

# ViP Ventilortester



ViP standard version with exchangeable single sensors or as

## ViPex (tension)



The **ViP Ventilortester** is a mobile microprocessor controlled measurement meter for flow, volume, pressure and oxygen. Developed for medical and laboratory applications and especially used to test ventilators its main advantages are its high measuring precision and simplicity of use. Its wide spectrum of use lets this meter stand as an ideal unit for surveying and testing tasks. The measured values can be displayed, saved and printed by a PC programme (communication via RS232).

EKU has put into action the requests and suggestions of the medical engineers who have been working with the **ViP Ventilortester** for many years. The expansion **ViPex (tension)** comes to the point. Its special feature are the three flow sensors integrated in a flexible electronic measuring unit.

Advantages:

- no compliance loss, as the measuring unit is directly plugged at the device which has to be tested
- therefore it has a higher measuring precision
- device is less sensitive to disturbances
- troublesome plugging of the single sensors does no longer apply

The following parameters were extended:

- flow measurement even 'lower': with an additional small flow sensor for more exact measurements at minimal flow
- flow measurement even 'higher': expansion of the range to > 200 l/min
- bi-directional inspiratory and expiratory flow measurement with indication of the direction directly at the Y-piece
- measuring of humidity in the respiration system

**Technical Specifications:****Measuring units:**

Flow unidirectional, tidal volume, minute volume, peak flow, time measurement ( $T_I, T_E, I:E$ , frequency), differential pressure (500 mbar option), high pressure (option), ambient pressure, oxygen concentration (option)

**Measuring principle:**

Flow: hot-wire principle (constant temperature)  
Pressure: temperature compensated semi-conductor sensor  
Oxygen: electrochemical cell  
Medium (flow measurement): Air; optional:  $O_2$  (high and low range),  $N_2O$  (only low range flow sensor)

**Measuring range:**

Flow (high range flow sensor VSE2): 0,5 - 180 l/min (Air), 0,5 - 150 l/min ( $O_2$ )  
Flow (low range flow sensor VSN3): 0,1 - 20 l/min (Air,  $O_2, N_2O$ )  
Flow display in: ATP, STP, BTPS  
Tidal volume: 0 - 50 l (big sensor), 0 - 5 l (small sensor)  
Minute volume: 0 - 500 l/min (big sensor), 0 - 50 l/min (small sensor)  
Peak flow: 0,5 - 150 (100) l/min (big sensor), 0 - 20 l/min (small sensor)  
Time measurement:  $T_I, T_E$ : 0.00 - 9,98 s,  $I:E$ : 1:0.0 - 1: 9.9, frequency: 6 - 99,9  $min^{-1}$   
Pressure: 0 - 120 mbar (0 - 122  $cmH_2O$ , 0 - 12 kPa, 0 - 90 mmHg, 0 - 1,74 psi)  
(optional 100 -500 mbar differential pressure measurement)  
High pressure: 0 - 7 bar (0 - 7140  $cmH_2O$ , 0 - 700 kPa, 0 - 5250 mmHg, 0 - 101,5 psi)  
Ambient pressure: 600 - 1150 mbar  
Oxygen: 10 - 100 Vol%

**Accuracy:**

Flow and related units: approx.  $\pm 2,5\%$  ( $\pm 5\%$  with  $O_2$  or  $N_2O$ )  
Tidal volume: approx.  $\pm 2,5\%$   
Minute volume: approx.  $\pm 2,5\%$   
Time measurement:  $T_I, T_E$ :  $\pm 2\%$  or  $\pm 0,04$  s,  $I:E$ :  $\pm 2\%$  or  $\pm 0,2$ , frequency:  $\pm 2\%$  or  $\pm 0,2$   $min^{-1}$   
Pressure:  $\pm 1\%$  (20 - 25°C) or  $\pm 0,5$  mbar,  $\pm 2\%$  (10 - 35°C) or  $\pm 1$  mbar  
Option 500mbar:  $\pm 1\%$  (20 - 25°C) or  $\pm 2,5$  mbar,  $\pm 2\%$  (10 - 35°C) or  $\pm 5$  mbar  
High pressure:  $\pm 1\%$  (20 - 25°C) or  $\pm 40$  mbar,  $\pm 2\%$  (10 - 35°C) or  $\pm 60$  mbar  
Ambient pressure:  $\pm 1\%$  (20 - 25°C) or  $\pm 4$  mbar,  $\pm 2\%$  (10 - 35°C) or  $\pm 8$  mbar  
Oxygen:  $\pm 1$  Vol% (15 - 30°C, 40 - 80% rel. humidity)  
Operating temperature: 10 - 35 °C  
Features: peak detection for flow and pressure measurement  
alarm limits for pressure, frequency and tidal volume  
adjustable trigger levels for volume measurement  
Display: LCD (with backlight), 62 x 43 mm  
Interface: RS 232 (optional: PC-Programme)  
Power supply: 230V AC, 50/60 Hz, approx. 8 VA (optional: accumulator 12V, 0.8Ah)  
Dimensions: 184 x 80 x 175 mm (W x H x D)  
Weight: approx. 3 kg

**Additional data ViPex:  
additional measuring units:**

Flow bi-directional, humidity

**Measuring range:**

Flow big sensor: 0,5 - 210 l/min (Air), 0,2 - 150 l/min ( $O_2$ )  
Flow middle sensor: 0,10 - 30 l/min (Air,  $O_2, N_2O$ )  
Flow small sensor: 0,02 - 5 l/min (Air,  $O_2, N_2O$ )  
Humidity: 0 - 100 % rel. humidity

**Accuracy:**

Flow and related units:  $\pm 2.0\%$  ( $\pm 4\%$  with  $O_2$  or  $N_2O$ )  
Tidal volume, Minute volume:  $\pm 2\%$   
Humidity:  $\pm 3\%$  rel. humidity

**Software:**

service documentation, device accountancy with processing of maintenance and invoicing, graphic display, analysis of defects, pressure-flow long-term measurement with PC

**Service:**

maintenance and calibration service,  
issue of the corresponding calibration certificates

Above listed data are valid for calibrated instruments. All data are subject of change without further notice.