

HI9829

GPS Multiparameter Meters

pH/ORP/ISE, EC/TDS/Resistivity/Salinity/Seawater σ , Turbidity, DO, Temperature and Atmospheric Pressure

- **Logging**
 - Logging from probe or meter
- **Fast Tracker**
 - Tag Identification System
- **Sensor Check™**
 - Auto-recognition of all sensors
- **GLP features**
 - Meets Good Laboratory Practices
- **Connectivity**
 - PC compatible via USB
- **Help feature**
 - On-screen user guides
- **Backlight**
 - Backlit, graphic LCD display
- **Waterproof**
 - Waterproof casing



Rugged, Waterproof and ideal for field measurements

Rugged, waterproof and easy to use, the HI9829 is the ideal meter for field measurements of lakes, rivers and seas. The HI9829 meter displays 1 to 12 parameters simultaneously from up to 15 user selectable parameters.

Combined with one of the HI76x9829 series probes, the HI9829 can measure water quality parameters such as pH, ORP, conductivity, turbidity, temperature, ions ammonium, nitrate, chloride (as NH_4^+-N , NO_3^--N or Cl^-), dissolved oxygen (as % saturation or concentration), resistivity, TDS, salinity, and seawater σ . Atmospheric pressure is measured for DO concentration compensation.

Autonomously Logging Probes

After starting a log, the HI7629829 and HI7639829 logging probes can autonomously log parameters without further connection to the HI 9829. Just connect the logging probe to the HI9829 or a PC to retrieve the logged measurements.

GPS Capabilities

The HI9829 with the GPS option incorporates a built-in GPS receiver and antenna that guarantees position accurately. Measurements from specific locations are tracked with detailed coordinate information that can be viewed immediately on the display.

User-friendly Features

The HI9829 features a graphic, backlit LCD that scales digits to fit up to 12 parameters and allows full configuration of each parameter measured along with an on-screen graphing capability. HELP key displays context sensitive help. The alpha-numeric keypad offers a user friendly way to complete the input fields.

The Perfect Monitoring Tool

Water scientists and managers alike utilize data-collection programs as part of environmental monitoring. These programs are designed to reveal changes in water and the environment around it over time. Reliable, dependable measurements are required to monitor these changes and understand the contributions from seasonal fluctuations, weathering, as well as manmade pollution.



HI7609829
for pH/ORP, Dissolved
Oxygen, EC

HI7629829
for pH/ORP, Dissolved
Oxygen, EC, Logging

Two probes to choose from. These Digital probes provide stable, noise-free sensor signal management without the need for pre-amplified pH sensors.

Specifications	HI7609829	HI7629829	
Supported Configuration	Connector 1	pH, pH/ORP, ammonium ISE, chloride ISE, nitrate ISE	
	Connector 2	dissolved oxygen	
	Connector 3	EC	
Upgradeable	to HI7619829, adding EC/turbidity sensor and long protective shield	to HI7639829, adding EC/turbidity sensor and long protective shield	
Temperature sensor	built-in	built-in	
Autonomous Logging	-	yes	
Logging Interval	-	1 second to 3 hours	
Computer Interface	-	USB (HI76982910)	
Memory	-	140,000 measurements (single parameter logged); 35,000 measurements (all parameters logged)	
Operating Temperature	-5 to 55°C*	-5 to 55°C*	
Maximum Depth	20 m (66')*	20 m (66')*	
Cable Specification	Multistrand-multiconductor shielded cable with internal strength member rated for 68 kg (150 lb.) intermittent use		
Wetted Materials	Body: ABS; Threads: nylon; Shield: ABS/316 SS; Temperature Probe: 316 SS; O-rings: EPDM		
Logging Probe Internal Battery Type	-	1.5V (4) AA alkaline	
Logging Probe Battery Life <small>Note: Log space must be available for continuous logging</small>	-	Interval	All channels logging (no averaging)
	-	1-5 seconds	72 hours
	-	1 minute	22 days
	-	10 minutes	70 days
Sample Environment	fresh, brackish, seawater	fresh, brackish, seawater	
Waterproof Protection	IP68	IP68	
Dimensions (without cable)	342 mm (13.5"), dia=46 mm (1.8")	442 mm (17.4"), dia 46 mm (1.8")	
Weight (with batteries and sensors)	570 g (20.1 oz.)	775 g (27.3 oz.)	

* Reduced for ISE sensors



Sensors

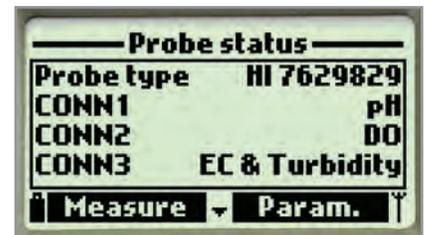
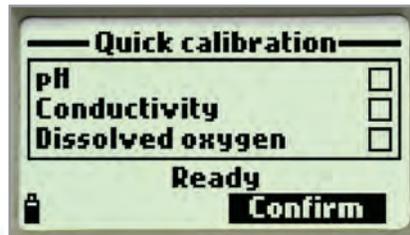
Hanna offers a selection of 7 sensors to be used on the intelligent probes. Sensor replacement is quick and easy with screw type connectors and are color coded for easy identification. The HI9829 automatically recognizes sensor presence.

The new HI7609829-4 EC/turbidity sensor is field replaceable and offers readings from both parameters at the same time.

All potentiometric sensors feature a double junction design and are gel filled to increase resistance to contamination. One of the ISE sensors can be used in place of the pH sensor and is automatically recognized. pH in mV readings are also displayed –which is useful for troubleshooting.



HI9828-25 "Quick Calibration" solution



- **Field Ready**

- For field calibration, our quick calibration solution allows users to standardize pH and conductivity with one calibration solution.

- **Quick Calibration**

- Simply screw the calibration beaker filled with HI 9828-25 solution onto the probe, select "Quick calibration" from the menu and press OK. Individual calibration may also be performed using multiple calibration points.

- **Auto-sensor recognition**

- In this example, the HI9829 is identifying a pH, dissolved oxygen and turbidity/EC sensor

A Great Combination

The use of Hanna's microprocessor-based multiparameter intelligent probes with HI9829 will provide reliable data collection that can lead to an improved scientific understanding of the interconnections between natural, chemical and geological processes and man-made pollution to effectively evaluate applications for waste-discharge permits, remediate contaminated sites and to protect or restore biological resources.

The HI76x9829 probes utilize field replaceable sensors with auto-recognition. The sensors are housed with the probe electronics in a rugged housing and a water-tight cable connection. The HI76909829 probe allows conductivity, pH/ORP (or an ISE), and dissolved oxygen measurement. Other probe models allow turbidity and logging.

The probes are available with a choice of cable lengths such as 4m, 10m and 20m (13, 33') that utilize a DIN connection to interface with the meters. Logging probes can be connected directly to a PC with the HI76982910 USB adapter cable, and HI929829 PC application software to download log files directly from the probes.

Reliable temperature measurements are a critical parameter of aquatic system monitoring. Temperature and temperature changes due to water releases can affect the ability of water to hold oxygen as well as the ability of organisms to resist certain pollutants. The intelligent probes incorporate an accurate thermistor that changes predictably with temperature changes. Accurate temperature reading in degrees Celsius, Fahrenheit and kelvin are displayed and utilized by other detectors for temperature correction.

The HI 7609829-0 and -1 feature a double junction design and are gel filled to increase resistance to contamination. These pH or pH/ORP sensors incorporate the technology that has made Hanna so successful as a pH manufacturer. Reliable pH measurements are one of the most important indicators of water chemistry indicating the relative amount of free hydrogen and hydroxyl ions in the water. Hanna's pH sensors utilize a resilient PEI body to protect them from solid particulates found in water samples. Consistency and quality are the hallmarks of these sensors. Our differential measurement system further enhances the measurement reliability, providing temperature corrected pH.

A choice of 3 ion selective electrodes (ISE) is available for constant reporting of common surface water contaminants. Nitrate, ammonium and chloride ISE's are available. Each ISE is a combination

Sensor Configurations

Both probes can accommodate a multitude of sensor configurations. The long sensor cap fits all configurations while the short sensor cap fits configurations not requiring the turbidity/EC sensor.



Dissolved Oxygen

HI7609829-2 DO

pH

HI7609829-0 pH
HI7609829-1 pH/ORP

ISE

HI7609829-10 Ammonium ISE
HI7609829-11 Chloride ISE
HI7609829-12 Nitrate ISE

Conductivity

HI7609829-3 EC

Conductivity and Turbidity

HI7609829-4 EC/Turbidity

HI7698295

Short cap for probes without EC/turbidity sensor

HI7698296

Long cap for probes with EC/turbidity sensor

electrode incorporating an extremely constant reference spiral; all potentiometric probes feature a double junction and solid gell reference design. By utilizing conductivity, the HI9829 can convert ion activity measurements to concentration units. The HI9829 displays these measurements as ppm ammonium-nitrogen, ppm chloride and ppm nitrate-nitrogen.

The HI7609829-3 4-electrode conductivity sensor using the polarographic measurement principal ensures stable conductivity readings. Electrolytic conductivity measures the ability of water to conduct an electrical current. It is highly dependent on the amount of dissolved solids (such as salt) in the water. Absolute conductivity, temperature-corrected conductivity, salinity, Seawater and water hardness (TDS) determinations are possible with measurements from this sensor.

The oxygen dissolved in lakes, rivers, and oceans is crucial for the organisms and creatures living in it. If dissolved oxygen concentrations drop below normal levels in water bodies, the water quality degrades and the organisms begin to die off. The HI7609829-2 galvanic DO sensor does not require long polarization times so is ready for measurement at a moment's notice. This sensor also utilizes a replaceable cap design for ease of maintenance and a safe non-

toxic electrolyte. DO readings are compensated for the effects of temperature (using the probe's built-in temperature sensor) and atmospheric pressure (using the HI 9829's internal atmospheric pressure sensor). The DO measurement complies with standard methods 4500-0 G and EPA article 360.1.

The HI7609829-4 combined EC/turbidity sensor is a replaceable design for instantaneous conductivity and turbidity measurements that conform to ISO 7027 standards. It provides measurements from 0.0 to 1000 FNU. Turbidity is the amount of particulate matter that is suspended in water. Turbidity measures the scattering effect that suspended solids have on light: the higher the intensity of scattered light, the higher the turbidity. Material that causes water to be turbid include: clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, plankton and microscopic organisms. Conductivity measurement is the same as in the HI7609829-3.

Probes with the logging function have a logging memory that allows storage of up to 140,000 individual samples or 35,000 complete sample data sets with date and time stamp thus permitting up to a 70 day deployment with all channels logging at 10 minute intervals. The probe incorporates a temperature sensor for temperature compensation of all parameters.

Monitoring and Tracking

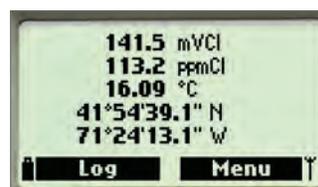
The HI 9829 with GPS module can track measurement locations with detailed coordinate information. All models of the HI 9829 are equipped with the Fast Tracker™ TAG ID system which is an invaluable tool for associating measurements with their locations. The HI 9829 also incorporates a real-time clock which stamps all logged data with a time and date in addition to location information.

GPS (Global Positioning System)

The HI 9829 with GPS features an internal 12 channel GPS receiver and antenna that calculates its position to track locations along with measurement data. The GPS tracks your location using satellites to within 30 ft (10 m) so you can be sure that you return to the same location for repeated measurements. The GPS coordinates can be shown on the LCD together with up to 10 measurement parameters and are recorded with logged data. Users can connect to GPS tracking software such as Google™ Maps* to view locations where samples have been taken. Measurement information is shown right on the map.



	Date	Time	Temp.[°C]	pH	ORP[mV]
1	2011.06/08	18:42:17	24.84	6.27	45.4
2	2011.06/08	18:42:22	24.84	6.27	45.4
3	2011.06/08	18:42:27	24.78	6.29	46.2
4	2011.06/08	18:42:32	24.73	6.25	43.6
5	2011.06/08	18:42:37	28.93	7.36	12.9
6	2011.06/08	18:42:42	29.66	7.38	12.3
7	2011.06/08	18:42:47	29.71	7.41	12.2
8	2011.06/08	18:42:52	29.73	7.45	13.1
9	2011.06/08	18:42:57	29.78	7.49	13.4
10	2011.06/08	18:43:02	29.54	7.45	17.3
11	2011.06/08	18:43:07	29.73	7.58	14.4
12	2011.06/08	18:43:12	29.76	7.60	14.6
13	2011.06/08	18:43:17	29.76	7.62	14.7
14	2011.06/08	18:43:22	29.75	7.63	15.0
15	2011.06/08	18:43:27	29.73	7.63	15.8
16	2011.06/08	18:43:32	29.74	7.64	16.1
17	2011.06/08	18:43:37	29.74	7.65	16.2
18	2011.06/08	18:43:42	29.73	7.66	16.4
19	2011.06/08	18:43:47	29.70	7.66	17.3
20	2011.06/08	18:43:52	29.72	7.67	17.0
21	2011.06/08	18:43:57	29.73	7.68	17.0
22	2011.06/08	18:44:02	29.71	7.68	17.2
23	2011.06/08	18:47:35	26.52	6.52	47.7

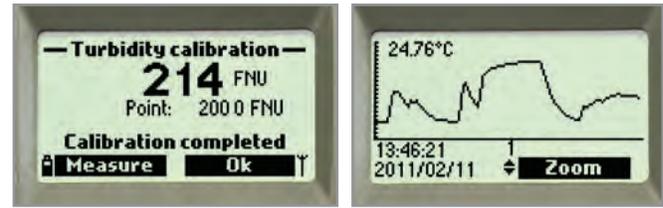


- GPS data can be customized to meet specific requirements
- Displays distances between current and predefined locations
- Display current readings along with GPS coordinates
- Shows current position and number of satellites
- Basic GPS Features
 - GPS coordinates shown on the LCD with up to 10 measurement parameters
 - GPS signal strength shown on LCD
 - Logged data is embedded with GPS coordinates
 - GPS status screen
- Advanced GPS Features
 - Users can associate GPS coordinates with alphanumeric locations
 - Distances between current location and predefined locations are displayed arranged by distance
 - Memorizes last location and time should signal be lost
- HI 929829 PC Application Software
 - Manages logged data from the HI 9829
 - Displays GPS coordinates with logged data
 - Automatically maps samples on your PC (internet connection required)
 - Shows location points on map with measurement data

*Google™ is a registered trademark of Google™, inc. HANNA Instruments® has no affiliation with Google™.



Intuitive Configuration, Measurement and Help



- **Calibration**
 - Calibration with the HI 9829(0) is easy and intuitive.
- **Help**
 - The context sensitive help screen is always accessible.
- **Graphing**
 - Trend graphing may be viewed on the display or transferred to a PC. The sample date and time stamp will also be displayed.

Fully Configurable Measurement Screen



Fast Tracker™ –Tag Identification System

HANNA's Fact Tracker™–Tag Identification System simplifies test logging. iButton®s with a unique ID can be installed at various sampling sites. When the matching connector on the meter contacts the location button, measurements are logged and labeled with the alphanumeric user-entered location ID. Location, date, time and measurements are logged into the meter which can be transferred to a PC. The Fast Tracker™ system complements the GPS for ultimate tracking.

iButton® Tags are Easy to Install

Install the optional TAGs near your sampling points for quick and easy iButton® readings. Each TAG contains a computer chip with a unique identification code encased in stainless steel. You can install a practically unlimited amount of TAGs. Additional TAGs can be ordered for all of your traceability requirements.

FastTracker™
location traceability



Specifications	HI9829	HI9829 with GPS
Temperature Compensation	automatic from -5 to 55°C (23 to 131°F)	automatic from -5 to 55°C (23 to 131°F)
GPS	–	12 channel receiver, 10 m (30 ft) range
Logging Memory from Meter	44,000 records	44,000 records
Logging Interval	1 second to 3 hours	1 second to 3 hours
Computer Interface	USB (with HI 929829 software)	USB (with HI929829 software)
FastTracker™ TAG ID	Yes	Yes
Waterproof Protection	IP67	IP67
Environment	0 to 50°C (32 to 122°F); RH 100%	0 to 50°C (32 to 122°F); RH 100%
Power Supply	1.5V alkaline C cells (4) / 1.2V NiMH rechargeable C cells (4), USB, 12V power adapter	1.5V alkaline C cells (4) / 1.2V NiMH rechargeable C cells (4), USB, 12V power adapter
Dimensions	221 x 115 x 55 mm (8.7 x 4.5 x 2.2")	221 x 115 x 55 mm (8.7 x 4.5 x 2.2")
Weight	750g (26.5 oz.)	750g (26.5 oz.)



HI9829 Parameter Specifications

pH / mV of pH input		ORP mV	Ammonium-Nitrogen	Chloride	Nitrate-Nitrogen
Range	0.00 to 14.00 pH / ±600.0 mV	±2000.0 mV	0.02 to 200 ppm (as N)	0.6 to 200 ppm	0.62 to 200 ppm (as N)
Resolution	0.01 pH / 0.1 mV	0.1 mV	0.01 ppm to 1 ppm; 0.1 ppm to 200 ppm		
Accuracy	±0.02 pH / ±0.5 mV	±1.0 mV	±5% of reading or 2 ppm, whichever is greater		
Calibration	automatic one, two, or three points with five memorized standard buffers (pH 4.01, 6.86, 7.01, 9.18, 10.01) or one custom buffer	automatic at one custom point	1 or 2 point, 10 ppm and 100 ppm		

Conductivity		TDS	Resistivity	Salinity	Seawater σ
Range	0 to 200 mS/cm (absolute EC up to 400 mS/cm)	0 to 400000 mg/L or ppm (the maximum value depends on the TDS factor)	0 to 999999 Ω•cm; 0 to 1000.0 kΩ•cm; 0 to 1.0000 MΩ•cm	0.00 to 70.00 PSU	0 to 50.0 σ _t , σ ₀ , σ ₁₅
Resolution	manual: 1 μS/cm; 0.001 mS/cm; 0.01 mS/cm; 0.1 mS/cm; 1 mS/cm; automatic: 1 μS/cm from 0 to 9999 μS/cm; 0.01 mS/cm from 10.00 to 99.99 mS/cm; 0.1 mS/cm from 100.0 to 400.0 mS/cm; automatic mS/cm: 0.001 mS/cm from 0.000 to 9.999 mS/cm; 0.01 mS/cm from 10.00 to 99.99 mS/cm; 0.1 mS/cm from 100.0 to 400.0 mS/cm	manual: 1 mg/L (ppm); 0.001 g/L (ppt); 0.01 g/L (ppt); 0.1 g/L (ppt); 1 g/L (ppt); automatic: 1 mg/L (ppm) from 0 to 9999 mg/L (ppm); 0.01 g/L (ppt) from 10.00 to 99.99 g/L (ppt); 0.1 g/L (ppt) from 100.0 to 400.0 g/L (ppt); autorange g/L (ppt) scales: 0.001 g/L (ppt) from 0.000 to 9.999 g/L (ppt); 0.01 g/L (ppt) from 10.00 to 99.99 g/L (ppt); 0.1 g/L (ppt) from 100.0 to 400.0 g/L (ppt)	dependent on resistivity reading	0.01 PSU	0.1 σ _t , σ ₀ , σ ₁₅
Accuracy	±1% of reading or ±1 μS/cm, whichever is greater	±1% of reading or ±1 mg/L, whichever is greater	–	±2% of reading or ±0.01 PSU, whichever is greater	±1 σ _t , σ ₀ , σ ₁₅
Calibration	automatic one point with six memorized standards (84 μS/cm, 1413 μS/cm, 5.00 mS/cm, 12.88 mS/cm, 80.0 mS/cm, 111.8 mS/cm) or custom point	based on conductivity or salinity calibration		one custom point	based on conductivity or salinity calibration

Turbidity		Dissolved Oxygen	Atm. Pressure	Temperature
Range	0.0 to 99.9 FNU; 100 to 1000 FNU	0.0 to 500.0%; 0.00 to 50.00 ppm	450 to 850 mm Hg; 17.72 to 33.46 in Hg; 600.0 to 1133.2 mbar; 8.702 to 16.436 psi; 0.5921 to 1.1184 atm; 60.00 to 113.32 kPa	-5.00 to 55.00°C; 23.00 to 131.00°F; 268.15 to 328.15K
Resolution	0.1 FNU from 0.0 to 99.9 FNU; 1 FNU from 100 to 1000 FNU	0.1%; 0.01 ppm	0.1 mm Hg; 0.01 in Hg; 0.1 mbar; 0.001 psi; 0.0001 atm; 0.01 kPa	0.01°C; 0.01°F; 0.01K
Accuracy	±0.3 FNU or ±2% of reading, whichever is greater	0.0 to 300.0%; ±1.5% of reading or ±1.0% whichever is greater; 300.0 to 500.0%; ±3% of reading; 0.00 to 30.00 ppm; ±1.5% of reading or 0.10 ppm, whichever is greater; 30.00 ppm to 50.00 ppm; ±3% of reading	±3 mm Hg within ±15°C from the temperature during calibration	±0.15°C; ±0.27°F; ±0.15K
Calibration	Automatic 1, 2 or 3 points at 0, 20 and 200 FNU, or custom	automatic one or two points at 0, 100% or one custom point	automatic at one custom point	Automatic at one custom point

Ordering Information

Meter and Probe with Rugged Carrying Case

HI9829 - w x y z



W=	0	Basic meter, no GPS
	1	Meter with GPS
x=	0	No turbidity basic probe
	1	Turbidity basic probe
	2	Autonomously logging probe, no turbidity
y=	04	4 meter cable length
	10	10 meter cable length
	20	20 meter cable length
z=	1	115V
	2	230V

All HI9829 Kits Include:

- HI 9829 or HI 98290 (GPS Model) Meter
- HI 710140 Hard carrying case
- HI 710005/8 (115V) or HI710006/8 (230V) Multiparameter Probe (see table)
- HI 7692892 Probe Maintenance Kit
- HI 929829 Application Software
- HI 7698291 USB cable (PC to meter)
- HI 710045 Power supply cable
- HI 710046 Cigarette lighter cable
- HI 7609829-1 pH/ORP sensor
- HI 7609829-2 Galvanic DO Sensor
- HI 920005 iButton® with holder (5 pcs)
- HI 9828-25 Calibration solution
- Instruction Manual

Optional Kit Components:

- HI 7609829-12 Nitrate sensor
- HI 7619829-11 Chloride ISE sensor
- HI 7609829-10 Ammonium ISE sensor
- HI 7698297 Long quick release flow cell
- Spare Solution (see below)

HI9829-10	25 sachets 10ppm ammonia-nitrogen calibration solution
HI9829-10/11	10 sachets each of 10ppm and 100ppm ammonia-nitrogen calibration solution
HI9829-11	25 sachets 100ppm ammonia-nitrogen calibration solution
HI9829-12	25 sachets 10ppm chloride calibration solution
HI9829-12/13	10 sachets each of 10ppm and 100ppm chloride calibration solution
HI9829-13	25 sachets 100ppm chloride calibration solution
HI9829-14	25 sachets 10ppm nitrate-nitrogen calibration solution
HI9829-14/15	10 sachets each of 10ppm and 100ppm nitrate-nitrogen calibration solution
HI9829-15	25 sachets 100ppm nitrate-nitrogen calibration solution

Kit Specific Components:

Kit Number	Multiparameter Probe	HI7609829-3 EC Sensor	HI7698290 Short calibration beaker	HI7609829-4 EC/Turbidity Sensor	HI7698293 Long calibration beaker	HI9829-16.0 FNU calibration solution	HI9829-17.20 FNU calibration solution	HI9829-18.200 FNU calibration solution	HI76982910 USB cable (PC to Probe)	HI7698295 Short protective sleeve	HI7698296 long protective sleeve
HI9829-0004Z	HI7609829/4	•	•							•	
HI9829-0010Z	HI7609829/10	•	•							•	
HI9829-0020Z	HI7609829/20	•	•							•	
HI9829-0104Z	HI7609829/4			•	•	•	•	•			•
HI9829-0110Z	HI7609829/10			•	•	•	•	•			•
HI9829-0120Z	HI7609829/20			•	•	•	•	•			•
HI9829-0204Z	HI7629829/4	•	•							•	•
HI9829-0210Z	HI7629829/10	•	•							•	•
HI9829-0220Z	HI7629829/20	•	•							•	•
HI9829-0304Z	HI7629829/4			•	•	•	•	•	•	•	•
HI9829-0310Z	HI7629829/10			•	•	•	•	•	•	•	•
HI9829-0320Z	HI7629829/20			•	•	•	•	•	•	•	•
HI9829-1004Z	HI7609829/4	•	•								•
HI9829-1010Z	HI7609829/10	•	•								•
HI9829-1020Z	HI7609829/20	•	•								•
HI9829-1104Z	HI7609829/4			•	•	•	•	•			•
HI9829-1110Z	HI7609829/10			•	•	•	•	•			•
HI9829-1120Z	HI7609829/20			•	•	•	•	•			•
HI9829-1204Z	HI7629829/4	•	•							•	•
HI9829-1210Z	HI7629829/10	•	•							•	•
HI9829-1220Z	HI7629829/20	•	•							•	•
HI9829-1304Z	HI7629829/4			•	•	•	•	•	•	•	•
HI9829-1310Z	HI7629829/10			•	•	•	•	•	•	•	•
HI9829-1320Z	HI7629829/20			•	•	•	•	•	•	•	•

z=1 is supplied with 115V AC to 12V DC Adapter
z=2 is supplied with 230V AC to 12V DC Adapter