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WHEN MEASUREMENTS MATTER

PVS5120D

Discrete Portable Automatic Liquid Sampler

Sampler Optimized for Datalogger or RTU Control

Vacuum technology for better samples

Overview

The PVS5120D is a discrete sampler that deposits its water samples into 1 to 24 containers. This sampler uses a vacuum sampler controller, the VSC100, to allow a Modbus RTU master, SDI-12 master device, simple pulse input, or Campbell Scientific PakBus datalogger to control and communicate with the water sampler.

This sampler is lightweight, portable, and battery-powered. It can fit in a small-sized manhole and be suspended by a stainless-steel harness for sewer applications.

The PVS5120D can be used with a standard or large pump. The standard pump takes samples at 1.6 m/s (5.1 ft/s) for horizontal draws of 7.6 m (25 ft). The large pump takes samples at 2.2 m/s (7.1 ft/s) at 7.6 m (25 ft). Both of these velocities are typical values measured at sea level. Intake velocities will decrease as altitude increases.

Benefits and Features

- Diagnostic feedback provided to the master device: bottle number, sample number, response code/message, sampler battery voltage
- The installation of a bottle position encoder enables verification of arm position before sampling and then moving the arm if it is not centered above the correct bottle
- Multiple bottle configurations possible: 1, 2, 3, 4, 6, 8, 12, 24
- Auto deploy that automatically sets the purge and vacuum times based on hose length
- Repeatable volume collection via metering chamber
- Selectable internal or external power via three-way power switch
- One control cable for all control types
- An optional water present sensor detects the presence of water at the mouth of the sampler intake hose to ensure a sample is available

Detailed Description

The PVS5120D uses an external vacuum pump to draw water through intake tubing, instead of the traditional peristaltic pump that induces flow by squeezing flexible tubing. Because the vacuum method disturbs the water samples less, they

better represent the original water solution, especially if the solution has high concentrations of supsended solids.

To prevent cross contamination, the sampler uses air pressure (up to 28 psi) to purge the tubing of excess water. The standard pump can lift as high as the large pump and is appropriate for most applications—especially when the power budget is a concern. The large pump is appropriate for applications with long hose distances or high lifts because it provides higher pumping velocity.

Specifications

Enclosure	LLDPE (linear low-density polyethylene), three-piece construction, and stainless-steel fittings
Cooling System	Insulated container wall, cavity space for ice
Horizontal Velocity	Refer to the "PVS5120 Intake Velocity versus Hose Length at Sea Level" plot.
Storage Temperature Range	-20° to +50°C
Operating Temperature Range	› 0 to 40°C (large pump) › 0 to 50°C (standard pump)
Operating Voltage	› 12 Vdc (nominal) › 16 Vdc (maximum) › 10.8 Vdc (minimum)
Body Case Diameter	42.8 cm (16.85 in.)
Height	› 80.9 cm (31.875 in.) › 96.2 cm (37.875 in.) with extended base

Weight

Sampler with Standard Pump and No Battery	10.4 kg (23 lb)
Sampler with Large Pump and No Battery	11.8 kg (26 lb)
7 Ah Battery	1.8 kg (4 lb)
17 Ah Battery	6.3 kg (14 lb)

Controller

Sampler Triggering Methods	› SDI-12 Master Device › Modbus RTU Master › Campbell Scientific PakBus datalogger › Pulse trigger (1 to 10,000 pulses) › Time-based sampling (stand alone)
RS-485 Communication	Can return sampler status when triggering samples via pulse or time-based control.
Backup Power Source	Internal lithium battery maintains program settings and information in case of power failure.
Bottle Position Encoder	Verifies arm position and moves to correct bottle if it is out of position.
Multi-purpose Button	Service sampler, collect manual sample, and auto deploy
Auto Deploy	Automatically sets the purge and vacuum times based on hose length (between 25 and 100 ft)
Sampler Status/Feedback	Bottle number, sample number, response code, sampler battery voltage (available after every sample)

Vacuum System

Pinch Valve	Fixed – normally open
Purge Cycle	Adjustable from 1 to 800 s (280 s for SDI-12)
Suction Cycle	Variable (until liquid contacts level electrode in metering chamber or adjusts automatically to two times the purge time)
Metering Chamber Cover	› Nylon (standard) › Teflon (option)
Volume Control Tube	316 stainless steel
Metering Chamber Level Electrode	316 stainless steel
Intake Hose	Ordered as a common accessory. Campbell Scientific offers PVC hose with 25-ft and user-specified lengths. Intake end can have a lead sinker or stainless-steel strainer. Sampler end can have a clamp or quick-connect termination.
Discharge Hose Material	› Latex (standard) › Options include Teflon lined, silicon.