



# APPLICATION NOTE PRESSURIZED PURGE FOR HAZARDOUS ENVIRONMENTS

SLICK SLEUTH



Slick Sleuth oil detectors are designed for use in facilities and areas where production, processing, storage and transport of oil occur. These detectors are installed in many explosive / hazard rated settings, including Class 1 Division 1, Division 2, Group C and Group D classified environments. A few examples of customers using Slick Sleuth detectors in refinery, production, terminal petrochemical type facilities include: Shell, British Petroleum (BP), Occidental (Oxy), Chevron / CalTex, SK Energy, Chinese Petroleum Corp (CPC), Formosa, Valero, etc.

Existing Slick Sleuth customers use various methods to assure installation safety in/around/near areas where explosive gases are or may be present, in compliance with end-user requirements and local regulations. These techniques include: (1) elevated installation of sensor - placing it in safe zone, (2) use of purge systems, and (3) use of explosive-proof enclosures.

Interconnection of wiring and other components connected to the system is the responsibility of the installer and end user, subject to each facility's internal requirements and local regulations.

The ultimate responsibility for installation and compliance lies with the end-user and is subject to company's / facility's internal policies and local regulatory requirements.

## Safe-Zone Installation Within Refineries & Other Hazardous Environments

Slick Sleuth is typically mounted a minimum of 1.5 - 4.0 meters above the target surface (water, ground, etc.). As such the sensor is installed ABOVE the area rated as hazardous / explosive. Hazardous / explosive ratings typically apply only to elevation of 1.5 meters and below, due to the fact that explosive gases are heavier than ambient air. As such, mounting the detector 1.5 meters or higher above ground or water typically places the sensor ABOVE the hazardous area, within zones rated "safe - non-explosive". Because Slick Sleuth is installed well above the hazardous area it is NOT a potential source of ignition.

This is the strategy of numerous Slick Sleuth users at refineries, petrochemical plants, production facilities, tank farms, etc. It is a simple cost-effective approach wherever applicable and highlights one of the distinct advantages attributed to Slick Sleuth being a NON-CONTACT above water (or ground) optical detector. This approach is of course company facility-specific, subject to interpretation of key personnel and local regulations.

**Purge System - Class I Division 2**

The Slick Sleuth NEMA 4X (IP66) can be fitted for use with purge systems rated for use in Class 1 Division 2 hazardous environments. The recommended purge system for these applications is the Pepperl+Fuchs Bebcos Model 1001A (UL & FM Certified for Class 1 Division 2 Group C&D).

This purge system regulates a source of compressed instrument air or inert gas to the enclosure. It is used to regulate, maintain and monitor positive pressure within sealed (protected) enclosures thereby preventing possible incursion of flammable gas. Maintained pressure is very low (roughly 2 PSI). The purge system includes a contact relay that provides a low-pressure alarm should air-pressure fall below normal.

**Purge System - Class I Division 1**

The Slick Sleuth NEMA 4X (IP66) can be fitted for use with purge systems rated for use in Class 1 Division 1 hazardous environments. The recommended purge system for these applications is the Pepperl+Fuchs Bebcos Model 2001A (UL & FM Certified for Class 1 Division 1 Group C&D).

With this type of purge the Slick Sleuth is interconnected both mechanically and electrically to the purge system. In addition to regulating, maintaining and monitoring supply of compressed instrument air or inert gas, the system includes an electrical power control unit (EPCU) that monitors system operation and controls enclosure power.

The EPCU provides a 'power-kill-switch' to the sensor in addition to the contact relay that provides low-pressure alarm should air-pressure ever fall below normal.

**Hazardous Area Classifications**

Hazardous (classified) locations are those areas in an industrial complex where the atmosphere contains flammable concentrations of gases or vapors by leakage, or ignitable concentrations of dusts or fibers by suspension or dispersion. Area classifications are established using three factors / ratings: CLASS RATINGS, DIVISION RATINGS and GROUP RATINGS

**Class Ratings:**

Classes are used to define the explosive or ignitable substances that are present in the atmosphere.

- Class I - Flammable gases or liquid vapors
- Class II - Ignitable metal, carbon or organic dusts
- Class III - Ignitable fibrous materials

**Division Ratings:**

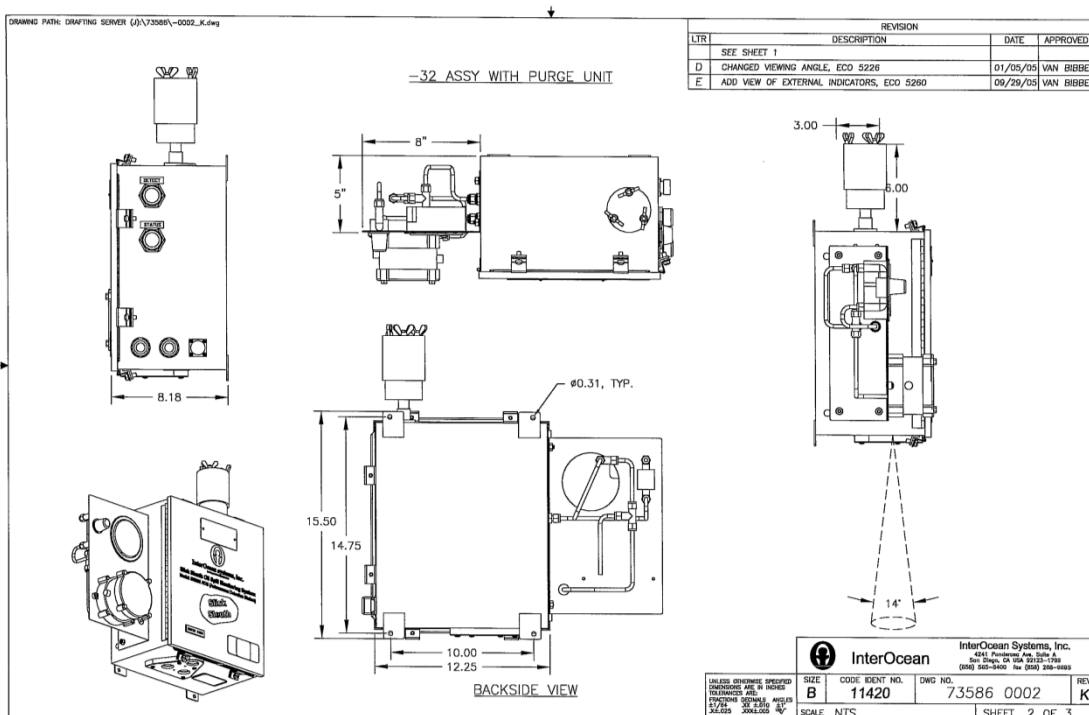
Divisions are used to define the degree of hazard by determining the explosive or ignitable substance's expected concentration in the atmosphere.

- Division 1 - Contains substances under normal conditions
- Division 2 - Contains substances under abnormal conditions

**Group Ratings:**

Groups are used to define substances by rating their explosive or ignitable nature, in relation to other known substances.

- Group A - Acetylene
- Group B - Hydrogen or > 30% Hydrogen by Volume
- Group C - Ethyl Ether & Ethylene
- Group D - Acetone, Ammonia, Benzene & Gasoline
- Group E - Aluminum, Magnesium & Alloys
- Group F - Carbon, Coke & Coal
- Group G - Flour, Grain, Wood, Plastic & Chemicals



*Please note that herein we've primarily referenced the Class/Division-type rating system. Zone 1/2/3 and ATEX-types of rating systems should be reviewed for European / non-USA equivalents.*