

EasyOne Pro

Portable pulmonary function laboratory



EasyOne Pro

DLCO ready to go

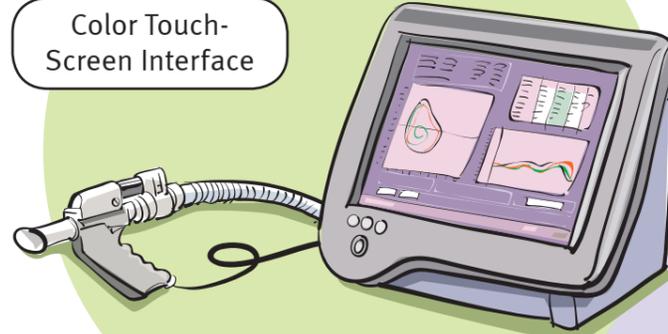
Parameter	FVC	FVL	SVC	MVV	DLCO	UPG	Description
FVC	x	x					Forced vital capacity
FEV6	x	x					Forced expiratory volume after 6 seconds
FEV.25	x	x					Forced expiratory volume after 0.25 seconds
FEV.5	x	x					Forced expiratory volume after 0.5 seconds
FEV.75	x	x					Forced expiratory volume after 0.75 seconds
FEV1	x	x					Forced expiratory volume after 1 second
FEV3	x	x					Forced expiratory volume after 3 seconds
FEF10	x	x					Forced expiratory flow at 10% of FVC (ERS: MEF90)
FEF25	x	x					Forced expiratory flow at 25% of FVC (ERS: MEF75)
FEF40	x	x					Forced expiratory flow at 40% of FVC (ERS: MEF60)
FEF50	x	x					Forced expiratory flow at 50% of FVC (ERS: MEF50)
FEF60	x	x					Forced expiratory flow at 60% of FVC (ERS: MEF40)
FEF75	x	x					Forced expiratory flow at 75% of FVC (ERS: MEF25)
FEF80	x	x					Forced expiratory flow at 80% of FVC (ERS: MEF20)
FEF2575	x	x					Average flow rate between 25 and 75% of FVC, also called MMEF
FEF7585	x	x					Average flow rate between 75 and 85% of FVC
AmbPressure	x	x	x	x	x	x	Ambient Pressure
AmbTemp	x	x	x	x	x	x	Ambient Temperature
BTPSin	x	x	x	x	x	x	Body Temperature Pressure Saturated inspiratory
BTPSex	x	x	x	x	x	x	Body Temperature Pressure Saturated expiratory
AmbHumidity	x	x	x	x	x	x	Ambient Humidity
ti							Inspiration Time
PEF	x	x					Peak expiratory flow
FET	x	x					Forced Expiratory Time. Elapsed time since T ₀ at which end-of-test criteria is met
FET2575	x	x					Forced expiratory time between FEF25 and FEF75 also called MET (mean expiratory time)
FIVC	x						Forced inspiratory vital capacity
FIV.25	x						Forced inspiratory volume after 0.25 seconds
FIV.5	x						Forced inspiratory volume after 0.5 seconds
FIV1	x						Forced inspiratory volume after 1 second
FIF25	x						Forced inspiratory flow at 25% of FVC (ERS: MIF75)
FIF50	x						Forced inspiratory flow at 50% of FVC (ERS: MIF50)
FIF75	x						Forced inspiratory flow at 75% of FVC (ERS: MIF25)
PIF	x						Peak inspiratory flow
T ₀	x	x					Time zero. This is the start time of the trial, calculated by back extrapolation.
BEV	x	x					Back extrapolated volume (at time T ₀)
MVV				x			Maximum voluntary ventilation
MVV6				x			MVV six seconds
FT				x			Breathing frequency in breaths per minute
VT [L]				x			
MVVtime				x			MVV maneuver time in seconds
PEFT	x	x					Time from T ₀ to peak flow
VCmax	x	x	x	x			VC max indicates the largest VC value of a Trial
VC				x			Vital capacity (from slow expiration)
VCin				x			Inspiratory vital capacity (also for DLCO)
IC				x			Inspiratory capacity from end of tidal breathing
ERV				x			Expiratory reserve volume
IRV				x			Inspiratory reserve volume
EOTV	x	x					End of test volume
RV				x			Tidal volume, also called TV
QA	x	x	x	x			Quality score
LungAge	x	x					Computed by inversion of FEV1 predicted equation
FEV.5/FVC	x	x					Ratio of FEV.5 and FVC
FEV.75/Vc	x	x					Ratio of FEV.75 and Vc
FEV.75/FVC	x	x					Ratio of FEV.75 and FVC
FEV.75/FEV6	x	x					Ratio of FEV.75 and FEV6
FEV1/Vc	x	x					Ratio of FEV1 and Vc
FEV1/FVC	x	x					Tiffenau Index, ratio of FEV1 and FVC
FEV1/FEV6	x	x					Ratio of FEV1 and FEV6
FEV3/FVC	x	x					Ratio of FEV3 and FVC
FEV3/Vc	x	x					Ratio of FEV3 and Vc
FEF50/Vc	x	x					Ratio of FEF50 and Vc
FEF50/FVC	x	x					Ratio of FEF50 and FVC
FEF2575/FVC	x	x					Ratio of FEF2575 and FVC
FIF50/FEF50	x	x					Ratio of FIF50 and FEF50, also called R50
FEV1/FIV1	x	x					Ratio of FEV1 and FIV1
Dose	x	x					Dosage value for broncho-challenge, user defined units of measure
PC15	x	x					Provocation conc. on 15% drop in md (dose units)
PC20	x	x					Provocation conc. on 20% drop in md (dose units)
CVI				x			FEV.5 / FIV.5
ATI	x	x					((VC - FVC) / VC) * 100
MTC1	x	x					(FEF75 - FEF50) * 4 / FVC
MTC2	x	x					(FEF50 - FEF25) * 4 / FVC
MTC3	x	x					FEF25 * 4 / FVC
MTCR	x	x					MTC1 / MTC3
E50/I50	x	x					FEF50 / FIF50
DLCO					x		CO diffusion capacity (SI units)
TLCO					x		CO diffusion capacity
DL Adj					x		Adjusted CO diffusion capacity (either carboxyhaemoglobin, haemoglobin and or, altitude correction)
DLCO/VA					x		Ratio of DLCO and VA
DL/VA Adj					x		Ratio of DL Adj and VA
Kroghs K					x		Ratio of DL and VA adj reported in STPD
VA					x		Alveolar volume (BTPS)
VA Cor					x		Alveolar Volume with Punjabi Correction
FRC					x		Functional residual capacity
FRC Cor					x		Functional residual capacity with Punjabi Correction
FI He					x		Inspiratory helium concentration
FE He					x		Expiratory helium concentration

Parameter	FVC	FVL	SVC	MVV	DLCO	UPG	Description
FI CO						x	Inspiratory CO concentration
FE CO						x	Expiratory CO concentration
BHT						x	Breath hold time
TLC						x	Total lung capacity (single breath test)
TLC Cor						x	Total Lung capacity with Punjabi Correction
RV						x	Residual volume calculated from TLC (single breath test)
RV Cor						x	Residual Volume with Punjabi Correction
RV/TLC						x	Ratio of RV and TLC (single breath test)
RV/TLC Cor						x	Ratio Residual Volume/Lung capacity with Punjabi Correction
FA He						x	Alveolar Helium concentration
FA CO						x	Alveolar CO concentration
STPD						x	Standard temperature, pressure - dry factor
DLadj/VA						x	
ERV						x	
DiscardVolume						x	Discard Volume
ColBarVol						x	Volume of collection bar
Anat Dead Space						x	
CO Conc						x	CO Concentration
COHb						x	Manually entered Carboxyhaemoglobin
Hb						x	Manually entered Hemoglobin level
HE Conc						x	Helium Concentration
O2 Conc						x	O2 Concentration
PaO2						x	Manually entered Arterial O2 pressure
S2						x	Slope of phase II
S3						x	Slope of phase III
Vd						x	Fowler dead space
VS1S2						x	Volume at start of phase II
VS2S3						x	Volume at start of phase III

This list is not complete. For additional parameters please contact nnd.

Technical specifications	Type	Accuracy	Resolution	Range
Flow/volume measurement	Ultrasound	± 2% or 0.050l	Volume: ± 1ml Flow: 4 ml/s	Volume: ± 12l Flow: ± 16l/s
Helium analyzer	Molar mass	< 0.1% He	< 0.05% He	0 – 50% He
Carbon monoxide analyzer	NDIR	+ 0.003%	0.001%	0 – 0.35%
Mouth pressure sensor	Differential pressure	+ 4%	0.05 mbar	± 100 mbar
Barometric pressure sensor	Silicon solid state	+ 7.5%	1 mbar	150 – 1150 mbar
Case temperature sensor	Solid state	+ 1 °C	0.02 °C	0 – 40 °C
Ambient temperature/	Ambient temperature	+ 0.4 °C	0.02 °C	0 – 40 °C
Humidity sensor	Ambient humidity	+/- 4%	1%	0 – 100%
Reference Values	Source			
Spirometry	NHANES III (Hankinson), Knudson (1983), Knudson (1976), Crapo, Morris, Hsu, Dockery (Harvard), Polgar, Cherniak, Pereira, ERS (ECCS, EGKS), Zapletal, Austria (Forche), Sapalidia, SEPAR (Roca), Hedenström, Gulsvik, Berglund, Hibbert, Gore, Crockett, IRS2001			
DLCO	Ayers, Burrows, Coates, Crapo, ERS, Goldman & Becklake, Miller, NHANES, Polgar, Roca, Zapletal			
Dimensions/weight	27H x 33.5W x 27D cm	Weight	< 8 kg	
Electrical	Voltage	Frequency	Power consumption	
	100 to 240 V(AC)	50/60 Hz	Max. 50 W	
Standards	Quality System	FDA	MDD 93/42/EEC	Electrical safety/ EMC
	ISO 9001/ISO 13485	510(k) market clearance (pending)	CE marked	EN 60601-1 EN 60601-1-2
System features	Languages	Printout	Data Transfer	Display
	English, Deutsch, Español	Direct USB to printer	Printer, modem memory stick, e-mail, Ethernet/LAN	colour touch-screen
Consumables	spirette™	bariette™	DLCO gas, Gas consumption (He 10%, CO 0.3%, 21% O ₂ in N ₂)	
Per patient	1	1		
Per trial			Approx. 5l	

Color Touch-Screen Interface



Embedded PC Function



Highly Portable



Robust, Calibration-Free

Small Footprint



nnd Medizintechnik AG
Technoparkstrasse 1
CH-8005 Zürich
www.nnd.ch



TrueFlow
makes the difference

MolMass
the next step

UPG
the new dimension

EasyCO
fast and reliable

Open system “le dernier cri” in patient interface design, comfort and gas management

No bags, fast gas without valve contact, light weight (120 - 300 gr), ergonomic design with the state of the art proven spirette™ for safe, tight, secure, contamination free patient contact with a place to put the teeth.

The components of the patient interface

- “2-in-1” tube from the main unit
- external tube never exposed to patient exhaled breath
- internal tube with perma-pure system never exposed to ambient conditions
- DLCO gas control unit actuator (motor)
- patient interface main body
- spirette™ the ndd introduced single use consumable that changed spirometry for good
- barriette™ the ndd virtual bacteria filter
- control and measurement cable to main unit

Connection tube patient interface to main unit

- “2-in-1” tube assembly
- outer tube supplies the DLCO gas, on demand, patient side is always isolated from supply
- inner tube draws the sample for CO measurement (temperature and humidity adjusted)

Socket for measurement/control cable
“2-in-1 click” tube low pressure socket

State of the art connectivity for easy communication quick and secure set up at visiting locations

Fan suction, RS 232 (2), LED indicators (power and HD), temperature and humidity sensor, external keyboard, DLCO gas input, reset button, ground, USB (2), gas relief, ethernet (2), main switch, VGA, mains socket



On site upgrades and software changes by memory sticks

- “Ferry” the requirements from any source
- e-mail; homepage from ndd
- CDR from suppliers



DLCO gas control unit

- high pressure reduction
- pressure safety relief system
- high flow, low resistance, low cracking pressure demand valve
- gas sample pump
- micro automatic calibration test gas circuit



New technology state of the art lung function analyzer:

- highly portable, self contained, instant point of care/bedside use, no warm up time
- no add-on components required (PC, monitor, keyboard, mouse etc.)
- easy to maintain
- 3 units with simple connection: patient interface, main unit, DLCO gas cylinder
- robust, calibration free, instant on sensors
- colour touch screen interface, wide view angle, hygienic, use with gloves, disinfectant friendly surface
- industrial standard embedded PC, Windows XP embedded operating system, supports standard printer, network, security and peripheral device functions



Main unit high resolution colour touch screen display

Type: LCD
Size: 12,1 inches
Resolution: 1024 x 768

User friendly:
weighs less than 8 kg, small foot print: 34 x 25 cm, suitable for use with protective gloves and easy cleaning (maintenance).

FLASH memory card keeps you safe

- 100% back up of configuration and patient data
- Instant system restore after service
- You keep your data



Mobility and portability of EasyOne Pro

Extremely mobile for the following reasons:

- quick disconnection and reconnection
- no warm up time at new location
- automatic calibration for EasyCO
- no calibration for TrueFlow, over 40'000 applications spanning 9 years, publications supporting manufacturer's claim, calibration check data from thousands of instruments (EasyOne) in world wide use, papers on the theory of operation are published on www.ndd.ch



Fully compatible with EasyOne Spirometer

- over 40'000 sold worldwide



Maintenance and serviceability of EasyOne Pro

The 3 components are totally interchangeable and replaceable

- consumable (single patient use) are only 2 items: barriette™ and the spirette™
- patient interface components:
“2-in-1” tube needs no maintenance, cleaning is possible, a yearly exchange is recommended.
- the main unit can be serviced by exchange unit without any set up work due to ndd FLASH memory card containing all relevant data: customer specific set up and configuration data, patient data made with the original unit
- the whole patient interface unit can be replaced without any need for calibration or adjustments
- DLCO gas (He 10%, CO 0.3%) can be locally provided in bottles of different sizes allowing for specific needs

Additional features for remote function checks, remote service and remote maintenance in accordance with the facilities of the EasyOne Pro (see connections) as well as with customers' possibilities (availability of internet connectivity at site etc.) are possible. Please enquire when opportune with details of requirements and description of availability. For warranty contact your ndd distributor.