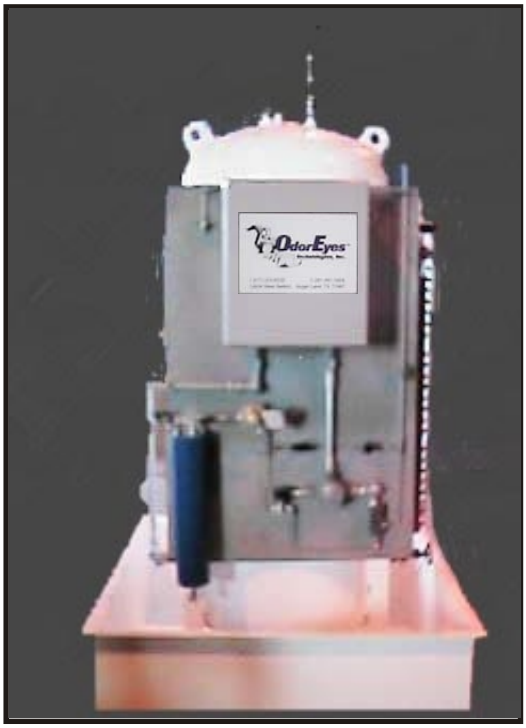
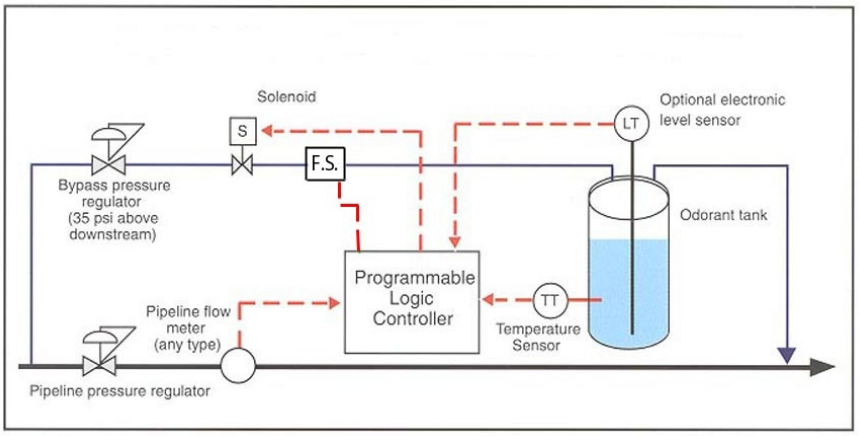
EcoSystem B/U

Environmentally **C**lean **O**dorizer Systems from OdorEyes Technologies are designed to provide safe, reliable and clean odorization of natural gas in your pipeline. EcoSystems have no pump to fail, no seals to leak and no moving parts - giving you a more maintenance-free system and giving us all a cleaner environment.

The EcoSystem B/U Pulse Gas Odorizer takes bypass odorizing to a new level. Using today's technology, we can overcome the problems associated with the old conventional buried bypass odorizer. The most significant advance in bypass technology has been the introduction of the bypass odorizer. Rather than relying on a constantly changing differential pressure across a restriction in the pipeline, the pulse-bypass odorizer pulses a known volume of gas through the odorant tank proportional to flow. This makes it a true flow tracking odorizer. The unique control technology incorporated in the EcoSystem B/U can provide continual odrization even in the event of loss of meter signal or power failure. The pulse bypass system can operate accurately down to zero flow and will never vapor lock. It is ideal for stations that may periodically cease operation or go to extremely low flow. When the flow returns or increases it will remain accurate and reliable. Additionally, the system can be equipped with a temperature sensor in the odorant tank. The bypass flow is adjusted to compensate for changes in odorant vapor concentration due to temperature changes. This OdorEyes feature allows the tank to be either buried or above ground and remain accurate.



The EcoSystem B/U is intended for natural gas pipeline or similar installations with flow rates less than one million standard cubic feet per hour. This model offers local monitoring and control functions for operations. For greater flow rates, OdorEyes™ Technologies offers the EcoSystem A/T pumpless odorizer or Accu/Line Injection style odorizer.



Simplified piping diagram of typical EcoSystem

Pulse By-pass Odoizers built by OdorEyes Technologies are manufactured under Patent number #6,142,162.

"Safe enough to be your next door

OdorEyes® Technologies, Inc.

OdorEyes Technologies
13839 West Bellfort
Sugar Land, Texas 77478
Phone: 1-877-ODORIZE
Phone: 281-491-3409 Fax: 281-491-8344

EcoSystem B/U

Modern Technology

The PLC carefully monitors the operation of the control solenoid. The unique pressure switch, utilized by OdorEyes, reports to the PLC each time the solenoid valve operates properly. An alarm is also generated if the solenoid fails in the closed mode.

EcoSystem B/U units utilize the most modern technology available. Should you experience a problem or failure of the PLC, you need not return the entire unit for repair. The PLC is modular, meaning the failed unit can be replace quickly by a new unit shipped via overnight carrier. It is not necessary to disconnect any wires or make any major changes to the system

Basic System Components

Regulator

The system regulator is sized for the flow and pressure required. This is determined by the information supplied by the user with the order. Regulators are equipped with a pressure gauge used for setting the outlet pressure. Outlet pressure should be set for approximately 40 psi above the downstream pressure.

Solenoid Valve

The EcoSystem B/U has a 24 VDC, two-way solenoid valve. The control solenoid is operated by the PLC each time the system pulses. The amount of gas flowing to the tank is determined by the dwell time of the control solenoid. By increasing or decreasing the dwell time, more or less gas can be passed to the tank, thereby increasing or decreasing the injection rate and resets the unit if a failure is indicated. A power-fail circuit provides a safe power-down sequence and subsequent restart.

Gas Flow Meter

The PLC will accept either an analog or digital signal from any type gas flow meter. The meter signal must be representative of instantaneous gas flow in the pipeline. Meters which store pulses and dump them periodically are not acceptable. Pulses must be delivered to the PLC as flow occurs. Digital signals should be in the form of a dry contact. Analog signals my be 1-5 VDC or 4-20 ma dc. Meters may be furnished by the user or by OdorEyes Technologies, Inc.

Odorant Storage Tanks

Storage tanks may be supplied as an integral part of the system or the user may supply them separately. Tanks supplied by OdorEyes Technologies are certified and ASME code stamped with the proper pressure rating for the system. Note that bypass tanks operate at pipeline pressure and must be sized accordingly. Optional relief valves, sight level gauges, skids and containment pans, and other accessories may be obtained as part of the total system package.

Tank Level

The Accu/Level electronic tank measurement system is designed specifically to work in conjunction with the EcoSystem B/U This highly accurate device works with any size odorant tank, but it must be properly sized and the PLC programmed accordingly. The Accu/Level transmitter sends a 4-20 ma dc signal to the PLC. This signal denotes the tank level inside the tank.

Temperature Detector

The EcoSystem B/U utilizes a resistance-type temperature detector installed in the tank to allow the system to properly adjust for temperature changes.

The temperature signal is used to compensate for temperature changes in the tank, which directly affect the tank pressure. This allows for the accuracy of the level reading. The PLC maintains a running inventory of the tank level. This information may be programmed in pounds, gallons, inches, ETC. The signal is also used to alter the pulse rate of the odorizer based on temperature (absorption rate changes with temperature). This maintains the accuracy of the odorizer itself.

Programmable Logic Controller

The PLC is a 24 VDC logic controller specifically programmed for odorization. It consists of a modular rack, input/output cards as required and an operator interface keypad. In case of complete power failure, memory is protected by the PLC back-up battery. This model offers local monitoring and control functions for operations.