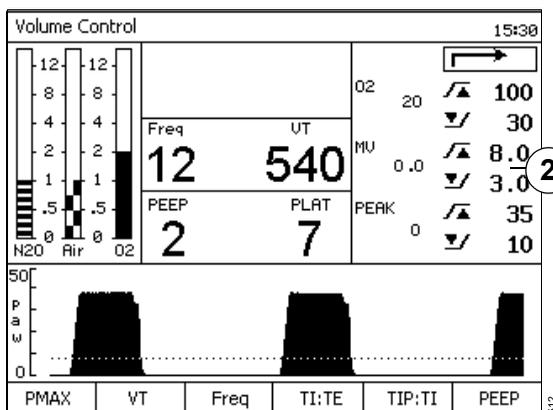
- To set the default alarm limits that take effect at machine power-up, see page 133.
- To set alarm limits for the current procedure, press the »  « key (**Alarms**).



- The alarm limits window is displayed on the screen.

The lower pressure limit **PAW low** is used for pressure monitoring to detect apneas (disconnection) and continuous pressure (on the screen represented as a dotted line). An alarm is generated when the pressure curve does not cross the pressure threshold either from above or below.

- Select the alarm limit value that needs to change.
- Confirm the alarm limit value and select a new value.
- Confirm the new value for the alarm limit. The new alarm limit is saved and the cursor moves to the return arrow.



The adjustment range and factory default values for all alarms on the Fabius Tiro are shown in the following table.

Alarm Parameter		Adjustment Range	Factory Default Value
O <sub>2</sub>	↗	19 to 100	100
%	↘	18 to 99	20
MV	↗	0.1 to 20.0	12.0
L/min	↘	0.0 to 19.9	3.0
Pressure cmH <sub>2</sub> O (hPa)	↗	10 to 70	40
	↘	5 to 30	8

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