



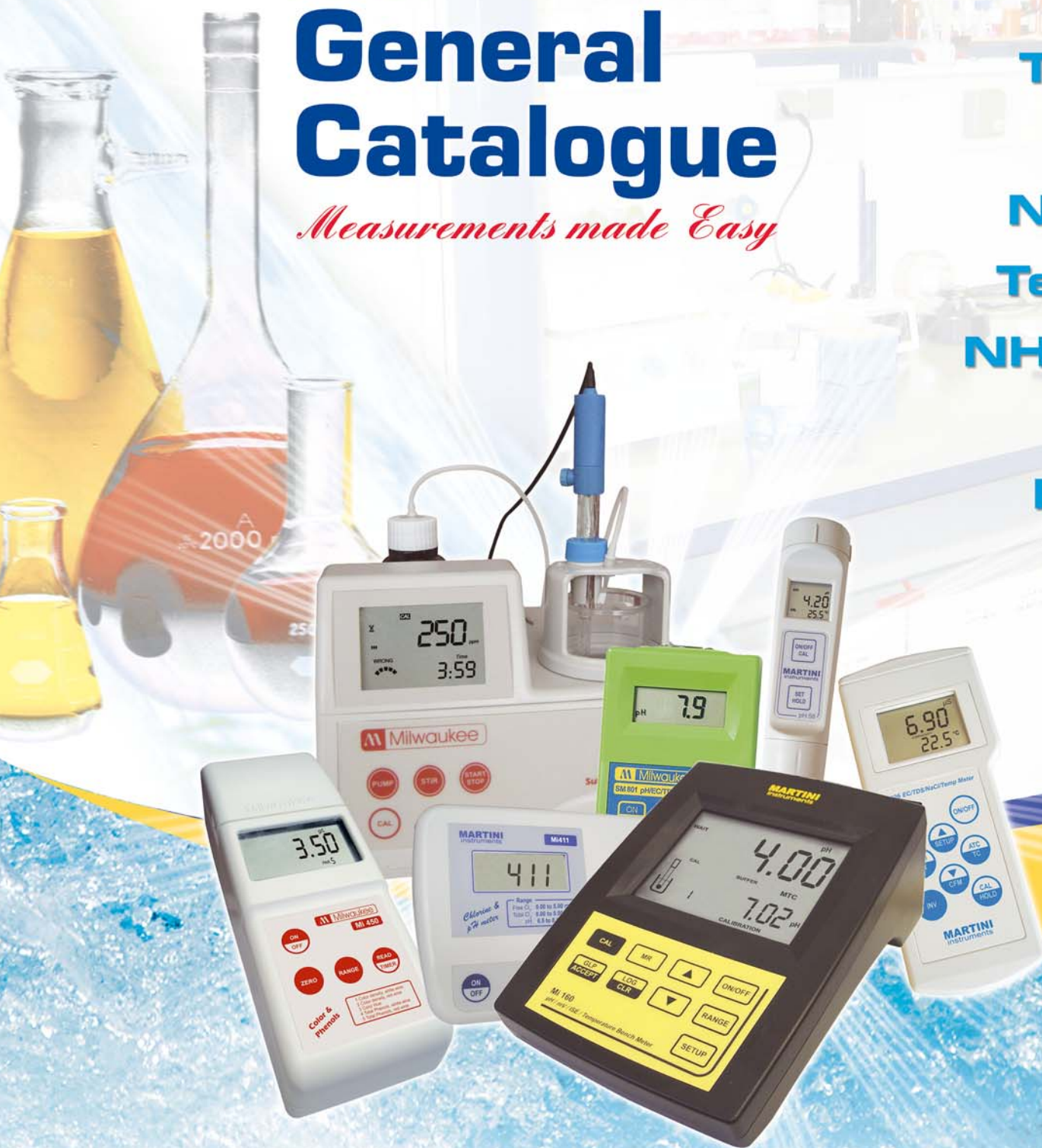
Milwaukee

2010

General Catalogue

Measurements made Easy

pH
ORP
EC
TDS
DO
NaCl
Temp
NH₃-N
Fe
PO₄
Cl₂
Cl⁻
TN

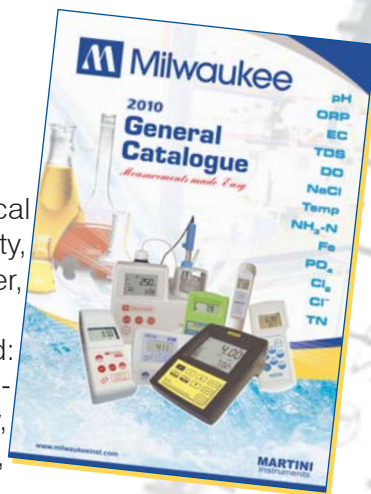


COMMITTED to TOTAL CUSTOMER SATISFACTION

Milwaukee is a dynamic worldwide manufacturer of electrochemical Instrumentation for water analysis to measure pH, Redox, Conductivity, Salinity, Dissolved Oxygen, Temperature, Turbidity, Chlorine, Ammonia, Copper, Chloride, Phosphate, Iron, etc.

Milwaukee serves all markets where water quality measurements are required: Laboratory market, food and beverage, environmental, education and government, water and waste water treatment, pharmaceutical and biotechnology, chemical, agriculture and horticulture, hydroponics, aquariums, swimming pools, etc.

Thanks to your valuable feedback our R&D team has designed a new line of instruments - Martini Instruments - for laboratory and field measurements.



Many of our instruments combine 2 or more parameters providing added versatility and excellent value for money. With an extended range of products, from basic hand held instruments to high performance laboratory bench meters, Milwaukee products have a reputation for reliability and accuracy.

All of our instruments are supplied with probes, electrode holders, buffer solutions and most come in a hard carrying case (Martini portable meters and photometers) and are complete and ready for use.

Milwaukee Instruments are available worldwide through a selected network of distributors and associated companies that are committed to Total Customer Satisfaction.

Everyone in Milwaukee Instruments is committed to exceeding your expectations.

Global Offices



Milwaukee S.r.l.

**Europe, South America, Africa,
Asia, Middle East and Pacific Rim**

Milwaukee S.r.l.

Corso Leonardo Da Vinci 48/50
21013 Gallarate (VA) - ITALY
tel: +39 0331 26 80 09 - fax: +39 0331 26 80 33
e-mail: sales@milwaukee.191.it



Milwaukee Instruments, Inc.






















United States of America

Milwaukee Instruments, Inc.

2950 Business Park Drive
Rocky Mount - NC 27804 - U.S.A.
tel: +1 252 443 3630 - fax: +1 252 443 1937
e-mail: sales@milwaukeetesters.com

Beauty of

Symbols

	CE CE certified products
	IP67 IP67 rated housing protects instrument from water and dust
	GLP (Good Laboratory Practices) Good Laboratory Practices requires that time and date should be recorded with the parameters measured
	USB Port Communication is via opto-isolated USB port
	RS232 Port Communication via opto-isolated RS232 port
	2 Years Warranty Instruments are covered by 2 years warranty
	3 Years Warranty Instruments are covered by 3 years warranty
	7 pH Memorized buffers 7 pH Memorized buffers for calibration
	MEM MEM key allows to memorize the last measurement
	LOG LOG key allows to save up to 50 measurements
	ALARM A LED light warns the user in the event the reading is outside the set point
	2 Point Calibration Calibration can be performed at 1 or 2 points
	3 Point Calibration Calibration can be performed at 1, 2 or 3 points
	Multiparameter Instruments Instruments that measure more than 1 parameter
	Automatic Temperature Compensation Automatically corrects the measured value based on the temperature of the solution
	Manual Temperature Compensation Is a method for temperature compensation through the manual input of sample temperature value
	Auto-Buffer Auto-Buffer Recognition ensures that correct buffer values are used during calibration
	Dual Level Display Displays simultaneously 2 parameters
	Replaceable Electrode Instrument with replaceable electrode
	Software CD The instrument is supplied with an application software
	Self-diagnostics Messages. Messages on the LCD to make the calibration easy and accurate

Contents

New Products		2
pH/ORP/ISE/Temp Measurements		
pH/Temp Bench Meter	.....	.3
pH/ORP/Temp Bench Meter	.....	.4
pH/ORP/ISE/Temp Bench Meter	.....	.5
pH Electrodes		
pH Electrodes basic	.....	.6
pH/ORP/ISE/Temp Measurements		
pH/Temp Portable Meter (<i>Professional</i>)	.....	.10
pH/ORP/Temp Portable Meter (<i>Professional</i>)	.....	.11
pH/ORP/Temp Portable Meters (<i>Economical</i>)	.....	.12
pH/Temp Pocket Testers (<i>Professional</i>)	.....	.13
pH/ORP/Temp Pocket Testers (<i>Professional</i>)	.....	.14
pH/ORP/Temp Pocket Testers (<i>Economical</i>)	.....	.15
pH Pocket Testers (<i>Economical</i>)	.....	.16
pH Monitors	.....	.17
pH/ORP Controllers	.....	.18
Conductivity/TDS/NaCl/Temp Measurements		
EC/TDS/NaCl/Temp Bench Meter	.....	.19
EC/TDS/NaCl/Temp Portable Meter (<i>Professional</i>)	.....	.20
EC/TDS Portable Meters (<i>Economical</i>)	.....	.21
EC/TDS/Temp Pocket Testers (<i>Professional</i>)	.....	.22
EC/TDS Pocket Testers (<i>Professional</i>)	.....	.23
EC/TDS Pocket Testers (<i>Economical</i>)	.....	.24
EC/TDS Monitors	.....	.25
Dissolved Oxygen/Temp Measurements		
DO/Temp Bench Meter	.....	.26
DO/Temp Portable Meter (<i>Professional</i>)	.....	.27
DO/Temp Portable Meter (<i>Economical</i>)	.....	.28
Multiparameter Measurements		
pH/ORP/EC/TDS/NaCl/Temp Bench Meter	.....	.29
pH/EC/TDS/Temp Portable Meters (<i>Professional</i>)	.....	.30
pH/EC/TDS Portable Meters (<i>Economical</i>)	.....	.31
Light Measurements		.32
Colorimetric Measurements		
Free, Total Chlorine & pH Portable Photometer	.....	.33
Ammonia, Iron & Phosphate Portable Photometers	.....	.34
Free, Total Chlorine & Chloride Portable Photometers	.....	.35
Turbidity Measurements		.36
Refractometers		
Digital Brix Refractometer	.....	.37
Digital Fructose Refractometer	.....	.38
Digital Glucose Refractometer	.....	.39
Digital Invert Sugar Refractometer	.....	.40
Mechanical Optical Refractometers	.....	.41
Electrodes & Probes		.43
NPK Test Kit		.45
Economical Pocket-Testers		.46
Calibration, Maintenance & Cleaning Solutions		.47

Simplicity

Highlights in this Catalog

New



Mi415: Turbidity Meter

Turbidity refers to the concentration of undissolved, suspended particles present in a liquid. This determination of clarity in water is important in many manufacturing operations such as beverage producers, food processors and potable water treatment plants. Turbidity is measured in Nephelometric Turbidity Units. This meter is designed to provide you a simple yet accurate way to test turbidity on-site.

Mi415 has two operating ranges: 0.00 to 50.00 FNU, and 50 to 1000 FNU that can accommodate the most turbid condition you may encounter. Mi415 is supplied in a hard carrying case, complete with reagents.

Milwaukee turbidity meters use the USEPA, Standard Methods & the European Community accepted methods to meet the strict requirements of professionals in many industries.

Mi180: Multi-parameter pH, ORP, Conductivity, TDS, NaCl and Temperature Bench Meter

Mi180 measures 6 different parameters: pH, ORP, EC, TDS (Total Dissolved Solids), percentage of NaCl and temperature in a variety of ranges. pH calibration can be performed in 3 points selectable between 7 memorized buffers, to provide a very accurate calibration curve even when testing different samples, where very wide differences in pH can be found. The auto-ranging feature for EC and TDS measurements automatically sets the resolution suitable to the tested sample. All measurements can be temperature compensated at 20 or 25°C and the compensation coefficient is selectable by the user. The automatic temperature compensation can also be disabled for measuring the actual conductivity value. The stability indicator on the LCD ensures accuracy. Conductivity readings are performed with the 4-ring probe supplied with the meter. The GLP feature allows users to store and recall data on system status. PC compatible through an RS232 port or USB.

New



New



MA871: Digital Brix Refractometer

The MA871 is an optical instrument that employs the measurement of refractive index to determine the % Brix of sugar in aqueous solutions. The method is both simple and quick. Samples are measured after a simple user calibration with deionized or distilled water. Within seconds the instrument measures the refractive index of the sample and converts it to % Brix concentration units.

The MA871 digital refractometer eliminates the uncertainty associated with mechanical refractometers and is easily portable for measurements in the field.

Mi490: Photometer for Peroxide Value in olive oil

Mi490 is a user-friendly photometer for monitoring peroxide value in the process of oil making. This instrument will give you direct readings, with a range of 0.0 to 25.0 meq O₂/Kg.

The measurement of the oil's chemical degradation is the peroxide value, which measures the degree to which the oil is oxidized. Rancidification is the decomposition of fats and other lipids by hydrolysis and/or oxidation. Hydrolysis will split fatty acid chains away from the glycerol backbone in glycerides. These free fatty acids can then undergo further auto-oxidation. Oxidation primarily occurs with unsaturated fats by a free radical-mediated process.

High peroxide values are a definite indication of a rancid fat, but moderate values may be the result of depletion of peroxides after reaching high concentrations.

New



Mi150

pH/Temperature Laboratory Bench Meter

Mi150 is an advanced pH/Temp microprocessor-based bench meter. It is ideal for students and technicians who need fast and reliable measurements. This meter is provided with a series of new diagnostic features which add an entirely new dimension to the measurement of pH, by allowing the user to dramatically improve the reliability of the measurement:

- Automatic Temperature Compensation (ATC) for good accuracy under fluctuating temperatures;
- Easy to read large custom LCD;
- Easy and Quick Push-button Calibration
- 7 memorized buffers (pH 1.68, 4.01, 6.86, 7.01, 9.18, 10.01 and 12.45) for calibration;
- Messages on the LCD to make the calibration easy and accurate;
- User-selectable "calibration time out" to remind when a new calibration is necessary;
- Stability Indicator prompts whenever reading stabilizes.

Moreover, it offers an extended temperature range from -20°C (-4°F) to 120°C (248°F), using the MA831R interchangeable temperature probe.



Years warranty
3

MEM

ATC

MTC

Points
2

Dual Display

Self diagnostics

Memorized buffers
7

CE

Specifications		Mi150
Range	pH	-2.00 to 16.00 pH
	Temp	-20.0 to 120.0°C / -4.0 to 248.0°F
Resolution	pH	0.01 pH
	Temp	0.1°C (0.1 °F)
Accuracy (@20°C / 68°F)	pH	±0.01 pH
	Temp	±0.4°C / ±0.8°F
Typical EMC	pH	±0.02 pH
Deviation	Temp	±0.4°C / ±0.8°F
pH Automatic Calibration		1 or 2 point-calibration, with 7 memorized buffers
Offset Calibration		±1 pH
Slope Calibration		from 80 to 108%
Temperature Compensation		automatic, from -20.0 to 120.0°C / -4.0 to 248.0°F or manual, without temperature probe
pH Electrode		MA917B/1 (included)
Temperature Probe		MA831R (included)
Environment		0 to 50°C / 32 to 122°F; max RH 95%
Input Impedance		10 ¹² Ohm
Power supply		12 VDC power adapter (included)
Dimensions		230 x 160 x 95 mm
Weight		0.9 kg

Glass Electrode & Temperature Probe

Choose from our wide selection of pH and ORP electrodes at pages 6 and 39.

Innovative Design

Compact-size ergonomic design with electrode holder that can hold multiple electrodes & probes.



Accessories

- MA9001 pH 1.68 buffer solution, 230 mL bottle
- MA9004 pH 4.01 buffer solution, 230 mL bottle
- MA9006 pH 6.86 buffer solution, 230 mL bottle
- MA9007 pH 7.01 buffer solution, 230 mL bottle
- MA9009 pH 9.18 buffer solution, 230 mL bottle
- MA9010 pH 10.01 buffer solution, 230 mL bottle
- MA9012 Refilling solution for double junction electrode, 230 mL bottle
- MA9015 Electrode storage solution, 230 mL bottle



- MA9016 Electrode cleaning solution, 230 mL bottle
- MA9112 pH 12.45 buffer solution, 230 mL bottle
- MA9310 12 VDC Adapter, 220 V
- MA9311 12 VDC Adapter, 110 V
- MA9315 Electrode Holder
- MA917B/1 Glass body, double junction refillable pH electrode
- MA831R Temperature probe

Ordering Information

- Mi150 is supplied complete with:
- MA917B/1 Double junction refillable pH electrode
 - MA831R Temperature Probe
 - MA9315 Electrode Holder
 - M10004 pH 4.01 Sachet Buffer Solution
 - M10007 pH 7.01 Sachet Buffer Solution
 - M10010 pH 10.01 Sachet Buffer Solution
 - M10016 Sachet Electrode Cleaning Solution
 - Graduate Pipet
 - 12 VDC Adapter
 - Instruction manual

Years
warranty
3

MEM

ATC

MTC

Points
2Dual
DisplaySelf
diagnosticsMemorized
buffers
7

CE



This high performance economy microprocessor-based pH/ORP/Temp Bench meter is an ideal tool in schools, laboratories and production plants. It is provided with a series of new diagnostic features which add an entirely new dimension to the measurement of pH, by allowing the user to dramatically improve the reliability of the measurement:

- Automatic Temperature Compensation (ATC) for good accuracy under fluctuating temperatures;
- Hold Function freezes reading for easy viewing;
- Easy to read large custom LCD;
- Stability Indicator prompts whenever reading stabilizes;
- 7 memorized buffers (pH 1.68, 4.01, 6.86, 7.01, 9.18, 10.01 and 12.45) for calibration;
- Messages on the LCD to make the calibration easy and accurate;
- User-selectable "calibration time out" to remind when a new calibration is necessary.

Mi151 can also measure with ORP electrodes, thanks to its capability to measure mV with a resolution up to 0.1 mV. For accurate measurements, use the electrode holder supplied with the meter.

Specifications Mi151

Range	pH	-2.00 to 16.00 pH
	mV	±699.9 mV / ±1999 mV
	Temp	-20.0 to 120.0°C / -4.0 to 248.0°F
Resolution	pH	0.01 pH
	mV	0.1 mV / 1 mV
	Temp	0.1°C (0.1°F)
Accuracy (@ 20°C)	pH	±0.01 pH
	mV	±0.2 mV / ±1 mV
	Temp	±0.4°C / ±0.8°F
Typical EMC Deviation	pH	±0.02 pH
	mV	±0.2 mV / ±1 mV
	Temp	±0.4°C / ±0.8°F
pH Automatic Calibration	1 or 2 point-calibration, with 7 memorized buffers	
Offset Calibration	±1 pH	
Slope Calibration	from 80 to 108%	
Temperature Compensation	automatic, from -20.0 to 120.0°C / -4.0 to 248.0°F or manual, without temperature probe	
pH Electrode	MA 917B/1 (included)	
Temperature Probe	MA 831R (included)	
Environment	0 to 50°C / 32 to 122°F; max RH 95%	
Input Impedance	10 ¹² Ohm	
Power supply	12 VDC power adapter (included)	
Dimensions	230 x 160 x 95 mm	
Weight	0.9 kg	

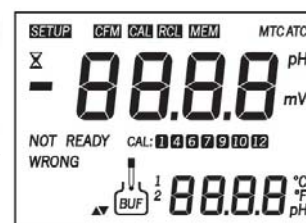
Glass Electrode & Temperature Probe



Choose from our wide selection of pH and ORP electrodes at pages 6 and 39.

Custom dual level LCD

Large and easy-to-read Custom dual level LCD Display with simultaneous readings and with user-friendly icons.



Accessories

MA9001	pH 1.68 buffer solution, 230 mL bottle
MA9004	pH 4.01 buffer solution, 230 mL bottle
MA9006	pH 6.86 buffer solution, 230 mL bottle
MA9007	pH 7.01 buffer solution, 230 mL bottle
MA9009	pH 9.18 buffer solution, 230 mL bottle
MA9010	pH 10.01 buffer solution, 230 mL bottle
MA9012	Refilling solution for double junction electrode, 230 mL bottle
MA9015	Electrode storage solution, 230 mL
MA9016	Electrode cleaning solution, 230 mL



MA9112	pH 12.45 buffer solution, 230 mL bottle
MA9310	12 VDC Adapter, 220 V
MA9311	12 VDC Adapter, 110 V
MA9315	Electrode Holder
MA917B/1	Glass body, double junction refillable pH electrode
MA921B/1	Double junction, gel filled ORP electrode with platinum sensor
MA831R	Temperature probe

Ordering Information

Mi151 is supplied complete with:

- MA917B/1 Double junction refillable pH electrode
- MA831R Temperature Probe
- MA9315 Electrode Holder
- M10004 pH 4.01 Sachet Buffer Solution
- M10007 pH 7.01 Sachet Buffer Solution
- M10010 pH 10.01 Sachet Buffer Solution
- M10016 Sachet Electrode Cleaning Solution
- Graduate Pipet
- 12 VDC Adapter
- Instruction manual

Mi160

pH/ORP/ISE/Temperature Laboratory Bench Meter

New

This new pH/ORP/ISE/Temp bench meter is ideal for very accurate and precise measurements for all laboratory needs. It can perform ion-selective measurements directly in ppm, as well as pH, ORP and temperature measurements. pH calibration can also be performed in 3 points selectable between 7 memorized buffers, to provide a very accurate calibration curve even when testing different samples, where very wide differences in pH can be found. Thanks to the memory it can store up to 50 data sets for each range that can be downloaded to a PC via RS232 or USB. These instruments also have GLP features so, at any time, the user can recall the calibration data.

- 7 memorized buffers (pH 1.68, 4.01, 6.86, 7.01, 9.18, 10.01 and 12.45) for pH calibration
- pH calibration up to 3 points
- ISE calibration up to 2 points; six standard solutions available: 0.01, 0.1, 1, 10, 100, 1000 ppm
- Messages on the LCD to make the calibration easy and accurate
- Relative mV feature
- GLP feature, to view last calibration data for pH or ISE



Years warranty
3

LOG

ATC

MTC

Points
3

RS232

USB

Software
CD

GLP

Dual
Display

Self
diagnostics

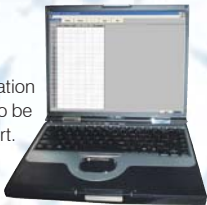
Memorized
buffers
7

CE

Specifications		Mi160
Range	pH	-2.00 to 16.00 pH
	mV	±699.9 mV / ±2000 mV
	ISE	0.001 to 19999 ppm
	Temp	-20.0 to 120.0°C / -4.0 to 248.0°F
Resolution	pH	0.01 pH
	mV	0.1 mV / 1 mV
	ISE	0.001 (0.001 to 9.999) ppm; 0.01 (10.00 to 99.99) ppm; 0.1 (100.0 to 999.9) ppm; 1 (1000 to 19999) ppm
	Temp	0.1°C / 0.1°F
Accuracy (@20°C)	pH	±0.01 pH
	mV	±0.2 mV / ±1 mV
	ISE	±0.5% Full Scale
	Temp	±0.4°C / ±0.8°F
Rel mV offset		±2000 mV
pH Calibration		1, 2 or 3 point-calibration, with 7 memorized buffers
ISE Calibration		1 or 2 point calibration, 6 standard solutions available
Temperature Compensation		automatic, from -20.0 to 120.0°C / -4.0 to 248.0°F or manual, without temperature probe
pH Electrode		MA917B/1 (included)
Temperature Probe		MA831R (included)
Environment		0 to 50°C / 32 to 122°F; max RH 95%
Input Impedance		10 ¹² Ohm
Power Supply		12 VDC power adapter (included)
Dimensions		230 x 160 x 95 mm
Weight		1.1 kg

Easy PC Compatibility

RS232 or USB communication interface allows readings to be downloaded to a serial port.



Rear Connector Panel layout

Communication to the PC is done via opto-isolated USB and RS232 ports.



Accessories

- MA9001 pH 1.68 buffer solution, 230 mL bottle
- MA9004 pH 4.01 buffer solution, 230 mL bottle
- MA9006 pH 6.86 buffer solution, 230 mL bottle
- MA9007 pH 7.01 buffer solution, 230 mL bottle
- MA9009 pH 9.18 buffer solution, 230 mL bottle
- MA9010 pH 10.01 buffer solution, 230 mL bottle
- MA9012 Refilling solution for double junction electrode, 230 mL bottle
- MA9015 Electrode storage solution, 230 mL
- MA9016 Electrode cleaning solution, 230 mL
- MA9112 pH 12.45 buffer solution, 230 mL bottle

- MA9310 12 VDC Adapter, 220 V
- MA9311 12 VDC Adapter, 110 V
- MA9315 Electrode Holder
- MA917B/1 Glass body, double junction refillable pH electrode
- MA921B/1 Double junction, gel filled ORP electrode with platinum sensor
- MA831R Temperature probe
- MA9350 RS232 connection cable with 2 m cable
- Mi5200 Application Software

Ordering Information

- Mi160 is supplied complete with:
- MA917B/1 Double junction refillable pH electrode
 - MA831R Temperature Probe
 - MA9315 Electrode Holder
 - M10004 pH 4.01 Sachet Buffer Solution
 - M10007 pH 7.01 Sachet Buffer Solution
 - M10010 pH 10.01 Sachet Buffer Solution
 - M10016 Sachet Electrode Cleaning Solution
 - Mi5200 Application Software
 - MA9350 RS232 connection cable with 2 meters cable
 - Graduate Pipet, 12 VDC Adapter & Instruction manual



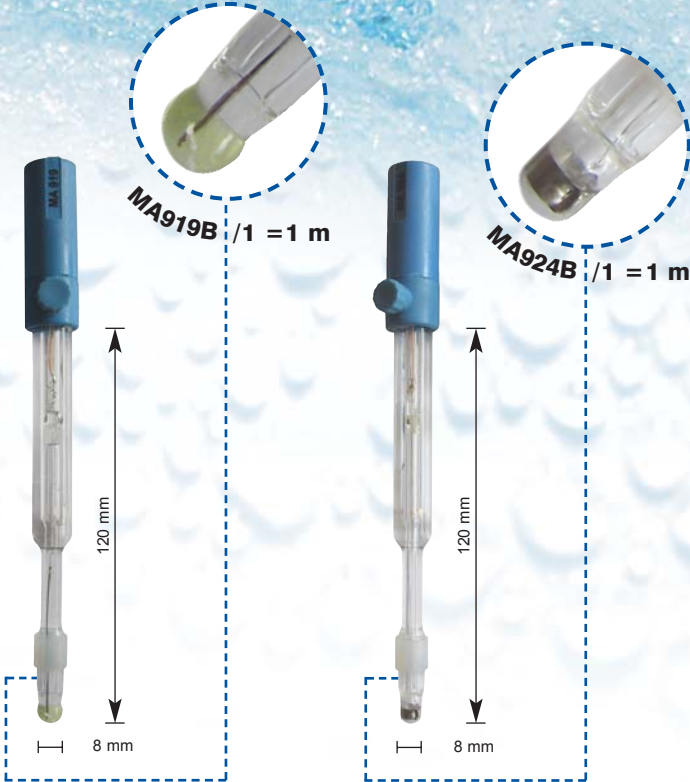
Milwaukee has a wide assortment of pH and ORP electrodes to meet all your specific requirements. Finding the right electrode for a specific application is a very important task and in order to solve this selection problem it is important to consider the following:

- Glass body electrode versus Epoxy (plastic) body electrode:** Glass body electrodes stand higher temperatures (typically 100°C against 80°C for plastic) and are more resistant to corrosive chemicals and solvents. They are easier to clean and are available in different shapes depending on the application. On the other hand plastic body electrodes are more rugged and the glass bulb is better protected.
- Gel filled electrodes versus refillable electrodes:** refillable electrodes last longer since electrolyte can be changed for repeated usage. The response is faster due to a greater outflow of electrolyte into the sample and therefore less likely to clog. Gel filled electrodes require less maintenance and resist to higher pressure.
- Double reference junction versus Single junction reference:** Double junction reference electrodes have a longer live and protects the sample measured from silver contamination from the electrolyte. The Silver wire is more protected and therefore gets less contaminated. The single junction electrodes normally costs less and are ideal for general purpose applications
- Conic shaped versus Sphere shaped:** The conic-shaped electrode is easier to clean and to maintain (ideal for applications such as dairy). Has a more rugged tip and therefore ideal for penetration. The sphere-shaped has a faster response time due to the larger surface area on the bulb.

pH Electrode basics

pH electrodes are constructed from a special composition glass which senses the hydrogen ion concentration. This glass is typically composed of alkali metal ions. The alkali metal ions of the glass and the hydrogen ions in solution undergo an ion exchange reaction, generating a potential difference. In a combination pH electrode, the most widely used variety, there are actually two electrodes in one body. One portion is called the measuring electrode, the other the reference electrode. The potential generated at the junction site of the measuring portion is due to the free hydrogen ions present in solution.

The potential of the reference portion is produced by the internal element in contact with the reference fill solution. This potential is always constant. In summary, the measuring electrode delivers a varying voltage and the reference electrode delivers a constant voltage to the meter. The voltage signal produced by the pH electrode is a very small, high impedance signal. The input impedance requires that it be interfaced only with equipment with high impedance circuits.



Model	MA919B/1	MA924B/1
Measuring Range	0 to 13 pH	±2000 mV
Temperature Range	-5 to 80 °C	-5 to 80 °C
Shaft material	glass	glass
Reference Electrolyte	KCL 3.5M	KCL 3.5M
Reference Type	double Ag/AgCl	double Ag/AgCl
Reference Junction	open	open
Shape of membrane	spheric	Platinum ring
Max. Pressure	0,1 bar	0,1 bar
Connector type	BNC	BNC
Cable length	coaxial 1 meter	coaxial 1 meter
Shaft length	120 mm	120 mm
Diameter	8 mm	8 mm
Application	food laboratory	food laboratory

pH Electrode basics

The pH electrode, due to the nature of its construction, needs to be kept moist at all times. In order to operate properly, glass needs to be hydrated. Hydration is required for the ion exchange process to occur. If an electrode should become dry, it is best to place it in some tap water for a half hour to condition the glass.

pH electrodes are like batteries; they run down with time and use. As an electrode ages, its glass changes resistance. This resistance change alters the electrode potential. For this reason, electrodes need to be calibrated on a regular basis. Calibration in pH buffer solution corrects for this change. Calibration of any pH equipment should always begin with buffer 7.0 as this is the "zero point." The pH scale has an equivalent mV scale. The mV scale ranges from +420 to -420 mV. At a pH of 7.0 the mV value is 0. Each pH change corresponds to a change of approx. ±60 mV. As pH values become more acidic the mV values become greater. pH electrodes have junctions which allow the internal electrolyte solution of the measuring electrode to leak out into the solution being measured.

Glass Conic Tip Sensor



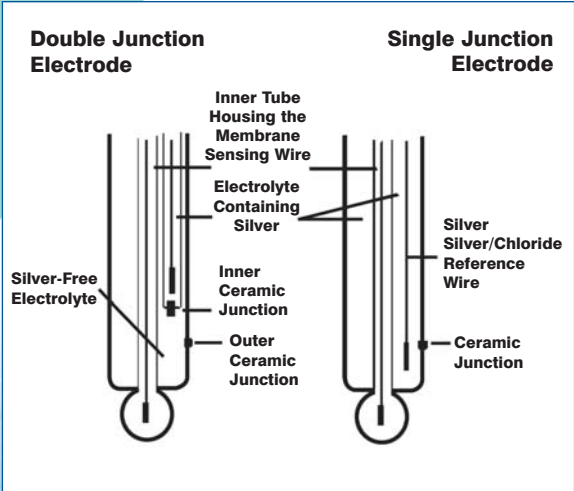
Glass Spheric Sensor



Epoxy Electrode

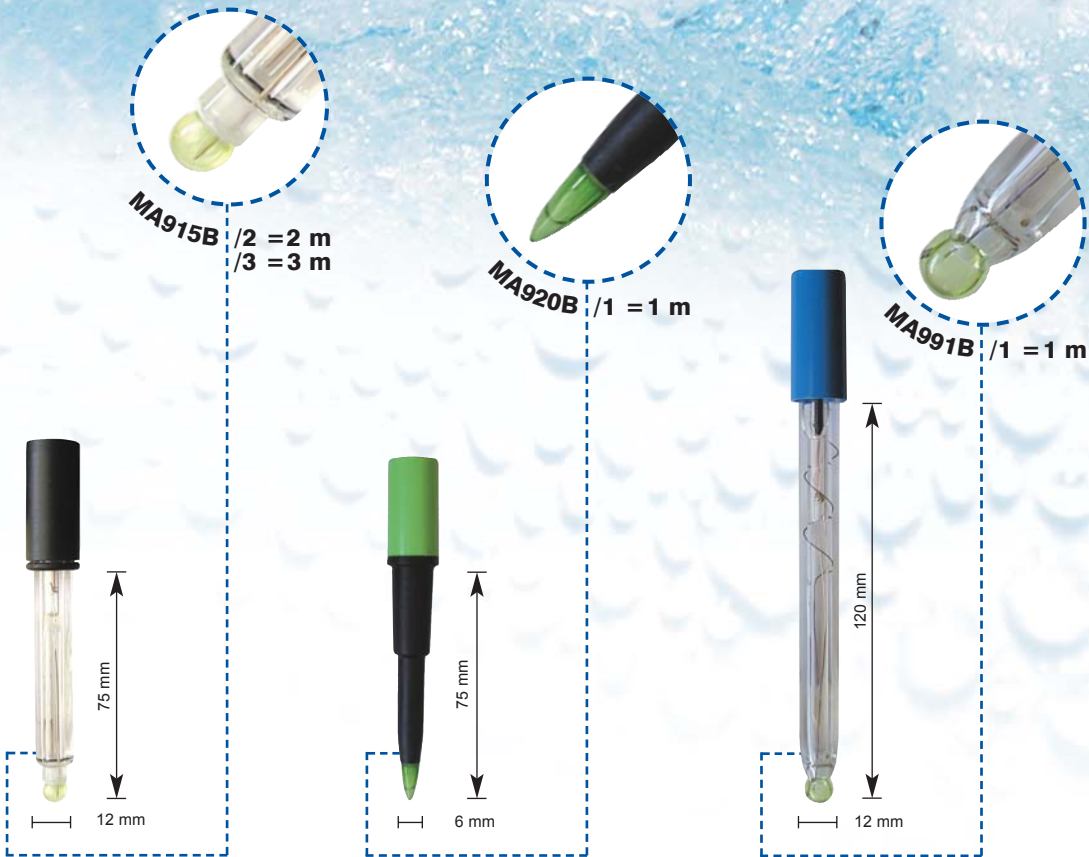


Model	MA916B/1-MA916B/3	MA917B/1	MA918B/1
Measuring Range	0 to 13 pH	0 to 14 pH	0 to 12 pH
Temperature Range	-5 to 100°C (23 to 212°F)	0 to 100°C (32 to 212°F)	-5 to 100°C (23 to 212°F)
Shaft Material	glass	glass	glass
Reference Electrolyte	KCl 3.5M + AgCl	KCl 3.5M	KCl 3.5M + AgCl
Reference Junction	ceramic, single	ceramic, single	ceramic, triple
Reference Type	single, Ag/AgCl	double, Ag/AgCl	single, Ag/AgCl
Shape of membrane	spheric	spheric	conic
Max pressure	0.1 bar	0.1 bar	0.1 bar
Connector Type	BNC	BNC	BNC
Cable length	coaxial, 1 or 3 m	coaxial, 1 m	coaxial, 1 m
Shaft length	120 mm	120 mm	120 mm
Diameter	12 mm	12 mm	12 mm
Application	laboratory applications	laboratory applications	laboratory applications



This junction can become clogged by particulates in the solution and can also facilitate poisoning by metal ions present in the solution. If a clogged junction is suspected it is best to soak the electrode in tap water to dissolve the material and clear the junction. When not in use it is best to store the electrode in either buffer 4.0 or buffer 7.0. Never store an electrode in distilled or deionized water as this will cause migration of the electrolyte solution from the electrode.

How long a pH electrode will last will depend on how it is cared for and the solutions it is used to measure. Typically, a gel-filled combination pH electrode will last six months to 1 year depending on the care and application. How long an electrode will last is determined by how well the probe is maintained and the pH application. The harsher the system, the shorter the lifespan. For this reason it is always a good idea to have a back-up electrode on hand to avoid any system down time. Calibration is also an important part of electrode maintenance. This assures not only that the electrode is behaving properly but that the system is operating correctly.



Model	MA915B/2 - MA915B/3	MA920B/1	MA991B/1
Measuring Range	0 to 13 pH	0 to 12 pH	0 to 13 pH
Temperature Range	-5 to 95°C	0 to 50°C (32 to 122°F)	-5 to 100°C (23 to 212°F)
Shaft Material	glass	PVDF	glass
Reference Electrolyte	polymer	Viscolene	KCl 3.5M
Reference Junction	ground glass	open	ceramic, single
Reference Type	double, ground glass	single, Ag/AgCl	single, Ag/AgCl
Shape of membrane	spheric	conic	spheric
Max pressure	3 bar	0.1 bar	0.1 bar
Connector Type	BNC	BNC	BNC
Cable length	2 or 3 m	coaxial, 1 m	coaxial, 1 m
Shaft length	75 mm	75 mm	più di 120 mm
Diameter	12 mm	6 mm	12 mm
Application	industrial applications	laboratory applications	laboratory applications

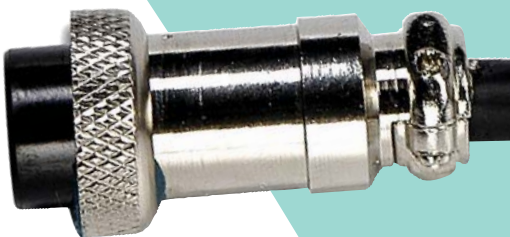
pH Electrode basics

Temperature compensation: When measuring pH using a pH electrode the temperature error from the electrode varies based on the Nernst Equation as 0.03pH/10C/unit of pH away from pH7. The error due to temperature is a function of both temperature and the pH being measured. Temperature compensation can be achieved manually or automatically. Manual temperature compensation is usually achieved by entering the temperature of the fluid being measured into the instruments menu and then the instrument will display a "Temperature Compensated" pH reading.

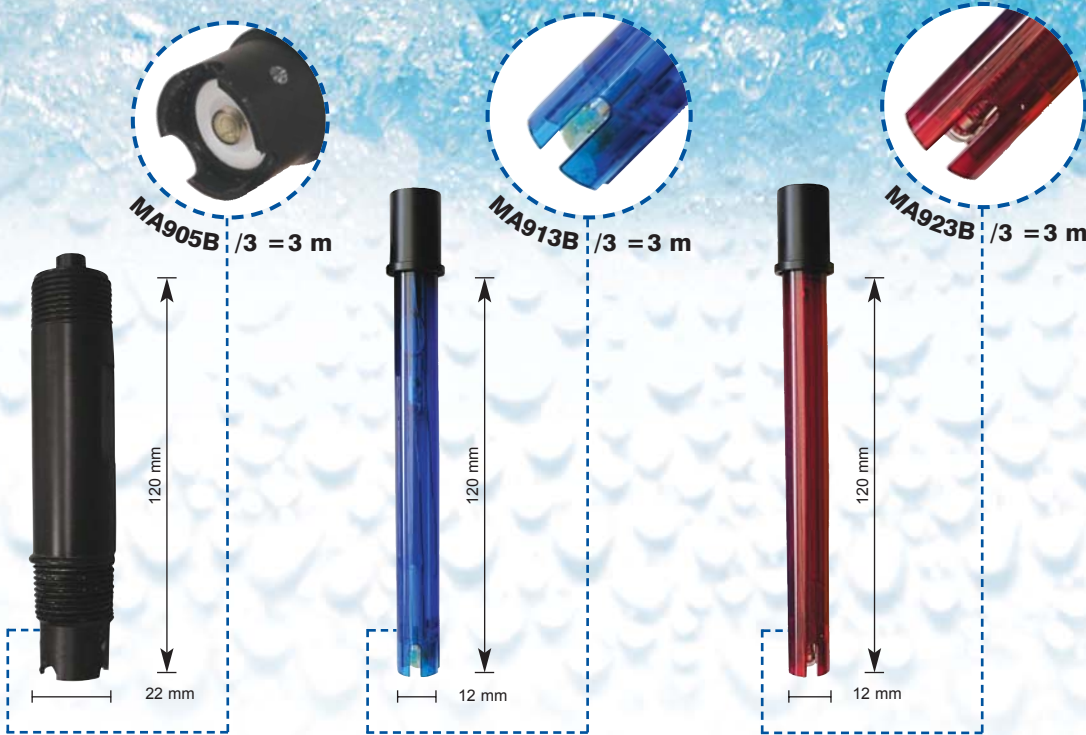
This means that the temperature is corrected to the value expected at 25 Deg C. Automatic temperature compensation requires input from a temperature sensor and constantly sends a compensated pH signal to the display. Automatic temperature compensation is useful for measuring pH in systems with wide variations in temperature.



DIN Connector



BNC Connector



Model	MA905B/3	MA913B/3	MA923B/3
Measuring Range	0 to 13 pH	0 to 13 pH	±1999 mV
Temperature Range	-5 to 95°C	0 to 60°C (32 to 140°F)	0 to 80°C (32 to 176°F)
Shaft Material		Epoxy	Epoxy
Reference Electrolyte	polymer	gel	gel
Reference Junction	double, Teflon	ceramic, single	cloth
Reference Type		single, Ag/AgCl	single, Ag/AgCl
Shape of membrane		spheric	spheric
Max pressure	6 bar	2 bar	3 bar
Connector Type	3/4" NPT - BNC	BNC	DIN
Cable length	3 m	coaxial, 3 m	7-pole, 1 m
Shaft length	120 mm	120 mm	120 mm
Diameter	22 mm	12 mm	14 mm
Application	industrial applications	water, waste water	water, waste water

Mi105

Portable pH/Temp Meter

Years
warranty
3

ATC

Points
2

Dual
Display

Self
diagnostics

CE



Extended Range pH and Temperature Meter in a compact casing

The included electrode has a built-in temperature sensor and amplifier to prevent electrical interference.

The large display shows readings in an extended range from -2.00 to 16.00 pH and simultaneously shows temperature from -5.0 to 105.0°C or 23 to 221°F.

The Mi105 has a stability indicator and hold feature that freezes the display for easy and accurate recording. The large display also has graphic symbols to guide you through all operations. The battery life of the meters guarantees over 500 hours of continuous use.

When switched ON it performs a self-check and displays the percentage of the remaining battery level to assure proper working condition. Calibration is performed automatically at 1 or 2 points using standard or NIST buffers.



Specifications	Mi105
Range(*)	pH -2.00 to 16.00 pH Temp -5.0 to 105.0°C / 23.0 to 221.0°F
Resolution	pH 0.01 pH Temp 0.1 °C / 0.1 °F
Accuracy (@25°C)	pH ±0.02 pH Temp ±0.5°C up to 60°C; ±1°C outside / ±1°F up to 140°F; ±2°F outside
Typical EMC Deviation	pH ±0.02 pH Temp ±0.2°C / ±0.4°F
Temperature Compensation	automatic, from -5 to 80°C
pH Calibration	automatic, 1 or 2 points
Probe	MA914BR/1, amplified pH/temperature probe (included)
Environment	0 to 50°C / 32 to 122°F; max RH 100%
Battery Type	1 x 9V alkaline (included)
Battery Life	approx. 500 hours of use
Auto-off	after 8 minutes of non-use
Dimensions	200x85x50 mm
Weight	260 g (with battery)

(*) The temperature range is limited to 80°C (176°F) if using the MA914BR/1 probe.

Calibration, Maintenance & Cleaning Solutions

Choose from our wide selection of calibration, maintenance and cleaning solutions at page 43.



Accessories

- MA914BR/1 Combination amplified pH/Temp probe with BNC & RCA connectors and 1 m cable
- M10004B pH 4.01 buffer solution 20 mL sachet (25 pcs)
- M10006B pH 6.86 buffer solution 20 mL sachet (25 pcs)
- M10007B pH 7.01 buffer solution 20 mL sachet (25 pcs)
- M10009B pH 9.18 buffer solution 20 mL sachet (25 pcs)



- M10010B pH 10.01 buffer solution, 20 mL sachet (25 pcs)
- MA9004 pH 4.01 buffer solution, 230 mL bottle
- MA9006 pH 6.86 buffer solution, 230 mL bottle
- MA9007 pH 7.01 buffer solution, 230 mL bottle
- MA9009 pH 9.18 buffer solution, 230 mL bottle
- MA9010 pH 10.01 buffer solution, 230 mL bottle
- MA9015 Electrode storage solution, 230 mL
- MA9016 Electrode cleaning solution, 230 mL
- M10000B Electrode rinse solution, 20 mL (25 pcs)

Ordering Information

Mi105 is supplied complete with MA914BR/1 pH/Temp amplified probe with 1 meter cable, 20 mL pH 4.01 and 7.01 sachet of calibration solution, 2x20 mL sachet of electrode cleaning solutions, 9V battery and instructions, all in a rugged carrying case.

Mi106

Portable pH/ORP/Temp Meter

Extended Range pH/ORP/Temperature Meter

The Mi106 multi parameter portable meter is ideal for field measurements. The included combined pH/ORP electrode has a built-in temperature sensor and amplifier to prevent electrical interference. The large display shows readings in an extended range from -2.00 to 16.00 pH or ± 2000 mV and simultaneously shows temperature from -5.0 to 105.0°C or 23 to 221°F.

The Mi106 has a stability indicator and hold feature that freezes the display for easy and accurate recording. The large display also has graphic symbols to guide you through all operations. When switched ON it performs a self-check and displays the percentage of the remaining battery level to assure proper working condition.

Calibration is performed automatically at 1 or 2 points using standard or NIST buffers.



Years warranty
3

ATC

Points
2

Dual Display

Self diagnostics

CE

Specifications	Mi106
Range (*)	pH -2.00 to 16.00 pH mV -2000 to +2000 mV Temp -5.0 to 105.0°C / 23.0 to 221.0°F
Resolution	pH 0.01 pH mV 1 mV Temp 0.1°C / 0.1°F
Accuracy (@25°C)	pH ± 0.02 pH mV ± 2 mV Temp $\pm 0.5^\circ\text{C}$ up to 60°C; $\pm 1^\circ\text{C}$ outside / $\pm 1^\circ\text{F}$ up to 140°F; $\pm 2^\circ\text{F}$ outside
Typical EMC Deviation	pH ± 0.02 pH mV ± 2 mV Temp $\pm 0.2^\circ\text{C}$ / $\pm 0.4^\circ\text{F}$
Temperature Compensation	automatic, from -5 to 80°C / 23 to 176°F
pH Calibration	automatic, 1 or 2-point
ORP Calibration	factory calibrated
Probe	MA923D/1, amplified pH/ORP/temperature probe (included)
Environment	0 to 50°C / 32 to 122°F; max RH 95%
Battery	1 x 9V alkaline (included)
Battery life	approx. 500 hours of use
Auto-off	after 8 minutes of non-use
Dimensions	200 x 85 x 50 mm
Weight	260 g (with battery)

(*) The temperature range is limited to 80°C (176°F) if using the MA923D/1 probe.

Hard Carrying Case

Each meter is supplied in a hard carrying case ideal for field measurements.



Accessories

- MA923D/1 Combination amplified pH/ORP/Temp probe with DIN connector and 1 m cable
- M10004B pH 4.01 buffer solution 20 mL sachet (25 pcs)
- M10006B pH 6.86 buffer solution 20 mL sachet (25 pcs)
- M10007B pH 7.01 buffer solution 20 mL sachet (25 pcs)
- M10009B pH 9.18 buffer solution 20 mL sachet (25 pcs)



- M10010B pH 10.01 buffer solution 20 mL sachet (25 pcs)
- MA9004 pH 4.01 buffer solution, 230 mL bottle
- MA9006 pH 6.86 buffer solution, 230 mL bottle
- MA9007 pH 7.01 buffer solution, 230 mL bottle
- MA9009 pH 9.18 buffer solution, 230 mL bottle
- MA9010 pH 10.01 buffer solution, 230 mL bottle
- MA9015 Electrode storage solution, 230 mL
- MA9016 Electrode cleaning solution, 230 mL
- M10000B Electrode rinse solution, 20 mL sachet (25 pcs)

Ordering Information

Mi106 is supplied complete with MA923D/1 pH/ORP/Temp amplified probe with 1 meter cable, 20 mL pH 4.01 and 7.01 sachet of calibration solution, 2x20 mL sachet of electrode cleaning solutions, 9V battery, instructions, all in a rugged carrying case.



SM100/SM101/SM102/SM500 Portable pH/ORP/Temp Meters

Smart portable meters with no frills!





Milwaukee's low cost durable meters for quick and reliable measurements.

Milwaukee's Smart meters are manufactured to be easy to use, practical and accurate. Ideal for the classroom, laboratory or for general field use.

- **SM100** performs pH measurements with a 0.1 pH resolution and with manual temperature compensation.
- **SM101** performs pH measurements with a 0.01 pH resolution and with manual temperature compensation.
- **SM102** is a microprocessor based pH/Temperature meter with extended range (-2.00 to 16.00 pH), Automatic Temperature Compensation, automatic calibration in 2 points and ± 0.02 pH accuracy.
- **SM500** performs ORP measurements with a range of ± 1000 mV.

All meters are supplied with pH or ORP electrodes and calibration solutions.

Specifications

		 SM100 pH Meter	 SM101 pH Meter	 SM102 pH/Temp Meter	 SM500 ORP Meter
Range	pH/ORP Temp	0.0 to 14.0 pH	0.00 to 14.00 pH	-2.00 to 16.00 pH -5 to 70°C	± 1000 mV
Resolution	pH/ORP Temp	0.1 pH	0.01 pH	0.01 pH 0.1°C	1 mV
Accuracy (@25°C)	pH/ORP Temp	± 0.2 pH	± 0.02 pH	± 0.02 pH $\pm 0.5^\circ\text{C}$	± 5 mV
Typical EMC Deviation	pH Temp			± 0.02 pH $\pm 0.5^\circ\text{C}$	
Temperature Compensation		manual, 0 to 50°C	manual, 0 to 50°C	automatic, 0 to 70°C	
Calibration		manual, 2-point through offset and slope trimmers	manual, 2-point through offset and slope trimmers	automatic, at 1 or 2 points	
pH Electrode		MA911B/1 (included)	MA911B/1 (included)	MA911B/1 (included)	
ORP Electrode					MA921B/1 (included)
Temperature Probe				MA830R (included)	
Environment		0 to 50°C, max RH 95%	0 to 50°C, max RH 95%	0 to 50°C; max RH 95%	0 to 50°C; max RH 95%
Battery Type		1 x 9V alkaline (included)	1 x 9V alkaline (included)	1 x 9V alkaline (included)	1 x 9V alkaline (included)
Battery Life		approx. 300 hours of use	approx. 300 hours of use	approx. 300 hours of use after 8 minutes of non-use	approx. 300 hours of use
Auto-off					
Dimensions		145 x 80 x 40 mm	145 x 80 x 40 mm	145 x 80 x 40 mm	145 x 80 x 40 mm
Weight		220 g (with battery)	220 g (with battery)	220 g (with battery)	220 g (with battery)

Accessories

M10004B	pH 4.01 buffer solution 20 mL sachet (25 pcs)
M10007B	pH 7.01 buffer solution 20 mL sachet (25 pcs)
M10010B	pH 10.01 buffer solution 20 mL sachet (25 pcs)
MA9004	pH 4.01 buffer solution, 230 mL bottle
MA9007	pH 7.01 buffer solution, 230 mL bottle
MA9010	pH 10.01 buffer solution, 230 mL bottle
MA9015	Electrode storage solution, 230 mL

MA9016	Electrode cleaning solution, 230 mL
M10000B	Electrode rinse solution, 20 mL sachet (25 pcs)
MA911B/1	pH electrode with BNC connector and 1 m cable
MA9020	200-275 mV ORP solution, 230 mL bottle
MA921B/1	Platinum ORP electrode with 1 m cable
MA950	Portable meter wall fixing kit
MA830R	Temperature probe



Ordering Information

SM100 and SM101 are supplied complete with a MA911B/1 pH electrode, pH 7.01 20 mL sachet of calibration solution, calibration screwdriver, 9V battery and instructions.

SM102 is supplied complete with a MA911B/1 pH electrode, MA830R stainless steel temperature probe, pH 4.01 and pH 7.01 20 mL sachet of calibration solution, 9V battery and instructions.

SM500 is supplied complete with a MA921B/1 platinum electrode, 9V battery and instructions.

pH55/pH56 Pocket-size pH/Temperature Meters with replaceable electrode

IP67 Waterproof pH testers with Large dual-level LCD that displays pH and temperature (°C or °F). The large display shows readings in an extended range from -2.0 to 16.0 pH (pH56 has a 0.01 pH resolution) and simultaneously shows temperature from -5.0 to 105.0°C or 23.0 to 221.0°F. They have a stability indicator and hold function that freezes the display for easy and accurate recording. The large display also has graphic symbols to guide you through all operations. Complete with a temperature probe for faster and more precise temperature measurement they compensate automatically for temperature. Calibration is made automatically in 1 or 2 points with memorized standard and NIST buffer sets. Auto power OFF saves battery power after non-use.

The double-junction electrode can be replaced in a very fast and simple way!
The modular design allows easy electrode and battery replacement.



- Years warranty 2
- ATC
- IP67
- Points 2
- AUTO Buffer
- Dual Display
- Self diagnostics
- CE

Specifications

		pH55	pH56
Range	pH Temp	-2.0 to 16.0 pH -5.0 to 60.0°C / 23.0 to 140.0°F	-2.00 to 16.00 pH -5.0 to 60.0°C / 23.0 to 140.0°F
Resolution	pH Temp	0.1 pH 0.1°C / 0.1°F	0.01 pH 0.1°C / 0.1°F
Accuracy (@25°C)	pH Temp	±0.1 pH ±0.5°C / ±1°F	±0.05 pH ±0.5°C / ±1°F
Typical EMC Deviation	pH Temp	±0.1 pH ±0.3°C / ±0.6°F	±0.02 pH ±0.3°C / ±0.6°F
Calibration		automatic, 1 or 2 points with 2 sets of memorized buffers (pH 4.01, 7.01, 10.01 or 4.01, 6.86, 9.18)	automatic, 1 or 2 points with 2 sets of memorized buffers (pH 4.01, 7.01, 10.01 or 4.01, 6.86, 9.18)
Temperature Compensation		automatic, from -5 to 60°C	automatic, from -5 to 60°C
Probe		Mi56P (replaceable)	Mi56P (replaceable)
Environment		-5 to 50°C / 32 to 122°F; max RH 100%	-5 to 50°C / 32 to 122°F; max RH 100%
Battery Type		4 x 1.5V; IEC LR44, A76 (included)	4 x 1.5V; IEC LR44, A76 (included)
Battery Life		approx. 300 hours of use	approx. 300 hours of use
Auto-off		after 8 minutes of non-use	after 8 minutes of non-use
Dimensions		200 x dia 38 mm	200 x dia 38 mm
Weight		100 g	100 g

Temperature Sensor

The pH55 and pH56's exposed temperature sensor provides fast response time, and its proximity to the pH electrode guarantees much more accurate temperature compensated readings.

Replaceable electrode

Replace the electrode in a fast and simple way yourself! Just unscrew the plastic ring on the top of the electrode and replace the electrode with a new one.



Accessories

- MAi56P Replaceable electrode for pH55 & pH56
- M10004B pH 4.01 buffer solution 20 mL sachet (25 pcs)
- M10007B pH 7.01 buffer solution 20 mL sachet (25 pcs)
- M10010B pH 10.01 buffer solution 20 mL sachet (25 pcs)
- MA9004 pH 4.01 buffer, 230 mL bottle

- MA9006 pH 6.86 buffer solution, 230 mL bottle
- MA9007 pH 7.01 buffer solution, 230 mL bottle
- MA9009 pH 9.18 buffer solution, 230 mL bottle
- MA9010 pH 10.01 buffer solution, 230 mL bottle
- MA9015 Electrode storage solution, 230 mL
- MA9016 Electrode cleaning solution, 230 mL
- M10000B Electrode rinse solution, 20 mL sachet (25 pcs)



Ordering Information

pH55 is supplied complete with protective cap, 20 mL, pH 4.01 and pH 7.01 sachets of calibration solution, hard carrying case, batteries and instructions.

pH56 is supplied complete with protective cap, 20 mL, pH 4.01 and pH 7.01 sachets of calibration solution, hard carrying case, batteries and instructions.

- Years warranty 2
- ATC
- IP67
- Points 2
- AUTO Buffer
- Dual Display
- Self diagnostics
- CE



ORP57/pH58

Pocket-size pH/ORP/Temperature Meters with replaceable electrode

Combination waterproof testers with advanced functions also include the new model pH58 for simultaneous pH and ORP measurements and temperature, which is continuously displayed on the dual level LCD. It shows readings in an extended range from -2.00 to 16.00 pH or ± 1000 mV and simultaneously shows temperature from -5.0 to 105.0°C or 23 to 221°F.

The pH58 has a stability indicator and hold feature that freezes the display for easy and accurate recording. The large display also has graphic symbols to guide you through all operations. Calibration is performed automatically at 1 or 2 points using standard or NIST buffers.

The modular design allows easy electrode and battery replacement.



Specifications

	ORP57	pH58
Range	pH ORP Temp ± 1000 mV -5.0 to 60.0°C / 23.0 to 140.0°F	-2.00 to 16.00 pH ± 1000 mV -5.0 to 60.0°C / 23.0 to 140.0°F
Resolution	pH ORP Temp 1 mV 0.1°C / 0.1°F	0.01 pH 1 mV 0.1°C / 0.1°F
Accuracy (@25°C)	pH ORP Temp ± 2 mV $\pm 0.5^\circ\text{C}$ / $\pm 1^\circ\text{F}$	± 0.05 pH ± 2 mV $\pm 0.5^\circ\text{C}$ / $\pm 1^\circ\text{F}$
Typical EMC Deviation	pH ORP Temp ± 2 mV $\pm 0.3^\circ\text{C}$ / $\pm 0.6^\circ\text{F}$	± 0.02 pH ± 2 mV $\pm 0.3^\circ\text{C}$ / $\pm 0.6^\circ\text{F}$
pH Calibration		automatic for pH, 1 or 2 points, from -5 to 60°C with 2 sets of memorized buffers (pH 4.01, 7.01, 10.01 or 4.01, 6.86, 9.18)
ORP Calibration	factory calibrated	factory calibrated
Probe	Mi57P (replaceable)	Mi58P (replaceable)
Environment	0 to 50°C; max RH 100%	-5 to 50°C; max. RH 100%
Battery Type	4 x 1.5V; IEC LR44, A76	4 x 1.5V; IEC LR44, A76
Battery Life	approx. 300 hours of use	approx. 250 hours of use
Auto-off	after 8 minutes of non-use	after 8 minutes of non-use
Dimensions	200 x dia 38 mm	200 x dia 38 mm
Weight	100 g	100 g

Replaceable combination pH/ORP electrode for pH58

Replace the electrode in a fast and simple way yourself! Just unscrew the plastic ring on the top of the electrode and replace the electrode with a new one.



Calibrations, Maintenance & Cleaning Solutions

Choose from our wide selection of calibration, maintenance and cleaning solutions at page 43.



Accessories

Mi57P	Replaceable electrode for ORP57	MA9006	pH 6.86 buffer solution, 230 mL bottle
Mi58P	Replaceable electrode for pH58	MA9007	pH 7.01 buffer solution, 230 mL bottle
M10004B	pH 4.01 buffer solution 20 mL sachet (25 pcs)	MA9009	pH 9.18 buffer solution, 230 mL bottle
M10007B	pH 7.01 buffer solution 20 mL sachet (25 pcs)	MA9010	pH 10.01 buffer solution, 230 mL bottle
M10010B	pH 10.01 buffer solution 20 mL sachet (25 pcs)	MA9015	Electrode storage solution, 230 mL
MA9004	pH 4.01 buffer solution, 230 mL bottle	MA9016	Electrode cleaning solution, 230 mL
		MA9020	ORP test solution (200/275 mV), 230 mL bottle
		M10000B	Electrode rinse solution, 20 mL sachet (25 pcs)



Ordering Information

ORP57 is supplied complete with protective cap, hard carrying case, batteries and instructions.

pH58 is supplied complete with protective cap, 20 mL pH 4.01 and pH 7.01 sachets of calibration solution, hard carrying case, batteries and instructions.

pH51/pH52/pH53/ORP50

Microprocessor Waterproof pH/ORP/Temp Meters

Sharp waterproof Testers are designed for all applications. Their IP67 waterproof casings and double junction replaceable electrodes make them suitable also for heavy duty applications, such as wastewater treatment and agriculture.

The modular design allows easy electrode and battery replacement.

Manual calibration on the pH51 prolongs the battery life up to 1500 hours.

pH51 and pH52 have a 0.1 pH resolution while pH53 has 0.01 pH resolution.

ORP50 reads ORP with a resolution of 1 mV.

Choose your pH, ORP, Temp tester according to the proper pH, ORP, Temp ranges for your application:

- **pH51:** 0.0 to 14.0 pH;
- **pH52:** -2.0 to 16.0 pH, -5.0 to 60.0°C;
- **pH53:** -2.00 to 16.00 pH, -5.0 to 60.0°C;
- **ORP50:** ±1000 mV.



Specifications		 pH51	 pH52	 pH53	 ORP50
Range	pH/ORP Temp	0.0 to 14.0 pH	-2.0 to 16.0 pH -5.0 to 60.0°C / 23.0 to 140.0°F	-2.00 to 16.00 pH -5.0 to 60.0°C / 23.0 to 140.0°F	±1000 mV
Resolution	pH/ORP Temp	0.1 pH	0.1 pH 0.1°C / 0.1°F	0.01 pH 0.1°C / 0.1°F	1 mV
Accuracy (@25°C)	pH/ORP Temp	±0.1 pH	±0.1 pH ±1°C / ±2°F	±0.02 pH ±1°C / ±2°F	±2 mV
Typical EMC Deviation	pH Temp	±0.1 pH	±0.1 pH ±0.2°C / ±0.4°F	±0.03 pH ±0.2°C / ±0.4°F	±2 mV
Temperature Compensation			automatic	automatic	
Calibration		manual, at 2 points through trimmers	automatic, 1 or 2 points	automatic, 1 or 2 points	factory calibrated
Adj.offset trimmer					±120 mV
pH Electrode		MA73600 (replaceable)	MA73047 (replaceable)	MA73047 (replaceable)	MA73500 (replaceable)
ORP Electrode					MA73500 (replaceable)
Environment		0 to 50°C, max RH 100%	-5 to 60°C; max RH 100%	-5 to 60°C; max RH 100%	0 to 50°C; max RH 100%
Battery Type		3 x 1.5V, alkaline	3 x 1.5V; alkaline (included)	3 x 1.5V; alkaline (included)	3 x 1.5V, alkaline (included)
Battery Life		More than 1500 hours of continuous use	approx. 200 hours	approx. 200 hours	approx. 1000 hours of continuous use
Dimensions		165 x 30 x 30 mm	165 x 30 x 30 mm	165 x 30 x 30 mm	165 x 30 x 30 mm
Weight		80 g	80 g	80 g	85 g

Accessories

- MA73047 Replaceable pH electrode with built-in temperature sensor
- MA73500 Replaceable ORP electrode
- MA73600 Replaceable pH electrode
- M10004B pH 4.01 buffer solution 20 mL sachet (25 pcs)
- M10007B pH 7.01 buffer solution 20 mL sachet (25 pcs)



- M10010B pH 10.01 buffer solution 20 mL sachet (25 pcs)
- MA9015 Electrode storage solution, 230 mL
- MA9016 Electrode cleaning solution, 230 mL
- MA9020 200/275 mV ORP solution, 230 mL bottle
- M10000B Electrode rinse solution, 20 mL sachet (25 pcs)

Ordering Information

All waterproof testers are supplied in a leather casing complete with calibration solution, batteries, instruction manual and screwdriver (only pH51) for calibration.

ORP50 is supplied in a leather casing complete with batteries and instruction manual.



pH40/pH41/pH42
Microprocessor pH Testers



The Sharp pH Tester Series features an extendable cloth reference junction system which eliminates reading errors from clogged junctions. Using tweezers, the cloth junction can be extended to expose new unused portions greatly extending the life of the electrode.




The Sharp Tester microprocessor provides the user with push button calibration and automatic buffer recognition. Auto Shut-off after 10 minutes saves on battery life. All Sharp injection-molded testers are built with a rugged "one piece" splash-proof casing preventing water infiltration immersible up to the LCD.

pH40, pH41 and pH42 are supplied complete with calibration solution and batteries.

- **pH40:** pH tester with 0.0 to 14.0 pH range and ± 0.2 pH accuracy;
- **pH41:** pH tester with 0.0 to 14.0 pH range and ± 0.1 pH accuracy;
- **pH42:** pH tester with 0.00 to 14.00 pH range and ± 0.02 pH accuracy.

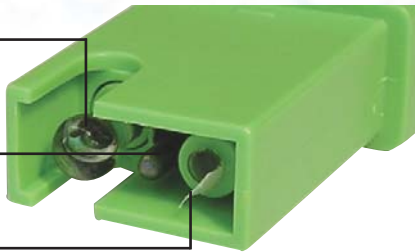


Specifications

	 pH40	 pH41	 pH42
Range	0.0 to 14.0 pH	0.0 to 14.0 pH	0.00 to 14.00 pH
Resolution	0.1 pH	0.1 pH	0.01 pH
Accuracy (@25°C)	± 0.2 pH	± 0.1 pH	± 0.02 pH
Calibration	automatic, 2 points	automatic, 2 points	automatic, 2 points
Temperature Compensation		automatic, 0 to 50°C / 32 to 122°F	automatic, 0 to 50°C / 32 to 122°F
Environment	0 to 50°C / 32 to 122°F; max RH 95%	0 to 50°C / 32 to 122°F; max RH 95%	0 to 50°C / 32 to 122°F; max RH 95%
Battery Type	4 x 1.5V alkaline (included)	4 x 1.5V alkaline (included)	4 x 1.5V alkaline (included)
Battery Life	approx. 300 hours of use	approx. 300 hours of use	approximately 300 hours of use
Auto-off	after 8 minutes of non-use	after 8 minutes of non-use	after 8 minutes of non-use
Dimensions	155 x 45 x 25 mm	155 x 45 x 25 mm	155 x 45 x 25 mm
Weight	150 g	150 g	150 g



Glass electrode



316 Stainless Steel casing for the temperature sensor compensates automatically for temperature in seconds

Cloth junction: The Sharp testers revolutionary new cloth junction ensures easy maintenance and longer life

Accessories

- M10004B pH 4.01 buffer solution, 20 mL sachet (25 pcs)
- M10007B pH 7.01 buffer solution, 20 mL sachet (25 pcs)
- M10010B pH 10.01 buffer solution, 20 mL sachet (25 pcs)

- MA9015 Electrode storage solution, 230 mL
- MA9016 Electrode cleaning solution, 230 mL
- M10000B Electrode rinse solution, 20 mL sachet (25 pcs)



Ordering Information

pH40, pH41 and pH42 are supplied in a box complete with pH 7.01 20 mL sachet of calibration solution, protective cap, 4 x 1.5V batteries and instructions.

SMS110/SMS115/SMS120

pH Monitors




The Smart pH monitor allows you to continuously monitor pH values directly in your reservoir.
Features include: user selectable set point (for SMS110 and SMS120), visual LED alarm when values go above the set point and manual calibration.

The SMS115 with the Cal-test button will warn the user when the electrode needs to be calibrated again.
Each monitor is powered by a 12 VDC adapter and is ideal for applications such as Hydroponic and Aquarium.

- The pH monitors are very simple to operate:
1. hang your monitor above the reservoir;
 2. connect the adapter to the meter and plug in the power supply (make sure that your power supply is in a safe area away from the water);
 3. immerse 2/3 of the electrode in the solution;
 4. the probe can now remain there permanently.

The SMS110 and the SMS120 are supplied complete with a MA911B/2 pH electrode, the SMS115 with MA912B/2 pH electrode.
Each monitor comes complete with a 12 VDC adapter and calibration solution.



Specifications				
		SMS110	SMS115	SMS120
Range	pH	0.0 to 14.0 pH	0.0 to 14.0 pH	0.0 to 14.0 pH
Resolution	pH	0.1 pH	0.1 pH	0.1 pH
Accuracy (@25°C)	pH	±0.2 pH	±0.2 pH	±0.2 pH
Calibration		manual, 2 point, through trimmers on the meter front and rear panels	manual, 2-point, through trimmers on the meter side	manual, 2 point, through trimmers on the meter front and rear panels
Set point		3.5 to 7.5 pH		5.5 to 9.5 pH
Alarm		active when measure is higher than selected set point		active when measure is higher than selected set point
pH Electrode		MA911B/2 (included)	MA912B/2 with BNC connector (included)	MA911B/2 (included)
Environment		0 to 50°C / 32 to 122°F; max RH 95%	0 to 50°C / 32 to 122°F; max RH 95%	0 to 50°C / 32 to 122°F; max RH 95%
Power Supply		12 VDC power adapter (included)	12 VDC power adapter (included)	12 VDC power adapter (included)
Dimensions		160 x 80 x 40 mm	85 x 104 x 39 mm	160 x 80 x 40 mm
Weight		220 g (meter only)	130 g (meter only)	220 g (meter only)

Accessories

- M10004B pH 4.01 buffer solution, 20 mL sachet (25 pcs)
- M10007B pH 7.01 buffer solution, 20 mL sachet (25 pcs)
- M10010B pH 10.01 buffer solution, 20 mL sachet (25 pcs)
- M100058B Cal-test solution for SMS115, 20 mL sachet (25 pcs)
- M10016B Electrode cleaning solution, 20 mL sachet (25 pcs)

- MA911B/1 Double junction, gel filled pH electrode with 1 m cable
- MA912B/2 pH electrode with BNC connector with 2 m cable
- M10000B Electrode rinse solution, 20 mL sachet (25 pcs)
- MA9015 Electrode storage solution, 20 mL sachet (25 pcs)
- MA9016 Electrode cleaning solution, 20 mL sachet (25 pcs)



Ordering Information

SMS110 is supplied complete with a 12VDC adapter, MA911B/2 pH electrode, 20 mL pH 7.01 sachet of calibration solution, calibration screwdriver and instructions.
SMS120 is supplied complete with a 12VDC adapter, MA911B/2 pH electrode, 20 mL pH 7.01 sachet of calibration solution, calibration screwdriver and instructions.
SMS115 is supplied complete with a 12VDC adapter, MA912B/2 pH electrode, 20 mL pH 4.01 and 7.01 sachets of calibration solution, 2x20 mL electrode cleaning solution sachets, 2x20 mL pH Cal-Test Solution, calibration screwdriver and instructions.



SMS122/SMS510/SMS125 pH & ORP Controllers

Ideal for the Aquarium market, the SMS122 pH controller enables you to automate your dosing of CO₂ and makes sure that the plants of your aquarium are always healthy. Simply plug in the solenoid valve to the plug socket supplied.

Every aquarium needs individual attention. This is why the SMS510 has a user selectable set point for the ORP (0 to 600 mV).




Simply plug the ozone generator into the controller's power plug and it will dose until the mV set point is reached.

It will automatically switch on again if the ORP falls below the adjusted point.

SMS125 has dual set points adjustable with knobs: for pH (4 to 8 pH) and for ORP (-200 to 600 mV).

Simply attach 2 solenoid valves or pumps to the plug sockets supplied to dose CO₂ and ozone as required! Perfect and ideal where 24-hours maintaining is required.

Specifications

	 SMS122	 SMS510	 SMS125
Range	0.0 to 14.0 pH	±1000 mV (ORP)	0.00 to 14.00 pH; ±1000 mV (ORP)
Resolution	0.1 pH	1 mV (ORP)	0.01 pH; 1 mV (ORP)
Accuracy (@25°C)	±0.2 pH	±5 mV (ORP)	±0.2 pH; ± 5 mV (ORP)
Set point pH	5.5 to 9.5 pH		4 to 8 pH
Set point ORP		0 to 600 mV	-200 to 600 mV
pH Alarm	active when measurement is higher than set point		active when measurement is higher than the set points
ORP Alarm		active when measurement is lower than set point	active when measurements are lower than set points
pH Output Power Socket	active when measurement is higher than set point (5A max)		active when measurement is higher than set point
ORP Output Power Socket		active when the measurement is lower than set point	active when the measurement is lower than set point
pH Electrode	MA911B/2 (included)		MA911B/2 (included)
ORP Electrode		MA921B/2 (included)	MA921B/2 (included)
Environment	0 to 50°C / 32 to 122°F; max RH 95%	0 to 50°C / 32 to 122°F; max RH 95%	0 to 50°C / 32 to 122°F; max RH 95%
Power Supply	12 VDC power adapter (included)	12 VDC power adapter (included)	12 VDC power adapter (included)
Power Drivers	115VAC, 2A, 60Hz or 230VAC, 1A, 50Hz	115VAC, 2A, 60Hz or 230VAC, 1A, 50Hz	115VAC, 2A, 60Hz or 230VAC, 1A, 50Hz
Dimensions	160 x 80 x 40 mm	160 x 80 x 40 mm	160 x 80 x 40 mm
Weight	220 g (meter only)	220 g (meter only)	220 g

Accessories

- M10004B pH 4.01 buffer solution 20 mL sachet (25 pcs)
 M10007B pH 7.01 buffer solution 20 mL sachet (25 pcs)
 M10010B pH 10.01 buffer solution 20 mL sachet (25 pcs)
 MA911B/1 Double junction, gel filled pH electrode with 1 m cable

- MA921B/2 ORP Electrode with BNC connector and 2 m cable
 M10000B Electrode rinse solution 20 mL sachet (25 pcs)
 MA9015 Electrode storage solution 20 mL sachet (25 pcs)
 MA955 Solenoid valve with 1.5 m cable



Ordering Information

SMS122 is supplied complete with 12 VDC adapter, MA911B/2 pH electrode, 20 mL pH4.01 sachet of calibration solution, 20 mL pH7.01 sachet of calibration solution, calibration screwdriver and instructions.

SMS510 is supplied complete with 12 VDC adapter, MA921B/2 ORP electrode and instructions.

SMS125 is supplied complete with 12 VDC adapter, power plug socket for ozone dosing, MA911B/2 pH electrode, MA921B/2 ORP electrode, 20 mL pH7.01 sachet of calibration solution, calibration screwdriver and instructions.

Mi170

Autoranging EC/TDS/NaCl/Temperature Laboratory Bench Meter

Mi170 measures 4 different parameters - EC, TDS (Total Dissolved Solids), percentage of NaCl and temperature in a variety of ranges. The auto-ranging feature for EC and TDS measurements automatically sets the resolution suitable to the tested sample. All measurements can be temperature compensated at 20 or 25°C and the compensation coefficient is selectable by the user.

The automatic temperature compensation can also be disabled for measuring the actual conductivity value. The stability indicator on the LCD ensures accuracy.

Conductivity readings are performed with the 4-ring probe supplied with the meter. The GLP feature allows users to store and recall data on system status. PC compatible through an RS232 or USB port.



- Years warranty 3
- LOG
- RS232
- USB
- ATC
- MTC
- Software CD
- Dual Display
- Self diagnostics
- GLP
- CE

Specifications	Mi170
Range	EC 0.00 to 29.99 µS/cm; 30.0 to 299.9 µS/cm; 300 to 2999 µS/cm; 3.00 to 29.99 mS/cm; 30.0 to 200.0 mS/cm; up to 500.0 mS/cm actual conductivity (uncompensated EC)* TDS 0.00 to 14.99 mg/L (ppm); 15.0 to 149.9 mg/L (ppm); 150 to 1499 mg/L (ppm); 1.5 to 14.99 g/L (ppt); 15.0 to 100.0 g/L (ppt); up to 400.0 g/L actual TDS* (with 0.80 factor) NaCl 0.0 to 400.0% Temp -20.0 to 120.0°C / -4.0 to 248.0°F
Resolution	EC 0.01 µS/cm; 0.1 µS/cm; 1.0 µS/cm; 0.01 mS/cm; 0.1 mS/cm TDS 0.01 mg/L; 0.1 mg/L; 1.0 mg/L; 0.01 g/L; 0.1 g/L NaCl 0.1% Temp 0.1°C / 0.1°F
Accuracy	EC ±1% of reading ± (0.05 µS/cm or 1 digit) TDS ±1% of reading ± (0.03 mg/L or 1 digit) NaCl ±1% of reading Temp ±0.4°C / ±0.8°F
Calibration	EC 1 point slope calibration with 6 memorized solutions (84.0 µS/cm, 1413 µS/cm, 5.00 mS/cm, 12.88 mS/cm, 80.0 mS/cm, 111.8 mS/cm) NaCl 1 point, with MA9066 calibration solution Temp 2 points, 0 to 50°C / 32 to 12 °F
Temp. Compensation	automatic or manual, from -20.0 to 120.0°C / -4.0 to 248.0°F
Temp. Coefficient	selectable from 0.00 to 6.00%/°C (EC and TDS only)
Probe	MA814DB/1 4-ring probe with built-in temperature sensor (included)
TDS Factor	0.40 to 0.80 (default value is 0.50)
Log on Demand	up to 50 samples on each range (EC, TDS, NaCl)
GLP	last EC, NaCl calibration data
PC Interface	RS232 / USB Opto-isolated
Environment	0 to 50°C / 32 to 122°F; max RH 95%
Power supply	12 VDC power adapter (included)
Dimensions	230 x 160 x 95 mm
Weight	0.9 kg

(*) Uncompensated conductivity (or TDS) is the conductivity (or TDS) value without temperature compensation.

More accurate readings with the 4-RING MA814DB/1 EC/TDS/NaCl and Temperature probe!

Conductivity readings are performed by applying an alternate current to the 4-ring probe which creates a variable voltage depending on the conductivity.



Rear Connector Panel layout

Communication to the PC is done via opto-isolated USB and RS232 ports.



Accessories

- MA814DB/1 EC/Temperature probe with DIN connector and 1 m cable
- MA9060 12880 µS/cm calibration solution, 230 mL bottle
- MA9061 1413 µS/cm calibration solution, 230 mL bottle
- MA9063 84 µS/cm calibration solution, 230 mL bottle
- MA9064 80000 µS/cm conductivity solution, 230 mL bottle
- MA9065 111.8 mS/cm calibration solution, 230 mL bottle



- MA9066 100% NaCl calibration solution, 230 mL bottle
- MA9069 5000 µS/cm solution, 230 mL bottle
- MA9310 12 VDC Adapter, 220 V
- MA9311 12 VDC Adapter, 110 V
- MA9315 Electrode holder
- MA9350 RS232 connection cable with 2 meters cable
- Mi5200 Application Software

Ordering Information

- Mi170 is supplied complete with
 - MA814DB/1 EC/TDS/NaCl/Temperature Probe
 - MA9315 Electrode Holder
 - M10030 12880 µS/cm calibration solution
 - M10031 1413 µS/cm calibration solution
 - Mi5200 Application Software
 - MA9350 RS232 connection cable with 2 meters cable
 - 12 VDC Adapter
 - Instruction manual

New

Mi306

Automatic & Logging EC/TDS/NaCl Temp Meter

Mi306 is a waterproof portable logging microprocessor-based Conductivity/TDS/NaCl/temperature meter.

The autoranging feature of the EC and TDS ranges automatically sets the meter to the scale with the highest possible resolution.

The Auto Endpoint (HOLD) feature automatically freezes the display when a stable reading is reached. The measurements are automatically (ATC) or manually (MTC) compensated for temperature.

The temperature coefficient value is user selectable. It is possible to disable the temperature compensation and measure the actual conductivity (NoTC).

The Battery Error Preventing System (BEPS) switches the meter off when the batteries are too weak to support proper function. The meter can store measurements in memory by logging function for retrieval at a later time upon user request.

Mi306 also allows data transfer to computer through the RS232 port. Double LCD displays, for simultaneous readings of the specific conductivity and temperature.

Years
warranty
2

LOG

RS232

ATC

MTC

Software
CDSelf
diagnostics

CE



Specifications

Mi306

Range	(Autoranging) EC	0.00 to 29.99 $\mu\text{S/cm}$; 30.0 to 299.9 $\mu\text{S/cm}$; 300 to 2999 $\mu\text{S/cm}$;
	(Autoranging) TDS	3.00 to 29.99 mS/cm ; 30.0 to 200.0 mS/cm ; up to 500.0 mS/cm actual(*) EC
	NaCl	0.00 to 14.99 mg/L ; 15.0 to 149.9 mg/L ; 150 to 1499 mg/L ; 1.50 to 14.99 g/L ;
	Temp	15.0 to 100.0 g/L ; up to 400.0 g/L actual(*) TDS (with 0.80 factor)
Resolution	EC	0.0 to 400.0 %
	TDS	0.0 to 60.0 °C
	NaCl	0.01 $\mu\text{S/cm}$ (from 0.00 to 29.99 $\mu\text{S/cm}$); 0.1 $\mu\text{S/cm}$ (from 30.0 to 299.9 $\mu\text{S/cm}$);
	Temp	1 $\mu\text{S/cm}$ (from 300 to 2999 $\mu\text{S/cm}$); 0.01 mS/cm (from 3.00 to 29.99 mS/cm);
Accuracy	EC	0.1 mS/cm (over 30.0 mS/cm)
	TDS	0.01 mg/L (from 0.00 to 14.99 mg/L); 0.1 mg/L (from 15.0 to 149.9 mg/L);
	NaCl	1 mg/L (from 150 to 1499 mg/L); 0.01 g/L (from 1.50 to 14.99 g/L);
	Temp	0.1 g/L (over 15.0 g/L)
Typical EMC Deviation	EC	0.1 %
	TDS	0.1 °C
	NaCl	$\pm 1\%$ of reading ($\pm 0.05 \mu\text{S/cm}$ or 1 digit whichever greater)
	Temp	$\pm 1\%$ of reading ($\pm 0.053 \text{ ppm}$ or 1 digit whichever greater)
Logging	EC	$\pm 1\%$ of reading
	TDS	$\pm 1\%$ of reading
	NaCl	$\pm 1\%$ of reading
	Temp	$\pm 0.1^\circ\text{C}$
Communication		up to 250 records, LOG on demand or auto-logging
EC Calibration		with PC through RS232 port
NaCl Calibration		1 point with 7 memorized buffers: 84 $\mu\text{S/cm}$, 1413 $\mu\text{S/cm}$, 5000 $\mu\text{S/cm}$, 80000 $\mu\text{S/cm}$, 111800 $\mu\text{S/cm}$
Temperature Compensation		1 point with MA9066 buffer (optional)
Temperature Coefficient		automatic or manual from 0 to 60 °C
TDS Factor		(can be disabled to measure actual conductivity and TDS)
Probe		0.00 to 6.00 %/°C (for EC and TDS only)
Auto-off		Default value is 1.90%/°C
Battery Type / Battery Life		0.40 to 0.80 (default value is 0.50)
Casing		reference Temperature: 20 or 25 °C
Environment		MA814D/1 EC probe with built-in temperature sensor & 1 m cable (included)
Dimensions		after 5 minutes of non use (can be disabled)
Weight		1 x 9V Battery (included) / approx. 100 hours of use
		IP 67
		0 to 50 °C / 32 to 122 °F; max RH 100%
		200 x 85 x 50 mm
		280 g

(*) Uncompensated conductivity (or TDS) is the conductivity (or TDS) value without temperature compensation.

Accessories



MA814D/1	4-ring EC probe with DIN connector and 1 m cable
M10030B	12880 $\mu\text{S/cm}$ calibration solution, 20 mL sachet, 25 pcs.
M10031B	1413 $\mu\text{S/cm}$ calibration solution, 20 mL sachet, 25 pcs.
M10033B	84 $\mu\text{S/cm}$ calibration solution, 20 mL sachet, 25 pcs.
M10035B	111.8 mS/cm calibration solution, 20 mL sachet, 25 pcs.
MA9060	12880 $\mu\text{S/cm}$ calibration solution, 230 mL bottle
MA9061	1413 $\mu\text{S/cm}$ calibration solution, 230 mL bottle
MA9063	84 $\mu\text{S/cm}$ calibration solution, 230 mL bottle
MA9065	111.8 mS/cm calibration solution, 230 mL bottle
MA9066	100% NaCl calibration solution, 230 mL bottle
MA9069	5000 $\mu\text{S/cm}$ solution, 230 mL bottle
MA9351	RS232 connection cable (5 to 9 pin) with 2 meters cable (for Mi306)
Mi5200	Application Software

Ordering Information

Mi306 is supplied in a hard carrying case complete with

- MA814D/1 EC/TDS/NaCl/Temp probe with DIN connector and 1 meter cable
- MA9060 12880 $\mu\text{S/cm}$ calibration solution
- Mi5200 Application Software
- MA9351 RS232 connection cable with 2 meters cable
- Instruction manual

SM301/SM302/SM401/SM402

Portable Conductivity & TDS Meters

SM301, SM302, SM401 and SM402 are conductivity and TDS Portable Meters, with Automatic Temperature Compensation, and are ideal for the educational and agricultural markets.

Soil conductivity is checked before fertilizer application to pinpoint field needs and after fertilization to establish its effectiveness. The EC testing provides all agricultural operation with a method to optimize chemical applications and minimize operational cost.

These instruments have been designed to meet the Grower's need for equipment suited to the aggressive environments found in agricultural and hydroponics applications.

Choose your portable EC & TDS meter according to the proper EC/TDS ranges for your application:

- **SM301:** 0 to 1990 $\mu\text{S}/\text{cm}$ with a 10 $\mu\text{S}/\text{cm}$ resolution;
- **SM302:** 0.0 to 10.0 mS/cm with a 0.1 mS/cm resolution;
- **SM401:** 0 to 1990 mg/L (ppm) with a 10 mg/L resolution;
- **SM402:** 0.0 to 10.0 g/L (ppt) with a 0.1 g/L resolution.

Each meter is supplied complete with Conductivity/TDS probe with 1 meter cable and calibration solution.



Specifications	 SM301	 SM302	 SM401	 SM402
Range	0 to 1990 $\mu\text{S}/\text{cm}$	0.0 to 10.0 mS/cm	0 to 1990 mg/L (ppm)	0.0 to 10.0 g/L (ppt)
Resolution	10 $\mu\text{S}/\text{cm}$	0.1 mS/cm	10 mg/L (ppm)	0.1 g/L (ppt)
Accuracy (@25°C)	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale
Conversion Factor			0.5	0.5
Calibration Solutions (included)	1413 $\mu\text{S}/\text{cm}$ (M10031B)	1413 $\mu\text{S}/\text{cm}$ (M10031B)	1382 mg/L (M10032B)	6.44 g/L (M10038B)
Conductivity Probe	MA811D/1 (included)	MA812D/1 (included)	MA811D/1 (included)	MA812D/1 (included)
Temperature Compensation	automatic, from 5 to 50°C	automatic, from 5 to 50°C	automatic, from 5 to 50°C	automatic, from 5 to 50°C
Environment	0 to 50°C, max RH 95%	0 to 50°C, max RH 95%	0 to 50°C, max RH 95%	0 to 50°C, max RH 95%
Battery Type	1 x 9V alkaline (included)	1 x 9V alkaline (included)	1 x 9V alkaline (included)	1 x 9V alkaline (included)
Battery Life	approx. 300 hours of use	approx. 300 hours of use	approx. 300 hours of use	approx. 300 hours of use
Dimensions	145 x 80 x 40 mm	145 x 80 x 40 mm	145 x 80 x 40 mm	145 x 80 x 40 mm
Weight	220 g (with battery)	220 g (with battery)	220 g (with battery)	220 g (with battery)

Accessories

- M10031B 1413 $\mu\text{S}/\text{cm}$ calibration solution, 20 mL (25 pcs)
- M10032B 1382 ppm (mg/L) calibration solution, 20 mL (25 pcs)
- M10038B 6.44 ppt (g/l) calibration solution, 20 mL (25 pcs)
- MA811D/1 EC/TDS probe with DIN connector and 1 m cable

- MA812D/1 EC/TDS probe with DIN connector and 1 m cable
- MA950 Portable meter wall fixing kit
- MA9060 12880 $\mu\text{S}/\text{cm}$ calibration solution, 230 mL bottle
- MA9061 1413 $\mu\text{S}/\text{cm}$ calibration solution, 230 mL bottle
- MA9062 1382 ppm TDS solution, 230 mL bottle



Ordering Information

SM301 is supplied complete with MA811D/1 EC probe, 20 mL 1413 $\mu\text{S}/\text{cm}$ sachet of calibration solution, screwdriver for calibration, 9V battery and instructions.

SM302 is supplied complete with MA812D/1 EC probe, 20 mL 1413 $\mu\text{S}/\text{cm}$ sachet of calibration solution, screwdriver for calibration, 9V battery and instructions.

SM401 is supplied complete with MA811D/1 EC probe, 20 mL 1382 ppm sachet of calibration solution, screwdriver for calibration, 9V battery and instructions.

SM402 is supplied complete with MA812D/1 EC probe, 20 mL 6.44 ppt sachet of calibration solution, screwdriver for calibration, 9V battery and instructions.

- Years warranty 2
- ATC
- IP67
- Dual Display
- Self diagnostics
- CE



EC59/EC60
Pocket-size EC/TDS/Temp Meters



These new waterproof Pocket-size EC/TDS/Temp Meters include features such as a replaceable probe, temperature in °C or °F, automatic temperature compensation with adjustable β, battery level indicator, stability indicator, automatic shut-off and automatic calibration all in a floating, waterproof casing.

EC59 shows on the dual-level LCD the EC (3999 µS/cm) or TDS (2000 ppm) value. It also displays the temperature from 0.0 to 60.0°C (or 32.0 to 140.0°F) on the secondary level at the same time.

EC60 shows on the dual-level LCD the EC (20.00 mS/cm) or TDS (10.00 ppt) value. It also displays the temperature from 0.0 to 60.0°C (or 32.0 to 140.0°F) on the secondary level at the same time.



Specifications

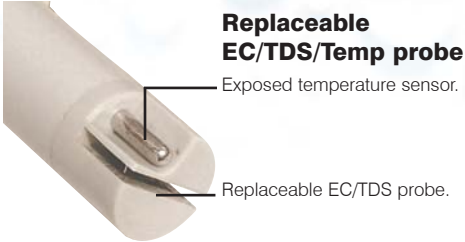
			
		EC59	EC60
Range	EC TDS Temp	3999 µS/cm 2000 ppm 0.0 to 60.0°C / 32.0 to 140.0°F	20.00 mS/cm 10.00 ppt 0.0 to 60.0°C / 32.0 to 140.0°F
Resolution	EC TDS Temp	1 µS/cm 1 ppm 0.1°C / 0.1°F	0.01 mS/cm 0.01 ppt 0.1°C / 0.1°F
Accuracy (@20°C)	EC TDS Temp	2% Full Scale 2% Full Scale ±0.5°C / ±1°F	2% Full Scale 2% Full Scale ±0.5°C / ±1°F
Typical EMC Deviation	EC TDS Temp	2% Full Scale 2% Full Scale ±0.5°C / ±1°F	2% Full Scale 2% Full Scale ±0.5°C / ±1°F
Calibration		automatic, 1 point	automatic, 1 point
Temperature Compensation		automatic, with β=0.0 to 2.4%/°C	automatic, with β=0.0 to 2.4%/°C
Probe		Mi59P (replaceable)	Mi59P (replaceable)
Environment		0 to 50°C / 32 to 122°F; max RH 100%	0 to 50°C / 32 to 122°F; max RH 100%
Battery Type		4 x 1.5V; IEC LR44, A76 (included)	4 x 1.5V; IEC LR44, A76 (included)
Battery Life		approx. 100 hours of use	approx. 100 hours of use
Auto-off		after 8 minutes of non-use	after 8 minutes of non-use
Dimensions		200 x dia 38 mm	200 x dia 38 mm
Weight		100 g	100 g

Easy to read Display

Dual level LCD displays EC/TDS and temperature.



Replaceable EC/TDS/Temp probe



Accessories

- Mi59P Replaceable probe for EC59 & EC60
- M10030B 12880 µS/cm calibration solution, 20 mL sachet, 25 pcs
- M10031B 1413 µS/cm calibration solution, 20 mL sachet, 25 pcs
- M10032B 1382 ppm (mg/L) calibration solution, 20 mL sachet, (25 pcs)
- M10038B 6.44 ppt (g/L) calibration solution, 20 mL sachet, (25 pcs)

- MA9060 12880 µS/cm calibration solution, 230 mL bottle
- MA9061 1413 µS/cm calibration solution, 230 mL bottle
- MA9016 Cleaning solution, 230 mL bottle
- M10000B Rinse solution, 20 mL sachet, 25 pcs

Ordering Information

EC59 is supplied complete with protective cap, 20 mL 1413 µS/cm sachet of calibration solution, hard carrying case, batteries and instructions.

EC60 is supplied complete with protective cap, 20 mL 12880 µS/cm sachet of calibration solution, hard carrying case, batteries and instructions.

C65/C66/T75/T76

Sharp Waterproof Conductivity & TDS testers

These simple and easy-to-use testers are designed for all applications.

Its IP67 Waterproof casing and replaceable probe make them suitable also for heavy duty applications, such as Wastewater treatment and Agriculture. The modular design allows easy probe and battery replacement.

4 models are available and all have Automatic Temperature Compensation:

- **C65:** Conductivity tester low range
Range: 0 to 1999 $\mu\text{S}/\text{cm}$
- **C66:** Conductivity tester high range
Range: 0.00 to 10.00 mS/cm
- **T75:** TDS tester low range
Range: 0 to 1999 ppm (mg/L)
- **T76:** TDS tester high range
Range: 0 to 9990 ppm (mg/L)



Specifications	 C65 Waterproof EC	 C66 Waterproof EC	 T75 Waterproof TDS	 T76 Waterproof TDS
Range	0 to 1999 $\mu\text{S}/\text{cm}$	0.00 to 10.00 mS/cm	0 to 1999 ppm (mg/L)	0 to 9990 ppm (mg/L)
Resolution	1 $\mu\text{S}/\text{cm}$	0.01 mS/cm	1 ppm (mg/L)	10 ppm (mg/L)
Accuracy	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale
Typical EMC Deviation	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale
Temperature Compensation	automatic from 5 to 50°C with $\beta=2\%/^{\circ}\text{C}$	automatic from 5 to 50°C with $\beta=2\%/^{\circ}\text{C}$	automatic from 5 to 50°C with $\beta=2\%/^{\circ}\text{C}$	automatic from 5 to 50°C with $\beta=2\%/^{\circ}\text{C}$
TDS Factor			0.5	0.5
Calibration	manual, at 1 point through trimmer	manual, at 1 point through trimmer	manual, at 1 point through trimmer	manual, at 1 point through trimmer
Probe	MA73075 (replaceable)	MA73076 (replaceable)	MA73075 (replaceable)	MA73076 (replaceable)
Environment	0 to 50°C; max RH 100%	0 to 50°C; max RH 100%	0 to 50°C; max RH 100%	0 to 50°C; max RH 100%
Battery Type	3 x 1.5V, alkaline	3 x 1.5V, alkaline	3 x 1.5V, alkaline	3 x 1.5V, alkaline
Battery Life	approx. 250 hours of continuous use	approx. 250 hours of continuous use	approx. 250 hours of continuous use	approx. 250 hours of continuous use
Dimensions	165 x 30 x 30 mm	165 x 30 x 30 mm	165 x 30 x 30 mm	165 x 30 x 30 mm
Weight	80 g	80 g	80 g	80 g

Accessories

- MA73075 Replaceable Conductivity probe, LR
- MA73076 Replaceable Conductivity probe, HR
- M10030B 12880 $\mu\text{S}/\text{cm}$ calibration solution, 20 mL (25 pcs)
- M10031B 1413 $\mu\text{S}/\text{cm}$ calibration solution, 20 mL (25 pcs)

- M10032B 1382 ppm (mg/L) calibration solution, 20 mL (25 pcs)
- M10038B 6.44 ppt (g/L) calibration solution, 20 mL (25 pcs)
- M10080B 800 ppm calibration solution 20 mL (25 pcs)

Ordering Information

C65 and C66 are supplied complete with protective cap, 20 mL 1413 $\mu\text{S}/\text{cm}$ sachet of calibration solution, hard carrying case, calibration screwdriver, batteries and instructions.

T75 is supplied complete with protective cap, 20 mL 1382 ppm sachet of calibration solution, hard carrying case, calibration screwdriver, batteries and instructions.

T76 is supplied complete with protective cap, 20 mL 6.44 ppt sachet of calibration solution, hard carrying case, calibration screwdriver, batteries and instructions.

C61/C62/T71/T72

High accuracy Conductivity and TDS Testers







These simple 1-point calibration testers are designed for the Horticultural and Agricultural market. They are built in a one-piece splash-proof casing and they are immersible up to the LCD.

All models have Automatic Temperature Compensation and the temperature sensor housing is made out of 316 inox steel instead of plastic. This ensures 100 times faster readings and higher accuracy. Models available are:

- **C61:** Conductivity tester low range
Range: 0 to 1999 μ S/cm
- **C62:** Conductivity tester high range
Range: 0.00 to 19.99 mS/cm
- **T71:** TDS tester low range
Range: 0 to 1999 ppm
- **T72:** TDS tester high range
Range: 0.00 to 10.00 g/L (ppt)



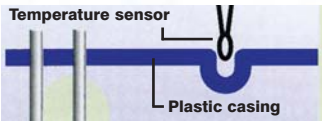
Specifications

	 C61 Sharp EC	 C62 Sharp EC	 T71 Sharp TDS	 T72 Sharp TDS
Range	0 to 1999 μ S/cm	0.00 to 19.99 mS/cm	0 to 1999 ppm	0.00 to 10.00 g/L
Resolution	1 μ S/cm	0.01 mS/cm	1 ppm	0.01 g/L
Accuracy	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale	$\pm 2\%$ Full Scale
Temperature Compensation	automatic from 5 to 50°C	automatic from 5 to 50°C	automatic from 5 to 50°C	automatic from 5 to 50°C
Battery Life	350 hours	350 hours	350 hours	350 hours
Dimensions	155 x 45 x 25 mm	155 x 45 x 25 mm	155 x 45 x 25 mm	155 x 45 x 25 mm

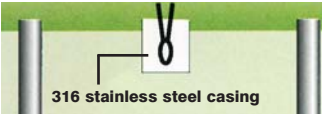
Stainless steel casing ATC

Temperature has a huge influence on TDS and EC, on the basis of a 2% error per degree Celsius. Even small temperature differences between the measured solution and the measuring instrument can lead to large reading errors. For instance, if the solution's temperature is 15°C, and the tester's is 35°C, the reading error is (35-15x2%) 40%. Conventional testers with plastic casings for their temperature sensors also slow response times. It can take at least 10 minutes for conventional testers to fully compensate temperature differences. This causes reading error. Sharp tester's new stainless steel encased temperature sensors can compensate in seconds, no matter how large the temperature difference. Sharp tester's fast response time guarantees high accuracy.

Conventional tester



Sharp Tester



Accessories

- M10030B 12880 μ S/cm calibration solution, 20 mL (25 pcs)
- M10031B 1413 μ S/cm calibration solution, 20 mL (25 pcs)
- M10032B 1382 ppm (mg/L) calibration solution, 20 mL (25 pcs)

- M10038B 6.44 ppt (g/L) calibration solution, 20 mL (25 pcs)
- M10080B 800 ppm calibration solution 20 mL (25 pcs)



Ordering Information

C61 and C62 are supplied complete with protective cap, 20 mL 1413 μ S/cm sachet of calibration solution, hard carrying case, calibration screwdriver, batteries and instructions. T71 and T72 are supplied complete with protective cap, 20 mL 1382 ppm sachet of calibration solution, hard carrying case, calibration screwdriver, batteries and instructions.

SMS310/SMS410/SMS315/SMS415

Conductivity and TDS Monitors

Reliable Conductivity and TDS monitors with Automatic temperature compensation and 1 point manual calibration powered by a 12 VDC adapter. They are ideal for the hydroponic market and allow you to continuously monitor EC or TDS values directly in your reservoir.


Other features include: user selectable set point, visual LED alarm when values go below the set point (for SMS310 and SMS410).

The CAL test feature on the SMS315 and SMS415 will warn the user (through an LED) when the probe needs to be calibrated again!

The monitors are very simple to operate:

1. hang your monitor above your reservoir
2. connect the adapter to the meter and plug in the power supply (make sure that your power supply is in a safe area from the water!)
3. immerse 2/3 of the probe in the solution
4. the probe can now remain there permanently.



Specifications					
		SMS310	SMS410	SMS315	SMS415
Range	EC/TDS	0.0 to 10.0 mS/cm	0 to 1990 ppm	0.00 to 9.99 mS/cm	0 to 1990 mg/L (ppm)
Resolution	EC/TDS	0.1 mS/cm	10 ppm	0.01 mS/cm	10 mg/L (ppm)
Accuracy (@25°)		±2% Full Scale	±2% Full Scale	±2% Full Scale	±2% Full Scale
Conversion Factor			0.7		approx. 0.7
Set point		1.5 to 3.5 mS/cm	700 to 1900 ppm		
Alarm		active when the measure is lower than the set point	active when the measure is lower than the set point		
Temperature Compensation		automatic, from 5 to 50°C	automatic, from 5 to 50°C		
Environment		0 to 50°C; max RH 95%	0 to 50°C; max RH 95%	0 to 50°C; max RH 95%	0 to 50°C; max RH 95%
Probe		MA811/2 (included)	MA812/2 (included)	MA815/2 (included)	MA816/2 (included)
Power Supply		12 VDC power adapter (included)	12 VDC power adapter (included)	12 VDC power adapter (included)	12 VDC power adapter (included)
Dimensions		165 x 80 x 40 mm	165 x 80 x 40 mm	85 x 104 x 39 mm	85 x 104 x 39 mm
Weight		220 g (meter only)	220 g (meter only)	130 g (meter only)	130 g (meter only)

Accessories

M10031B	1413 µS/cm calibration solution, 20 mL sachet (25 pcs)	M100040B
M10032B	1382 ppm calibration solution, 20 mL sachet (25 pcs)	MA811/2
M10039B	5.00 mS/cm calibration solution, 20 mL sachet (25 pcs)	MA812/2
M10442B	1500 ppm calibration solution, 20 mL sachet (25 pcs)	MA815/2
M100020B	Cal-Test solution for SMS315, 20 mL sachet (25 pcs)	MA816/2



Cal-Test solution for SMS415, 20 mL sachet (25 pcs)
Conductivity probe with 2 m cable
Conductivity probe with 2 m cable
Conductivity probe for SMS315 with 2 m cable
Conductivity probe for SMS415 with 2 m cable

Ordering Information

SMS310 is supplied complete with 12VDC adapter, MA811/2 EC probe, 20 mL 1413 µS/cm sachet of calibration solution, screwdriver for calibration and instruction.

SMS410 is supplied complete with 12VDC adapter, MA812/2 TDS probe, 20 mL 1382 ppm sachet of calibration solution, screwdriver for calibration and instruction.

SMS315 is supplied complete with 12VDC adapter, MA815/2 EC probe, 20 mL 1413 µS/cm sachet of calibration solution, screwdriver for calibration and instruction.

SMS415 is supplied complete with 12VDC adapter, MA816/2 TDS probe, 20 mL 1382 ppm sachet of calibration solution, 20 mL conductivity Cal-Test Solution, screwdriver for calibration and instruction.

New

Mi190

Extended Range Bench Dissolved Oxygen Meter

Ideal for testing Dissolved Oxygen in the pharmaceutical and food Industry, as well as monitoring in water treatment plants. The user can choose to measure D.O. readings in mg/L or % of saturation of O₂. This meter can be used for any type of water, as it allows measurements to compensate for temperature, altitude and salinity factors. The automatic logging interval can be set to perform analysis and store data into the memory.

All logged data can be downloaded to your PC through an RS232 or USB serial port. Memory can store up to 50 samples. Mi190 features an automatic calibration procedure, at 1 or 2 points (at 0 and 100% of O₂ saturation). The polarographic probe supplied with the meter (MA840/2) measures the current generated by the reaction of O₂ with Ag.

Mi190 is supplied complete with MA840/2 DO probe with 2 m cable, 2 spare membranes, MA7041 electrolyte solution (30 mL), 12 VDC power adapter, probe holder and instruction manual.



Specifications	Mi190
Range	O ₂ 0.00 to 45.00 mg/L (ppm) % Saturation O ₂ 0.0 to 300% Temp -5.0 to 55.0°C / 23.0 to 131.0°F
Resolution	O ₂ 0.01 mg/L (ppm) % Saturation O ₂ 0.1% Temp 0.1°C / 0.1°F
Accuracy	O ₂ ±1.5 Full Scale % Saturation O ₂ ±1.5 Full Scale Temp ±0.4°C / ±0.8°F
Logging	50 records, LOG on demand or auto-logging
DO Calibration	automatic, 1 or 2 point at 0% (MA9070) and 100% (in air)
Temperature Compensation	0.0 to 50.0°C / 32.0 to 122.0°F
Altitude Compensation	0 to 4000 m; resolution 100 m
Salinity Compensation	0 to 40 g/L; resolution 1 g/L
DO Probe	MA840/2 with DIN connector (included)
Temperature Probe	Included in DO probe
Calibration	2 points (0.0°C and 50.0°C / 32.0 to 122.0°F)
Log on demand	up to 50 records
PC interface	RS232 / USB Opto-isolated
Power supply	12 VDC power adapter (included)
Environment	0 to 50°C / 32 to 122°F; max RH 100%
Dimensions	230 x 160 x 95 mm
Weight	0.9 Kg

Polarographic D.O. Probe

Polarographic D.O. probe with 2 meters cable



Rear Connector Panel layout

Communication to the PC is done via opto-isolated USB and RS232 ports.



Accessories

- MA9070 Zero Oxygen Solution, 230 mL bottle
- MA9071 Refilling Electrolyte Solution, 230 mL bottle
- MA9310 12 VDC Adapter, 220 V
- MA9311 12 VDC Adapter, 110 V
- MA9315 Electrode Holder



- MA841 Spare membrane (5 pcs)
- MA840/2 DO probe with 2 meters cable
- MA9350 RS232 connection cable with 2 m cable
- Mi5200 Application Software

Ordering Information

- Mi190 is supplied complete with:
- MA840/2 DO probe with 2 meter cable
 - MA841 Spare membrane
 - MA9071 Electrolyte solution
 - MA9315 Electrode Holder
 - Mi5200 Application Software
 - MA9350 RS232 connection cable with 2 meters cable
 - 12 VDC Adapter
 - Instruction manual

Mi605 Portable D.O. Meter for Field Applications

Mi605 is a portable, microprocessor-based, Dissolved Oxygen meter with automatic calibration and temperature compensation (ATC) specifically designed for spot sampling applications.

Dissolved Oxygen measurements can be displayed in parts per million (ppm=mg/L) or in % of saturation.

The temperature is indicated in Celsius from 0 to 50°C with 0.1 resolution. The meter compensates salinity and altitude automatically after manual input.

Calibration is very simple and fast: just expose the polarographic Dissolved Oxygen probe MA840, supplied with the instrument, to air and press the CAL button.

No need for chemical solutions!

A HOLD button allows the user to freeze the reading on the LCD.

The low battery indicator and the easy to replace screw on cap membranes make the Mi605 a compact instrument and ideal for all applications: aquaculture, wastewater, environmental and educational.



Years
warranty
2

ATC

Dual
Display

Self
diagnostics

CE

Specifications		Mi605
Range	O ₂	0.0 to 45.00 mg/L (ppm)
	% Saturation O ₂	0.0 to 300%
	Temp	0.0 to 50.0°C / 32 to 122°F
Resolution	O ₂	0.01 mg/L (ppm)
	% Saturation O ₂	0.1%
	Temp	0.1°C
Accuracy (@25°C)	O ₂	±1.5% Full Scale
	% Saturation O ₂	±1.5% Full Scale
	Temp	±0.5°C
Typical EMC Deviation	O ₂	±0.3 mg/L (ppm)
	% Saturation O ₂	±3.5%
	Temp	±0.5°C
Calibration		automatic in saturated air
Temperature Compensation		automatic, from 0 to 50°C / 32 to 122°F
Altitude Compensation		0 to 4000 m; 100 m resolution
Salinity Compensation		0 to 80 g/L; 1 g/L resolution
Probe		MA840 (included)
Environment		0 to 50°C / 32 to 122°F; max RH 100%
Battery Type		1 x 9V alkaline (included)
Battery Life		approx. 100 hours of use
Auto-off		after 4 hours of non-use
Dimensions		200 x 85 x 50 mm
Weight		280 g (with battery)

Hard Carrying Case

Mi605 is supplied complete in a hard carrying case complete with a D.O. probe, spare membranes, calibration solutions, battery and instructions.



Accessories

- MA9071 Refilling Electrolyte solution, 230 mL bottle
- MA841 Spare membrane (5 pcs)
- MA840 D.O. Probe



Ordering Information

Mi605 is supplied complete with MA840 polarographic D.O. probe with 3 meters cable, 2 spare membranes, 20 mL bottle of electrolyte solution, rugged carrying case, 9V battery and instructions.

Portable Dissolved Oxygen Meter for Education



The SM600 is a Portable Dissolved Oxygen meter ideal for use in school laboratories. Dissolved Oxygen measurements are also very important in fish farms and ponds, where Oxygen levels are continuously monitored to obtain optimal reproduction.

The SM600 calibrates easily in 2 points (at 100% saturated air and in 0 Oxygen solution) and has Automatic Temperature Compensation which guarantees the highest accuracy.

The low battery warning, easy to replace screw on cap membranes make this meter very simple to operate. Rugged Carrying Case (Optional) provides handy on-site meter calibration and measurements.

SM600 is supplied complete with a MA840 D.O. polarographic probe with 3 m cable, calibration screwdriver, 2 spare membranes, MA7040 (20 mL) electrolyte solution, battery and instructions.

Specifications		SM600
Range	O ₂	0.0 to 19.9 mg/L
Resolution	O ₂	0.1 mg/L
Accuracy (@25°C)	O ₂	±1.5% Full Scale
Calibration		manual on 2 points (zero and slope)
Temperature Compensation		automatic from 0 to 30°C
Probe		MA840 (included)
Environment		0 to 50°C / 32 to 122°F; max RH 95%
Battery Type		9V alkaline (included)
Battery Life		approximately 70 hours of use
Dimensions		145 x 80 x 40 mm
Weight		220 g (with battery)

Altitude, Meters above Sea Level									
°C	0 m	300 m	600 m	900 m	1200 m	1500 m	1800 m	°F	
0	14.6	14.1	13.6	13.2	12.7	12.3	11.8	32.0	
2	13.8	13.3	12.9	12.4	12.0	11.6	11.2	35.6	
4	13.1	12.7	12.2	11.9	11.4	11.0	10.6	39.2	
6	12.4	12.0	11.6	11.2	10.8	10.4	10.1	42.8	
8	11.8	11.4	11.0	10.6	10.3	9.9	9.6	46.4	
10	11.3	10.9	10.5	10.2	9.8	9.5	9.2	50.0	
12	10.8	10.4	10.1	9.7	9.4	9.1	8.8	53.6	
14	10.3	9.9	9.6	9.3	9.0	8.7	8.3	57.2	
16	9.9	9.7	9.2	8.9	8.6	8.3	8.0	60.8	
18	9.5	9.2	8.7	8.6	8.3	8.0	7.7	64.4	
20	9.1	8.8	8.5	8.2	7.9	7.7	7.4	68.0	
22	8.7	8.4	8.1	7.8	7.7	7.3	7.1	71.6	
24	8.4	8.1	7.8	7.5	7.3	7.1	6.8	75.2	
26	8.1	7.8	7.5	7.3	7.0	6.8	6.6	78.8	
28	7.8	7.5	7.3	7.0	6.8	6.6	6.3	82.4	
30	7.5	7.2	7.0	6.8	6.5	6.3	6.1	86.0	
32	7.3	7.1	6.8	6.6	6.4	6.1	5.9	89.6	
34	7.1	6.9	6.6	6.4	6.2	6.0	5.8	93.2	
36	6.8	6.6	6.3	6.1	5.9	5.7	5.5	96.8	
38	6.6	6.4	6.2	5.9	5.7	5.6	5.4	100.4	
40	6.4	6.2	6.0	5.8	5.6	5.4	5.2	104.4	

ALTITUDE & SALINITY COMPENSATION:

If the sample contains salts or if you are performing the measurements at altitude different from sea level, the readout values must be corrected, taking into account the lower degree of oxygen solubility.

Altitude Compensation: all the readouts are referred to sea level, thus the displayed measurements are higher than the actual values. In fact, altitude affects D.O. concentration by decreasing its value.

The table on the left reports the oxygen solubility at various temperatures and altitudes, based on sea level barometric pressure of 760 mmHg.

This gives an idea of the error that can be introduced at different altitudes and allows to calculate the quantity to be subtracted to correct the reading.

Salinity Compensation: the table below shows the influence of salt concentration in the measurement of oxygen.

In SM600 all the readouts are referred to 0 g/L of salinity value. In fact, salinity affects D.O. concentration by decreasing its value. The table below reports the oxygen solubility at various temperatures and salinity.

From the table it is possible to calculate the quantity to be subtracted to correct the reading.

Salinity (g/L) at Sea Level						
°C	0 g/L	10 g/L	20 g/L	30 g/L	35 g/L	°F
10	11.3	10.6	9.9	9.3	9.0	50.0
12	10.8	10.1	9.5	8.9	8.6	53.6
14	10.3	9.7	9.1	8.6	8.3	57.2
16	9.9	9.3	8.7	8.2	8.0	60.8
18	9.5	8.9	8.4	7.9	7.6	64.4
20	9.1	8.5	8.0	7.6	7.4	68.0
22	8.7	8.2	7.8	7.3	7.1	71.6
24	8.4	7.9	7.5	7.1	6.9	75.2
26	8.1	7.6	7.2	6.8	6.6	78.8
28	7.8	7.4	7.0	6.6	6.4	82.4

Accessories

- MA9070 Zero Oxygen calibration solution, 230 mL bottle
- MA9071 Refilling Electrolyte solution, 230 mL bottle

- MA840 D.O. Probe
- MA841 Spare membrane (5 pcs)



Ordering Information

SM600 is supplied complete with MA840 probe, 2 spare membranes, 20 mL bottle of electrolyte solution, calibration screwdriver, 9V battery and instructions.

Mi180

pH/ORP/EC/TDS/NaCl/Temperature Laboratory Bench Meter

Mi180 measures 6 different parameters: pH, ORP, EC, TDS (Total Dissolved Solids), percentage of NaCl and temperature in a variety of ranges. pH calibration can be performed in 3 points selectable between 7 memorized buffers, to provide a very accurate calibration curve even when testing different samples, where very wide differences in pH can be found.

The auto-ranging feature for EC and TDS measurements automatically sets the resolution suitable to the tested sample. All measurements can be temperature compensated at 20 or 25°C and the compensation coefficient is selectable by the user. The automatic temperature compensation can also be disabled for measuring the actual conductivity value. The stability indicator on the LCD ensures accuracy. Conductivity readings are performed with the 4-ring probe supplied with the meter. The GLP feature allows users to store and recall data on system status. PC compatible through an RS232 port or USB.



- Years warranty 3
- MEM
- RS232
- USB
- ATC
- GLP
- Points 2
- Dual Display
- MULTI
- Software CD
- Self diagnostics
- CE

Specifications		Mi180
Range	pH	-2.00 to 16.00 pH; -2.000 to 16.000 pH
	mV	±699.9 mV; ±2000 mV
	EC	0.00 to 29.99 µS/cm; 30.0 to 299.9 µS/cm; 300 to 2999 µS/cm;
	TDS	3.00 to 29.99 mS/cm; 30.0 to 200.0 mS/cm; up to 500.0 mS/cm (uncompensated EC*)
	NaCl	0.0 to 14.99 mg/L (ppm); 15.0 to 149.9 mg/L (ppm); 150 to 1499 mg/L (ppm);
Resolution	Temp	up to 400.0 g/L actual TDS (with 0.80 factor)
	pH	0.0 to 400.0 g/L (ppt); 15.0 to 100.0 g/L (ppt);
	mV	0.0 to 400.0 g/L actual TDS (with 0.80 factor)
	EC	0.01 pH; 0.001 pH
	TDS	0.1 mV; 1 mV
Accuracy	NaCl	0.01 µS/cm; 0.1 µS/cm; 1 µS/cm; 0.01 mS/cm; 0.1 mS/cm;
	Temp	0.01 mg/L; 0.1 mg/L; 1.0 mg/L; 0.01 g/L; 0.1 g/L
	pH	0.1%
	mV	0.1°C / 0.1°F
	EC	±0.01 pH; ±0.002 pH
Rel mV offset	NaCl	±0.2 mV; ±1 mV
	Temp	±1% of reading ±(0.05 µS/cm or 1 digit)
	pH	±1% of reading ±(0.03 ppm or 1 digit)
	mV	±1% reading
	EC	±0.4°C / ±0.8°F
Calibration	NaCl	±2000 mV
	Temp	1, 2 or 3 points calibration, with 7 memorized buffers (pH 1.68, 4.01, 6.86, 7.01, 9.18, 10.01 and 12.45)
	pH	1 point slope calibration with 6 memorized solutions: (84 µS/cm, 1413 µS/cm, 5.00 mS/cm, 12.88 µS/cm, 80.0 µS/cm, 111.8 mS/cm)
	EC	1 point, with MA9066 solution
	NaCl	2 point, at 0 and 50°C / 32 and 122°F
Temperature Compensation	Temp	automatic or manual, from -20.0 to 120.0°C / -4.0 to 248.0°F
	Temp	selectable from 0.00 to 6.00%/°C (EC and TDS only)
	pH Electrodes & Temp Probe	MA917B/1 & MA831R (included)
	EC/TDS/NaCl/Temp Probe	MA814DB/1 (included)
	TDS Factor	0.40 to 0.80 (default value is 0.50)
Log on demand	GLP	up to 50 samples on each range (pH, mV, EC, TDS, NaCl)
	PC Interface	last pH, EC, NaCl calibration data
	Environment	RS232 / USB Opto-isolated
	Input Impedance	0 to 50°C / 32 and 122°F; max RH 95%
	Power supply	10 ¹² Ohm
Dimensions	Weight	12 VDC power adapter (included)
		230 x 160 x 95 mm
		0.9 kg

(*) Uncompensated conductivity (or TDS) is the conductivity (or TDS) value without temperature compensation.

Ordering Information

Mi180 is supplied complete with

- MA917B/1 pH Electrode
- MA814DB/1 EC/TDS/NaCl/Temperature probe
- MA831R Temperature Probe

- MA9315 Electrode Holder
- M10004 pH 4.01 Sachet Buffer solution
- M10007 pH 7.01 Sachet Buffer solution
- M10010 pH 10.01 Sachet Buffer solution
- M10030 12880 µS/cm calibration solution
- M10031 1413 µS/cm calibration solution

Accessories



- MA9001 pH 1.68 buffer, 230 mL bottle
- MA9004 pH 4.01 buffer, 230 mL bottle
- MA9006 pH 6.86 buffer, 230 mL bottle
- MA9007 pH 7.01 buffer, 230 mL bottle
- MA9009 pH 9.18 buffer, 230 mL bottle
- MA9010 pH 10.01 buffer, 230 mL bottle
- MA9012 Refilling solution for double junction electrode, 230 mL bottle
- MA9015 Electrode storage solution, 230 mL bottle
- MA9016 Electrode cleaning solution, 230 mL bottle
- MA9112 pH 12.45 buffer solution, 230 mL bottle
- MA9060 12880 µS/cm calibration solution, 230 mL bottle
- MA9061 1413 µS/cm calibration solution, 230 mL bottle
- MA9063 84 µS/cm calibration solution, 230 mL bottle
- MA9065 111.8 mS/cm calibration solution, 230 mL bottle
- MA9066 100% NaCl calibration solution, 230 mL bottle
- MA9069 5000 µS/cm solution, 230 mL bottle
- MA9310 12 VDC Adapter, 220 V
- MA9311 12 VDC Adapter, 110 V
- MA9315 Electrode Holder
- MA917B/1 Double junction refillable pH electrode
- MA814DB/1 EC/TDS/NaCl/Temperature probe with DIN connector and 1 m cable
- MA921B/1 Double junction, gel filled ORP electrode
- MA831R Temperature probe
- MA9350 RS232 connection cable with 2 meters cable

- M10016 Sachet Electrode Cleaning solution
- Mi5200 Application Software
- MA9350 RS232 connection cable with 2 meters cable
- Graduate Pipet, 12 VDC Adapter & Instruction manual

Mi805/Mi806

Portable pH/EC/TDS/Temperature Meters

- Years warranty
2
- ATC
- Points
2
- Dual Display
- MULTI
- Self diagnostics
- CE



Measures 4 parameters with 1 single probe. Mi805 and Mi806 offer you a combination of pH, Conductivity, total dissolved solids and temperature measurements.



You can select from a range of calibration buffers and also the temperature scale (°C or °F) can be selected. The multi-parameter probe MA851D/1, includes pH/EC/TDS and temperature, all in one rugged handle.

Other features include different TDS factors from 0.45 to 1.00, and a range of temperature coefficients (β) from 0.0 to 2.4% for greater consistency and reproducibility. The Stability Indicator prompts the user when the reading stabilizes.

The Auto-Hold Function automatically freezes reading for later viewing. Large and Easy-to-Read display provides simultaneous readings of pH and Temperature or EC/TDS and temperature.



Specifications

		 Mi805	 Mi806
Range	pH EC TDS Temp	0.00 to 14.00 pH 0 to 3999 μS/cm 0 to 1999 ppm 0.0 to 60.0°C / 32.0 to 140.0°F	0.00 to 14.00 pH 0.00 to 20.00 mS/cm 0.00 to 10.00 ppt 0.0 to 60.0°C / 32.0 to 140.0°F
Resolution	pH EC TDS Temp	0.01 pH 1 μS/cm 1 ppm 0.1°C / 0.1°F	0.01 pH 0.1 mS/cm 0.01 ppt 0.1°C / 0.1°F
Accuracy (@25°C)	pH EC/TDS Temp	±0.01pH ±2% Full Scale ±0.5°C / ±1°F	±0.01 pH ±2% Full Scale ±0.5°C / ±1°F
Typical EMC Deviation	pH EC/TDS Temp	±0.02 pH ±2% Full Scale ±0.5°C / ±1°F	±0.02 pH ±2% Full Scale ±0.5°C / ±1°F
Temperature Compensation		automatic from 0 to 60°C; with β adj. from 0.0 to 2.4%/°C	automatic from 0 to 60°C; with β adj. from 0.0 to 2.4%/°C
pH Calibration		automatic, 1 or 2-point with automatic buffer recognition	automatic, 1 or 2-point with automatic buffer recognition
EC Calibration		automatic, 1 point	automatic, 1 point
EC/TDS Conversion Factor		adj. from 0.45 to 1.00	adj. from 0.45 to 1.00
Probe		MA851D/1 amplified pH/EC/TDS/Temperature probe with DIN connector and 1 m cable (included)	MA851D/1 amplified pH/EC/TDS/Temperature probe with DIN connector and 1 m cable (included)
Environment		0 to 50°C / 32 to 122°F; max. RH 100%	0 to 50°C / 32 to 122°F; max. RH 100%
Battery Type		1 x 9V alkaline (included)	1 x 9V alkaline (included)
Battery Life		approx. 300 hours	approx. 300 hours
Auto-off		after 8 minutes of non-use	after 8 minutes of non-use
Dimensions		200 x 85 x 50 mm	200 x 85 x 50 mm
Weight		260 g (with battery)	260 g (with battery)

Accessories

MA851D/1	Amplified pH/EC/TDS/Temperature probe with DIN connector and 1 m cable
MA9004	pH 4.01 buffer solution, 230 mL bottle
MA9006	pH 6.86 buffer solution, 230 mL bottle
MA9007	pH 7.01 buffer solution, 230 mL bottle
MA9009	pH 9.18 buffer solution, 230 mL bottle
MA9010	pH 10.01 buffer solution, 230 mL bottle
MA9015	Probe storage solution, 230 mL
MA9016	General cleaning solution, 230 mL
MA9060	12880 μS/cm solution, 230 mL
MA9061	1413 μS/cm solution, 230 mL
M10000B	Rinse solution, 20 mL (25 pcs.)

Ordering Information

Mi805 is supplied complete with MA851D/1 pH/EC/TDS/Temp amplified probe with 1 meter cable, 2x20 mL pH 4.01 and pH 7.01 sachets of calibration solution, 2x20 mL 1413 μS/cm sachets of calibration solutions, 2x20 mL sachet of electrode cleaning solutions, rugged carrying case, 9V battery and instructions.

Mi806 is supplied complete with MA851D/1 pH/EC/TDS/Temp amplified probe with 1 meter cable, 2x20 mL pH 4.01 and pH 7.01 sachets of calibration solution, 2x20 mL 12880 μS/cm sachets of calibration solutions, 2x20 mL sachet of electrode cleaning solutions, rugged carrying case, 9V battery and instructions.

SM801/SM802

Portable pH/EC/TDS combination Meters



3 meters in 1! These meters allow you to measure pH, EC (conductivity) and TDS with just one instrument and one single probe!

The SM801 with a Conductivity range that goes up to 1990 $\mu\text{S}/\text{cm}$ and TDS range that goes up to 1990 ppm is an ideal tool for drinking water measurements.

The SM802, with a conductivity range that goes up to 6.00 mS/cm and the TDS up to 4000 ppm is ideal for testing in crop production. Soil and well water pH that is too acidic or alkaline can have an adverse effect on plant nutrient and water uptake and directly effect the efficiency of fertilizer, herbicides and pesticides. Soil Conductivity is checked before fertilizer application to pinpoint field needs and after fertilization to establish its effectiveness.

Supplied with the MA850 interchangeable probe to measure pH, Conductivity and TDS. The pH electrode utilizes a fiber junction to reduce contamination when measuring fertilizer solutions. Both meters calibrate manually in pH, Conductivity and TDS.



Specifications			
		SM801	SM802
Range	pH EC TDS	0.0 to 14.0 pH 0 to 1990 $\mu\text{S}/\text{cm}$ 0 to 1990 ppm	0.00 to 14.00 pH 0.00 to 6.00 mS/cm 0 to 4000 ppm
Resolution	pH EC TDS	0.1 pH 10 $\mu\text{S}/\text{cm}$ 10 ppm	0.10 pH 0.01 mS/cm 10 ppm
Accuracy (@20°C)	pH EC/TDS	± 0.2 pH $\pm 2\%$ Full Scale	± 0.20 pH $\pm 2\%$ Full Scale
Calibration Solutions		M10007 (pH 7.01) M10032 (1382 ppm) M10031 (1413 $\mu\text{S}/\text{cm}$)	M10007 (pH 7.01) M10442 (1500 ppm) M10031 (1413 $\mu\text{S}/\text{cm}$)
Conversion Factor		0.5	0.68
Calibration		manual, at 1 point	manual, at 1 point
Temperature Compensation		automatic, from 0 to 50°C	automatic, from 0 to 50°C
Probe		MA850 combination pH/EC/TDS probe	MA850 combination pH/EC/TDS probe
Environment		0 to 50°C / 32 to 122°F; max RH 95%	0 to 50°C / 32 to 122°F; max RH 95%
Battery Type / Battery Life		1 x 9 V alkaline / 150 hours of use	1 x 9 V alkaline / 150 hours of use
Auto-off		after 8 minutes of non-use	after 8 minutes of non-use
Dimensions		185 x 82 x 45 mm	185 x 82 x 45 mm
Weight		165 g (with battery)	165 g (with battery)

Combined interchangeable pH, Conductivity and TDS Probe

The pH electrode utilizes a fiber junction to reduce contamination when measuring fertilizer solutions.

pH Calibration

Adjust the calibration knob until the LCD shows the pH value at the above measured temperature.

EC/TDS Calibration

Turn the EC/TDS calibration knob until the display shows the EC or TDS reading at 25°C.



Accessories

M10004B	pH 4.01 buffer solution, 20 mL sachet (25 pcs)	M10032B	1382 ppm calibration solution, 20 mL sachet (25 pcs)
M10007B	pH 7.01 buffer solution, 20 mL sachet (25 pcs)	M10442B	1500 ppm calibration solution, 20 mL sachet (25 pcs)
M10010B	pH 10.01 buffer solution, 20 mL sachet (25 pcs)	MA 9015	Electrode storage solution, 230 mL bottle
M10031B	1413 $\mu\text{S}/\text{cm}$ calibration solution, 20 mL sachet (25 pcs)	MA850	pH/EC/TDS spare probe with 1 m cable



Ordering Information

SM801 is supplied complete with MA850 combination pH/EC/TDS probe, 20 mL sachet pH 7.01 buffer solution, 20 mL 1413 $\mu\text{S}/\text{cm}$ sachet of calibration solution, 20 mL 1382 ppm sachet of calibration solution, 9V battery and instructions.

SM802 is supplied complete with MA850 combination pH/EC/TDS probe, 20 mL sachet pH 7.01 buffer solution, 20 mL 1413 $\mu\text{S}/\text{cm}$ sachet of calibration solution, 20 mL 1500 ppm sachet of calibration solution, 9V battery and instructions.



SM700

Portable Lux Meter



The light is necessary for the development of the plants. In fact, it is necessary a sufficient contribution of light in order to favor the photosynthesis and the closing of the plants. The supplement of light by means of lamps electrical workers is the method simpler and economic in order to bring the necessary light to the plants.

SM700 is a portable Lux meter designed to perform light measurements. It is supplied with a light sensor connected to the meter that measures from 0 to 50000 Lux. Average indoor lighting ranges from 100 to 1000 Lux and average outdoor sun lights about 50000 Lux. Lux is a unit that indicates the density of light that falls on a surface. The human eye is sensitive only to blue, green, and red light, so in calculating the Lux falling on an object, only the light that the human eye sees is counted. When only infrared light falls on an object, the Lux is counted as zero since our eyes see nothing. Mathematically, a spectral weighting function becomes convolved with the actual illumination spectrum to calculate Lux exactly. This is the formal definition of Lux and it makes Lux an unusual unit of measure.



Still, Lux can be thought of as a way of measuring light in terms of what our eyes perceive. The metric unit of measure for luminance of a surface. One Lux is equal to one Lumen per square meter. One Lux equals 0.0929 footcandles.

Specifications	SM700
Range	0.000 to 1999 Lux 2000 to 19999 Lux 20000 to 50000 Lux
Range setting	manual through key buttons
Resolution	1 Lux 10 Lux 100 Lux
Accuracy	±6% of reading ±1 digit
Peak Wave Length	560 nm
Sensor Type	silicon photodiode
Sensor Sensitivity	100 scotopic Lux
Sensor Stability	±2% change per year (in the first two years)
Environment	0 to 50°C / 32 to 122°F; max RH 95%
Battery Type	1 x 9V (IEC 6LR61) alkaline
Battery Life	approximately 150 hours of continuous use
Auto-off	after about 5 minutes of non-use
Weight	approximately 270 g (meter with sensor)



Light Sensor

SM700 is provided with a light sensor connected to the meter through a coaxial cable.

Range keys

Press one of the three "Range keys" to select the proper scale according to the intensity of the light.



Ordering Information

SM700 is supplied complete with 9V battery and instructions.



Mi411

Free & Total Chlorine and pH Photometer

3 in 1 Combination Photometer.
This latest laboratory grade Microprocessor photometer has an excellent repeatability and is ideal for field measurements. Chlorine is the most commonly used water disinfectant. Applications vary from treatment of drinking water and waste-water to pool and spa sanitization and food processing to sterilization.

Martini Instruments has developed the Mi411, a portable microprocessor based instrument to measure three critical parameters to ensure good water quality: pH, free chlorine and total chlorine. This instrument provides greater resolution, better accuracy and immediate results.

Mi411 is supplied in a hard carrying case including 2 cuvetts, reagents for 100 tests, wiping tissue and instruction manual.



Specifications		Mi411 Free & Total Chlorine and pH
Range	Free Chlorine Total Chlorine pH	0.00 to 5.00 mg/L Cl ₂ 0.00 to 5.00 mg/L Cl ₂ 6.5 to 8.0 pH
Resolution	Free Chlorine Total Chlorine pH	0.01 mg/L (0.00 to 3.50 mg/L); 0.10 mg/L (above 3.50 mg/L) 0.01 mg/L (0.00 to 3.50 mg/L); 0.10 mg/L (above 3.50 mg/L) 0.1 pH
Accuracy	Free Chlorine Total Chlorine pH	±0.04 mg/L @1.50 mg/L ±0.04 mg/L @1.50 mg/L ±0.1 pH @7.2 pH
Method	Free Chlorine Total Chlorine pH	adaptation of the USEPA method 330.5 and Standard Method 4500-Cl G adaptation of the USEPA method 330.5 and Standard Method 4500-Cl G adaptation of the phenol red method
Light Source		tungsten lamp
Light Detector		silicon photocell and 525 nm narrow band interference filter
Environment		0 to 50°C / 32 to 122°F; max RH 100%
Battery Type		1 x 9V
Auto-off		after 10 minutes of non-use
Dimensions		192 x 104 x 52 mm
Weight		380 g

Hard Carrying Case

Mi411 comes complete in hard carrying case, making it ideal for field measurements.



Accessories

Mi504-100 Free & Total Chlorine reagent set (100 tests)
Mi509-100 pH reagent (100 tests)
Mi511-100 Free & Total Chlorine and pH reagent set (100 tests)

Mi0001 Glass cuvetts (2 pcs)
Mi0002 Caps for cuvetts (2 pcs)
Mi0003 Stoppers for cuvetts (2 pcs)
Mi0004 Tissue for wiping cuvetts (4 pcs)
Mi0005 9V battery (1 pc)



Ordering Information

Mi411 is supplied complete with 2 cuvetts, liquid reagents for 100 tests, hard carrying case, wiping tissue, 9V battery and instructions.



Mi405/Mi407/Mi408/Mi412

Ammonia, Iron & Phosphate Photometers

These user-friendly Colorimeters will give you direct readings in mg/L.

Ammonia detection in water treatment systems is particularly important for aquarium owners and fish farm operators. Ammonia is highly soluble in water and extremely toxic to fish. Fish farm owners must monitor and maintain careful control of ammonia levels to ensure optimum water conditions for their stock.

Milwaukee offers 2 instruments for low and medium concentrations: Mi405 with a range of 0.00 to 9.99 mg/L and Mi407 from 0.00 to 3.00 mg/L





Iron is naturally present in water supplies and its presence in both potable and industrial applications is regarded as objectionable. Milwaukee offers Mi408 Iron meter with a range of 0.00 to 5.00 mg/L.

Phosphates are present in natural waters and at concentrations typically found, do not pose any specific health threats to humans.

However, excessive contamination of water courses from agricultural fertilizer run off or wastewater/effluent discharge can promote excessive algae or plant growth.

Milwaukee offers Mi412 with range 0.00 to 2.50 mg/L.

Specifications

		 Mi405 Ammonia MR	 Mi407 Ammonia LR	 Mi408 Iron HR	 Mi412 Phosphate LR
Range	Ammonia Iron Phosphate	0.00 to 9.99 mg/L (NH ₃ -N)	0.00 to 3.00 mg/L (NH ₃ -N)	0.00 to 5.00 mg/L Fe	0.00 to 2.50 mg/L PO ₄
Resolution	Ammonia Iron Phosphate	0.01 mg/L	0.01 mg/L	0.01 mg/L	0.01 mg/L
Accuracy	Ammonia Iron Phosphate	±0.10 mg/L @5.00 mg/L	±0.04 mg/L @1.50 mg/L	±0.03 mg/L @1.50 mg/L	±0.04 mg/L @1.00 mg/L
Method		adaptation of Nessler method	adaptation of Nessler method	adaptation of the USEPA method 315 B and Standard method 3500 - Fe B	adaptation of Ascorbic Acid method
Light Source		Blue LED 466 nm	Blue LED 466 nm	tungsten lamp	tungsten lamp
Light Detector		silicon photocell and 466 nm narrow band interference filter	silicon photocell and 466 nm narrow band interference filter	silicon photocell and 525 nm narrow band interference filter	silicon photocell and 610 nm narrow band interference filter
Environment		0 to 50°C / 32 to 122°F; max RH 100%	0 to 50°C / 32 to 122°F; max RH 100%	0 to 50°C / 32 to 122°F; max RH 100%	0 to 50°C / 32 to 122°F; max RH 100%
Battery Type		1 x 9 volt	1 x 9 volt	1 x 9 volt	1 x 9 volt
Auto-off		after 10 minutes of non-use	after 10 minutes of non-use	after 10 minutes of non-use	after 10 minutes of non-use
Dimensions		192 x 104 x 52 mm	192 x 104 x 52 mm	192 x 104 x 52 mm	192 x 104 x 52 mm
Weight		380 g	380 g	380 g	380 g

Accessories

Mi505-100 Ammonia MR reagent (100 tests)
Mi507-100 Ammonia LR reagent (100 tests)
Mi508-100 Iron HR reagent (100 tests)
Mi512-100 Phosphate LR reagent (100 tests)

Mi0001 Glass cuvetts (2 pcs)
Mi0002 Caps for cuvetts (2 pcs)
Mi0003 Stoppers for cuvetts (2 pcs)
Mi0004 Tissue for wiping cuvetts (4 pcs)
Mi0005 9V battery (1 pc)



Ordering Information

Mi405, Mi407, Mi408 and Mi412 are supplied complete with 2 cuvetts, reagents for 100 tests, hard carrying case, wiping tissue, 9V battery and instructions.

Mi404/Mi406/Mi413/Mi414

Free & Total Chlorine and Chloride Photometers

Milwaukee provides a range of chlorine photometers for all applications: swimming pool treatments, household cleaners, dishwasher additives, laundry powders/liquids and cooling water treatment products all contain chlorine as an oxidizing biocide. Drinking water contains residual chlorine to maintain water purity throughout the supply lines.

Milwaukee offers 3 microprocessor-based instruments with greater resolution, better accuracy and immediate results. You can choose between three different models: Mi404 for measuring free (0.00 to 5.00 mg/L) and total (0.00 to 5.00 mg/L) chlorine, Mi406 for measuring free (0.00 to 5.00 mg/L) chlorine and Mi413 for measuring free (0.00 to 10.00 mg/L) and total (0.00 to 10.00 mg/L) chlorine.

Chloride is a major constituent of sea water and is extremely corrosive in acidic environments. It requires close monitoring in applications such as marine boiler systems that are effected by seawater contamination. Chlorides are used by the water treatment professional to determine cycles of concentration in low pressure boilers and cooling systems. It is essential to monitor chloride concentrations in boiler systems to prevent metal parts being damaged. In high levels, chloride can corrode stainless steel.



Specifications		 Mi404 Free & Total Chlorine	 Mi406 Free Chlorine	 Mi413 Free & Total Chlorine HR	 Mi414 Chloride
Range	Free Chlorine Total Chlorine Chloride	0.00 to 5.00 mg/L Cl ₂ 0.00 to 5.00 mg/L Cl ₂	0.00 to 5.00 mg/L Cl ₂	0.00 to 10.00 mg/L Cl ₂ 0.00 to 10.00 mg/L Cl ₂	0.00 to 20.00 mg/L Cl ⁻
Resolution	Free Chlorine Total Chlorine Chloride	0.01 mg/L (0.00 to 3.50 mg/L); 0.10 mg/L (above 3.50 mg/L); 0.01 mg/L (0.00 to 3.50 mg/L); 0.10 mg/L (above 3.50 mg/L)	0.01 mg/L (0.00 to 3.50 mg/L); 0.10 mg/L (above 3.50 mg/L)	0.01 mg/L (0.00 to 3.50 mg/L); 0.10 mg/L (above 3.50 mg/L); 0.01 mg/L (0.00 to 3.50 mg/L); 0.10 mg/L (above 3.50 mg/L)	0.01 mg/L
Accuracy	Free Chlorine Total Chlorine Chloride	±0.04 mg/L @1.50 mg/L ±0.04 mg/L @1.50 mg/L	±0.04 mg/L @1.50 mg/L	±0.10 mg/L @5.00 mg/L ±0.10 mg/L @5.00 mg/L	±0.4 mg/L @10.0 mg/L
Method		adaptation of the USEPA method 330.5 and Standard Method 4500-Cl G	adaptation of the USEPA method 330.5 and Standard Method 4500-Cl G	adaptation of the USEPA method 330.5 and Standard Method 4500-Cl G	adaptation of mercury (II) thiocyanate method
Light Source		tungsten lamp	tungsten lamp	tungsten lamp	Blue LED 466 nm
Light Detector		silicon photocell and 525 nm narrow band interference filter	silicon photocell and 525 nm narrow band interference filter	silicon photocell and 525 nm narrow band interference filter	silicon photocell and 466 nm narrow band interference filter
Environment		0 to 50°C / 32 to 122°F; max RH 100%	0 to 50°C / 32 to 122°F; max RH 100%	0 to 50°C / 32 to 122°F; max RH 100%	0 to 50°C / 32 to 122°F; max RH 100%
Battery Type		1 x 9V	1 x 9V	1 x 9V	1 x 9V
Auto-off		after 10 minutes of non-use	after 10 minutes of non-use	after 10 minutes of non-use	after 10 minutes of non-use
Dimensions		192 x 104 x 52 mm	192 x 104 x 52 mm	192 x 104 x 52 mm	192 x 104 x 52 mm
Weight		380 g	380 g	380 g	380 g

Accessories

- Mi504-100 Free & Total Chlorine reagent set (100 tests)
- Mi506-100 Free Chlorine reagent set (100 tests)
- Mi513-045 Free & Total Chlorine reagent set (45 tests)
- Mi514-100 Chloride reagent set (100 tests)

- Mi0001 Glass cuvetts (2 pcs)
- Mi0002 Caps for cuvetts (2 pcs)
- Mi0003 Stoppers for cuvetts (2 pcs)
- Mi0004 Tissue for wiping cuvetts (4 pcs)
- Mi0005 9V battery (1 pc)



Ordering Information

Mi404, Mi413 and Mi414 are supplied complete with 2 cuvetts, reagents, hard carrying case, wiping tissue, 9V battery and instructions.

New

Mi415
Turbidity Meter



Turbidity refers to the concentration of undissolved, suspended particles present in a liquid. Turbidity is a measure of the clarity of a sample. For potable water applications turbidity is a good indicator of water quality.

Turbidity Measurement is achieved by analyzing the amount of light refracted from suspended particles such as clay, silt and organic material. By measuring turbidity, by photometric or tube methods, it is possible to estimate suspended solids content.

Mi415 has two operating ranges; 0.00 to 50.00 FNU, and 50 to 1000 FNU that can accommodate the most turbid condition you may encounter.

Mi415 is supplied in a hard carrying case, complete with reagents.

Specifications	Mi415 Turbidity Meter
Range	0.00 to 50.00 FNU; 50 to 1000 FNU
Resolution	0.01 FNU; 1 FNU
Accuracy	±0.5 FNU or ±5% of reading, whichever is greater
Method	detection of scattered light
Light Source	high emission infrared LED
Light Detector	silicon photocell
Environment	0 to 50°C / 32 to 122°F; max RH 100%
Battery Type	1 x 9V
Auto-off	after 5 minutes of non-use
Dimensions	192 x 104 x 52 mm
Weight	380 g



Introduction to Turbidity

The cloudy appearance of water (called Turbidity) is caused by suspended material. The unit of measure adopted by the ISO Standard is the FNU (Formazine Nephelometric Unit) and by EPA is NTU (Nephelometric Turbidity Unit). The other two methods used to test for turbidity and their measurement units are the JTU (Jackson Turbidity Unit) and the Silica unit (mg/L SiO₂). See the conversion table of these methods and their units for your reference.

	JTU	FTU (NTU/FNU)	SiO ₂ (mg/L)
JTU	1	19	2.5
FTU	0.053	1	0.13
SiO ₂	0.4	7.5	1

Accessories

Mi515-100 AMCO-AEPA-1 @ 0 FNU calibration solution, 30 mL
AMCO-AEPA-1 @ 10 FNU, calibration solution, 30 mL
AMCO-AEPA-1 @ 500 FNU, calibration solution, 30 mL

Mi0011 Glass cuvetts (2 pcs)
Mi0012 Caps for cuvetts (2 pcs)
Mi0013 Stoppers for cuvetts (2 pcs)
Mi0004 Tissue for wiping cuvetts (4 pcs)
Mi0005 9V battery (1 pc)



Ordering Information

Mi415 is supplied complete with 2 cuvetts, reagents, hard carrying case, wiping tissue, 9V battery and instructions.

MA871 Digital Brix Refractometer

The MA871 is an optical instrument that employs the measurement of refractive index to determine the % Brix of sugar in aqueous solutions. The method is both simple and quick. Samples are measured after a simple user calibration with deionized or distilled water. Within seconds the instrument measures the refractive index of the sample and converts it to % Brix concentration units.

The MA871 digital refractometer eliminates the uncertainty associated with mechanical refractometers and is easily portable for measurements in the field.

The measurement technique and temperature compensation employ methodology recommended in the ICUMSA Methods Book (Internationally recognized body for Sugar Analysis). Temperature (in °C or °F) is displayed simultaneously with the measurement on the large dual level display along with icons for Low Power and other helpful message codes.

Key features include:

- Dual-level LCD
- Automatic Temperature Compensation (ATC)
- Easy setup and storage
- Battery operation with Low Power indicator (BEPS)
- Automatically turns off after 3 minutes of non-use.

Specifications	MA871
Range	0 to 85% Brix 0 to 80°C / 32 to 175°F
Resolution	0.1% Brix 0.1°C / 0.1°F
Accuracy	±0.2% Brix ±0.3°C / ±0.5°F
Light Source	yellow LED
Measurements Time	approximately 1.5 seconds
Minimum Sample Volume	100 µL (cover prism totally)
Sample Cell	SS ring and flint glass prism
Temperature Compensation	automatic between 10 and 40°C / 50 to 104°F
Case Material	ABS
Enclosure Rating	IP 65
Battery Type	1 x 9V AA (included)
Battery Life	5000 reading
Auto-shut off	after 3 minutes of non-use
Dimensions	192 x 102 x 67 mm
Weight	420 g

Ordering Information

MA871 is supplied complete with MI0005 9V battery and instruction manual.

Introduction to Sucrose

A measure of the sugar content of liquids, developed by A.F.W. Brix. Brix is officially expressed in degrees, but very often the degree symbol is dropped. Each degree of brix represents one gram of sugar per 100g of liquid. Thus, a liquid with a brix of 25 contains 25 grams of sugar for every 100 g of liquid. Sugar, or sucrose, is a carbohydrate that occurs naturally in every fruit and vegetable in the plant kingdom. It is the major product of photosynthesis, the process by which plants transform the sugar energy into food. Sugar occurs in greatest quantities in sugar cane and sugar beets from which it is separated for commercial use. There is no difference in the sugar produced from either cane or beet. Sugar cane, a giant grass, thrives in a warm, moist climate, storing sugar in its stalk. The sugar beet grows best in a temperate climate and stores its sugar in its white root. Sugar from both sources is produced by nature in the same fashion as all green plants produce sugar as a means of storing the sun's energy.

Brix measurement is an important tool in winemaking, as it can be used to determine the sweetness of grapes and grape juice. It is used prior to harvest to help choose the best time to pick the grapes; most grapes for table wines are harvested at levels of 21-25 brix. If grapes are harvested at a lower brix, the resulting grape juice may be too acidic and require chaptalization (the adding of supplemental sugar to the fermenting juice). If grapes are harvested at a higher brix, the resulting grape juice may lack the acidity needed for a balanced wine, and may require acidification (the adding of supplemental acids). Moreover, high-brix grapes may produce a wine with unacceptable levels of residual sugar, which (unless it's a dessert wine) may also throw off the taste. Since yeast gradually converts the sugars in grape juice into alcohol, measuring brix also helps keep track of the fermentation process. Over the course of fermentation, about 55-60% of the sugars in grape juice will be transformed into alcohol, and therefore the level of brix at harvest can be an indicator of the final alcohol content of the finished wine. The accepted conversion factor is 0.55; therefore, if the grapes on the vine display a brix of 25, their "potential alcohol" is 13.75% (25/0.55).

New



Stainless Steel Sample Well and Prism

Place a few drops of the sample in the well and press the READ key.

Liquid Cristal Display (LCD)

Dual Level LCD with Primary and Secondary Display.



New

Years
warranty
2

ATC

Dual
Display

Self
diagnostics

CE



MA872

Digital Refractometer for Fructose Measurements

The MA872 is an optical instrument that employs the measurement of refractive index to determine the % Fructose in aqueous solutions. The method is both simple and quick. Samples from expressed, reconstituted or concentrated juice are measured after a simple user calibration with deionized or distilled water. Within seconds the instrument measures the refractive index of the sample and converts it to % by weight concentration units.

The MA872 digital refractometer eliminates the uncertainty associated with mechanical refractometers and is easily portable for measurements in the plant.

The measurement technique and temperature compensation employ methodology recommended in the ICUMSA Methods Book (Internationally recognized body for Sugar Analysis). Temperature (in °C or °F) is displayed simultaneously with the measurement on the large dual level display along with icons for Low Power and other helpful message codes.

Key features include:

- Dual-level LCD
- Automatic Temperature Compensation (ATC)
- Easy setup and storage
- Battery operation with Low Power indicator (BEPS)
- Automatically turns off after 3 minutes of non-use.

Specifications	MA872
Range	0 to 85% mass 0 to 80°C (32 to 175°F)
Resolution	0.1% 0.1°C (0.1 °F)
Accuracy	±0.2% ±0.3°C (±0.5°F)
Light Source	yellow LED
Measurement Time	approximately 1.5 seconds
Minimum Sample Volume	100 µL (cover prism totally)
Sample Cell	SS ring and flint glass prism
Temperature Compensation	automatic between 10 and 40°C (50 to 104°F)
Case Material	ABS
Enclosure Rating	IP 65
Battery Type	1 x 9V AA (included)
Battery Life	5000 reading
Auto-shut off	after 3 minutes of non-use
Dimensions	192 x 102 x 67 mm
Weight	420 g



Stainless Steel Sample Well and Prism

Place a few drops of the sample in the well and press the READ key.

Liquid Cristal Display (LCD)

Dual Level LCD with Primary and Secondary Display.



Ordering Information

MA872 is supplied complete with Mi0005 9V battery and instruction manual.

Introduction to Fructose

Fructose (which is also known as fructopyranose) means, literally, "fruit sugar". It is a very sweet six-carbon sugar that serves as a building block for more complex sugars and carbohydrates. It is found naturally in fruits and some vegetables and is used widely in the food industry because it is sweeter than sucrose.

Fructose 1,6-bisphosphate is a key glycolysis intermediate (it is classified as a hexose diphosphate). It was discovered by Arthur Harden and William Young in 1905. In the third step of glycolysis, fructose 6-phosphate and ATP are converted to fructose 1,6-bisphosphate and ADP with the aid of phosphofructokinase. In step 4, fructose 1,6 bisphosphate (with the aid of aldolase) is cleaved into dihydroxyacetone phosphate and glyceraldehyde 3-phosphate.

MA873

Digital Refractometer for Glucose Measurements

The MA873 is an optical instrument that employs the measurement of refractive index to determine the % Glucose in aqueous solutions. The method is both simple and quick. Samples are measured after a simple user calibration with deionized or distilled water. Within seconds the instrument measures the refractive index of the sample and converts it to % by weight concentration units.

The MA873 digital refractometer eliminates the uncertainty associated with mechanical refractometers and is easily portable for measurements on the go.

The measurement technique and temperature compensation employ methodology recommended in the ICUMSA Methods Book (Internationally recognized body for Sugar Analysis). Temperature (in °C or °F) is displayed simultaneously with the measurement on the large dual level display along with icons for Low Power and other helpful message codes.

- Key features include:**
- Dual-level LCD
 - Automatic Temperature Compensation (ATC)
 - Easy setup and storage
 - Battery operation with Low Power indicator (BEPS)
 - Automatically turns off after 3 minutes of non-use.

Specifications	MA873
Range	0 to 85% mass 0 to 80°C (32 to 175°F)
Resolution	0.1% 0.1°C (0.1 °F)
Accuracy	±0.2% ±0.3°C (±0.5°F)
Light Source	yellow LED
Measurement Time	approximately 1.5 seconds
Minimum Sample Volume	100 µL (cover prism totally)
Sample Cell	SS ring and flint glass prism
Temperature Compensation	automatic between 10 and 40°C (50 to 104°F)
Case Material	ABS
Enclosure Rating	IP 65
Battery Type	1 x 9V AA (included)
Battery Life	5000 reading
Auto-shut off	after 3 minutes of non-use
Dimensions	192 x 102 x 67 mm
Weight	420 g

Ordering Information

MA873 is supplied complete with Mi0005 9V battery and instruction manual.

Introduction to Glucose

Glucose (Glc), a monosaccharide (or simple sugar), is an important carbohydrate in biology. The living cell uses it as a source of energy and metabolic intermediate.

This form (D-glucose) is often referred to as dextrose monohydrate, or, especially in the food industry, simply dextrose (from dextrorotatory glucose).

Glucose is produced commercially via the enzymatic hydrolysis of starch. Many crops can be used as the source of starch. Maize, rice, wheat, potato, cassava, arrow-root, and sago are all used in various parts of the world.

Glucose is a ubiquitous fuel in biology. It is used as an energy source in most organisms, from bacteria to humans. Use of glucose may be by either aerobic or anaerobic respiration (fermentation).



Stainless Steel Sample Well and Prism

Place a few drops of the sample in the well and press the READ key.

Liquid Cristal Display (LCD)

Dual Level LCD with Primary and Secondary Display.



New

Years
warranty
2

ATC

Dual
Display

Self
diagnostics

CE



MA881

Digital Refractometer for Invert Sugar Measurements

The MA881 is an optical instrument that employs the measurement of refractive index to determine the % Invert Sugar in aqueous solutions. The method is both simple and quick. Samples are measured after a simple user calibration with deionized or distilled water.

Within seconds the instrument measures the refractive index of the sample and converts it to % by weight concentration units.

The MA881 digital refractometer eliminates the uncertainty associated with mechanical refractometers and is easily portable for measurements in the field.

The measurement technique and temperature compensation employ methodology recommended in the ICUMSA Methods Book (Internationally recognized body for Sugar Analysis).

Temperature (in °C or °F) is displayed simultaneously with the measurement on the large dual level display along with icons for Low Power and other helpful message codes.

Key features include:

- Dual-level LCD
- Automatic Temperature Compensation (ATC)
- Easy setup and storage
- Battery operation with Low Power indicator (BEPS)
- Automatically turns off after 3 minutes of non-use.

Specifications	MA881
Range	0 to 85% mass 0 to 80°C (32 to 175°F)
Resolution	0.1% 0.1°C (0.1 °F)
Accuracy	±0.2% ±0.3°C (±0.5°F)
Light Source	yellow LED
Measurement Time	approximately 1.5 seconds
Minimum Sample Volume	100 µL (cover prism totally)
Sample Cell	SS ring and flint glass prism
Temperature Compensation	automatic between 10 and 40°C (50 to 104°F)
Case Material	ABS
Enclosure Rating	IP 65
Battery Type	1 x 9V AA (included)
Battery Life	5000 reading
Auto-shut off	after 3 minutes of non-use
Dimensions	192 x 102 x 67 mm
Weight	420 g



Stainless Steel Sample Well and Prism

Place a few drops of the sample in the well and press the READ key.

Liquid Cristal Display (LCD)

Dual Level LCD with Primary and Secondary Display.



Ordering Information

MA881 is supplied complete with Mi0005 9V battery and instruction manual.

Introduction to Invert Sugar

Invert sugar is a food additive that is produced by the application of heat and a bit of acid to sucrose. This causes hydrolysis of the sucrose, a process that breaks down the sucrose molecule (a compound sugar) into its component fructose and glucose molecules. This occurs naturally in the process of preserving fruit as jam and in the production of honey by bees.

Invert sugar is so named because of the effect a solution of it has on polarised light. When a solution of fructose and glucose is analyzed with a polarimeter, it rotates a plane of polarised light in the opposite direction to that of a sucrose solution. This quality can be used to measure the extent to which a sucrose solution is hydrolyzed.

Invert sugar has been adopted by the processed food industry for several physical characteristics that distinguish it from sucrose, including a sweeter taste, greater moisture retention, lessened tendency to crystallize, and a lowered freezing point. This makes it suitable for use in soft drinks, baked goods, jelly, and ice cream, among other things.

Range of Refractometers for Agri-food Applications

The MR series refractometers are precision optical Instruments used for measuring concentrations of substances in aqueous solutions.

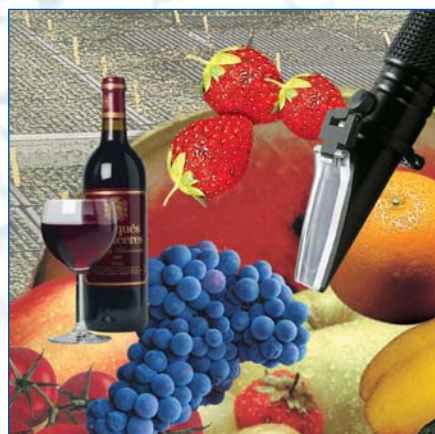
They work using the principle of light refraction through liquids. When passing light through a liquid the refracted angle will be shown on the scale determining the amount of dissolved solids in the liquid.

Very simple to use: simply place one drop of your sample on the prism and read the results on the scales immediately! They have adjustable focus and they provide direct readings and can measure concentrations of all kinds of solutions such as: fruit juices, beverages, wine, jam, honey, milk, salt water, brine, canned foods, cleaning fluids, battery fluids, antifreeze etc.

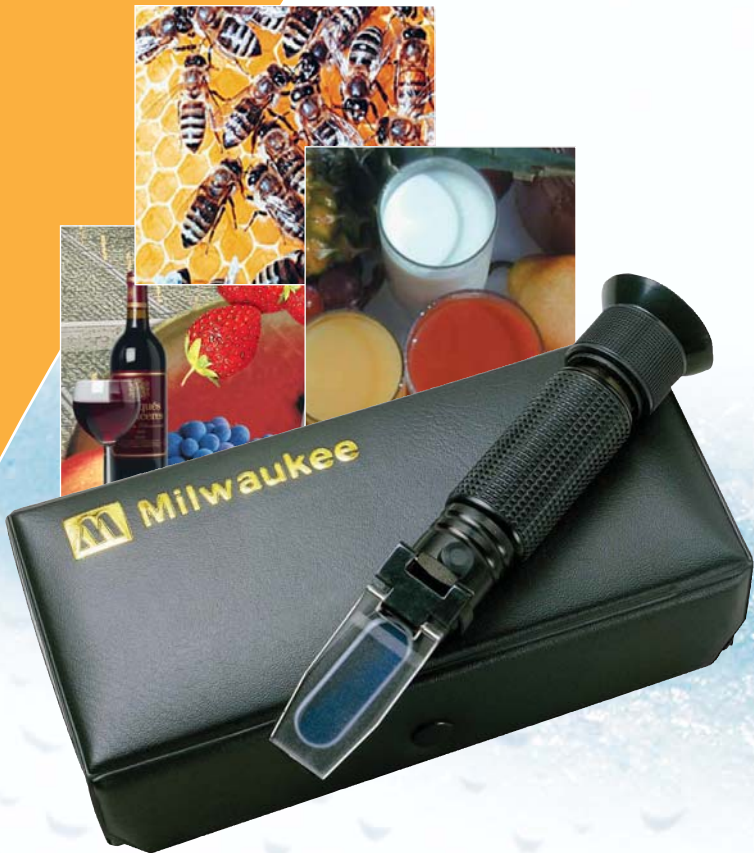
Models with automatic temperature compensation (ATC) are suitable for applications where the temperature of the samples varies.



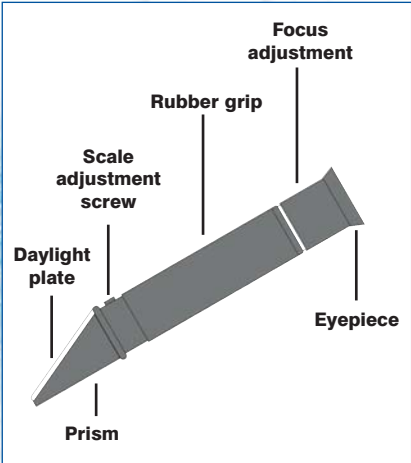
Brix	Range	Resolution	Accuracy
MR10ATC	0 to 10% Brix	0.1%	±0.1%
MR18ATC	0 to 18% Brix	0.1%	±0.1%
MR32ATC	0 to 32% Brix	0.1%	±0.2%
MR55ATC	0 to 55% Brix	1%	±1%
MR62ATC	28 to 62% Brix	0.2%	±0.2%
MR80	0 to 80% Brix	0.5%	±0.5%
MR82ATC	45 to 82% Brix	0.5%	±0.5%
MR92ATC	58 to 92% Brix	0.2%	±0.2%
Grape Must	Range	Resolution	Accuracy
MR200ATC	0 to 140°Oe 0 to 25KMWBabo 0 to 32% Brix	1°Oe 0.2°KMWBabo 0.1% Brix	±1°Oe ±0.2°KMWBabo ±0.1%
MR210ATC	0 to 190°Oe 0 to 40KMWBabo 0 to 44% Brix	2.0°Oe 0.5°KMWBabo 0.5% Brix	±2.0°Oe ±0.5°KMWBabo ±0.5%
MR325ATC	0 to 25% Alcohol	0.2%	±0.2%
MR330ATC	0 to 20% Baume 0 to 25% Alcohol	0.2Be' 0.2%	±0.2Be' ±0.2%
MR380ATC	0 to 80% Alcohol	1%	±1%
Salinity	Range	Resolution	Accuracy
MR100ATC	0 to 100‰ Salinity 1.000-1.070 SG	1‰ 0.001	±1‰ ±0.001
MR110ATC	0 to 10% Salinity	0.1%	±0.1%
MR128ATC	0 to 28% Salinity	0.2%	±0.2%
Honey	Range	Resolution	Accuracy
MR90ATC	58 to 90% Brix 38 to 43Be' 12 to 27% Water	0.5% 0.5Be' 1%	±0.5% ±0.5Be' ±1%
Serum Protein Clinical / Veterinary	Range	Resolution	Accuracy
MR514ATC	0 to 12 g/100 mL 1.000 to 1.050 SG 1.330 to 1.360 RI	0.2 g/100 mL 0.005 SG 0.0005 RI	±0.2 g/100 mL ±0.005 SG ±0.0005 RI
Contact Lens	Range	Resolution	Accuracy
MR635ATC	35 to 80% Water	1%	±1%
Freezing Point	Range	Resolution	Accuracy
MR410ATC	0 to -50°C PG 0 to -50°C EG 1.10 to 1.40 SG	5°C 5°C 0.01 SG	±5°C ±5°C ±0.01 SG



Range of Refractometers
for Agri-food Applications

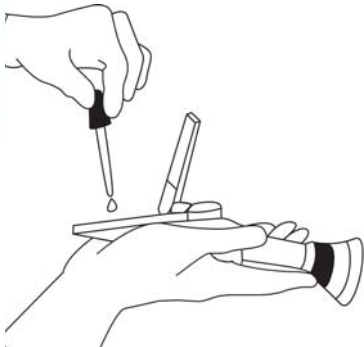


Milwaukee refractometers work in ambient light with no battery or other power source necessary. They can be used in labs or in the field. Simply place a couple of drops of the sample on the prism and read the results immediately. The refractometers have rubber coated hand grip and construction to insulate the test solution and avoid inaccuracy caused by the body heat of the user. All of our refractometers have Automatic Temperature Compensation (ATC): when temperature of product sample varies from 68°F (20°C), readings are automatically adjusted to compensate for temperature variance between 50°F to 86°F (10°C to 30°C). Easy to recalibrate with distilled water. Covered eyepiece and bright clearly defined scale, with large easy to read measurements. They are supplied in a hard carrying case, instructions and screwdriver for calibration.

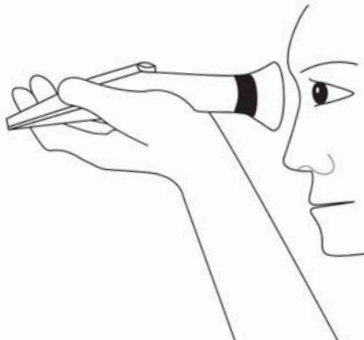


Calibration

1. Lift up the daylight and put one or two drops of distilled water on the prism. Close the daylight, confirm that distilled water has spread over the entire prism surface.



2. Turn the bright direction and look at the scale through the eyepiece. If the boundary line doesn't coincide with 0% turn the scale adjustment screw with a screwdriver until it does.



Ideal Brix Concentration of Known Substances

Fruit	% Concentration
Oranges, pears	6-13%
Tomato	3-6%
Apples, melons	12-18%
Strawberries, peaches	6-12%
Grape seeds	13-24%
Concentrated fruit juices	42-68%
Fruit juice	12-18%
Strained tomato	7-16%
Tomato juice	5-9%
Aerated drinks	6-15%
Nectars	16-23%
Drinks with lactic acid	16, 5-21, 5%
Foods	% Concentration
Condensed milk	52-68%
Liquid sugar	58-80%
Canned fruit	14-28%
Egg yoke	45-48%
Milk	12-17%
Marmalade, flour	60-70%
Vegetable oils	57-90%
Industry	% Concentration
Oils emulsions	0-7%
Oils for soluble temper	0-20%

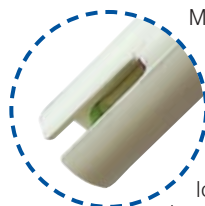
Ordering Information

Each refractometer is supplied complete with hard carrying case, calibration screwdriver, dosing pipette and instruction manual.



Electrodes & Probes

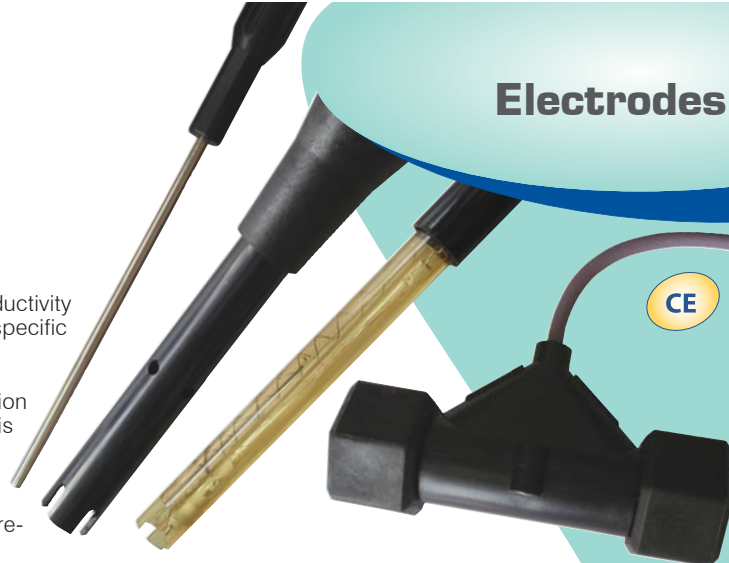
pH, ORP, Conductivity, Dissolved Oxygen



Milwaukee has a wide assortment of pH, ORP, Conductivity and other specialty sensors to meet all your specific requirements.

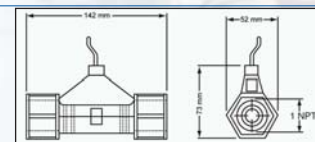
Finding the right electrode for a specific application is a very important task and in order to solve this selection problem it is important to consider the following: electrode body, reference construction and junction.

Below you will find a list of Milwaukee electrodes and probes with corresponding instruments they are supplied with.



OTHERS ELECTRODES & PROBES

	MA811D/1	Conductivity/TDS probe with DIN connector and 1 meter cable (for SM301 & SM401)
	MA811/2	Conductivity/TDS probe with 2 meter cable (for SMS310)
	MA812D/1	Conductivity/TDS probe with DIN connector and 1 meter cable (for SM302 & SM402)
	MA812/2	Conductivity/TDS probe with 2 meter cable (for SMS410)
	MA814DB/1	4-ring Conductivity/TDS/NaCl/Temperature probe with DIN connector and 1 meter cable (for Mi170 & Mi180)
	MA814D/1	4-ring Conductivity/TDS/NaCl/Temperature probe with DIN connector and 1 meter cable (for Mi306)
	MA815/2	Conductivity probe with 2 meter cable (for SMS315)
	MA816/2	TDS probe with 2 meter cable (for SMS415)
	MA818/5	In line 4-pin Conductivity probe with pipe threads at both end with NTC sensor and 5 meter cable
	MA831R	Stainless steel Temperature probe
	MA840	Polarographic D.O. probe with 3 meter cable (for SMS600 & Mi605)
	MA850	Combination spare probe for pH/Conductivity/TDS with 1 meter cable (for SM801 & SM802)
	MA851D/1	pH/Conductivity/TDS/Temperature amplified probe with DIN connector and 1 meter cable (for Mi805 & Mi806)
	MA911B/1 MA911B/2	Double junction, gel filled pH electrode with BNC connector, with 1 or 2 meter cable
	MA914BR/1	pH/Temperature amplified probe with BNC & RCA connectors with 1 meter cable
	MA921B/1 MA921B/2	Double junction, gel filled ORP electrode with platinum sensor, with BNC connector and 1 or 2 meter cable
	MA923D/1	pH/ORP/Temperature amplified probe with DIN connector and 1 meter cable (for Mi106)





Electrode Selection Guide
pH, ORP, Conductivity, Dissolved Oxygen

Milwaukee has a wide assortment of pH, ORP, Conductivity and other specialty sensors to meet all your specific requirements.

Before selecting an electrode, please consult the table below. The recommended electrodes are the ones best suited to each application, however we also ask you to verify the specifications on pages 6-7-8-9

Special electrodes for specific applications can also be manufactured upon request.

Applications	pH	MA905B/3	MA911B/1	MA913B/3	MA914BR/1	MA915B/2	MA916B/1	MA916B/3	MA917B/1	MA918B/1	MA919B/1	MA920B/1	MA923D/1	MA991B/1	ORP	MA921B/1	MA923B/3	MA924B/1	Conductivity	MA818/5	MA813D/1	D.O.	MA840
Agriculture / Soil testing																							
Aquarium																							
Cheese																							
Dairy products																							
Emulsions																							
Environmental, Pollution																							
Fish farming																							
Food and beverage (general use)																							
Galvanizing waste solution																							
Hi purity water																							
Heavy duty applications																							
In-line applications																							
Laboratory (general use)																							
Meat																							
Paints																							
Paper																							
Photographic chemicals																							
Strong acid																							
Swimming pools																							
Water supply																							
Wine processing																							

pH Electrode Storage and Maintenance

pH Electrode Storage and Maintenance

To ensure a quick response and free-flowing liquid junction, the sensing element and reference junction must not be allowed to dry out. The following instructions apply to refillable electrodes. For gel-filled electrodes, consult instruction manual.

Routine Storage

Soak electrode in a pH Electrode Storage Solution (MA9015). If a storage solution is unavailable, pH 4 buffer or pH7.01 may be used. The fill hole should be covered to prohibit evaporation of reference fill solution.

Maintenance

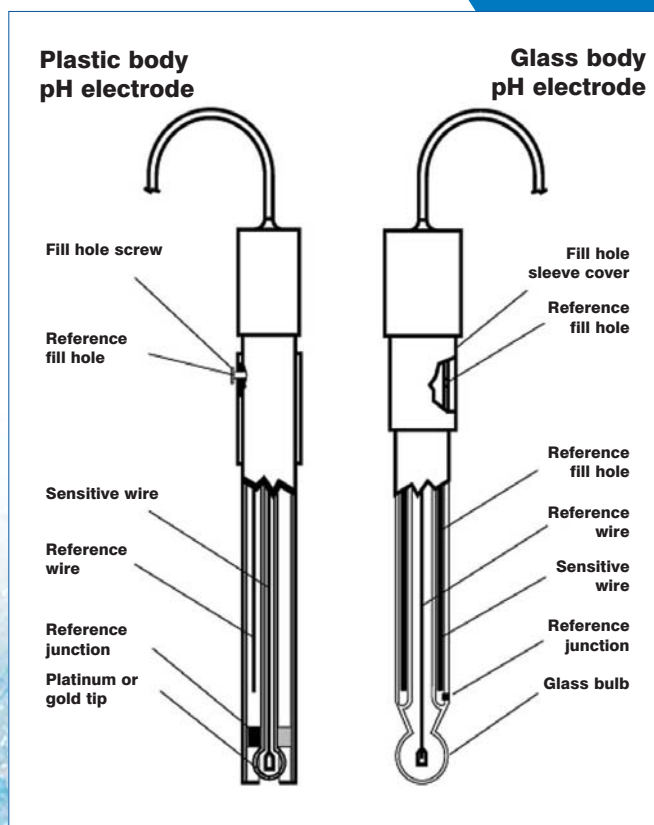
Cleaning your electrode between and after use will help extend the life of your electrode and avoid the cost of early replacement.

Routine Cleaning

Soak electrode in MA9016 cleaning solution for half an hour, followed by soaking it in storage solution (MA9015) for at least two hours.

Weekly Maintenance

Inspect electrodes for scratches, cracks, salt crystal buildup, or membrane/junction deposits. Rinse off any salt buildup with distilled water, and remove any membrane/junction deposits as directed in cleaning procedures below. The reference chamber should be drained, flushed with fresh filling solution, and refilled.

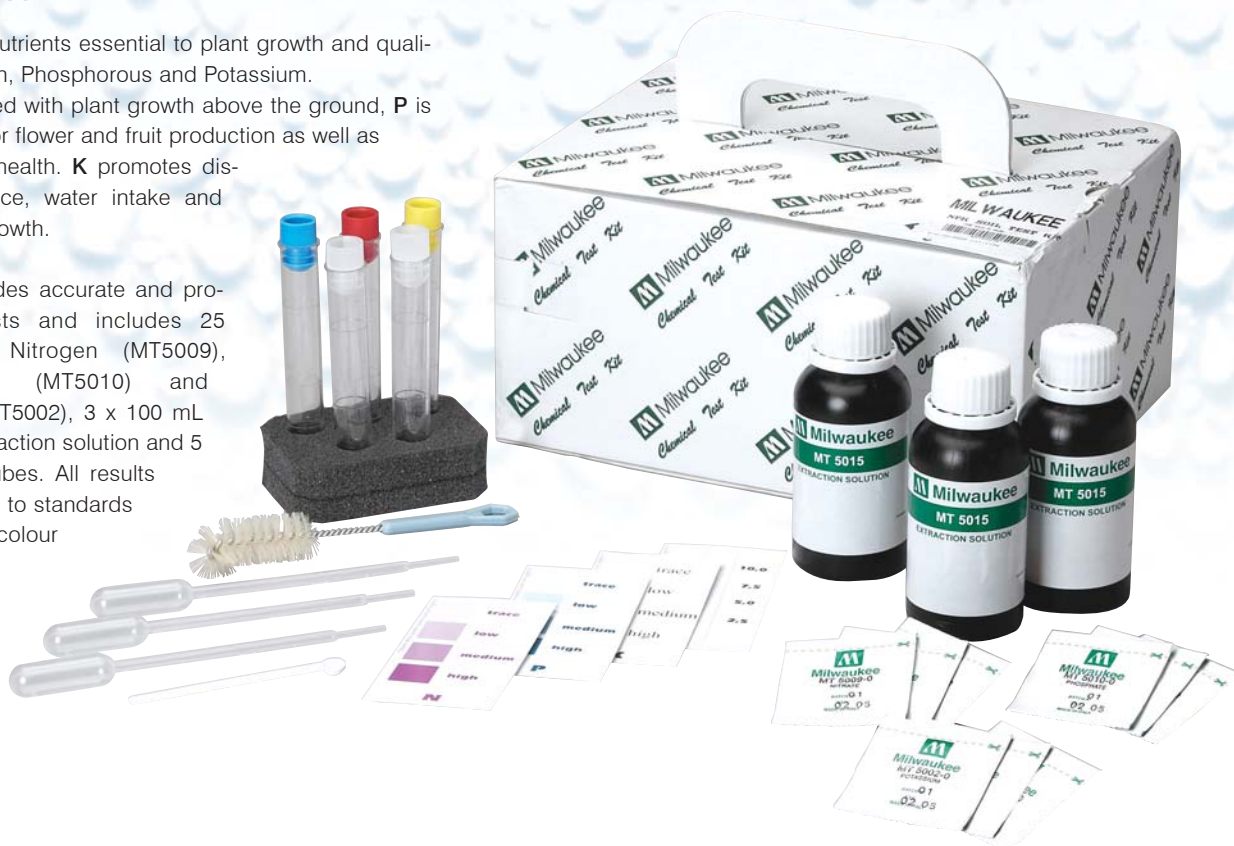


MT6003 NPK Soil Test Kit

The primary nutrients essential to plant growth and quality are Nitrogen, Phosphorous and Potassium.

N is associated with plant growth above the ground, **P** is responsible for flower and fruit production as well as overall plant health. **K** promotes disease resistance, water intake and strong root growth.

This kit provides accurate and professional tests and includes 25 sachets of Nitrogen (MT5009), Phosphorous (MT5010) and Potassium (MT5002), 3 x 100 mL bottles of extraction solution and 5 plastic test tubes. All results are compared to standards on laminated colour charts.





pH600/CD600/CD601/CD610/CD611/CD97 pH/EC & TDS Economical Pocket Testers




Milwaukee's economical testers are easy-to-use and low cost instruments to measure quick and reliable pH, EC or TDS values.

Measuring electrical conductivity is the best way of checking the amount of salt or dissolved solids (TDS) in water. Milwaukee provides you with a range of pocket testers that will allow you to measure from very low to very high conductivity solutions.




All EC/TDS testers compensate for the temperature variance automatically.



Specifications

	 pH600	 CD600	 CD601
Range	0.0 to 14.0 pH	0 to 1990 ppm	0 to 1990 μ S/cm
Resolution	0.1 pH	10 ppm	10 μ S/cm
Accuracy	± 0.1 pH	$\pm 2\%$ full scale	$\pm 2\%$ full scale
Calibration	manual, 1 point		
Temperature Compensation		automatic from 5 to 50°C	automatic from 5 to 50°C
Environment	0 to 50°C / 32 to 122°F; max RH 95%	0 to 50°C / 32 to 122°F; max RH 95%	0 to 50°C / 32 to 122°F; max RH 95%
Battery Type / Battery Life	3 x 1.5V, alkaline / 700 hours of use	4 x 1.5V, alkaline / 350 hours of use	4 x 1.5V, alkaline / 350 hours of use
Dimensions / Weight	150 x 30 x 24 mm / 85 g	150 x 30 x 24 mm / 85 g	150 x 30 x 24 mm / 85 g

Specifications

	 CD610	 CD611	 CD97
Range	0 to 10000 ppm	0 to 20000 μ S/cm	0 to 1000 ppm
Resolution	100 ppm	100 μ S/cm	1 ppm
Accuracy	$\pm 2\%$ full scale	$\pm 2\%$ full scale	± 10 ppm
Temperature Compensation	automatic from 5 to 50°C	automatic from 5 to 50°C	automatic from 5 to 50°C
Environment	0 to 50°C / 32 to 122°F; max RH 95%	0 to 50°C / 32 to 122°F; max RH 95%	0 to 50°C / 32 to 122°F; max RH 95%
Battery Type / Battery Life	4 x 1.5V, alkaline / 350 hours of use	4 x 1.5V, alkaline / 350 hours of use	4 x 1.5V, alkaline / 350 hours of use
Dimensions / Weight	150 x 30 x 24 mm / 85 g	150 x 30 x 24 mm / 85 g	150 x 30 x 24 mm / 85 g

Accessories

- M10004B pH 4.01 buffer solution 20 mL sachet (25 pcs)
- M10007B pH 7.01 buffer solution 20 mL sachet (25 pcs)
- M10010B pH 10.01 buffer solution, 20 mL sachet (25 pcs)
- M10030B 12880 μ S/cm calibration solution, 20 mL (25 pcs)
- M10031B 1413 μ S/cm calibration solution, 20 mL (25 pcs)

- M10032B 1382 ppm (mg/L) calibration solution, 20 mL (25 pcs)
- M10038B 6.44 ppt (g/L) calibration solution, 20 mL (25 pcs)
- M10080B 800 ppm calibration solution 20 mL (25 pcs)
- MA9015 Electrode storage solution, 230 mL
- MA9016 Electrode cleaning solution, 230 mL
- M10000B Electrode rinse solution, 20 mL (25 pcs)

Ordering Information

pH600, CD600, CD601, CD610, CD611 and CD97 are supplied complete with protective cap, calibration screw-driver, batteries and instructions.

Calibration, Maintenance & Cleaning Solutions

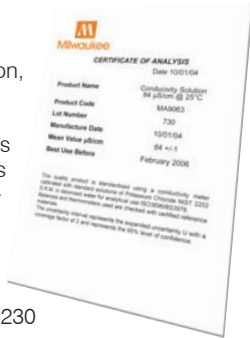
Milwaukee offers a wide range of calibration, maintenance & Cleaning solutions.

The use of calibration and cleaning solutions is fundamental for the correct use of electrodes and for obtaining the most accurate and reproducible readings. Often readings are not correct because the sensors have not been properly handled.

Milwaukee standard solutions are available in 230 mL bottles and 20 mL sachets. Traditional buffer solutions are packed in 230 mL leak-proof bottles and are recommended for lab applications.

Sachets are sealed against light and air and are ideal for on-the-spot calibration.

Simply open, insert the tester or electrode into the sachet and calibrate. Sachets are sold in boxes of 25 pieces.



Calibration, Maintenance & Cleaning Solutions

MA9001	pH 1.68 Calibration Buffer Solution, 230 mL	M10000B	Rinse Solution - Deionized Water (box of 25x20 ml sachet)
MA9004	pH 4.01 Calibration Buffer Solution, 230 mL	M10004B	pH 4.01 Calibration Buffer Solution (box of 25x20 ml sachet)
MA9006	pH 6.86 Calibration Buffer Solution, 230 mL	M10006B	pH 6.86 Calibration Buffer Solution (box of 25x20 ml sachet)
MA9007	pH 7.01 Calibration Buffer Solution, 230 mL	M10007B	pH 7.01 Calibration Buffer Solution (box of 25x20 ml sachet)
MA9009	pH 9.18 Calibration Buffer Solution, 230 mL	M10009B	pH 9.18 Calibration Buffer Solution (box of 25x20 ml sachet)
MA9010	pH 10.01 Calibration Buffer Solution, 230 mL	M10010B	pH 10.01 Calibration Buffer Solution (box of 25x20 ml sachet)
MA9011	Refilling Electrolyte Solution 3.5M KCl for pH/ORP electrodes, 230 mL	M10016B	Cleaning Solution for electrodes (box of 25x20 ml sachet)
MA9012	Refilling Electrolyte Solution 1M KNO ₃ for double junction electrodes, 230 mL	M10030B	12880 μ S/cm Conductivity Calibration Solution (box of 25x20 ml sachet)
MA9015	Storage Solution for pH/ORP electrodes, 230 mL	M10031B	1413 μ S/cm Conductivity Calibration Solution (box of 25x20 ml sachet)
MA9016	Cleaning Solution for pH/ORP electrodes, 230 mL	M10032B	1332 ppm TDS Calibration Solution (box of 25x20 ml sachet)
MA9020	200-275 mV ORP Solution, 230 mL	M10033B	84 μ S/cm Conductivity Calibration Solution (box of 25x20 ml sachet)
MA9060	12880 μ S/cm Conductivity Calibration Solution, 230 mL	M10035B	111.8 mS/cm Conductivity Calibration Solution (box of 25x20 ml sachet)
MA9061	1413 μ S/cm Conductivity Calibration Solution, 230 mL	M10038B	6.44 ppt TDS Calibration Solution (box of 25x20 ml sachet)
MA9062	1382 ppm TDS Calibration Solution, 230 mL	M10442B	1500 ppm TDS Calibration Solution (box of 25x20 ml sachet)
MA9063	84 μ S/cm Conductivity Calibration Solution, 230 mL	M10080B	800 ppm TDS Calibration Solution (box of 25x20 ml sachet)
MA9064	80000 μ S/cm Conductivity Calibration Solution, 230 mL	M100020B	Cal-Test Solution for SMS315 (box of 25x20 ml sachet)
MA9065	111.8 mS/cm Conductivity Calibration Solution, 230 mL	M100040B	Cal-Test Solution for SMS415 (box of 25x20 ml sachet)
MA9066	100% NaCl Calibration Solution, 230 mL	M100058B	Cal-Test Solution for SMS115 (box of 25x20 ml sachet)
MA9069	5000 μ S/cm Conductivity Calibration Solution, 230 mL		
MA9070	Zero Oxygen Solution, 230 mL		
MA9071	Electrolyte Solution for D.O. Probes, 230 mL		
MA9112	pH 12.45 Calibration Buffer Solution, 230 mL		

Certified Solutions

For those operators who request it, we provide standard solutions complete with certificate of analysis, prepared against NIST standards, to avoid any possible error in determining the actual value. The certificates show the date of production, batch number, accuracy rating and the expiration date.

WARRANTY POLICY

Bench Meters



Portable Meters



Milwaukee warrants its instruments to be free of manufacturing defects as follows: bench meters for 3 years, portable and pocket testers for 2 years and electrode/sensors for 6 months (unless otherwise specified). The warranty period commences from the original date of sale to the user. Warranty is valid only when the product is used under normal conditions and in accordance with the operating limitations and prescribed maintenance procedures.

Milwaukee reserves the right to make improvements in design, construction and appearance of its products without advance notice.

Instrument service

Warranty and non-warranty service are performed by our technicians in Milwaukee headquarters. All items must have a Return Goods Authorization (RGA) number before returning the goods. This number can be obtained by contacting the Milwaukee technical Service department.

All products returned without an RGA number will be refused.



FURTHER INFORMATION

Latest updates on new products, technical tips, download of MSDS and free software updates.

Visit our website at:

www.milwaukeeinst.com

for the latest updates on new products, technical tips, download of MSDS, as well as free software updates.



SPECIFIC APPLICATION LITERATURE

Latest updates on new products, technical tips, download of MSDS and free software updates.

Specific application catalogues and leaflets are also available. Please kindly send us an e-mail at:

sales@milwaukee.191.it





Milwaukee




Global Offices

Milwaukee S.r.l.

Corso Leonardo Da Vinci 48/50
21013 Gallarate (VA) - ITALY
tel: +39 0331 26 80 09 - fax: +39 0331 26 80 33
e-mail: sales@milwaukee.191.it

Milwaukee Instruments, Inc.

2950 Business Park Drive
Rocky Mount - NC 27804 - U.S.A.
tel: +1 252 443 3630 - fax: +1 252 443 1937
e-mail: sales@milwaukee testers.com



pH
ORP
EC
TDS
DO
NaCl
Temp
NH₃-N
Fe
PO₄
Cl₂
Cl⁻
TN



Authorized Distributor