

CARDIOVIT AT-2 plus



TWO in ONE!  
ECG & Spirometry



**SCHILLER**

## AT-2 plus – the "double winner"!



The diagnostic value of spirometry as a tool for the early detection of chronic-obstructive pulmonary function restriction and other heart diseases is high. However, with the constant rise in the number of patients there is clearly a need to conduct pulmonary function tests on a routine basis.

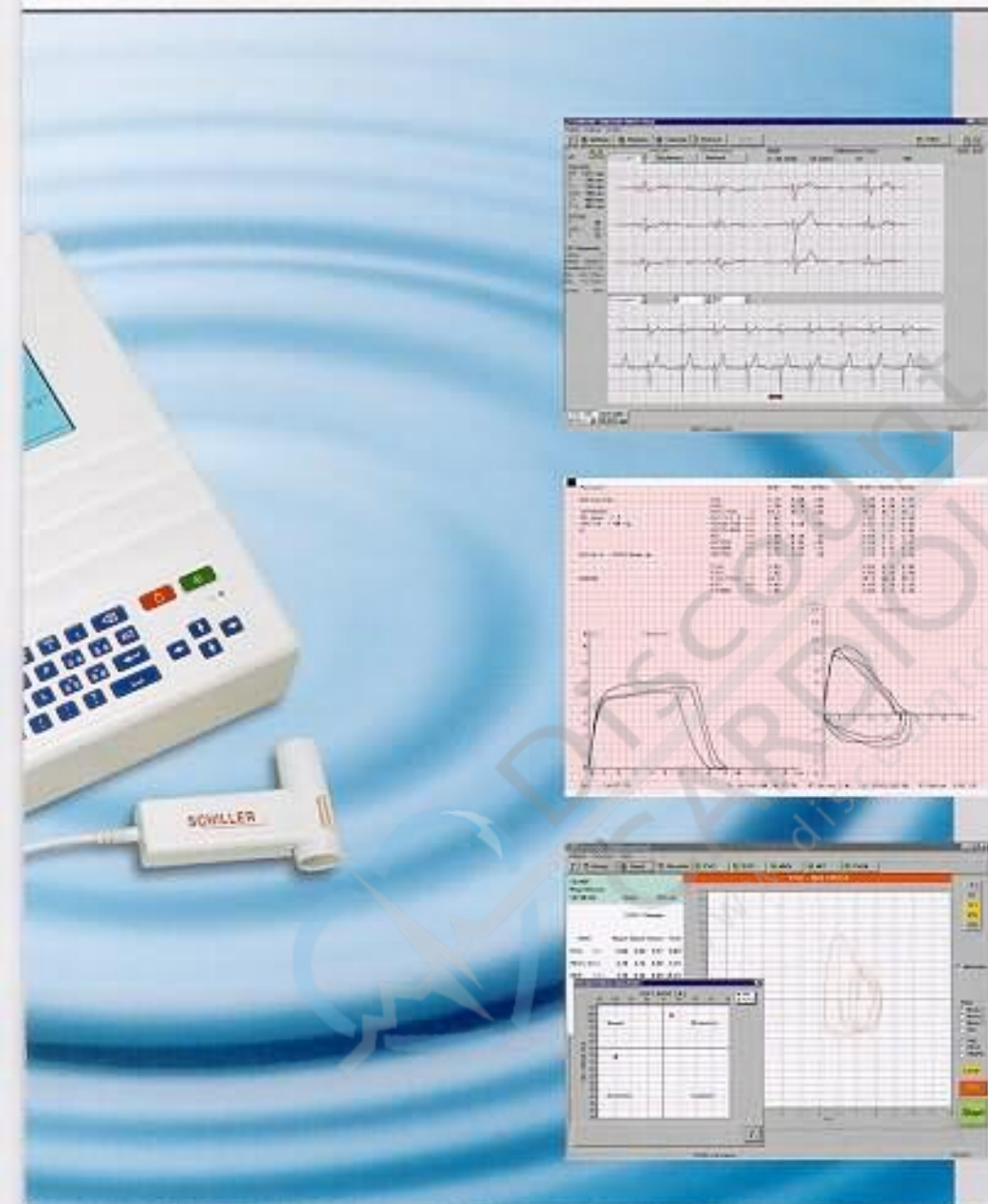
SCHILLER combined the two most frequently used cardiac/pulmonary function tests in one single unit:

the **CARDIOVIT AT-2 plus** offers ECG and spirometry all in one product.

This innovative device can be used for quick and easy initial clarification, for routine examinations of affected patients, and to monitor the progress of therapy. This "double winner" scores high, due to its low purchasing costs, its economic operation and the possibility of "double" reimbursement (for ECG as well as spirometry).

### World-renowned ECG technology

- 6-channel print-out in realtime at 5, 25 or 50 mm/s
- Automatic print-out function for 6 and 12 channels on one or two sides of the paper
- Fast, reliable, computer-aided ECG interpretation program including complete measurement for adult and pediatric ECGs (optional).



### Simple to handle – double the benefit!

- Two tests in one – meaning double reimbursement from health insurance schemes
- Two different instrument functions – but only one operating system
- Easy to transport due to low weight and compact dimensions
- Maximum quality and absolute reliability
- The built-in printer supplies A4 print-outs in ready-to-file cardex format
- Print-out with diagnosis guidance and all measurements in less than 20 seconds
- Integrated rechargeable battery
- Expanded print-out possibilities and unlimited copying function
- Splash-resistant alphanumeric keyboard with direct function keys makes it quick and easy to enter patient data
- Possibility of saving test results for more than 60 patients (optional)
- Interface enables data transmission

- The curve quality of all 12 leads can easily be checked on the integrated 3-channel monitor – saving both time and paper!
- The repetition rate is cut to zero because the curve quality on the print-out is optimized using the SSF SCHILLER Smoothing Filter and the SBS SCHILLER Baseline Stabilizer.



### The very highest standards in spirometry

- The unique SP-250 disposable sensor minimizes the risk of cross-contamination
- Compact size and low weight
- Calibration is simple and fast
- Inspiratory / expiratory tests: FVC, SVC, MV, MVV as well as pre and post medication tests
- Predicted value tables are stored for free selection.

- A4 print-out within seconds
- Visual patient support due to realtime curves and measurement information on the large screen.

# Technical data

## Technical Data for AT-2 plus

### System:

**Dimensions:** 400 x 330 x 101 mm; approximately 5 kg

### Built-in monitor:

- 120 x 90 mm effective display area
- 320 x 240 dots resolution

### On-screen status indicators:

- Battery status
- Date, time
- Power source

### Control panel and keyboard:

User-friendly, alphanumeric keyboard, LED indicator and monitor

**Power supply requirements:** 220 - 240 V (nominal), 50/60 Hz; 110 - 115V (nominal), 50/60 Hz; stand-alone operation with built-in rechargeable battery, LED indicator for mains operation, integrated power supply unit.

**Battery capacity:** 4 hours of normal use (approximately 300 automatic ECG print-outs or 100 spirometry records).

**Line frequency filter:** Distortion-free suppression of superimposed 50 Hz or 60 Hz sinusoidal interference by means of adaptive digital filtering.

### Frequency range of digital recording system:

0 Hz - 150 Hz (IEC/AHA)

### Chart paper:

Thermo-reactive, Z-folded, 210 mm wide (A4)

**Printing process:** High-resolution thermal head printer, 8 dots / mm (amplitude axis), 40 dots/mm (time axis) @ 25 mm/s.

**Interface:** RS-232 interface to connect spirometry, serial data transmission to PC (SEMA 200), and external modem connection.

### Environmental conditions:

- Temperature during operation: 10° to 40° C
- Temperature during storage: -10° to 50° C
- Relative humidity: 25 to 95% (non-condensing)
- Pressure during operation: 700 to 1060 pPa

### Safety standards:

#### Safety standard:

CF according to IEC 601-1 and IEC 601-2-25

**Protection class:** I according to IEC 601-1 (with internal battery), IIa according to EEC Directive 93/42 (medical protection class)

**Conformity:** CE according to 93/42 EEC

## Technical Data for ECG

**Patient input circuit:** Fully floating and isolated, defibrillation-protected (only with original SCHILLER patient cable)

### Monitor display:

- 3-channel display of the selected leads
- 25, 50 mm/s
- 5, 10, 20 mm/mV
- Filter status (on/off)
- Insufficient electrode contact
- Heart Frequency, HF
- mm/mv, mm/s

**Leads:** 12 simultaneous leads: Standard / Cabrera

### Chart print-out speed:

5 / 10 / 25 / 50 mm/s (manual printout)

**Sensitivities:** 5 / 10 / 20 mm/m, either automatically adjusted or manually selected

### Automatic lead programs:

- 6/12-channel presentations of 12 simultaneously recorded standard leads on one or more A4 pages
- numerous print-out formats can be selected

### Data record:

- Patient data (name, age, height, weight, BP), user ID
- Listing of all ECG recording conditions (date, time, filter)
- With optional measurement (M) and interpretation (C) program: ECG measurement results (intervals, amplitudes, electrical axes), average complexes with optional measurement reference markings, guidance on interpreting adult and pediatric ECGs

### Recording tracks:

- 6/12-channel presentation, optimal positioning on a width of 200 mm, automatic baseline adjustment

### Filter:

**Myogram filter (muscle tremor filter):**

25 or 35 Hz, can be switched on/off

### ECG amplifier:

- Simultaneous recording of all 9 active electrode signals (= 12 leads)
- Sampling frequency: 1000 Hz
- Pacemaker detection:  $\geq \pm 2$  mV/± 0.1 ms

## Technical Data for Spirometry

### (Option)

#### Measured values:

**FVC:** FVC, FEV<sub>0.5</sub>, FEV<sub>1.0</sub>, FEV<sub>1.5</sub>, FEV<sub>2.0</sub>, FEV<sub>2.5</sub>/FVC, FEV<sub>3.0</sub>/FVC, FEV<sub>3.0</sub>/FVC, FEV<sub>3.0-1.2</sub>, FEV<sub>25-75%</sub>, FEV<sub>75-95%</sub>, PEF, FEV<sub>75%</sub>, FEV<sub>50%</sub>, FEV<sub>25%</sub>, FVC, FV<sub>1.0</sub>, FV<sub>1.0</sub>/FVC, FV<sub>1.0</sub>/FVC, PIF, FV<sub>50%</sub>, FMFT

**SVC:** SVC, ERV, IRV, TV

**MV:** MV, RR, TV

**MVV:** MVV, RR, TV

#### Presentation possibilities (print-out and screen):

- Flow/volume graph (loop)
- Volume/time graph
- Table of measured values
- Realtime flow curve

#### Data record:

- Patient data (name, age, height, weight), user ID
- Registration conditions (date, time, date of last calibration)
- Flow/volume graph and/or volume/time graph
- Table of measured values with PREDICTED/ACTUAL/ DIFFERENTIAL values
- Diagnosis guidance

### Prediction equation:

**Adults:** ECCS, Austria, Crapo, Morris, Knudson, Knudson76, Polgar, Berglund, Finland, India, Composite

**Children:** Quanjer & Tammeing, Austria, India, Knudson, Knudson76, Polgar

### Extrapolated predicted values

Comparison of PRE/POST-medication is possible

**Standards Compliance:** ATS, A7594, CSHA, NIOSH

**Sensor:** SPROVIT SP-250 Pneumotach Flow sensor (P/N 2.100022) with disposable mouthpiece (P/N 2.100077)

### Dimensions of SP-250:

118 x 36 x 28 mm; approximately 120 g

**Measuring method:** Pneumotachometer

**Measuring accuracy:** According to ATS standards

**Flow impedance:** < 0.2 mbar\*s/l at 12 l/s

### Scope of delivery:

- 1 sensor, SP-250
- 2 nose clips
- 1 pack disposable sensor mouthpieces for SP-250
- 1 operating manual

### Scope of delivery for CARDIOVIT AT-2 plus Standard:

Quiescent ECG with 12 simultaneous leads, pacemaker detection

### Accessories:

- 1 10-lead patient cable
- 1 set of electrodes or disposable electrodes
- 1 power cable
- 1 pack chart paper
- 1 operating manual

### Software option:

- Automatic ECG measurement and computer-aided ECG interpretation for pediatric and adult ECGs
- Memory for up to 40 ECGs or 40 spirometry records
- SEMA 200 PC software to save, validate and archive ECG and spirometry data on a PC

### Hardware option:

- Equipment trolley
- Spirometry sensor, SP-250
- Calibration syringe

Subject to technical modifications due to continuous innovations

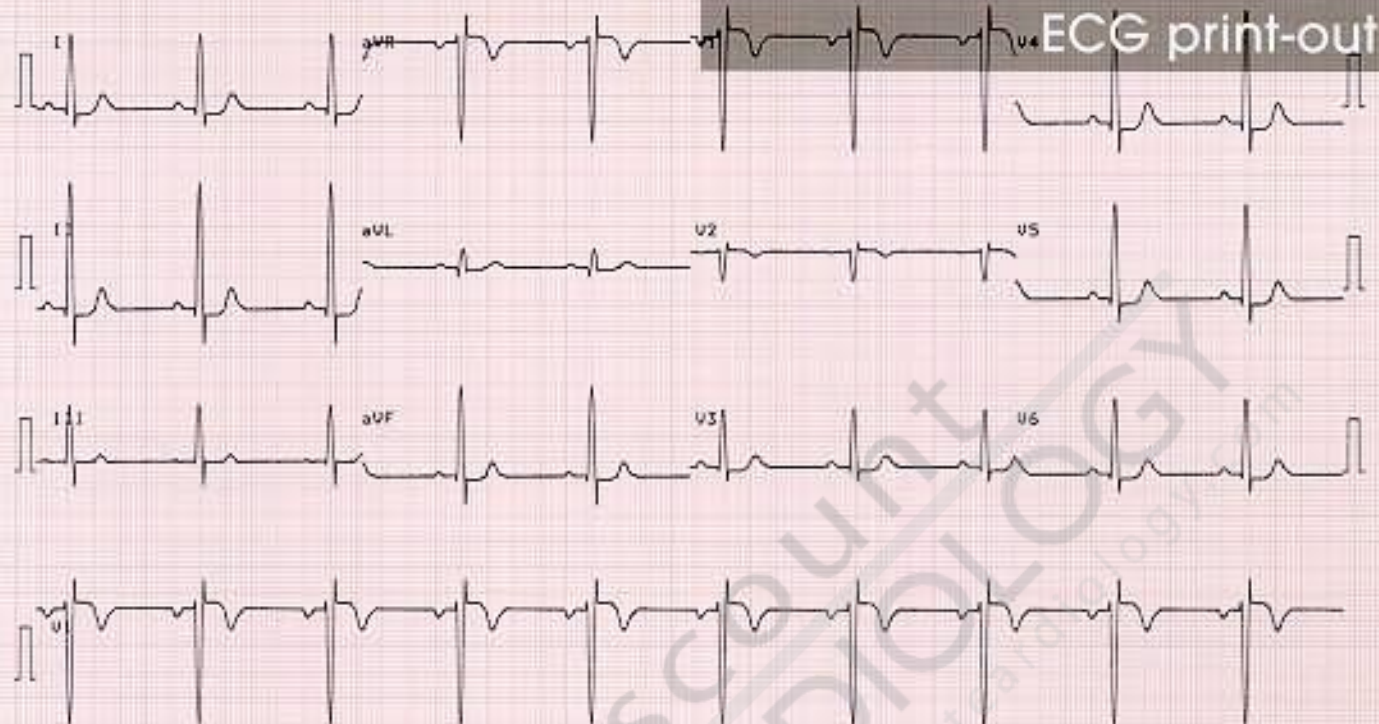
Patient: HR 68/min

Rolando

12-13-126  
25 year / M  
188 cm / 71 kg  
128/88 mmHg  
NO

18 mm/mV

18 mm/mV



ECG print-out

25 mm/s

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RT-2plus 4.82

Patient:

Marcus May

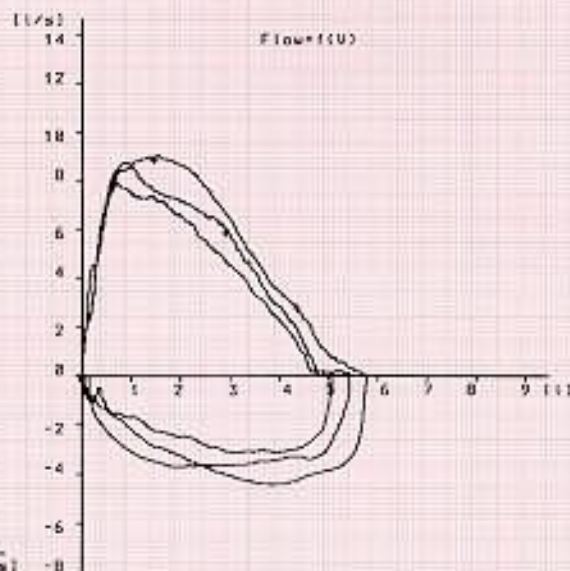
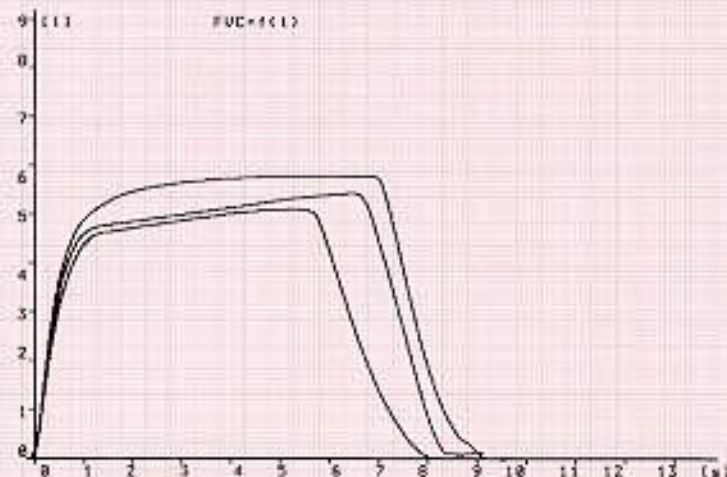
19738325  
25 year / M  
184 cm / 88 kg

Normals: ECCS/Guanjer

NORMAL

		BEST	PRED.	XPRED	MERS1	MERS2	MERS3
FVC	l	5.79	5.68	183	5.79	5.42	5.89
FEV1	l	4.98	4.78	184	4.98	4.68	4.48
FEV1/FVC	%	84.6	82.7	182	84.6	84.9	85.3
FEF <sub>2-1.2</sub>	l/s	7.82			7.82	7.14	6.56
FEF <sub>25-75%</sub>	l/s	5.56	5.28	187	5.56	5.26	4.92
FEF <sub>75-85%</sub>	l/s	1.74			1.74	1.67	2.02
PEF	l/s	9.88	18.39	87	9.88	8.71	7.74
FEF <sub>25%</sub>	l/s	8.98	8.85	181	8.98	7.77	7.31
FEF <sub>58%</sub>	l/s	6.66	5.85	114	6.66	6.43	5.36
FEF <sub>75%</sub>	l/s	2.75	2.81	98	2.75	2.71	2.64
FIVC	l	5.83			3.82	3.24	2.84
FIV1	l	3.82			65.5	68.8	55.9
FIV1/FIVC	%	65.5			4.49	3.76	3.22
PIF	l/s	4.49			4.89	3.71	2.93
PIF58%	l/s	4.89					

Spirometry print-out



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