Liquid Carryover Sensor

Product Overview

The Insight Analytical Liquid Carryover Sensor is a compact, high-reliability detection system engineered to identify the presence of liquids in gas-phase analyzer sample systems. It combines a cyclone separator, knock-out pot, and capacitive sensor to detect carryover of water, glycol, alcohols, and hydrocarbons before they compromise gas analyzer accuracy. This early-warning system improves sample system performance, reduces downtime, and supports safer, more reliable gas measurement in both standard and hazardous area installations. Available in ATEX Zone 1 and CSA Class 1 Division 2 configurations, it's an essential tool for analyzer protection.

LIQUID DETECTION

EARLY-WARNING SYSTEM

ANALYZER PROTECTION

Field of Application

The Insight Analytical Liquid Carryover Sensor detects liquids such as water, glycol, alcohols, and hydrocarbons in gas-phase analyzer sample systems at pressures up to 3,450 kPag (500 psig). It integrates a cyclone separator, knock-out pot, and capacitive sensor into one compact assembly.

Models are available for CSA Class 1 Division 2 and ATEX Zone 1 hazardous areas. The sensor supports two-wire (20–250 V AC/DC) or five-wire (10–30 VDC PNP) operation depending on certification. Both versions have normally open outputs and require an external fuse rated 2A or less.

Constructed with NACE MR0175-compliant materials, the sensor is suitable for sour gas service. However, it should not be used with corrosive chemicals such as HCl, nitric acid, halogens, phenol, or carbon disulfide, which may damage the housing.

Maximum Pressure Rating:
3,450 kPag (500 psig) at 40°C maximum
1,380 kPag (250 psig) at 60°C maximum
690 kPag (100 psig) at 70°C maximum

Temperature Range: -20°C to 70°C (-4°F to 158°F)

Inlet and Outlet Connection Size: 1/8" NPT female thread

Wetted Materials: Electroless nickel plated 6061 T6 aluminum, glass filled PEEK, nylon, perfluoroelastomer (FFKM) o-ring.

NACE Compliance: NACE MR0175/ISO 15156 and MR0103 Compliant.

Area Classification:
CSA Class I, Division 2, Groups A, B, C and D;
Class II, Division 2, Groups E, F, and G T
4, ambient temperature range -25°C to 70°C
Ingress Protec on IP65/Type 4/4X

ATEX/IECEx 2G Ex mb IIC T4 Gb
T ambient -20°C to 80°C
Ingress Protec on IP67

Power Requirements:
CSA Model: 20 to 250 V AC/DC, 200mA peak
ATEX Model: 10 to 30 VDC, 200mA peak

Electrical Connection Size:
CSA Model: 2m PVC cable, 2 wires
ATEX Model: 2m PVC cable, 5 wires

Output Type:
Normally Open, with minimum load current of 5 mA and maximum switching output of 200 mA

Internal Volume: 16 cm3 (1 in3)

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Scan the QR Code to Learn More!

See more details on our website, or feel free to contact us with any questions!

Principle of Operation

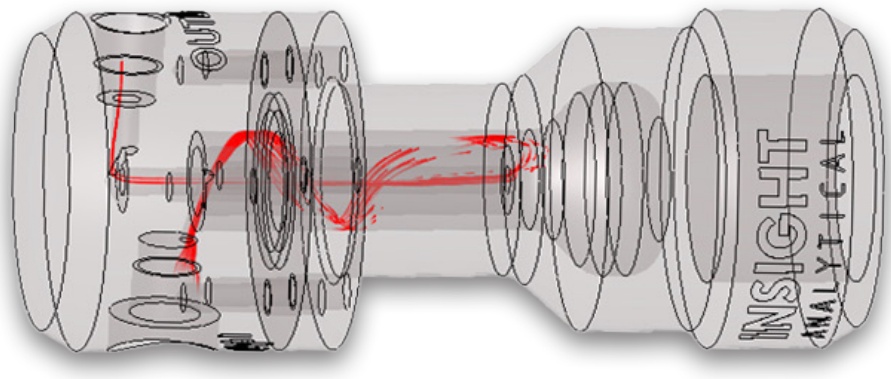
The sample housing has an upper section made from electroless nickel plated aluminum with 1/8” NPT inlet and output ports, with the inlet gas going through a 2mm diameter orifice and flowing tangentially into a small diameter bore. This inlet geometry results in large centrifugal forces on the gas sample which tends to move denser components, such as liquid aerosols and particulates, radially outward towards the walls of the housing where they can coalesce. Any liquids or particulates that are separated from the gas collect at the inside bottom of the lower housing, which is made from glass filled PEEK.

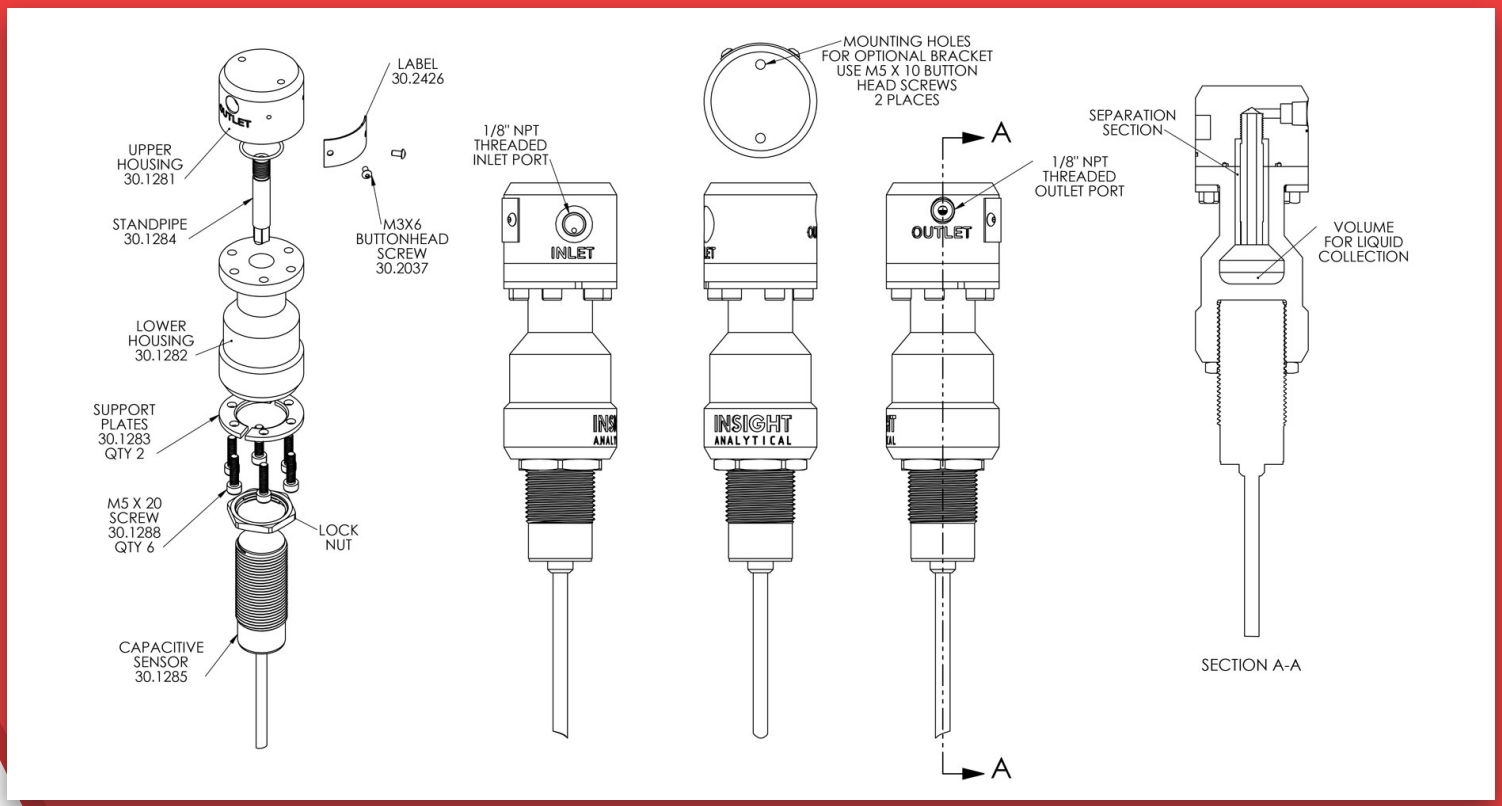
A capacitive sensor with non-incendive hazardous area certification for either Class I Division 2 or ATEX/IECEx 2G Ex mb IIC T4 Gb is threaded into the bottom of the lower housing and will detect liquids or particulates that collect in the bottom of the housing. The capacitive sensor is isolated from the sample gas by the bottom wall of the housing and can detect accumulated liquid through the wall of the housing because the PEEK has a low dielectric constant, only slightly higher than air. Sensitivity of the capacitive sensor can be adjusted with a potentiometer on the bottom of the sensor.

The quantity of liquid required to trip the sensor depends on the dielectric constant, with it generally being very sensitive to water and somewhat less sensitive to glycol, alcohols, and saturated hydrocarbons such as compressor oil. Particulates with high dielectric constants can also be detected, such as metals or metallic compounds.

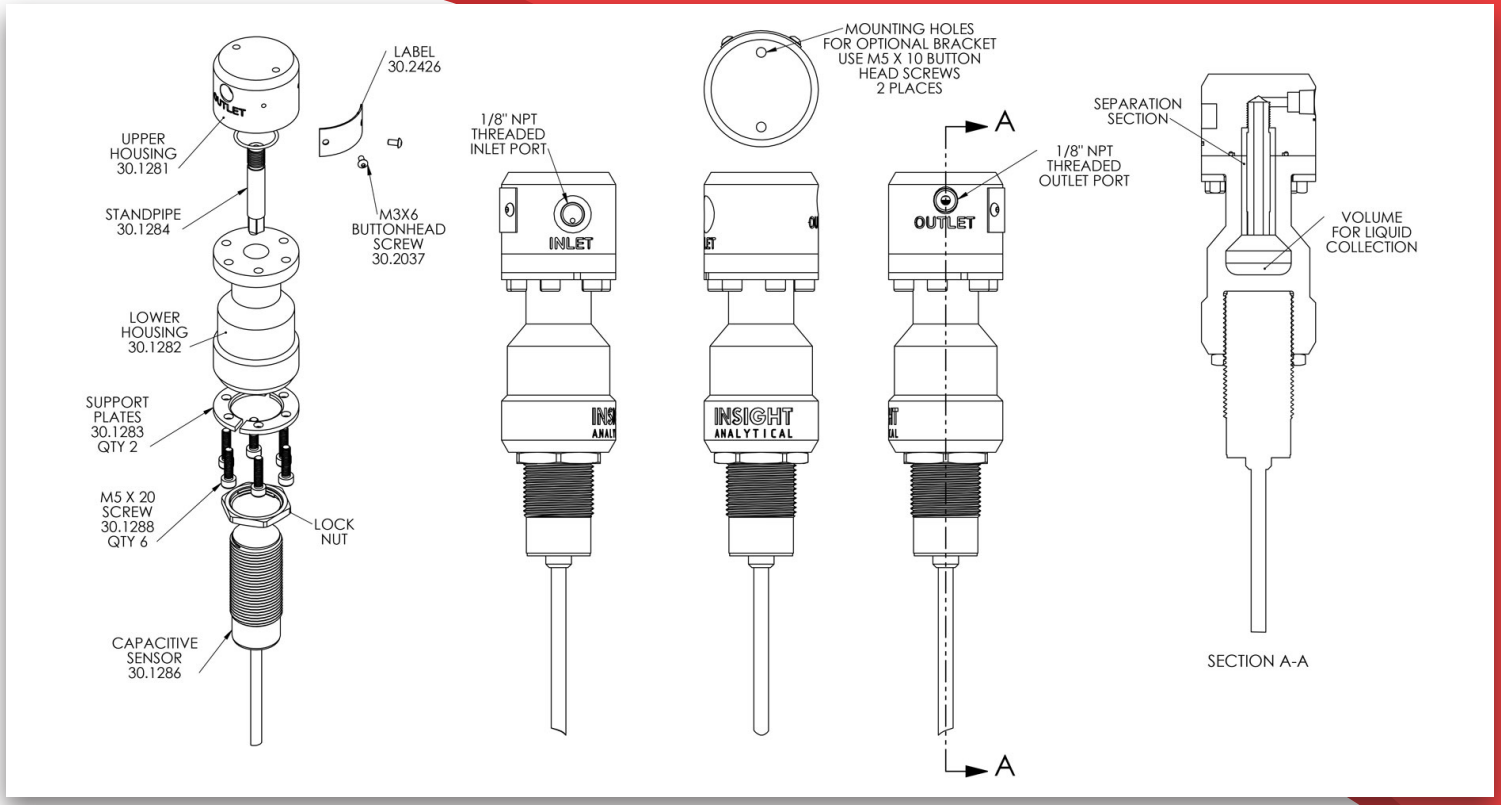
Advantages

- Detects water, glycol, alcohols, and hydrocarbons early in gas-phase analyzer sample systems.
- Combines cyclone separation, knock-out pot, and capacitive sensing into one device.
- Prevents contamination and failure of downstream gas analyzers.
- Compact and rugged for installation in confined or hazardous spaces.
- ATEX Zone 1 and CSA Class 1 Division 2 models available.
- Two-wire and five-wire sensor options support a wide range of electrical requirements.
- NACE MR0175-compliant materials allow sour gas service.
- Works at pressures up to 3,450 kPag (500 psig).
- Requires no moving parts, reducing maintenance needs.
- Compatible with most sample system designs and analyzer configurations.
- Helps ensure accurate and reliable gas measurements in process industries.





DIV 2 CARRYOVER SENSOR - ASSEMBLY DRAWING



ZONE 1 CARRYOVER SENSOR - ASSEMBLY DRAWING