VO_2max Tracker
ergospirometer

CE 1011

VO2maxTracker ergospirometer is a powerful portable system for cardiopulmonary exercise tests held in natural field (running, biking, rowing, sailing, etc.) during real training, competition or rehabilitation without loading devices (bicycle, treadmill). This system may also be used in laboratories where load my be set on connected treadmill or cycle-ergometer. Ergospirometer exceeds the accuracy standards of both the American Thoracic Society and the European Respiratory Society

Air tubes eliminated thanks to headpiece digitizing

We have brought to effect the main change of flow transforming in our devices. We have developedand registrated in Patent's Office our new invention which enable to eliminate air tubes and a flow signal from our pneumotachograph MES DV 40 is changed to a digital form next to pneumotachograph and sent by cable to a main unit. We can say that we produce digital pneumotachograph now.

Features and advantages of VO2maxTracker:

- light, portable measuring system fit for field and laboratory operation
- unending free of charge upgrades
- “breath by breath” analysis method
- light, low-resistant pneumotach headpiece without movable elements
- flow converted to a digital form close to headpiece
- air tubes for flow measurement eliminated
- automatic ambient conditions measuring system
- automatic calibration of gas analysers
- display real-time data and graphs in either pre-defined or user formats in laboratory (bluetooth) and field (by using bluetooth and telemetry module)
- preview of measuremed values on smartphone or tablet in real time
- 24-hours record of a test in natural conditions
- intern accumulators (4 x AA 1,2V) can be changed during exercise
- easy transmission (bluetooth or cable) of a field test record to the computer
- presentation of the measured values against the background of standard values
- add user defined parameters and predicted equations with custom based formulas
- numerous upgrading options: 12 ECG Stress Test (in laboratory only), pulsoximetry, nutrition asessement etc.
- standard and custom exercise protocols design
- automatic or manual determination of the aerobe, anaerobe thresholds and RCP
- O2 Kinetics feature automatically provides O2 debt, O2 deficit and time constant values
- indirect cardiac output by “Wassermann Algorithm”
- alternative method of pulse measurement
- 9-plot Wasserman report with a single page report containing the 9 graphs
- summary report provides data for a simple and easy interpretation
- advanced data elaboration with evaluation algoritm
- edition of test report
- VO2max determination
- ready-to-print pre-defined reports
- test report transmission software compatible with Microsoft Windows
- automatic treadmill or bicycle ergometer control
- wide selection of treadmills and bikes for both clinical and performance applications
- telemetry module option with range 2000m
- low maintenance costs and easy servicing

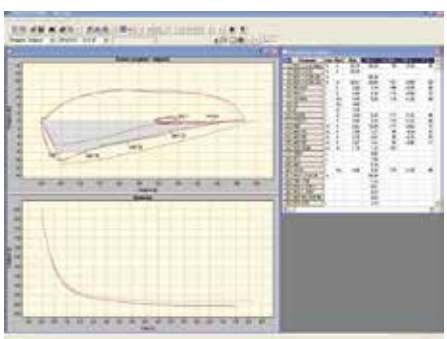
Application fields:

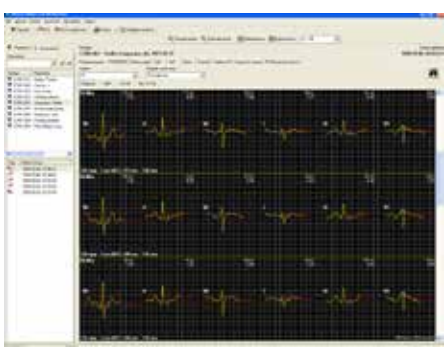
- Cardiopulmonary Exercise Testing
- Pulmonology
- Exercise Physiology
- Sports Medicine
- Cardiac Rehabilitation
- Occupational Medicine
- Intensive Care
- Nutrition assessment
- Enviromental Medicine

Small sophisticated system for excellent diagnostic

Thanks to application of a low resistant pneumotach headpiece patented by MES, it is possible to measu-re minute ventilation for many hours. CO_2 and O_2 analysers and wireless pulse recording provide for full recording of the most important ergospirometric parameters. **VO_2maxTracker** stores exercise up to 24 hours. The recorded results are transmitted to the computer for analysis, graphic presentation, printout and storage. This system may also be operated in laboratories with direct preview of the measured values. Loads may be set on cycle-ergometer, treadmill, or other devices. Lab option may be extended with 1-12 ECG leads with full analysis of values, preview in real time, and storage.

VO_2maxTracker weights only 280g and equipped with intern batteries 4 x AA), which guarantee 12 hours continue operation, it weights 380g. **VO_2maxTracker** is held in a special belt, in front or at the back. The unit may be optionally equipped with software for spirometric tests, pulsoximeter, automatic system measuring ambient conditions. Results of spirometric tests are transmitted to the ergospirometric system and standard values for minute ventilation and oxygen consumption are automatically calculated.



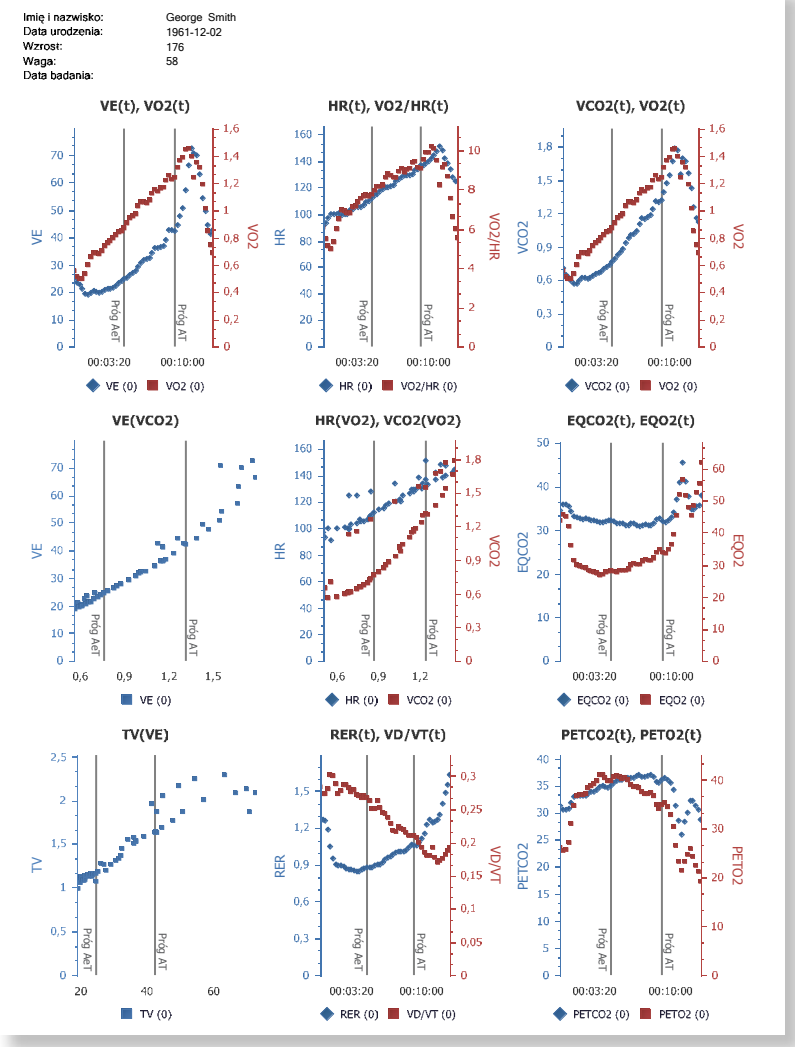


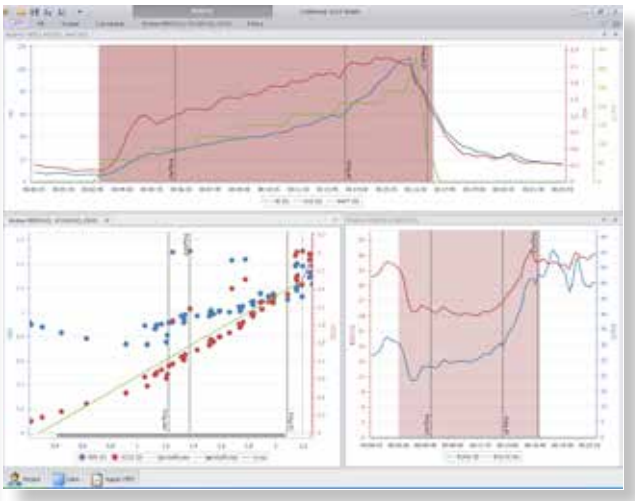
Standard software range

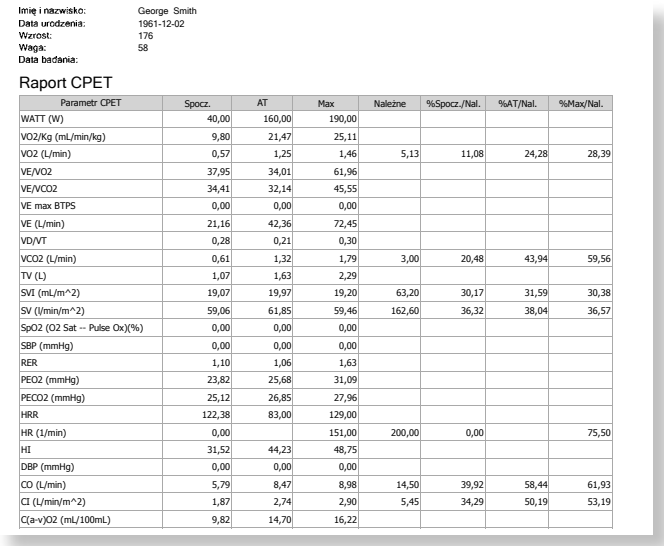
- **Exercise test of respiratory system**
  measured values: t, VE, BF, TV(VT), FeO2, FeCO2, VO2, VCO2, VE/VO2(EQO2), VE/VCO2(EQCO2), RER(RQ), VO2/kg, VO2/kg/HR, TI, TE, MET, TTOT, TI/TE, TI/TTOT, WATT(Work rate), PEF, PIF, SpO2, PEO2, PECO2, BR, VET, SUM, TV/TE, O2 Kinetics (T0,5VO2peak, t63%delta VO2), O2 oxygen deficit and debt parameters, indirect calorymetry.
  Cardiac output parameters estimated noninvasively from oxygen uptake during exercise (by Wassermann Algorithm):
  C(a-v)O2,CO, SV, HI, SVI, CI
  Cardiac output and stroke volume can be estimated during progressive work rate exercise testing from measured VO2 (in normal subjects and patients with congestive heart failure) and the resultant linear regression.
- **Wireless pulse recording system**
  Additional optional module and software:
  - Full range of spirometric test (rest spirometry, flow/volume loop, MVV) fulfilled all ERS/ATS standards, with quality and correctnes control measured values: VC, IC, ERV, TV, IRV, MV, BF, MVV, BR, FEV0.5, FEV0.75, FEV1, FEV2, FEV3, FEV6, FVC EX, PEF, MEF75, MEF50, MEF25, MEF@FRC, FEF75/85, FEF25/75, FEF 0.2-1.2, VPEF, TPEF, FET, TPEF%FET, MEF50% FVC EX, FEV1% FVC EX, FEV1% VC, FEV1/PEF, VCmax, FEV1% VCmax, FEV1% FEV3, FEV1% FEV6, BEV, BEV%FVCex, TC25/50, MTT, AEX, FVC IN, FIV1, PIF, MIF50, FIT, TPIF, VPIF, TPIF%FIT, FEV1% FVC IN, MEF50/MIF50, PEF/PIF, FEV1/FIV1, FET%FIT, TTOT.
- **Aditional options:**
  - Exercise test of circulatory system based on 12 ECG leads (in laboratory only)
  - Nutrition software
  - Pulsoximetry with SpO2 analysis
  - Module SBP/DBP for noninvasive measurement (in laboratory only)
  - Telemetry unit with range 2000m

Powerful evaluation software with report generator

- summary report provides data for a simple and easy interpretation
- ready-to-print pre-defined reports
- 9-plot Wasserman report with a single page report containing the 9 graphs and additional test results for an easy clinical interpretation



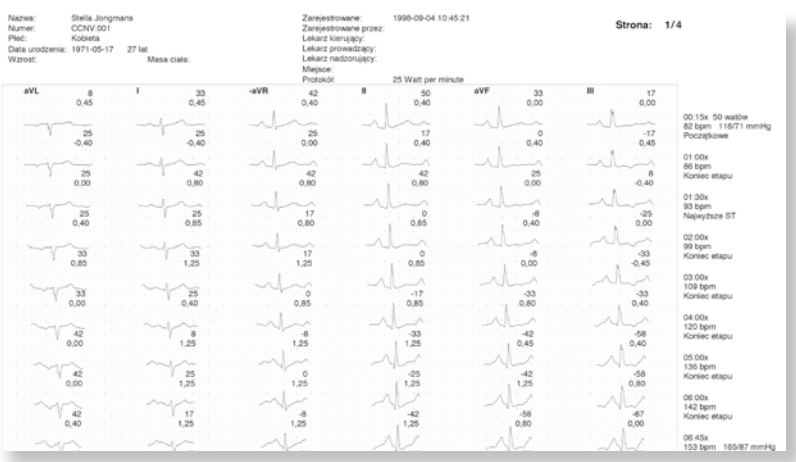


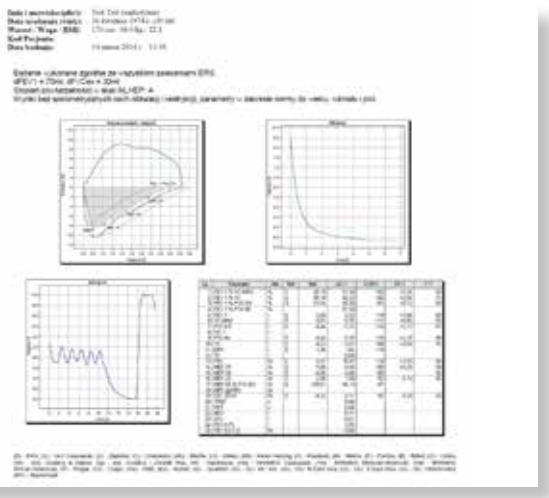


Imię i nazwisko: George Smith
Data urodzenia: 1961-12-02
Wzrost: 176
Waga: 58
Data badania:

Raport CPET

Parametr CPET	Spocz.	AT	Max	Należne	%Spocz./Nal.	%AT/Nal.	%Max/Nal.
WATT (W)	40,00	160,00	190,00				
VO2/Kg (mL/min/kg)	9,80	21,47	25,11				
VO2 (L/min)	0,57	1,25	1,46	5,13	11,08	24,28	28,39
VE/VO2	37,95	34,01	61,96				
VE/VCO2	34,41	32,14	45,55				
VE max BTPS	0,00	0,00	0,00				
VE (L/min)	21,16	42,36	72,45				
VD/VT	0,28	0,21	0,30				
VCO2 (L/min)	0,61	1,32	1,79	3,00	20,48	43,94	59,56
TV (L)	1,07	1,63	2,29				
SVI (mL/m^2)	19,07	19,97	19,20	63,20	30,17	31,59	30,38
SV (l/min/m^2)	59,06	61,85	59,46	162,60	36,32	38,04	36,57
SpO2 (O2 Sat -- Pulse Ox)(%)	0,00	0,00	0,00				
SBP (mmHg)	0,00	0,00	0,00				
RER	1,10	1,06	1,63				
PEO2 (mmHg)	23,82	25,68	31,09				
PECO2 (mmHg)	25,12	26,85	27,96				
HRR	122,38	83,00	129,00				
HR (1/min)	0,00		151,00	200,00	0,00		75,50
HI	31,52	44,23	48,75				
DBP (mmHg)	0,00	0,00	0,00				
CO (L/min)	5,79	8,47	8,98	14,50	39,92	58,44	61,93
CI (L/min/m^2)	1,87	2,74	2,90	5,45	34,29	50,19	53,19
C(a-v)O2 (mL/100mL)	9,82	14,70	16,22				





Technical specifications:

Flow rate measurement:

- measuring headpiece	MES DV40(or DV40e)
- deadspace	38ml(or 20ml)
- flow range	± 20 l/s
- flow resolution	2,4 ml/sec
- usable flow resolution	10 ml/s
- volume measurement range	0 ± 10 l (0-20 l)
- accuracy	< 2%
- headpiece resistance	< 0,9 $cmH_2O/l/s$ (*at 14 l/s flow rate*)
- the measured ventilation	300 l/min

General data:

Dimensions (length/width/height)		150/100/55 mm
Weight		280g
Supply voltage	accumulators	4 x1,2V AA Ni-MH
Power consumption		1,5W
Ambient conditions:		0-100% humidity
		-20 + 50ºC
		500 – 1200 hPa

Oxygen analyzer:	electrochemical cell
- measurement range	0-25%(0- 100%)
- response time	t90 < 100ms
- accuracy	± 0,02%
- resolution	0,01%
Carbon dioxide analyzer:	NDIR (infrared absorption)
- measurement range	0 - 10% (0-15%)
- response time	t90 < 90 ms
- accuracy	+/- 0,01 %
- resolution	0,01%

Accumulator charger:

Supply voltage	230-240 V AC, 50Hz
Number of loaded accumulators	4

Standard packaging includes:
the measurement module, the coupler for headpiece with built in digital converter of flow, ambient temperature and humidity sensors, connected cable and air tube for gas analysers, accumulator charger, 4 x AA 1,2 V accumulators, USB cable, pneumotach (10 pcs), large, medium and small face masks with caps and couplers, 3 liter calibration syringe, POLAR reciver and sender belt, software for ergospirometry(needs Windows 7/8/10), belt(harness) for measurement module, carry bag for modules and accessories, manual.

MES has certificate ISO 13485

Advantages of our digitizing headpiece:

- air tubes for flow measurement not neccessary
- parameters do not change in the course of a test
- headpiece cable conneced with main unit
- pre-test calibration is not required
- high accuracy and resolution
- sterile for each patient
- easily sterilizable
- no moving elements
- small dead space
- low flow resistance
- no heating system

Distributor:

Manufacturer

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