

# Technical Specifications

## FlowAnalyser, PF-300, PF-301, PF-302

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Flow and Pressure Measurements		Range	Accuracy
<b>Flow</b>	Measuring direction	bidirectional	
	Temperature compensated	yes	
	Pressure compensated	yes	
	Humidity compensated	yes	
	O <sub>2</sub> compensated	yes	
		High	± 300 L/min
	Low	± 20 L/min	± 1.75%* or ± 0.04 L/min**
<b>Pressure</b>	High Pressure	0–10 bar	± 1%* or ± 10 mbar**
	Differential Pressure (PF-300 only)	± 150 mbar	± 0.75%* or ± 0.1 mbar**
	Relative Pressure (PF-301 and PF-302)	± 150 mbar	± 0.75%* or ± 0.1 mbar**
	Low (for PF-302 only)	0–5 mbar	± 1%* or ± 0.01 mbar**
	In High Flow Channel	0–150 mbar	± 0.75%* or ± 0.1 mbar**
	Barometer	0–1150 mbar (abs)	± 1%* or ± 5 mbar**
	Vacuum pressure (for PF-301 only)	± 1000 mbar	± 0.5%* or ± 2 mbar**
<b>Measuring Unit</b>	Flow	L/min, L/s, cfm, mL/min, mL/s	
	Pressure	bar, mbar, cmH <sub>2</sub> O, inH <sub>2</sub> O, Torr, inHg, hPa, kPa, mmHg, PSI	
Other Measurements		Range	Accuracy
Oxygen	Concentration	0–100%	± 1% O <sub>2</sub> **
	Pressure compensated	yes	
Temperature	In High Flow Channel	0–50°C	± 1.75%* or ± 0.5°C**
Dew point	In High Flow Channel	-10–50°C	± 2%* or ± 1°C**
Humidity	In High Flow Channel	0–100%	± 3%**
CO <sub>2</sub>	Concentration (with OR-703)	0–10%	± (0.2% ABS + 2% REL)
		10–20%	± (0.3% ABS + 4% REL)
N <sub>2</sub> O	Concentration (with OR-703)	0–100%	± (2% ABS + 2% REL)
HAL, ISO, ENF	Concentration (with OR-703)	0–8%	± (0.15% ABS + 5% REL)
		8–12%	± (0.2% ABS + 10% REL)
SEV	Concentration (with OR-703)	0–10%	± (0.15% ABS + 5% REL)
		10–15%	± (0.2% ABS + 10% REL)
DES	Concentration (with OR-703)	0–22%	± (0.15% ABS + 5% REL)
		22–25%	± (0.2% ABS + 10% REL)
Gas types	Air, Air/O <sub>2</sub> , N <sub>2</sub> O/O <sub>2</sub> , Heliox (21% O <sub>2</sub> ), He/O <sub>2</sub> , N <sub>2</sub> , CO <sub>2</sub> , customised gas types		
Gas standards	ATP, ATPD, ATPS, AP21, STP, STPH, BTPS, BTPS-A, BTPD, BTPD-A, 0/1013, 20/981, 15/1013, 25/991, 20/1013, NTPD, NTPS		
Ventilation Parameters <sup>1)</sup>		Range	Accuracy
Breath rate		1–1000 bpm	± 1 bpm or ± 2.5%**
Time	Ti, Te	0.05–60 s	± 0.02 s
I:E ratio		1:300–300:1	± 2.5%*
Ti/Ttotal		0–100%	± 5%*
Breath volumes	Vti, Vte (@Low Flow)	± 10 L	± 1.75% or ± 0.10 mL (> 2.4 L/min)
	Vti, Vte (@High Flow)	± 10 L	± 1.75% or ± 0.20 mL (> 6.0 L/min)
Minute volume	Vi, Ve	0–300 L/min	± 2.5%*
Pressure	Ppeak, Pmean, PEEP, Pplateau	0–150 mbar	± 0.75%* or ± 0.1 mbar**
Peakflow	Peakflow Insp./Exp.	± 300 L/min	± 1.75%* or ± 0.1 L/min**
Compliance	Cstat	0–1000 mL/mbar	± 3%* or ± 1 mL/mbar**
Trigger	Adult, Pediatric, HFO	Adult, Pediatric, HFO; Adjustable on flow or pressure curves with user-defined limits.	
General Information			
AC input	100–260 VAC, 50/60 Hz		
Battery (lead rechargeable battery)	3 hrs (with OR-703 2 hrs)		
Power consumption	25 VA		
Weight	3.7 kg		
Dimensions (w × d × h)	22 × 25 × 12 cm		
Data Storage	all parameters (measured as well as respiratory values)		
Display	Intuitive user interface with numerical measuring values, statistics, volume trigger configuration, gas type selection and calibration menus.		
Communication Interfaces	USB for Windows Software FlowLab, RS-232 for individual communication, TTL for external trigger and TSI4000 Protocol.		
Calibration	annually		
Conditions Ambient temperature	10–40°C (50–104°F)		
Conditions Humidity	10–95% R.H.***		
Approvals	CE, CSA		

**Legend** The greater tolerance is valid: \*Tolerance related to the measured value, \*\* Absolute tolerance, \*\*\* Non-condensing  
<sup>1)</sup> Tolerance related to the optimal calibration of the trigger.

Subject to technical changes.

# Technical Specifications

CITREX H4

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Flow and Pressure Measurements		Range	Accuracy
<b>Flow</b>		$\pm 300$ sL/min***	Air: $\pm 1.9\%$ * or $\pm 0.1$ sL/min**
Temperature compensated		yes	
Pressure compensated		yes	
<b>Pressure</b>			
High		0–10 bar	$\pm 1\%$ * or $\pm 10$ mbar**
Differential		$\pm 200$ mbar	$\pm 0.75\%$ * or $\pm 0.1$ mbar**
Flow channel		- 50–150 mbar	$\pm 0.75\%$ * or $\pm 0.1$ mbar**
<b>Units</b>			
Flow		L/min, L/s, cfm, mL/min, mL/s	
Pressure		bar, mbar, cmH <sub>2</sub> O, inH <sub>2</sub> O, Torr, inHg, hPa, kPa, mmHg, PSI	
Other Measurements		Range	Accuracy
Oxygen, pressure compensated		0–100 %	$\pm 1\%$ O <sub>2</sub> **
Gas temperature		0–50 °C	$\pm 1.75\%$ * or $\pm 0.5$ °C**
Gas types		Air, Air/O <sub>2</sub> , N <sub>2</sub> O/O <sub>2</sub> , Heliox (21% O <sub>2</sub> ), N <sub>2</sub> , CO <sub>2</sub>	
Gas standards		ATP, ATPD, ATPS, AP21, STP, STPH, BTPS, BTPS-A, BTPD, BTPD-A, 0/1013, 20/981, 15/1013, 25/991, 20/1013, NTPD, NTPS	
Ventilation Parameters		Range	Accuracy
Breath rate		1–1000 bpm	$\pm 1$ bpm or $\pm 2.5\%$ **
Time	Ti, Te	0.05–60 s	$\pm 0.02$ s
Ratio	I:E	1:300–300:1	$\pm 2.5\%$ *
	Ti/Ttotal	0–100 %	$\pm 5\%$ *
Volume	VTi, Vte	$\pm 10$ L	$\pm 2\%$ * or $\pm 0.20$ mL (> 6 sL/min)**
Minute volume	Vi, Ve	0–300 sL/min	$\pm 2.5\%$ *
Peak flow	Insp./Exp.	$\pm 300$ sL/min	Air: $\pm 1.9\%$ * or $\pm 0.1$ sL/min**
Pressure	Ppeak, Pmean, PEEP, Pplateau	0–150 mbar	$\pm 0.75\%$ * or $\pm 0.1$ mbar**
Compliance	Cstat	0–1000 mL/mbar	$\pm 3\%$ * or $\pm 1$ mL/mbar**
Volume trigger	Adult, Pediatric, HFO	flow or pressure at preset and at adjustable levels	

General Information	
Color display	yes
Realtime curves	flow, pressure, volume, temperature, oxygen, ventilation parameters
Interface	RS-232, USB, Ethernet, CAN, Analog Out, TTL (external Trigger Input), TSI4000 Protocol
Power	100–240 VAC, 50–60 Hz
Battery	4 hours
Dimension (w×d×h)	11.4 × 6 × 7 cm
Weight	0.4 kg
Calibration	annually
Memory card	yes
Approvals	CE, CSA, IEC 61010-1:2010, IEC 61326-2:2005

**Legend** The greater tolerance is valid: \* Tolerance related to the measured value, \*\* Absolute tolerance, \*\*\* The unit sL/min is based on ambient conditions of 0°C and 1013 mbar (DIN 1343).

Subject to technical changes.

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