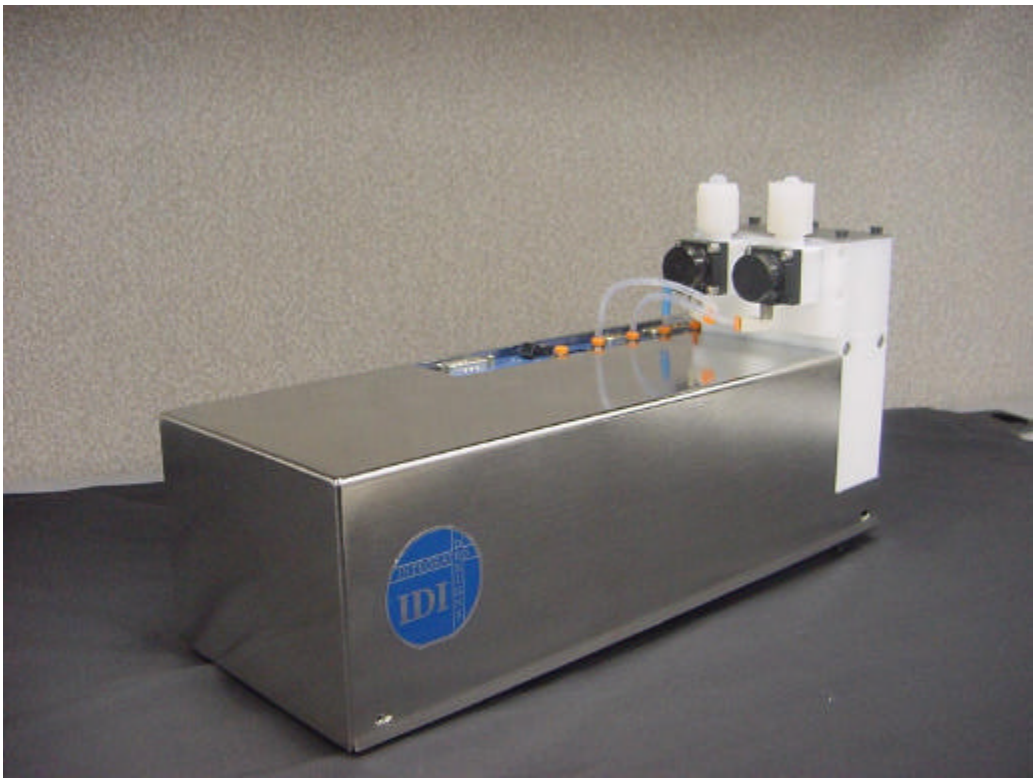
M600 HIGH VISCOSITY PUMP

PATENT PENDING

REV E



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WARRANTY

Integrated Designs, LP, warrants their products for 12 months from date of shipment against defects of parts and workmanship. During the warranty period, Integrated Designs, LP, will, at their option, repair or replace the product if failure is due to defective parts or workmanship. All warranty service will be performed during normal business hours.

IDS UNITS AND SUPPORT EQUIPMENT

Warranty repairs of individual dispense units are to be performed at Integrated Designs, LP, facility. The customer is responsible for shipping products under warranty to IDI. If, upon inspection, the product is shown to have been damaged by misuse or neglect and the customer desires to have the product repaired, Integrated Designs, LP, will repair the product at our standard rates for parts, labor, and expenses. Integrated Designs, LP, is not obligated to replace items that are normally designated to be replaced periodically, or consumed during the life of the product (i.e. batteries, filters, etc.). Replacement parts will be new or remanufactured.

SYSTEMS

Warranty repairs of dispense systems, such as **ChemLink**, bulk pumping systems, etc., and their associated dispense equipment will be performed at the customer site for the length of the warranty period. If, upon inspection, the product is shown to have been damaged by misuse or neglect and the customer desires to have the product repaired, Integrated Designs, LP, will repair the product at our standard rates for parts, labor, and expenses. Integrated Designs, LP, is not obligated to replace items that are normally designated to be replaced periodically, or consumed during the life of the product (i.e. batteries, filters, etc.). Replacement parts will be new or remanufactured.

CUSTOMER RESPONSIBILITIES

The customer is responsible for performing all recommended preventive maintenance to keep the equipment in proper operating condition.

WHAT IS NOT COVERED

This warranty applies only to Integrated Designs, LP, equipment, operating under the conditions for which it is designed, and does not cover loss or damage resulting from external causes, such as collision with an object, fire, flooding, lightning, earthquake, exposure to weather conditions, battery leakage, theft, misuse or abuse, damage resulting from the failure or improper use of an electrical source, or damage caused by connection to products not recommended by Integrated Designs, LP.

LIMITATIONS OF LIABILITY

In no event shall Integrated Designs, LP, or its suppliers be liable for any damages whatsoever (including, without limitation, to damages or loss of business profits, business interruption, or other pecuniary loss) arising out of the use or inability to use the Integrated Designs, LP, products.

INTEGRATED DESIGNS, LP, MAKES NO OTHER WARRANTY EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF A PARTICULAR PURPOSE.

TRADEMARKS

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ChemLink®

ChemNet?

Kidde-Fenwal, Inc.

Fenwal? 2320 Fire Control Panel

PALL Corporation

PALL?

NOW Technologies, Inc.

NowPak?

Millipore Corporation

Millipore?

Hoechst Celanese Corp.

Aquatar?

E.I. du Pont de Nemours and Company

Teflon?

Viton?

Kalrez?

Microsoft Corporation

Windows?

MS-DOS?

Windows-NT?

Nalge Nunc International

Nalgene?

SMC Pneumatics, Inc.

SMC? One Touch Connector

Swagelok? Quick-Connect Co.

Swagelok? Quick-Connects

SYSTEM OVERVIEW

The High Viscosity Pump (HVP) dispenses chemicals in very accurate and repeatable amounts using positive displacement and pressure on demand enhancement technology. The HVP positive displacement technology works within chemical viscosity ranges of 250 centipoises to 30,000 centipoises. The units all **Teflon** flow path is compatible with a wide range of chemicals: polyimides, solvents, and high viscosity fluids used in the semiconductor industry

The system is user friendly and uses **ChemNet** software. The **ChemNet** application provides all of the necessary functions to completely control, configure and monitor HVP chemical dispense units.

ChemNet is a Graphical User Interface (GUI) developed by Integrated Designs to interface with various IDI devices. This software runs in a Windows 95 or Windows NT environment on any laptop or desktop PC with an RS232 serial port. With the use of an optional RS-232 to RS-485 converter, this software is capable of connecting to multiple devices.

THEORY OF OPERATION

During operating conditions the HVP will sit in an idle state waiting for a trigger signal from the process equipment controlling dispenses. The HVP responds to a process equipment trigger signal to dispense a pre-programmed amount. The HVP dispense volume and time, suckback delay time, and suckback volume are programmed by using the **ChemNet** software.

The HVP recharges after dispense. The time is set through the software. Dispense, and recharge time is set to the viscosity of the chemical in use. Higher viscosity chemicals require longer fill times.

ChemNet application provides all of the necessary functions to completely control, configure, and monitor the chemical dispense units. All programmable features are accessed through RS-232 or RS485 communications links, through the P2 connector on the dispense unit.

The dispensing unit has the capability to store two recipe programs in the IDI interface mode and three recipe programs in the TEL interface mode. The recipes are loaded through the software. Program selection is through the discrete track interface or through the serial communications interface. In the TEL interface mode, the two dispense trigger lines indicate the recipe to be used.

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SECTION 1

INSTALLATION

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HVP INSTALLATION PROCEDURE

1. Mount the dispense system horizontally in a location that makes it accessible for maintenance.
2. The HVP dispense system **must** be connected to a good protective earth ground before continuing with installation. (10-32 terminal located on the end of chassis) **Only qualified maintenance personnel should perform installation.**

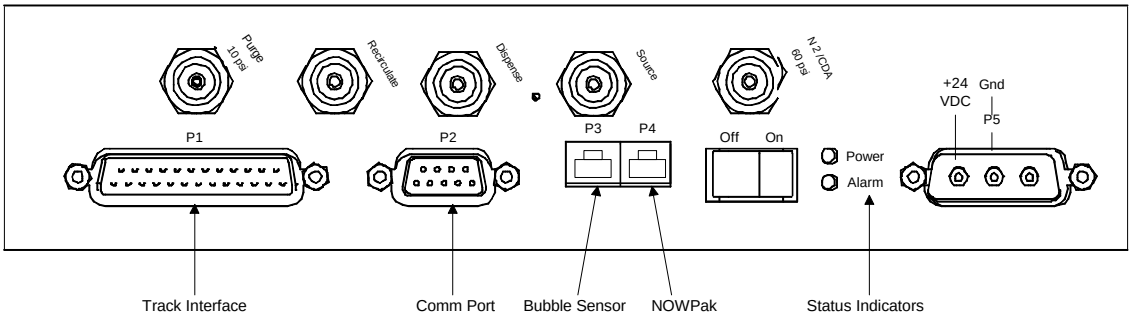

Figure 1-1, Install Connection

3. Connect N_2 using a one 1/8-inch tube pressed firmly into the 1/8" bulkhead labeled N_2/CDA. The supply must be regulated at 70 psi (4.8 Bar) and able to provide 1 cfm (26.8 L/min).
4. Connect the purge supply, if required, at 10 psi (0.7 Bar) with 1/8-inch tube pressed firmly into the 1/8" bulkhead labeled Purge.
5. Connect the output tubing to the output valve.
6. Connect the source input tubing to the chemical source valve. 1/2 OD x 3/8-inch I.D. tubing is recommended for this line depending on the unit configuration. ***Do not connect to the chemical container at this time.***
7. Connect the dispense system to the power source—24VDC.
8. Connect communications terminal to P2 on Unit, start **CHEMNET GUI software,** and set the unit address if necessary.
9. Connect the track interface cable from the track system to the Dispense Unit, P1, and test interface signals.
10. Connect the source line to the chemical container and allow the system to fill.

WARNING:
IDI RECOMMENDS THE USE OF THE OPTIONAL INPUT BUBBLE SENSOR TO KEEP THE INPUT LINES FULL. FAILURE TO DO SO CAN CAUSE AN INTERRUPTION IN THE OUTPUT PROCESS FLUID.

11. From the Maintenance Menu, purge the system until all air is removed from the source and dispense lines.
12. Set "Operational parameters" and "Dispense Cycle" to match the desired process as described in Section 2.
13. Adjust suckback and do the final setup of the process parameters.

PUMP STATUS INDICATORS

STATUS	INDICATORS
NORMAL OPERATION	The Power LED flashes at 10 Hz (10 times/sec) and the Alarm LED is off.
ALARM/ERROR	The Power LED flashes at 10 Hz (10 times/sec) and the Alarm LED is on.
UNIT CALIBRATING	The Power LED flashes at 2.1 Hz (about 2 times/sec). The Alarm LED is normally off but may be on if the configuration and/or recipe data is corrupt (as is the case of adding a new processor).
MAINTENANCE MODE	The Power LED and Alarm LED normally flash ***alternately*** at 3 Hz (3 times/sec) but will flash ***together*** if there is an alarm/error condition.
PASSTHROUGH MODE (IDI SERVICE USE ONLY)	The power LED flashes at 5 Hz (5 times/sec). The Alarm LED will flash every second for 0.2 sec. **NOTE: While in the passthrough mode, the unit will not respond to ChemNet or Track Signals.**
CORRUPTED FIRMWARE (BAD FROM CHECKSUM)	The Power and Alarm LED's will flash together at about 2 Hz (2 times/sec). **NOTE: The unit will be non-functional in this mode.**
BAD OR MISSING PROCESSOR	The Power LED in on (steady) and the Alarm LED is off

IF YOU SHOULD EXPERIENCE ANY PROBLEMS CALL IDI FIELD SUPPORT AT: (888) 434-7372.

SECTION 2

INITIAL SETUP

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INITIAL CONNECTION TO THE HVP

Connect and turn on a PC to the HVP dispense unit. The PC will display the ChemNet screen below.

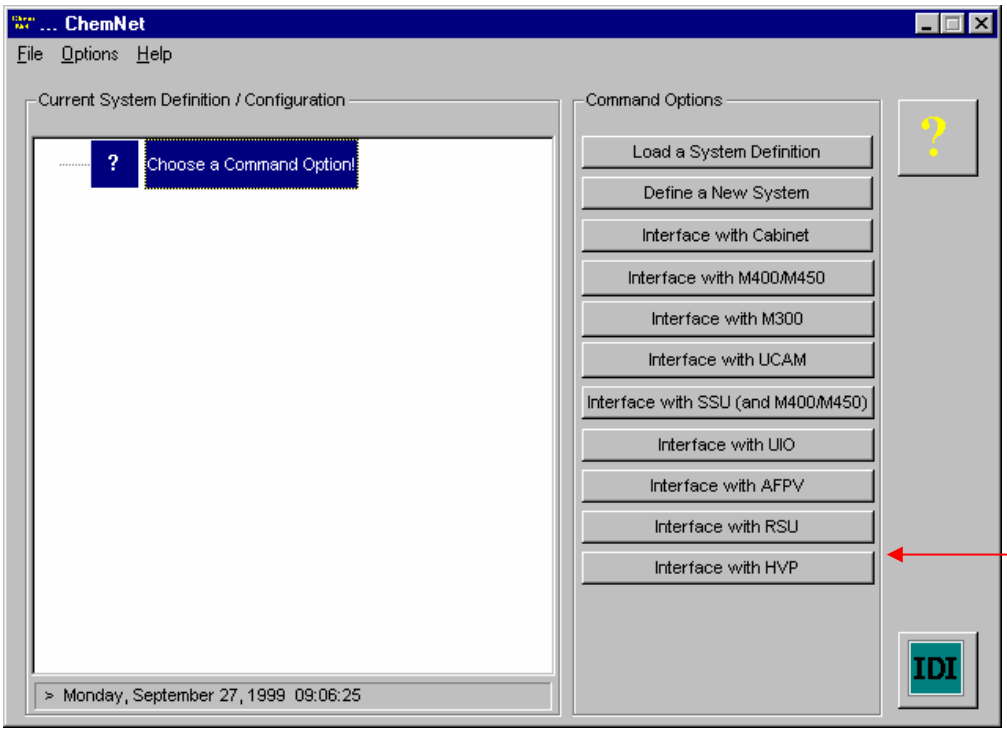

Figure 2-1, Initial Connection Screen

From the Command Options column, select the Interface with HVP button. The below screen will appear.

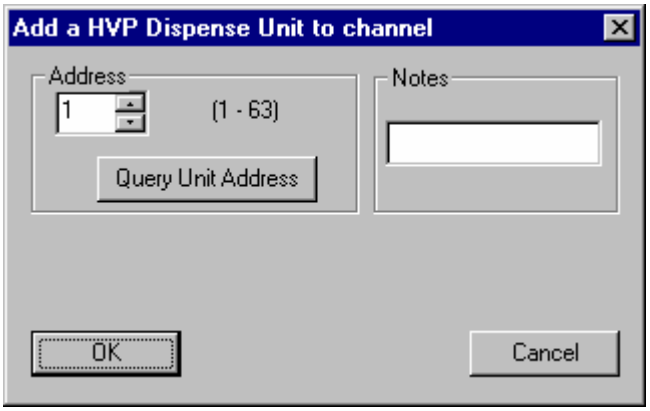

Figure 2-2, Add a HVP Dispense Unit to Channel Initial Screen

If this is the initial connect with a unit with an unknown address; click the Query Unit Address button to determine the unit's address. The user can change the address leave it as is. If there are, no changes click the OK button.

After selecting the OK on the Add a HVP Dispense Unit to channel screen. The next screen that will appear is the Option screen (see below)

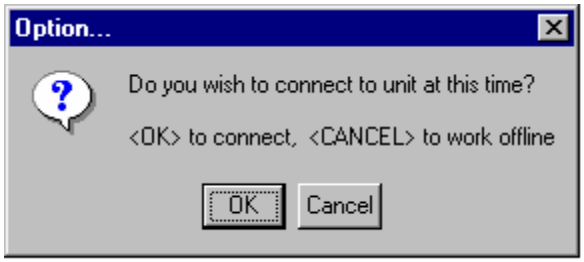

Figure 2-3, Option Screen

Select the OK button to continue.

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PARAMETERS SETUP

The View/Modify Parameters button when selected provides the functions necessary to configure the operational parameters of the HVP.

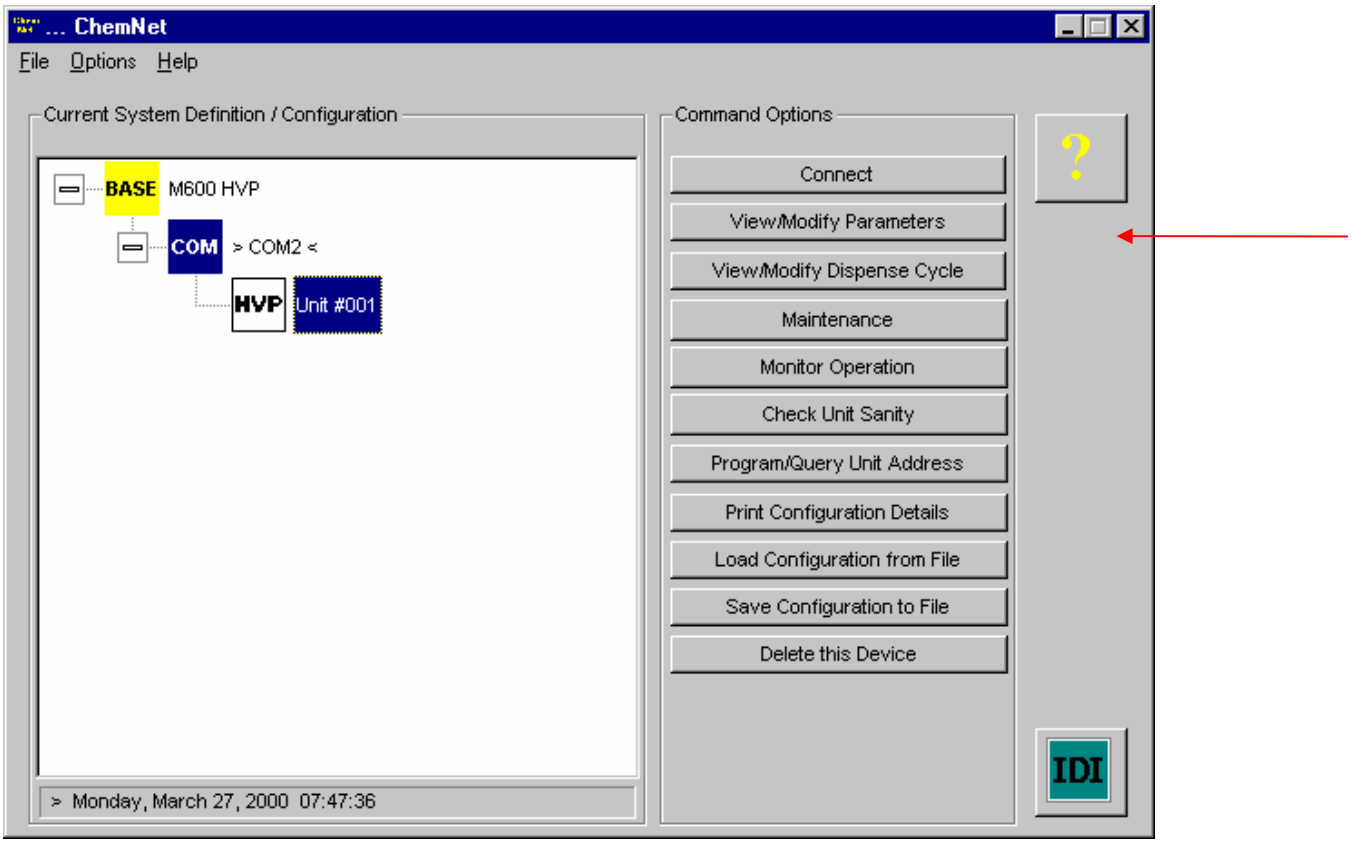


Figure 2-4, Command Options

Click the View/Modify Parameters option button to setup your parameters. The View/Modify parameters dialog box will have two different layouts depending on the HVP firmware version.

The below screen has the fields for operatonal parameters for HVP firmware versions before V2.00.

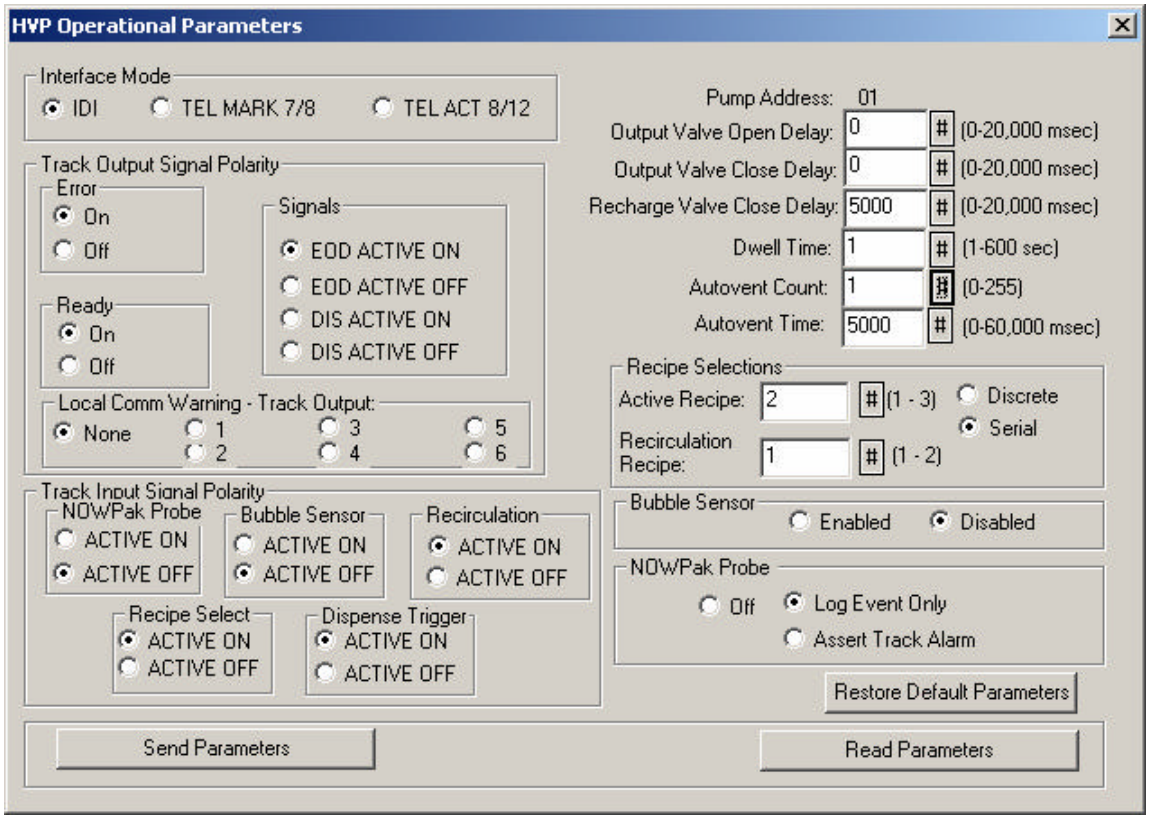


Figure 2-5a, HVP Operational Parameters for firmware before V2.00

The screens below show operation parameters layout for HVP firmware versions V2.00 and later.

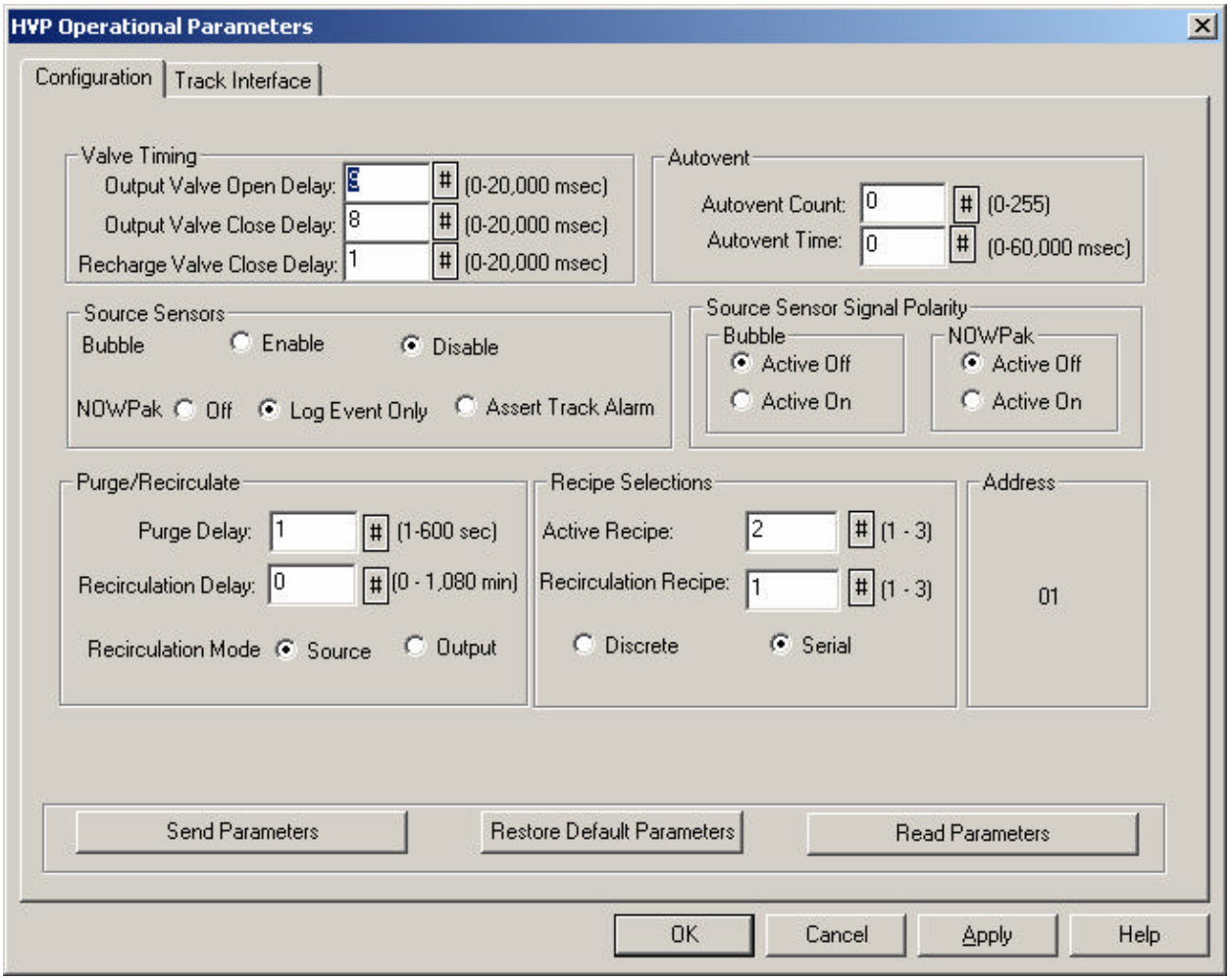


Figure 2-5b, HVP Operational Parameters for firmware V2.00 and later

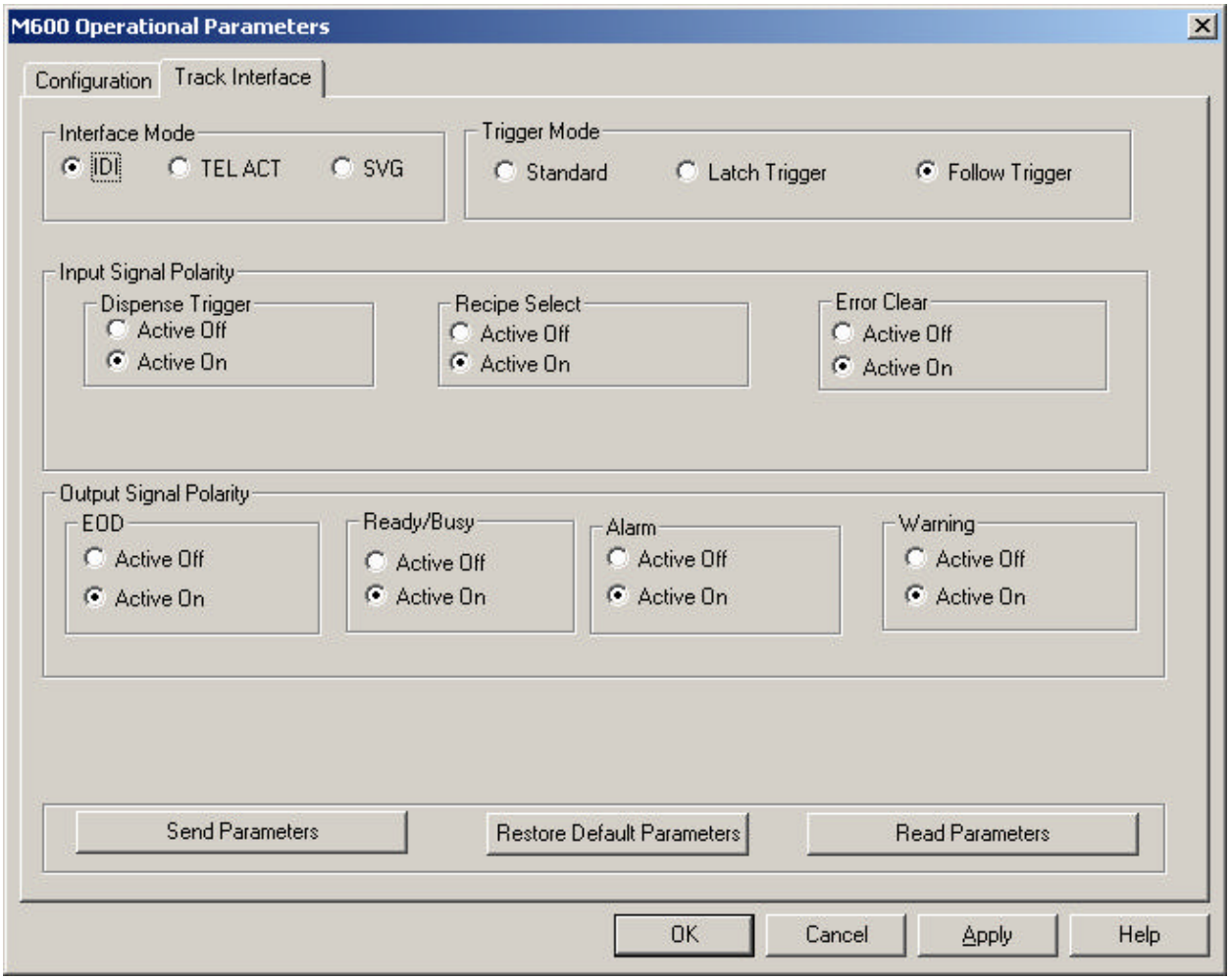


Figure 2-5c, HVP Track Interface for firmware V2.00 and later

INTERFACE MODES FOR PRE-V2.00 FIRMWARE

The interface mode determines the characteristics of the track interface used by the HVP. The IDI mode is the standard interface mode for all IDI dispense units. The **TEL MARK 7/8** and **TEL ACT 8/12** are interface modes used with each of these TEL track models.

The IDI Mode allows configuration of four output signals, three input signals and two sensor signals.

TRACK OUTPUT SIGNAL POLARITY

Error

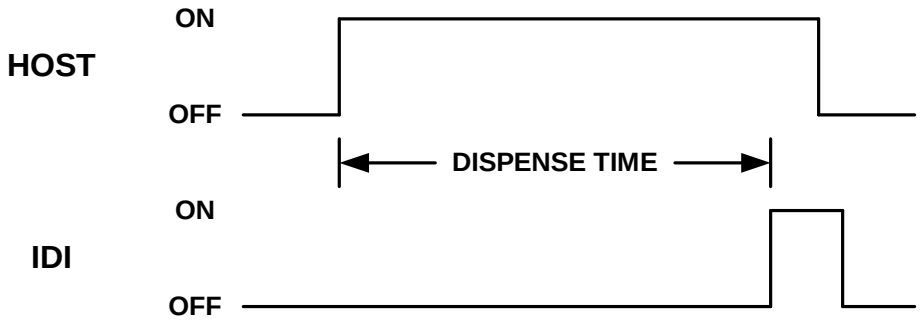
This signal is active when the HVP detects a problem with the dispensing unit operations.

Ready

This signal is active when the HVP is ready to dispense. It is non active when the HVP is dispensing, recharging, or in an error condition.

Signals

The end of dispense (EOD) operation is as follows:



The HVP has the EOD signal off.

The Host/Track system sends the trigger signal.

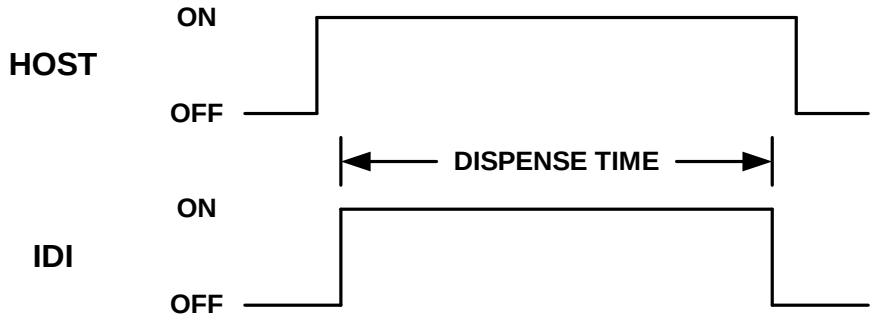
The HVP dispense valve opens for programmed time.

The HVP closes its output valve and turns on the EOD signal.

Host equipment removes trigger signal.

The HVP turns off its EOD signal in preparation for the next wafer.

The Dispense (DIS) operation is as follows:



The HVP has the DIS signal turned off.

The Host/Track system sends the trigger signal.

When the HVP receives the trigger signal, the DIS signal is activate.

The HVP dispense valve opens for the programmed time.

The HVP closes its output valve and turns off the DIS signal.

Host system removes the trigger signal.

LOCAL COMMS WARNING TRACK OUTPUT

Allows the user to choose which of the track outputs will be active when a local RS-232 connection is made at the HVP. An example is when a laptop is used to change setup or recipe parameters.

TRACK INPUT SIGNAL POLARITY

NOWPak Probe

The NOWPak Probe is used in conjunction with NOW Technologies Smart Probes. When a Smart Probe is installed, the corresponding probe parameter must be enabled for the HVP to respond to the sensor.

Bubble Sensor

The bubble sensor is used for detecting air bubbles in the source line. The sensor circuit is normally closed until the line becomes empty, them the bubble sensor circuit will open

Recirculation

When the recirculation input is active, the HVP will continually dispense, suckback and recharge using the recipe parameters set in the recirculation Recipe configuration setting. During this time the HVP will indicate that it is using the track busy signals (normal dispenses **cannot** occur).

NOTE: That The Unit Will Not Become Ready As Soon As This Signal Is Non-Active Since It Has To Complete The Last Cycle.

This mode is implemented with a hardware input (versus software configuration) to provide the user with the maximum flexibility. For instance, the process equipment could initiate this mode if desired. As an alternatively use an external switch (and/or timer). As an option to the recirculation input signal IDI offers an independence on and off switch

Recipe Select

When the Recipe Select is non-active, the HVP will use Recipe 1 parameters, and when active, it will use Recipe 2.

NOTE: That If The Active Recipe Configuration Is Set To Serial (Versus Discrete) This Input Will Be Ignored And The Specified Recipe Will Always Be Used.

Dispense Trigger

The HVP will dispense when the Dispense Trigger is active. If the input is non-active before the dispense is complete the operation will immediately terminate and will be error logged.
In all cases, **ACTIVE OFF** selection defines the input or output enabled state as a state in which no current flows. The **ACTIVE ON** selection defines the input or output enabled state as a state in which current is flowing.

INTERFACE MODES FOR V2.00 AND LATER

The interface mode determines the characteristics of the track interface used by the HVP. The IDI mode is the standard interface mode for all IDI dispense units. The **TEL ACT 8/12** mode and the **SVG** mode are available for use with each of these track models.

The IDI Mode allows configuration of four output signals, three input signals and two sensor signals.

TRACK OUTPUT SIGNAL POLARITY

Error

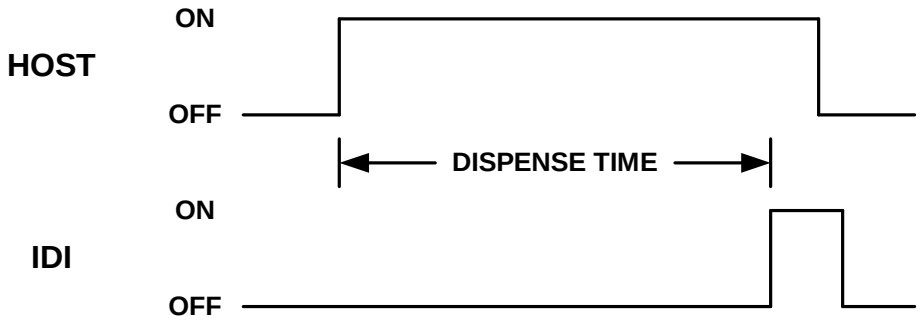
This signal is active when the HVP detects a problem with the dispensing unit operations.

Ready

This signal is active when the HVP is ready to dispense. It is non active when the HVP is dispensing, recharging, or in an error condition.

Signals

The end of dispense (EOD) operation is as follows:



The HVP has the EOD signal off.

The Host/Track system sends the trigger signal.

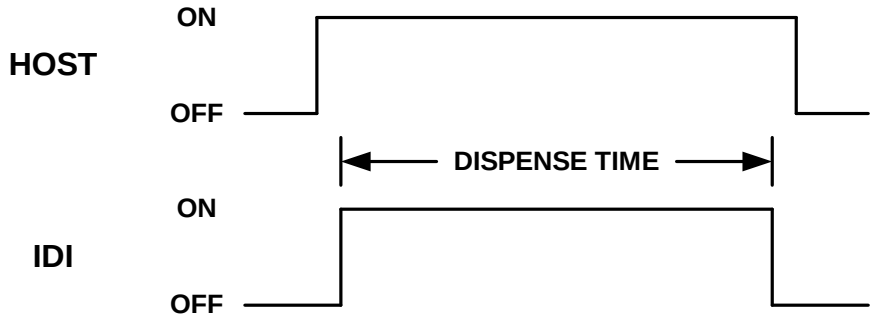
The HVP dispense valve opens for programmed time.

The HVP closes its output valve and turns on the EOD signal.

Host equipment removes trigger signal.

The HVP turns off its EOD signal in preparation for the next wafer.

The Dispense (DIS) operation is as follows:



The HVP has the DIS signal turned off.
The Host/Track system sends the trigger signal.
When the HVP receives the trigger signal, the DIS signal is activate.
The HVP dispense valve opens for the programmed time.
The HVP closes its output valve and turns off the DIS signal.
Host system removes the trigger signal.

TRIGGER MODE

This parameter allows the HVP to be operated in one of three trigger modes defined in the table below.

Mode	Action when trigger removed
Standard	Dispense aborts with error & event logged
Latch Trigger	Ignored (dispense completes as per recipe)
Follow Trigger	Dispense aborts, no error or event logged

TRACK INPUT SIGNAL POLARITY

Recipe Select

When the Recipe Select is non-active, the HVP will use Recipe 1 parameters, and when active, it will use Recipe 2.

NOTE: That If The Active Recipe Configuration Is Set To Serial (Versus Discrete) This Input Will Be Ignored And The Specified Recipe Will Always Be Used.

Dispense Trigger

The HVP will dispense when the Dispense Trigger is active. If the input is non-active before the dispense is complete the operation will immediately terminate and will be error logged.
In all cases, **ACTIVE OFF** selection defines the input or output enabled state as a state in which no current flows. The **ACTIVE ON** selection defines the input or output enabled state as a state in which current is flowing.

Error Clear

If the HVP is in an error state, asserting this input will clear the HVP error allow it to restart. In all cases, **ACTIVE OFF** selection defines the input or output enabled state as a state in which no current flows. The **ACTIVE ON** selection defines the input or output enabled state as a state in which current is flowing.

SEND PARAMETERS

The Send Parameters button uploads parameter data to the HVP.

NOTE: Newly downloaded (read) data will not be automatically saved to a disk configuration file.

Output Valve Open Delay (0-20,000 msec)

The Output Valve Open Delay is used to build pressure in the chamber and sets the time delay before the output valve opens at the beginning of the dispense cycle.
Entering a time delay the pump will wait that specified amount of time before opening the output valve. When a time delay of zero is entered the output valve will open immediately after the pump motor starts moving (**this is the default value and is recommended for most applications**). Change the output valve from zero only under extreme conditions (Call IDI Field Service 1-888-434-7372) before changing the value.

NOTE: Adjusting The Value From Zero Will Effect Normal Operation.

Output Valve Close Delay (0-20,000 msec)

This feature allows the pressure in the pump chamber to equalize directly after a dispense and/or suckback. The value entered sets the time delay before the output valve closes at the end of the dispense cycle. If suckback is used then the delay will occur after the suckback.

Recharge Valve Close Delay (0-20,000 msec)

This value when entered set the time delay before the output valve closes at the end of the recharge cycle. To prevent thick chemical being drawn back into the dispense tube and the pump chamber leave the recharge valve open at the end of the recharge operation, this will allow flow into the chamber until the pump chamber pressure equalizes. A setting of 5000ms is a recommended pressure to equalize the pump chamber before the dispense valve is opened. It is not necessary to use this delay with low viscosity chemicals.

Dwell Time (1-600 sec) (Firmware before V2.00)

Purge Delay (1-600 sec) (Firmware V2.00 and after)

Dwell time or Purge Delay is the time between fill and drain as well as the time between dispenses.

Recirculation Delay (1-600 sec) (Firmware V2.00 and after)

Recirculaton Delay is the time between recirculation cycles.

Autovent Count (0-255)

The Autovent feature will automatically vent trapped gas from the top of the filter canister. The value determines how frequently the autovent operation will occur. A recommend value of 1will cause the filter autovent to occur after every dispense.

NOTE: Allowing Gas To Accumulate Will Cause Accuracy Errors To Occur In The Dispense

Autovent Time (0-60,000 msec)

The Autovent time determines the duration of the autovent operation. This value controls the amount of time that the filter vent valve is open during the filter autovent operations. Thicker chemicals require longer times. A value of 5000 ms is recommended as a starting point

RECIPE SELECTION

Active Recipe (1-3)

Enter the recipe that will be use by the HVP. Selecting the *Discrete* radio button the HVP will use the inputs from the track. Selecting the *Seria*l radio button the HVP will use the recipe selection the Active Recipe box that was enter.

Recirculation Recipe

When the recirculation input is active, the HVP will continually dispense, suckback and recharge using the recipe parameters set in the Recirculation Recipe configuration setting. During this time the HVP will indicate that it is using the track busy signals (normal dispense **cannot** occur).

NOTE: The Unit <u>Will Not</u> Become Ready As Soon As This Signal Is Non-Active It Has To Complete The Last Cycle.

BUBBLE SENSOR

This feature allows software disablement of the bubble sensor during any special operations. Remember to Enabled the bubble sensor before continuing normal operations. **It is not recommended** to leave the bubble sensor disabled during normal operations.

NOWPAK PROBE

The selections for the NOWPak Probe are Off/Log Event Only/Assert Track Alarm.

RESTORE DEFAULT PARAMETERS

This button when selected restores the defaults Parameters in the HVP firmware.
DEFAULTS PARAMETERS

Output Valve Open Delay	0
Output valve Close Delay	0
Recharge Valve Close Delay	0
Dwell Time	1

READ PARAMETERS

The read parameters allows the user to upload from the HVP for review.

QUICK PRIME/PURGE

For a quick prime/purge, you must select the maintenance button on the initial connection screen after **setting up** operational parameters. The system **must be purged of air and be primed with chemical.** Selecting the Maintenance button will display the HVP Maintenance screen shown below.

There are six tabs in the maintenance dialogue sheet as illustrated. Purge Drain, Event Log, Filter, Repair and Service. Select the purge tab for the quick prime/purge.

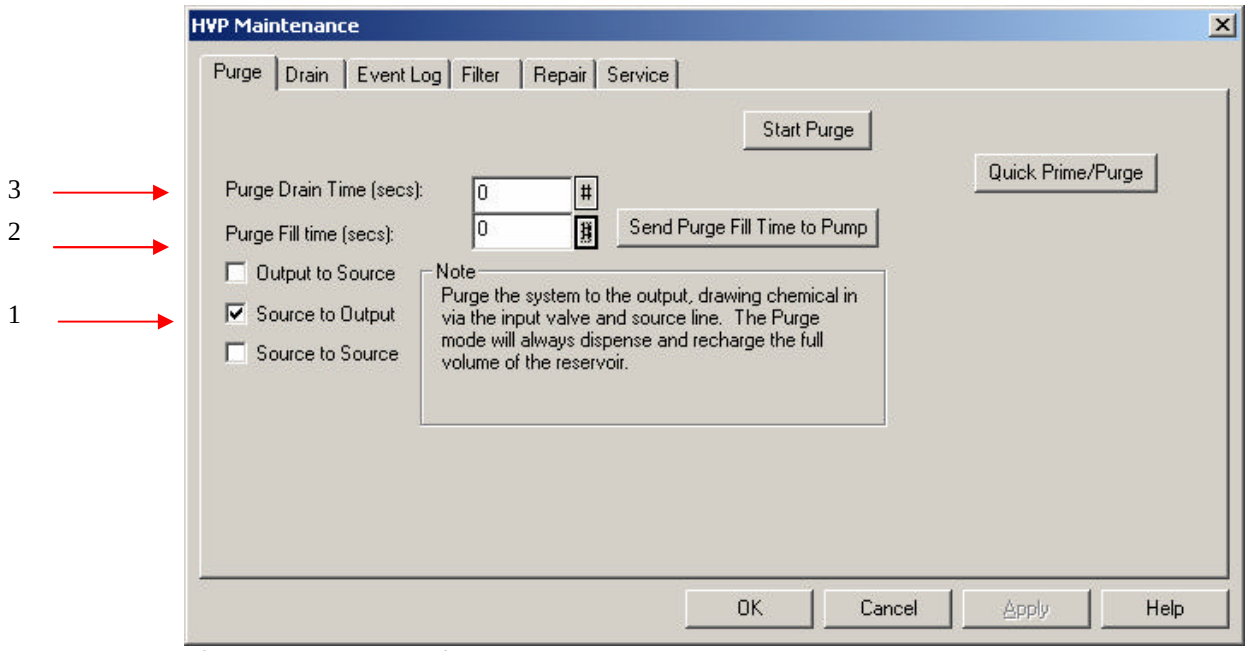


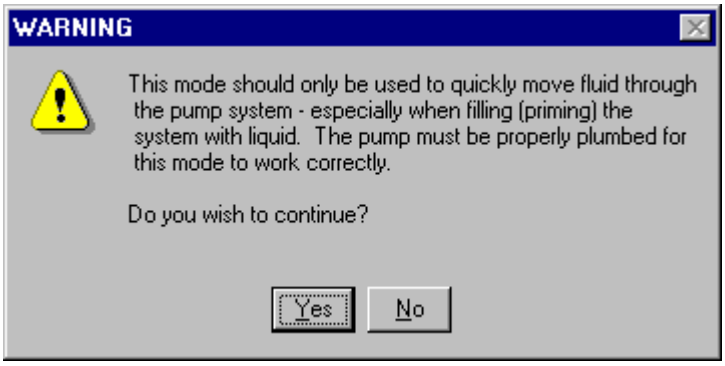
Figure 2-6, HVP Maintenance

To activate the Quick Prime/Purge select:

1. Source to Output Option
2. Set the Purge Fill time to zero.
3. Set the Purge Drain Time to zero.

When these options and values are selected and entered into the software system this will activate the auto rate mode. The auto rate mode will **AUTOMATICALLY** determine the fastest rate the fluid will move in the HVP system, regardless of fluid viscosity or system setup (plumbing).

When you select and click on the Quick Prime/Purge button you get the following warning.



If the pump is properly plumbed then select the Yes button, If the pump is not properly plumbed then select No and plumb the pump.
To start the auto rate program select and click on the Quick Prime/Purge button. When Quick Prime/Purge is finished select and click on Start Purge. Read the Warning before continuing. When the system starts to purge the below screen will appear.

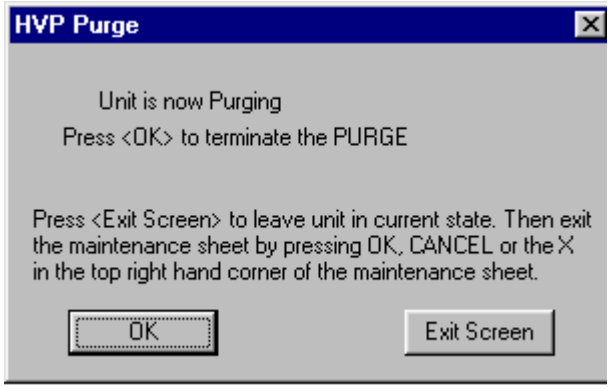


Figure 2-7, HVP Purge

You may exit from this screen and return to the HVP maintenance screen, or return to the main screen to select another option. IDI recommends that you remain at the maintenance screen until the system has completed the purge.
The system is purged when there are no air bubbles in the lines and there is a constant flow of chemical observed in the output and input lines.
Selecting OK will cancel the purge.
Once the system is purged, exit back to the main screen to continue your setup.

DISPENSE CYCLE

The **View/Modify Dispense Cycle** option button provides access to the functions necessary to configure the dispense cycle parameters of the HVP. The specific dispense cycle or 'recipe' determines how the chemical is to be dispensed by specifying values for chemical dispense volume and time.

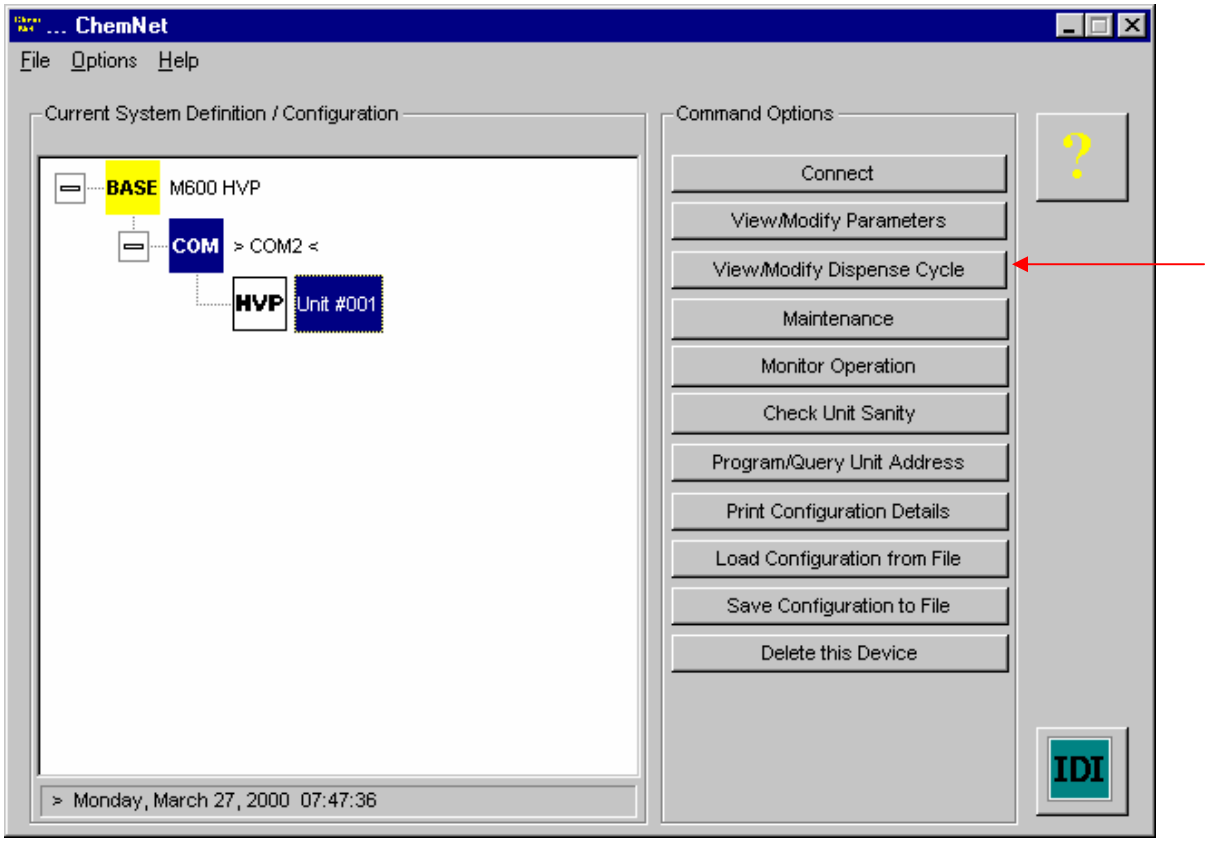


Figure 2-8, ChemNet Command Options

Click the **View/Modify Dispense Cycle** option button to open the **HVP Dispense Cycle Parameters** screen, which contains a separate property settings tab for each of the two dispense cycle recipes.

The HVP Dispense Cycle Parameters screen below contains a separate property setting tab for each dispense cycle recipes.

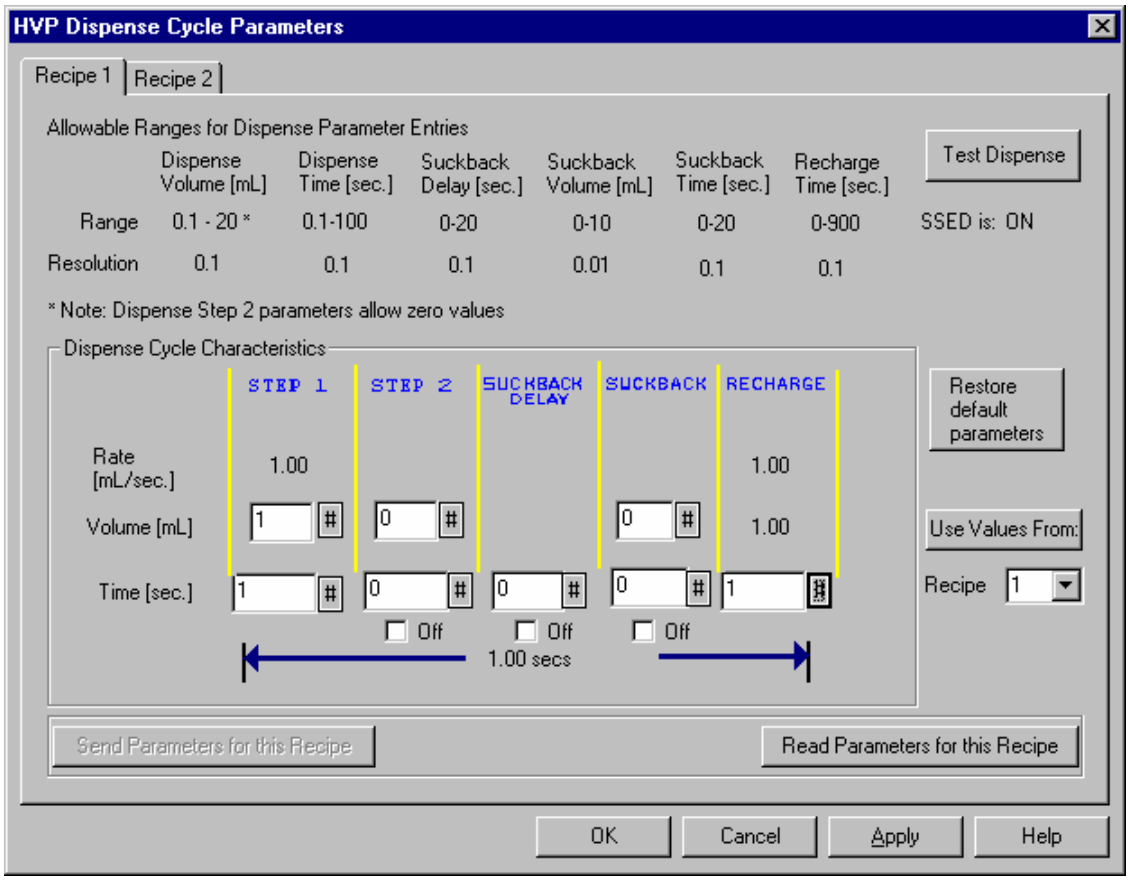


Figure 2-9, HVP Dispense Cycle Parameters

The dispense cycle for an HVP is comprised of the following:

- Step 1 and Step 2.
- Suckback delay.
- Suckback.
- Recharge.

The dispense and Suckback steps can be programmed to dispense a user settable volume within a certain duration of time. By adjusting the dispense volume and/or the dispense time the user **can vary the flow rate** of chemical during dispense and Suckback. The first two steps of the dispense cycle allow the HVP to provide a 'variable rate' dispense.

DISPENSE & SUCKBACK VOLUMES

The dispense cycle has user settable volume values for the dispense and Suckback **steps (top row of entry boxes).** For the dispense portion of the cycle two different volumes may be specified. **It is not** necessary to fill-in both of the volume entry boxes, one of the boxes may be left blank. For the Suckback portion of the cycle, the user may specify one volume. It is not necessary to enter a value into this box. **There are a total of three volume values that can be entered while only one is required**. The volume values may range from 0.1 ml to 20.0 ml with a resolution of 0.1 ml.

DISPENSE & SUCKBACK TIMES

The dispense cycle has user settable time values for the dispense and Suckback steps (**bottom row of entry boxes).** The time values control how long the HVP takes to dispense or Suckback the specified volume of chemical. Variation of this value gives the user **control over the flow rate** of chemical during dispense or Suckback (smaller time values will yield a faster flow rate for any given volume setting). Specify the time from 0.0 to 10.0 seconds with a resolution of 0.1 seconds. The total dispense duration is indicated below the entry boxes graphic for the dispense process.

The HVP will respond to a trigger from the process equipment and dispense a pre-programmed amount. The HVP dispense volume and time, suckback delay time, and suckback volume and time **can be set.**

NOTE: IDI recommends that the track dispense time should be set at .1 to .2 seconds above the total time of the dispense depicted in the bottom graph on the Dispense Cycle Parameters Page. Failure to do so can affect dispenses volume repeatability.

RECHARGE

The HVP is setup to dispense once and then refill the reservoir.
The reservoir recharges after every dispense. The fill time is set through the software. Set the dispense time to the viscosity of the chemical in use. Higher viscosity chemicals will require longer fill times.

TEST DISPENSE

The dispense cycle can be manipulated and tested from this property page. In order to test a particular set of dispense cycle parameters, enter the desired settings as described above and click the **Test Dispense** button. The application will upload the dispense parameters for the selected program and will instruct the HVP to dispense.
The HVP will dispense using the parameters stored in the unit for the currently selected program as determined by the hardware select lines of the unit. If the unit's hardware select lines are configured to run program 3 for example, issuing the test dispense request from the property page for program 1 will upload the parameters for program 1 and request a dispense as expected. However, the unit will dispense based on the parameters it currently has stored for program 3.

Values

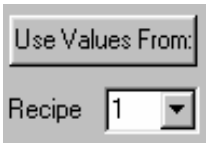
Typical dispense cycle parameter settings are provided to serve as a basis for creating and customizing a recipe for the dispense process. Consider these values only as a starting point – the actual setting of a recipe requires the knowledge of a trained technician. Example of Variable Rate Dispense Settings:

Step:	1	2	3	4	5
Volume:	1	2		0.5	2.5
Time:	10	10	0.5	5	0

NOTE: With Zero Entered In The Recharge Time, The Auto Rate Recharge Will Be Activated

Copying Parameters

The complete set of dispense cycle parameters for a particular program can be copied from the settings of another program as follows:
Select the recipe from which to copy the parameter settings using the program combo-box shown below. Click the Use Values From button to copy the settings to the current program.



Sending and Reading Data from Unit

The *Send Parameters for this Recipe* and *Read Parameters for this Recipe* buttons upload and download parameter data to the HVP respectively. The operations are performed only for the recipe associated with the property page. Select each program individually and repeat the desired Send or Read function to ensure all programs are covered.
Sending parameters to the HVP has the same effect as clicking the *Send Parameters* button of the Operational Parameters property sheet in that the operation will also apply any changes that were made to the parameters.

NOTE: Newly downloaded (read) data will not be automatically saved to a disk configuration file.

TEL MAR 7/8 AND TEL ACT 8/12

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TEL MARK 7/8 MODE

The TEL Mark 7/8 mode allows configuration of four output signals, three input signals, and two sensor signals as explained below.

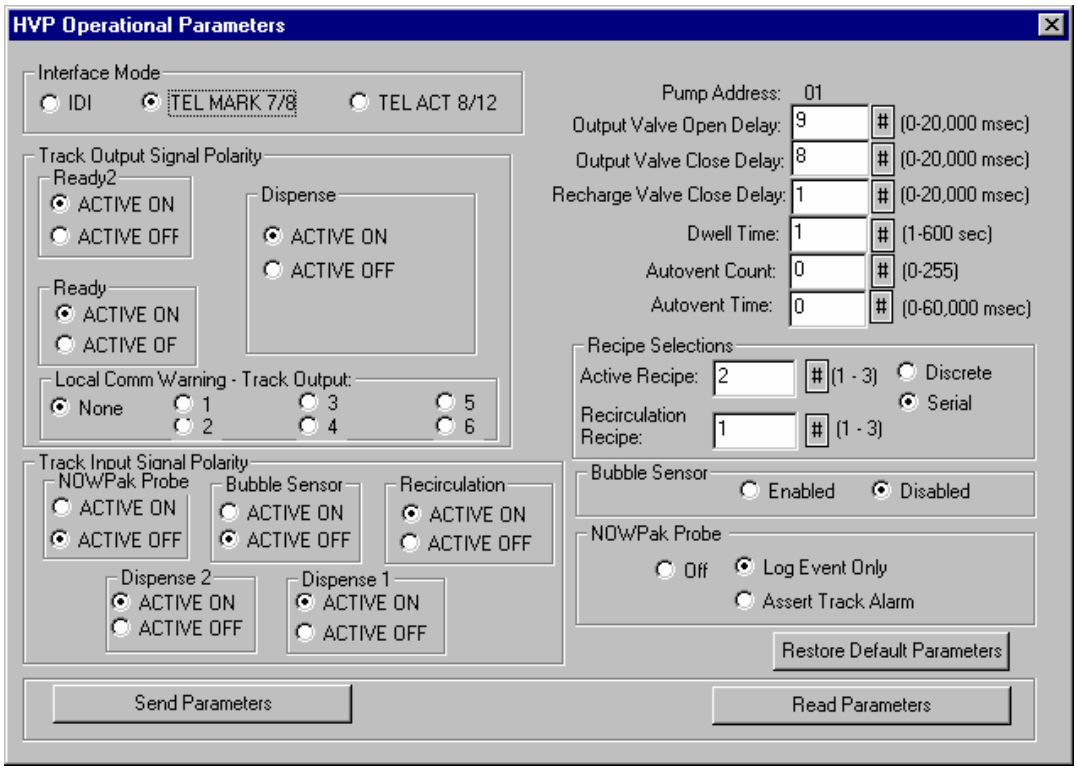

Figure 2-10, HVP Operational Parameters TEL MARK 7/8

OUTPUT SIGNALS

Ready2 - The Ready2 signal is active when the HVP is ready to dispense. It is non-active when the unit is dispensing, recharging, or in an error mode. The default setting is ACTIVE OFF.

Ready - The Ready signal is active when the HVP is ready to dispense. It is non-active when the unit is dispensing or in an error mode. The default setting is ACTIVE OFF.

Dispense - The Dispense signal is active when the HVP is dispensing. The default setting is ACTIVE ON.

Local Comms Warning Track Output - Allows the user to choose which of the track outputs will be active when a local RS-232 connection is made at the HVP. An example, is when a laptop is used to change setup or recipe parameters.

INPUT SIGNALS

Enable Recharge - When Enable Recharge is active, the HVP will recharge the reservoir if it is empty. This is an optional signal for the Mark 7/8 track and is normally not used.

Dispense 1, Dispense 2.

The Dispense 1 and Dispense 2 signals are used as a recipe select and dispense trigger. The operation is as follows.

Table 2-1, Dispense Trigger Setting For Tel Mark 7/8

DISPENSE 2	DISPENSE 1	OPERATION
OFF	OFF	IDLE
OFF	ON	DISPENSE RECIPE 1
ON	OFF	DISPENSE RECIPE 2
ON	ON	DISPENSE RECIPE 3

The default setting for the Dispense 1 and 2 signals should ACTIVE ON.

NOWPak Probe, Line Sensor.

If a NOWPak probe or optical line sensor is used with the HVP, the user can select the signal polarity for each sensor.

SEE SECTION 1 FOR QUICK PRIME/PURGE

TEL ACT 8/12 MODE

The TEL Act 8/12 mode allows configuration of three output signals, three input signals, and two sensor signals as explained below.

FIRMWARE BEFORE V2.00

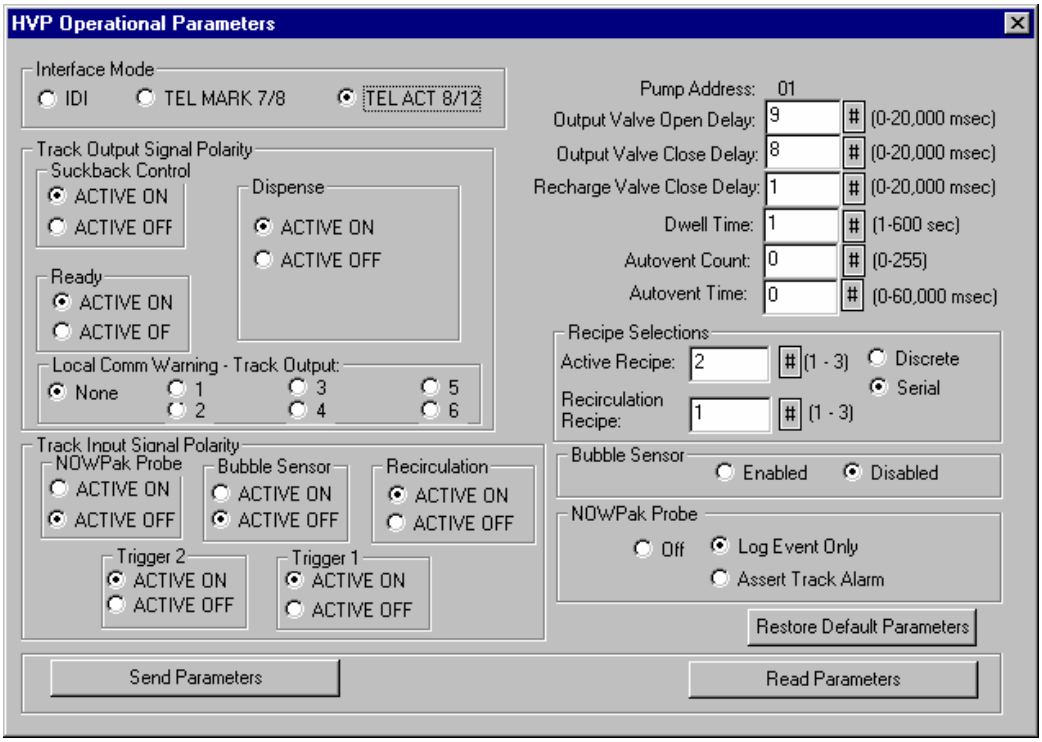

Figure 2-11a, HVP Operational Parameters – TEL ACAT 8/12 (Firmware before V2.00)

OUTPUT SIGNALS

Suckback - The Suckback signal is active when the HVP is ready and is non-active when the HVP is dispensing and in the suckback mode. The default setting is **ACTIVE ON**.

Ready - The Ready signal is non-active when the HVP is ready to dispense. It is active when the unit is dispensing, recharging, or in an error mode. The default setting is **ACTIVE OFF**.

Dispense - The Dispense signal is active when the HVP is ready to dispense and is non-active when the HVP is dispensing. The default setting is **ACTIVE ON**.

SEE SECTION 1 FOR QUICK PRIME/PURGE

INPUT SIGNALS

NOWPak Probe, Line Sensor - If a NOWPak? probe or optical line sensor is used with the HVP, the user can select the signal polarity for each sensor.
Enable Recharge - When Enable Recharge is active, the HVP will recharge the reservoir if it is empty. This is an optional signal for the Mark 7/8 track and is normally not used.
Trigger 1, Trigger 2 - The Dispense 1 and Dispense 2 signals are used as both a recipe select and dispense trigger. The operation is as follows.

Table 2-2, Dispense Trigger Setting For Tel Act 8/12

TRIGGER 2	TRIGGER 1	OPERATION
OFF	OFF	IDLE
OFF	ON	DISPENSE RECIPE 1
ON	OFF	DISPENSE RECIPE 2
ON	ON	DISPENSE RECIPE 3

The default setting for the Trigger 1 and 2 signals should be ACTIVE ON.

PARAMETERS

Pump Address

This is a read-only indication of the bus address of the HVP dispense unit.

Number of Dispenses before Recharge

This value should always be one.

Output Valve Open Delay, Output Valve Close Delay

These two parameters allow the HVP output valve operation to be modified during the dispense cycle.

Input Valve Close Delay

This parameter allows the HVP input valve operations to be modified at the end of a recharge.

Recharge Time

This parameter changes the speed at which the HVP will recharge the reservoir.

Active Recipe

This parameter allows the user to determine how the HVP will accept recipe selection information. If DISCRETE is selected then the inputs from the track used, if SERIAL is selected then the recipe selection in the box to the left and will ignore any track recipe select inputs. The HVP will retain the serial recipe selection in non-volatile memory.

Line Sensor

If a line sensor is installed for detecting voids in the source line, this parameter should be enabled and the input polarity should be selected.

NOWPak Probe

The **NOWPak Probe** is used in conjunction with NOW Technologies Smart Probes. When a **Smart Probe** is installed, the corresponding probe parameter must be enabled for the HVP to respond to the sensor. The user may select between asserting an error to the track or only logging the event in the HVP event buffer when the Smart Probe? signal is active.

FIRMWARE V2.00 AND LATER

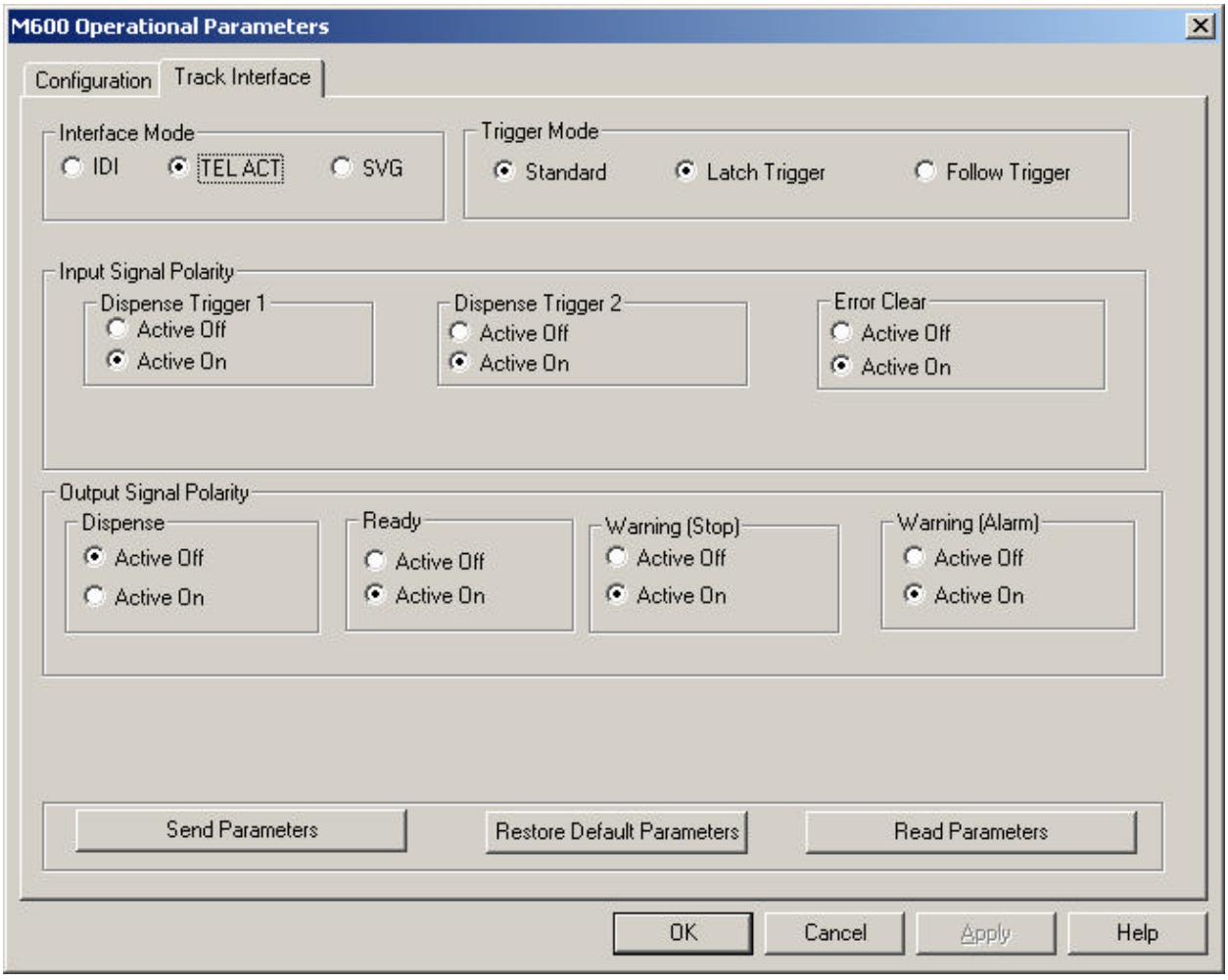

Figure 2-11b, HVP Operational Parameters – TEL ACAT 8/12 (V2.00 and later)

OUTPUT SIGNALS

Dispense - The Dispense signal is active when the HVP is ready to dispense and is non-active when the HVP is dispensing. The default setting is **ACTIVE OFF**.
Ready - The Ready signal is non-active when the HVP is ready to dispense. It is active when the unit is dispensing, recharging, or in an error mode. The default setting is **ACTIVE ON**.
Warning (Stop) – This Warning signal is active when the HVP is in an alarm state that has stopped the pump from operating. The default setting is **ACTIVE ON**.
Warning (Alarm) – This Warning signal is active when the HVP is in an alarm state that has not stopped the pump from operating. The default setting is **ACTIVE ON**.

SEE SECTION 1 FOR QUICK PRIME/PURGE

INPUT SIGNALS

Trigger 1, Trigger 2 - The Dispense 1 and Dispense 2 signals are used as both a recipe select and dispense trigger. The operation is as follows.

Table 2-2, Dispense Trigger Setting For Tel Act 8/12

TRIGGER 2	TRIGGER 1	OPERATION
OFF	OFF	IDLE
OFF	ON	DISPENSE RECIPE 1
ON	OFF	DISPENSE RECIPE 2
ON	ON	DISPENSE RECIPE 3

The default setting for the Trigger 1 and 2 signals should be ACTIVE ON.

Error Clear - When the HVP is in an alarm state, asserting this input will clear the error and allow the HVP to restart. The default setting is **ACTIVE ON**.

TRIGGER MODE

This parameter allows the HVP to be operated in one of three trigger modes defined in the table below.

Mode	Action when trigger removed
Standard	Dispense aborts with error & event logged
Latch Trigger	Ignored (dispense completes as per recipe)
Follow Trigger	Dispense aborts, no error or event logged

SVG (ASML) TRACK INTERFACE

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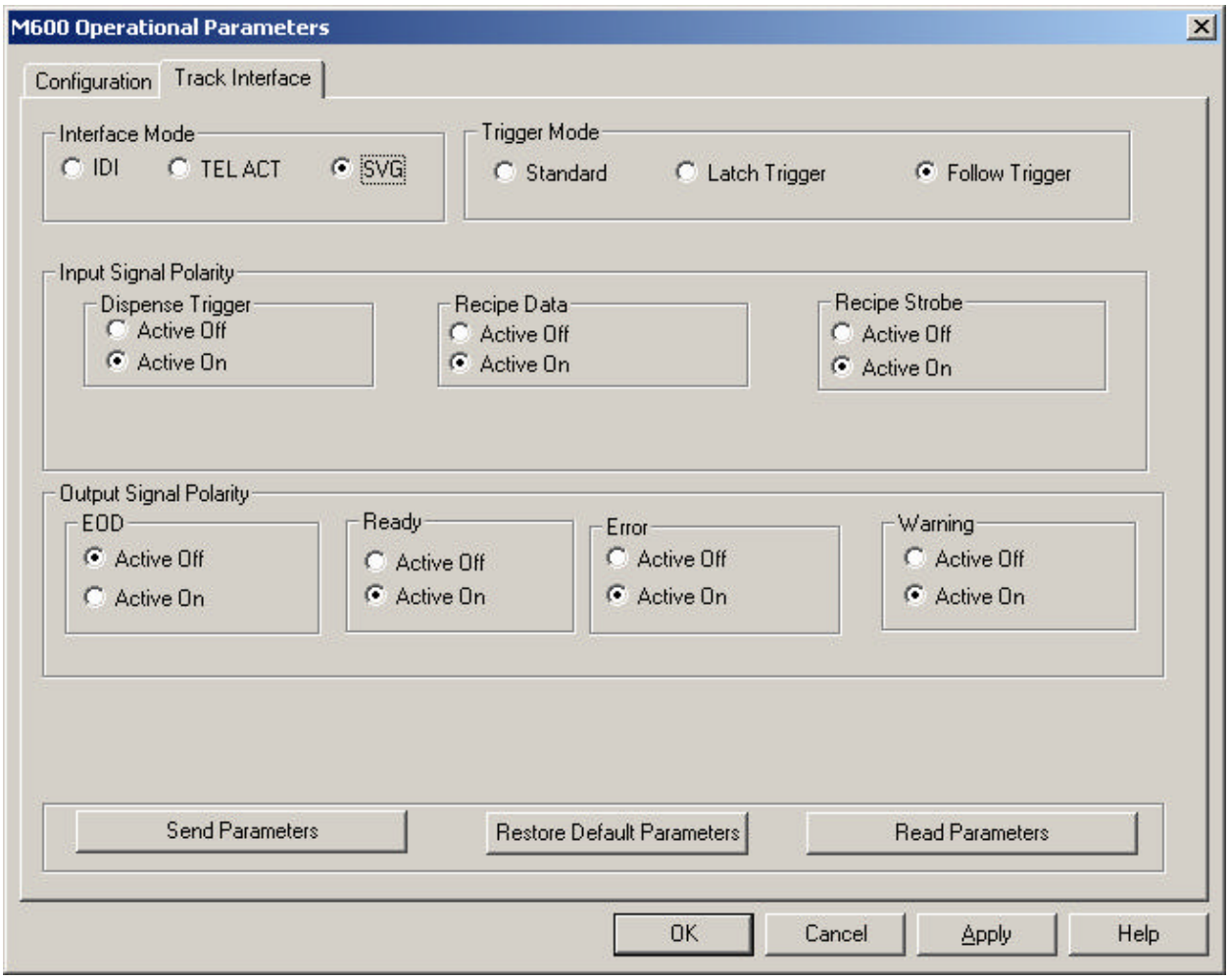
SVG (ASML) MODE

The screen below shows the layout for the SVG track mode parameters. This mode is only available in firmware versions 2.00 and later.



OUTPUT SIGNALS

EOD - The EOD signal is active when the HVP is completes the dispense. The EOD will deassert once the trigger deasserts. The default setting is **ACTIVE OFF**.

Ready - The Ready signal is non-active when the HVP is ready to dispense. It is active when the unit is dispensing, recharging, or in an error mode. The default setting is **ACTIVE ON**.

Error – The Error signal is active when the HVP is in an alarm state that has stopped the pump from operating. The default setting is **ACTIVE ON**.
Warning – The Warning signal is active when the HVP is in an alarm state that has not stopped the pump from operating. The default setting is **ACTIVE ON**.

SEE SECTION 1 FOR QUICK PRIME/PURGE

INPUT SIGNALS

Dispense Trigger - The Dispense Trigger signal starts the HVP dispense. The default setting is **ACTIVE ON**.
Recipe Data – The Recipe Data allows the track to select either Recipe 1 or 2. The default setting is **ACTIVE ON**.
Recipe Strobe – The Recipe Strobe signals the HVP that the recipe data is ready to be read by the pump. The default setting is **ACTIVE ON**.

TRIGGER MODE

This parameter allows the HVP to be operated in one of three trigger modes defined in the table below.

Mode	Action when trigger removed
Standard	Dispense aborts with error & event logged
Latch Trigger	Ignored (dispense completes as per recipe)
Follow Trigger	Dispense aborts, no error or event logged

SECTION 3

MAINTENANCE

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MAINTENANCE

There are five tabs in the maintenance dialogue sheet as illustrated. Purge, Drain, Event Log, Service and Repair.

PURGE

Purge mode is used to purge air from the system after the physical setup of the pump has been changed or after an extended idle time. Chemical can be dispensed to the source or the output in the purge mode.

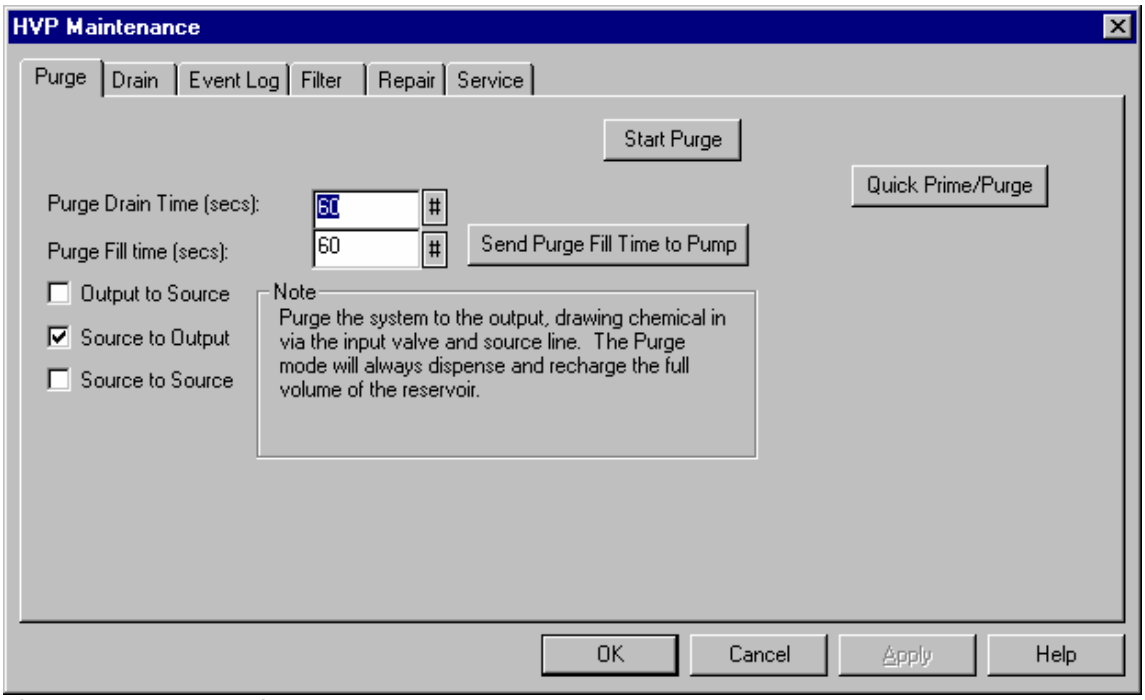


Figure 3-1, HVP Maintenance Purge

Purge Drain Time

This is the total time that it will take to empty the chamber. By adjusting the purge time the user can adjust the flow rate during the purge operation (smaller times will yield a faster flow rate for any given volume).

Purge Fill Time

This is the total time its takes to fill the chamber. By adjusting the purge fill time the user can adjust the flow rate during the recharge operation (smaller times will yield a faster flow rate for any given volume).

CAUTION: ***Care must be taken to adjust Purge Fill Time so that the fill rate Is not too fast. Filling the HVP too quickly can cause severe damage to internal components.***

Output To Source

Selecting this box allows the HVP to dispense to source during the purge operation.

Source To Output

Select this box to allow the HVP to dispense to the output during the purge operation.

Source To Source

Selecting this box allows the HVP to purge the system back to the source. The purge in this mode will always dispense and recharge the full volume of the reservoir.

Start Purge

Clicking the Start Purge button starts the purge operation.

MAINTENANCE DRAIN

The Drain mode is similar to the purge mode and is used to clear the chemical from the dispense unit. In this mode, the chemical drains through the selected path, either the output or input valves until the operator ends the drain operation. A re-fill of the unit does not occur in the drain mode.

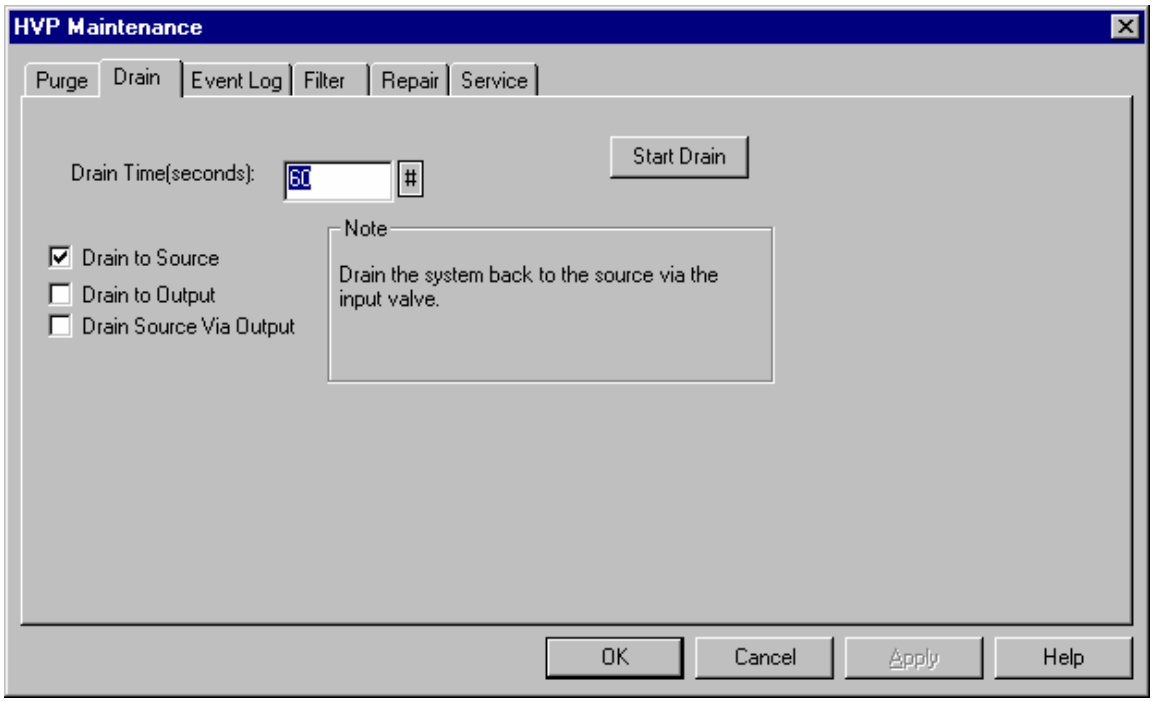


Figure 3-2, HVP Maintenance Drain

Drain Time

This is the total time that it will take to empty the pump. By adjusting the Drain time the user can adjust the flow rate during the drain operation (smaller times will yield a faster flow rate for any given volume).

Drain To Source

Selecting this box allows the HVP to dispense to source during the drain operation.

Drain To Output

Selecting this box allows the HVP to dispense to the output during the drain operation.

Drain To Source Via Output

Selecting this box allows the HVP to drain the system back to the source through the output and recirculation valve. (3-way valve)

Start Drain

Clicking the Start Drain button starts the drain operation.
You **cannot** select the Drain to Source, or the Drain to Output, during the drain operation.

CAUTION: ***Draining Chemical Back To The Source May Pressurize And/Or Overfill The Source Container. Do Not Leave The Unit Unattended When Draining Chemical.***

NOTE: Canceling The Drain Operation Does Not Remove The Unit From Maintenance Mode.

EVENT LOG

The Event Log page gives access to all event information generated by the HVP. The log is non-volatile, that is information is retained when the HVP is not powered.

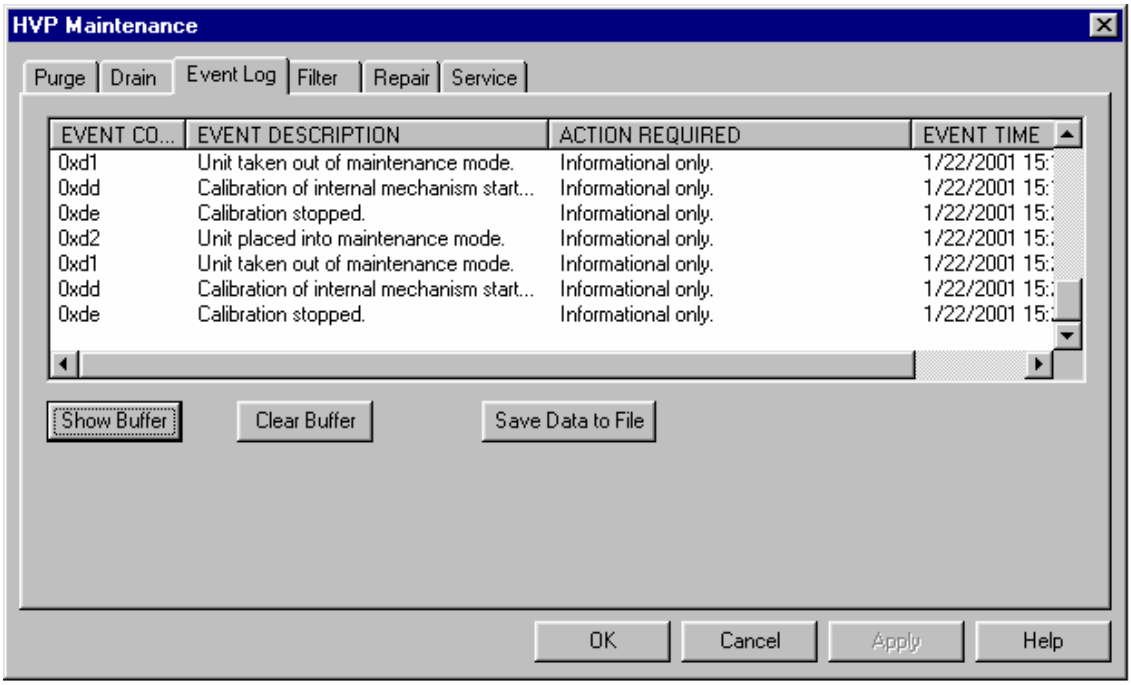


Figure 3-3, HVP Maintenance Event Log

When an error is encountered by the HVP the Alarm LED on the top of the pump will illuminate and the track Error signal will be asserted. The error that has been encountered may or may not disable operation of the pump until the problem is corrected. Some errors that are encountered may clear automatically or be cleared by subsequent operations. If alarms are continuously being generated – the problem should be investigated and corrected. Open the application help screen by clicking on the event code and a detailed description of the event will be displayed.

Show Buffer

To troubleshoot errors with the HVP, go to the Event Log page and select the 'Show Buffer' button. This will upload the latest event information from the HVP to **ChemNet.**

Clear Buffer

This button is used to erase the HVP event buffer. Selecting this button will clear all event and error information from the HVP and cause the Alarm LED on the HVP to turn off. The HVP Error State will be cleared. Note that certain types of errors cannot be cleared.

Save Data to File

This button can be used to save the entire contents of the event log to a text file. This text file can then be used by IDI service personnel to aid with troubleshooting any problems that are being encountered.

NOTE: The Log Is Saved As A Plain Text File That Can Be Viewed/Printed With Any Standard Text Editor (E.G. Notepad). It Can Also Be E-Mailed Directly To IDI If Required.

EVENT LOG CODES

Table 3-1, Event Log

Event Code	Event Description	Action required
?	Unknown error code.	Save the event to a file and call IDI Technical Support.
0x10	Motor controller illegal variable number.	Save the event to a file and call IDI Technical Support.
0x11	Motor controller illegal operand code.	Save the event to a file and call IDI Technical Support.
0x12	Motor controller motor busy.	Save the event to a file and call IDI Technical Support.
0x14	Motor controller sequence already exists.	Save the event to a file and call IDI Technical Support.
0x15	Motor controller sequence does not exist.	Save the event to a file and call IDI Technical Support.
0x19	Motor controller sequence does not exist.	Save the event to a file and call IDI Technical Support.
0x1A	Motor controller sequence does not exist.	Save the event to a file and call IDI Technical Support.
0x16	Motor controller already in sequence storage.	Save the event to a file and call IDI Technical Support.
0x1B	Motor controller out of non-volatile memory.	Save the event to a file and call IDI Technical Support.
0x1C	Motor controller hardware fault.	Save the event to a file and call IDI Technical Support.
0x1D	Motor controller invalid checksum during flash upgrade.	Save the event to a file and call IDI Technical Support.
0x1E	Motor controller invalid password during flash upgrade.	Save the event to a file and call IDI Technical Support.
0x20	Motor controller EEPROM timeout.	Save the event to a file and call IDI Technical Support.
0x60	Source empty detected by (SSED)	Check the source line for air.
0x61	Source empty detected by (SSED)	Check the source line for air.
0x62	Source empty detected by (SSED)	Check the source line for air.
0x63	Source empty detected by (SSED)	Check the source line for air.
0x64	SSED error – the SSED cannot be used in the current setup	Disable the SSED. For further information call IDI technical support
0x70	Precharge anomaly occurred	Informational only
0x71	Precharge anomaly occurred	Informational only
0x72	Precharge anomaly occurred	Informational only

Event Code	Event Description	Action required
0x80	Configuration information (operational parameters) is corrupt.	Load new configuration. System uses default values until new configuration is loaded.
0x81	Recipe 1 is corrupt.	Reload Recipe 1. . System uses default values until new until Recipe 1 is loaded.
0x82	Recipe 2 is corrupt.	Reload Recipe 2. . System uses default values until new until Recipe 2 is loaded.
0x83	Recipe 3 (TEL track interface mode only) is corrupt.	Reload recipe 3. System uses default values until new until Recipe 3 is loaded.
0x84	The event log corrupt, logged information has been lost.	Informational only.
0x85	Read-only information is corrupt.	Informational only.
0x86	Configuration information (operational parameters) set to defaults	Informational only
0x87	Recipe 1 set to defaults	Informational only
0x88	Recipe 2 set to defaults	Informational only
0x89	Recipe 3 set to defaults	Informational only
0x8A	Configuration Information (operational parameters) changed	Informational only
0x8B	Recipe 1 changed	Informational only
0x8C	Recipe 2 changed	Informational only
0x8D	Recipe 3 changed	Informational o nly
0x90	The bubble sensor has detected a bubble in the source line.	Unit disabled until corrected.
0x91	The **NOWPak** sensor has detected an error.	Unit disabled until corrected.
0x92	Chemical leak	System will not operate. Call IDI Technical Support.
0x93	N_2 or CDA supply pressure lost.	Establish proper N_2 supply to unit.
0x94	The filter vent valve closed.	Informational only.
0x95	The filter vent valve opened.	Check the filter vent for proper connections to a drain.
0x96	The pressure sensor zero offset was set.	Informational only.
0x97	Track recipe strobe error (only V2.00 and later).	Informational only.
0xA0	Powered up.	Informational only.
0xA1	Powered down.	Informational only.
0xA2	Internal watchdog reset.	Save the event to a file and call IDI Technical Support.
0xA3	External watchdog reset.	Save the event to a file and call IDI Technical Support.

Event Code	Event Description	Action required
0xA4	Pump reset by track after fatal error (only V2.00 and later).	Informational only.
0xB0	Motor controller fault.	See the next event in the log for details.
0xB1	Motor controller communications error.	Save the event to a file and call IDI Technical Support.
0xB2	Motor controller sequence version mismatch	Save the event to a file and call IDI Technical Support
0xC0,	Operation timeout Location = xxx	Save the event to a file and call IDI Technical Support.
0xC1	Dispense operation aborted	Correct any problem)s) and cylce power to the unit.
0xC2	Pump position indeterminate	Cycle power to the unit
0xC3	Recharge operation aborted	Correct the problem and cycle power to the unit.
0xC4	An internal software error has occurred.	Save the event to a file and call IDI Technical Support.
0xc4	Internal software error has occurred (only V1.14 and earlier)	Save the event to a file and call IDI Technical Support
0xC5	Precharge operaton aborted	Informational only
0xD0	The "Load Default Settings" switch is on.	Informational only.
0xD1	Unit taken out of maintenance mode.	Informational only.
0xD2	Unit placed into maintenance mode.	Informational only.
0xD3	Unit taken out of “pass-through” mode.	Informational only.
0xD4	Unit placed into “pass-through” mode.	Informational only.
0xD5	Unit placed into purge mode.	Informational only.
0xD6	Purge operation stopped.	Informational only.
0xD7	Recirculation mode.	Informational only.
0xD8	Recirculation mode ended.	Informational only.
0xD9	Drain operation started.	Informational only.
0xDA	Drain operation stopped.	Informational only.
0xDB	Home diaphragm operation started.	Informational only.
0xDC	Home diaphragm operation stopped.	Informational only.
0xDD	Calibrating internal mechanism started	Informational only.
0xDE	Calibrating stopped.	Informational only.
0xE0	Dispense volume too large.	Cycle power to the unit.
0xE1	Current recipe’s Recharge Rate too high (Recharge Time is too low).	Increase the Recharge Time in the Dispense Parameters.
0xE2	Current recipe’s Dispense Rate too high (Dispense Time is too low).	Increase the Dispense Time in the Dispense Parameters.
0xE3	Cannot precharge the chamber to the desired pressure.	Cycle power to the unit

Event Code	Event Description	Action required
0xE4	Source empty detected by (SSED)	Check the source line for air.
0xE5	Purge Fill Rate is too high (Purge Fill Time is too low).	Increase the Purge Fill Time.
0xE6	Default rate for pump during calibration is too high (time is too low).	Increase the Recharge Time within the appropriate recipe
0xE7	Current Drain Rate too high (Drain Time is too low).	Increase the Drain Time.
Event Code	Event Description	Action required
0xE8	Current Suckback Rate too high (Suckback Time is too low).	Increase the Suckback Time within the appropriate recipe.
0xE9	HVP setup conditions not compatible with Auto-rate Recharge.	Try using a specific Recharge Time (i.e. greater than 0).Cycle power to the unit.
0xF0-0xFF	Internal hardware/software error.	Save the event to a file and call IDI Technical Support.

MAINTENANCE FILTER

This tab work injunction with the HVP filter during the purge and drain operations.

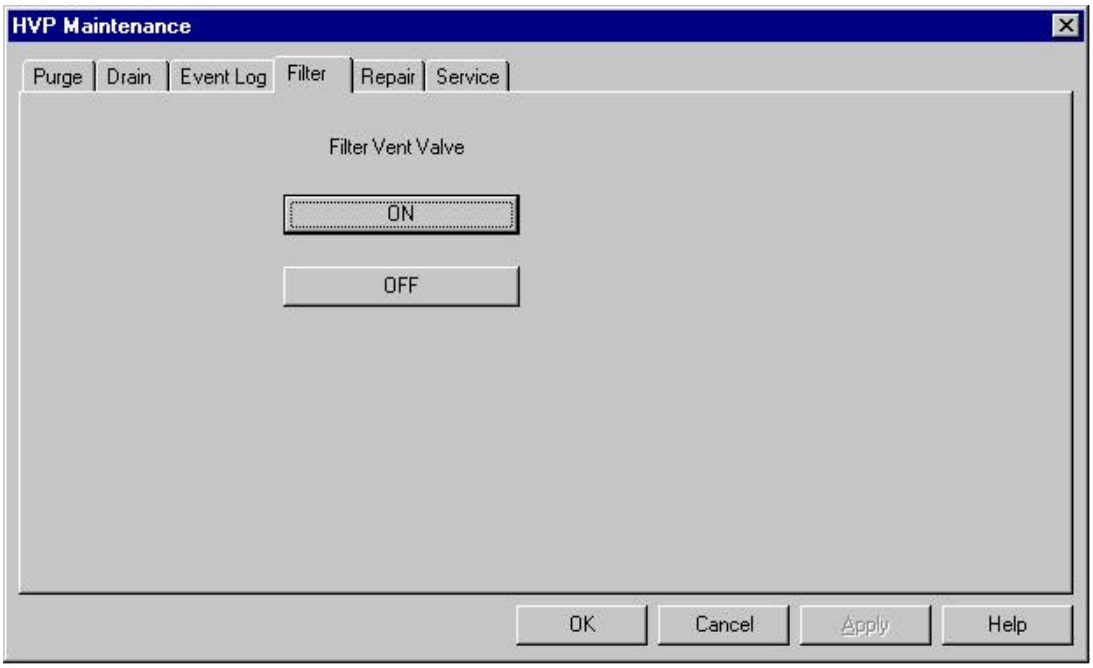


Figure 3-4 Maintenance Filter

During the purge mode, select ON (open) button for the Filter Vent Valve, to bleed the filter of air bubbles. When the line become clear of air bubbles and a stead stream of liquid is flowing, then select the OFF (close) button.

MAINTENANCE REPAIR

The intend of this functions on this page are to help the user remove the Teflon pump chamber assembly from the main chassis of the pump.

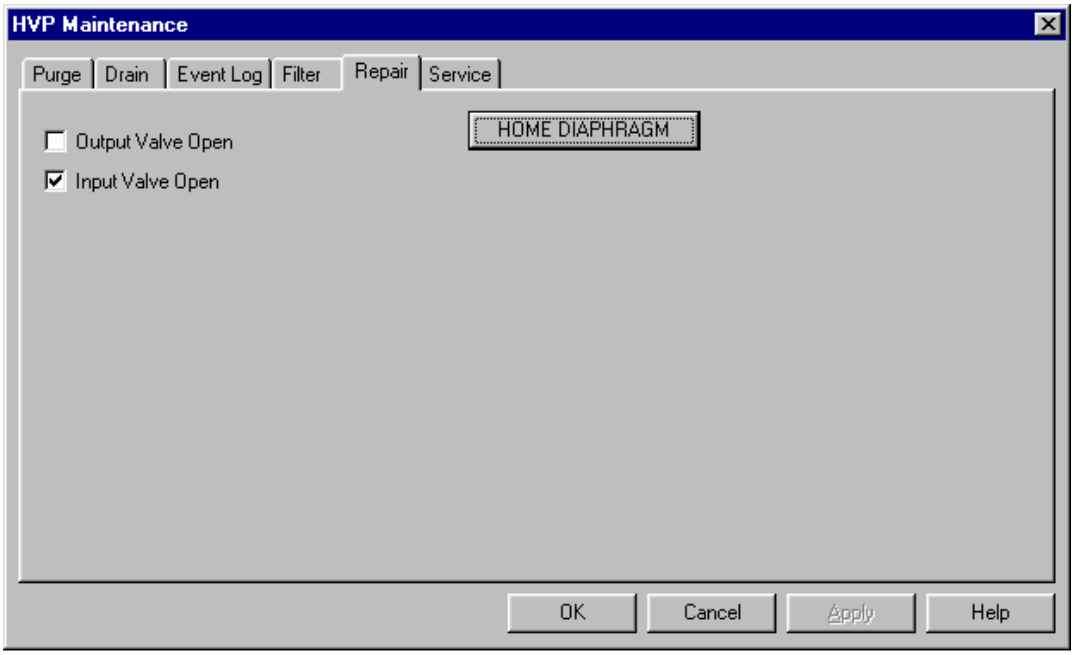


Figure 3-5, HVP Maintenance - repair

The HVP consists of two main sections:

1. The chassis which contains the control and drive mechanism (all the stainless steel parts).
2. The white Teflon pump chamber assembly (the fluid path).

The HVP is built in two separable sections so that the pump control or drive mechanism can be taken away for service without breaking into the fluid path. The pump chamber assembly can be left intact and remain connected to the fluid path of the chemical system.

The feature should always be used with the 'Input Valve Open' check box selected. When the 'Home Diaphragm' button is pressed the internal mechanisms of the pump will move to a predefined position, which will allow for easy separation of the pump chamber assembly from the drive mechanism.

MAINTENANCE SERVCE

Use of this service page only under special circumstances by trained technicians.

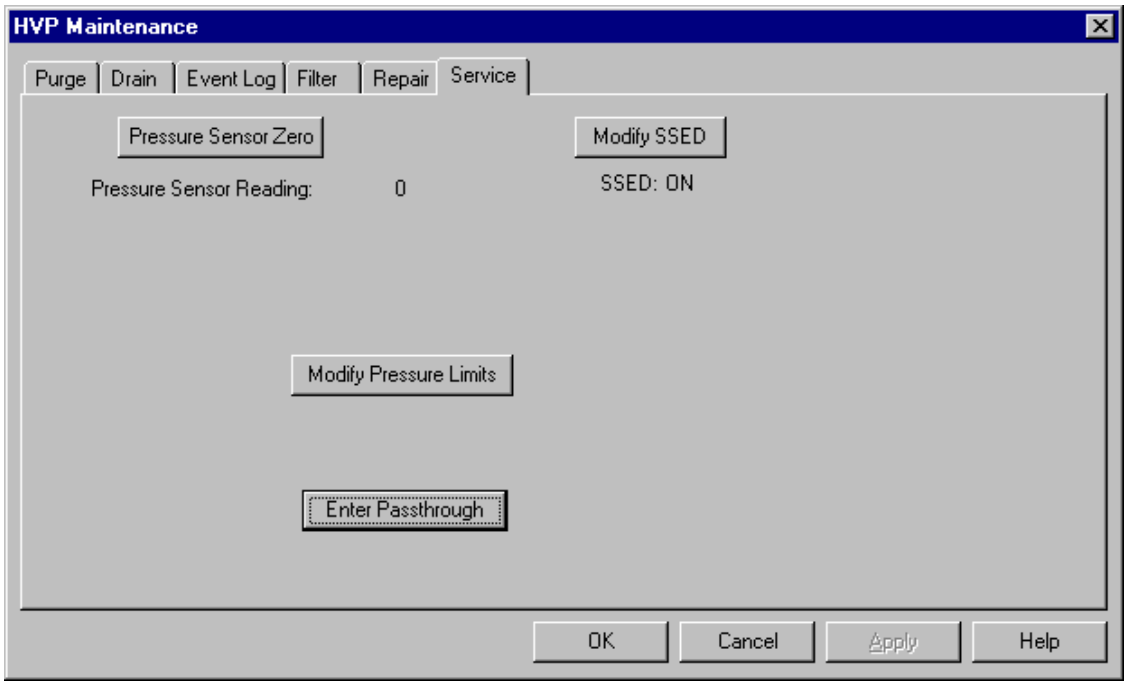


Figure 3-6, HVP Maintenance Service

Pressure Sensor Zero

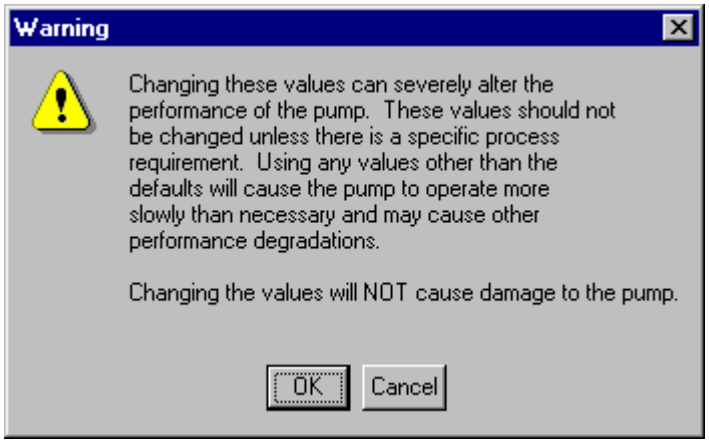
This button is used to calibrate the HVP pressure sensor. The pressure sensor only needs to be calibrated if the battery is removed from the HVP main board, or the whole board is changed, or if the pressure sensor is changed. The pressure sensor should only be calibrated by IDI field service personel. If it is determined that the pressure sensor needs to be calibrated, please call IDI field service.

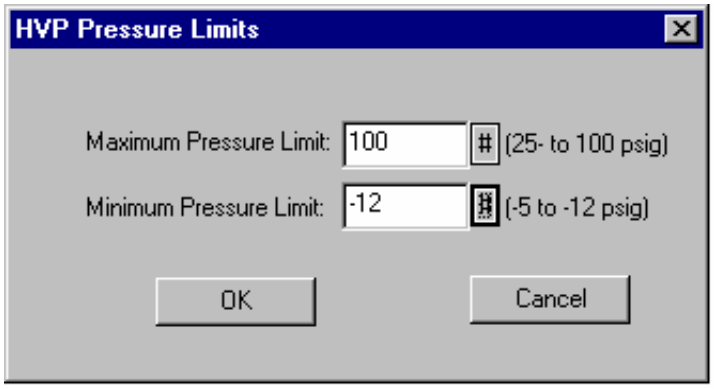
Modify SSED

The HVP has within its operational software the capability to detect a potential source empty condition (an empty source bottle). The feature is called Software Source Empty Detection (SSED). The SSED default setting is off. This button is password protected.

Modify Pressure Limits

This button should only be use with the HVP filter version. When a filter is part of the HVP the pressure in the chamber needs to be adjusted to compensate for the filter size.
Read the Warning before continuing.





The default Max and Min pressure Limits are shown above.

Enter Passthrough

This button will place the pump in a state that allows the IDI representative to communicate directly with the drive control portion of the pump. This feature is for use by IDI representative **only.** This button is password protected.

SECTION 4

HVP MONITOR

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MONITOR OPERATIONS PAGE

The Monitor Operations page enables the user to quickly and easily determine the status of the dispense unit. Click the *Monitor Operation* button to display the Monitor Operations Page. The Monitor Operation Page displays the following items: Polling Options, Log Options, Alarms, Current Configuration Status, Current Operation Mode, Dynamic Data, and the Sensor Status as shown below.

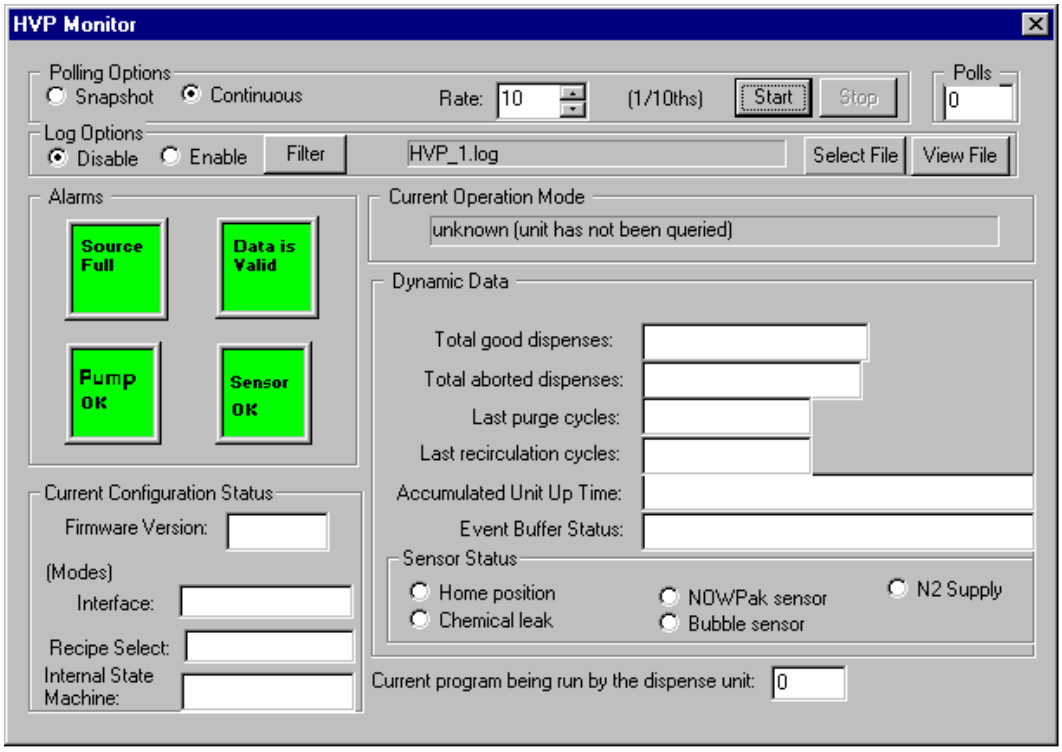

Figure 4-1, HVP Monitor Screen

POLLING OPTIONS:

The Snapshot and Continuous buttons determine whether or not the monitor operation will be a one-time poll (snapshot) or a periodic poll (continuous). If the continuous option is selected the Rate field specifies the interval at which the HVP will be polled for status information. The *Start* and *Stop* buttons initialize and terminates the polling operation. For snapshot operation, only the *Start* button is used as the poll only occurs one time. When the continuous polling mode is selected, the Polls field counts the number of times that the HVP has reported its status.

LOG OPTIONS:

The information retrieved from the monitor operation may be logged to a disk file for future analysis.
Clicking the Enable button enables logging to a file. All changes in status information will be logged to a disk file. Select the Disable button to end the file logging function.
Clicking the Filter button will open a dialogue box that allows the user to select certain changes in the unit status that will be logged to the file. The page shows a list of six specific changes in unit status which, if they occur, can be logged to the log file.

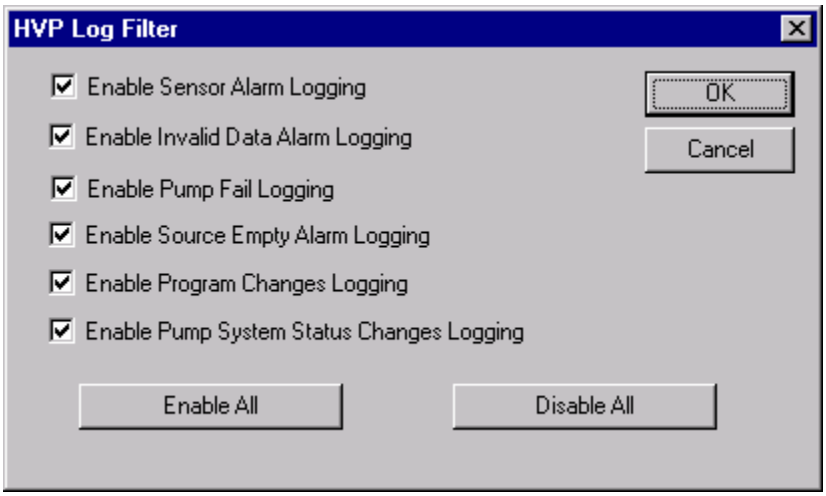

Figure 4-2, HVP Log Filter

If an alarm condition is enabled and the file logging feature of the monitoring operation is turned on, all changes to the enabled alarm condition's state will be time-stamped and logged to the file. If a condition is disabled, changes in its state will not be logged to the file.

NOTE: Enabling Or Disabling An Item In The Filter Dialog Will Only Affect Whether Or Not The Item Is Logged To The Disk File. This Feature Does Not Change The Information That Is Displayed On The Main Monitor Screen.

ALARMS

The Alarm Icons graphically illustrate the status of the alarms that may be generated by the HVP. If an alarm condition exists, the corresponding icon will be shown with a red background (the figure shows the four potential alarm states with green backgrounds because no alarms have occurred).
If an icon is indicating an alarm, it may be clicked with the left mouse button to display an information window, which will explain the specific alarm.

CURRENT CONFIGURATION STATUS

This window will display information about the HVP pump and software configuration.

CURRENT OPERATION MODE

The Current Operation Mode window will update to reflect the real-time operational status of the unit. For example, the window will inform when the HVP is dispensing or when the unit is refilling.

DYNAMIC DATA

While the unit is being solicited for status information, the dynamic data window will continuously update the values associated with the operation of the HVP.

SENSOR STATUS

This will tell you about the status of the sensors.

CURRENT PROGRAM

The Currently Selected Program window indicates which of the four programs are being selected by the unit's discrete hardware select signals.

SECTION 5

HVP ELECTRICAL INTERFACE

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INTERFACE

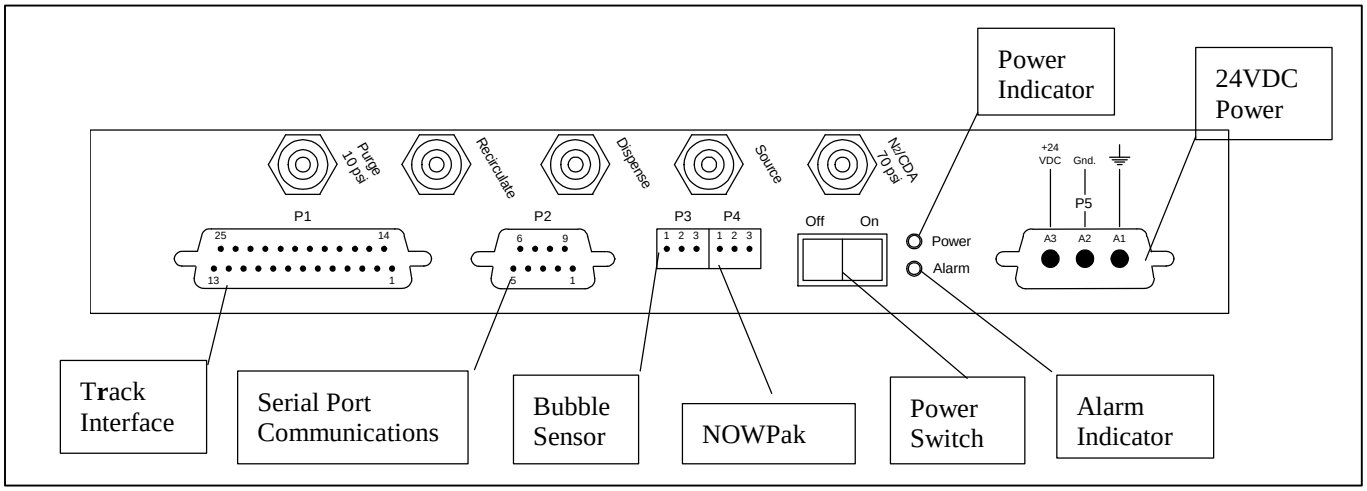


Fig 5-1, Interface

The HVP requires 24 volts DC to operate. In addition, several interface signals are available to allow handshaking with a process tool or connection to optional support equipment available from IDI. Each discrete signal that handshakes with the process tool is isolated from the tool with an optical isolator. This opto-isolator protects the track and dispense unit from power differences caused by floating grounds, different ground references, etc.

DISCRETE INPUT SIGNALS

Each track input on the HVP operates from 5-30VDC. The current is internally limited to approximately 1.6mA. The signal circuit is polarity sensitive. A positive voltage should be applied to pins with a (+), ground or negative voltage should be applied to pins with a (-).

The HVP has the ability to store two (three in TEL interface mode) programs (recipe configurations). The programs are accessed by the RECIPE signal in IDI modes and the TRIGGER1 and TRIGGER2 signals in TEL mode. Additionally the HVP can be configured to use the program specified through the serial interface (i.e. ignore the hardware signals). Connector P3 pins 4 and 5 form program select signal SEL_0, and P3 pins 6 and 7 form program select signal SEL_1. When a voltage is applied to the signal pair, it forms a logical 1. When removed it forms a logic 0. The bit pattern for each of the programs is as follows:
1=voltage applied, 0=voltage off

Program #	SEL 1	SEL 0
1	0	0
2	0	1
3	1	0
4	1	1

The HVP trigger signal is applied at Connector P3 pins 8 and 9. When a voltage is applied to these contacts it will activate the dispense cycle. The trigger signal must be on throughout the time of the dispense cycle. If the trigger signal is interrupted, the dispense cycle will immediately terminate.

NOTE: Signal Inputs And Outputs Are Polarity Sensitive.

DISCRETE OUTPUT SIGNALS

Each discrete signal output can switch a maximum of 30VDC @ 10.0mA. All outputs switch their respective signals to a common return signal -SIG_OUT.
The ALARM signal: connector P3 pins13 and 14, is active when the pump detects one of the alarm conditions that will prevent the unit from conducting normal dispense operations. Some failure conditions that could cause the alarm signal to be activated are exceeding the empty count, the unit being in Maintenance Mode, the overfill sensor detecting an overfill, failure to reach dispense pressure, or another hardware problem. When the alarm signal is activated, the unit will not dispense until the alarm has been cleared.
The WARNING signal: connector P3 pins 11 and 14, is activated whenever the dispense unit fails to fill in the programmed time frame, indicating that the chemical source is empty.
The EOD signal, connector P3 pins15 and 14, activates at the end of the dispense cycle and is the handshake signal to the host equipment to notify the host that the dispense is complete. There are four modes of operation for the EOD cycle. The EOD mode is selectable through the *ChemNet*™ software, and must be configured to match the requirements of the host equipment.

HOST COMMUNICATIONS

The HVP has the ability to communicate with a host PC or track system through a high level communications protocol developed by IDI. This protocol allows programming and status information to be transmitted through an RS232 or RS485 communications link. Access to the communications link is available through connector P1. For the HVP to communicate with a track system, the track must have the capability of handling the IDI communications protocol.

CONNECTOR PINOUTS

Track Interface Connector P1 (Firmware before V2.00)

Table 5-1a, Track Interface Pinouts

CONNECTOR	**INTERFACE MODE**			
Pin	**IDI EOD**	**IDI DIS**	**TEL Mark7/8**	**TEL Act 8/12**
1	+TRIGGER	+TRIGGER	+TRIGGER1	+TRIGGER1
2	+RECIPE	+RECIPE	+TRIGGER2	+TRIGGER2
3	+FILL	+FILL	+FILL	+FILL
4	RS-232 RXD	RS-232 RXD	RS-232 RXD	RS-232 RXD
5	RS-232 TXD	RS-232 TXD	RS-232 TXD	RS-232 TXD
6	RS-232 DTR	RS-232 DTR	RS-232 DTR	RS-232 DTR
7	GND	GND	GND	GND
8	+EOD	+DIS	+DISPENSE	+DISPENSE
9	+READY	+READY	+READY	+READY
10	+ERROR	+ERROR	+READY2	+SUCKBACK
11	+tbd	+tbd	+tbd	+tbd
12	+FILTER VENT	+FILTER VENT	+FILTER VENT	+FILTER VENT
13	+OUTPUT VALVE	+OUTPUT VALVE	+OUTPUT VALVE	+OUTPUT VALVE
14	-TRIGGER	-TRIGGER	-TRIGGER1	-TRIGGER1
15	-RECIPE	-RECIPE	-TRIGGER2	-TRIGGER2
16	-FILL	-FILL	-FILL	-FILL
17	RS-485 +	RS-485 +	RS-485 +	RS-485 +
18	RS-485 -	RS-485 -	RS-485 -	RS-485 -
19	GND	GND	GND	GND
20	-EOD	-DIS	-DISPENSE	-DISPENSE
21	-READY	-READY	-READY	-READY
22	-ERROR	-ERROR	-READY2	-SUCKBACK
23	-tbd	-tbd	-tbd	-tbd
24	-FILTER VENT	-FILTER VENT	-FILTER VENT	-FILTER VENT
25	-OUTPUT VALVE	-OUTPUT VALVE	-OUTPUT VALVE	-OUTPUT VALVE

Track Interface Connector P1 (Firmware V2.00 and later)

Table 5-1b, Track Interface Pinouts

CONNECTOR	INTERFACE MODE		
Pin	**IDI EOD**	**SVG**	**TEL Act 8/12**
1	+TRIGGER	+TRIGGER	+TRIGGER1
2	+RECIPE	+RECIPE	+TRIGGER2
3	+ERROR CLEAR	+RECIPE STROBE	+ERROR CLEAR
4	RS-232 RXD	RS-232 RXD	RS-232 RXD
5	RS-232 TXD	RS-232 TXD	RS-232 TXD
6	RS-232 DTR	RS-232 DTR	RS-232 DTR
7	GND	GND	GND
8	+EOD	+EOD	+DISPENSE
9	+READY	+READY	+READY
10	+ERROR	+ERROR	+WARNING (STOP)
11	+WARNING	+WARNING	+WARNING (ALARM)
12	+FILTER VENT	+FILTER VENT	+FILTER VENT
13	+OUTPUT VALVE	+OUTPUT VALVE	+OUTPUT VALVE
14	-TRIGGER	-TRIGGER	-TRIGGER1
15	-RECIPE	-RECIPE	-TRIGGER2
16	-ERROR CLEAR	-RECIPE STROBE	-ERROR CLEAR
17	RS-485 +	RS-485 +	RS-485 +
18	RS-485 -	RS-485 -	RS-485 -
19	GND	GND	GND
20	-EOD	-EOD	-DISPENSE
21	-READY	-READY	-READY
22	-ALARM	-ERROR	-WARNING (STOP)
23	-WARNING	-WARNING	-WARNING (ALARM)
24	-FILTER VENT	-FILTER VENT	-FILTER VENT
25	-OUTPUT VALVE	-OUTPUT VALVE	-OUTPUT VALVE

Maintenance Communications Connector P2

Table 5-2, Maintenance Communications Pinouts

PIN	FUNCTION
1	RS-485 -
2	RS-232 TXD
3	RS-232 RXD
4	RS-232 DSR
5	GND
6	RS-485 +
7	NC
8	NC
9	RS-232 DTR

Source Bubble Sensor P3

Table 5-3, Bubble Sensor Pinouts

PIN	FUNCTION
1	+24V DC
2	Input
3	0V

NOWPak/Smart Probe Sensor P4

Table 5-4, Sensor Pinouts

PIN	FUNCTION
1	+24V DC
2	Input
3	0V

Power Connector P5

Table 5-5, Power Connector Pinouts

PIN	FUNCTION
A1	Chassis
A2	0VDC
A3	+24VDC

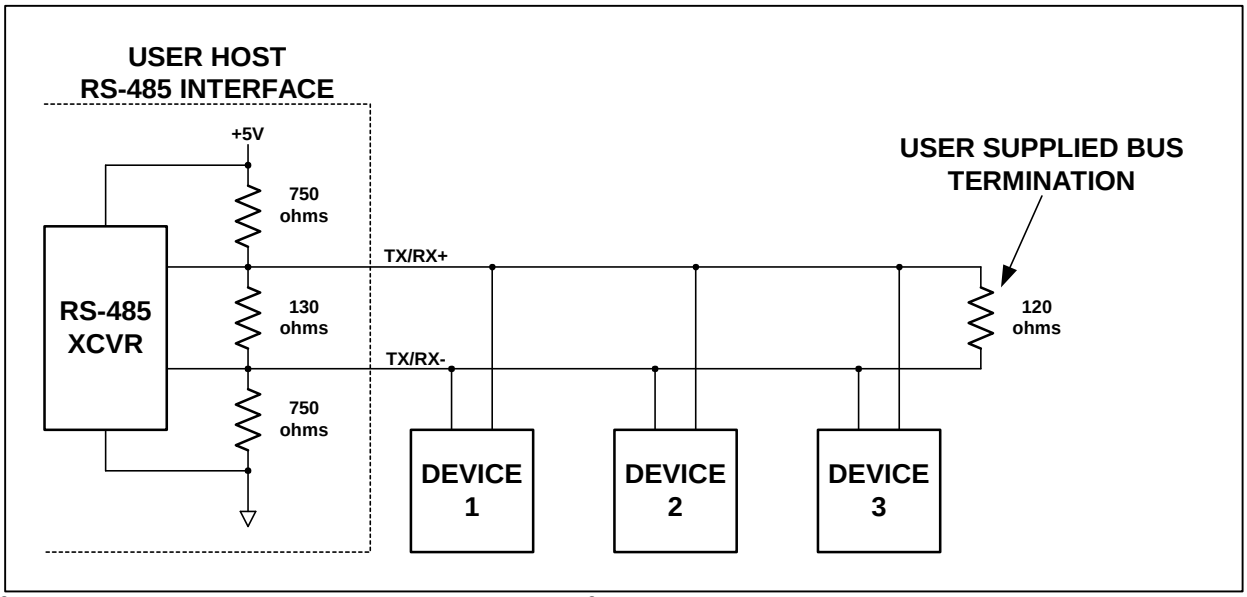
The power source should be well filtered and capable of supplying 3A of current at 24VDC.

RS-485 BUS APPLICATIONS

The HVP has biasing and termination resistors on the circuit board for properly connecting to an RS-485 bus. The accompanying diagram shows a typical RS-485 bus installation. DEVICE 1 corresponds to a pump near the host end of the bus, DEVICE 2 corresponds to a pump or pumps in the middle of the bus, and DEVICE 3 corresponds to a pump at the end of the bus opposite the host. The biasing and termination resistors shown on the USER HOST and the termination resistor shown at the end of the bus must be installed for proper operation of the bus.

NOTE: It Is Very Important That The Biasing And Termination Resistors Be Placed Exactly As Shown At The Host And Device Ends Of The Bus Or The Bus May Experience Erratic Operation, Even If The Resistors Are Installed. No Other Devices On The Bus Should Have Termination Resistors Installed Or The Bus May Not Function.

Fig 5-2, RS 485 Bus Applications



If desired, the HVP may be placed at the end of the bus (at DEVICE 3) and by using the appropriate jumper setting, provide the bus termination at the end of the bus rather than using the external bus termination. If the USER HOST **does not** provide the proper biasing and termination as shown in the diagram, the HVP may be placed at the host end of the bus (at DEVICE 1) and by using the appropriate jumper setting, provide the bus biasing and termination for the host end.

The table below shows how the HVP jumpers should be configured for each application. The HVP is shipped from the factory with all jumpers' open.

Table 5-6, Jumper Configuration

LOCATION OF HVP ON BUS	HOST BIAS AND TERMINATION	USER SUPPLIED TERMINATION	JP3	JP4	JP5
DEVICE 1 OR 2	PRESENT	PRESENT	OPEN	OPEN	OPEN
DEVICE 1 *	NONE	see note below	SHORT	SHORT	SHORT
DEVICE 2 **	NONE	see note below	OPEN	OPEN	OPEN
DEVICE 3	PRESENT	PRESENT	OPEN	OPEN	OPEN
DEVICE 3	PRESENT	NONE	OPEN	OPEN	SHORT
DEVICE 3 ***	NONE	NONE	OPEN	OPEN	SHORT

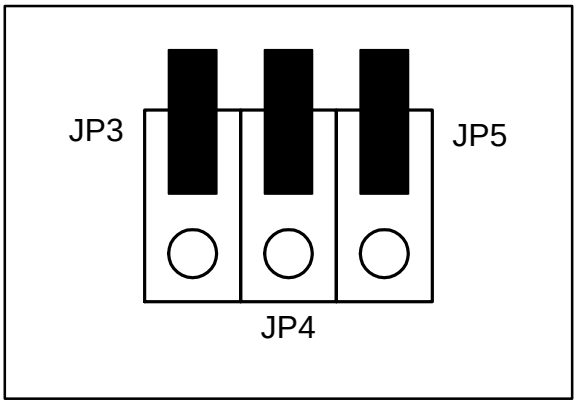
* - the user must supply an external bus termination at the end of the bus in this configuration

** - the user must supply both biasing and termination at the host end of the bus and an external bus termination at the end of the bus in this configuration

*** - the user must supply biasing and termination at the host end of the bus in this configuration

The diagram below shows how the jumpers on the HVP will appear in the OPEN position.

Fig 5-3 Jumper Diagram



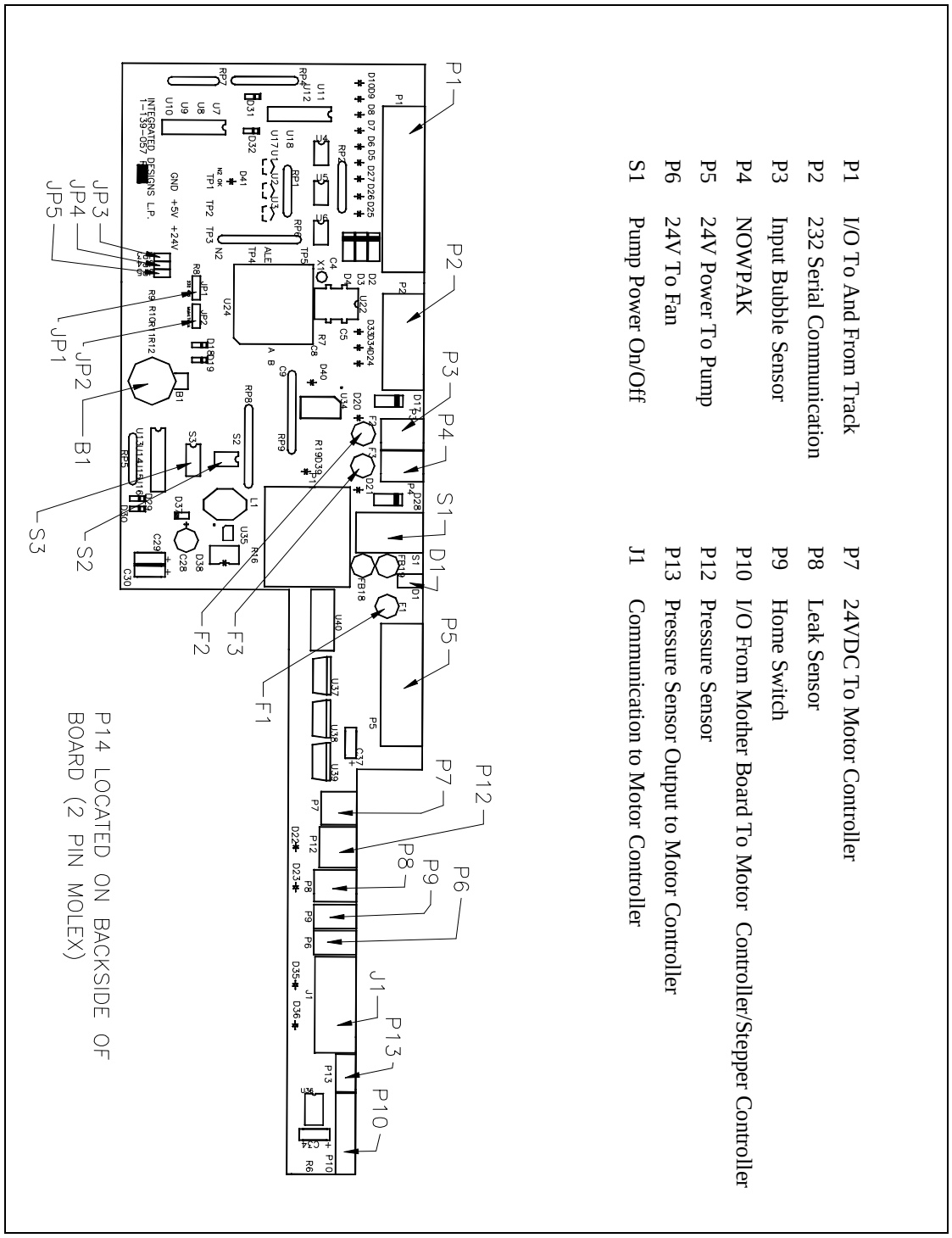


Figure 5-4, P Connector Diagram

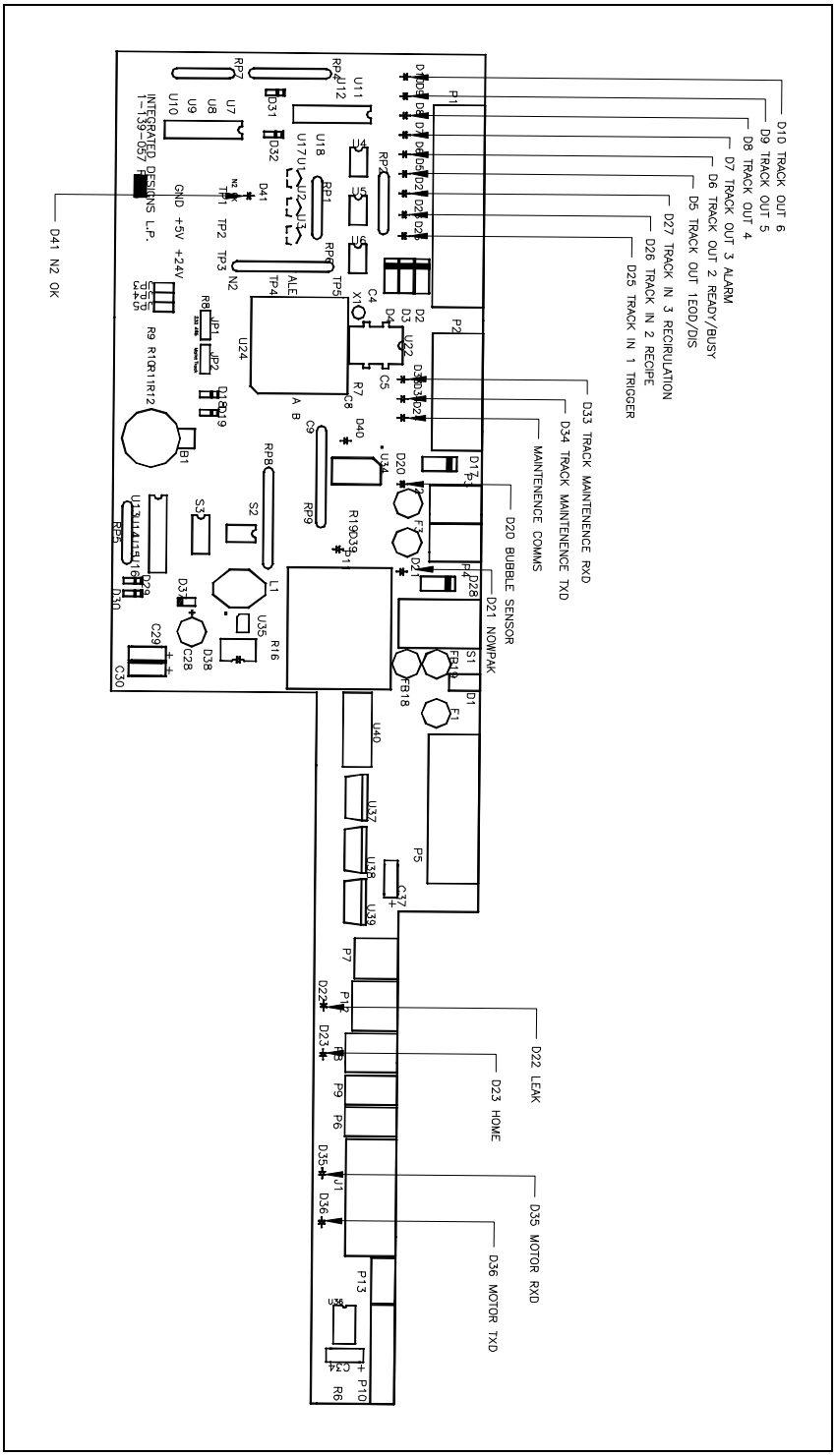


Figure 5-5, PCB Led Description

SECTION 6

TROUBLESHOOTING

2853 DICKERSON PARKWAY
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IDI MODEL HVP FAILURE TROUBLESHOOTING GUIDE

Troubleshooting Guide & Repair/ Replace Procedures

UNIT WILL NOT POWER ON

Check Fuse F1 on the PC board.
Verify that 24V are being supplied to the unit.

HVP NOT DISPENSING

Dispense Unit in maintenance mode

Exit maintenance mode

Parameters in Software are incorrect.

Dispense polarity **is not set to match** the dispense signal from the track. Check Dispense Trigger ACTIVE State.

The **NowPak probe** is **not turned on**, or it is enabled when no NowPak probe is in use. Set parameter accordingly.

The **NowPak probe** and line sensor operational parameters are not set to their correct active states, or they are enabled when not in use.

The unit is recharging.

The HVP **will not** dispense until after the recharge is complete. **Check** the recharge time parameter to see if it is desirable for the application.

No or low N2

Turn on N2 and **regulate** for 70 psi.

Dispense unit not being triggered by track or work cell.

Trigger Signal is **not being sent** from the track/work cell.

Bad MCT5211 Opto Isolator on Trigger input to the dispense unit, replace U4.

Bad cabling from the track/work cell to the dispense unit.

Bad PC Board.

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ALARM SIGNAL PROBLEMS.

Track system does not receive an error alarm.

Correct the Error State setting in the Operational Parameters screen.

Bad alarm opto-isolator on dispense board.

Replace the alarm MCT5211 U9.

Bad or wrong trigger cable.

Repair or replace cable.

Track not properly configured to monitor IDI alarms.

Correct configurations.

NO EOD SIGNAL TO TRACK/WORK CELL (ONLY IN IDI MODE)

EOD to track settings not correct

Set proper EOD mode on dispense unit to match track/work cell.

Insure that the track sensor mode is set properly to receive EOD signal.

Wrong or bad trigger cable

Repair or replace cable

PARTIAL OR UNSTABLE DISPENSES

No or low N2

Turn on N2 and regulate for 70 psi

HVP NOT PURGING/DRAINING

No or low N2.

Turn on N2 and **regulate** for 70psi

Leak Sensor activated.

Motor Controller communication problems

Open and view the **ChemNet** error log under HVP Maintenance, Event Buffer tab.

SUCKBACK PROBLEMS

Suckback is not adjusted properly.

Adjust the suckback in the HVP Dispense Cycle Parameters dialog box.

Air in dispense lines.

Verify all fittings in the dispense line **are tight** and leak free.

Purge the dispense unit to output to remove any air trapped in the dispense lines.

Insure that Suckback is adjusted in a manner that **does not allow** bubbles to be pulled back into the dispense line.

HVP NOT FILLING

No or low n2

Turn on N2 and **regulate** for 70 psi.

The Source is empty

Replace empty source.

Loose fittings.

Insure all fittings into chamber are **tightened** correctly.

Bad input valve.

Replace valve.

NowPak sensor (optional) is turned off.

Check container for proper lid placement.

Optical line sensor (optional) is turned off.

Disable sensor until the source line if full.

AIR IN DISPENSE LINES

Suckback set incorrectly causing bubbles to be drawn back up dispense lines.

Adjust Suckback parameters.

Dispense lines loose or not seated properly at valve.

Check and tighten all fittings.

Pump left idle for an extended period of time allowing the media to outgas.

Purge unit to drain and source **to remove** all air.

NO COMMUNICATIONS BETWEEN THE TRACK AND THE HVP

Wrong address set on the HVP unit.

Correct settings.

Bad PC board.

Replace the PC card on the dispense unit.

Serial communications cable is bad.

Repair or replace cable.

HVP Unit is in a ChemLink Cabinet.

Switch S2 switch bit 2 to ON. This provides the NO parity setting for communication in the cabinet.

REPAIR AND REPLACE PROCEDURES

SOLENOID VALVE REPLACEMENT

1. **Turn** off power and CDA/N2 to the HVP
2. Remove the cover to the dispense unit.
3. Using a small screwdriver, unscrew the two Phillips screws holding the solenoid in place, and remove the solenoid from the manifold. Insure that the solenoid gasket is off the manifold.
4. Disconnect the two-wire connector from the solenoid.
5. Verify that the replacement solenoid is the same type of solenoid as the one being replaced.
6. Insure that the replacement solenoid has a gasket installed.
7. Insert the two-wire connector into the replacement solenoid.
8. Mount the new solenoid on the manifold using the two Phillips screws removed earlier.
9. Turn on the CDA/N2 and power.
10. Test unit operation.
11. Reinstall the cover.

PRESSURE SENSOR REPLACEMENT

1. Drain and power off the dispense unit.
2. **Disconnect** the four-pin connector from the **P6** connector on top of the HVP.
3. **Remove** the retaining ring from around the sensor located on the **Teflon** pump head. **Use a spanner wrench** to loosen the ring.
4. **Remove** the pressure sensor from the unit.
5. **Replace** the new sensor into the HVP unit.
6. **Install** the mounting ring over the sensor and reattach to the pump head again using the spanner wrench.
7. **Connect** the cable connector to **P5.**
8. **Turn the Power** on and **test** the unit.

PUMP HEAD REMOVAL / REPLACEMENT

NOTE: It is always recommended to home the pump and motor assembly if possible before removal of the pump head from the motor assembly.

1. **Drain** unit.
2. **Remove** the source line form the source **or disconnect** source line from pump.
3. **Place** the unit in purge mode.
4. The pump will try to fill then dispense.
5. When the unit pauses between fill and dispense the unit is “home”.
6. **Turn off power** while unit is pausing in home position.
7. With power off **remove** the power connection.
8. **Disconnect** the input and output lines.
9. **Remove** cover by **removing** five Phillips head screws located around the lower perimeter of the cover.
10. **Remove** hose clamp using a 5/16 nut driver.
11. **Remove** the top motor carriage by removing the two 6-32 hex screws in the top corners of the motor. (the bottom two 6-32 screws are to remain in place) Note how the carriage fits into the slot in the pump head. On assembly, you will want it to fit the same way.
12. **Open** the pump head coupling be removing the two 8-32 hex screws located in the upper portion of the coupling.
13. **Remove** coupling upper portion.
14. **Lift off** the pump head from the pump assembly.
15. To reassemble, **replace** pump head into coupling and tighten.
16. **Install** the motor carriage top plate and two screws**. Be careful** to insert the tab on the carriage into the slot in the **Teflon** pump head.
17. Install and tighten hose clamp.
18. **Install** cover and five Phillips screws.
19. **Reconnect** input & output lines.
20. **Turn on** power to the unit.

OPTICAL LEAK DETECTION LENS / SENSOR (OLDS) REPLACEMENT

1. Turn off power to the unit.
2. **Remove** the pump head. (Following the pump head removal procedure.)
3. **Remove the** motor carriage assembly by **removing** the three mounting screws using a 3/32” hex wrench.
4. Using a 3/32” hex wrench remove the optical sensing lens in need of replacement. Unplugging the fiber optic from the sensor as required.

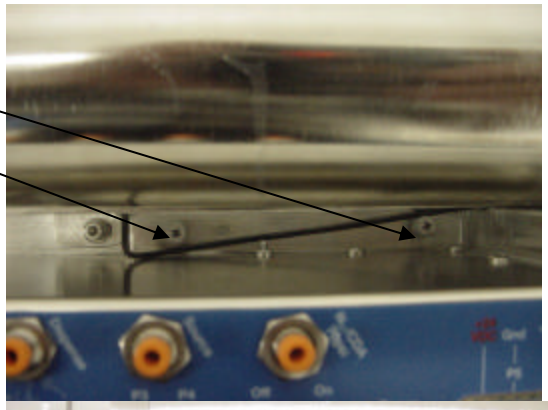
NOTE: When Replacing The Optic Lenses. The Fiber Optic Lines Simply Plug And Unplug Into The Sensor Body. It Is Only A Friction Fit. No Glue Or Tools Are Required To Join The Components. The Length Of The Fiber Is Precut And Come In Two Sizes. Chare Should Be Taken To Replace The Shorter Length On The Left End (Motor End) And Longer On The Right End (Pump Head End) Of The Motor Carriage Assembly.

12. Remove the optic sensor by unplugging the wire harness and removing the mounting screws.
13. Reinstall the optic sensor; wire harness and fiber optic connections back onto the motor carriage assembly.
14. Reinstall the motor carriage onto the pump chassis.
15. Reinstall the pump head.
16. Turn Power On to the unit.

PC BOARD REPLACEMENT

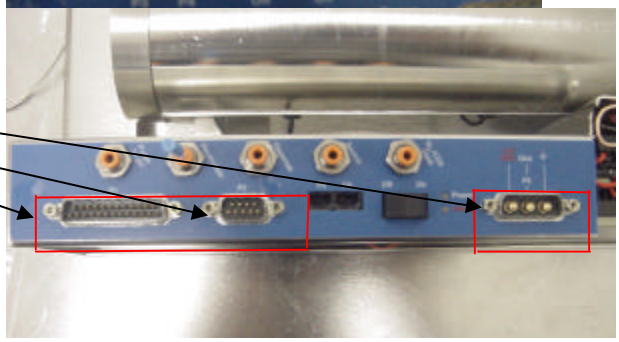
1. Turn Power off to the unit and disconnect the 24-volt power, connector P5, from the unit.
2. Remove the cover and disconnect the remaining cable connections from the board.

3. **Remove** the two mounting screws using a 7/64” hex wrench



4. **Remove** the six hex screws on the Interface Connection Place

Two screws per connection Total of six Screws



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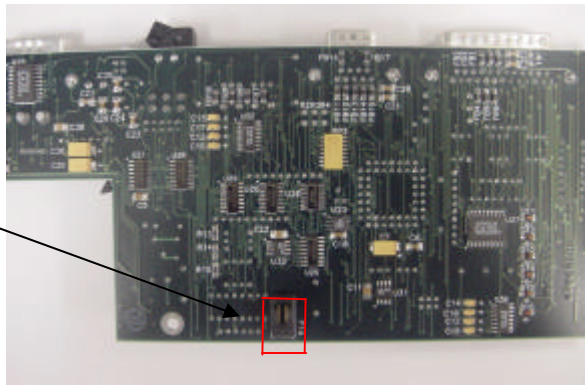
5. **Carefully** remove the plug from the back of the PCB

Connector P14



6. Install the replacement board and mount to the unit using the three hex screws.
7. Reconnect all of the electrical connectors.
8. Reassemble the board back into the pump and install the fasteners.
9. Once the pump is running, reload operational and dispense parameters. Addressing may also need to be set.

SECTION 8

DRAWINGS

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DRAWINGS

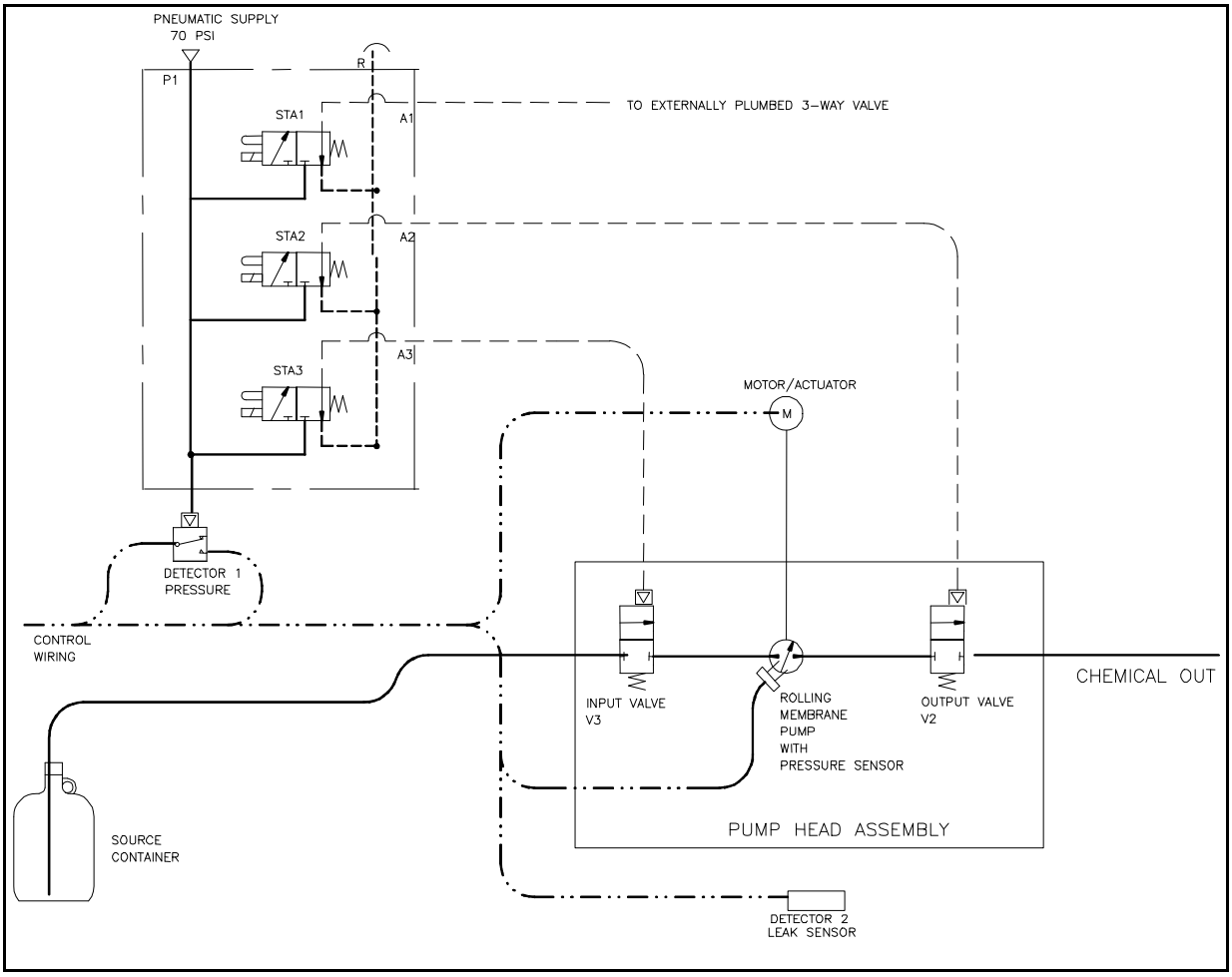

Figure 8-1, HVP Flow Diagram

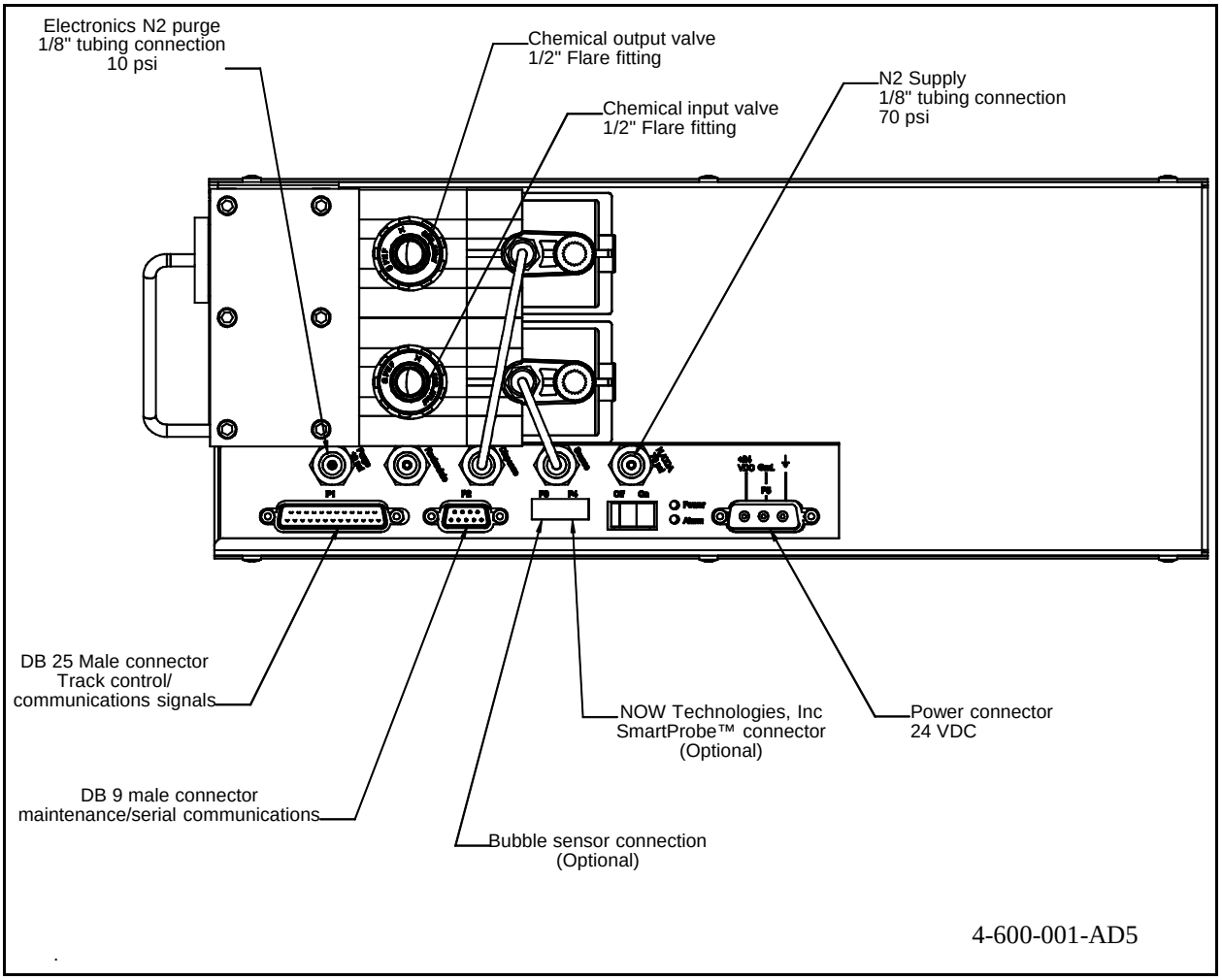

Figure 8-2A, 1/2" Facility Connections

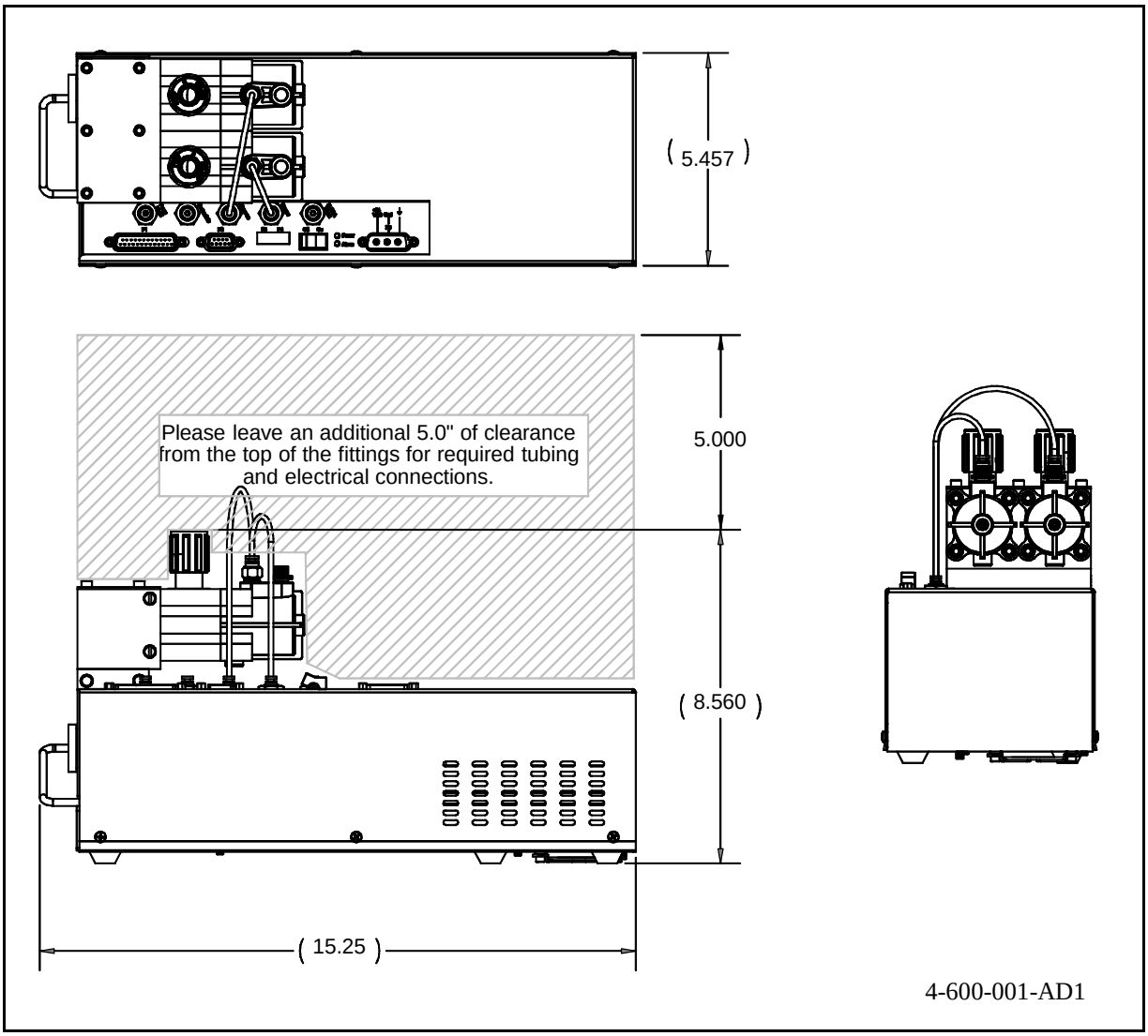

Figure 8-2B, 1/2" Dimensions

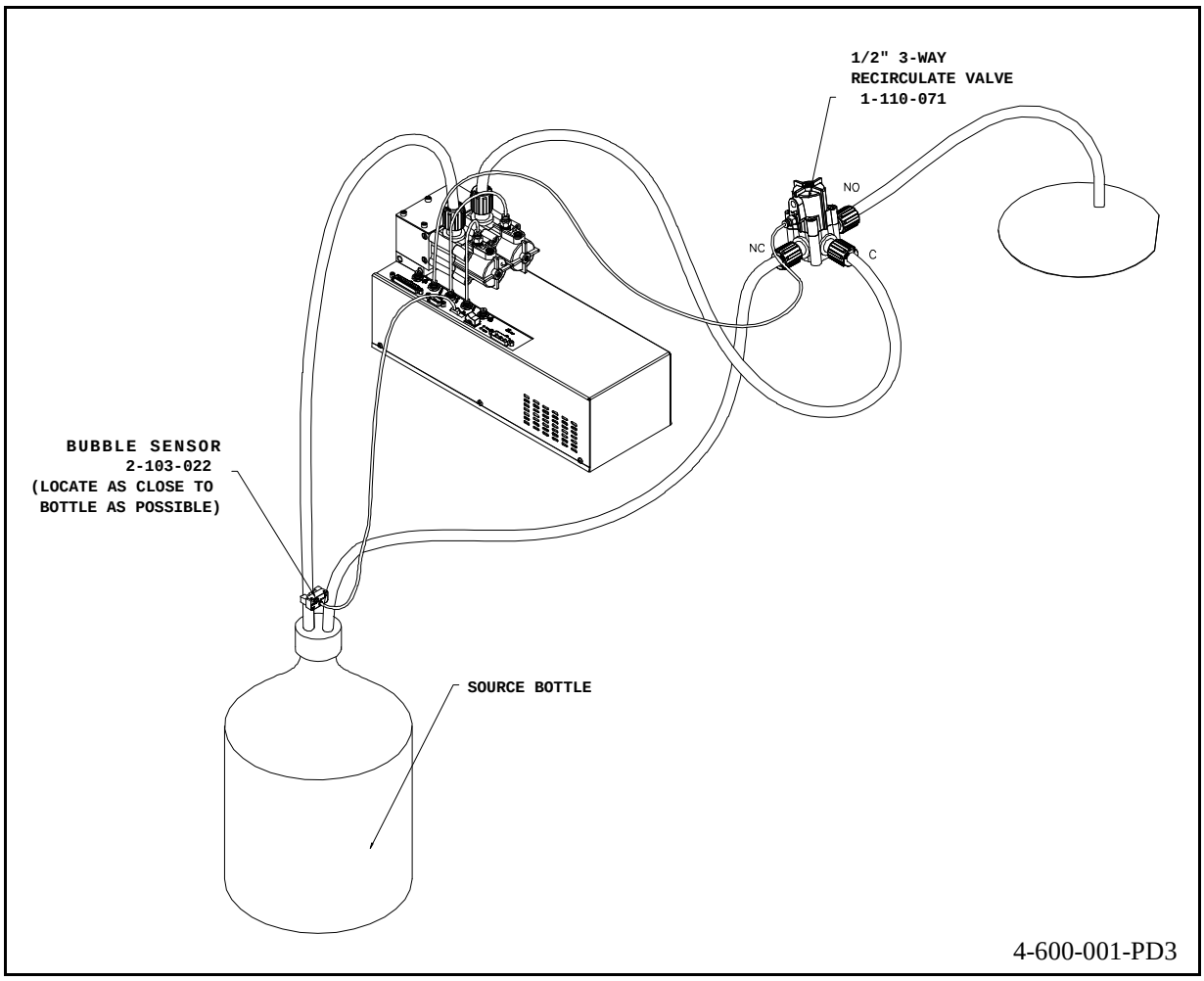

Figure 8-3 1/2"3-Way Recirculation Valve

ITEM NO.	QTY.	PART NO.	REVISION	DESCRIPTION	NOTE
6	1	1-140-193	A/00	PUMP CHAMBER ASSEMBLY	
12	2	1-120-850	A/00	SCREW, SCKT HD CAP	#8-32 X 1/2 IN LG
14	6	1-118-620	A/00	SCREW, PHIL PAN	#6-32 X 1/2 SS
17	3	1-120-830	A/00	SCREW, SCKT HD CAP	#8-32 X 3/8 IN LG
18	2	1-122-008	A/00	FLAT WASHER	#8 (SS)
22	4	1-120-420	A/00	SCREW, SCKT HD CAP	#4-40 X 1/4 IN LG
26	4	1-115-614	A/00	SCREW, SCKT HD CAP	#6-32 X 1-3/8 IN LG
29	4	1-122-016	A/00	LOCK WASHER	#6 (SS)
31	5	1-122-018	A/00	LOCK WASHER	#8 (SS)
32	8	1-122-006	A/00	FLAT WASHER	#6 (SS)
34	4	1-122-019	A/00	STAR WASHER	#4 (SS)
38	4	1-123-091	A/00	RUBBER GROMMET	1/8" INSIDE DIAMETER
39	1	1-135-195	A/00	FINGER GUARD	
40	4	1-121-022	A/00	LOCK NUT, 6-32	SS WITH NYLON INSERT
41	1	1-140-200	A/00	1/2" VALVEBLOCK	ASSEMBLY,HVP
42	1	2-103-043	A/00	HVP PRESSURE SENSOR	0-200 PSIA
44	1	1-116-130	A/00	SCREW, BUTTON HD CAP	10-32 x 3/8' SS
45	2	1-104-232	A/00	MALE CONNECTOR	1/8" T x 1/8" MNPT
47	1	1-123-209	A/00	STAINLESS STEEL CLAMP	2.25" - 3.125"
48	1	1-135-267	A/00	HVP STEPPER MOTOR CONTROLLER	API CONTROLS
49	1	1-141-196	A/00	HVP SHAFT COUPLING ASSY	BODY AND CAP
51	1	2-103-035	A/00	HVP STEPPER MOTOR ASSY	
52	1	1-135-266	A/00	CARD EDGE CONNECTOR	.
54	1	1-120-550	A/00	SCREW, FLAT SOCKET HD	1/4-28 x 1/2" SS
55	4	1-123-020	A/00	RUBBER FOOT, BLACK	SELF ADHESIVE
56	1	1-135-268	A/00	FAN, 24VDC	23 CFM
57	1	1-142-089	A/00	MOUNTING BRACKET	HVP STEPPER MOTOR
58	1	1-142-087	A/01	ELECTRONICS COVER	HIGH VISCOSITY PUMP
59	1	1-142-088	A/01	BOTTOM SLEEVE	HIGH VISCOSITY PUMP
60	1	1-142-086	A/01	TOP SLEEVE	HIGH VISCOSITY PUMP
63	1	1-142-091	A/00	CHASSIS	HIGH VISCOSITY PUMP
65	4	1-120-661	A/00	SCREW, SCKT HD CAP	#6-32 X 7/8 IN LG
70	1	1-137-048	A/00	HVP LEAK SENSOR	FIBER OPTIC
72	1	4-600-001-AD3	A/00	MOUNTING PLATE ASSEMBLY	

Figure 8-4A, 1/2" Parts Break Down

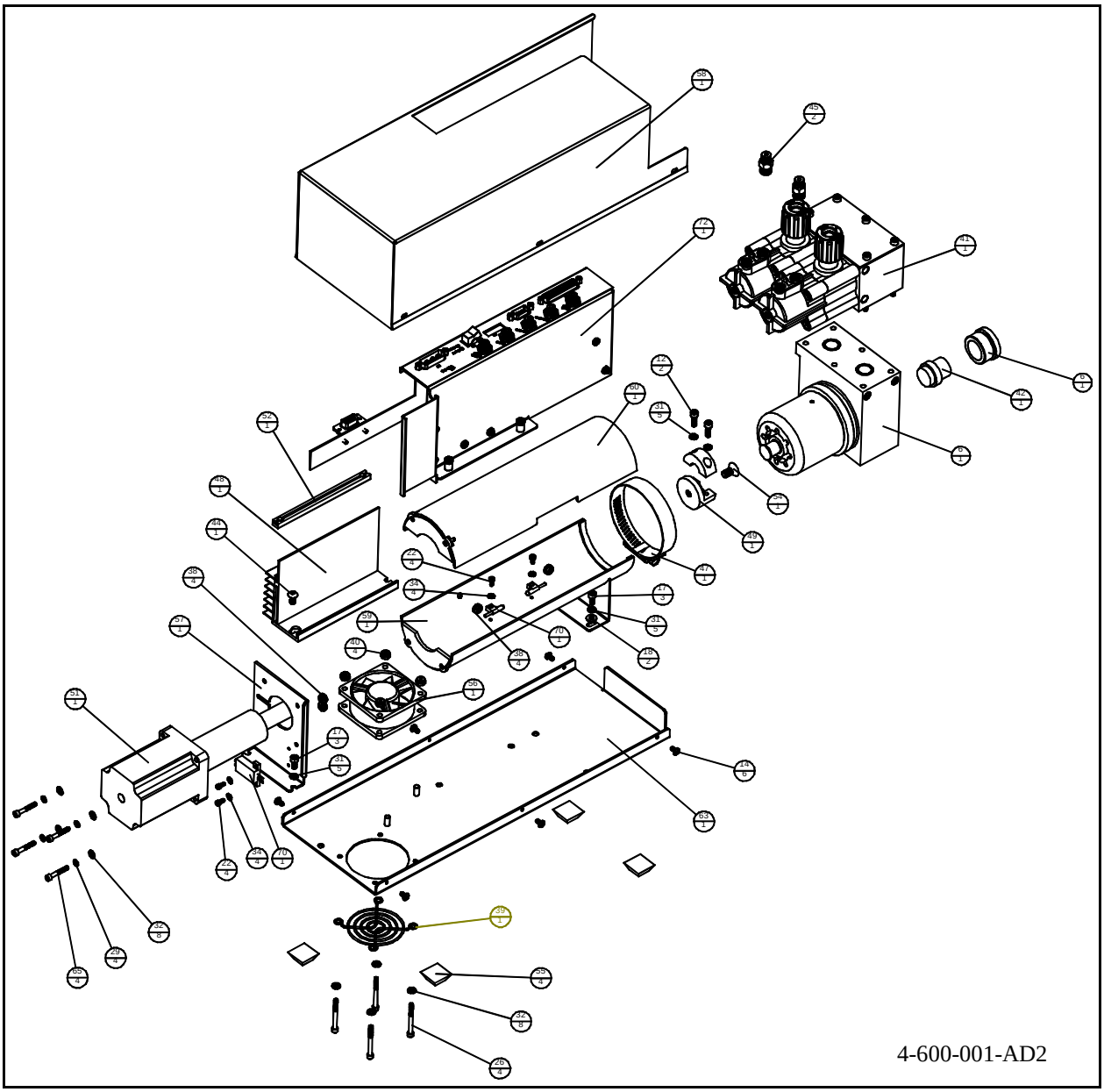

Figure 8-4B 1/2" Parts Break Down

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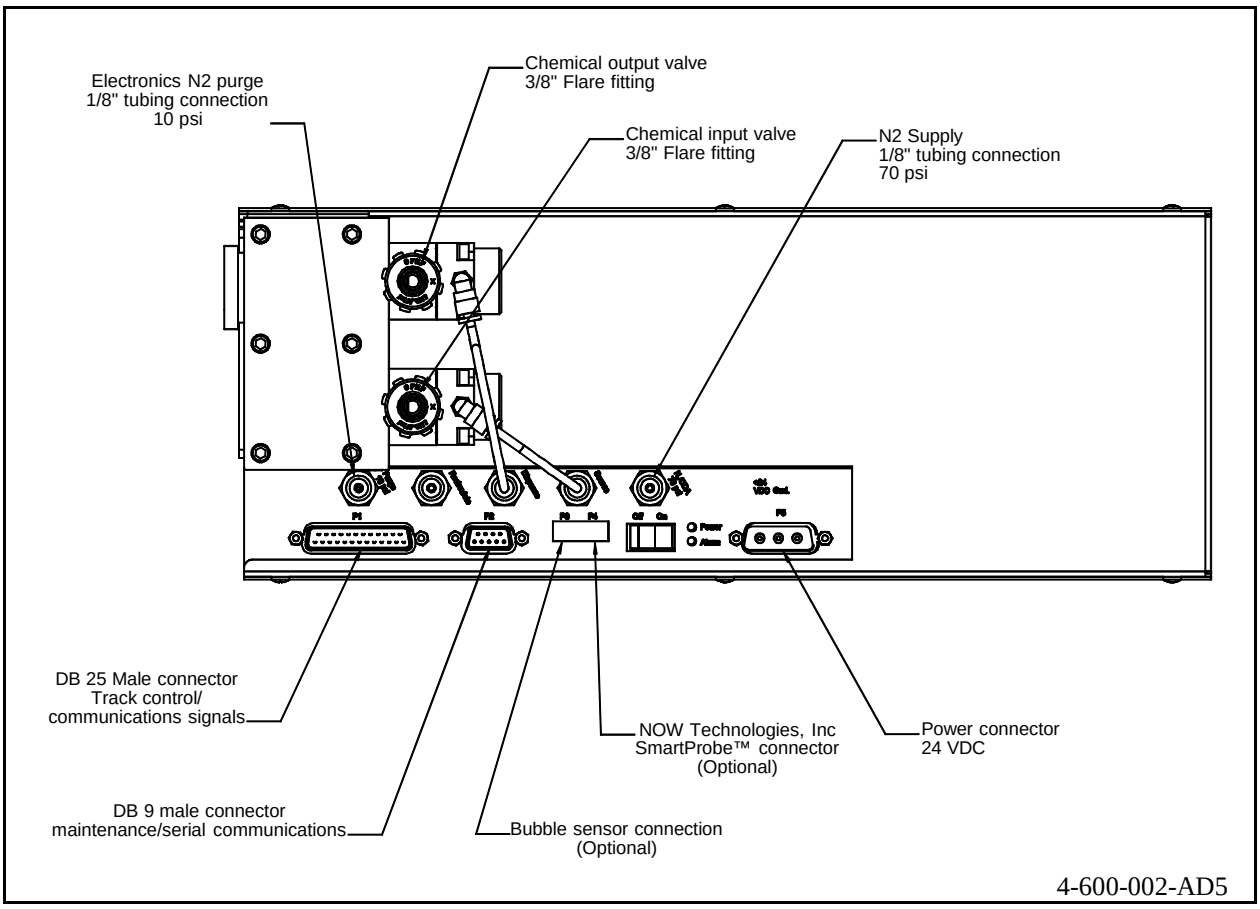

Figure 8-5, 3/8" Facility Connections

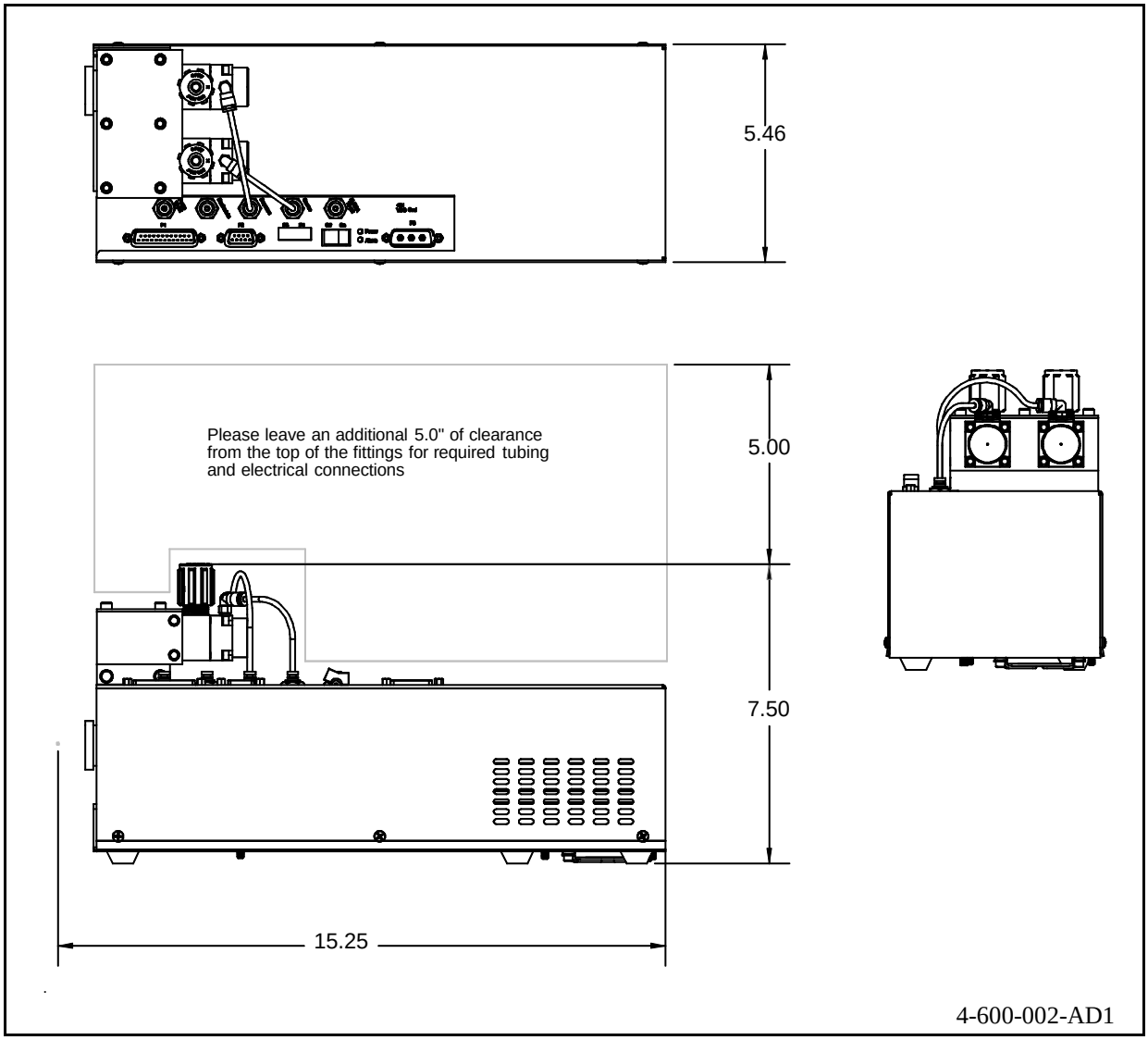

Figure 8-6, 3/8" Dimensions

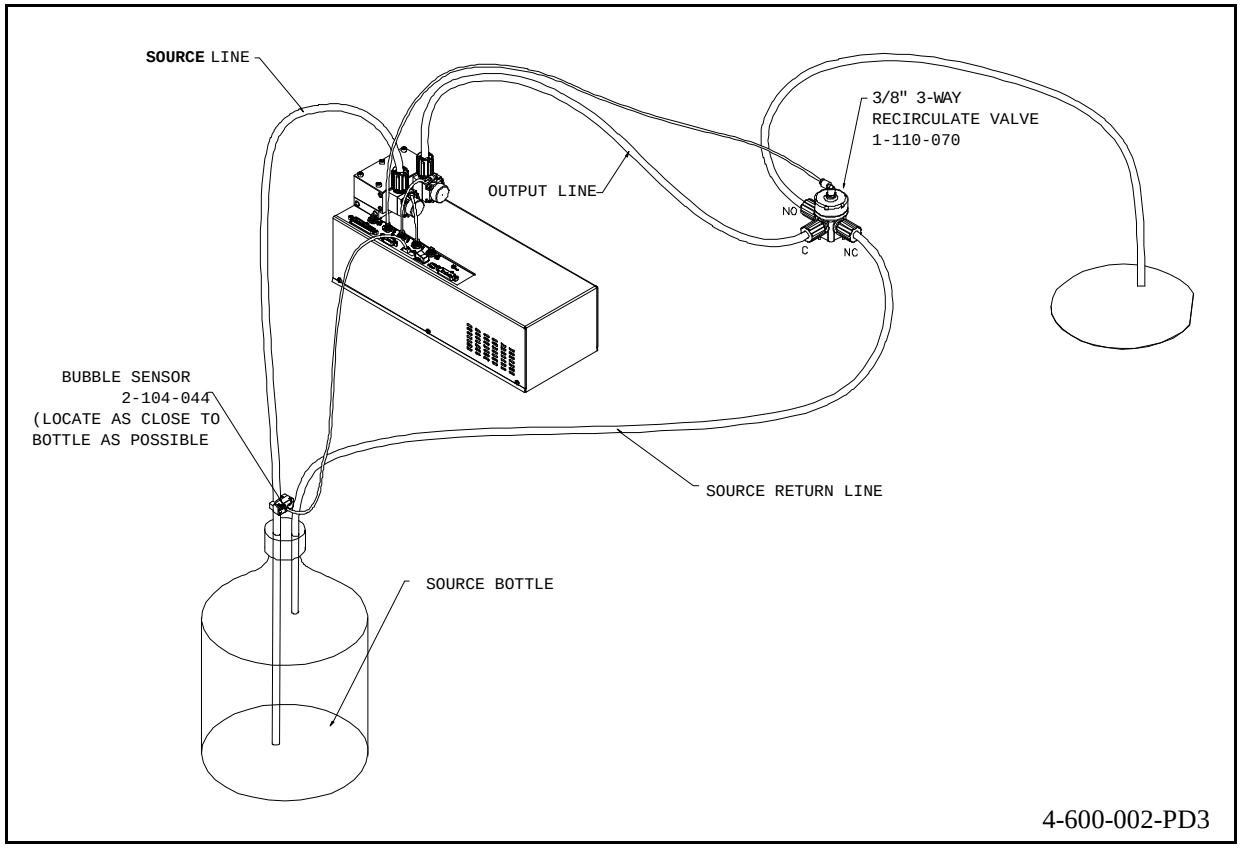

Figure 8-7 3/8" 3-Way Recirculation Valve

ITEM NO.	QTY.	PART NO.	REVISION	DESCRIPTION	NOTE
6	1	1-140-193	A/00	PUMP CHAMBER ASSEMBLY	
12	2	1-120-850	A/00	SCREW, SCKT HD CAP	#8-32 X 1/2 IN LG
14	6	1-118-620	A/00	SCREW, PHIL PAN	#6-32 X 1/2 SS
17	3	1-120-830	A/00	SCREW, SCKT HD CAP	#8-32 X 3/8 IN LG
18	2	1-122-008	A/00	FLAT WASHER	#8 (SS)
22	4	1-120-420	A/00	SCREW, SCKT HD CAP	#4-40 X 1/4 IN LG
26	4	1-115-614	A/00	SCREW, SCKT HD CAP	#6-32 X 1-3/8 IN LG
29	4	1-122-016	A/00	LOCK WASHER	#6 (SS)
31	5	1-122-018	A/00	LOCK WASHER	#8 (SS)
32	8	1-122-006	A/00	FLAT WASHER	#6 (SS)
34	4	1-122-019	A/00	STAR WASHER	#4 (SS)
38	4	1-123-091	A/00	RUBBER GROMMET	1/8" INSIDE DIAMETER
39	1	1-135-195	A/00	FINGER GUARD	
40	4	1-121-022	A/00	LOCK NUT, 6-32	SS WITH NYLON INSERT
42	1	2-103-043	A/00	HVP PRESSURE SENSOR	0-200 PSIA
44	1	1-116-130	A/00	SCREW, BUTTON HD CAP	10-32 x 3/8' SS
47	1	1-123-209	A/00	STAINLESS STEEL CLAMP	2.25" - 3.125"
48	1	1-135-267	A/00	HVP STEPPER MOTOR CONTROLLER	API CONTROLS
49	1	1-141-196	A/00	HVP SHAFT COUPLING ASSY	BODY AND CAP
50	1	1-137-048	A/00	HVP LEAK SENSOR	FIBER OPTIC
51	1	2-103-035	A/00	HVP STEPPER MOTOR ASSY	
52	1	1-135-266	A/00	CARD EDGE CONNECTOR	.
54	1	1-120-550	A/00	SCREW, FLAT SOCKET HD	1/4-28 x 1/2" SS
55	4	1-123-020	A/00	RUBBER FOOT, BLACK	SELF ADHESIVE
56	1	1-135-268	A/00	FAN, 24VDC	23 CFM
58	1	4-600-001-AD3	A/00	HVP MOUNTING PLATE ASSEMBLY	
60	2	1-104-207	A/00	MALE ELBOW	10-32 x 1/8" TUBE
63	1	1-140-201	A/00	3/8" HVP VALVE BLOCK ASSY	.
64	1	1-142-089	A/00	MOUNTING BRACKET	HVP STEPPER MOTOR
65	1	1-142-091	A/00	CHASSIS	HIGH VISCOSITY PUMP
66	1	1-142-087	A/01	ELECTRONICS COVER	HIGH VISCOSITY PUMP
67	1	1-142-088	A/01	BOTTOM SLEEVE	HIGH VISCOSITY PUMP
68	1	1-142-086	A/01	TOP SLEEVE	HIGH VISCOSITY PUMP
70	4	1-120-661	A/00	SCREW, SCKT HD CAP	#6-32 X 7/8 IN LG

Figure 8-8A, 3/8" Parts Break Down

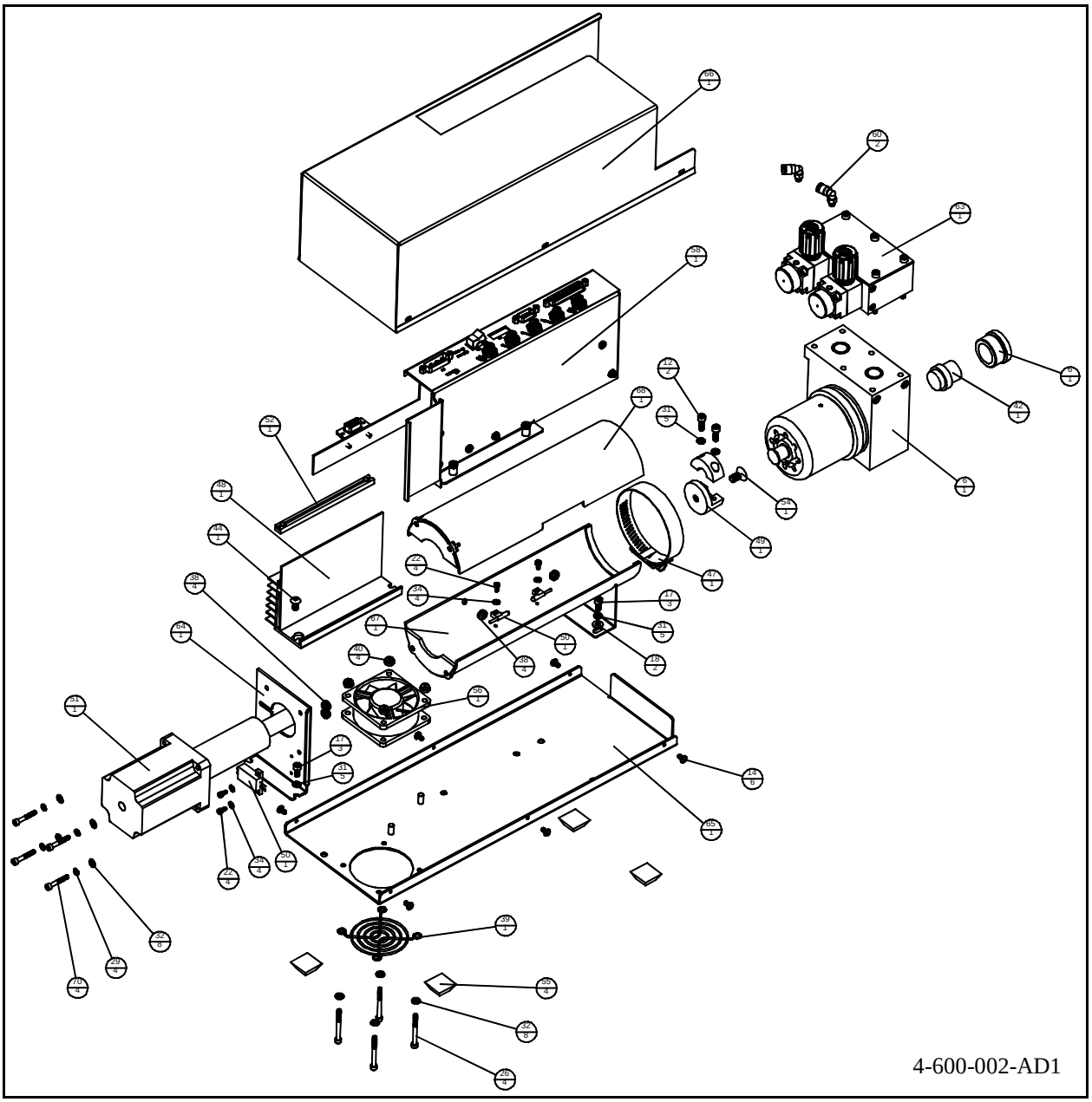

Figure 8-8B, 3/8" Parts Break Down

ITEM NO.	QTY.	PART NO.	REVISION	DESCRIPTION	NOTE
1	1	1-142-090	A/00	HIGH VISCOSITY PUMP	MOUNTING PLATE
4	1	1-123-207	A/00	HVP LABEL	MOUNTING PLATE
5	1	1-139-057	A/02	HIGH VISCOSITY PUMP	PCB ASSEMBLY
6	1	1-103-067	A/00	MANIFOLD, 3 POSITION	VQ BLANK
7	4	1-104-204	A/00	MALE CONNECTOR	10-32 x 1/8" TUBE
9	2	1-120-620	A/00	SCREW, SCKT HD CAP	#6-32 X 1/4 IN LG
13	1	1-104-207	A/00	MALE ELBOW	10-32 x 1/8" TUBE
14	2	1-115-615	A/00	SCREW, SCKT HD CAP	#6-32 X 5/8 IN LG
16	1	1-103-201	A/00	PLUG 10-32	NICKLE PLATED
17	1	1-104-260	A/00	UNION TEE	1/8" x 1/8" x 1/8"
18	1	1-115-671	A/00	SCREW, PHIL PAN	#6-32 X 3/4 NYLON
19	2	1-122-020	A/00	STAR WASHER	#6 (SS)
20	1	1-104-019	A/00	RESTRICTOR	DIAMETER .004"
21	2	1-123-002	A/00	STANDOFF, MALE/FEMALE	6-32 x 3/4" SS
22	1	1-137-010	A/00	PRESSURE SWITCH	60 PSI
23	6	1-123-024	A/00	SCREW LOCK FEMALE	4-40 x .312
24	3	1-110-047	A/00	VQ SOLENOID VALVE	24V, LOW POWER
25	5	1-104-250	A/00	MALE CONNECTOR	1/4T X 1/4T

Figure 8-9A, Mounting Plate Assembly 4-600-001-AD3

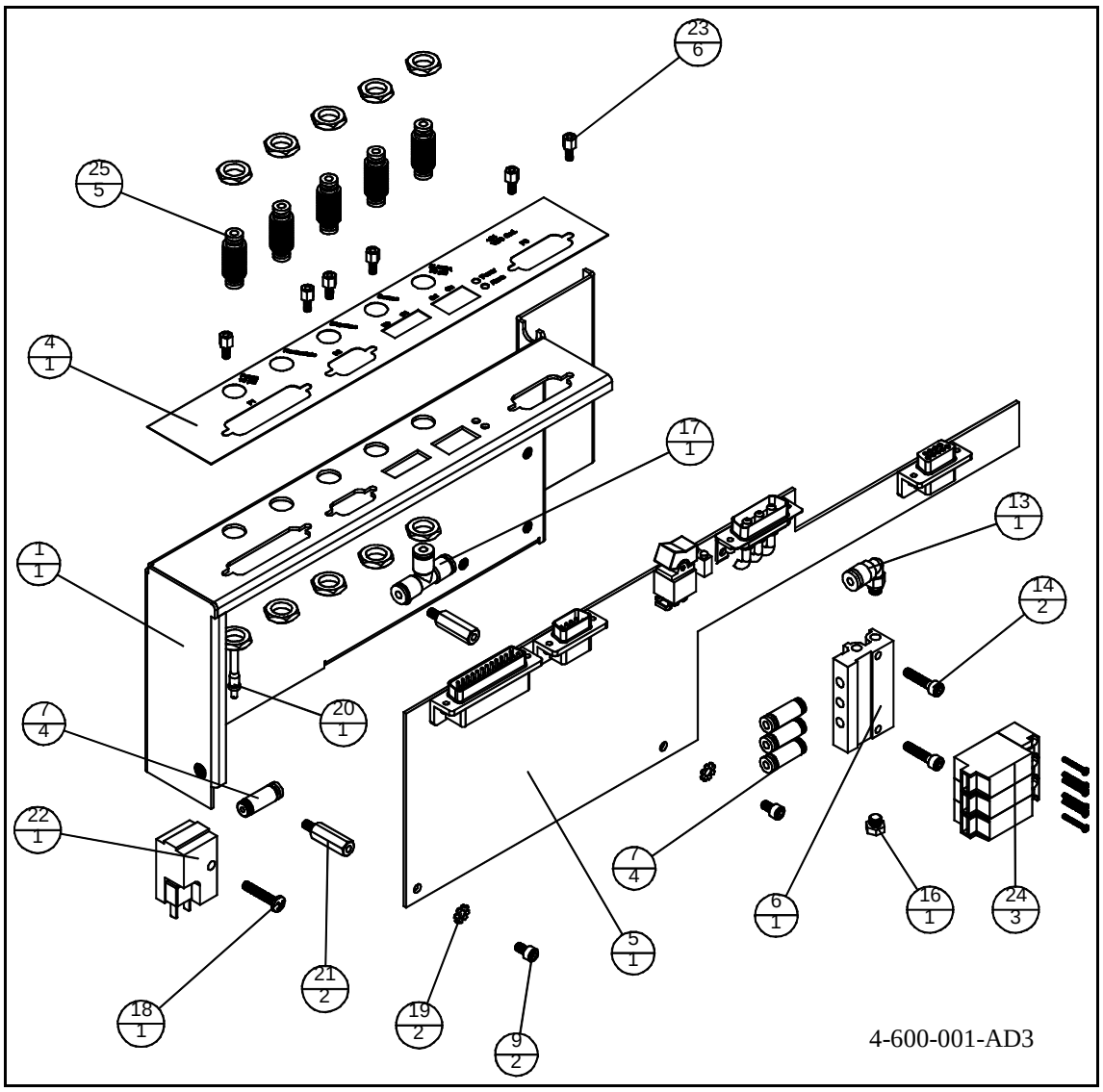

Figure 8-9B, Mounting Plate Assembly

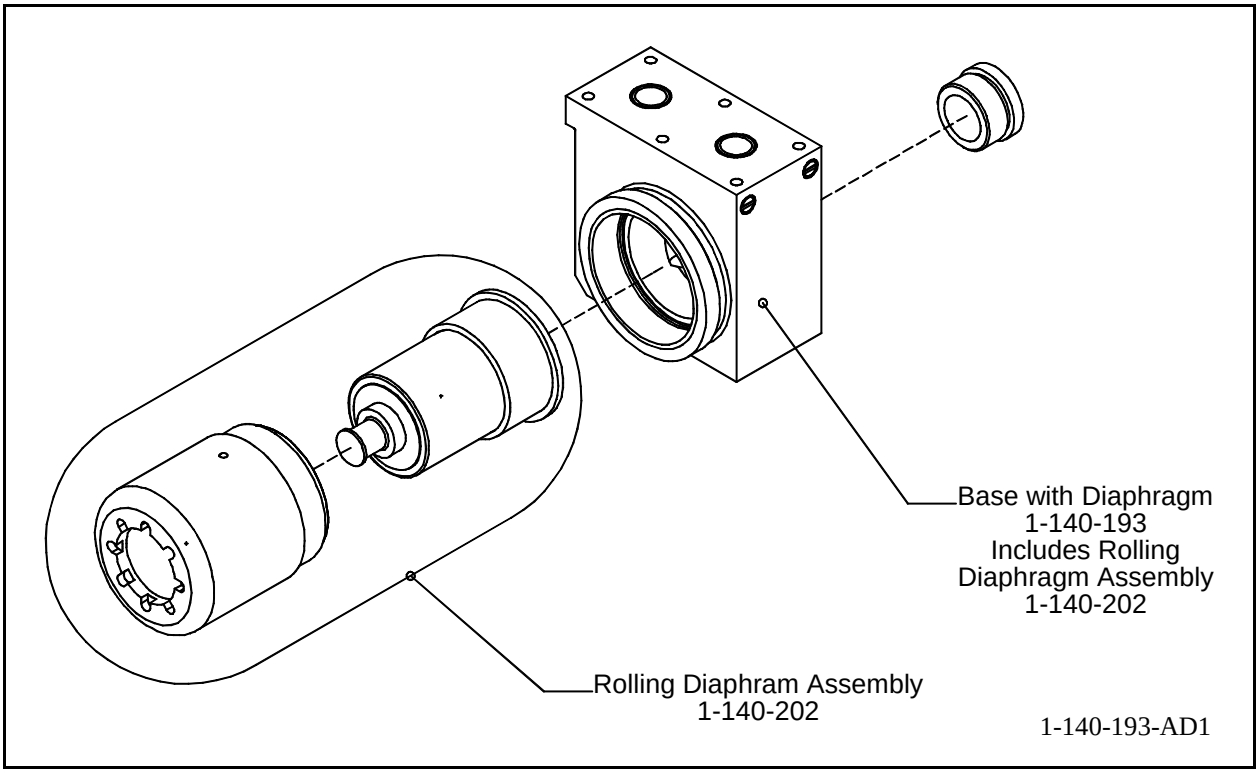

Figure 8-10, HVP Head Assembly

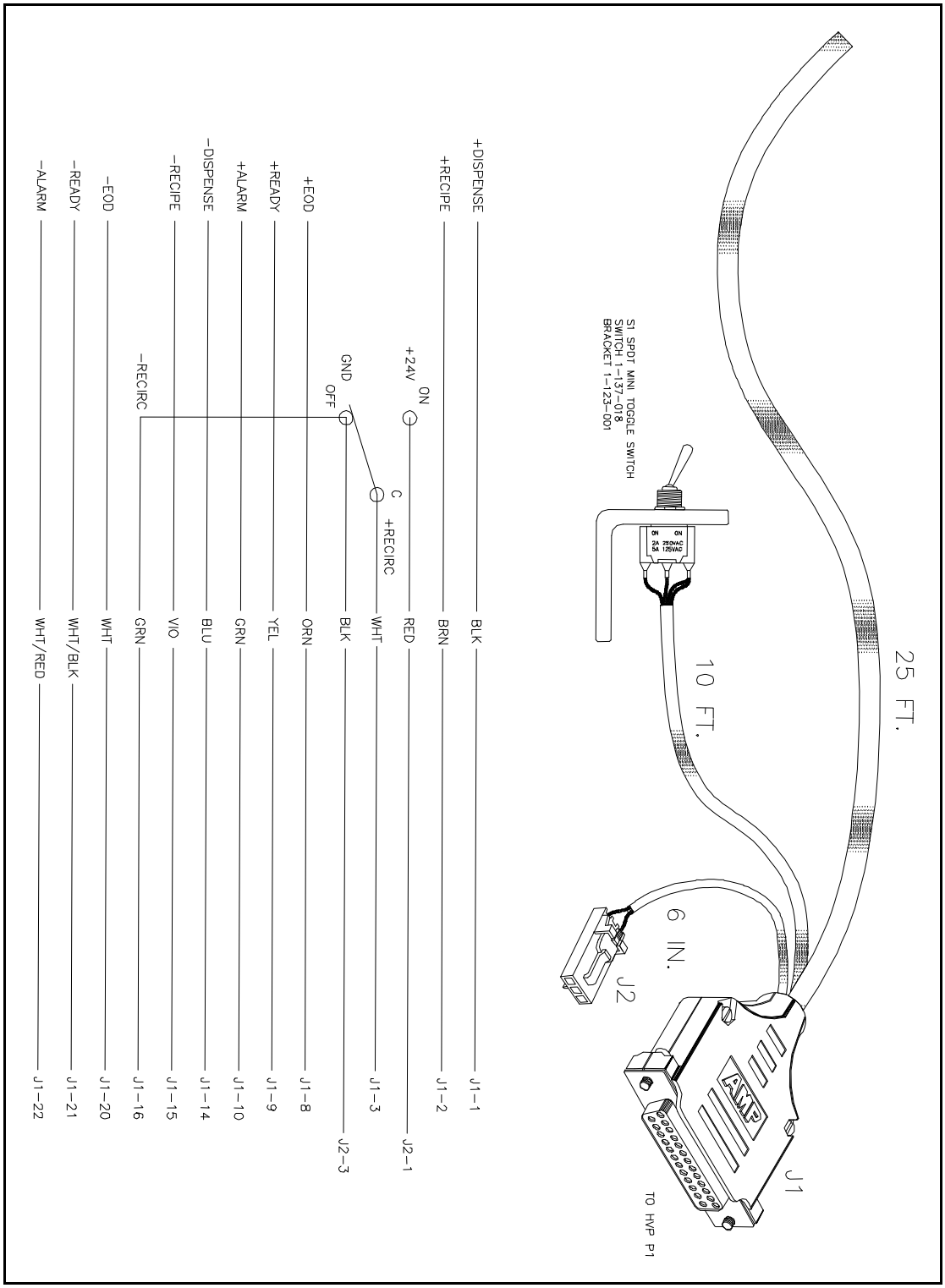

Figure 8-11, External Recirculation Switch

SECTION 9

SPARE PARTS

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RECOMMENDED SPARE PARTS

IDI Part Number	Description	Quantity
1-110-047	Solenoid Valve 24v	1
1-135-267	Stepper Motor Controller	1
1-137-010	Pressure Switch 60PSI	1
1-137-048	Fiber Optic leak sensor & lens	1
1-139-057	PCB Assembly HVP	1
1-140-193	HVP Pump Head Assembly	1
2-103-035	HVP Stepper Motor Assembly	1
2-103-036	HVP Fan Assembly	1
2-103-043	Sensor, Pressure	1

SECTION 10

OPTIONS

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OPTIONS

FILTER

The HVP is installed with or without a filter.

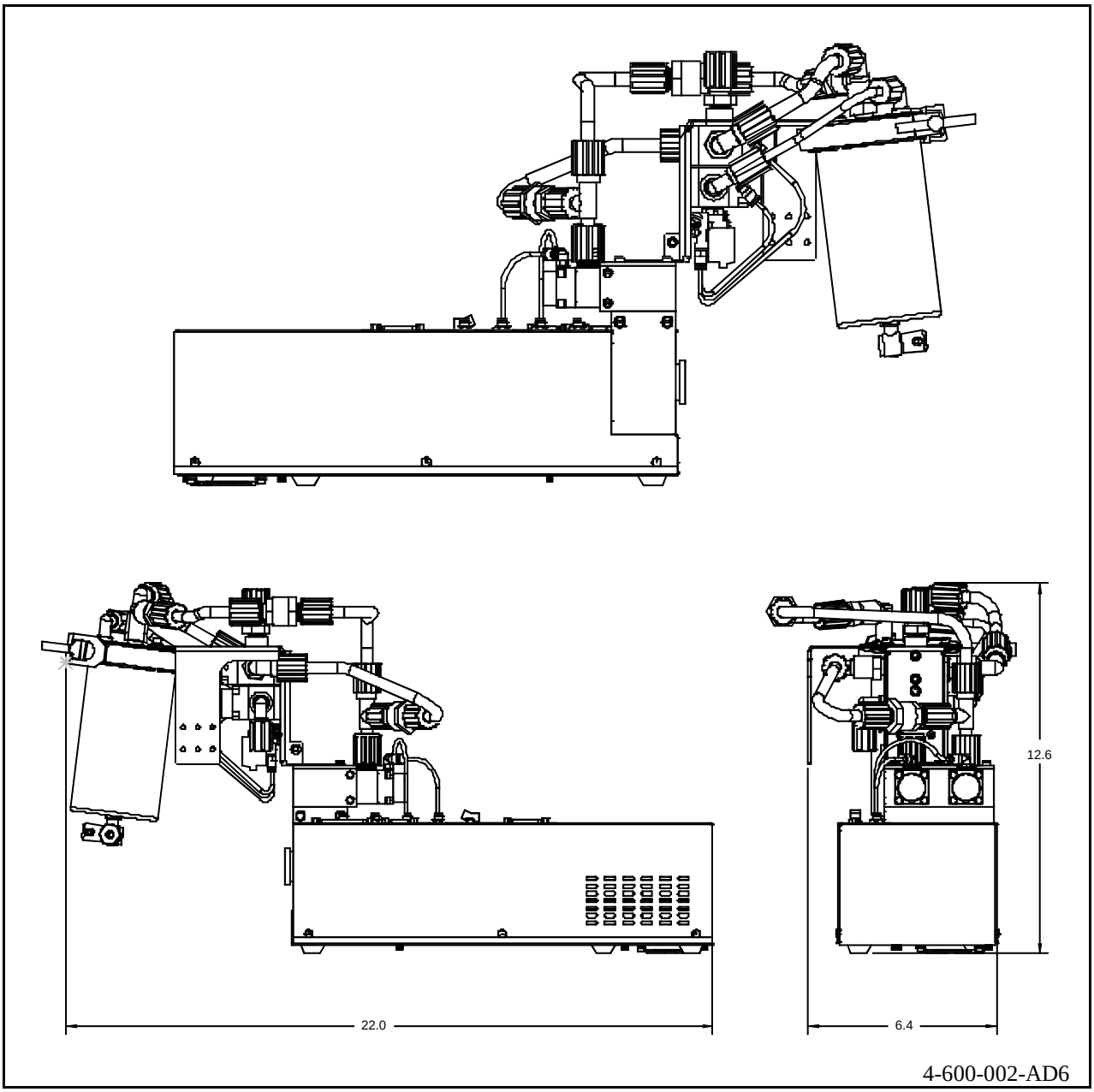


Figure 10-1 HVP With Filter

The filter assembly is connected in the dispense circuit portion of the HVP flow path. The filter is configured so the pumped fluid will be filtered as it is being dispensed.

The filtration configuration supports suckback after dispense, the suckback will be so that there will not be reversed flow through the filter (Flow through the filter is one direction). This filtration will provide a way for gas and air bubbles to be vented out of the system.

INPUTS/OUTPUTS

The below figure is a general plumbing diagram of the HVP filter system

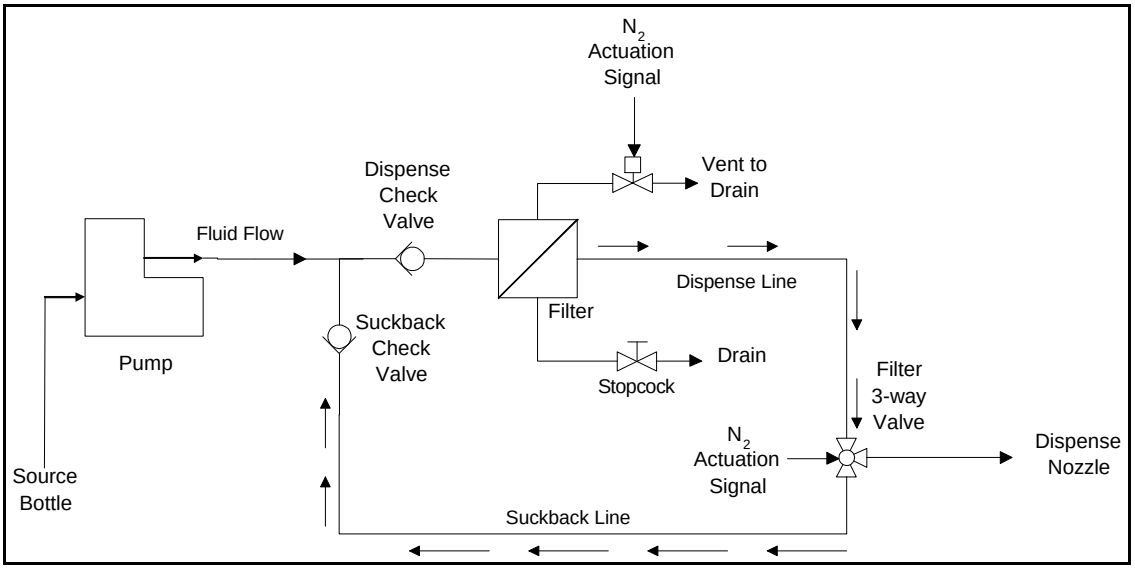


Figure 10-2, Filter System Diagram

The filter container has one input and two outputs.

- One input for liquid fluid being filtered.
- One output for the filtered liquid fluid.
- One output to selectively vent trapped multi-phase fluid out of the filter container.

The control portion will provide one pneumatic signal to actuate the three-way filter valve and one pneumatic signal to actuate the two-way vent valve.

For pin/wiring connections see figure 10-3

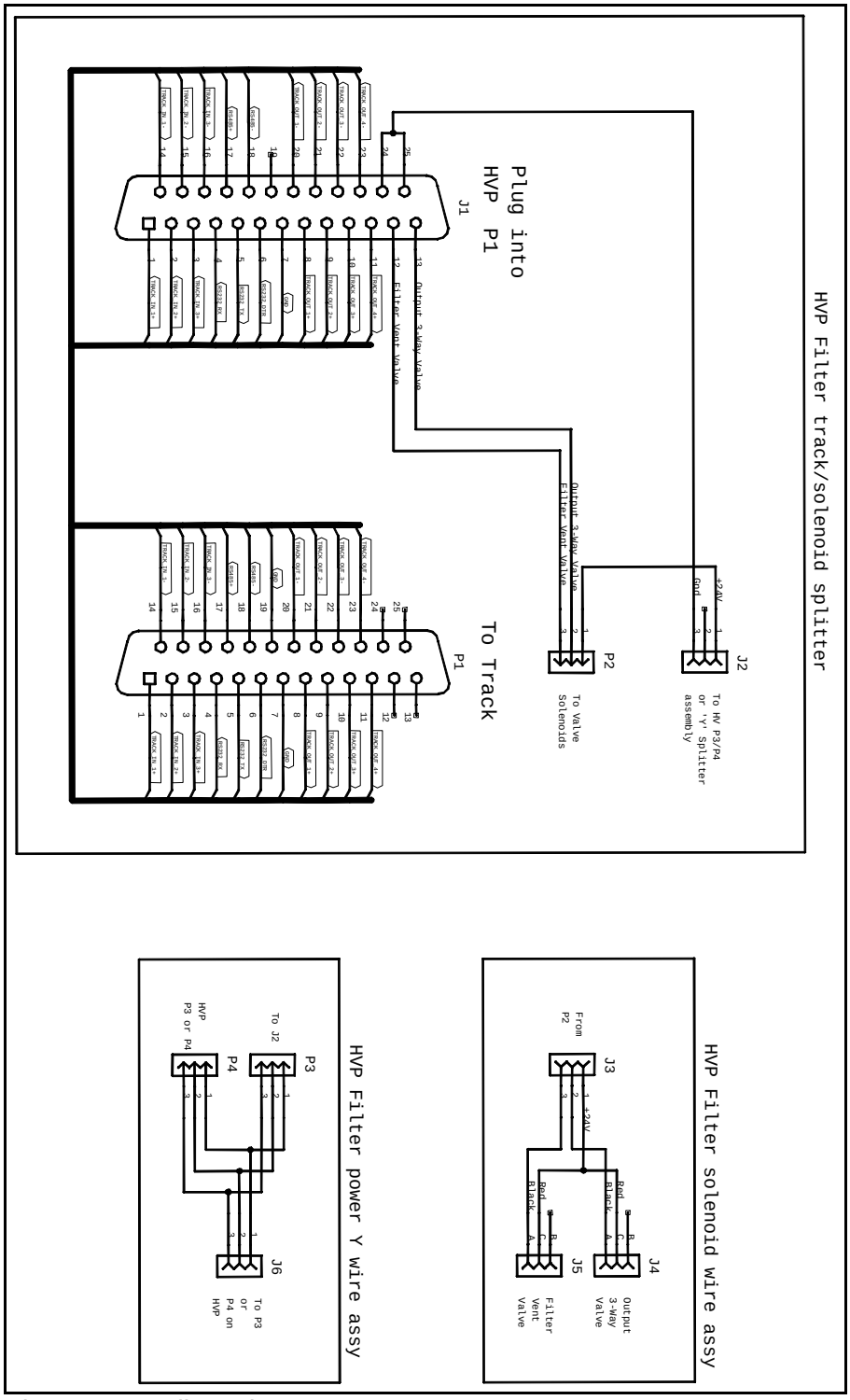


Figure 10-3, Filter Diagram

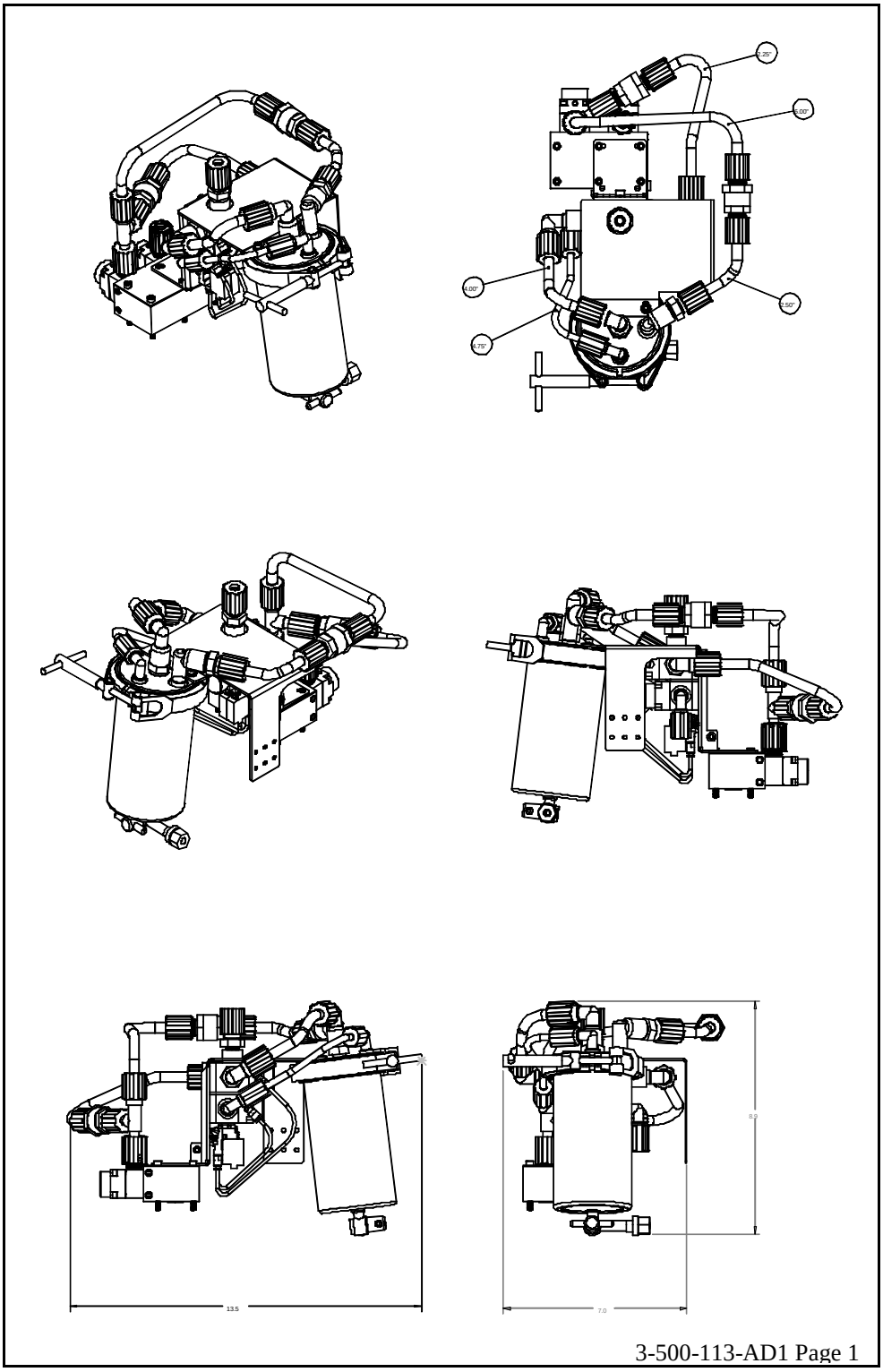
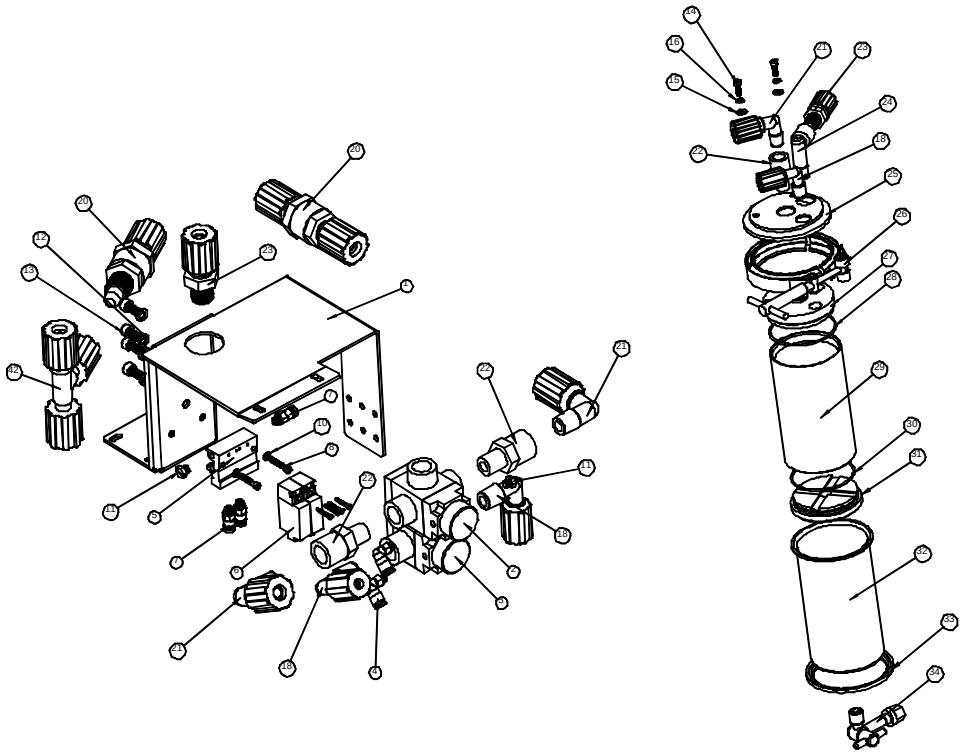


Figure 10-4 40 Stack w/Double External O-Ring

ITEM NO.	PART NO.	REVISION	DESCRIPTION		QTY.
1	1-141-208	A/00	FILTER BRACKET		1
2	2-103-062	A/00	THREE WAY VALVE		1
3	1-110-032	A/00	VALVE, DIAPHRAGM	2 WAY, NC	1
4	1-104-207	A/00	MALE ELBOW	10-32 x 1/8" TUBE	2
5	1-103-069	A/00	PILOT MANIFOLD VQ 2 POS	SMC# VV3Q12-2	1
6	1-110-047	A/00	VQ SOLENOID VALVE	24V, LOW POWER	2
7	1-104-204	A/00	MALE CONNECTOR	10-32 x 1/8" TUBE	3
8	1-120-460	A/00	SCREW, SCKT HD CAP	#4-40 X 5/8 IN LG	2
10	1-122-014	A/00	LOCK WASHER	#4 (SS)	2
11	1-103-201	A/00	PLUG 10-32	NICKLE PLATED	2
12	1-122-011	A/00	LOCK WASHER	#10 (SS)	4
13	1-120-130	A/00	SCREW, SCKT HD CAP	#10-32 X 3/8 IN LG	4
14	1-120-850	A/00	SCREW, SCKT HD CAP	#8-32 X 1/2 IN LG	2
15	1-122-008	A/00	FLAT WASHER	#8 (SS)	2
16	1-122-018	A/00	LOCK WASHER	#8 (SS)	2
18	1-105-035	A/00	ELBOW	1/4" FLARE M/F	3
20	1-105-374	A/00	CHECK VALVE, PFA	1/4" FLARE, 1/2 PSI	2
21	1-105-141	A/00	ELBOW	1/4" FLARE x 1/4" MNPT	3
22	1-105-144	A/00	UNION CONNECTOR	1/4" MNPT x 1/4" FNPT	3
23	1-105-143	A/00	UNOIN CONNECTOR	3/8" FLARE X 1/4" NPT	2
24	1-105-142	A/00	STREET ELBOW	1/4" FNPT x 1/4" MNPT	1
25	1-141-479	A/00	FILTER HOUSING CAP		1
26	1-100-303	A/00	CLAMP-QUICK RELEASE	V INSERET	1
27	1-140-251	B/00	FAB, TOP, FILTER	511 DOUBLE O RING	1
28	1-124-064	A/00	O-RING, EPR, FILTER TOP	2-038	1
29	1-140-253	F/00	FILTER TUBE		1
30	1-124-101	A/00	O-RING, TEFLEX, PFA/VITON	2-037	1
31	1-140-386	B/00	TEFLON FILTER BASE	MODEL 510	1
32	1-141-482	C/00	CASING, FILTER BOWL	350 mL, 5.433 LONG	1
33	1-141-484	C/00	FILTER RING		1
34	1-110-097	A/00	VALVE, STOPCOCK		1
42	1-105-145	A/00	TEE	1/4" FLARE	1
43	1-140-201	A/00	3/8" HVP VALVE BLOCK ASSY		1



3-500-113-AD1 Pages 2,3,4,

Figure 10-5 40 Stack w/Double External O-Ring Parts List

FILTER CARTRIDGE REMOVAL AND REPLACEMENT

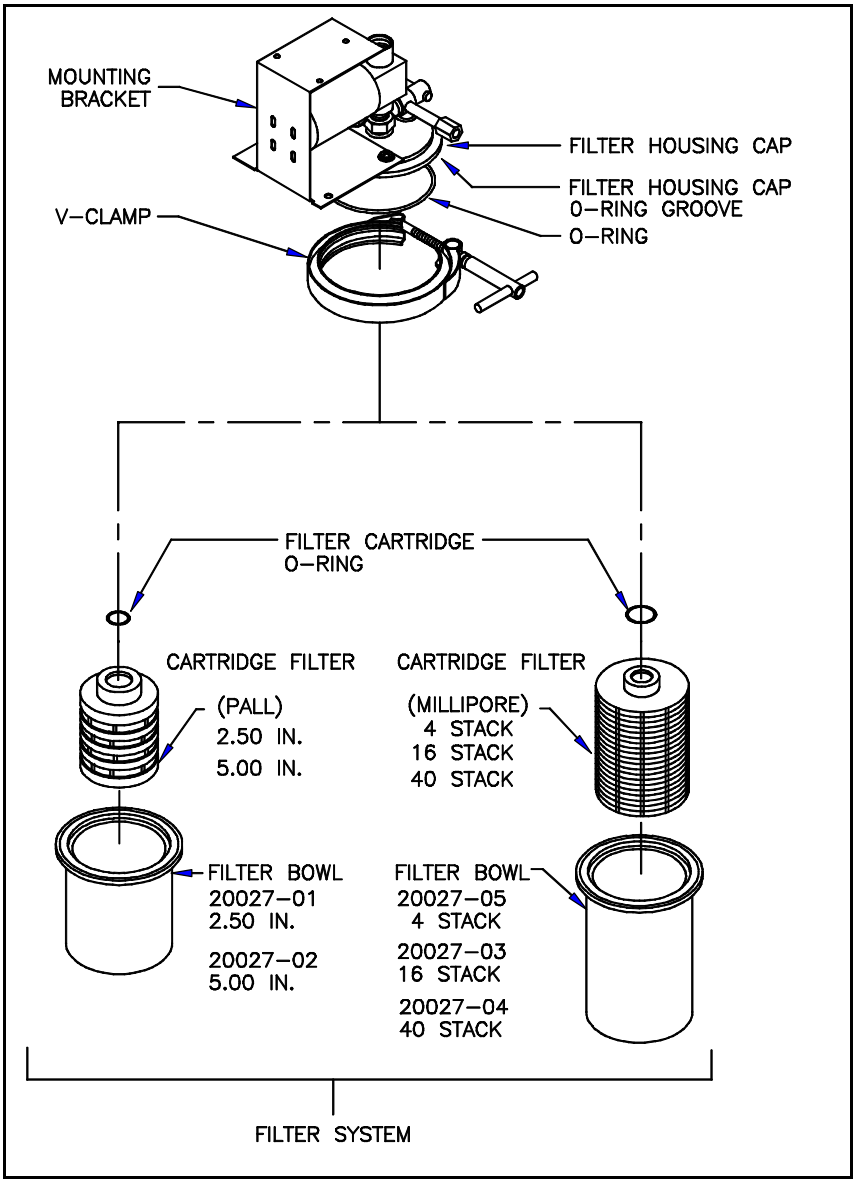


Figure 10-6, Filter System

To remove and replace the filter cartridge perform the following:

1. Remove power.

CAUTION: When Draining Chemicals From The Filter System Use A Safety Hazardous Container.

2. Place a safety hazardous container under the filter housing and open the stopcock to drain the fluids from the filter housing for approximately 30 – 60 seconds, depending on the fluid viscosity.
3. After the Filter housing is drained close the stopcock and loosen the V-Clamp and carefully separate filter housing from the filter housing cap.
4. Remove filter cartridge from the filter bowl. Pour any remaining liquid in the filter bowl into a hazardous container.
5. Inspect filter housing cap O-ring for damage. Replace if damaged. Install O-ring in filter.

NOTE: Certain Application Fluids Require The Filter Cartridge To Be Wet Before Use. Refer To The Application Fluid And Filter Manufactures' Instructions.

6. On the new filter ensure that the proper cartridge 0-ring is installed inside the cartridge.
7. Place the cartridge flush against the filter housing cap and tighten the V clamp until you can not tighten any longer with you hand. Check stopcock to ensure it is closed.
8. Turn power on and perform the *Quick Prime/Purge* procedure as described in section two of this manual.