

***RheoVac*® Probe Installation**

The *RheoVac* probe can be installed only in the condenser-to-exhauster vacuum line where a conditioned gas/water vapor stream exists and where it will not be exposed to temperatures above 210 F (99 C). For best noise-free flow rate measurements, a location at least 15 diameters downstream of a line turn or valve and 5 diameters upstream of the next perturbation is recommended. If these distances are not available, install the probe with two-thirds of the available straight-run upstream of the probe and one-third downstream¹. These locations are shown in the “*RheoVac* Probe Location Recommendation,” Figure 1.

Figure 1 shows four plane line configurations found in operating power plants. Configurations A and B feature line layouts that generally place the exhauster inlet above the condenser outlet. In Configurations C and D, the exhauster inlet can be found below the condenser outlet. When considering probe placement in Configurations A and C, select a location with acceptable straight-run and accessibility to aid in probe insertion and removal.

Configurations B and D show exhauster lines which have been installed in a manner that creates a water trap. Under conditions where ambient temperature outside the line is lower than the stream temperature, condensation of water vapor can occur and accumulate in the trap, restricting or completely shutting off the vapor/gas flow stream to the exhauster. This condition eventually leads to water spray or water surging in the line beyond the trap. For this reason, probe installation in the trap or between the trap and the exhauster is not recommended.

Probes in horizontal, vertical (flow up or down), or angled runs should be installed at a 90 angle to the pipe in a position where the probe is parallel to the ground (see Figure 2). This prevents water droplets from clinging to the probe tips, which can occur if the probe axis is angled with the tips downward. There are no other critical orientation requirements except the probe must be rotated such that the flow vector passes between the probes. The junction box on the probe will have a directional arrow which should be properly aligned with flow in the pipe.

The *RheoVac* probe installs through an Bionetics-supplied hot tap assembly. A 1½” female NPT coupling (supplied) must be welded on the pipe as shown in Figure 2, and the pipe must have a 1½” hole drilled through it. Allow 4 feet of clearance out from the coupling to accommodate probe installation through the hot tap assembly.

Prior to inserting probe, loosen the compression nut on the thermocouple connector of the hot tap and clean the inner surface of the thermocouple connector to ensure it is free of particles that may cause probe damage.

¹ Straight-run is limited in many plants. Lack of straight-run does not prevent use of the unit. This suggestion comes from good practices for high accuracy flow measurement, but several of the primary *RheoVac* measurements are not affected by straight-run and a mass flow measurement error only affects the air in-leakage reading by a small percentage. There is much value in trending data over time and observing changes in *RheoVac* readings in relation to plant events.

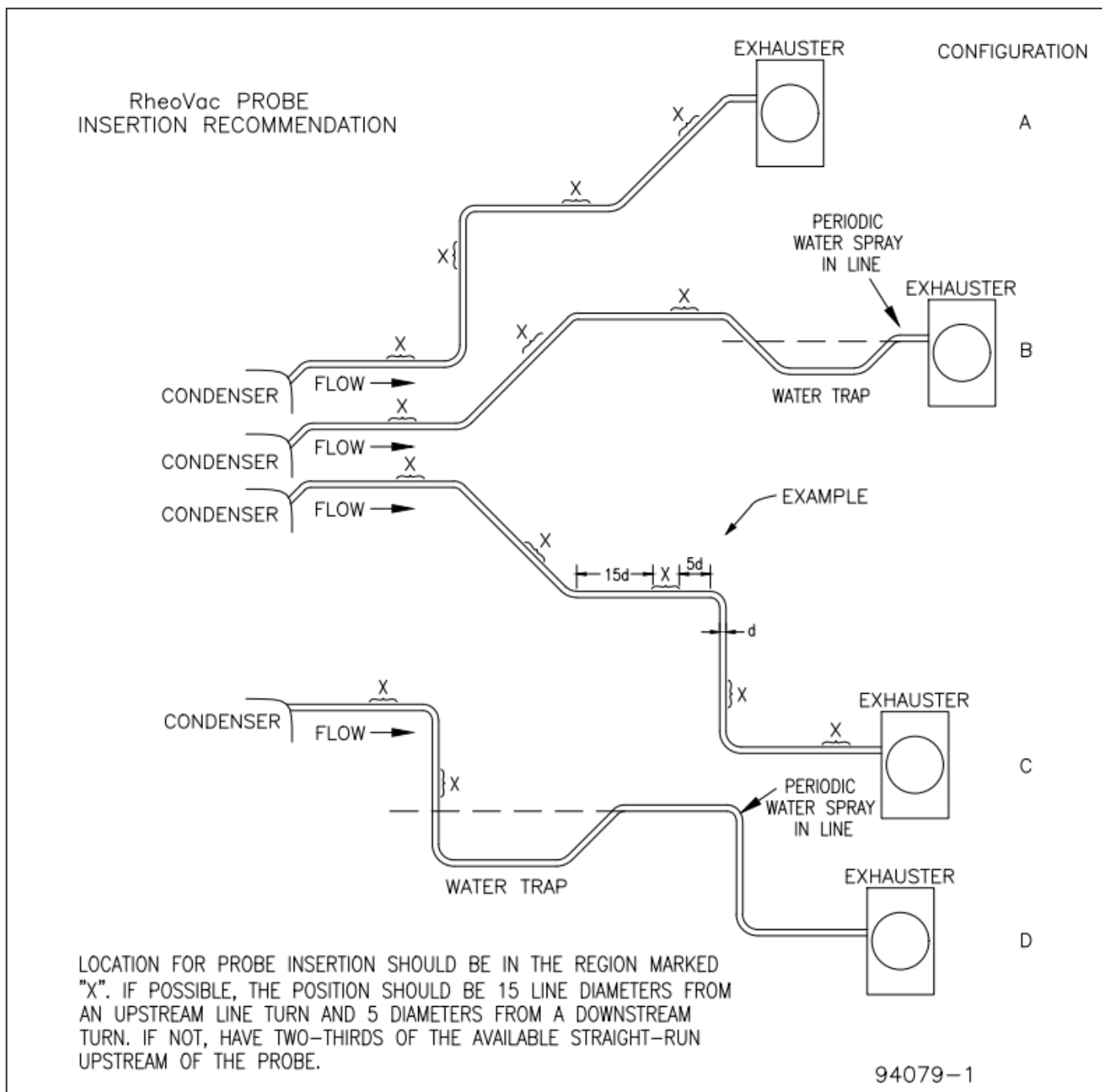
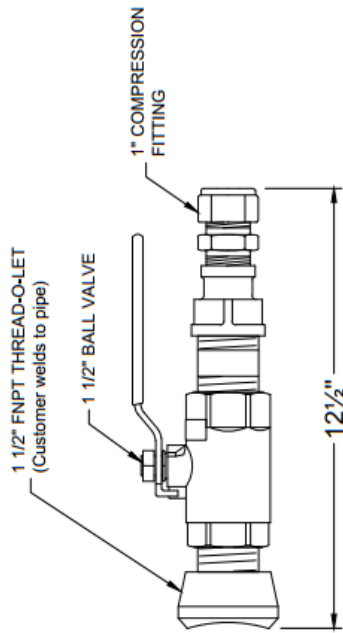
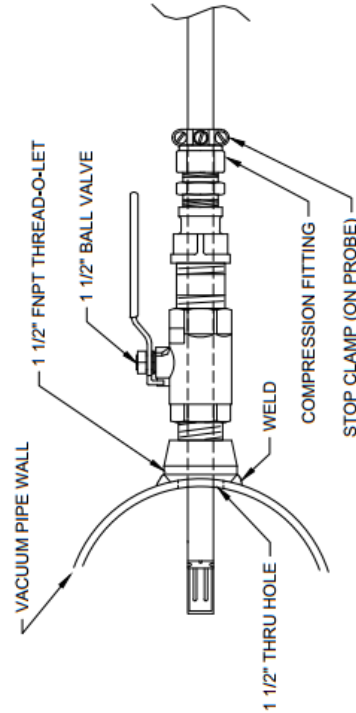


Figure 1

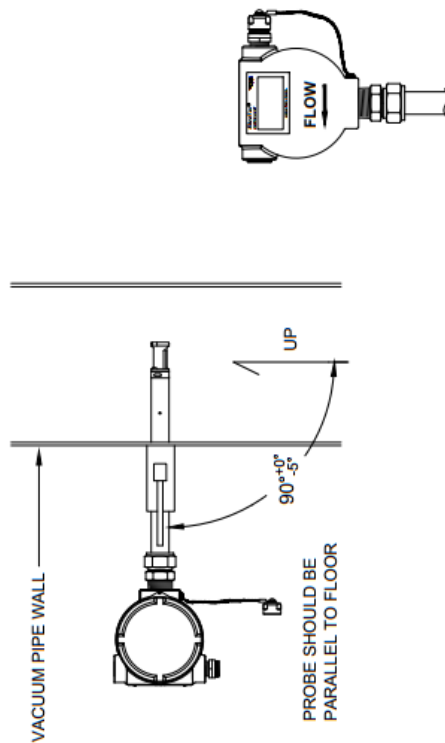
BALL VALVE ASSEMBLY



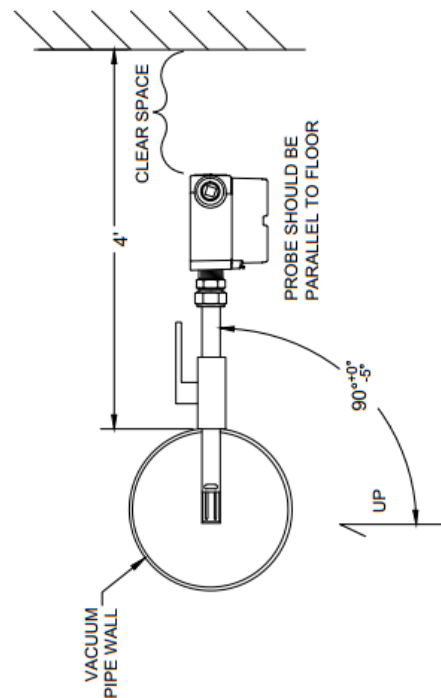
BALL VALVE ASSEMBLY INSTALLATION



REQUIRED INSTALLATION ANGLE FOR VERTICAL PIPE RUN



REQUIRED INSTALLATION ANGLE FOR HORIZONTAL PIPE RUN



RheoVac		THE BIONETICS CORPORATION COMMERCIAL ENGINEERING SERVICES GROUP OHIO, U.S.A.	
PROGRAM	DATE	DATE	DATE
DRAWN	MD	07/02/19	
CHECKED	DATE		
PROD ENG	DATE		
TEST ENG	DATE		
QA ENG	DATE		
APPROVAL	DATE		
SIZE	CAGE CODE	DWG NO.	REV
A	1WS12	19002-9	1
SCALE	N/A	SHEET	1-OF-1

Figure 2

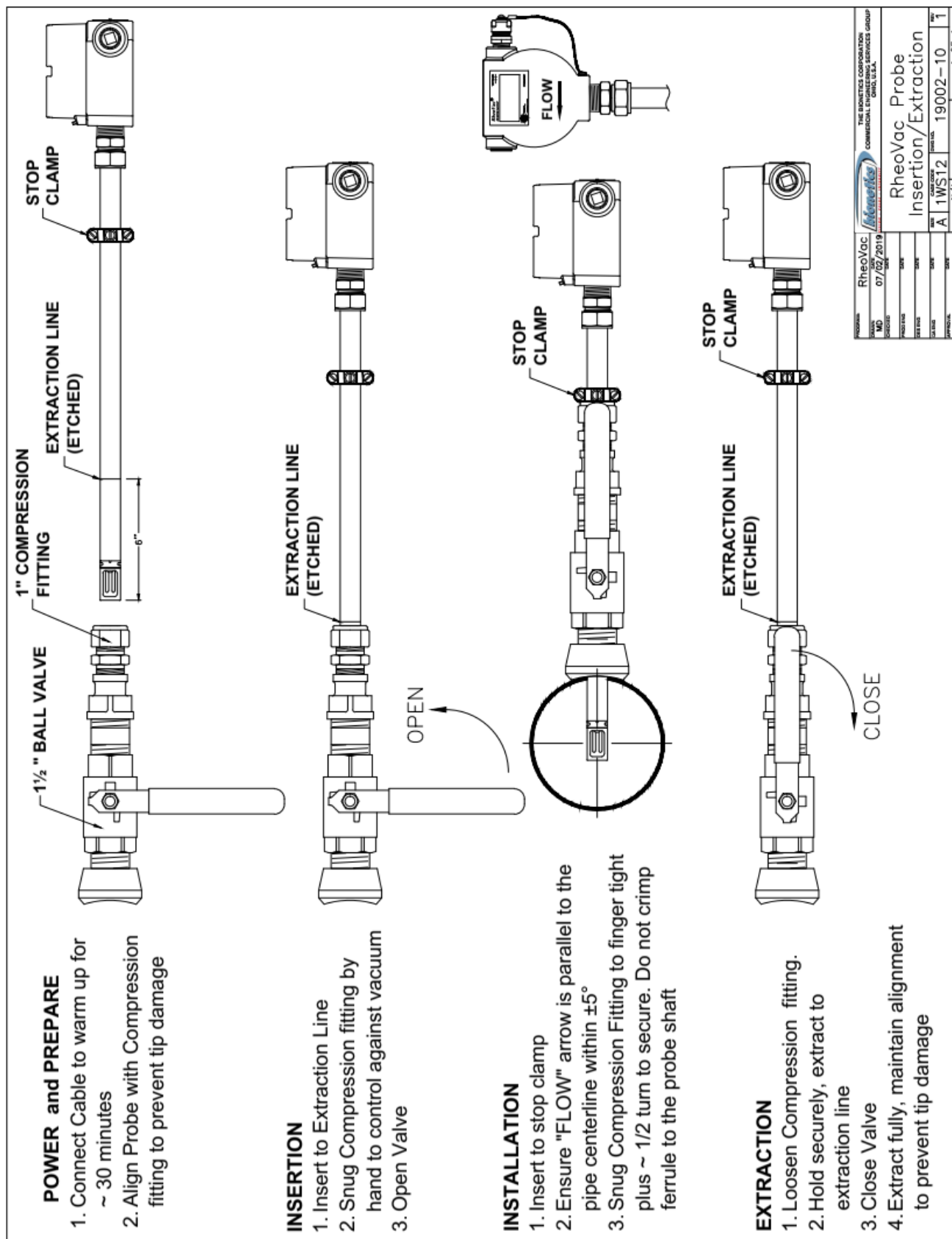


Figure 3