

3/Vista and HS3/Vista Differences

General

The following documentation details the differences between the standard Vista and the HS3/Vista (Ultra High Capacity models).

Models

Model	Type	Inlets	Products Dispensed	Hoses per Side
HS3/V387Dx/4R	Master	1	1	1
HS3/V387Dx/4	Master/Master	1	1	1 (2 sides)
HS3/V388Dx/4	Master/Master	2	2	1 (2 sides)
HS3/V389Dx/4R	Master/Master	2	2	2 (1 side)
HS3/V388Cx/4	Master/Satellite	2	2	1 (2 sides-Master/Sat Combo)
HS3/V287S/4R	Satellite	1	1	1
HS3/V288S/4	Satellite/Satellite	2	2	1 (2 sides)
HS3/V289S/4R	Satellite/Satellite	2	2	2 (1 Side)

x = numeric placeholder representing price posting and payment method

Technical Information

Performance:	Ultra High Capacity (UHC): Up to 60 GPM (227 LPM) maximum test rate at discharge outlet (based on total of both Master & Satellite hoses in use at same time). IMPORTANT: Actual flow rates will depend upon the installation conditions, product dispensed, dispenser accessories, and the size of the submersible pump.
Meter:	Ultra High Capacity Models: Liquid Controls® M-5 positive displacement rotary meter with Wayne optical pulser. Electronic calibration.
Strainer:	Ultra High Capacity Models: No strainer is provided. See filter section. Disposable strainer canisters are available as an option to replace the internal filters.
Filter:	Ultra High Capacity Models: Two internal Cimtek Series 800 filters (40 GPM each) per hose with 30-micron particulate filter elements. IMPORTANT: User should make sure the filter element meets the application and replace with the appropriate element as necessary.
Flow Control Valve:	Ultra High Capacity Models: Two-stage 1-1/2" (3.81cm) 24V valve.
Inlet:	Ultra High Capacity Models: 2" (5.1cm) male NPT. (Satellite models are 1-1/2" NPT).
Outlet:	Ultra High Capacity Models: 1-1/4" (3.2cm) female NPT. 1" (2.5cm) reducing bushing supplied for 1" hose assemblies. Outlet for satellite connection on Master configurations is 1-1/2" NPT.

Dispenser Views



Figure 1 - View of HS3/V388Dx/4 hydraulics with right inlet reversed for more room when connecting to two satellites.



Figure 2 - Full view of HS3/V389Dx/4R

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Hydraulic/Electronic/Software Changes

- Ultra High Capacity models use the Liquid Controls (LC) M-5 meter with a direct coupled Wayne optical pulser in place of the iMeter and WIP. There is no longer a gear train between the M-5 meter and the pulser (as in the HS1 models). Calibration is no longer performed with an adjuster on the M-5 meter (as in the HS1 models). One meter is used per hose.
- Piping in the lower part of the cabinet uses NPT threaded pipe. The tube that travels up through the side column to the valance is double bump pipe.
- Each dispenser is equipped to be configured as a Master dispenser. A 1-1/2" NPT plug can be removed to provide an outlet to the satellite and wires are in place, in the junction box, for connecting to a satellite.
- There are two 40 GPM, internal filters for each hose. (See "Filter" section.)
- Unlike standard Vista models, the inlets for the UHC enter the bottom of the dispenser on the opposite side of where they exit. See the base layouts for the exact locations.
- A two-stage, 24VDC, 1-1/2" proportional valve is used in place of the standard 7/8" proportional valve. While this valve has a proportional type of control coil, the actual valve is a 2 stage valve that can run in either low flow or high flow mode.

IMPORTANT: You cannot regulate the rate of flow with this valve other than low or high flow. If the flow rate needs to be regulated (like for fueling small trucks), an external mechanical flow regulator is required.

- The LC meter is used in conjunction with a Pulse Processing Module (PPM) that is located in the head of the dispenser. The PPM has a switch for each meter that is used to calibrate the meter. Switch "Side A – M1" is used to calibrate the meter on Side A while switch "Side B – M1" is used to calibrate the meter for Side B. If the dispenser has two hoses on the same side, Switch "Side A – M1" is used for Hose 1 and "Side B – M1" is used for Hose 2. This procedure is similar to that of opening the door on the WIP to calibrate the dispenser.
- US Weights and Measures required a wire seal over the PPM calibration switch bracket (in the head) and around the pulser cover (at the LC M-5 meter.)
- A calibration container that handles at least 50 gallons (or 190 liters) is recommended for verifying, and calibrating if necessary, this high capacity dispenser.
- A Satellite "In-Use" indicator is available as an option. It uses one of the unit price displays, on the Master dispenser, to show when the satellite is active. Scrolling dashes appear on the display when the satellite has been turned on.
- Messages you will/may see on the unit price display during the calibration process on dispensers using the PPM are:
 - **CAL** - when switch position 1 is set to "On" -signifying calibration mode in process.
 - **RECD** - after dispensing product in test measure and setting switch back to "Off" position, the new calibration factor was received.
 - **C-ER** - calibration error -calibration factor not received.

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Installation

- Piping from tank to dispenser should slope upwards to avoid air or liquid traps. Use 2” minimum piping. 3” or 4” piping is recommended to maximize flow.
- A double poppet emergency valve, where the top valve is normally in a closed position when there is no flow, is recommended (e.g. OPW 2” 10RUP). The top valve acts as a check valve which reduces the reverse flow of product that can occur in some high speed installations. Reverse flow of product can result in pulser errors.
- Long lengths of flexible piping are not recommended because it can expand when the nozzle is closed and can cause excessive reverse flow of product and pulser errors.
- The HS3 Vista dispenser can only be used with UHC Satellites.

Vista

HS3/V287S/4R (Vista Single Satellite)

HS3/V288S/4 (Vista Satellite/Satellite)

HS3/V289S/4R (Vista Single-Sided Sat/Sat)

HS3/V388Cx/4 (Master/Satellite combo)

UHC Low Hose

3/G7037/JKLR (UHC Low Hose Single Satellite)

3/G7038/JKL (UHC Low Hose Satellite/Satellite)

3/G7039/JKLR (UHC Low Hose Single-Sided Sat/Sat)

Precautions

- Prior to calibrating the dispenser for the first time, be sure to bleed the product lines to make sure all air and air pockets are bled from the product trunk lines. To thoroughly flush out all air and completely fill the system prior to verification and calibration, dispense product from the dispenser (and satellite if applicable) until a continuous and steady flow of product is observed at each nozzle.

NOTE: If all air and air pockets are not removed from the dispenser and satellite product lines, you may receive pulser errors when the air decompresses and causes the pulser to move backwards.

- In applications involving the resale of fuel, for the initial use and after any adjustments to the calibration, the meter will need to be sealed by the appropriate Weights & Measures authority.
- Only one position on one switch can be set to “On” during the calibration process (only one meter at a time can be calibrated).

NOTE: If position 1 (M1) on both switches is set to “On” at the same time during the calibration of the meter, a calibration “RECD” message may be displayed erroneously.

- If the Pulse Processing Module is replaced, the dispenser must be calibrated first prior to running a sale. If not calibrated first and you try to run a sale, the sale will be stopped due to a calibration error shown on the display as “C-ER.”
- If you are replacing a “Knock-Down” unit, you need to consider any attached satellites. These units must be matched with the proper satellites due to the valves.

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Meter Check (Calibration Check)

Step 1 Dispense product into a certified calibration container to wet the container and then empty it back into the tank, allowing it to drain for 10 seconds.

Step 2 Dispense product into the container until exactly the quantity of the container is shown on the dispenser display.

NOTE: When temperature compensation is activated (Canada), the dispenser should be placed into Temp Comp Fueling Mode, so that the accuracy can be verified using the gross (uncompensated) volume shown on the display in this mode.

Step 3 Compare the reading on the container's sight glass to the dispenser display. For the "Acceptance" test, the container volume should be within a total of +/- 1 cu. in. plus +/- 0.5 cu. in. for each gallon dispensed for a 5 or 10 gallon prover. For larger provers, the acceptance tolerance is $\pm 0.2\%$ (units rated over 30 GPM).

NOTE: For U.S. Weights & Measures applications, acceptance tolerance of +/- 1 cu. in. plus +/- 0.5 cu. in. for each gallon dispensed (into a 5 or 10 gallon prover) and 0.2% into a larger prover, is only required for newly placed in service devices for 30 days. After 30 days, the maintenance tolerance is increased to +/- 1 cu. in. plus +/- 1 cu. in. for each gallon dispensed (into a 5 or 10 gallon prover) and 0.3% for larger provers. Consult Handbook 44 for full information.

Step 4 If the values are out of range, proceed with the following calibration procedure.

Step 5 Repeat the verification procedure for each hose.

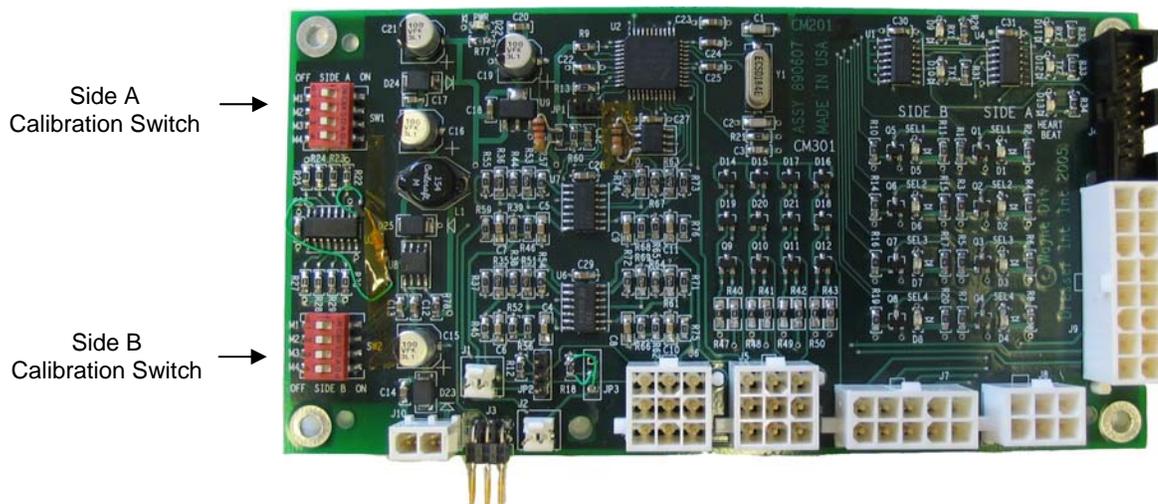
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Calibration Procedure

- Step 1** Verify that the dispenser calibration volume is set to match the test container that will be used to calibrate the dispenser. This can be checked (and if needed changed) using the F19.26 (Gallons) or F19.16 (Liters) function in the dispenser software configuration. The entry must be in whole gallons or whole liters.
- Step 2** Dispense product into the certified calibration container to wet the container and then empty it back into the tank, allowing it to drain for 10 seconds.
- Step 3** Identify the calibration switch for the meter in need of calibration. The Pulse Processing Module (PPM) is located in the electronics area of the dispenser. It is mounted on a bracket directly above the vapor barrier. The switches are located behind a bracket used to seal the switches. Reference Figure 1 for the location of the calibration switches.

Note: To identify the hose designation, when viewing the dispenser from the side of the iGEM CPU, the Hose A discharge outlet is always on the left side of the dispenser and the Hose B discharge outlet is always on the right side.

Figure 3 Pulse Processing Module



- Step 4** Remove the seal wire and screw to allow access to the calibration switch.
- Step 5** Set the calibration switch of the meter to be calibrated to the “on” position. “CAL” will display on the dispenser Unit Price display indicating the dispenser is in calibration mode.
- Step 6** Fill the calibration container to exactly the “0” mark on the sight glass (read the bottom of the meniscus). Disregard any volumes shown on the dispenser display.
- Step 7** Return the nozzle to the nozzle boot and set the calibration switch to the “off” position (this now redefines the calibration factor in the PPM). If the calibration is accepted by the dispenser, “rECd” will show in the Unit Price display for 5 seconds. If the calibration is rejected, a “C-Er” message will appear in the display for 5 seconds, and the calibration procedure will need to be repeated.
- Step 8** Empty the container back into the tank and let it drain for 10 seconds.
- Step 9** Verify the accuracy by following the verification procedure on the previous page.
- Step 10** If this is a twin dispenser, repeat the calibration procedure for the other hose.
- Step 11** Replace the calibration switch cover and seal the calibration cover.

Filters

Ultra high capacity models have two high capacity filters per hose prior to the meter in place of an inlet strainer. If the filters are removed for any reason (e.g. external filters are desired), they must be replaced with disposable 100-mesh strainer canisters (p/n 890255-002) in order to protect the meter.

Dirty filters will slow down the delivery of product. With new tank and piping installations, it may be necessary to replace the filters two or three times during the first few days of operation to remove installation debris and pipe sealant. After this, filter replacement should be performed periodically. If strainer canisters are used, a drop in flow may indicate a need to replace the disposable strainer.



WARNING

Before removing the filters or strainer canisters, always turn off the power to the dispenser, and if applicable, turn off the power to the submersible pump and close the emergency shutoff valve underneath the dispenser. Failure to do so may result in a hazardous condition that can result in serious injury. Make sure safety goggles are worn. Loosen the filter or strainer canister slightly and allow the product to drain into a plastic container until pressure is relieved. Return the product to the appropriate tank.

The filters or strainer canisters are removed by unscrewing it (the same way an oil filter is removed from a car engine). Place a container under the filter to catch the product and sediment. To install the new filters or strainer canisters: apply a film of oil to the gasket, hand turn until gasket contacts base, then tighten 3/4 turn (follow any directions supplied with filter). Open the emergency shutoff valve, turn the electrical power ON, and check for leaks.



WARNING

Remote dispensers are shipped with 30-micron particulate filters (unless the dispenser is supplied with the optional strainer canister). These filters do not provide water absorption. The installer and user should make sure the filters meet the requirements of the application, satisfy local/state/federal codes, and replace the filters with appropriate filters as necessary. If strainer canisters are used, or for special applications even when the internal filters are supplied, external filters, used on the discharge, may be required for the application. Some applications, such as aircraft refueling, require special filtration equipment in order to ensure product purity. Replacement filters must be UL-recognized.

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Configuration

The following configuration settings change for HS3 dispensers.

Function Number & Name		Sub-function Number & Description		HS3/Vista Configuration Setting
F08	Side A Dispenser Type Configuration Part #1	.61	Primary valve type, 1–2, 1 = on/off, 2 = proportional, 3 = Two stage	3 (2 for standard models)
F09	Side B Dispenser Type Configuration Part #1	.61	Primary valve type, 1–2, 1 = on/off, 2 = proportional, 3 = Two stage	3 (2 for standard models)
F16	Pulser Configuration	.04	Meter type 1 = WIP, 2 = PPM w/ LC meter, 3 = PPM w/ E85 meter, 4 = xflow	2 (1 for standard models)
F17	Dispenser Limits Configuration	.00	Max. # of pulse errors on an in-use pulser (in a transaction), 1-99	50 (10 for standard models)
F19	Volume Unit Specific Configuration	.16	Calibration Test Container Volume –Liters (UHC only) 20 – 1000 Liters	20
		.26	Calibration Test Container Volume – Gallons (UHC only) 5 – 250 Gallons	5
F37	Satellite Configuration Side A	.61	Primary valve type, 1–2, 1 = on/off, 2 = proportional, 3 = Two stage	3 (2 for standard models)
F38	Satellite Configuration Side B	.61	Primary valve type, 1–2, 1 = on/off, 2 = proportional, 3 = Two stage	3 (2 for standard models)

Troubleshooting

- **Pulser Errors (typically a #50 or #51 error)**

Pulse errors typically take place as fluid flow backwards through the meter due to the line shock caused when a nozzle slams closed. If a pulse error occurs, the transaction will end immediately. Fluid cannot compress, however there are a variety of conditions that can allow too much fluid to go through the meter backwards thus creating a pulser error. Most pulse errors appear to originate from one of the following:

- Air in the Lines – Air in any of the product lines (including the satellite lines and lines on the opposite side of the dispenser for a Twin I) can cause pulser errors. All air must be purged from all lines to remedy this problem.
- Incorrect Configuration Setting – F17.00 must be set for 50 (not 10 like a normal Vista). This setting determines the number of reverse pulses allowed during a transaction.
- Flexible Piping – Flexible piping anywhere in the product stream can cause pulser errors as the piping expands and contracts. If flexible piping is used, the only remedy is to install a double poppet emergency valve, where the top valve is normally in a closed position.
- Other Installation Issues – Long lengths of hose, leaky foot valves, etc. can cause excessive fluid to flow backwards thus creating a pulse error. The best solution for these situations is to install a double poppet emergency valve, where the top valve is normally in a closed position.

- **Dispenser will not turn on (activate) when the handle is turned on after the PPM board is replaced**

New PPM boards need to be calibrated. If a PPM board is replaced, each side of the dispenser will need to be calibrated before the dispenser can be used. In order to start a transaction for a particular side of the dispenser, the CAL switch for that side will need to be turned on. When calibrating a side, be sure the calibration switch is turned off and then back on, immediately before the beginning of the calibration transaction so that product dispensed in previous transactions is not counted as a part of the calibration transaction.

- **Calibration message displays “rECd” during calibration, but verification test fails**

Check to make sure that both calibration switches on the PPM board are not set to the “On” position at the same time during the calibration.