

APPLICATION NOTE 2

***FLUID INVENTORY IN
STORAGE TANKS
PRESSURE MEASUREMENT***



Scanivalve

SCANIVALVE APPLICATION NOTE 2

GENERAL DESCRIPTION

Scanivalve's line of Intelligent Pressure Scanners are well suited for making multiple tank level measurements. The 16 channel pressure modules are rugged and enclosed in a stainless steel box that is splash resistant. 1/16, 1/8 or 1/4 inch steel or small diameter plastic tubing can be accommodated depending on the model.

PRESSURE MEASUREMENT

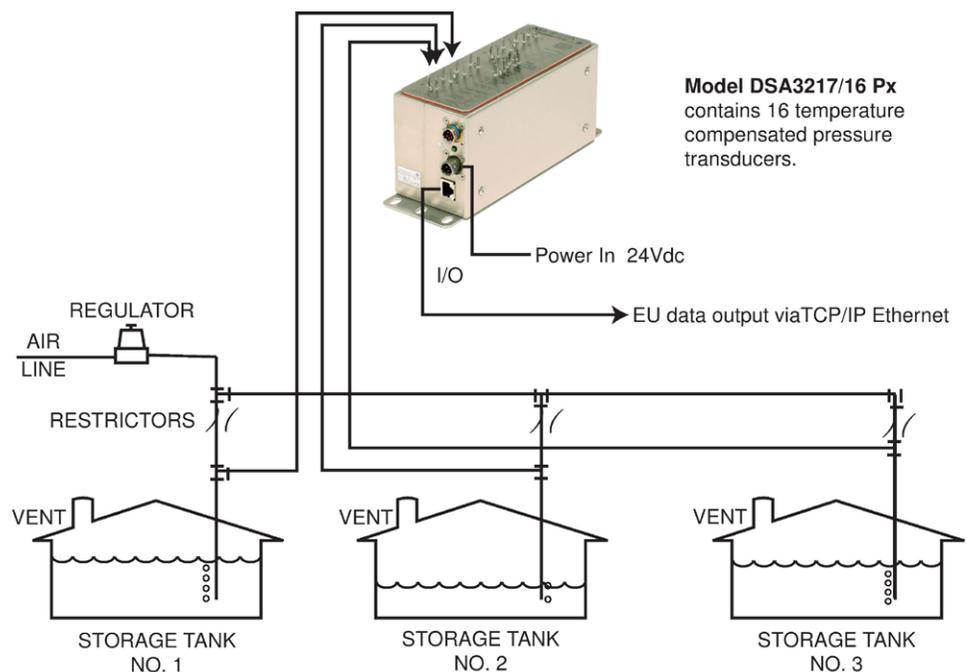
TANKS OPEN TO ATMOSPHERE

One of the oldest level measuring methods is bleeding a gas, such as CO₂ or N₂, to the bottom of a storage tank and using this gas pressure to determine stored weight and fluid height. This process can be applied economically with Scanivalve's intelligent pressure modules. The model DSA3217 pressure module can measure storage tank levels and can be located near the tanks by utilizing an Ethernet communication interface. This digital approach eliminates many analog wires, signal conditioners and individual pressure transducers or transmitters.

Another important advantage is the increased reliability through the absence of moving parts in the storage tanks. Incorporated in the DSA3217 are 16 temperature compensated pressure transducers, a 16 bit A/D, microprocessor, and a calibration valve in a rugged stainless steel box. The DSA module outputs engineering units via Ethernet TCP/IP or UDP.

RECOMMENDED MODELS

- DSA3217/16px-xx
psid 16 channel module
(With 1/16 inch input tubulations)
- DSA3218/16px-xx
psid 16 channel module
(With 1/8 or 1/4 inch
steel Swagelok® input fittings).



TANK CLOSED TO ATMOSPHERE

This method of tank level measurement is more common today than using tanks open to the atmosphere. The same advantages and principles from the previous page still apply, only now we are measuring a differential pressure.

Using the no moving parts technique of bleeding a gas at the bottom of each tank, the PC or host can determine the stored weight from the differential pressure measurements that are referenced to the inside tank vapor pressure.

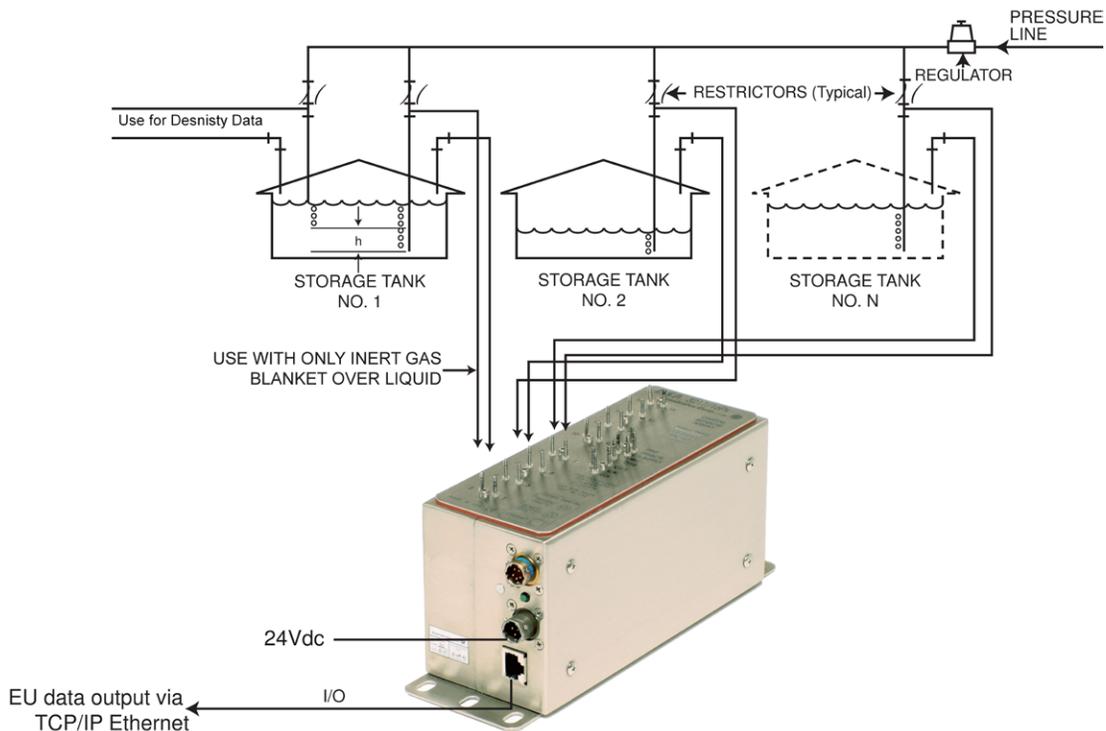
From this information, the weight and height of the fluid can be determined.

COMMUNICATION

The DSA3200 series intelligent modules communicate through industry proven Ethernet TCP/IP or UDP. Communication can be made directly with ASCII commands via Telnet or a custom interface created with our LabVIEW driver.

RECOMMENDED MODELS:

- Model DSA3217/8DPx-xx psid 8 channels of true differential measurement with individual reference ports (With 1/16 inch input tubulations).
- Model DSA3218/16DPx-xx psid 16 channels with individual reference ports per transducer (With 1/8 or 1/4 inch steel Swagelok® fittings).



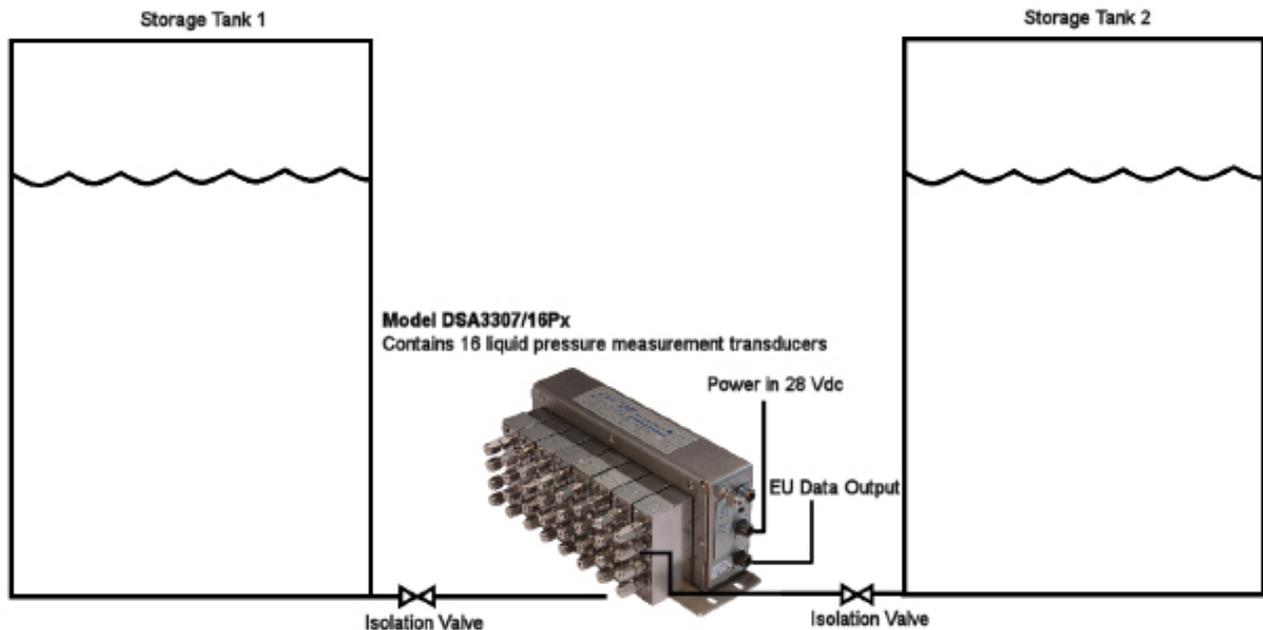
Model DSA3217/8D Px
contains 8 temperature compensated true differential pressure transducers.

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DSA3207/3307 LIQUID OPTION

Another solution to measure fluid storage inventory is the DSA3207/3307. This is an “all media” module, meaning that it is capable of reading liquid, and gas pressures. The DSA3207/3307 is capable of measuring anywhere from 2 up to 16 liquid absolute pressures per module. Pressures are input into a 1/8 inch Swagelok® fittings via copper, steel or plastic tubing. The pressure transducers are isolated from the media on the measurement side of the sensor by a stainless steel diaphragm.

Note: Due to the fact that hydrostatic pressure is directly proportional to the height of the fluid, it is important that the DSA3207/3307 be positioned at the same height as the base of the fluid in the storage tank.



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