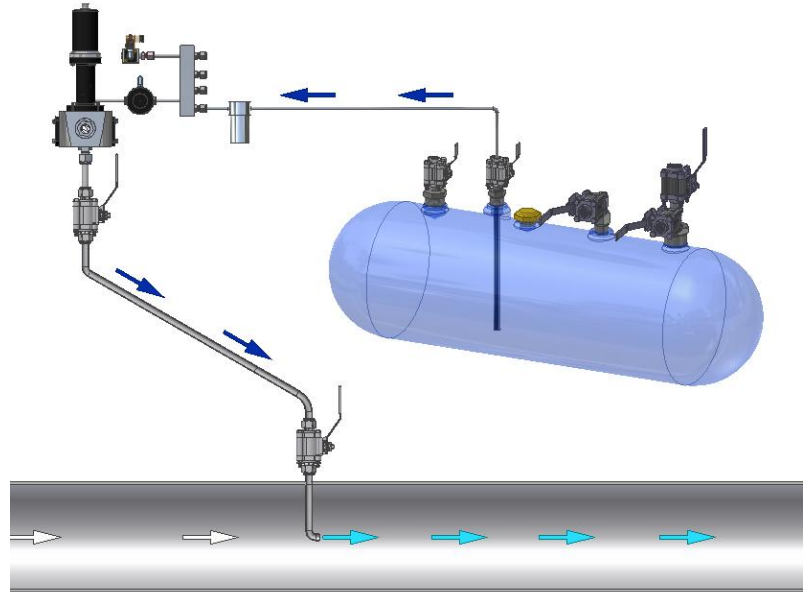


# Section 1: Overview—Principles of Odorant Flow

The easiest way to visualize the Z9000 is to think about the old drip style odorizer. Odorant was pushed to a valve. The valve was opened to allow drops to fall into the pipeline. A sight glass allowed the operator to see the drops and adjust the valve to achieve the desired frequency.

- The supply vessel (blue tank on right) is pressurized 20 psig above the maximum expected pipeline pressure.
- The odorant (dark blue arrows) flows from the tank to an externally mounted filter, then to an isolation valve inside the Z9000.
- The isolation valve is held open when odorant is allowed to reach the metering valve. A pneumatic source holds the actuator open.
- The odorant then passes to a 20 turn metering valve which controls the drop frequency.

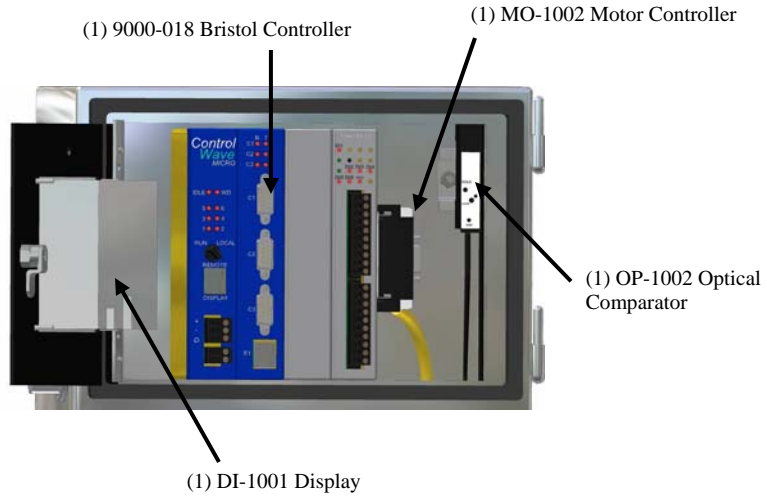


- The metering valve is turned by an encapsulated, geared servo motor which controls the position of the valve. An optical encoder verifies the position.
- A pair of optical arrays look through windows below the valve and account for every drop. A third window allows the operator to see each drop as it is being measured.
- The information from both the servo and the optical arrays goes to the internal Bristol ControlWave Micro RTU that monitors gas flow, drops, and then adjusts the metering valve to deliver the desired injection rate. Detailed audit and historical information is recorded and available to be downloaded.
- Communication with the controller is both local and remote. The VFD on the unit provides local access. Remote access can be Ethernet, RS232, RS485, or discretes. BSAP, modbus, and TCP/IP protocols are used.

# Section 1: Overview—System Components

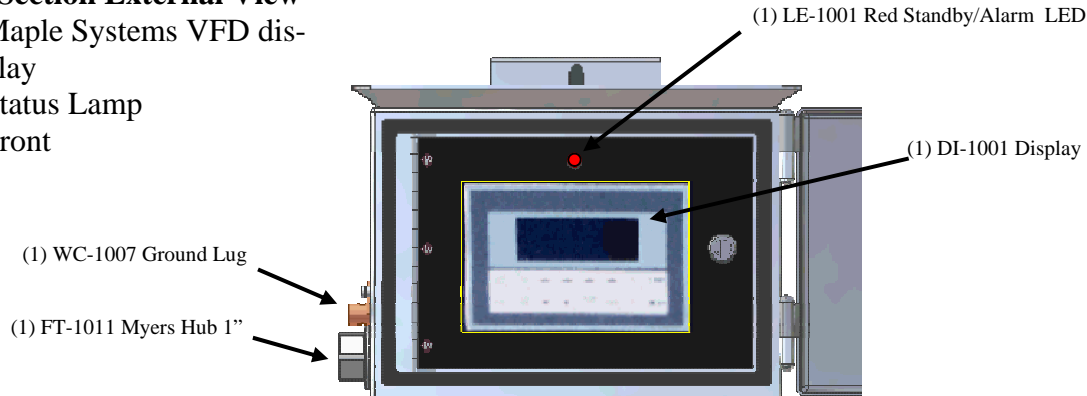
## Top Section Internal View

- Bristol ControlWave Micro
  - Details on next page
- Servo Motor Controller
- Optical Comparator



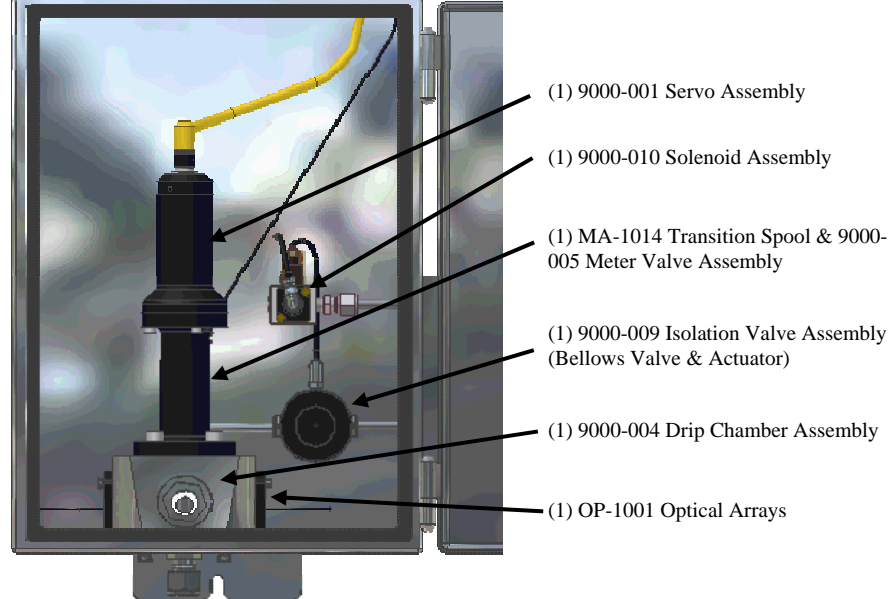
## Top Section External View

- Maple Systems VFD display
- Status Lamp
- Front



## Lower Section

- Odorant Metering Unit
  - Servo
  - Transition Spool
  - Metering Valve
  - Drip Chamber
  - Optical Arrays
- Isolation Valve
  - Bellows Valve
  - Actuator
  - Solenoid



Z9000 with Top & Bottom doors opened

# Section 6: Installation & Operation—Typical Setup

