PART 1 GENERAL

1.0 Section includes

A. Portable sampler for the representative collection of water samples for NPDES stormwater compliance, stormwater runoff monitoring, pretreatment compliance, CSO studies and monitoring, industrial wastewater discharge, and WWTP process control.
B. Suitable for the representative collection of toxic and conventional pollutants.

1.1 Measurement Procedures

A. The method of sample collection shall use a high-speed peristaltic pump for collection of the sample liquid.
B. The method of sample detection shall be ultrasonic.

1.2 Alternates

A. Other samplers that do not use a high-speed peristaltic pump are not acceptable.

1.3 System Description

A. Performance Requirements
   1. Sample volume: programmable in 10 mL increments from 10 to 10,000 mL.
   2. Sample volume repeatability ±5% of 200 mL sample volume with: 4.6 m (15 ft.) vertical lift, 4.9 m (16 ft.) of 3/8- in vinyl intake tube, single bottle, full bottle shut-off at room temperature and 1524 m (5000 ft.) elevation.
   3. Pacing intervals: selectable in single increments from 1 to 9,999 flow pulses or 1 to 999 hours in 1 minute increments. Accepts 4-20mA input from an external device to pace the sampler.
   4. Vertical lift: 8.5 m (28 ft.) using 8.8m (29 ft.) maximum of 3/8-in. vinyl intake tube at sea level at 20 to 25°C (68 to 77°F).
   5. Sample volume accuracy: ±5% of 200 mL sample volume with: 4.6 m (15 ft.) vertical lift, 4.9 m (16 ft.) of 3/8- in. vinyl intake tube, single bottle, full bottle shut-off at room temperature and 1524 m (5000 ft.) elevation.
   6. Sample transport velocity: 0.9 m/s (2.9 ft./s) at 4.6 m (15 ft.) vertical lift (16 ft. of 3/8-in. vinyl intake tubing at 70°F at 5000 ft. elevation).
   7. Pump flow rate: 4.8 L/min (1.25 gpm) at 1 m (3 ft.) vertical lift with 3/8-in intake tube typical.

1.4 Certifications

A. Controller: CE
B. Optional AC power supply: UL/CSA/CE
C. Optional battery: CE

1.5 Environmental Requirements

A. Operational Criteria
   1. Operating temperature: 0 to 50°C (32 to 122°F)
   2. Storage temperature: -40 to 60°C (-40 to 140°F)

1.6 Warranty

A. The product includes a one-year warranty from date of shipment.

1.7 Maintenance Service

A. Scheduled maintenance: monthly: visual inspection, if necessary, clean
B. Unscheduled maintenance:
   1. Pump tube replacement
   2. Rotor removal and cleaning
   3. Distributor arm tubing replacement
   4. Desiccant replacement

PART 2 PRODUCTS

2.0 Manufacturer

A. Hach Company, Loveland, CO
   1. Hach AS950 Portable Sampler

2.1 Manufactured Unit

A. The Hach AS950 Portable Sampler consists of a controller and interchangeable compact and standard bases for the collection containers.
B. Tubing:
   1. Pump tube: 0.95 ID x 0.16 OD cm (3/8 ID x 5/8 in. OD)
   2. Intake tube: 9.5 mm (3/8 in.) ID vinyl or Teflon® lined polyethylene in 10- , 25- , or 100-ft. lengths
C. Weighted strainer constructed of 316 stainless steel and Teflon

2.2 Equipment

A. The controller housing of the AS950 sampler is submersible, watertight, dust-tight, corrosion- and ice-resistant to NEMA 4X, 6, IP68 standards.
B. The base housing is 3-section construction with a double-walled base with 2.54-cm (1-in.) insulation. Ice is in direct contact with the sample bottles.
C. The power requirement is 12 Vdc supplied by optional a/c power supply or battery. The average current with the pump running is 2.25 amps dc. An optional solar power panel provides 12 Vdc regulated supply voltage, 5 watts minimum.
D. The Graphics Display is 1/4 VGA, Color; self-prompting/ menu-driven program.
E. The membrane switch keypad user interface is self-prompting/menu driven program with 2 multiple function soft keys.
F. The desiccant cartridge, which prevents moisture from accumulating inside the controller electronics area, shall be visual and accessible externally from the side of the controller; the replacement of the desiccant shall not require tools or disassembly of controller from base.
G. The pump shall use spring loaded rollers and be accessible by a clear hinged cover with single thumbscrew.
H. Sampling pacing modes shall include Time Weighted, Flow Weighted, Time Table, Flow Table, and Event.
I. Datalogging

1. Sample History: Stores up to 4000 entries for sample time stamp, bottle number and sample status (success, bottle full, rinse error, user abort, distributor error, pump fault, purge fail, sample timeout, power fail and low main battery)
2. Measurements: Stores up to 325,000 entries for selected measurement channels in accordance with the selected logging interval
3. Event Log: Stores up to 2000 entries. Records Power On, Power Fail, Firmware Updated, Pump Fault, Distributor Arm Error, Low Memory Battery, Low Main Battery, User On, User Off, Program Started, Program Resumed, Program Halted, Program Completed, Grab Sample, Tube Change Required, sensor communication errors, cooling failed, heating failed, thermal error corrected

J. Communication choices include:
1. USB and optional RS485 (Modbus)
2. Permits embedded software upgrades in the field
3. FSData data management software used to download, analyze, and report data, save templates, download sample history and event logs, create graphs for reports and presentations. Link directly to PC A to A USB cable.

K. Internal software shall be protected by a 7 amp fuse.

L. Diagnostics: View event and alarm logs.

M. A program lock shall be provided for access code protection to prevent tampering of program and system settings.

N. The sampler is convertible to composite operation by installing a composite container and full bottle shut off.

O. The available bases of the AS950 sampler, which hold the sample bottle(s) are interchangeable. Base capacities are as follows.

Standard base:

a. (24) 1-L polyethylene or 350-mL glass bottles
b. (8) 2.3-L polyethylene or 1.9-L glass bottles
c. (4) 3.8-L polyethylene or 3.8-L glass bottles
d. (2) 3.8-L polyethylene or 3.8-L glass bottles
e. or (1) 21-L (5.5-gal.) polyethylene bottle
f. or (1) 15-L (4-gal.) polyethylene composite bottle
g. or (1) 10-L (2.5-gal.) polyethylene or glass bottle

Compact base:

h. (24) 575-mL (19.44 oz.) polyethylene bottles
i. (8) 950-mL (32.12 oz.) glass bottles
j. (1) 10-L (2.5-gal.) polyethylene or glass bottle

P. Sampling features shall include:
1. Dual programming: Up to 2 sample programs can be run sequentially, in parallel, or according to day of week scheduling; enabling a single sampler to function like multiple samplers
2. Cascade sampling: for two samplers in combination—the first sampler, at the completion of the program, initiates the second.
3. Status Screen: Communicates what program is running, if there are any missed samples, when the next sample will be taken, how many samples remain, number of logged channels, time of last measurement, memory available, number of active channels, if alarms were triggered, when alarms were triggered, active sensors and cabinet temperature

Q. Automatic shutdown modes:
1. Multiple bottle mode: after complete revolution of distributor arm (unless continuous mode is selected).
2. Composite mode: after preset number of samples have been delivered to composite container, from one to 999 samples, or upon full container.

R. Sample distribution modes include continuous/non-continuous, bottles per sample, or samples per bottle
S. Manual grab sample can be made with the AS950 sampler to deliver a grab sample to a specific bottle location
T. The high-speed peristaltic sample pump uses four rollers with spring tension.
U. The intake air purge is made automatically before and after each sample. The duration automatically compensates for varying intake line lengths.
V. The intake line is optionally rinsed with source liquid prior to each sample from one to three times.
W. The sample collection cycle is optionally repeated from one to three times if a sample is not obtained on the initial attempt.

2.3 Factory Installed Options

A. Two Sensor Ports: Sampler accepts Hach digital Differential pH, Hach digital AV9000 analyzer with submerged area velocity flow and/or Hach digital US9000 ultrasonic level sensors.
B. Rain/RS485 Port: Sampler accepts Hach Rain Gauge (not included) or can be used as RS485 communications.

2.4 Components

A. Standard equipment:
    1. Controller: high impact injection-molded ABS/PC plastic
    2. Base: impact resistant ABS plastic. Choose from:
        a. Standard base
        b. Compact base
        c. Composite base
    3. Pump enclosure: corrosion-resistant polycarbonate door, high impact-resistant plastic, polyphenylene sulfide track
    4. Intake strainers in standard size, high velocity, or low profile for shallow depth applications. Choice of:
        a. Teflon and 316 stainless steel construction
        b. All 316 stainless steel
B. Dimensions:
    1. With standard base: 50.5 x 69.4 cm (19.9 x 27.3 in.)
    2. With compact base: 44.1 x 61 cm (17.4 x 24 in.)
    3. With composite base: 50.28 x 79.75 cm (19.8 x 31.4 in.)
C. Weight:
    1. Controller with standard base:
        a. With (24) 1-L polyethylene bottles: 15 kg (35.6 lbs.)
        b. With (1) 2.5-gal. polyethylene container: 14.8 kg (32.6 lbs.)
    2. Controller with compact base:
        a. With (24) 575-mL polyethylene bottles: 12.2 kg (27 lbs.)
        b. With (1) 2.5-gal. polyethylene container: 12.9 kg (28.3 lbs.)
    3. Controller with composite base: with (1) 5.5-gal polyethylene container: 15 kg (36 lbs.)

2.5 Accessories

A. Bottle kits
B. Tubing and strainers
C. Battery
D. Cables and interfaces
E. Suspension harness

F. Manhole support bracket
G. IO9000 Input/Output Module

PART 3 EXECUTION

3.0 Preparation

A. Clean the sample bottles and caps.
   1. Wash with brush, water and mild detergent.
   2. Flush bottles with water followed by a distilled water rinse.
B. Install bottle (s) in base compartment.
C. Plumb the sampler.
D. Install intake tube and strainer in main stream of sample source.
E. Connect sampler to power.
F. Where applicable, connect sampler to peripheral devices or sensors.
G. Program sampler.

END OF SECTION