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External Reference Vacuum CDG Kit: p/n 4986635

Consists of:

| Item Num | Qty | Description  |
|----------|-----|--|
| 3138978  | 1   | 102975,CLAMP,KF16,ALUM,WING NUT  |
| 3134540  | 1   | 101544,RING,SS,CTR,VITON,KF16  |
| 3836181  | 1   | VALVE,BUTTERFLY,MANUAL,0.75 IN. VALVE,NW-16 FLANGE,304 STAINLESS STEEL       |
| 4989008  | 1   | 626C BARATRON ABS. C. MANOMETER (0.1-1000 TORR), 15-PIN D-SUBMIN. ELEC. CON. |
| 3142866  | 1   | 103636,PWR SUPPLY,CDG,DUAL   |
| 3841085  | 1   | PG9000-5352,RUGGED REUSABLE MOLDED TRANSIT CASE FOR PG9607 VAC MEASURE KIT   |
| 3142875  | 1   | 103638,CBL,CDG TO PWR SUPPLY,10FT  |
| 1259450  | 1   | FACTORY BASE WARRANTY, 1 YEAR  |

The above kit, when used with the procedure below, presumes the user has an external 25 mm TEE assembly. This hardware can be procured separately or with the PK-7600-VAC-VENT kit, part number 3070854.

| p/n     | Qty | Description                      |
|---------|-----|----------------------------------|
| 3133103 | 1   | 100352,RING,SS,CTR,VITON,KF10/16 |
| 3134533 | 2   | 101542,RING,SS,CTR,VITON,KF25    |
| 3135575 | 2   | 102121,CLAMP,KF25,ALUM,WING NUT  |
| 3138978 | 1   | 102975,CLAMP,KF16,ALUM,WING NUT  |
| 3139823 | 1   | 103123,TEE,KF25,ALUM             |
| 3139838 | 1   | 103124,VALVE,VENT,KF10,ALUM,     |
| 3139845 | 1   | 103125,RDCR,SS,KF25/KF16         |
| 3152620 | 1   | 560046,INSTR,VACUUM VENT KIT     |
| 1259450 | 1   | FACTORY BASE WARRANTY, 1 YEAR    |

## 7.3.5 CALIBRATION OF RESIDUAL VACUUM GAUGE

### 7.3.5.1 OVERVIEW

The PG7601-AF platform is equipped with a thermal conductivity vacuum gauge used to measure the residual vacuum under the PG7601-AF's bell jar in absolute measurement mode. The vacuum gauge should be regularly calibrated.

The vacuum gauge is calibrated by comparison to a vacuum reference. The calibration is performed without removing the gauge from the PG7601-AF platform. The reference gauge vacuum is attached to the PG7601-AF platform KF25 vacuum port (see Figure 43 .) The procedure requires that measurements be taken in static conditions, in which the reference and test vacuum gauges are isolated from the vacuum pump.

Once PG7601-AF vacuum gauge and reference vacuum gauge readings have been taken, the pressure adder (PA) and multiplier (PM) are edited in the PG7601-AF platform from the PG Terminal front panel to adjust the vacuum gauge as needed.

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### 7.3.5.2 PROCEDURE

Calibrating the PG7601-AF vacuum gauge requires a reference vacuum gauge and hardware to connect it to the PG7601-AF KF25 reference vacuum shutoff valve (see Figure 1).

To compare the PG7601-AF vacuum gauge and a reference vacuum gauge, proceed as follows (refer to Figure 43):

- 1 Allow all instrumentation to soak at laboratory temperature for at least 4 hours prior to calibration.

- 2 Remove the PG7601-AF piston-cylinder module (see Section 3.3.5).

Close the PG7601-AF vacuum vent valve (see Figure 1).

Close the PG7601-AF platform shutoff valve (see Figure 1).

- 3 Install a vacuum valve, valve 1 (see Figure 43), at the PG7601-AF KF25 vacuum port (valve 1 is provided with the PG7601-BAS-AF).

Install a KF25 tee at valve 1 (see Figure 43).

Install a vacuum valve, valve 2, at the end of the tee (see Figure 43) (valve 2 is NOT provided with the PG7601-BAS-AF).

Connect a reference vacuum gauge at the open leg of the tee. If the vacuum gauge has its own isolation valve, install the valve and gauge at the tee.

If the vacuum gauge will be zeroed prior to calibration, connect a vacuum pump suitable for zeroing the reference vacuum gauge at valve 2.

- 4 Use **[SYSTEM]** on the PG Terminal to reach the SYSTEM screen which displays the current reading of the PG7601-AF vacuum gauge (see Section 4.3.5). The vacuum value can only be displayed in the unit of measure Pa (Pascal).

- 5 With valves 1 and 2 open, turn on the vacuum pump and pull a vacuum until a pressure of 0.5 Pa (3.7 mTorr) is indicated by the reference vacuum gauge. If the reference vacuum gauge has its own isolation valve, view the pressure read by the PG7601-AF vacuum gauge and displayed on the PG Terminal to determine when vacuum is low enough to safely open the reference isolation valve.

Maintain vacuum at approximately 0.5 Pa for one hour to allow appropriate vacuum gauge warm up time and sufficient outgassing.

- 6 If zeroing the reference vacuum gauge prior to calibration, close valve 1. Pull a vacuum of 0.7 mPa ( $5.0 \times 10^{-6}$  Torr) or lower, as indicated by an ion or other low vacuum gauge, then zero the reference vacuum gauge.

Open valve 1 and allow pressure stabilize. If pressure as indicated by the reference vacuum gauge is greater than 1 Pa (7.4 mTorr), control pressure back to approximately 0.5 Pa (3.7 mTorr).

- 7 Close valve 2.

In order to proceed with the calibration, the rate of increase of pressure when valve 2 is closed must be less than 0.1 Pa/second (0.75 mTorr/s). If the rate is too great, OPEN valve 2 and pull down longer to complete outgassing of system. After repeating this step, a rate greater than 0.1 Pa/second is indicative of a leak.

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- ⑧ Record simultaneous readings of the reference vacuum gauge and the PG7601-AF vacuum gauge as the pressure slowly drifts up through the range in which the vacuum gauge is normally used. Take data points at approximately 1, 2, 3, 4, 5, 6 and 7 Pa.
- ⑨ If the PG7601 vacuum gauge is out of tolerance, calculate the values of the vacuum gauge pressure adder (PA) and multiplier (PM) (see Section 7.3.5.3), enter them into the platform and validate the results by rerunning the procedure.

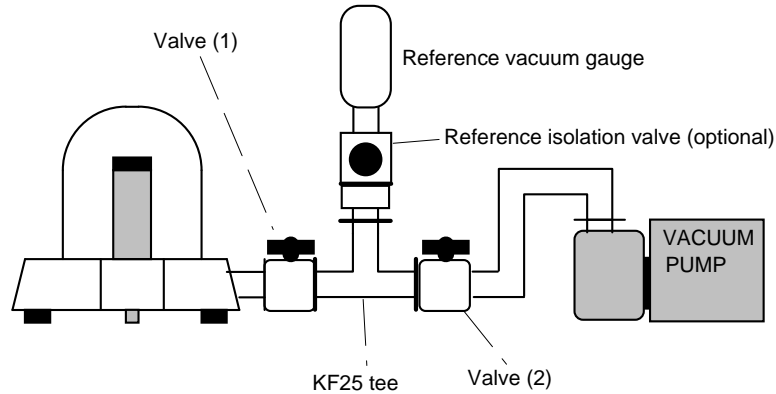


Figure 43. Vacuum gauge calibration setup

### 7.3.5.3 CALCULATING AND UPDATING VACUUM GAUGE CALIBRATION INFORMATION

#### PURPOSE

To view and adjust the output of the on-board vacuum gauge.

#### ○ OPERATION

To view the output of the vacuum gauge, press **[SPECIAL]**, **<7cal>**, **<6vac>**, **<1view>**. The display is:

1. Current reading of the vacuum gauge in Pascal. Reads **< >20 >** when the current reading is greater than 20 Pa.
2. Indication that this is a vacuum display.
3. Current value of the Pressure Multiplier applied to the vacuum gauge reading.
4. Current value of the Pressure Adder (always in Pascal [Pa]) applied to the vacuum gauge reading.

|        |           |
|--------|-----------|
| 6.5 Pa | vac       |
| PA 0.2 | PM0.99999 |

To adjust the values of PA and/or PM press **[SPECIAL]**, **<7cal>**, **<6vac>**, **<2cal>** to access a screen in which the values of PA and PM can be edited. From here, press **[ESCAPE]** and select **<6vac>**, **<1view>** to view the vacuum gauge reading with the edited calibration coefficients applied.