Contamination Prevention System (CPS) Maintenance
(addendum/revision to 6270A Service Manual)

The contamination prevention system (CPS) is an accessory used to protect the pressure controller from contamination from the Device Under Test (DUT).

Note
Replace parts as required. See the Replaceable Parts section of the
6270A Service Manual

CPS Normal Operation

When the CPS is enabled, the controller (6270A or 2271A) controls the CPS valves to decrease the test system pressure, purge contaminates, and completely vent the test system.

The CPS **Vent** valve is used to decrease test system pressure (see Figure A).
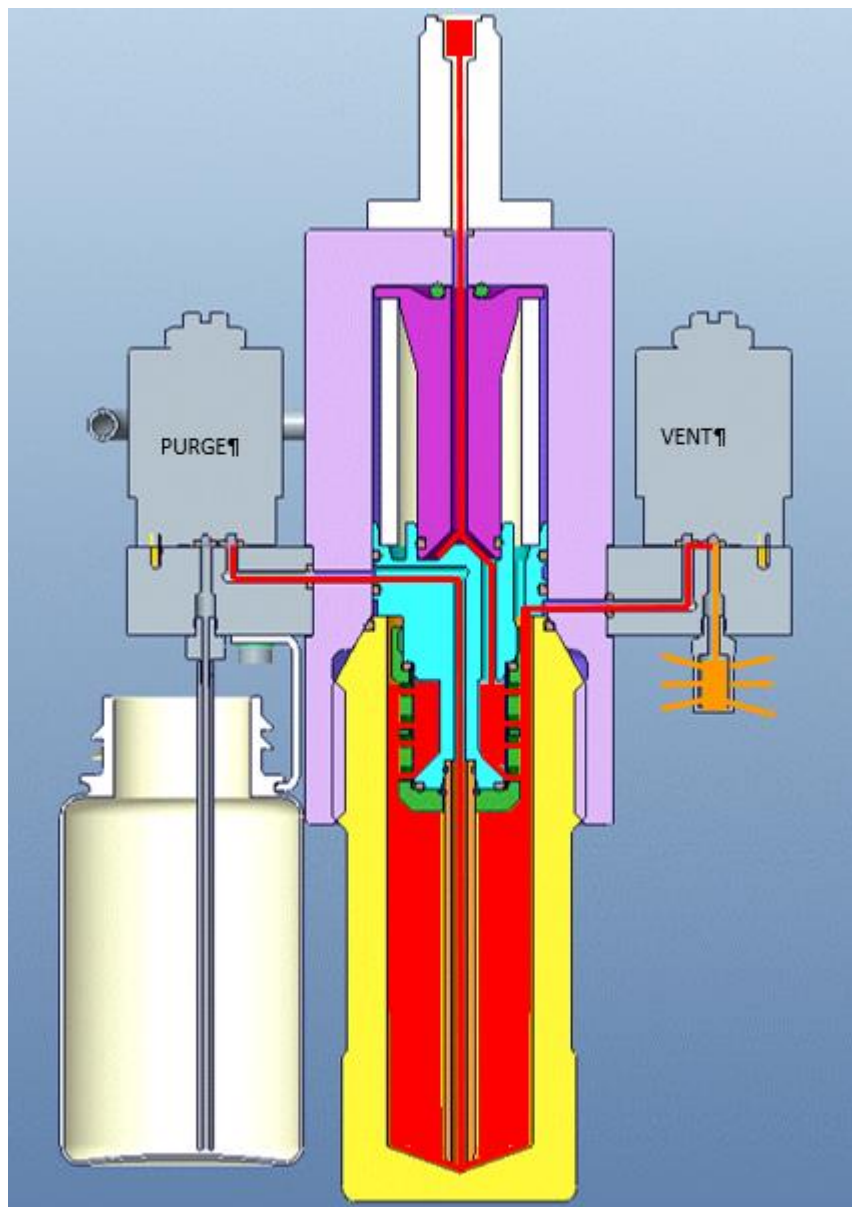

Figure A. CPS Purge (Final Vent Also)

Note
Pressure from the controller is also decreased and vented through the
CPS but is not shown in Figure A or B.

The CPS **Purge** valve is fully opened when the test system pressure is less than 170 kPa (25 psi) to push contaminates to the waste bottle, and leave the test system fully vented (see Figure B).
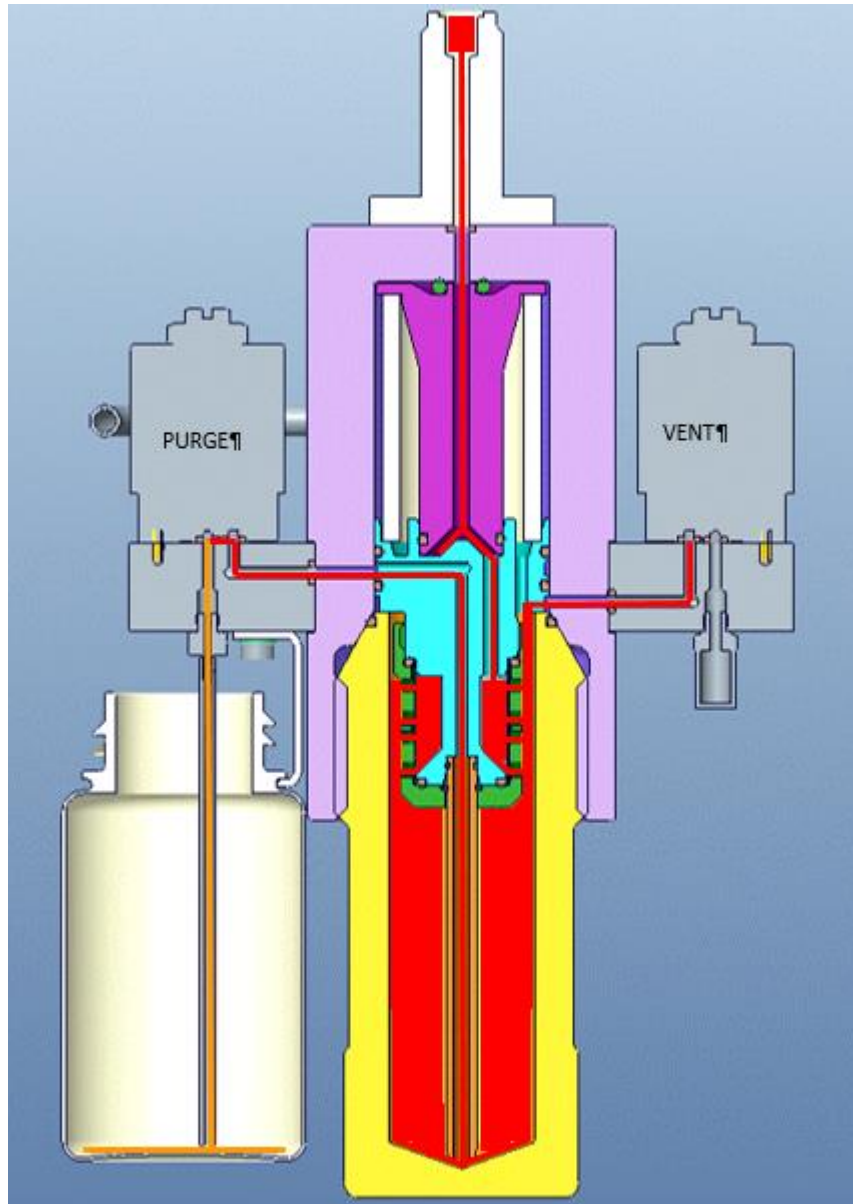

Figure B. CPS Purge (fully vented condition also)

Note
When fully vented, the controller's vent valve is also open.

Note
Some pressure control is done by the controller for precise pressure control to a setpoint.

CPS Tasks (from the Setup --> Tasks menu path on the controller's display)
Purge
Purge is used to purge the test system connected to the CPS of liquid or particulate contaminates by pressurizing and venting the test system plumbing through the CPS (same as normal operation). It is recommended to do this before a calibration is performed if contaminates might be present. To purge the system, the Product pressurizes to the user-defined purge pressure and then vents to the plastic waste container. The controller repeats the process for the number of cycles that are set.

To run a purge process:
1. Select the Purge Task to enter the menu.
2. Set the Pressure, 500 kPa (70 psi) for example (but not higher than the rating of the DUT).
3. Set the number of cycles.
4. Select Run to start the purge process.

CPS Cleanout
CPS Cleanout is a function that pushes contaminates from the sump of the CPS to the waste bottle. A low pressure setpoint is automatically set to establish a flow to clean out the CPS for the specified amount of time. This same function occurs every time the CPS is controlling downward or venting with the pressure less than 170 kPa (25 psi).

CPS Cleanout function (with TEST port capped, or DUT on top of CPS)
Flow is from the controller, through the paper coalescing filter (outside to inside), down to the sump, up through the purge tube and filter manifold, through the purge valve and into the waste bottle
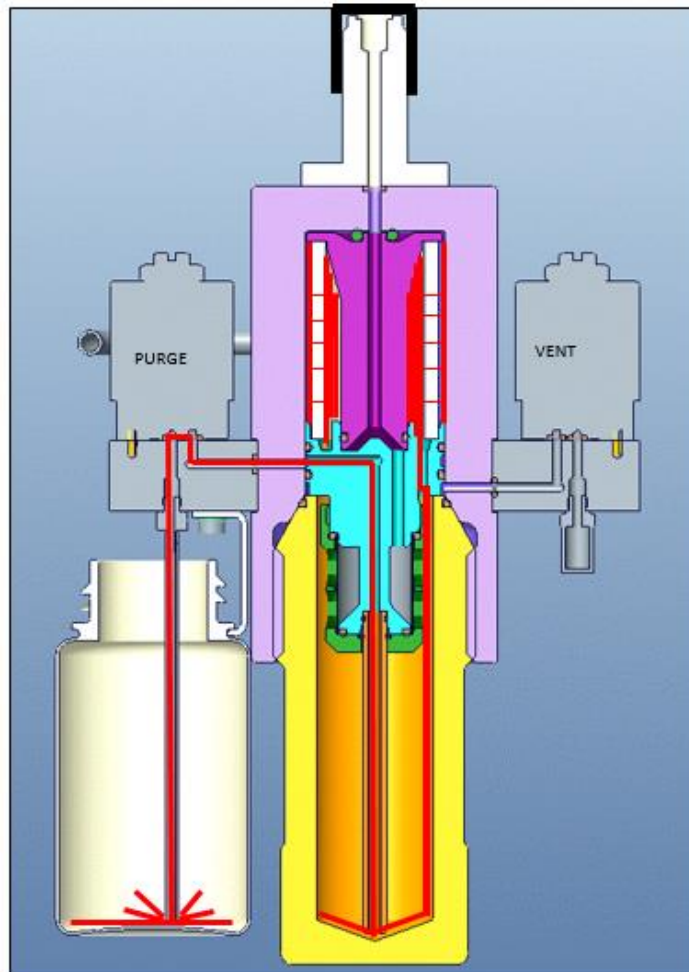

Figure C. CPS Cleanout function (with TEST port capped)

CPS Cleanout function (with TEST port open)

Flow is the same path as with the TEST port capped; and also through the screen (outside to inside), up through the filter manifold and filter retainer, and out the TEST port. If you remove the waste bottle and pinch the waste tube closed you might get more flow out the TEST port. Hold a towel over the TEST port so contaminates are not sprayed out of it. (wear safety glasses)
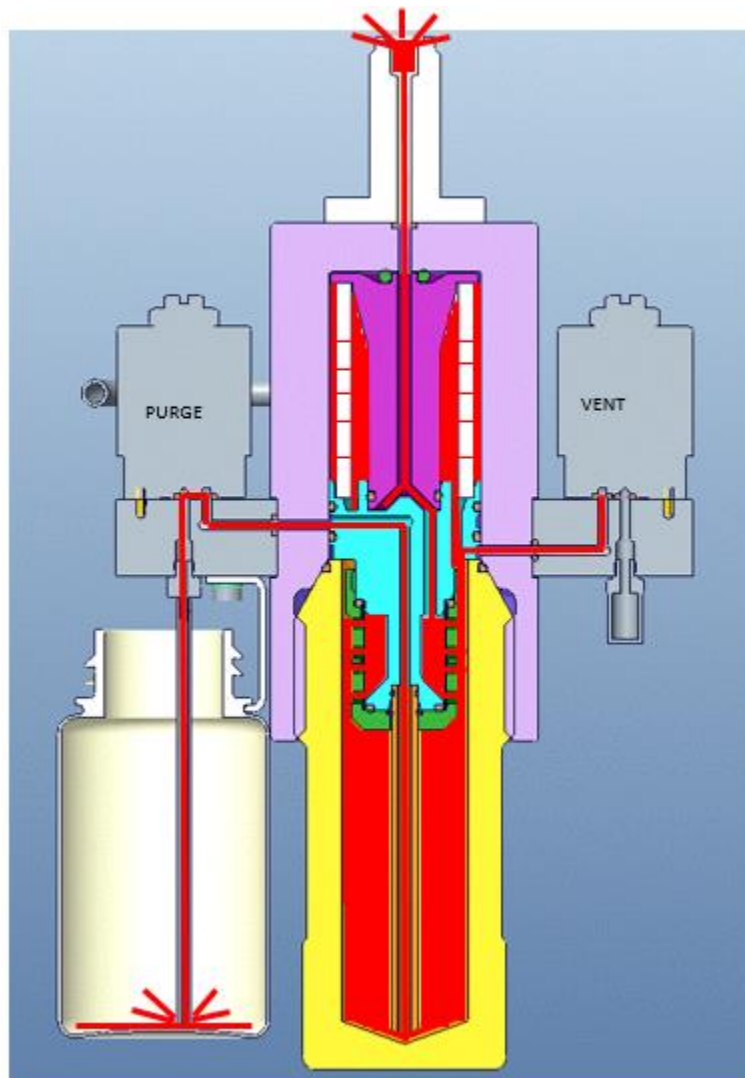

Figure . CPS Cleanout (with TEST port open)

CPS Cleaning and Inspection

To clean and inspect the CPS filter assembly (see Figure 48):

1. Vent the Product to remove all pressure to and from the CPS.
2. Remove the hose from the quick connect (1).
3. Remove the lower housing (2) from the upper housing (3). Turn the housing counter clockwise to loosen it.
4. Pull straight out on the purge tube portion of the filter assembly (4) to remove entire assembly from the upper housing.
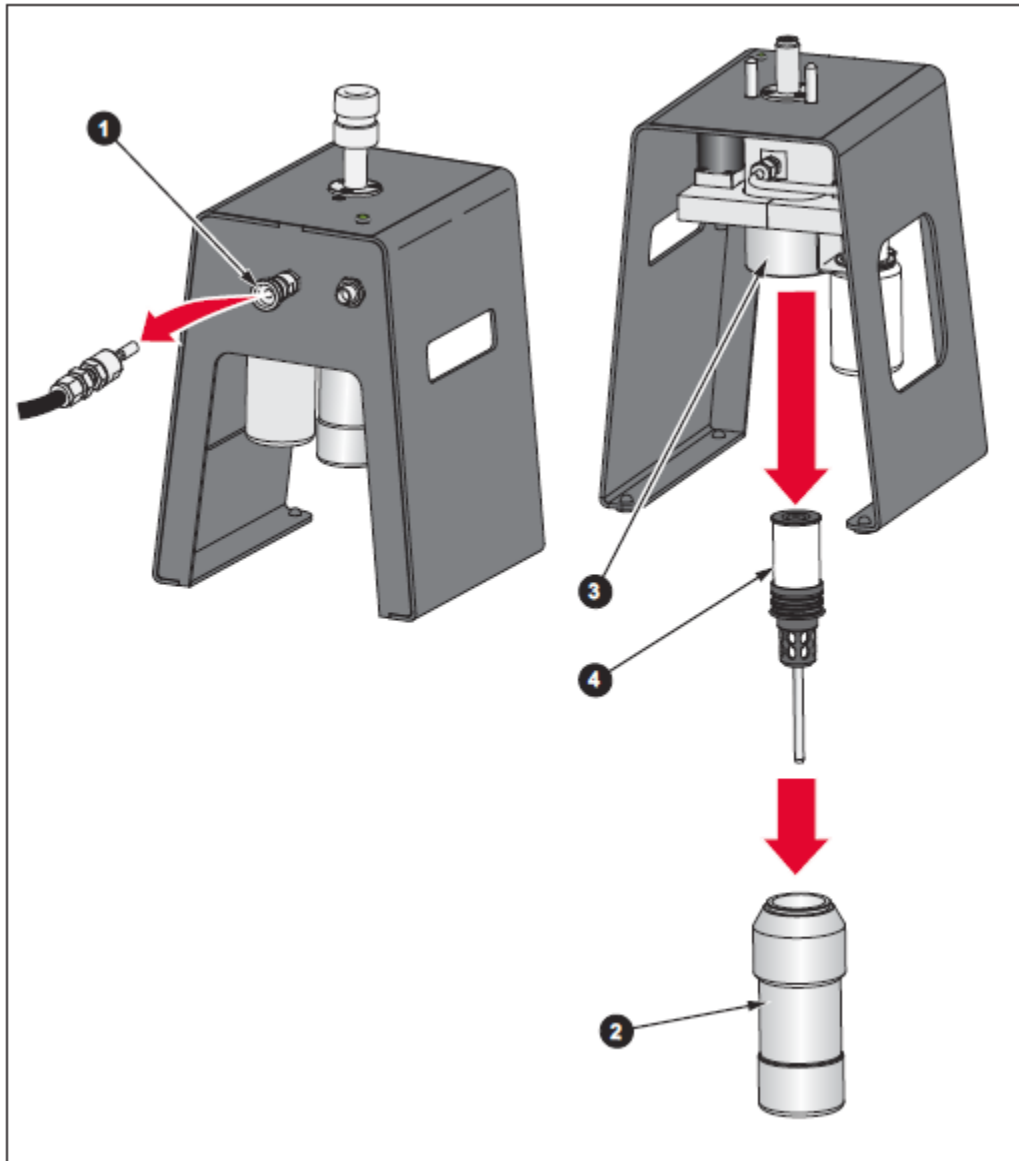

Figure 48. CPS Cleaning and Inspection

5. To disassemble the filter assembly (see Figure 49), turn the screen retainer (5) counter clockwise to remove it from the filter manifold (6).
6. Pull the filter and retainer from filter manifold while rocking side to side carefully to remove the coalescing filter (7) and filter retainer (8).
7. Remove the purge tube (9) from the filter manifold (6) by pulling them straight apart. It is sealed by a small O-ring on the end of the purge tube.
8. The screen (10) is the part most likely to be contaminated with particulates or liquids/oils. It can be removed from the screen retainer (5) by pulling it out. It is stainless steel and should be cleaned with a solvent (like alcohol), then dried with clean dry air or nitrogen. Remove the screen retainer (5) O-ring also.
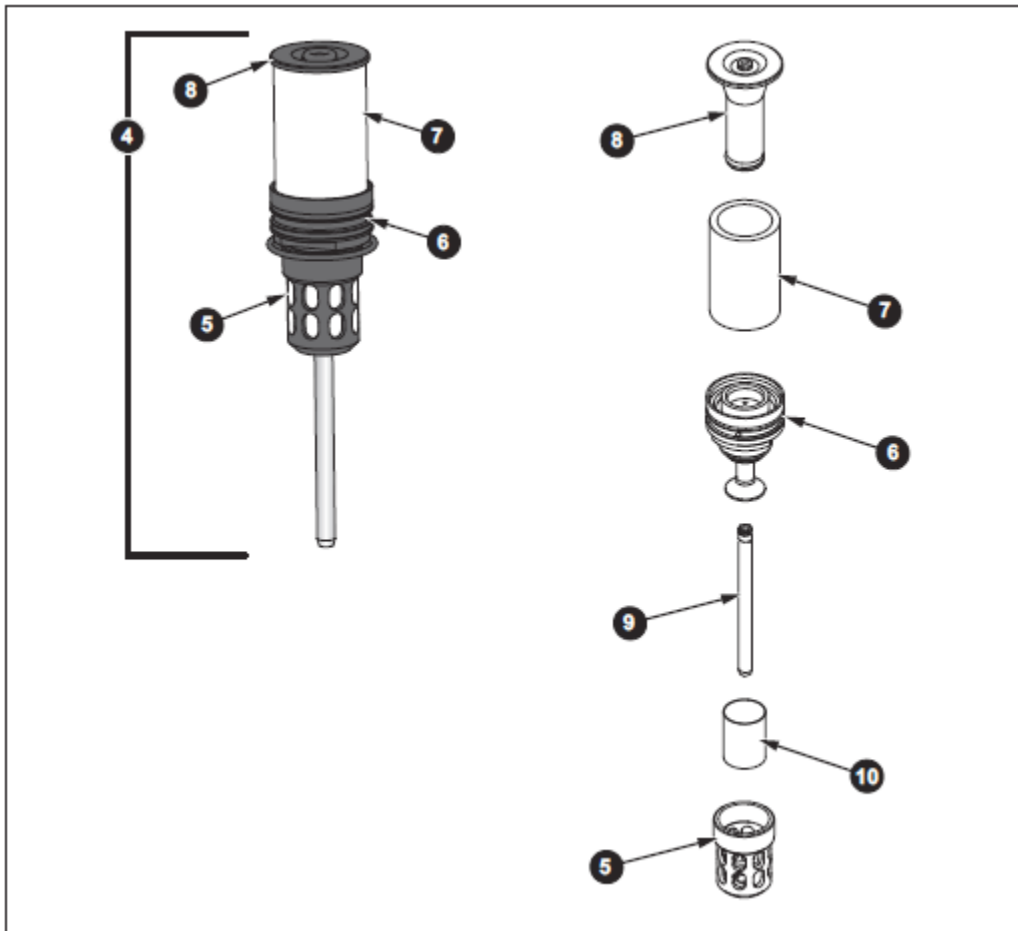

Figure 49. CPS Filter Disassembly

9. Inspect all of the parts and clean or replace as necessary. Coat the O-rings *lightly* with vacuum grease (except for the screen filter retainer o-ring that is not greased).

> To install the screen:
> A. Carefully insert screen (10) into screen retainer (5).Do not apply vacuum grease.
> B. Insert screen retainer o-ring into screen retainer (5) to groove just below threads. Do not apply vacuum grease to this o-ring. Tuck o-ring between screen and retainer.
> C. Drop purge tube (9) into screen retainer (5).
> D. Guide filter manifold (6) with o-rings into screen retainer (5). Take care to not bend edges of screen.
> E. Hand-tighten screen retainer onto filter manifold until positive stop. Do not over-tighten.

10. Inspect to make sure all O-rings are in the correct place prior to re-assembly (see Figures 48, 49 and 50).
    • The filter retainer (8) has an O-ring on each end.
    • The filter manifold (6) has 3 O-rings.
    • The purge tube (9) has one O-ring and a c-clip.
    • The screen retainer (5) has one O-ring.
    • The lower housing has (2) one O-ring.
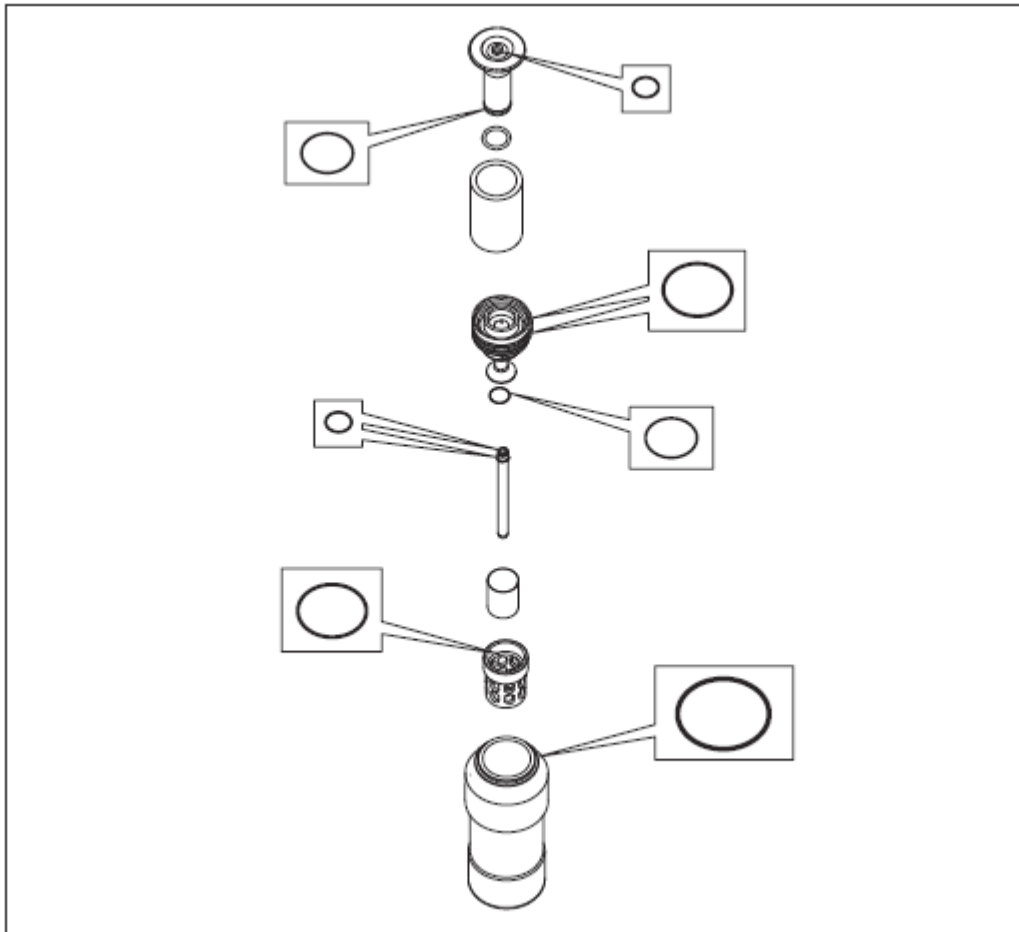11. Reassemble in reverse order.

Figure 50. O-ring locations

Note:
There must not be any grease or oil on the metal screen (10) because this can cause a differential pressure over the screen (and from the 6270A controller to the DUT). If you notice a differential pressure from the 6270A controller to the DUT inspect the metal screen.

Separate the Lower and Upper Housing

To separate the lower and upper housing, see Figures 51 and 52:

1. Vent the controller to remove all pressure to and from the CPS.
2. Remove the hose from the quick connect (1).
3. Use a 3 mm socket to remove the 3 M4-0.7 X 12 MM socket-head screws (2) and remove the mounting-post assembly (3). Ensure the O-ring (4) remains secure in place.
4. Place the entire assembly on its top and use a 9/16 inch wrench and 5/8 inch wrench to remove the tube (5).
5. Stand the assembly upright and while holding the lower housing (6), use a #2 Philips screwdriver to loosen two of the three screws (7) and completely remove them.
6. Hold the lower housing assembly and remove the 3rd screw (8) while carefully supporting the entire lower and upper housing assembly (9). The assembly is heavy. Let it rest on a table top after you remove the 3rd screw.
7. With the lower and upper housing assembly separated from chassis (10), carefully tilt the chassis back to allow full access to the valves (11).
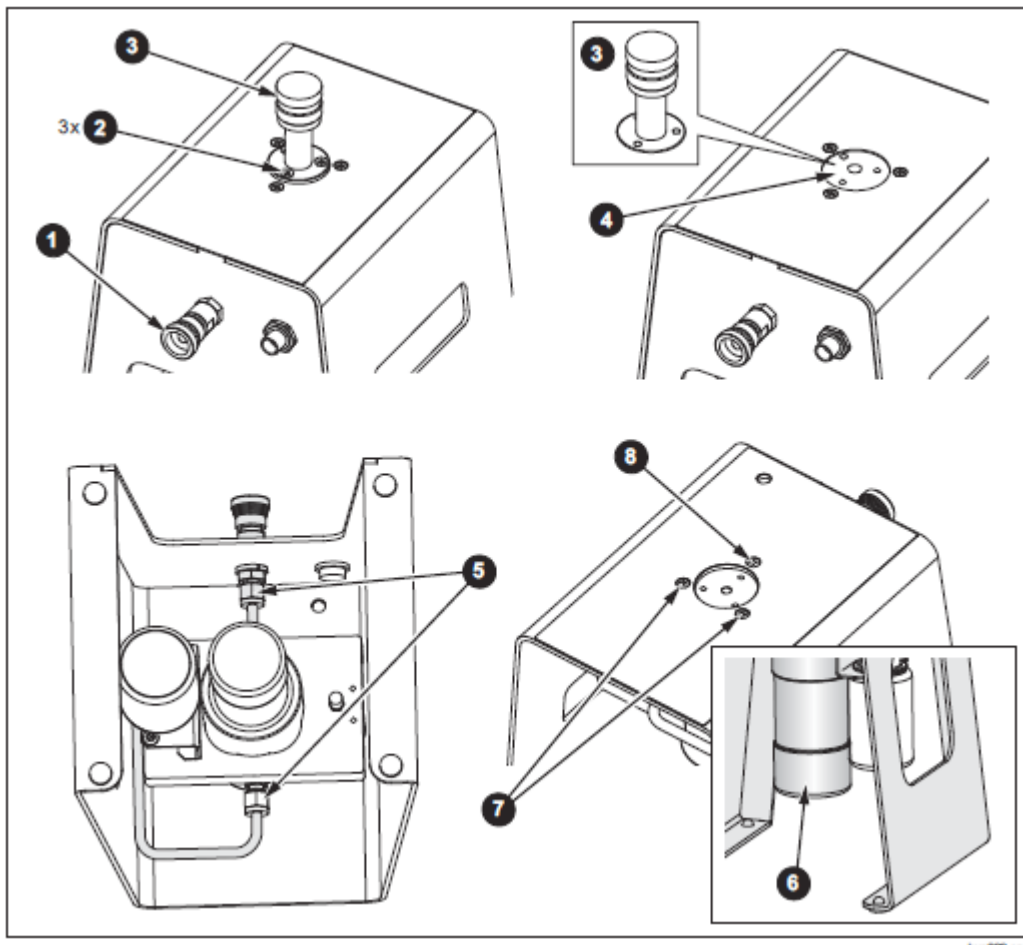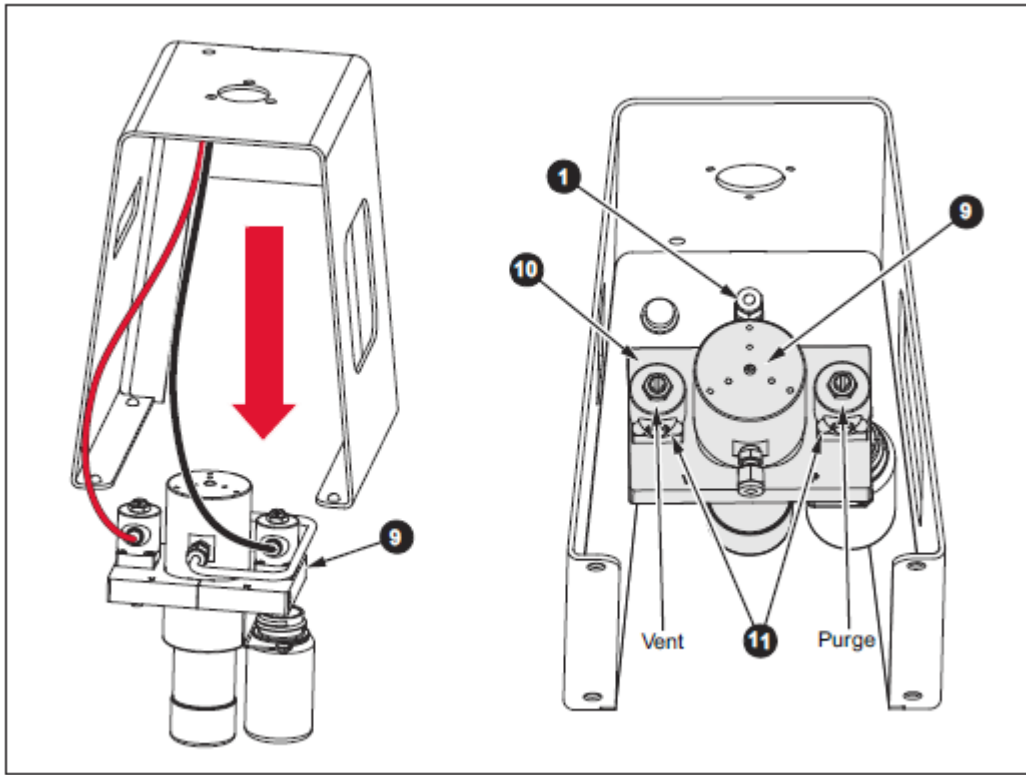8. Reassemble in reverse order.

Figure 51. CPS Disassembly

Figure 52. Housing Removal, and Vent and Purge Valve Identification

Inspect and Replace the CPS valves

To inspect and replace the CPS valves, see Figure 53:

1. Separate the lower and upper housing from the chassis as described previously.
2. Vent the controller to remove all pressure to and from the CPS.
3. Use a 9/16 inch socket or wrench to remove the retaining nut (1) for the valve coil (2).
4. Remove the coil from the valve base (3).
5. Use a flat-head screwdriver to remove the valve stem (4) from the valve base.
6. Ensure the O-ring (5) remains in the valve base and do not lose the valve body (6). Note that the vent valve has a spacer that goes above the valve body and must be in the vent valve assembly for proper operation.
7. Remove the valve body from the valve stem and inspect the sealing surface (7) for any contamination or damage.
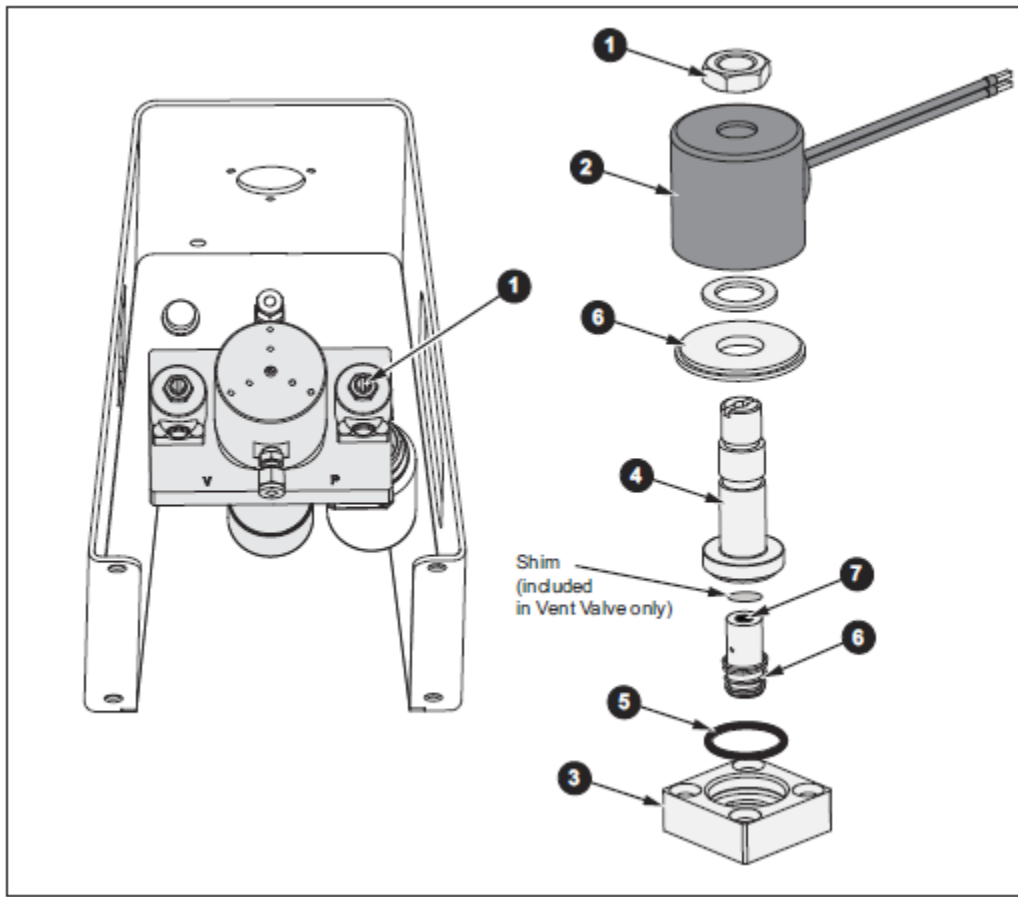8. Reassemble in reverse order.

Figure 53. CPS Valve Replacement

Note:
When the lower and upper housing is mounted to the chassis, lift the assembly up and install one screw and leave it slightly loose to allow orientation. Then install the remaining two screws.