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Service Note

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# ZERO/SPAN VALVE RETROFIT FOR A MODEL M300E

**I. PURPOSE:**

This note describes how to install a Zero/Span valve option into an M300E analyzer that previously did not have one.

**II. TOOLS:**

Diagonal Cutters
2 Adjustable wrenches
Phillips head screwdriver

**III. PARTS:**

KIT000232 M300E Z/S valve option

**IV. PROCEDURE:**

1.) Turn the analyzer off and unplug the power cord. Remove the Phillips head screws holding the cover to the chassis. Make sure to loosen the captive screw on the top center of the rear panel. Remove the cover from the analyzer.

2.) Locate the piece of 1/8$^{th}$ inch tubing running from the sample inlet bulkhead fitting on the rear panel to the sample filter on the front panel. Remove this piece of tubing.

3.) Take the two bulk head fittings and install them on the rear panel in the ports labeled Zero and Span. Tighten the fittings into place using two adjustable wrenches.

4.) Mount and orientate the valves as shown in the M300E drawing below. Use the four 8 3/8" (SN-11) screws to mount it to the bottom of the chassis.

5.) Located near where the valves were installed you will find two quick connectors. These will be labeled Z/S and Sam/Cal. You may have to remove some heat shrink on the connector in order to see the label. Wire up the valves so that the Zero/Span valve connects to the Z/S connector and the Sample/cal valve is wired up to the Sam/Cal connector.

6.) Locate the piece of 1/8$^{th}$ inch tubing coming off the Sample/Cal valve that is labeled "Sample In". Run this piece of tubing to the rear panel of the analyzer and connect it to the Sample In fitting. Ensure this fitting is tight using a wrench.

7.) Locate the piece of 1/8$^{th}$ inch tubing coming off the Sample/Cal valve that is labeled "To Filter". Run this piece of tubing to the sample particulate filter on the front panel and connect it to the fitting that you disconnected the tubing from in step 2. Ensure this fitting is tight using a wrench.

8.) Locate the piece of 1/8$^{th}$ inch tubing coming off the Zero/Span valve that is labeled "To Span". Run this piece of tubing to the Span gas input fitting that you installed on the rear panel in step 3. Ensure this fitting is tight using a wrench.

9.) Locate the piece of 1/8th inch tubing coming off the Zero/Span valve that is labeled “To Zero”. Run this piece of tubing to the Zero input fitting that you installed on the rear panel in step 3. Ensure this fitting is tight using a wrench.

10.) The valves are now pneumatically and electronically connected. We need to now tell the analyzer that we have installed new hardware. Turn on the analyzer. After it boots up press <SETUP><MORE><DIAG>when ever it asks for the password enter in 929. Once in the DIAG menu hit the NEXT button until you come to FACTORY OPTIONS and hit ENTER. Hit SET> or NEXT once until you get ZERO/SPAN VALVES: OFF. Edit this option and turn it ON. Exit back to the main menu and cycle power. When the analyzer powers back up you should see CAL, CALZ, and CALS. This indicates that the analyzer has Valves installed in it. If you do not have these three calibration buttons go back into the Factory Options and make sure the ZERO/SPAN VALVES are turned ON.

11.) The valves are now installed into the analyzer. Before returning the analyzer back into normal service make sure that the analyzer does not leak and that the flow rates are correct.

**Leak checking**

To leak check the analyzer cap the sample inlet and make sure the pressure drops to <10”Hg and sample flow rate drops to <10cc. Next remove the cap on the Sample inlet and cap the ZERO port. Press the CALZ button on the front panel of the analyzer. Again make sure the pressure drops to <10”Hg and sample flow rate drops to <10cc. Next remove the cap on the ZERO port and cap the SPAN port. Press EXIT then the CALS button on the front panel of the analyzer. Again make sure the pressure drops to <10”Hg and sample flow rate drops to <10cc. If all of these check out then the analyzer is not leaking.

12.) Next measure the flow of the analyzer in all 3 modes with an external flow meter. The normal expected flow rate of each analyzer is listed below. Measure all the flow rates and ensure that all flows are to with in +/- 10%

**EXPECTED FLOW RATES IN ALL THE MODES OF OPERATION**

| | | | |
|---|---|---|---|
| In Sample mode: | Sample In=800cc/min | Zero In=0cc/min | Span In=0cc/min |
| In CALZ mode: | Sample In=0cc/min | Zero In=800cc/min | Span In=0cc/min |
| In CALS mode: | Sample In=0cc/min | Zero In=0cc/min | Span In=800cc/min |

13.) If the analyzer passes leak and flow check, then put the cover back on, replace the Phillip head screws, and return the analyzer to normal operation

M300E