Oscilloscope
OX 9000 SERIES
isolated channels

4-in-1 Instrument

Oscilloscope

Multimeter

Analyzer

Logger
with the recorded files directly viewable on screen

Safety
- All channels isolated from one another and from the earth, 600V CAT III

Ergonomic
- Modern, high tech design which is simple, compact and practical

Optimization
- of all tools; communication, storage and operation

Our products are backed by over 125 years of experience in test and measurement equipment, and encompass the latest international standards for quality and safety.

AEMC®
INSTRUMENTS
CHAUVIN ARNOUX GROUP

OSCILLOSCOPE OX 9000 SERIES

ERGONOMICS

Designed to simplify use with one button access to most functions

In a housing tailor-made to be as compact as possible, the mechanical design makes it possible to integrate the hardware components in a small size with the keypad benefits from new technology developed in the automotive industry.

CHANNEL AND PARAMETER IDENTIFICATION

Each channel and related parameters are identified with identical color against a black background for simpler, quicker viewing.

EASY ACCESS VIA TOUCH SCREEN

Intuitive icons are provided to facilitate their use, even with gloves on.

ADJUSTABLE STRAP

This helps to optimize operation of the oscilloscope in your hand or on your shoulder when working in the field.

A stand is also available to vary the orientation of the oscilloscope when it is placed on a bench. The oscilloscope can be safely left unattended using the Kensington locking system.

NEW KEYPAD DESIGN FOR OPTIMUM USER COMFORT

Configuration and measurement displays are simple to access from the front panel in one of these 5 specific areas: Utilities (brightness, full screen, screenshot), Measurements, Vertical, Horizontal, Trigger.

LINE POWER OR LI-ION BATTERY

Port on left side.
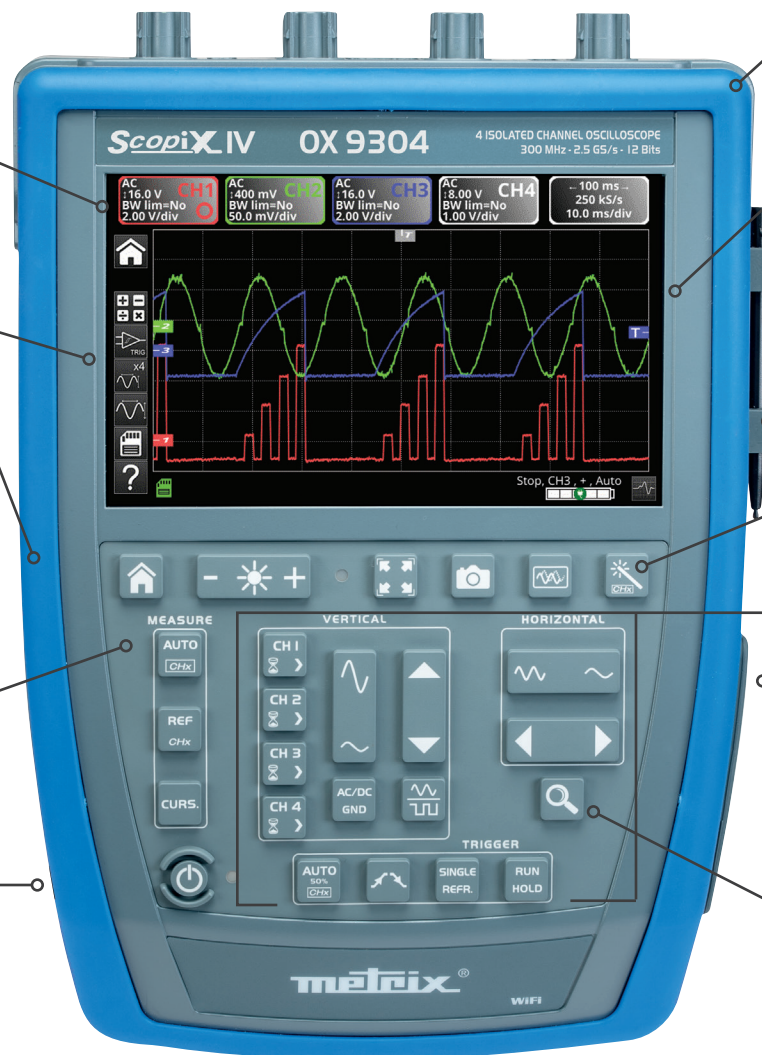
PRODUCT INCLUDES

Scope in carrying case with shoulder strap, set of two 5 ft color-coded leads, alligator clips and test probes, 10 ft USB cable, µSD memory card, 1-PROBIX Banana Plug Adapter, set of 5 styli pens, LI-ION 5.8 Ah battery pack, PA40W-2 power adapter with 110V power cord. Additional accessories may be model dependent.

APPLICATIONS

Ideal for electronic and industrial maintenance

IP54

Housing protected against dust and water spray.

7" WVGA WIDE COLOR TFT TOUCH SCREEN

Makes it easy to view and read the measurements clearly.
It also provides a screen resolution of 800 x 480 dpi with manual
or automatic brightness.

TOUCH-SCREEN STYLUS STORAGE

Among the essential tools available, the sylus is equipped with a
hook for the addition of a cord to make it captive, as required. One
end is slightly flattened to prevent rolling when placed on a table
or bench.

AUTOSET BUTTON

Quickly and effortlessly adjusts the horizontal and vertical;
sensitivity and scales to provide the best resolution.

DIRECT SETTING AND SET-UP BUTTONS

COMMUNICATION INTERFACES

These are isolated from one another and from the measurement
channels. A dedicated compartment on the right side protected
by a flexible cover contains all the different communication
interface ports:

- USB host for communication with a PC
- wired RJ45 or WiFi for communication with a PC or
  printing via a network printer
- µSD card for data storage with quick transfer and for
  upgrading of the instrument's firmware

DIRECT ACCESS ZOOM BUTTON

Channels are isolated.

Electronic maintenance

The OX 9304 model is ideal for electronics with its
300 MHz bandwidth, 4 x 600V CAT III isolated channels,
advanced trigger functions, integrated FFT function,
complex mathematical calculations on the curves, automatic
measurements on 4 channels and the built-in WEB server.
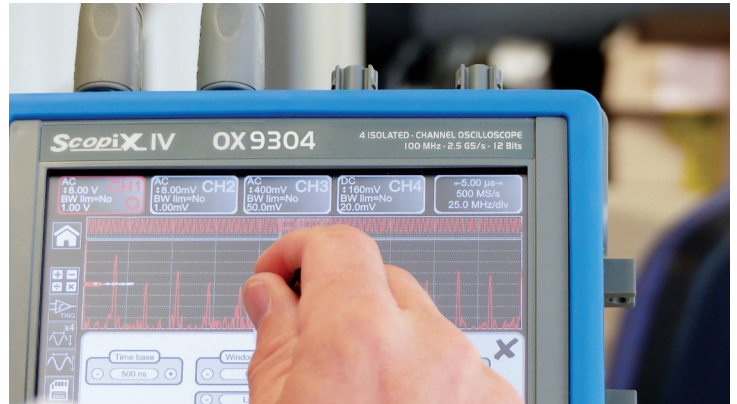
Industrial maintenance

The OX 9304's large 7-inch screen, 300 MHz bandwidth,
4 x 600V CAT III isolated channels and Harmonic
Analyzer and Multimeter modes make it ideal for
industrial maintenance applications.

CATALOG NO.	DESCRIPTION
2150.31	Hand-Held Oscilloscope Model OX 9062 IV 60MHz
2150.32	Hand-Held Oscilloscope Model OX 9102 IV 100MHz
2150.33	Hand-Held Oscilloscope Model OX 9104 IV 100MHz
2150.34	Hand-Held Oscilloscope Model OX 9304 IV 300MHz

ACCESSORIES

Accessories automatically recognized when connected to the oscilloscope

The plug and play accessories included are automatically recognized when connected to the oscilloscope. They provide quick and easy implementation with total user safety. Additionally, accessories equipped with BNC connectors or standard banana plugs can also be connected when using the supplied adapter.

Interchangeable ID Markers can be used on the accessories plugged into a given channel to identify them with the trace color displayed on the screen.

Additionally the 10:1 probe accessory is equipped with 3 adjustable buttons to optimize its measurement capabilities.

Identification and Safety Management

Once one of the provided standard accessories has been plugged in, it is automatically identified and its characteristics and calibration references are retrieved by the OX9000 Series Oscilloscope. All accessories are directly powered by the oscilloscope.

Channel Configuration and Sensor Management

Sensor coefficients scales and units of measure are managed automatically, as is channel configuration. Control buttons on the probes can be used to modify the settings of the channels to which they are connected. They also offer functions accessible on the oscilloscope's front panel.

PROBE FUNCTIONS

voltage measurements
- by probe with different bandwidths and attenuation
- by BNC or banana jack connection

current measurements
- by AC or AC/DC current clamp
- directly through banana jack connections

temperature measurements
- using a K thermocouple sensor
- using a PT100 RTD sensor

	Entrée:	Entrée flottante:	Entre voies:
CH1	300V CAT III HX130 - 1/10 Probe 500MHz Bandwidth, +/- 1%(DCV)	300V CAT III 300V CAT III	300V CAT III
CH2	600V CAT III HX33 - DERATING -20dB/decade >100kHz. Use safety rated leads	600V CAT III 600V CAT III	600V CAT III
CH3	230Vrms MAX HX94 - 4-20mA Adapter (1V/40mA) Use safety rated leads	1000V CAT II 1000V CAT II	1000V CAT II
CH4	1000V CAT II 600V CAT III 1/10 Probe 250MHz Bandwidth, +/- 1%(DCV)	600V CAT III 600V CAT III	600V CAT III

Accessories & Replacements
Cat #2124.73 - PROBIX PRHX1 10:1 Probe, 250MHz 600V CAT III
Cat #2124.77 - PROBIX Current Probe, 20mA-20A 1MHz-3dB
Cat #5000.17 - Set of 5 styli pens

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COMMUNICATION

For added equipment and operator safety all communication from the instrument is totally isolated from the measurement process

Choice of communication interfaces—you can choose the type of communicaton to fit your requirements. Several communication choices are built into the OX9000 Series oscilloscope.

- Wired Ethernet LAN network with integrated DHCP server for easy connection to your network
- WiFi® radio link to communicate with a PC, tablet or smartphone using the dedicated interfaces
- USB for interfacing with the PC; record, recall or load configurations
- µSD with >8 GB, default storage giving priority over the 1 GB internal memory

File Management

Any of the signal traces can be displayed instantaneously as the reference by pressing a single button which will obtain a comparison an immediate measurements of the deviation of ongoing measurements.

Backups are available in various formats for direct export into a standard application such as Windows base spreadsheets or word processors.

It is easy to take screenshots directly from the front panel and save them in a .PNG format, print documents on a network printer and transfer or delete files in the file manager.

Storage capability for each mode

|	Type of file				
	setup (cfg)	traces (trc)	math (fct)	meas (txt)	screen shot (png)
Oscilloscope mode	✔	✔	✔		✔
Multimeter mode	✔				✔
Logger mode	✔				✔
Harmonics mode	✔			✔	✔

Data Processing

- Use the oscilloscope screen to recall screenshots and stored traces for direct review on screen
- On your PC, use the ScopeNet application in your web browser with either the USB or Ethernet connection for remote control and programming with SCPI commands
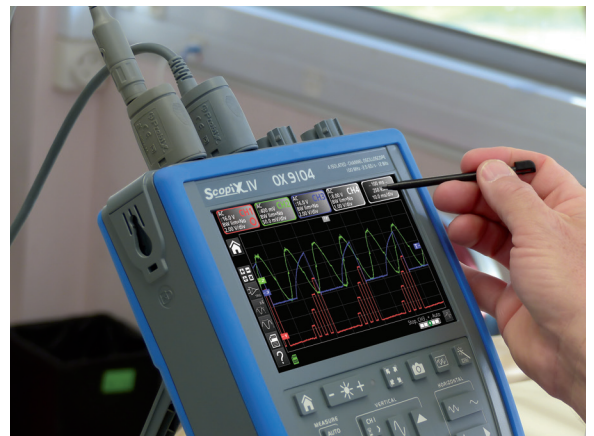
Electrical Troubleshooting

Education
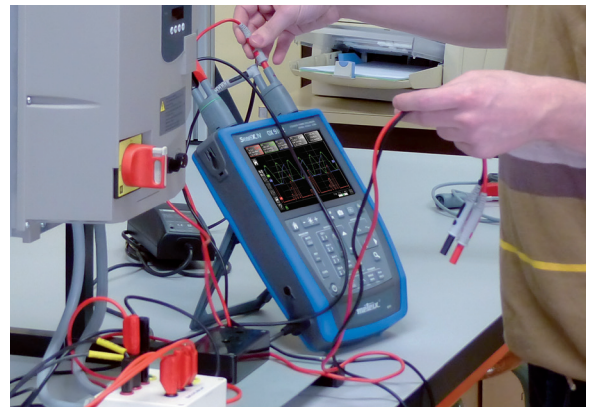
In the laboratory

OSCILLOSCOPE OX 9000 SERIES

4 MODES: Oscilloscope, Multimeter, Analyzer, Recorder

Improved functions and performance levels of the OX9000 Series

- wider bandwidth up to 300 MHz
- new triggering and recording options
- increased storage capacity, and more!

- 12 bit resolution
- 2.5 GS/sec

OSCILLOSCOPE:

Trigger Functions

An oscilloscope with complex trigger functions records what is necessary, while capturing all the faults The OX9000 models offer advanced triggers which complement the main edge trigger options: pulse width, counting and delay.

- The Delay mode enables you to observe any event with maximum resolution, even if it occurs a long time after effective triggering, or on two different channels.
- The Counting mode enables you to count the events before triggering, so that you can check the content of digital frames. For example, the trigger can be linked to a second "auxiliary" signal which is different from the "main" signal.

Automatic Measurements

Comprehensive automatic measurements are displayed with cursors for precise analysis. The automatic measurements window displays all 20 parameters at the touch of a button for 4 channels. Two horizontal and vertical cursors can be used to view the section of the signal where the first automatic measurement was performed.

A specific measurement area can then be selected by framing it with manual cursors for more accurate, reliable results.

Direct comparison of two traces can be performed by checking the "reference memory deviation" box, so that these 20 signal parameters are displayed in terms of deviations.

The Math Functions

In oscilloscope mode, the MATH functions (1, 2, 3 and 4) allow you to define a mathematical function for each of the traces, along with vertical scaling and labeling of the actual physical unit.

The mathematical editor is capable of displaying 4 calculated traces on which all the automatic or cursor measurements remain available. This means it is possible to examine the waveforms, such as the power (V x I), and perform all the associated measurements.

A large number of operators are available, including +, -, x and / , as well as more complex operators such as sine, cosine, exponential, logarithm, square root, etc. opening the way for specific applications.

Real-time Fast Fourier Transform (FFT) for frequency decomposition of your signals on 4 channels

The FFT is used to calculate, from 2500 points upwards, the discrete representation of a signal in the frequency domain from its representation in the time domain. It is often particularly useful for arriving at an effective diagnosis during qualitative analysis of the signals:

- measurement of the individual harmonics or distortion of a signal
- analysis of a pulse response
- search for the source of noise in the logic circuits

Several weighting windows are available, as well as 2 representation modes: linear or logarithmic (scale in dB). The 2 cursors can then be used for precise measurements of the frequency lines, the levels and the attenuations, taking advantage of the 80 dB dynamic range allowed by the 12-bit / 2.5 GS/s conversion.

The autoset button makes it easier to obtain an optimum spectral representation to which a graphical zoom can be applied to analyze all the details of the spectrum.

PRACTICAL! **VIEW ALL 4 CHANNELS SIMULTANEOUSLY**
waveform + FFT
waveform + XY
waveform + zoom

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4 MODES: Oscilloscope, Multimeter, Analyzer, Recorder

The four modes are directly accessed at the press of a button or touch screen icon providing instant access the mode you need

Harmonic Analysis

Harmonic analysis is performed on all 4 channels up to the 63rd order to comply with the requirements of the EN 50160 standard (THD on harmonics up to the 50th), with a fundamental frequency between 40 and 450 Hz.

It is possible to preselect the frequency of the fundamental for the standards (50 Hz, 60 Hz and 400 Hz).

This function helps to improve analytical performance and, above all, measurement when the level of a harmonic order is greater than the fundamental.

It is possible to view the harmonic analyses of two or four channels simultaneously: RMS level, harmonic distortion, harmonic frequency, phase of the harmonic in relation to the fundamental.

Multimeter

By simply selecting the dedicated icons, you can gain access to the multimeter mode without changing the measurement input channels. The OX9000 models offer an 8,000-count TRMS digital multimeter with two or four channels which can perform the following measurements:

- amplitude (DC or AC voltage and current, power, temperature, etc.)
- resistance, continuity, capacitance
- component diode tests

Temperature is measured using the Pt 100 and Pt 1000 sensors or K thermocouples via the dedicated PROBIX sensors. The power measurements are proposed as follows with choice of the configuration:

- single-phase power
- three-phase power on balanced network without neutral
- three-phase power on balanced network with neutral
- 3-wire three-phase power (2-wattmeters method)

Recorder/logger

This is the mode for recording the trends in Multimeter mode. A genuine fast digital logger is provided inside the instrument to monitor the variations of physical or mechanical phenomena over time. It offers acquisition intervals as short as 40µs between 2 measurements and recording can cover any period from 2 seconds to one month.
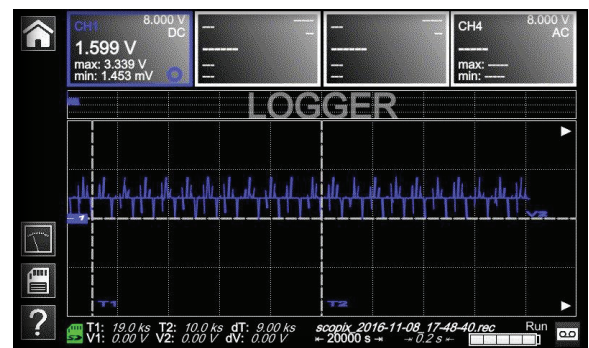
Harmonics
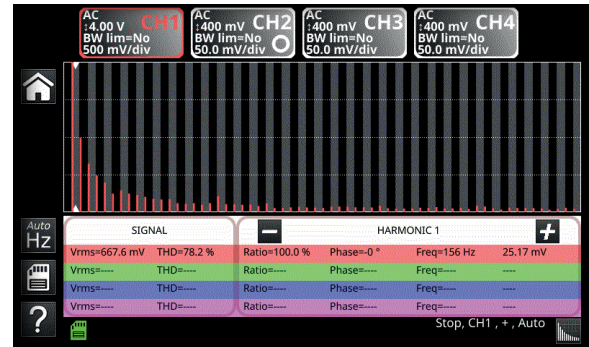
4 Simultaneous Channels
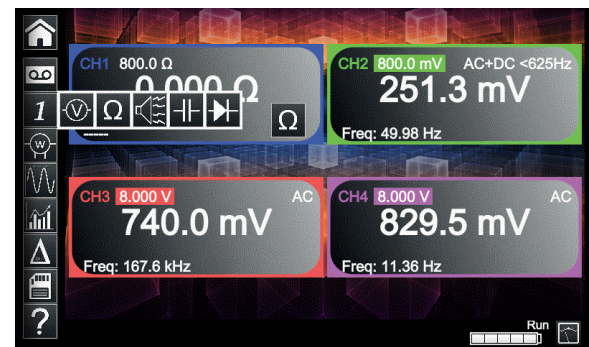
Measurement between H and V cursors: T1, T2, Dt, 1/Dt, V1, V2, dV, Ph

TECHNICAL SPECIFICATIONS	OX 9062	OX 9102	OX 9104	OX 9304
HUMAN-MACHINE INTERFACE				
Type of display	7" WVGA color TFT LCD touch screen, 800x480 – LED backlighting (adjustable standby mode)			
Different display mode	2,500 real acquisition points on screen - Vectors with interpolation			
Display of curves on screen	4 curves + 4 references – Split Screen & Full Screen modes			
Screen commands	Touch screen – ANDROID-type icons and graphical commands – customizable channel colors			
Choice of language	15 complete languages, menus & online help			
OSCILLOSCOPE MODE				
Vertical deflection				
Bandwidth	60 MHz	100 MHz	100 MHz	300 MHz
	15 MHz, 1.5 MHz or 5 kHz bandwidth limiter			
Number of channels	2 isolated channels		4 isolated channels	
Input impedance	1 MΩ ± 0.5% , approx. 12 pF			
Maximum input voltage	600 V / CAT III (1,000V per Probix) – from 50 to 400 Hz – Probix safety connectors			
Vertical sensitivity	16 ranges from 2.5 mV to 200 V/div and up to 156 µV/div in vertical zoom mode (12-bit converter) – Accuracy ± 2%			
Vertical zoom	"One Click Winzoom" mode (12-bit converter and direct graphical zoom on screen) – x 16 max.			
Probe factor (non-Probix)	1 / 10 / 100 / 1,000 or any scaling – definition of measurement unit			
Horizontal deflection				
Sweep speed	35 ranges from 1 ns/div to 200 s/div., accuracy ± [50 ppm + 500 ps] – Roll mode from 100 ms to 200 s/div			
Horizontal zoom	"One Click Winzoom" system (direct graphical zoom on screen) x 1 to x 5 or x 100 – storage 100 kpts/channel			
Triggering				
Mode	On all the channels: automatic, triggered, one-shot, auto level 50%			
Type	Edge, pulse width (16 ns-20 s), delay (48 ns to 20 s), counting (3 to 16,384 events) Continuous adjustment of Trigger position			
Coupling	AC, DC GND, HFR, LFR, noise – Level and Hold-Off adjustable from 64 ns to 15 s			
Sensitivity	≤ 1.2 division p-p up to 300 MHz			
Digital storage				
Maximum sampling rate	2.5 GS/s in one-shot mode on each channel (100 GS/s max. in ETS mode)			
Vertical resolution	12 bits (vertical resolution 0.025 %)			
Memory depth	100 kpts per channel and file viewer in the manager			
User storage File management	Internal = 1 GB to store the files: trace, text, configuration, math functions, System memory: .pdf print files, .png image files + high-capacity removable µSD-Card: SD 2 GB, SDHC 4-32 GB and SDXC > 32 GB			
GLITCH mode	Duration ≤ 2 ns – 500,000 Min/Max pairs			
Display modes	Envelope, vector, accumulation-, averaging (factors 2 to 64) – XY (vector) and Y(f)=FFT			
Other functions				
AUTOSET	Complete in under 5 s, with recognition of the channels – Frequency > 30 Hz			
FFT analyzer & MATH functions	2,500-point FFT (Lin or Log) with measurement cursors – Functions + , - , x , / and mathematical function editor			
Cursors	2 or 3 cursors: simultaneous V and T with AUTO measurement: T1, T2, Dt, 1/Dt, dBV, Ph			
Automatic measurements	Simultaneously with waveform, 20 automatic measurements per channel and on the 4 channels simultaneously with scroll			
MULTIMETER MODE				
General specifications	2 or 4 channels – 8,000 cts min/max/frequency/relative – TRMS – Time/date-stamped graphical recording in logger mode			
AC, DC and AC + DC voltages	600 mV to 600 VRMS, 800 mV to 800 VDC – VDC accuracy +/- (0.5 % + 25 D) – 200 kHz bandwidth			
Resistance	80 Ω to 32 MΩ – accuracy 0.5%R+ 25D – Quick continuity test < 10 ms			
Other measurements	Temperature (HX0035 = KTC, HX0036 = Pt100) / Capacitance 5nF to 5mF / Frequency 200 kHz / Diode test 3.3 V			
Single and three-phase power	Active, Reactive and Apparent power values plus Power Factor simultaneously with the U & I measurements			
HARMONIC ANALYSER MODE				
Multi-channel analysis	2 or 4 (depending on model), 63 orders, fundamental frequency 40 to 450 Hz in auto or manual mode			
Simultaneous measurements	Total Vrms, THD and selected order (% fundamental, phase, frequency, Vrms)			
LOGGER MODE				
Acquisition	Duration: 20,000 s – Interval: 0.2 s – Files: 100,000 measurements			
GENERAL SPECIFICATIONS				
Configuration memories	Not limited according to device - variable file sizes			
Printing	Network printing via Ethernet/Wifi in .png format			
PC communication – software link	Ethernet (100 baseT), WiFi-USB (device, 12 Mbs) – "ScopeNet" application software for PC			
Software	PC: Ethernet and USB, ScopeNet (remote control, data recovery, cursors and automatic measurements) Android tablet – ScopeAdmin Fleet Administration utility			
Mains power supply	Li-Ion rechargeable battery (6,900mAH-40 Wh) – Battery life of up to 8 hrs – Adjustable standby mode Adapter / 2-hour fast charger, universal 98-264 V / 50/60 Hz)			
Safety / EMC	Safety as per IEC 61010-2-30, 2010 – 600V CAT III / 1000V CAT II – EMC as per EN61326-1, 2010			
Mechanical specifications	292.5 x 210.6 x 66.2 mm – 2.1 kg with batteries – IP54 protection			