

# EasyOne Pro Portable pulmonary function laboratory

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
BTPSex	x	x	x	x	x	x	Body Temperature Pressure Saturated inspiratory
BTPSin	x	x	x	x	x	x	Body Temperature Pressure Saturated expiratory
AmbHumidity	x	x	x	x	x	x	Ambient Humidity
DiscardVolume						x	Discard Volume
ColBarVol						x	Volume of collection bar
tI						x	Inspiration Time
PEF	x	x					Peak expiratory flow
FET	x	x					Forced Expiratory Time. Elapsed time since T <sub>0</sub> 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 <sub>0</sub>	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 <sub>0</sub> )
MVV				x			Maximum voluntary ventilation
MVV6				x			MVV six seconds
FT				x			Breathing frequency in breaths per minute
VT (L)			x	x			
MVVtime				x			MVV maneuver time in seconds
PEFT	x	x					Time from T <sub>0</sub> 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			x			Inspiratory vital capacity (also for DLCO)
IC	x			x			Inspiratory capacity from end of tidal breathing
ERV	x			x			Expiratory reserve volume
IRV	x			x			Inspiratory reserve volume
EOTV	x	x					End of test volume
Rf		x	x				Tidal volume, also called TV
QA	x	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						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 DLAdj and VA

Parameter	FVC	FVL	SVC	MVV	DLCO	UPG	Description
Kroghs K						x	Ratio of DL and VAadj 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
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 Cor						x	Ratio Residual Volume/Lung capacity with Punjabi Correction
RV/TLC						x	Ratio of RV and TLC (single breath test)
FA He						x	Alveolar Helium concentration
FA CO						x	Alveolar CO concentration
STPD						x	Standard temperature, pressure - dry factor
Anat Dead Space						x	
CO Conc						x	CO Concentration (eng. corrected)
COHb						x	Manually entered Carboxyhaemoglobin
ColBar Vol						x	
DLadjVA						x	
ERV						x	
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 ndd.

Technical specifications	Type	Accuracy	Resolution	Range
Flow/volume measurement	Ultrasound	± 2% or 0.050 l	Volume: > 1 ml Flow: 4 ml/s	Volume: ± 12 l Flow: ± 16 l/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/ Humidity sensor	Ambient temperature	± 0.4 °C	0.02 °C	0 – 40 °C
	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), Sapaldia, SEPAR (Roca), Hedenström, Gulsvik, Berglund, Hibbert, Gore, Crockett, JRS2001			
DLCO	Ayers, Burrows, Coates, Crapo, ERS, Goldman & Becklake, Miller, NHANES, Polgar, Roca, Zapletal			
Dimensions/weight	10.6H x 13.2W x 11D	18 lbs.		
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 <sub>2</sub> in N <sub>2</sub> )
Per patient	1	1		
Per trial			Approx. 5l	



n d d Medical Technologies, Inc.  
Two Dundee Park  
Andover, MA 01810  
www.nddmed.com



## EasyOne Pro DLCO ready to go

- Robust, calibration-free
- Color touch-screen interface
- Embedded PC function
- Highly portable
- Small footprint



**TrueFlow**  
makes the difference

**MolMass**  
the next step

**UPG** the new dimension

# n d d EasyOne Pro DLCO ready to go

## Patient interface tube assembly

tube within a 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

## Report

- plain paper, letter size, color or greyscale print
- direct USB connection
- export to 'excel', ascii, xml, etc...
- Pictbridge compatible

## Connectivity

- easy, fast, reliable connectivity
- quick and secure setup



## New state of the art technology lung function analyzer

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

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the next step

## Mobility and portability of EasyOne Pro

### Lightweight, weighs less than 18 lbs.

- quick disconnection and reconnection
- no warm up time at new location
- automatic calibration/QC checks



### Main unit high resolution color touch screen display

Type: LCD  
Size: 12.1 inches  
Resolution: 1024 x 768

User friendly:  
weighs less than 18 pounds, small foot print: 14 x 10 inches, suitable for use with protective gloves and easy cleaning

### barriette™

The virtual filter approved for optimum hygienic separation of spirette / patient from the analyzer. The new consumable designed by n d d.



### spirette™

- simple, comfortable fit for adults and children
- hygienic, single patient use
- no sensor elements



## Maintenance and serviceability of EasyOne Pro

The 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 exchanging the unit with minimal set up due to n d d 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 inquire for requirements and description of availability. For warranty contact n d d Medical Technologies Inc. at 877-904-0090.

### FLASH memory card keeps you safe

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



### On site upgrades and software changes by memory sticks

- e-mail
- www.ndd.com



## Other n d d products



Easy on-PC



EasyOne Plus Spirometer



EasyOne Screen