3B Scientific



SAFE EXPERIMENTING IN CLASS
MODERN MEASURING INSTRUMENTS

3bscientific.com

Power supplies • Multimeters • Function generators • Oscilloscopes • Digital thermometers • Sound level meters • pH meters • Geiger counters • Measurement amplifiers



Dear Customers,

Carrying out experiments on one's own is a fascinating and important part of any science lesson. Of course, though, it is essential never to lose sight of students' safety. Student experiments on open electric circuits, for instance, are particularly demanding in terms of electrical safety.

In this brochure we have put together a selection of electricity power supplies for you, each of which is equipped with a safety transformer compliant with European standard EN 61558-2-6 and guarantees safe isolation between the mains supply and output circuitry.

It goes without saying that our measuring instruments also meet the utmost demands for electrical safety. For analogue voltage and current measurements, we recommend using our ESCOLA range of multimeters and our new demo-multimeter or, for measuring very small charges, currents and voltages, our electrometer or the new U-series measurement amplifier.

Moreover, we also offer you a selection of modern digital measuring instruments. Among the new items in the range are two inexpensive digital oscilloscopes, a thermal imaging camera, an infra-red thermometer, two pH meters and a laser range finder. See for yourselves the many and varied uses to which they can be put.

Our whole project range for physics can be found in our 3B Scientific Physics catalogue or online at **3bscientific.com**.

If you do not have the catalogue to hand at the moment, that is no problem. We will be happy to send you your own personal example. Alternatively you can simply visit us online. All of our catalogues are available for download in PDF format.

We hope you have a lot of fun in discovering our selection of new products. We would always be happy to hear from you about your needs or suggestions and look forward to your ordering from us. Our expert team is of course at your disposal at any time for personal advice.

Yours faithfully,



Dr. Johannes Selbach
Head of Product Management Natural Sciences

CONTENTS

3 Power supplies
6 Multimeters
8 Function generators
9 Digital oscilloscopes
10 Thermal imaging camera / Digital thermometers
12 Sound level meters
13 pH meters / Miscellaneous
14 Geiger counters
15 Measurement amplifiers

POWER SUPPLIES

Ideal for electron tubes!



U8498294-230

ADVANTAGES

+ Very high-quality and extremely lightweight equipment in modern casing
+ 3-digit digital display for high voltage
+ Regulated high-voltage output not dependent on mains voltage
+ High-voltage-proof supply for heater voltage
+ No need to change fuses

High-Voltage Power Supply E (230 V, 50/60 Hz)
Universally applicable, floating high-voltage source for electrostatic experiments and for operating spectral tubes, gas discharge tubes and electron tubes. With built-in transformer resistance to external voltage to provide the heating voltage for electron tubes. Continuously adjustable high-voltage source, which is safe to touch, with passive current limiting and digital voltage display.

- Current limiting to protect against contact with high voltages
- Safety transformer conforming to EN 61558-2-6
- Safe isolation between power supply and output circuits

High-voltage output:	0 – 5000 V DC, max. 2 mA, floating
Heater voltage output:	6.3 V AC, max. 3 A, resistance to voltage up to 5 kV

U8498294-230



U8521400-230

Ideal for experiments on electrostatics!



U8557480-230

NEW!

High-Voltage Power Supply 10 kV (230 V, 50/60 Hz)
Universally applicable, floating high-voltage source for experiments on electrostatics or for operating electron tubes. With built-in transformer resistance to external voltage to provide the heating voltage for electron tubes. Continuously adjustable high-voltage source, which is safe to touch, with passive current limiting and digital voltage display. A temperature-controlled fan protects the equipment from overheating.

- Current limiting to protect against contact with high voltages
- Safety transformer conforming to EN 61558-2-6
- Safe isolation between power supply and output circuits

High-voltage output:	0 – 10000 V DC, max. 2 mA, floating
Heater voltage output:	6.3 V AC, max. 3 A, resistance to voltage up to 10 kV

U8557480-230

More Power Supplies at 3bscientific.com!

DC Power Supply 450 V (230 V, 50/60 Hz)
Power supply with three outputs for supplying electrical power in experiments using an electrometer (1001025).

- Current limiting to protect against contact with high voltages
- Safety transformer conforming to EN 61558-2-6
- Safe isolation between power supply and output circuits

Output 1:	
Voltage:	0 – 450 V DC
Max. current:	10 µA
Output 2:	
Voltage:	1.2 – 12 V DC
Max. current:	100 mA
Output 3:	
Voltage:	0 – 12 V AC
Max. current:	10 mA
Dimensions:	250x100x160 mm^3 approx.
Weight:	0.8 kg approx.

U8521400-230

POWER SUPPLIES

› WITH 3B PRODUCTS - SAFE EXPERIMENTING IN CLASS!



Transformer 12 V, 25 VA (230 V, 50/60 Hz)
Simple transformer for student exercises. Short circuit proof, with connection leads and two cascadable 4 mm safety plugs.

- Safety extra-low voltage (SELV) and functional extra-low voltage (FELV)
- Safety transformer conforming to EN 61558-2-6
- Safe isolation between power supply and output circuits

Output: 12 V AC, max. 2 A
Dimensions: 110x95x65 mm³ approx.
U8475470-230



U8475470-230

Especially safe!

Transformer 12 V, 60 VA (230 V, 50/60 Hz)
Powerful electronic power supply, e.g. for the operation of lamps as used in optics. Short circuit proof, with connection leads and two cascadable 4 mm safety plugs.

- Safety extra-low voltage (SELV) and functional extra-low voltage (FELV)
- Safety transformer conforming to EN 61558-2-6
- Safe isolation between power supply and output circuits

Output: 12 V AC, max. 5 A
Dimensions: 140x90x60 mm³ approx.
U33500-230



U33500-230

Ideal for student experiments!



U33300-230

Transformer with Rectifier 3/ 6/ 9/ 12 V, 3 A (230 V, 50/60 Hz)
Extra low voltage power supply with overload protection contained in plastic housing. Output voltage switchable in four stages.

- Safety extra-low voltage (SELV) and functional extra-low voltage (FELV)
- Safety transformer conforming to EN 61558-2-6
- Safe isolation between power supply and output circuits

AC output: 3/ 6/ 9/ 12 V, max. 3 A
DC output: 3/ 6/ 9/ 12 V, max. 3 A
Dimensions: 210x170x90 mm³ approx.
Weight: 2.6 kg approx.
U33300-230

Especially safe!

Transformer with Rectifier 2/ 4/ 6/ 8/ 10/ 12/ 14 V, 5 A (230 V, 50/60 Hz)
Safety isolating transformer with safety cut out contained in metal housing. Output voltage switchable in 7 steps

- Safety extra-low voltage (SELV) and functional extra-low voltage (FELV)
- Safety transformer conforming to EN 61558-2-6
- Safe isolation between power supply and output circuits

AC output:	2/ 4/ 6/ 8/ 10/ 12/ 14 V, max. 5 A
DC output:	2/ 4/ 6/ 8/ 10/ 12/ 14 V, max. 5 A
Dimensions:	260x140x130 mm³ approx.
Weight:	3.1 kg approx.

U8521112-230



U8521112-230

Ideal for student experiments!

DC Power Supply 1.5 – 15 V, 1.5 A (230 V, 50/60 Hz)
Handy DC power supply contained in a sturdy metal housing. The output voltage is continuously adjustable and is displayed via an analogue measuring instrument. The output is short circuit proof and floating.

- Safety extra-low voltage (SELV) and functional extra-low voltage (FELV)
- Safety transformer conforming to EN 61558-2-6
- Safe isolation between power supply and output circuits

DC output:	1.5 – 15 V, max. 1.5 A
Residual ripple:	10 mV
Dimensions:	100x80x150 mm³ approx.
Weight:	2 kg approx.

U8521121-230



U8521121-230

More Power Supplies at 3bscientific.com!


U8521131-230

AC/DC Power Supply 0 – 20 V, 5 A (230 V, 50/60 Hz)
Power supply with adjustable and stabilised DC voltage and analogue voltage and current display for DC voltage. The DC voltage component features an automatically alternating voltage and current control and is protected against continuous short circuits. The AC voltage can be selected in eight steps, the output is protected by an overcurrent circuit breaker.

- Safety extra-low voltage (SELV) and functional extra-low voltage (FELV)
- Safety transformer conforming to EN 61558-2-6
- Safe isolation between power supply and output circuits

DC output:	0 – 20 V, 0 – 5 A
AC output:	2, 4, 6, 8, 10, 12, 15, 20 V, max. 5 A
Residual ripple:	<10 mV
Dimensions:	235x175x245 mm³ approx.
Weight:	8 kg approx.

U8521131-230

MULTIMETERS

Analogue Multimeters ESCOLA
Clear moving-coil instrument in shock-resistant plastic casing with two mirrored linear scales and clearly distinguishable measuring ranges. Includes battery test function and display of charge status as well as electronic calibration of zero point to the centre of the scale for all DC current and voltage ranges.
Use of a measurement amplifier ensures the measured values are linear even for AC voltages of up to 40 kHz. Only an inexpensive 1.5 V battery element is needed for operation. Nevertheless the meter will work for several years after any change of battery with normal usage, since the current discharge when in operation is no more than 2.5 mA maximum.

Scale length:	80 mm
Operating voltage:	1 – 3.5 V DC
Battery type:	Mignon, AA, R6
Accuracy:	Class 2 (DC), class 3 (AC)
Dimensions:	100x150x50 mm³ approx.
Weight:	300 g approx.

THE IDEAL METER FOR STUDENT EXPERIMENTS

+ Unmistakeable measurement readings
+ Only an inexpensive 1.5 V battery element is needed for operation
+ Full functionality guaranteed even when the battery is no longer fully charged
+ Lithium batteries with higher open-circuit voltage can also be used
+ Battery protected by automatic cut-off after approximately 50 mins.
+ Distinct difference between 0 V display and the equipment being switched off due to inherently different position of needle



U8557330

Analogue Multimeter ESCOLA 30
Permanently short-circuit-proof student measuring instrument for measuring voltage and current in the safety extra-low voltage range. The electronic overload protection is achieved without the use of an equipment fuse, therefore obviating any need to change fuses or order spares. The protective system nevertheless operates without any auxiliary energy and is guaranteed even when the battery is flat or no battery is present.

Direct and alternating voltage:	0.3 – 30 V, 5 ranges each
Direct and alternating current:	1 – 3000 mA, 5 ranges each
Instrument category:	CAT I, 30 V

U8557330



U8557380

Analogue Multimeter ESCOLA 100
Meter for classroom and practical experiments to measure voltage and current up to 600 V or 10 A respectively. Also features audible continuity testing. Includes a fuse to guarantee safety up to CAT III. The separate terminal sockets for current and voltage permit connection of the instrument that allows for current as well as voltage to be measured without having to reconnect the measuring leads. When switching from one measuring range to another, the circuit is never broken. All current measuring ranges are overload-proof for long-term current of up to 10 A.

Direct and alternating voltage:	0.1 – 600 V, 9 ranges each
Direct and alternating current:	0.1 mA – 3000 mA, 11 ranges each
Instrument category:	CAT III, 600 V

U8557380

Electrical safety of measuring instruments for current and voltage are assessed according to measurement categories stipulated in IEC 61010-1:

CAT I or unstipulated: Approved for measurements in circuits which are not directly connected to the low voltage mains grid (e.g. batteries).

CAT II: Approved for measurements in circuits which are directly connected, by a mains lead and plug for instance, to the low voltage mains grid (e.g. household or office appliance and lab equipment).

CAT III: Approved for measurements in circuits which are part of a building's wiring installation (e.g. stationary consumers, distribution terminals, appliances connected directly to the distribution box).

CAT IV: Approved for measurements in circuits which are directly connected to the source of the low voltage mains (e.g. electricity meters, main service feed, primary excess voltage protection). Note: the closer measurement is to be made to the low-voltage mains installation, the higher the measuring category needs to be.

NEW!



U8557160

Easy to replace fuses!



U118071



U11806

Demo Multimeter
Electronic meter featuring a double scale for analogue measurement of current and voltage in demonstration experiments. It can handle measurements of current and voltage values and also allows the zero point to be set up in the centre of the scale for measurement of DC quantities. Switching between measuring ranges does not break any circuits connected to the equipment. This means it is possible to carry out measurements on voltage converters, for example, without causing induction surges. Resistance R, conductance G, impedance Z and admittance Y can easily be determined as quotients of current and voltage measurements thanks to the non-interrupting switch capability without the need to change the wiring.

This equipment is protected by fuses and authorised for making measurements in circuits directly connected to the low-voltage mains via plugs (CAT II), i.e. for measurements on house-hold appliances, for example. The current measuring ranges are resistant to long-term overloading up to 10 A. The meter is suitable for use as a free-standing instrument or for setting up in training panel frames.

Voltage ranges:	0.1 - 600 V AC/DC, 9 ranges
Current ranges:	0.1 mA - 10 A AC/DC, 11 ranges
Measuring category:	CAT II: 600 V
Dimensions:	259x297x125 mm³ approx.
Weight:	1.7 kg approx.

U8557160

Digital Mini Multimeter
Very reasonably priced mini multimeter in pocket format for measuring voltage, DC current, resistance and temperature and also including diode and continuity tests. Overload protection for mA ranges, 10 amp range is unprotected. Includes measuring leads, type K thermocouple and battery.

DC voltage:	200 mV – 250 V, 5 ranges, ±0.8% ± 2 digits
AC voltage:	200/ 250 V, 2 ranges, ±1.2% ± 10 digits
DC current:	200 µA – 10 A, 5 ranges, ±1,0% ± 2 digits
Resistance:	200 Ω – 2000 kΩ, 5 ranges, ±0.8% ± 2 digits
Temperature:	0 – 1000°C, ±2,0% ± 3 digits
Safety classification:	CAT II 250 V (IEC-1010-1)

U118071

Digital Multimeter P1035
Compact 3½ digit multimeter for measuring voltage, current and resistance and also including diode and continuity tests. Complete with pouch, leads and battery.

DC voltage:	200 mV – 600 V, 5 ranges, ±0.5% ± 2 digits
AC voltage:	200/ 600 V, 2 ranges, ±1.2% ± 10 digits
DC current:	2000 µA – 10 A, 4 ranges, ±1% ± 2 digits
Resistance:	200 Ω – 2000 kΩ, 5 ranges, ±0.8% ± 2 digits
Safety classification:	CAT III 600 V (IEC-1010-1)

U11806

More Multimeters at 3bscientific.com!

FUNCTION GENERATORS

ADVANTAGES

+ Easy and accurate adjustment
+ With built-in continuous sweep-mode
+ Ideal for recording resonance curves



U8533600-230

Function Generator FG 100 (230 V, 50/60 Hz)
Function generator with power amplifier for use in versatile student and practical experiments covering simple harmonic oscillation, AC electricity and induction. Featuring illuminated, digital display for frequency, signal form, offset and other parameters. The output is short-circuit protected as well as being protected against induced voltages and spark discharges, e.g. for when experiment leads are unintentionally pulled out while coils are connected. In internal sweep mode, one trigger pulse is output per cycle and the voltage output is proportional to the frequency. With retractable feet. Includes power supply.

- Safety transformer conforming to EN 61558-2-6
- Safe isolation between power supply and output circuits

Frequency range:	0.001 Hz to 100 kHz
Signal forms:	Sine, square, triangular
Offset:	0 to ±5 V, adjustable in 0.1 V steps
Output amplitude:	0 to 10 V, continuously adjustable
Power output:	10 W, permanent
Output current:	1 A, permanent, 2 A max.
Sweep modes:	External, continuous internal, individual internal
Frequency range:	1 Hz to 100 kHz
Time range:	0.04 s to 1000 s
External sweep:	Start via trigger pulse or application of 0 to 5 V control voltage
Internal sweep:	Start and stop via Start/Stop button One trigger output per cycle plus proportional voltage
Power supply:	Plug-in power supply, 12 V AC, 2 A
Dimensions:	170x105x40 mm³ approx.
Additional features:	Fold-out feet

U8533600-230

ADVANTAGES

+ Ideal for introductory student experiments on AC
+ Simple generator for oscillations and waves



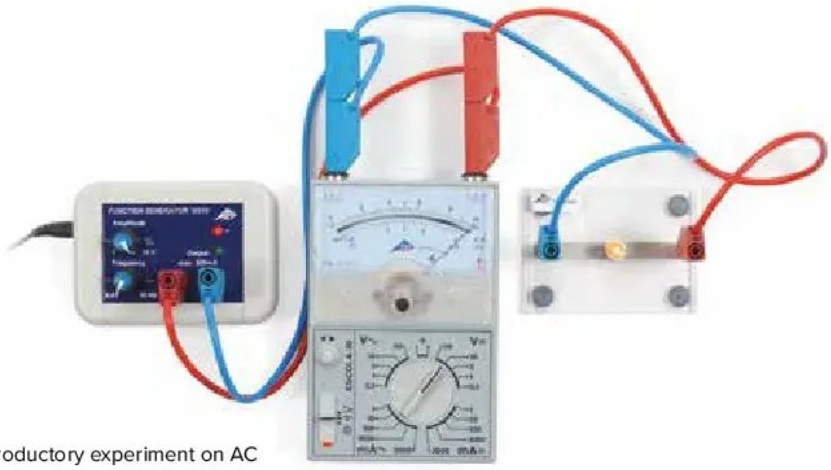
U8498288-230

Function Generator SG10 (230 V, 50/60 Hz)
Sine-wave generator, which is particularly easy to use, featuring a power amplifier for use in student experiments. Includes 12 V AC plug-in power supply. One red and one green LED indicate the positive and negative half-waves of the output voltage. Their brightness corresponds to the configured amplitude. The way the output signal changes over time can be traced by means of an analogue voltmeter with zero-point in the centre or by means of an oscilloscope. The output is protected against short-circuits and against induced voltages as well as spark discharges.

- Safety transformer conforming to EN 61558-2-6
- Safe isolation between power supply and output circuits

Signal form:	Sine-wave
Frequency range:	0.01 – 10 Hz
Output amplitude:	1 – 10 Vpp, continuously adjustable
LED display:	As of 2 V output voltage
Output power:	1.5 W permanent
Output current:	300 mA max.
Distortion factor:	<5%
Connectors:	4-mm safety sockets
Power supply:	12 V AC, 500 mA plug-in power supply

U8498288-230



Introductory experiment on AC

OSCILLOSCOPES

NEW!



U11831

Digital Oscilloscope 2x30 MHz
Latest generation, dual-channel, digital storage oscilloscope with high-resolution colour display and large internal data memory.

- Mathematical functions including fast Fourier transforms (FFT)
- 20 Automatic measuring modes
- User-friendly operation featuring autoset and autoscale
- PASS/FAIL function implemented
- VGA output for connection to an external monitor
- LAN connection for remote connection via network
- USB connection for real-time data transmission or reading of internal memory

Includes two probes, two BNC cables, USB connecting cable, and software CD for Windows 2000/XP/VISTA/7/8/10.
U11831

NEW!



U11830

PC Oscilloscope, 2x25 MHz
Dual-channel, PC-based oscilloscope to be connected to a computer. Features powerful PC software for control and data requests. The highest possible degree of safety for users and the computer system thanks to galvanic isolation of the USB port.

- Mathematical functions including fast Fourier transforms (FFT)
- 20 Automatic measuring modes
- Data export for further processing (bin, txt, csv or xls)
- Image file for screenshots (png, bmp or gif)

Includes two probes (1:1, 10:1), a USB connecting cable, two BNC cables, operating instructions and software CD for Windows® XP/ Vista/7/8
U11830

	Digital Oscilloscope (U11831)	PC Oscilloscope (U11830)
Channels:	Two	
Band width:	30 MHz	25 MHz
Sample rate:	250 MSa/s	200 MSa/s
Operating modes:	CH1, CH2, XY	
Input coupling:	DC, AC, GND	
Input impedance:	1 MΩ ±2% II 10 pF ± 5 pF	
Input voltage:	0 – 400 V DC or ACpp	
Deflection coefficient:	2 mV/div. – 10 V/div.	2 mV/div. – 50 V/div.
Time-base coefficient:	5 ns/div. – 100 s/div.	
Trigger type:	Edge, Video, Pulse, Slope	Alternate, Edge, Video, Pulse, Slope
Trigger modes:	Auto, Normal, Single	
Trigger detection:	Sample, Peak Detect, Average	
Memory size:	10000 measurements	5000 measurements
Interface:	USB 2.0, VGA, LAN	USB 2.0
Power supply:	100 – 240 V, 50/60 Hz	via two USB ports
Dimensions:	355x178x118 mm^3 approx.	170x120x18 mm^3 approx.
Weight:	1,6 kg approx.	260 g approx.

DIGITAL THERMOMETERS

› NEW!



Thermal Imaging Camera
Modern infra-red thermal imaging camera for producing images of infra-red radiation from an object based on detected infra-red radiation in relation to the ambient temperature.

- User-friendly graphic menu operation
- Photography using built-in digital camera
- Up to 25000 photos can be saved on Micro SD card
- Recordings featuring time and date documentation
- Images with emission factor and measurements
- Five colour palettes for thermal imaging
- Five levels of photograph and thermal imaging superimposition
- Cross-hairs, plus cold-spot and hot-spot display
- Minimum and maximum value display
- Automatic shut-off

Includes case, batteries, Micro SD card and instruction manual.

Temperature range:	-20°C ... 300°C
Resolution:	0.1°
Sensitivity:	0.3°C
Precision:	±2% or 2°C
Display:	60 mm (2.4") LCD-TFT
Thermal image resolution:	60 x 60 pixels
Field of vision:	20° x 20°
Emission factor:	Adjustable from 0.1 – 1.0
Wavelength:	8 – 14 µm
Image frequency:	6 Hz
Focus range:	50 cm (fixed)
Memory:	Micro SD card
Voltage supply:	4 x 1.5 V AA batteries
Display:	Multi-line, multi-function display
Dimensions:	212 x 95 x 62 mm³ approx.
Weight:	320 g approx.

U11832

› NEW!



ADVANTAGES

+ Fast, easy and accurate measurements
+ Automatic selection of measurement range
+ Practical single-handed operation
+ Modern, handy design
+ Large-scale 3½-digit LCD display

Infra-red Thermometers
Surface thermometer for contactless temperature measurement from a safe distance, e.g. in inaccessible places, hot or moving objects. With laser diode for laser sighting, illuminated LCD display, range overflow display, measured value storage function, selection between Celsius and Fahrenheit, automatic switch off.
The infra-red thermometer 380°C D permits rapid measurement of temperature differential with the LED display (red, green or blue).
Including case, battery and instruction manual.

	U118152	U11833
Designation	**Infra-red Thermometer, 800°C**	**Infra-red Thermometer, 380°C D**
Measuring range	-50° C – +800° C	-50° C – +380° C
Accuracy	±1 % of measured value	±2 % of measured value
Response time	150 ms	< 1 s
Optical resolution	20:1	10:1
Max. temperature display	yes	---
Voltage supply	9 V battery	9 V battery
Dimensions	146x43x104 mm³ approx.	200x124x50 mm³ approx.
Weight	170 g approx.	220 g approx.

Digital Thermometer Type K/IR
Digital two channel thermometer with two K- type inputs and additional external infra-red sensor. Can also be used for measurements at low temperatures. With automatic shut off, maximum value storage and data hold function. Includes case, 2 K-type thermocouple sensors, infra-red temperature sensor, 9 V battery and instruction manual.

Measurement inputs:	2x K-type, external IR input
Measuring functions:	T1, T2, T3, T1-T2, T1-T3, T2-T3
Measuring range:	-200 – 1372°C (type K), -30 – 550°C (IR)
Measurement error:	±0.5% + 2°C (type K), ±2.5% + 2°C (IR)
Resolution:	0.1°C
Unit of measurement:	°C or K
Emission factor:	0.95 fixed
Digital display:	3¾ digit LCD
Background lighting:	blue
Voltage supply:	9 V battery
Dimensions:	75x200x50 mm³ approx.
Mass:	280 g approx.

U11823



U11823

Infrared Temperature and Humidity Gauge
Digital measuring device for contact-free temperature measurement from large distances, e.g. of hot or moving objects or inaccessible points of measurement, and for simultaneous humidity display. With laser diode as detection aid, integrated in the measuring probe, illuminated LCD display, max and data-hold function, switchable between °C and °F, automatic switch-off. Includes pouch and battery.

Measuring range, temperature:	-50° C to +500° C
Divisions:	0.1° C
Accuracy:	± 2% of measured value ± 2° C
Measuring range, humidity:	5% to 95%
Divisions:	0.1%
Accuracy:	± 3.5%
LCD dual-function display:	3 ½-digit, 21 mm with backllighting
Voltage supply:	9 V battery
Dimensions:	90x170x45 mm³ approx.
Mass:	360 g approx.

U11819



U11819

Digital Thermometers
Versatile digital thermometers for type-K temperature sensors with single or dual input (1002794) for measuring instantaneous or differential temperature (T1 – T2 1002794). With storage of maxima and Data-Hold function. Includes type-K temperature sensor (1002794 2x), battery, holster and carrying bag.



	U11817	U11818
Designation	**Digital Thermometer, 1 Channel**	**Digital Thermometer, 2 Channels**
Measuring range	-50° C – +1300° C 223 K – 2000 K	-50°C – +1300°C
Division	0.1° C, 1 K	0.1°C/F
Accuracy	±0.5% +1° C	±0.5% +1°
Display	3½ digit illuminated LCD	3½ digit illuminated LCD
Digit size	21 mm	21 mm
Voltage supply	9 V battery	9 V battery
Dimensions	90x170x45 mm³ approx.	90x170x45 mm³ approx.
Weight	350 g approx.	350 g approx.

SOUND LEVEL METERS



U11801



U11804

Sound Level Meter P5055
Digital measuring instrument for universal application in detecting noise levels from a variety of sound sources over a broad range. Features built-in calibration signal plus maximum value and value hold functions. Slow mode for average noise level and fast mode for recording brief sound sequences and determining maximum noise level. A-weighting of frequency (based on human hearing) for open-air measurements and also C-weighting, e.g. for measurements of engine noise. Robust plastic casing, analogue output for external measuring instruments, threaded hole for mounting on a stand. Foam-filled carry case.

Measurement range:	35 – 130 dB
Resolution:	0.1 dB
Accuracy:	±3.5 dB at 94 dB (1kHz)
Display:	3½-digit LCD, 17 mm
Microphone:	Electret capacitor micorphone
Voltage supply:	9 V block-type battery
Dimensions:	251x64x40 mm³ approx.
Weight:	250 g approx.

U11801



U10610

Noise Level Meter P8005
Digital noise meter with background noise suppression for all types of measurements of ambient noise, e.g. for measuring noise levels in schools, offices, factories, traffic and homes or for noise projects. Includes data logger and USB port for long-term measurements. Choice of manual and automatic operating modes. Capability for min. and max. measurements.
Includes case, USB cable, Windows software, stand, 9 V mains adaptor, 9 V battery and instruction manual.

Frequency range:	31.5 Hz – 8 kHz
Dynamic range:	50 dB
Level ranges:	30 – 80 dB (low) 50 – 100 dB (medium) 80 – 130 dB (high) 30 – 130 dB (automatic)
Precision:	±1.4 dB
Digital display:	4 digit LCD, 20 mm
Multi-functions display:	Digital display of measurement, measuring time, bar graphs plus overs and unders
Applicable standards:	IEC-61672-1 type 2, ANSI S1.4 type 2
Response times:	125 ms (fast), 1s (slow)
Microphone:	½-inch, with electret capacitor
Analogue output:	AC/DC
Voltage supply:	9 V battery or 9 V mains adaptor
Dimensions:	90x280x50 mm³ approx.
Weight:	350 g approx.

U11804

NOISE ...

... damages hearing
... makes it more difficult to hear genuinely important signals
... impedes both physical and mental work
... disturbs and adversely affects well being
... disturbs relaxation and sleep
... can cause chronic stress, physical ailments and illness

Noise Level Indicator SPL
Handy and easy-to-use noise level meter with digital display in decibels (dB) and an arbitrarily adjustable trigger threshold for use as a traffic-light style noise indicator with a happy green face and a sad red face. Can be mounted on a wall or set up on a table top. Its well-conceived compact design makes it easy to transport. Automatically switches to electricity-saving stand-by mode when noise is low for a long period. The brightness of the display can also be adjusted. Includes a stand base, USB/miniUSB cable and USB power supply.

Display:	100 mm diam, with LED
Measuring range:	40 dB to 130 dB
Resolution:	1dB
Thresholds for colour display:	Adjustable to any level in steps of 1 dB
Voltage supply:	5 V DC via miniUSB socket
Power consumption:	150 mA (normal operating mode) <1 mA (stand-by)
USB power supply:	100 – 240 V, 50/60 Hz
Dimensions:	130x145x12 mm³ approx.
Weight:	400 g approx.

U10610

pH-METERS

pH Meter (2 in 1)
Digital pH meter for the simultaneous measurement of the pH value of aequous fluids and their temperatures. The measurement of the pH value is performed by determining the electrical potential difference between acidic, neutral and base fluids.
Robust, water-proof housing, large LCD display with permanent background illumination and simple to operate. Including calibrating solution, batteries and instruction manual.

pH range:	0 – 14 pH
Resolution:	0.01 pH
Accuracy:	± 0.05 pH
Temperature compensation:	0 – 50°C
Temperature measurement:	0 – 50°C
Resolution:	0.1°C
Accuracy:	± 1°C
Voltage supply:	4 x 1.5 V (AG-13) batteries
Protection class:	IP 65 water-proof
Display:	3½-digit LCD display, 11 mm, max. 1999
Dimensions:	190x35x35 mm³ approx.
Weight:	100 g approx.

U11838

› NEW!



U11838



U11839

pH Meter
Digital pH measuring instrument for the measurement of the pH value of aqueous liquids using the immersion probe tips to determine the electrical potential difference between acidic, neutral and basic liquids. The device has a robust housing with compact dimensions and is easy to operate. It is equipped with a large LCD display with continuous background illumination, 2 adjustment potentiometers for calibrating to pH = 4 or to pH = 7 using the matching screwdriver. Including calibration solution, screwdriver, battery and instruction manual.

pH range:	0 – 14 pH
Resolution:	0.01 pH
Accuracy:	± 0.05 pH
Temperature compensation:	0 – 50°C
Voltage supply:	9 V battery (NEDA 1604)
Display:	3½-digit LCD display, 18 mm, max. 1999
Dimensions:	150x70x25 mm³ approx.
Weight:	230 g approx.

U11839

› NEW!



U11827

Laser Range Finder
Professional laser range finding instrument with multi-lined LCD display and background illumination especially designed for distance measurements of extremely high precision and for locations difficult to access. Speed buttons for direct and indirect measurement (according to Pythagoras), area and volume calculation, addition and subtraction operations. With internal memory for 99 recorded measurement values, retractable 90° bracket for precise targeting of the measurement point, spirit level and tripod socket. Including case, batteries and instruction manual.

Measurement range:	0.05 – 60 m
Measurement units:	m (metre), in (inch), ft (feet)
Accuracy:	± 2 mm
Internal memory:	99 values
Laser:	620 nm – 680 nm, <1 mW, class: 2
Voltage supply:	2 x 1.5 V AAA batteries
Display:	Multi-lined multifunction display
Dimensions:	118x54x28 mm³ approx.
Weight:	135 g approx.

U11827

Digital Luxmeter
Reasonably priced, easy to use pocket luxmeter for testing and measurement of light conditions. C.I.E. standard spectrum. Including light sensor, pouch and battery.

Measuring ranges:	200 – 50000 lux, 4 ranges, ±5%
Voltage supply:	12 V battery (A23)
Dimensions:	65x115x25 mm³ approx.
Weight:	160 g approx.

U11803



U11803

GEIGER COUNTERS



U111511



U8557150

Geiger Counter
Versatile, easy to use and compact precision instrument for measuring α-, β- and γ-radiation. With filter selection switch for filtering out types of radiation, large display and integrated USB interface. Including USB cable, Windows software, and operating instructions.
The following functions and operating modes are available for measurement:

- Standard mode for displaying the current radiation level. Also equipped with variable acoustic and optical warning threshold signal and display of average radiation from previous day.
- Pulse counting either permanent or with variable gate time. Additional optional acoustic count indication.
- Count rate measurement.
- Integrated display of date and time.
- The number of pulses registered is stored in the internal memory. This facilitates recording e.g. of weekly values for up to 10 years.
- Computer docking station. The software enables the measured data to be evaluated and processed on an MS-Windows PC.

Radiation types:	α from 4 MeV, β from 0.2 MeV, γ from 0.02 MeV
Measured variables:	equivalent dose in Sv/h, mSv/h, µSv/h pulses/s, pulses/variable time interval
Display:	LCD, 4 digit, numerical with display of measured variable, quasi analogue bar chart, operating mode indicators
Radiation detector:	End window Geiger-Müller counter tube, stainless steel housing with neon-halogen filling
Measuring length:	38.1 mm
Measuring diameter:	9.1 mm
Mica window:	1.5 – 2 mg/cm²
Gamma sensitivity:	114 pulses/min for ^{60}Co radiation = 1 µSv/h in background radiation energy band
Background rate:	10 pulses per minute approx.
Internal memory:	2 kilobytes
Battery life:	3 years approx.

U111511

Dosimeter Radex RD 1706
Used for determining dose rates in µSv/h for β-, γ- and X-rays, this radiation meter can be operated by non-professionals while nonetheless offering the features of a professional dosimeter. Including two built-in Geiger-Müller counter tubes and a large, illuminated LCD display. The device measures the activity of β-and γ-particles and uses the results to calculate the dose rate. Detection of each particle is indicated by an audio signal to facilitate searching for radioactive sources. The difference between the mean dose rate and background radiation level, as well as the background radiation level itself are displayed in the „background" mode. Measured values remain saved after the device has been turned off.

Counters:	Two GM counter tubes SBM20-1
Measurement variable:	Ambient equivalent dose rate H*(10)
Measuring range:	0.05 ... 999.0 µSv/h
Alarm threshold:	Adjustable from 0.10 to 99.0 µSv/h
Alarm:	Audio or vibration signal
Measurement and calculation times:	26 s, 1 s (at H*(10) > 3.5 µSv/h)
Value display duration:	Continuous
Energy detection range	
X-radiation and γ-radiation:	0.03 to 3.0 MeV
β-radiation:	0.25 to 3.5 MeV
Batteries:	1.5 V, AAA (1 x or 2 x)
Operating time:	500 h

U8557150

Geiger-Müller Counter Tube
Self-quenching halogen pulse ionisation chamber for detecting alpha, beta, gamma and x-ray radiation. In metal housing with mica window, removable mounting clamp with shaft. Long plateau length.

Filling:	Neon/argon mixture, halogen as quenching agent
Cathode dimensions:	approx. 39x14 mm²
Window:	mica, 9 mm dia.
Mass per unit area:	1.5 – 2.0 mg/cm²
Plateau length:	400 V – 600 V
Operating voltage:	400 – 600 V (recommended: 500 V)
Relative plateau slope:	0.04 %/V
Dead time:	90 µs
Limiting resistor:	10 MΩ, integrated in holder
Shaft:	100 mm x 10 mm dia. approx.

U8533430

Additionally required:
U11255 HF Patch Cord, 1 m
U8533341-230 Digital Counter (230 V, 50/60 Hz)



U8533430

U8533341-230

MEASUREMENT AMPLIFIERS

U8521400-230



U8557330

U8531408-230

Electrometer (230 V, 50/60 Hz)
Impedance converter with high-resistance input for measuring extremely small charges and currents. The input signal is converted into a proportional voltage, which can then be measured with an external voltmeter. During the measurement the potentials of the electrometer and the experimenter must be matched by using a metal rod connected to earth. Includes a 12 V AC plug-in power supply.

Electrometer gain factor:	1.00
Input resistance:	$>10^{12}$ Ω
Output resistance:	<1 kΩ
Input current:	<10 pA
Input capacitance:	<50 pF
Max. output voltage:	±10 V
Resistance to excess voltage:	1 kV (from low-resistance sources) 10 kV (from high-resistance sources)
Supply voltage:	12 V AC
Dimensions:	110x170x30 mm^3 approx.
Weight:	1 kg approx.

U8531408-230

Additionally recommended:
U8531420 Electrometer Accessories
U8557330 Analogue Multimeter Escola 30
U8521400-230 DC Power Supply 450 V (230 V, 50/60 Hz)

NEW!



U8557560-230

Measurement Amplifier U (230 V, 50/60 Hz)
Measurement amplifier U amplifies low-amplitude measurement signals from low-resistance signal sources for measurement with any chosen voltmeter or oscilloscope. By using an external shunt resistor it is also possible to measure small currents. Offset voltages can be compensated using coarse and fine offset adjustment knobs. Amplification (gain) can be selected in ranges from 0 to 5 powers of ten. High-frequency noise or other interference signals are filtered out by means of a low-pass filter with step-wise selectable time constants between 0 and 3 seconds. The output voltage has the same sign as the input voltage.

Input resistance:	10 kΩ
Output resistance:	300 Ω
Offset voltage drift:	< 2 µV/K (after 15 mins. operation approx.)
Gain factors:	10^0; 10^1; 10^2; 10^3; 10^4; 10^5
Tolerance for gain factors:	< 2.5 %
Input voltage:	max. ±12 V (overload protected for brief transients up to 100 V)
Output voltage:	0 ... ±12 V (short-circuit protected)
Power supply (via plug-in supply provided):	12 V AC
Ambient temperature:	5°C ... 23°C ... 40°C
Storage temperature:	-20 ... 70°C
Relative humidity:	<85% no condensation
Operational alignment:	Horizontal
Contamination level:	2
Protection class:	IP20
Dimensions:	170x105x50 mm^3 approx.
Weight:	335 g approx.

U8557560-230

Electrometer Accessories
Set of accessories for carrying out basic experiments on electrostatics, electricity and the photoelectric effect in combination with an electrometer (1001025) and 450 V DC power supply (1008535).

Contents:
1 Faraday cup
1 Pair of friction rods
1 Metal rod with 4-mm drilled hole
1 Safety adaptor socket
1 Plug-in capacitor 1 nF
1 Plug-in capacitor 10 nF
1 Plug-in resistor 100 MΩ
1 Plug-in resistor 1 GΩ
1 Plug-in resistor 10 GΩ
1 Zinc electrode
1 Grid electrode
U8531420

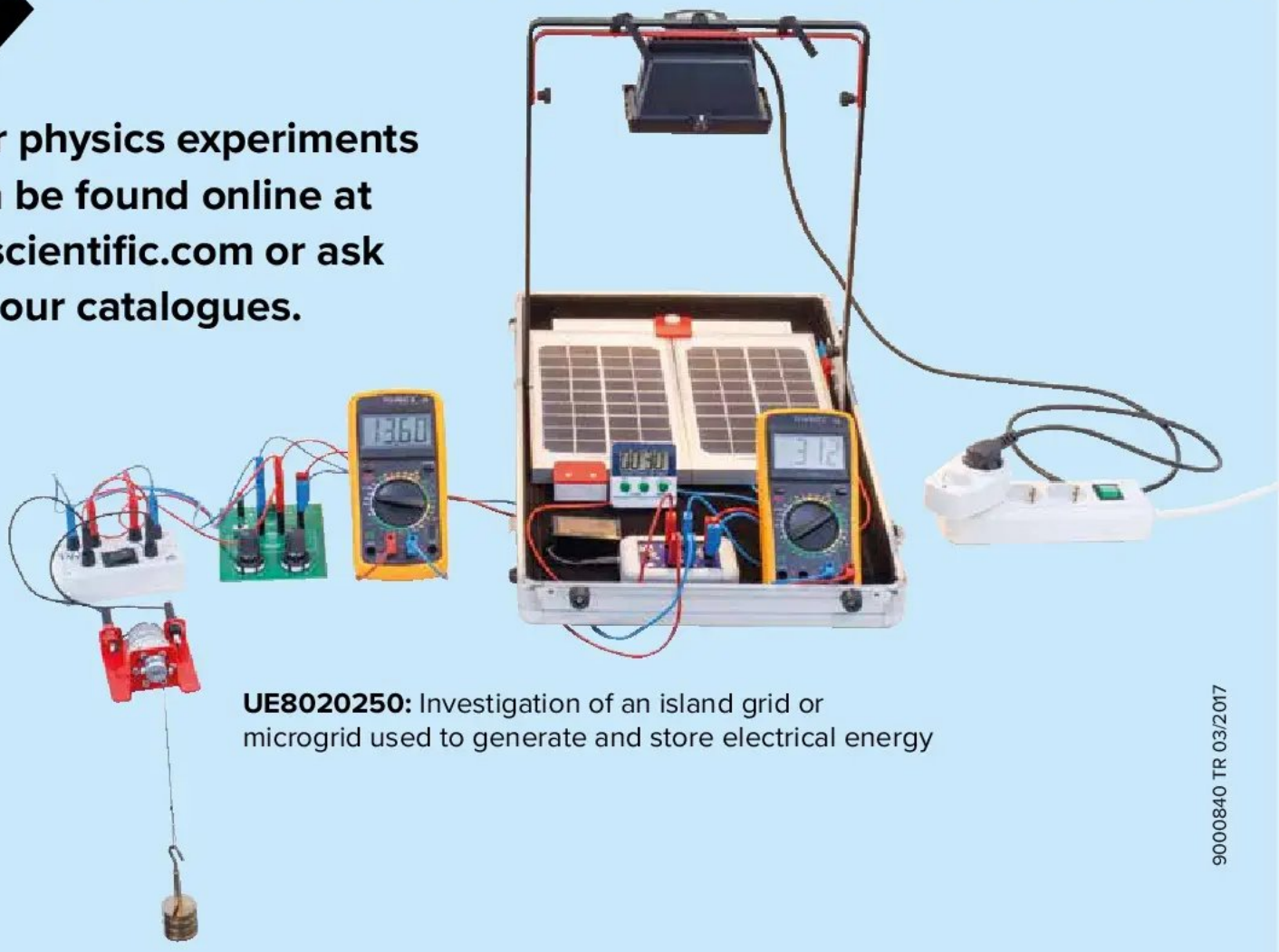


U8531420

3B Scientific
A worldwide group of companies

3B Scientific TR
Oruçreis Mah. Tekstilkent Cad. 10-C Blok Daire 111
34235 Tekstilkent (A24 Blok No:32)
Esenler • İstanbul • Türkiye
Phone: + 90 (0)212-422-8800 • Fax: + 90 (0)212-422-8801
3bscientific.com.tr

Our physics experiments can be found online at 3bscientific.com or ask for our catalogues.



UE8020250: Investigation of an island grid or microgrid used to generate and store electrical energy

9000840 TR 03/2017