

Automatic Wastewater Samplers

Solutions to Match Your Applications



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AMERICAN
SIGMA

900 Series Samplers

The American Sigma 900 Series Is Your Total Solution

The Five Advantages of American Sigma

The advanced technology and comprehensive customer service you get when you purchase an American Sigma water sampler can be summarized in five key concepts: accuracy, simplicity, flexibility, reliability and economy. We know that these are the primary areas of concern to our customers - and they're our priority. American Sigma equipment is designed to accomplish each of these goals, to help you monitor your water stream as effectively and efficiently as possible.

- > **Accuracy:** Highly accurate measurements keep your system in compliance at all times.
- > **Simplicity:** The easiest to operate equipment saves you valuable time and effort.
- > **Flexibility:** Extensive product options and features accommodate your specific needs.
- > **Reliability:** Robust products with minimal downtime and outstanding support.
- > **Economy:** Affordably priced products give you the best value for your money.

Choose From 900 or 900 Max Controllers

With so many variables affecting your water quality management needs, a one-size-fits-all sampler isn't enough. With American Sigma's 900 Series, you have a full range of options. If you simply need to obtain a repeatable sample volume at a timed interval or after a predetermined volume of flow, the 900 is your answer. However, should you be required to sample for regulatory compliance, monitor combined sewer overflows or storm water outfalls, or conduct biomonitoring or water quality research, look no further than the advanced technology of the 900 MAX. Both of these controllers are available in a portable, refrigerated, or all-weather refrigerated configuration to further enhance your flexibility.



American Sigma samplers are available in portable, refrigerated and all-weather refrigerated models. You configure each with a 900 Controller or a 900MAX Controller. (See page 4 for controllers.)

Sample Integrity

The Highest Sample Integrity Every Time

Consistent Representative Sampling

The fundamental purpose of water sampling is to obtain a representative sample from your water system. With American Sigma's 900 Series samplers, you can expect the accurate, repeatable data your wastewater management demands. With our samplers, you can know exactly what is in your water stream at all times.

Reliable Peristaltic Pump Technology

Generating highly reliable data requires advanced technology - an American Sigma trademark. Our samplers feature a positive displacement peristaltic pump constructed of corrosion-resistant Delrin®. The pump induces flow by squeezing a flexible 3/8 in. ID tube (only the tubing has contact with the liquid). While other peristaltic pump samplers fail to meet EPA1 criteria for representative intake velocity, our samplers produce a 3.3 ft./sec. velocity at 3 ft. lift in a 3/8 in. ID intake line. The liquid is under pumped-flow from the point of intake until it reaches the sample bottle.

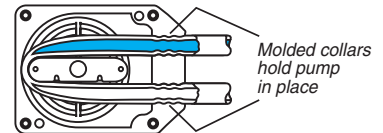
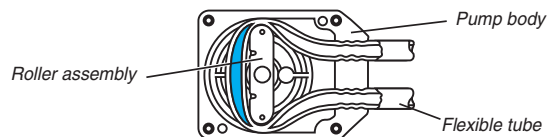
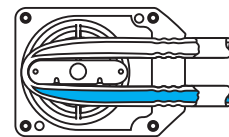
Advanced Liquid Detection

The non-contact ultrasonic liquid sensing system guarantees volume accuracy and repeatability regardless of changes in head or composition of the waste stream. It also works well with wide temperature variations in the sample liquid. We also have systems in place to ensure that your sample is never compromised. For example, the intake line is thoroughly purged before and after every sample collection. To greatly reduce cross-contamination, you can easily perform a line rinse - in which the intake is preconditioned with the source liquid - prior to collection. Should a plugged intake prevent collecting the sample, the unit detects the failed attempt and immediately repeats the cycle starting with a high-pressure purge. The 900 Series is designed to maximize sample accuracy and minimize missed samples.



The 900 Series Liquid Sensing System ensures volume accuracy and repeatability even when temperature or other conditions vary.

Peristaltic pump cutaway view. Pump induces flow by squeezing a flexible tube.



¹ USEPA manual NPDES Compliance Inspection Manual MCD-51: "Sample train velocity should exceed 2 ft./sec."
USEPA Manual Sampling of Water and Wastewater: "The sampler flow velocity should be at least 2 ft./sec."

900 & 900 MAX Controllers

The Right Controller For Your Application

From handling the basics to performing the most advanced sampling processes, American Sigma has the right solution for your monitoring needs. For applications requiring sampling alone, the 900 provides simple operation and maximum reliability. If and when your needs become more complex, the 900 MAX has options for any monitoring function you need to perform. Both models are easy to program and guarantee superior corrosion resistance.

900



The 900 Simplifies Sampling

Sampling doesn't need to be difficult. With the 900 controller, you can maintain total EPA conformance. The self-prompting format of the 900 - with its 24-character alphanumeric display - is as easy to use as a calculator. Suitable for NPDES, Stormwater or Combined Sewer Overflow applications, the 900 can be configured for ten composite or multiple bottle setups. You can easily enter and store five separate sampling programs into the controller memory. And, the 900 is equipped with a vertically mounted pump that isolates electronics from fluid spills. This reliable sampler is simple to understand, efficient to use and tough enough to last - everything you need for basic sampling.

900 MAX



The 900 MAX Monitors & Manages

For a full-fledged water management tool, nothing compares to the 900 MAX. This highly advanced sampler features a large 8-line x 40-character backlit display that allows you to quickly select information from an easy menu-type programming format. And with 12 datalogging channels, the 900 MAX can be much more than a sampler. Its multitasking ability allows monitoring of rainfall, level, flow, velocity, temperature, pH or ORP, conductivity, and dissolved oxygen. You can also log up to seven external analog signals in the 900 MAX All Weather Sampler and up to three in the 900 MAX Portable and Refrigerated Samplers. The 900 MAX records as many as 116,000 readings on one or any combination of the 12 channels. RAM memory is automatically allocated as necessary during operation - either as "wrap-around" (drops off the oldest data) or "slate" (stops storing new data). Flash memory allows you to install software enhancements (available on the Internet) easily, without returning the sampler to the factory, so you'll always have the latest monitoring technology.

Unique Constant Time/Variable Volume Sampling

The 900 MAX's unique Constant Time/Variable Volume feature varies sample size in proportion to flow rate, capturing flow-weighted samples on the first try. This patented* method closely simulates manual grab sampling. Conventional samplers vary the intervals between samples in relation to the flow rate, while sample sizes remain constant. During low flow periods, sample intervals can increase dramatically, producing insufficient sample volumes for proper analysis. High flows cause sample containers to fill before the desired sample period ends. These conditions make capturing short-lived illicit discharges or significant storm events difficult. The 900 MAX Constant Time/Variable Volume feature takes regularly timed samples, adjusting the sample size proportionally to the flow rate. The sample volume increases and decreases with the flow, ensuring that proportional samples are taken at even intervals throughout the sampling period.

*Constant Time, Variable Volume patent #5587926, "Refrigerated fluid sampling apparatus and method with variable volume sampling system."

900 & 900 MAX Controllers

Set Points Take Convenience to the MAX

While conventional samplers operate in response to elapsed time or volume of flow, the 900 MAX once again takes monitoring to a higher level. In addition to time and flow, it samples in response to changing levels of selected parameters. Just set high and low trip points, and a sample will be immediately collected once a parameter exceeds your preset limits. For added efficiency, samples are taken only when the parameter exceeds these settings - eliminating the need to analyze large numbers of blindly collected samples. Then, by designating "Trouble Bottles," the out-of-limits sample may be segregated from your normal samples to help you quickly identify the source of the problem.



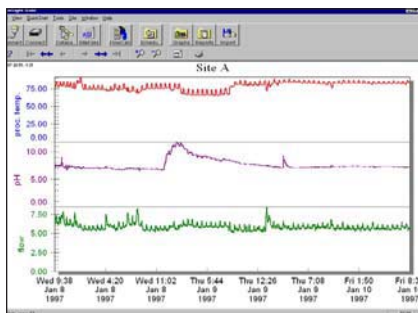
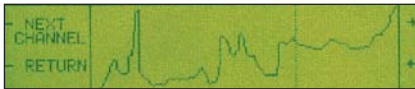
The 900's 24-character alphanumeric display prompts the user through the programming steps.

The 900 MAX's 8-line x 40-character display provides data in:

Tabular Format



Graphical Format



American Sigma's Data Management and Analysis Software lets you produce printable reports with charts, graphs, and program summaries. Sample data can be integrated with level, flow, rainfall, and a variety of water quality parameters including dissolved oxygen, conductivity, temperature, pH and ORP.

Data Management Software Makes Life Easy

Once the 900 MAX collects your data, its powerful and user-friendly software makes it easy to analyze the data and produce presentation-quality reports. Our Data Management software's reporting capability includes maximums, minimums, totals and averages for a day, a month or any period you choose. You can also generate customized reports integrating sample collections with flow, level, rainfall, and any number of water quality parameters such as pH, ORP, temperature, conductivity or dissolved oxygen.

Three Ways to Download Data with the 900 MAX

The advanced two-way communications of the 900 MAX seamlessly integrate with your existing communications. You can download your data three ways:

- > **Sampler to DTU to PC** Compared to laptops, American Sigma's palm-sized Data Transfer Unit is a much faster, easier and more economical way to get data from field to office. The waterproof DTU is so simple, it requires no training or PC experience to use. It can hold data from up to 20 samplers.
- > **Sampler to Modem to PC** Our built-in modem transmits your data via cellular phone or telephone lines right to your office. American Sigma's Data Management and Analysis Software can automatically call your sampler at a predetermined time to retrieve data, or data may be retrieved on demand. Additionally, the 900 MAX can send out alarm conditions to up to three pagers or a central monitoring computer.
- > **Sampler to PC** American Sigma's Data Management and Analysis Software allows you to link your 900 MAX directly to your PC via the standard built-in RS-232 serial port.

Portable Samplers

900 Series Portable Samplers

Field Convertible for Compact or Discrete Sampling

Designed to combine accuracy and convenience, the 900 Series Portable sampler, with a three-gallon polyethylene bottle installed, weighs only 28 lbs. This unique sampler is available with an interchangeable compact or standard sized base and can be quickly configured in the field for composite or discrete sampling. The efficient design and flip-up handles make carrying as easy as possible. In addition, this compact model can be configured for single or multiple bottle applications (see page 14). Unlike samplers of conventional size, the compact-base model is specifically designed for use in 18 in. manholes

Applications

- > NPDES Compliance
- > Stormwater Runoff Monitoring
- > Pretreatment Compliance
- > CSO Monitoring
- > Industrial Wastewater Discharge
- > WWTP Process Control



Portable Samplers

Designed for Use Under Harsh Conditions

Durable, Heavy-Duty Construction

Portable samplers take a lot of abuse in the field. But rest assured that the American Sigma 900 Portable Sampler is rugged enough to take whatever the elements dish out. It features a tough, molded ABS exterior designed to be tough, and a tightly sealed controller that withstands humidity and hostile, corrosive environments. The controller conforms to NEMA 4X,6 standards (capable of withstanding hose spray and submersion under 6 ft. of water for a minimum of 30 minutes), isolating all electromechanical components while the keypad switches and display are covered by a waterproof, corrosion resistant membrane. The sealed connectors (even without capping) and pump shaft seal further protect the unit's environmental integrity.

Once the sample is collected, it's kept cool within the double-walled insulated base. The compact base holds 8-1/2 lbs. of ice with the twenty-four 575 ml bottles in place, and the standard base holds 32 lbs. of ice with twenty-four 350 ml glass bottles in place. The sampler's light beige color reflects sunlight, helping the ice to last even longer.



900 Series controllers are tightly sealed to prevent moisture damage during manhole surcharge conditions.



The weatherproof Data Transfer Unit keeps you from having to take an expensive laptop out into the field to collect data, especially important during stormy weather.

900 Portable General Specifications

Dimensions	With Compact Base and 3 gal. poly. container: Diameter 17-3/8" (44.1 cm), Height 24" (61 cm), Weight 28.3 lbs. (12.9 kg). With Standard Base and 3 gal. poly. container: Diameter 19-7/8" (50.5 cm), Height 27-3/16" (69.4 cm), Weight 32.6 lbs. (14.8 kg).
Sample Containers	Glass: (1) 2-1/2 gal., (2) 1 gal., (4) 1 gal., (8) 950 ml, (8) 1.9 liter, (8) 2.3 liter, (12) 950 ml, (24) 350 ml. Polyethylene: (1) 3 gal., (1) 4 gal., (1) 5-1/2 gal., (2) 1 gal., (4) 1 gal., (24) 575 ml, (24) 1 liter.
Power Requirements	12 VDC (supplied by 12 VDC battery or AC adapter). Overload Protection: 5-amp DC line fuse for Pump, 1 amp DC line fuse (AC power converter).
Optional AC Power Backup	Rechargeable 6 Amp-hour gel lead acid battery takes over automatically with AC power failure. Integral trickle charger maintains battery at full charge.
Sampler Enclosure	Controller Housing: High impact injection molded ABS; submersible, watertight, dust tight, corrosion & ice resistant; NEMA 4X,6. Sampler Housing: High impact ABS, 3-section construction, double walled insulated base.
Sample Cooling	Icing Capacity: Compact Base: 8-1/2 lbs. (3.9 kg) with (24) 575 ml bottles; Standard Base; 32 lbs. (14.5 kg) with (24) 350 ml glass bottles.
Temperature Range	General use: 32°F to 120°F, (0° to 49°C). Liquid Crystal Display: Operating -14° to 158°F, (-10° to 70°C); Storage -40°F to 176°F, (-40° to 80°C).

All Weather Refrigerated Samplers

900 Series All Weather Refrigerated Samplers



Unsurpassed Corrosion Resistance

With American Sigma's All Weather Refrigerated Sampler, spending time and money to maintain your sampler is a thing of the past. We designed this unit to last longer than any other sampler available. First, we put the compressor on top to avoid hydrogen sulfide and other corrosive heavier-than-air gases, which attack conventional refrigerated samplers with floor-level compressors. Then, we equipped the sampler with a tough, chemically resistant coating to better protect refrigeration lines against moisture and corrosive gases. Finally, we used stainless steel hardware, sealed electrical connections and weather resistant cables to complete its corrosion-resistant design.

Operates in Varying Weather Conditions

Customers quickly learn that the name All Weather is no exaggeration. This sampler is designed to operate anywhere - indoors or out - without a secondary enclosure. Completely self-contained, the All Weather is rated for operation in temperatures from -40° to 120°F. The cabinet is resin transfer-molded fiberglass with rounded, moisture-shedding, UV-resistant surfaces. Its sidewall ventilation system allows positioning against a wall, and its sturdy locks prevent tampering. A level adjustment and stainless steel anchoring rails ensure proper, secure installation.



The Advantages of the All Weather

- > All fiberglass construction provides superior corrosion and UV resistance.
- > NEMA 4X,6 controller seals out moisture and corrosive gases.
- > High integrity temperature control system automatically adjusts to ensure 4°C samples in ambient environments from -40° to 120°F (-40° to 50°C).
- > Mechanical door latch with compressible gasket ensures positive seal, even with wide temperature fluctuations.
- > Lip overhangs door seal, preventing precipitation from entering sample containers.



All Weather Refrigerated Samplers

900 Series All Weather Refrigerated Samplers

Any Temperature Outside, One Temperature Inside

While outside temperatures may range from -40° to 120°F, samples are preserved at a constant 4°C inside the All Weather. Sample compartment cooling or heating is microprocessor controlled in response to a system of sensors that continually monitor the temperature of the evaporator plate, ambient air, and sample liquid. Unlike units that sense air temperature within the sample compartment, the All Weather uses a patented¹ thermal mass equivalent to 150 ml of water in compliance with EPA methods.

The All Weather's sample compartment is surrounded by thick, two-inch foam insulation and features an oversized evaporator. Its unique top mounted compressor lets compressor-generated heat vent harmlessly outside. (Compressors located below the sample compartment generate heat, forcing the systems to work harder, age quicker, and require service sooner). The integral heaters also ensure frost-free operation.

Compliance with EPA sample preservation guidelines is easily documented, thanks to the internal datalogger that keeps track of sample temperature. You can even produce a report verifying no sample degradation.*

Environmentally Safe Refrigerant

The All Weather Refrigerated Sampler is provided with environmentally safe, non-CFC refrigerant.



The All Weather's top-mounted compressor is thermally more efficient and less subject to corrosion than floor level compressors in conventional samplers.



The rugged All Weather Sampler stands up to environmental extremes without a secondary enclosure.

900 All Weather General Specifications

Dimensions	Width 28" (71 cm), Depth 28" (71 cm), Height 49" (125 cm), Weight 175 lbs. (79 kg).
Sample Containers	Glass: (1) 2-1/2 gal., (2) 2-1/2 gal., (4) 2-1/2 gal., (8) 1.9 liter, (24) 350 ml. Polyethylene: (1) 6 gal., (2) 3 gal., (4) 3 gal., (8) 2.3 liter, (24) 1 liter.
Power Requirements	115 VAC, 60 Hz (230 and 100 VAC optional). Compressor Running Amperage 1.5-2.0 A. Locked rotor current 12 Amps. Overload Protection: 5 amp DC line fuse for Pump, 1 amp DC line fuse (AC power converter); Compressor: Thermal overload relay opens at 230°F (110°C).
Optional AC Power Backup	Pump/Controller Only: Rechargeable 6 Amp-hour gel lead acid battery takes over automatically with AC line power failure. Integral trickle charger maintains battery at full charge (factory installed option).
Sampler Enclosure	Controller Housing: High impact injection molded ABS; submersible, watertight, dust tight, corrosion & ice resistant; NEMA 4X,6. Sampler Housing: Fiberglass reinforced plastic with beige, UV-inhibited, polymer laminate.
Sample Cooling	Refrigeration: Top mounted compressor and fan-forced air cooled condenser; 3-sided wrap-around evaporator plate; 2" rigid foam insulation; microprocessor controlled thermostat maintains sample liquid at 4°C (±1°C); frost free; non-CFC R134A refrigerant; compression gasket door seal; refrigeration components and plumbing are corrosion protected with conformal coating. Recovery Time with door open: 1 min. in 75°F (24°C) ambient and 4°C sample temperature, 5 minutes. Pull Down Time: From 75°F (24°C) to 39°F (4°C), 15 minutes.
Temperature Range	General use: -20° to 122°F (-29° to +50°C); With optional controller compartment heater, -40° to 122°F, (-40° to +50°C). Liquid Crystal Display: Operating -14° to 158°F, (-10° to 70°C); Storage -40° to 176°F, (-40° to 80°C).

¹U.S. Patent # 5587926

*900 MAX only

Refrigerated Liquid Samplers

900 Series Refrigerated Liquid Samplers

The Corrosion Seal of Approval

This fixed-site sampler is designed to endure the most humid and highly corrosive environments. American Sigma's Refrigerated Sampler features a sealed controller for maximum protection from the elements and is available with an optional stainless steel refrigerator. A NEMA 4X,6 housing isolates all electro-mechanical components while the keypad, switches and display are covered by a waterproof, corrosion resistant polyester membrane. The unit's sealed connectors and pump shaft seal further guarantee the 900's environmental integrity.

Accurate Temperatures

Refrigeration temperature is controlled in accordance with U.S. EPA and international guidelines by a custom-designed air-sensing thermostat. A high efficiency compressor/condenser assembly, wraparound evaporator, and rigid foam insulation ensure optimum 9°F (4°C) sample temperature. The unit's forced air blower and front ventilation provide the flexibility to position the sampler either against a wall or inside a sampler enclosure.

900 Refrigerated Sampler Features

- > Highest sample integrity for data you can count on
- > Simple to understand, efficient to use
- > Refrigerator maintains 4°C
- > Sealed controller, corrosion protected... it's built to last
- > 900 and 900 MAX to meet your needs

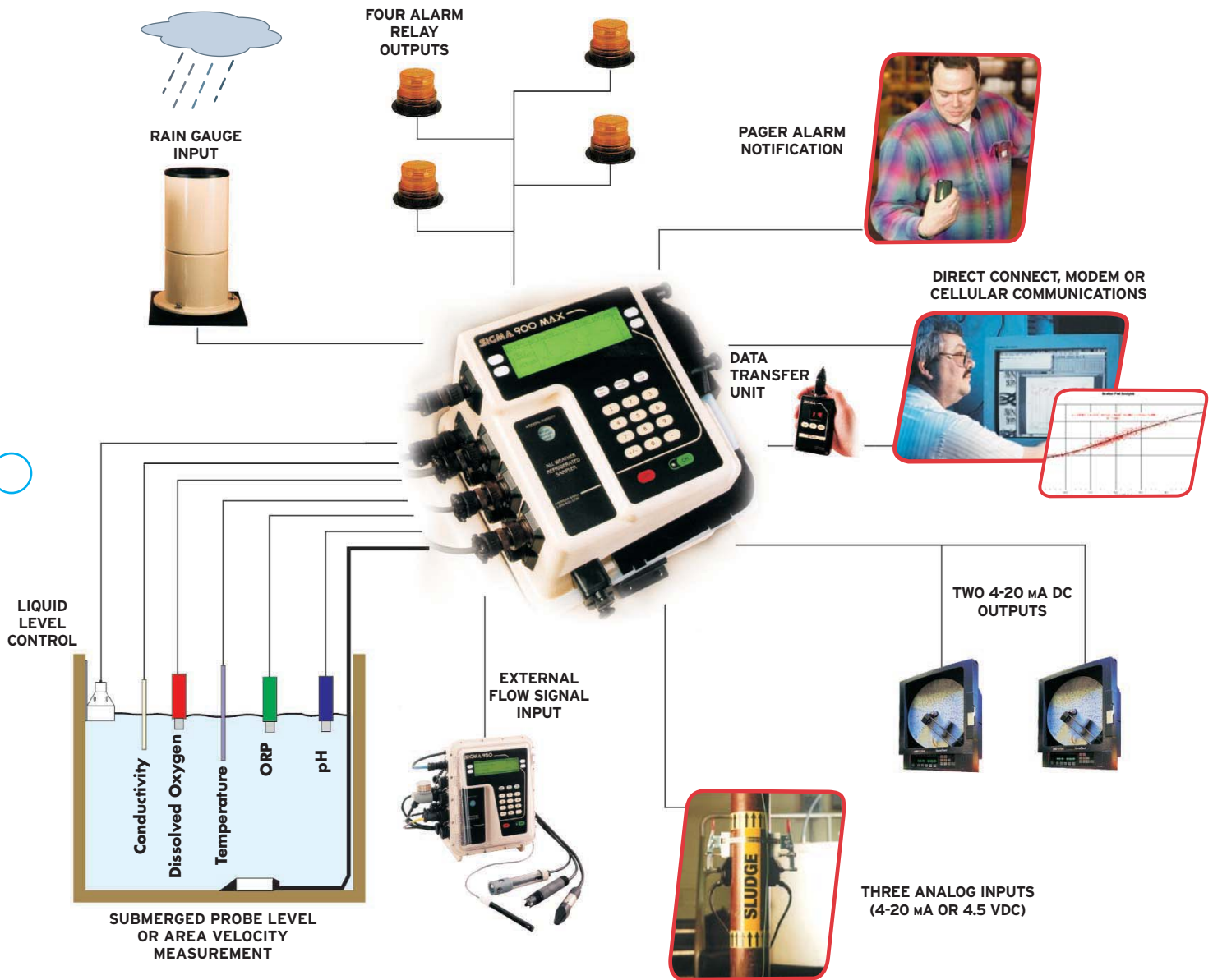


900 Refrigerated General Specifications

Dimensions	Width 24" (61 cm), Depth 24" (61 cm), Height 44" (112 cm), Weight 140 lbs. (63 kg).
Sample Containers	Glass: (1) 2-1/2 gal., (2) 1 gal., (4) 1 gal., (8) 950 ml, (8) 1.9 liter, (12) 950 ml, (24) 350 ml. Polyethylene: (1) 3 gal., (1) 4 gal., (1) 5-1/2 gal., (2) 1 gal., (4) 1 gal., (8) 2.3 liter, (24) 575 ml, (24) 1 liter.
Power Requirements	115 VAC, 60 Hz (230 VAC optional). Compressor current: 1.5-2.0 A. running. Locked rotor current 12 Amps. Overload Protection: 5 amp DC line fuse for Pump, 1 amp DC line fuse (AC power converter) Compressor: Thermal overload relay opens at 230°F (110°C).
Optional AC Power Backup	Pump/Controller Only: Rechargeable 6 Amp-hour gel lead acid battery takes over automatically with AC line power failure. Integral trickle charger maintains battery at full charge (factory installed option).
Sampler Enclosure	Controller Housing: High impact injection molded ABS; submersible, watertight, dust tight, corrosion & ice resistant; NEMA 4X,6. Refrigerator: Vinyl Coated Steel or Stainless Steel (optional).
Sample Cooling	Refrigeration: 1/10 HP, 75 Watt, 400 BTU/hr. compressor, 120 CFM condenser fan; 3 sided wraparound plate type evaporator; rigid foam insulation; air sensing thermostat capable of maintaining sample liquid at 39°F (4°C) in ambient temperatures up to 120°F (49°C); accurate to ±1.5°F (0.8°C); magnetic door seal; refrigerator body is 22 gauge steel with vinyl laminate over-coating; refrigeration components and copper plumbing are corrosion protected with conformal coating.
Temperature Range	General use: 32° to 120°F, (0° to 49°C); Liquid Crystal Display: Operating -14° to 158°F, (-10° to 70°C); Storage 40° to 176°F, (-40° to 80°C).

Sampler Data Communications

Flow Chart



900 Sampler Series - General Specifications

- > **Pump Body:** High impact, corrosion resistant, glass reinforced Delrin®.
- > **Sample Pump:** High speed peristaltic, dual roller, with 3/8" (.95 cm) ID by 5/8" (1.6 cm) OD pump tube.
- > **Vertical Lift:** 27' (8.2 m) maximum (note: Remote Pump Option recommended for lifts from 22' (6.7 m) to 35' (10.7 m)).
- > **Internal Clock:** Indicates real time and date, 0.007% time base accuracy.
- > **Liquid Sensor:** Single sensor, non-contact, ultrasonic.
- > **Sample Transport Velocity:** 2'/sec. (.6 m/sec.) minimum at 15' (4.6 m) vertical lift in a 3/8" (.95 cm) ID intake tube.
- > **Pump Flow Rate:** 60 ml/sec at 3' vertical lift in a 3/8" (.95 cm) ID intake tube.
- > **Sample Volume Repeatability:** ±5% typical.
- > **Status Output:** Low battery, low memory power, plugged intake, jammed distributor arm, sample collected, and purge failure.
- > **Sample Volume:** Programmed in milliliters, in one ml increments from 10 to 9,999 ml.
- > **Intake Strainers:** Teflon® and 316 stainless construction. All 316 stainless steel in standard size and low profile for shallow depth applications.
- > **Intake Purge:** Air purged automatically before and after each sample; duration automatically compensated for varying intake line lengths.
- > **Intake Rinse:** Intake line automatically rinsed with source liquid prior to each sample, from 1 to 3 rinses.
- > **Intake Tubing:** 3/8" ID vinyl, 1/4" ID vinyl, 3/8" ID Teflon/polyethylene.
- > **Intake Fault:** Sample collection cycle automatically repeated from 1 to 3 times if sample not obtained on initial attempt.
- > **Cascade:** Allows using two samplers in combination where the first sampler at the completion of the program initiates the second.
- > **Program Languages:** Czech, Danish, Dutch, English, French, German, Italian, Spanish, and Swedish.
- > **Manual Sample:** Initiates a sample collection independent of program in progress.
- > **Automatic Shutdown:** Multiple Bottle Mode: After complete revolution of distributor arm (unless Continuous Mode selected). Composite Mode: After preset number of samples has been delivered, from 1-999 samples, or upon full container.
- > **Interval Between Samples:** Selectable in single increments from 1 to 9,999 flow pulses (momentary contact closure 25 msec. or 5-12 VDC pulse; 4-20 mA interface optional), or 1 to 9,999 minutes in one minute increments.
- > **Program Lock:** Access code protection precludes tampering.
- > **Multiple Programs:** Stores up to five sampling programs.

900 Controller Specifications

- > **Sampling Modes:** Multiple Bottle Time, Multiple Bottle Flow, Composite Time, Composite Flow, Flow with Time Override, Variable Interval, Start/Stop, Level Actuation.
- > **Internal Battery:** 5-year lithium battery maintains program settings and real time clock.
- > **User Interface:** 18 key membrane switch keypad; 24 character alphanumeric liquid crystal display.
- > **Diagnostics:** Tests RAM, ROM, pump, and distributor.
- > **Data Logging:** Program start time and date, stores up to 400 sample collection times/dates, all program entries, operational status including number of minutes or pulses to next sample, bottle number, number of samples collected, number remaining, sample volume collected, volume remaining, sample identification number.
- > **Multiplex:** Multiple Bottle Mode: multiple samples per bottle and/or multiple bottles per sample collection.
- > **Program Delay:** Sampler start at time of day or delay in minutes.

900 MAX Controller Specifications

- > **Diagnostics:** Tests keypad, display, ROM, pump, and distributor.
- > **Program Delay:** Three formats: (1) 1-9,999 minutes or flow pulses in one unit increment (2) programmable start time/day, and (3) programmable time/day/week.
- > **Sampling Modes:** Multiple Bottle Time, Multiple Bottle Flow, Composite Multiple Bottle Time, Composite Multiple Bottle Flow, Composite Time, Composite Flow, Constant Time / Variable Volume, Constant Volume / Variable Time, Flow with Time Override, Variable Interval, Start/Stop, and Level Actuation.
- > **Temperature Range:** General use: 32° to 120°F, (0° to 49°C) Liquid Crystal Display: Operating -14° to 158°F, (-10° to 70°C), Storage -40°F to 176°F, (-40° to 80°C).
- > **Serial Interface:** RS-232; up to 19,200 baud; allows on-site collection of stored data.
- > **Internal Battery:** Two C-cell alkaline batteries; maintains program logic and real time clock for five years. Internal battery draws less than 40 micro amps.
- > **User Interface:** 21 key membrane switch keypad with 4 multiple function soft keys; 8 line x 40 character alphanumeric, liquid crystal graphics display. Self prompting/menu driven program.
- > **Data Logging:** Records program start time and date, stores up to 400 sample collection times/dates, all program entries, operational status including number of minutes or pulses to next sample, bottle number, number of samples collected, number remaining, sample volume collected, volume remaining, sample identification number, and all logged data (i.e., level, flow velocity, rainfall, stream temperature, pH or ORP, and any logged external inputs).

- > **Set Point Sample Trigger:** When equipped with data logging options (i.e., level, flow velocity, rainfall, stream temperature, pH or ORP, and any logged external inputs) ... Mode 1 - Sampling can be triggered upon an upset condition when field selectable limits are exceeded. Mode 2 - Concurrent with normal sampling routine, sample liquid is deposited in designated "Trouble Bottle(s)."
- > **Automatic Shutdown:** Multiple Bottle Mode: After complete revolution of distributor arm (unless Continuous Mode selected). Composite Mode: After preset number of samples have been delivered to composite container, from 1-999 samples, or upon full container.
- > **Flash Memory:** Via RS-232; permits embedded software upgrades in the field.

Specifications for 900 MAX Factory Installed Options

Integral pH Temperature or ORP Meter

- > **Control/Logging:** Field selectable to log pH & Temperature or ORP independent of sampler operation or to control sample collection in response to value exceeding low/high set points.
- > **Recording Intervals:** 1, 2, 3, 5, 6, 10, 12, 15, 20, 30, and 60-minutes.
- > **Probe Pre-amplifier/Junction Box:** NEMA 4X with labeled terminal strip. pH and Temperature Sensor: Temperature compensated; impact resistant ABS plastic body; combination electrode with porous Teflon® junction.
- > **Measurement Range:** 0 to 14 pH.
- > **Operating Temperature Range:** 0 to 176°F, (-18° to 80°C).
- > **Dimensions:** .75" (1.9 cm) diameter x 6" (15.2 cm) long with .75" (1.9 cm) mpt cable end.
- > **Cable Length:** 25', (7.6 m).

Integral Dissolved Oxygen Meter:

- > **Control/Logging:** Field selectable to log dissolved oxygen independent of sampler operation or to control sample collection in response to value exceeding low/high set points.
- > **Recording Intervals:** 1, 2, 3, 5, 6, 10, 12, 15, 20, 30, and 60-minutes.
- > **Measurement Method:** Galvanic.
- > **Sensor:** Temperature compensated; impact resistant polypropylene body.
- > **Range:** 0-20 mg/l.
- > **Resolution:** .01 mg/l.
- > **Accuracy:** ±3% of reading or .1 mg/l.
- > **Operating Temperature Range:** 32° to 122°F, (0 to 50°C).
- > **Dimensions:** .65" (1.7 cm) diameter x 6.25" (15.7 cm) long with .75 (1.9 cm) mpt cable end.
- > **Cable Length:** 25', (7.6 m).

Delrin and Teflon are registered trademarks of E.I. DuPont de Nemours Inc.

Rain Gauge Input:

- > For use with American Sigma tipping bucket rain gauge; the sampling program can be initiated upon field selectable rate of rain; sampler records rainfall data; 0.01" (0.25mm) of rainfall per bucket tip.

4-20 mA Outputs:

- > Up to two (2) field assignable outputs, optically isolated, up to 600 ohm load per output each.

Expanded Memory:

- > Increases memory from 18,432 data points to 116,736 points (512K).

Integral Flow Meter

- > **Control/Logging:** Field selectable to log flow/level independent of sampler operation or to pace sample collection in proportion to flow.
- > **Operating Temperature Range:** 14° to 150°F (-10° to 65.5°C).
- > **Monitoring Intervals:** 1, 2, 3, 5, 6, 10, 12, 15, 20, 30, and 60-minutes.
- > **Accuracy:** 0.2% best straight line for combined nonlinearity, hysteresis, and repeatability.
- > **Program Memory:** Nonvolatile, programmable flash, can be updated via RS-232 port.
- > **Time Based Accuracy:** ± 1 second per day.
- > **Units of Measurement:** Level – in., m, cm, ft. Flow – GPS, GPM, GPH, LPS, LPM, LPH, MGD, AFD, CFS, CFM, CFH, CFD, M3S, M3M, M3H, M3D. Totalized Flow – gal., ft.³ acre-ft., L, m³.
- > **Totalizers:** Two software totalizers (one resettable and one non-resettable); field selectable scaling constant and flow units (gallons, cubic feet, acre feet, cubic meters and liters).
- > **Data Storage:** Capacity – 402 days of level, velocity and rainfall readings at 15 minute intervals plus 300 events. Data Types – Level, velocity, rainfall & water quality. Storage Mode – Wrap or slate.
- > **Output Conditions:** Set point on level, velocity, rainfall, flow, flow rate of change and water quality.
- > **Communications:** Serial connection to IBM compatible computer with American Sigma data analysis software.

Integral Temperature Meter:

- > Measures and records ambient or sample stream temperature. Control/Logging: Field selectable to log temperature independent of sampler operation or to control sample collection in response to value exceeding low/high set points.
- > **Recording Intervals:** 1, 2, 3, 5, 6, 10, 12, 15, 20, 30, and 60-minutes.
- > **Sensor:** Platinum RTD with 316 stainless steel body
- > **Range:** 32° to 212°F; (0 to 100°C).
- > **Accuracy:** ±1.8°F; (±1°C).
- > **Operating Temperature Range:** 0 to 176°F; (0 to 80°C).
- > **Dimensions:** 0.125" (.3 cm) diameter x 8" (20.3 cm) long, with .75" (1.9 cm) mpt cable end.
- > **Cable Length:** 15', (4.6 m).

Analog Input Data Logging Channels:

- > Up to three additional data logging channels record data from external source(s); -4 to +4 VDC and 0-20 mA.

Modem:

- > 14400, V.32 bis, V.42, MNP2-4 error correction. V.42 bis, MNP5 data compression. MNP 10EC Cellular Protocol (cell phone optional). FCC approved.

Alarm relay:

- > Four(4) alarm relays, 10A @ 120 VAC or 5A @ 220 VAC, form C, field assignable with settable trip points.

Integral Conductivity Meter:

- > **Control/Logging:** Field selectable to log conductivity independent of sampler operation or to control sample collection in response to value exceeding low/high set points.
- > **Recording Intervals:** 1, 2, 3, 5, 6, 10, 12, 15, 20, 30, and 60-minutes.
- > **Sensor:** Temperature compensated; impact resistant polypropylene body.
- > **Range:** 10-100 mS/cm.
- > **Resolution:** 0.01 mS/cm or 1 mS/cm (selectable).
- > **Accuracy:** ±2% of reading or .01 ms.
- > **Operating Temperature Range:** 32° to 122°F; (0 to 50°C).
- > **Dimensions:** .67" (1.7 cm) diameter x 6" (15.2 cm) long with .75" (1.9 cm) mpt cable end.
- > **Cable Length:** 25', (7.6 m).

Integral Submerged Depth/Velocity Sensor Accuracy

- > **Velocity Measurement: Method:** Doppler ultrasonic. *Transducer Type:* Twin 1 MHz piezoelectric crystals. *Typical Minimum Depth for Velocity:* .8" (2 cm). *Range:* -5 to 20 fps (-1.52 to 6.10 m/s). *Zero Stability:* <.05 fps (.015 m/s). *Accuracy:* (2% of reading). *Operating Temperature:* 0 to 140°F; (-18° to 60°C).
- > **Level Measurement (nonlinearity and hysteresis):** *Standard:* .018' to 11.5' ±.023', (.005 m - 3.5 m ±.007 m). *Extended:* .018' to 34.6' ±.07', (.005 - 10.5 m ±.021 m). *Maximum Allowable Level:* 3x over pressure. *Operating Temperature Range:* 32° to 160°F; (0 to 71°C). *Compensated Temperature Range:* 32° to 86°F; (0 to 30°C). *Temperature Error:* .018' - 11.5' ±.004"/°F; (.005 m - 3.5 m ±.0022 m/°C); .018' - 34.6' ±.012"/°F, (.018 - 10.5 m ±.006 m/°C) (maximum error within compensated temperature range – per degree of change). *Velocity Induced Error on Depth:* 0 to 10"/sec. (0 to 3.05 m/s) = .085% of reading. *Air Intake:* Atmospheric pressure reference is desiccant protected. *Material:* Polymer body with stainless steel diaphragm. *Cable:* Urethane sensor cable with air vent. *Cable Length:* 25' (7.6 m) standard. 250' (76 m) maximum. *Dimensions (combination sensor):* .8" H x 1.5" W x 5" L, (2 cm x 3.8 cm x 12.7 cm).

Submerged Depth

- > **Level Measurement Accuracy: (non-linearity and hysteresis):** .018' to 11.5' ±.023', (.063 m - 3.5 m ±.007 m); .018' to 34.6' ±.07', (.063 m - 10.5 m ±.021 m).
- > **Transducer Type:** Differential silicon resistive with balanced bridge.
- > **Maximum Range:** 5 psi .018' - 11.5', (.063 m - 3.5 m); 15 psi .018' - 34.6' (.063 m - 10.5 m).
- > **Maximum Allowable Level:** 3x over pressure.
- > **Operating Temperature Range:** 32° to 160°F; (0 to 71°C).
- > **Compensated Temperature Range:** 32° to 86°F; (0 to 30°C).
- > **Temperature Error:** .018' - 11.5' ±.002"/°F; .018' - 34.6' ±.006"/°F (maximum error within compensated temperature range – per degree of change).
- > **Air Intake:** Atmospheric pressure reference is desiccant protected.
- > **Material:** Epoxy body with stainless steel diaphragm.
- > **Cable:** Polyurethane sensor cable with air vent.
- > **Cable Length:** 25' (7.6 m) standard. 250', (76 m) maximum.
- > **Dimensions (sensor only):** .8" H x 1.5" W x 5" L, (2 cm x 3.8 cm x 12.7 cm).

Ultrasonic

- > **Level Measurement Accuracy:** From 0 to 11' = ± .01' (±.003 m) at 72°F; 22°C, still air, 40 – 70% relative humidity.
- > **Range:** Minimum distance from sensor to liquid 9" (23 cm). Maximum distance from sensor to liquid 11' (3.3 m).
- > **Span:** 0 - 20', (0 - 6 m).
- > **Ambient Operating Temperature Range:** -40° to 165°F; (-40° to 74°C).
- > **Temperature Error:** + .000047 ft./°F (maximum error with compensated temperature range – per degree of change).
- > **Resolution:** .0011'.
- > **Material:** PVC housing with Buna-N acoustic window.
- > **Cable:** 4 conductor with integral stainless steel support cable.
- > **Cable Length:** 25' (7.6 m) standard, 1000' (305 m) using RS-485 two wire remote sensor option.
- > **Crystal Specification:** 40 KHz, 12° included beam angle. 75 KHz, 10.4° included beam angle.
- > **Dimensions (transducer only):** 40 KHz - 3.75" H x 2.75" diameter, (9.5 cm x 7 cm).

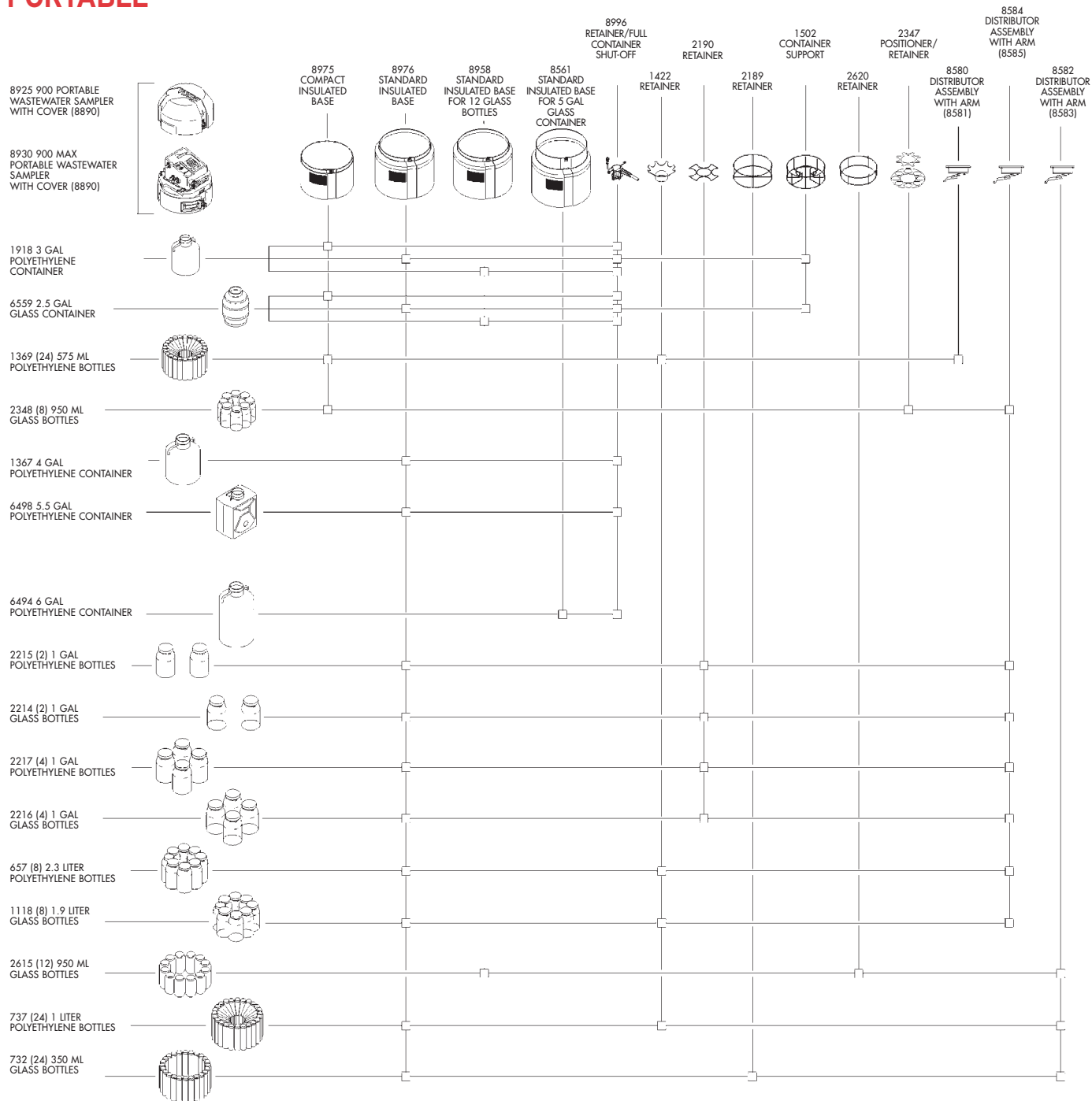
American Sigma products are manufactured under ISO 9001 Standards.

* U.S. Patent #5587926

Sampler Bottles

Configuration Options

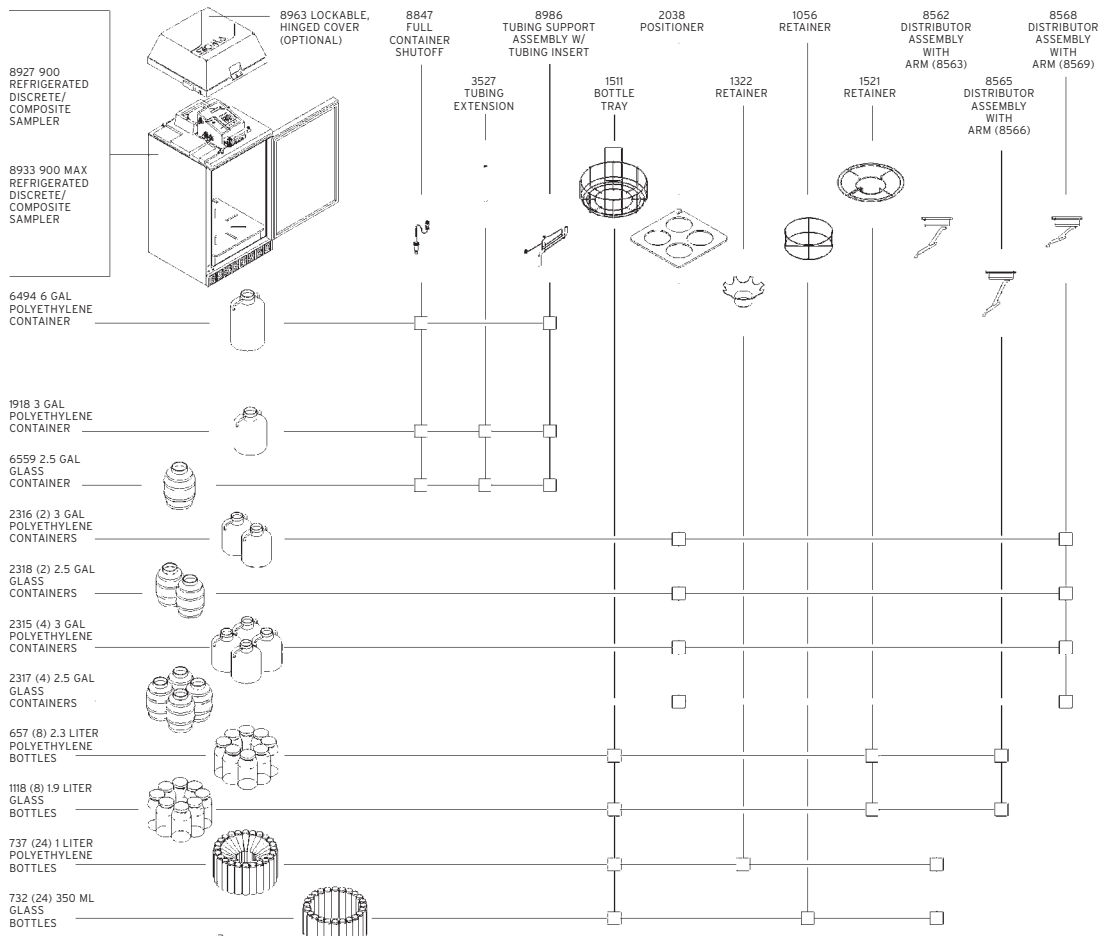
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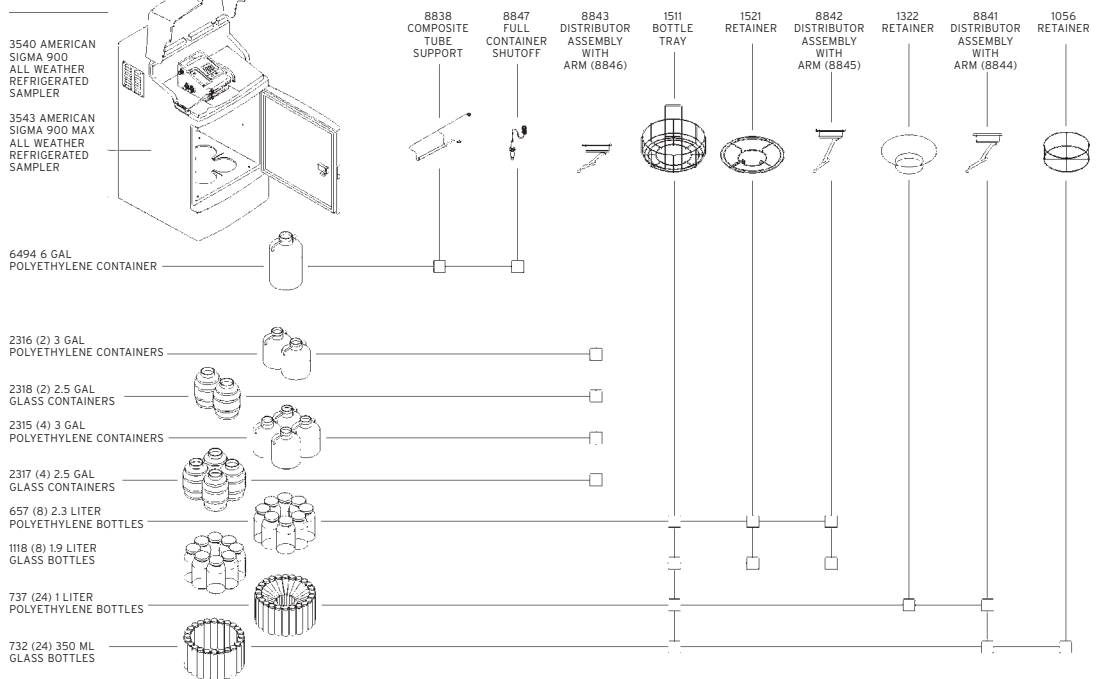
Sampler Bottles

Configuration Options

REFRIGERATED



ALL WEATHER



Samplers to Fit Your Application

Sampler Model Guide

Features	Port Pump	900 Composite Controller	900 Portable	900 MAX Portable	900 Refrigerated	900 MAX Refrigerated	900 All Weather Refrigerated	900 MAX All Weather Refrigerated	1600 Dipper*
Manual Sampling	•								
Automatic Sampling		•	•	•	•	•	•	•	•
Portable	•		•	•					
Stationary Site		•			•	•	•	•	•
AC Power	•	•	•	•	•	•	•	•	•
Battery Power	•	•	•	•					
All Weather	•	•	•	•			•	•	
Remote Pump		•	•	•	•	•	•	•	
Solenoid Valve Control for Pressurized Pipe Sampling		•	•	•	•	•	•	•	
Integral Flow Monitoring				•		•		•	
pH/Temp ORP				•		•		•	
DO/Conductivity				•		•		•	
Rain Gauge				•		•		•	
4-20 mA Outputs				•		•		•	
Alarm Relays				•		•		•	
Flow Proportional Sampling Input		•	•	•	•	•	•	•	•
Analog Inputs				•		•		•	
Modem (USA, Canada only)				•		•		•	

* For continuous flow-through sampling. Request literature #3402

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