

# SIGMA 900 MAX Portable Sampler

## Sigma Portable Sampler Overview

### 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. The compact base model is specifically designed for use in 18 in. manholes, unlike samplers of conventional size.

### Applications:

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

### Durable, Heavy-Duty Construction:

Portable Samplers take a lot of abuse in the field. But rest assured that the Sigma 900 Series 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.

## Sigma Portable Sampler Specification

### Model 900 Portable Sampler Specifications

#### General Specifications:

#### Dimensions:

- Compact Base - Diameter 17-3/8" (44.1 cm), Height 24" (61 cm).
- Standard Base - Diameter 19-7/8" (50.1 cm), Height 27-3/16" (69.4 cm).

#### Sample Pump:

- High speed peristaltic, dual roller, with 3/8" (.95 cm) ID by 5/8" (1.6 cm) OD pump tube.

**Pump Body:**

- High impact, corrosion resistant, glass reinforced Delrin\*.

**Vertical Lift:**

- 27 ft. (8.2 m) maximum (note: Remote Pump Option recommended for lifts from 22 ft. (6.7 m) to 35 ft. (10.7 m)).

**Sample Transport Velocity:**

- 2 ft./sec. (.6 m/sec.) minimum at 15 ft. (4.6 m) vertical lift in a 3/8" (.95 cm) ID intake tube.

**Pump Flow Rate:**

- 60 ml/sec at 3 ft. vertical lift in a 3/8" (.95 cm) ID intake tube.

**Liquid Sensor:**

- Single sensor, non-contact.

**Sample Volume:**

- Programmed in milliliters, in one ml increments from 10 to 9,999 ml.

**Sample Volume Repeatability:**

- $\pm 5\%$  typical.

**Sample Bottle Capacity:**

- **Composite:** 2.5 gal. glass, 3 gal. polyethylene, 4 gal. polyethylene, 5.5 gal. polyethylene, and 6 gal. polyethylene.  
**Multiple Bottle:** (2) 1 gal. glass, (2) 1 gal. polyethylene, (4) 1 gal. glass, (4) 1 gal. polyethylene, (8) 950 ml glass, (8) 1.9 liter glass, (8) 2.3 liter polyethylene, (12) 950 ml glass, (24) 350 ml glass, and (24) 575 ml polyethylene and (24) 1 liter polyethylene.

**Sampling Modes:**

- Multiple Bottle Time,
- Multiple Bottle Flow,
- Composite Time,
- Composite Flow,
- Flow with Time Override,
- Variable Interval,
- Start/Stop,
- Level Actuation.

**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.

**Multiplex:**

**Multiple Bottle Mode:**

- multiple samples per bottle and/or multiple bottles per sample collection.

**Intake Purge:**

- Air purged automatically before and after each sample; duration automatically compensated for varying intake line lengths.

**Pump/Controller Housing:**

- High impact injection molded ABS; submersible, watertight, dust tight, corrosion & ice resistant; NEMA 4X,6.

**Control Panel:**

- 18 key membrane switch keypad; 24 character alphanumeric liquid crystal display.
- **Internal Clock:** Indicates real time and date; 0.007% time base accuracy.
- **Diagnostics:** Tests RAM, ROM, pump, and distributor.
- **Program Delay:** Sampler start at time of day or delay in minutes.
- **Manual Sample:** Initiates a sample collection independent of program in progress.
- **Intake Rinse:** Intake line automatically rinsed with source liquid prior to each sample, from 1 to 3 rinses.
- **Intake Fault:** Sample collection cycle automatically repeated from 1 to 3 times if sample not obtained on initial attempt.
- **Multiple Programs:** Stores up to five sampling programs.
- **Cascade:** Allows using two samplers in combination where the first sampler at the completion of the program initiates the second.
- **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.

**Status Output:**

- Low main battery,
- Low memory power
- Plugged intake
- Jammed distributor arm
- Sample collected
- Purge failure.

**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.
- **Program Lock:** Access code protection precludes tampering.
- **Intake Tubing:** 3/8" ID vinyl. 1/4" ID vinyl. 3/8" ID Teflon and polyethylene.
- **Intake Strainer:** Teflon® and 316 stainless construction. All 316 stainless steel in

- standard size and low profile for shallow depth applications.
- **Sampler Case:** High impact ABS, 3 section construction; double walled insulated base.

#### **Power Requirements:**

- **12 VDC** (supplied by 12 VDC battery or AC adapter).
- **Optional AC Power Backup:** Rechargeable 6 Amp-hour gel lead acid battery takes over automatically with AC line power failure. Integral trickle charger maintains battery at full charge.
- **Internal Battery:** 5 year lithium battery maintains program settings and real time clock.
- **Overload Protection:** 5 amp DC line fuse 1 amp DC line fuse (AC power converter).

#### **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).

**Note:** Specifications are subject to change without notice.

## **Sigma 900 MAX Controller Specifications**

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#### **Diagnostics:**

- Tests keypad,
- display,
- ROM,
- pump,
- distributor.

#### **Program Delay:**

- (1) 1-9,999 minutes or flow pulses in one unit increment
- (2) programmable start time/day,
- (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,

- 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.

### 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 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.