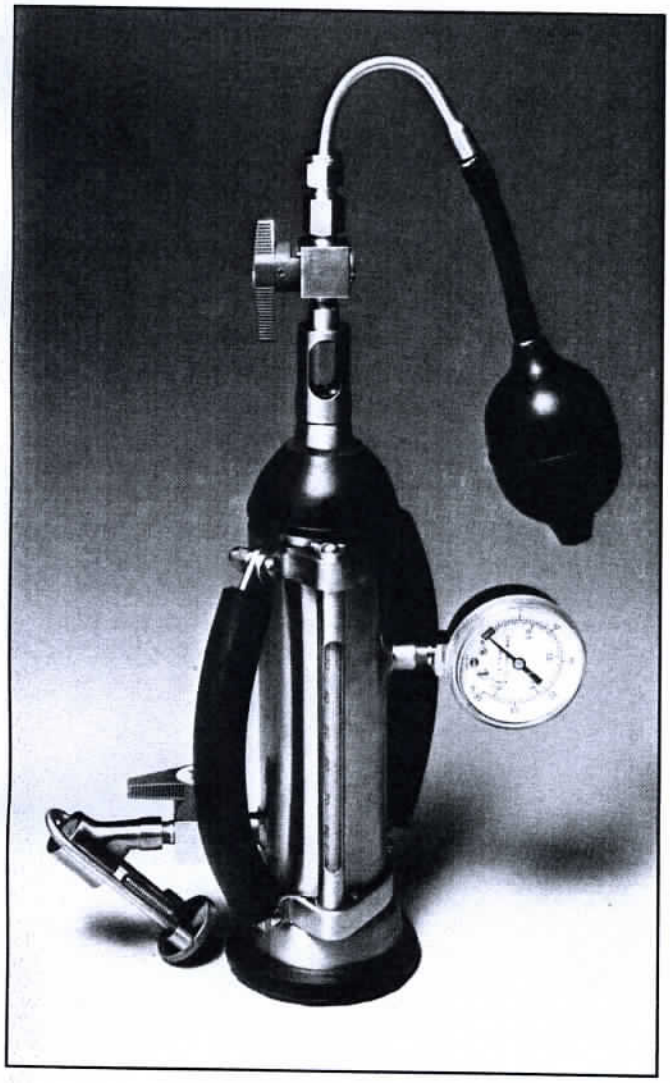
Zahm SS-60 Volume Meter (Series 1000)



The Zahm SS-60 Volume Meter was developed to determine average $C0_2$ levels of gas in tank stored beverages. Its improved design over the older Zahm-Hartung Volume Meter (Series 2000) greatly improves accuracy and time required to run a test. A precise piston release mechanism eliminates bleeding off of the sample and the potential for human error. Samples undergo repeatable, precise volumetric expansion test after test for more accurate measurements. The lightweight design reduces operator fatigue while the stainless steel construction increases strength and resists corrosion. The thermometer may also be replaced in the field without the need to return it to the factory for replacement. The parts list on page 4 and the line drawing on page 4 of this manual should be used when ordering replacement parts or operating the instrument.

Operating Instructions

The pressure gauge has been calibrated to plus or minus 1/4 psi (mid range) and the thermometer tested to plus or minus 1/4 degree prior to shipment of the instrument. If after a period of use there is a question of gauge and thermometer accuracy, the following checks should be performed on the unit:

1. The gauge should be checked and calibrated using the Zahm & Nagel Tester (Series #8000), a "Dead Weight" Tester or a Digital Test Gauge. The most accurate range of the gauge is the mid-range and the gauge should be calibrated to this area. The needle can be re-set by removing the face cover and inserting a small screwdriver into the slotted brass screw located at the 5 o'clock position of the gauge. Turn the screwdriver clockwise or counterclockwise to match the pressure established on the gauge tester or dead weight tester. A "Zero Zone" is located on the gauge face and the needle may occupy any place in this zone and still be in calibration — do not attempt to calibrate the gauge back to this zone.

2. The thermometer liquid column may become separated due to rough handling and may be rejoined as per enclosed instruction sheet — "Separated Columns". If the thermometer is broken please refer to replacement instructions sent with the instrument.

3. The piston **(1005)** may become stuck in the piston body **(1006)** — if this condition occurs, unlock the piston locking pin **(1008),** open the inlet valve **(1020-B)** and pull the piston out to full open position. Apply a small amount of "O" ring lubricant to the piston and work the piston up and down to lubricate the internal "O" ring **(1009)** located inside the piston body. This should be done at frequent intervals as part of the routine maintenance of the instrument.

WARNING: OPERATOR MUST WEAR EYE PROTECTION WHILE OPERATING THIS INSTRUMENT.

The line drawing and parts description on page 4 show the components of the Volume Meter — Refer to this page when operating the instrument or when ordering parts.

To Operate:

NOTE: Before operating, cool the Volume Meter to the approximate temperature of the beer being tested.

1. Close the lower inlet valve **(1020-B)** and lock the expansion piston **(1005)** in the "IN" position.

2. Open the top vent valve **(1020-B)** and establish counterpressure with the aspirator bulb **(1042)** (or other convenient pressure source) up to the approximate counter-pressure plus hydrostatic head pressure existing in the tank to be sampled and then close the top vent valve **(1020-B).**

3. Attach the Volume Meter to the trycock of the tank by opening the clamping device screw **(1024)** and sliding the clamping device yoke **(1023)** over the boss of the trycock. Turn the clamping device screw clockwise so that the clamping device gasket **(1025)** makes a tight seal between the trycock and clamping device assembly **(1021).**

4. Open the inlet valve **(1020-B)** and then fully open the trycock.

5. When the gauge pressure is steady, remove the aspirator bulb **(1042)** and partially open the top vent valve **(1020B)** so that the pressure on the gauge drops about 1 psi. Allow the Volume Meter to fill until the beer overflows at the gooseneck **(1045).**

Operating Instructions *(Continued)*

6 Fully open the vent valve **(1020-B)** so as to allow the beer flow to sweep out any air bubbles.

7 Close the inlet valve, vent valve and the trycock. Remove the Volume Meter from the trycock on the tank.

8 Partially open the vent valve **(1020-B)** to reduce the false pressure reading and allow the gauge pressure to drop to approximately the equilibrium pressure expected in the test, and then close the vent valve **(1020-B).**

9 Turn the piston handle **(1007)** clockwise to the release position. DO NOT PULL THE HANDLE OUT but allow the bottle pressure to force the piston out as the sample is shaken. Pulling the handle out will result in damage to the gauge.

10 Vigorously shake the Volume Meter until equilibrium temperature and pressure is established and record the readings. Refer to the chart **(1049)** on page 10 of this manual for the corresponding gas volumes. Equilibrium is achieved when after shaking, the temperature and pressure remain constant. Do not allow your hands to touch the metal body of the Volume Meter when shaking as this will cause a rise in temperature of the beer. Hold the Volume Meter by the handles — if the Volume Meter is not equipped with handles hold it by the base shield **(1003)** and the neck shield **(1004A).** NOTE: The Volume Meter chart **(1049)** gives solubility of $C0_2$ gas in average beer, and will be found to give lower readings than charts based on solubility in water.

Care of the Instrument:

A After the test has been completed open both inlet and outlet valves **(1020-B)** and blow out the beer sample with pressure from the aspirator bulb **(1042).**

B Rinse the inside of the Volume Meter with water to remove any traces of beer. This can be accomplished by attaching a hose from a water source to the gooseneck **(1045)** and then opening the inlet and outlet valves to let water flush through the instrument. Do not use hot water as it will damage the thermometer.

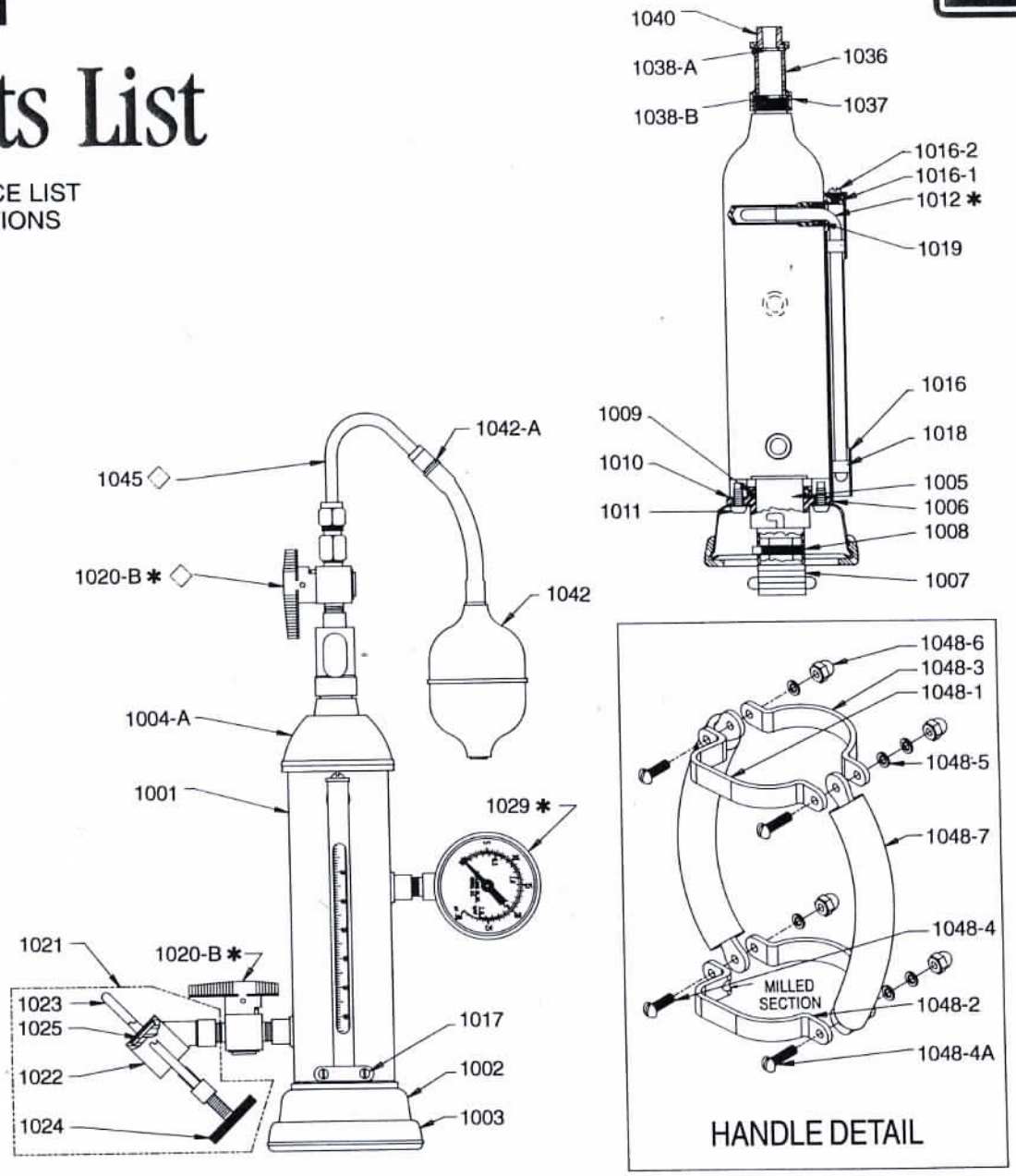
C Apply a small amount of "O" ring lubricant to the piston **(1005)** and work the piston up and down to lubricate the internal piston "O" ring **(1009).**

D Rinse out any traces of beer from the aspirator bulb **(1042)** to prevent the check valve from sticking.

E Store the Volume Meter at room temperature to prevent damage to the thermometer.

Parts List

★ SEE PRICE LIST FOR OPTIONS



P/N	DESCRIPTION	P/N	DESCRIPTION	P/N	DESCRIPTION
1000	SS-60 VOLUME METER	1017	THERMOMETER GUARD SCREW (2 ea.)	1040	VENT COCK SWIVEL
1001	BODY	1018	THERMOMETER CUSHION RING (2 ea.)	1042	ASPIRATOR BULB
1002	BASE	1019	THERMOMETER SEAL RING (2 ea.)	1042-A	ASPIRATOR BULB "O" RING
1003	BASE SHIELD	1020-B	VALVE (2 ea.)	1045	GOOSENECK
1004-A	NECK SHIELD	1021	CLAMPING DEVICE ASSEMBLY	1048	CLAMP HANDLE ASSEMBLY
1005	PISTON	1022	CLAMPING DEVICE BODY	1048-1	FRONT BRACE
1006	PISTON BODY	1023	CLAMPING DEVICE YOKE	1048-2	MILLED BRACE
1007	PISTON HANDLE	1024	CLAMPING DEVICE SCREW	1048-3	REAR BRACE (2 ea.)
1008	PISTON LOCK PIN	1025	CLAMPING DEVICE GASKET	1048-4	SCREW — LEFT SIDE (2 ea.)
1009	PISTON "O" RING	1029	PRESSURE GAUGE	1048-4A	SCREW — RIGHT SIDE (2 ea.)
1010	PISTON BODY GASKET	1036	SIGHT GLASS	1048-5	LOCK WASHER (6 ea.)
1011	BASE SCREW (6 ea.)	1037	SIGHT GLASS CAGE	1048-6	CAP NUT (4 ea.)
1012	THERMOMETER	1038-A	SIGHT GLASS GASKET (TOP)	1048-7	HANDLE W/RUBBER
1016	THERMOMETER GUARD	1038-B	SIGHT GLASS GASKET (BOTTOM)		SLEEVE (2 ea.)