

Series 7100 – Precision Metering Skids

Easy-to-use high accuracy systems for fiscal transfer applications



The 7100 series is a right-fit for any business cases that involve liquid custody transfer via commercial containers like lorries, road tankers, ISO tanks or barges. Whether your liquid be white oils, petrochemicals, solvents or fuels, the 7100 is equipped with state-of-the-art positive displacement flow sensor, high-capacity degassing system and pumps carefully selected and sized as per your discharge requirements.

This product is a cut above standard techniques such as dip rods and weigh bridges due to using an oscillating flowmeter with a precision at least 1000x of commercially available weigh bridges. The system also does not suffer from variations in specific gravity due to precise volumetric segmentation in measurement chamber of the flowmeter.

Customers have been able to enhance productivity, minimize tanker decanting time and claim losses by using our top-notch legal metrology certified decanting system and thus reduced cost of purchased raw material.

Overview

Your Benefits

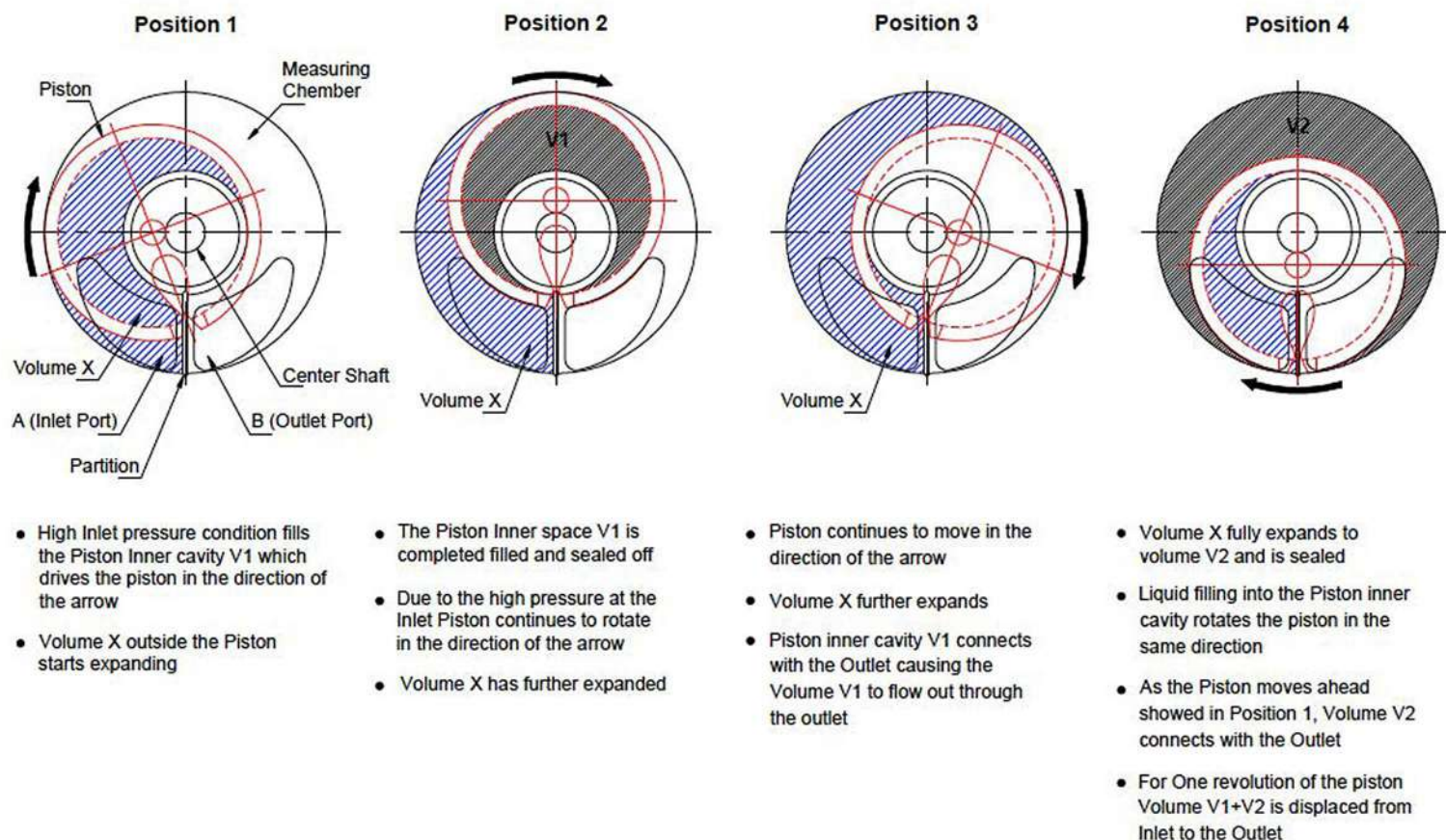
- An alternative to less precise methods like dip rods and weigh bridges
- An accurate flowmeter, degassing system and right-sized pump and strainer in the same skid
- Repeatability – Better than $\pm 0.05\%$
- Measurement not affected by inevitable two-phase flow profiles
- Compensated pressure drop due to right-sized pump in skid
- Direct gravity head decanting option is available
- Smart controller for process, diagnostic information, control and safety features
- Measurement not affected by changes in density of product
- Uses 50 micron strainer element



Specs at a glance

- Max measurement error (liquid) - $\pm 0.1\%$ (Standard)
- Measuring range 0 to 60,000 LPH (0 to 16,000 GPH)
- Medium temperature - -20 deg to 80 deg C
- Wetted materials 316L/304 SS/ MS/Aluminium
- Explosion-proof transmitters, fittings and electronics
- All-chemical compatibility system internals
- Choice of centrifugal and positive displacement pumps

Internal Flow measurement technology



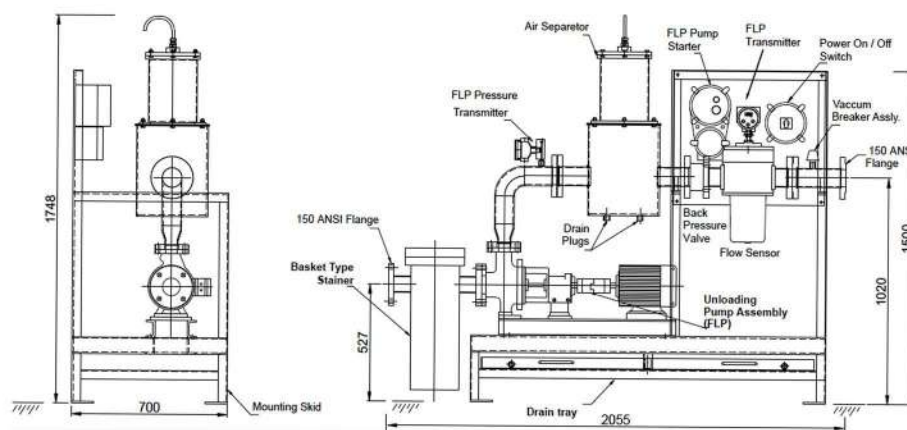
The Positive Displacement principle is the only accurate method of flow measurement due to its **direct measurement of volume**. Volume is not inferred from velocity of liquid or mass flow rates as in inferential meters.

The Fluidyne oscillating piston meter is a unique single rotor principle works by continuously filling and emptying a measurement chamber of fixed volume for a certain meter geometry. The correlation of piston movement to the calibrated volume is the calibration factor or 'k factor' which is adjusted as per the liquid to be measured by the flowmeter.

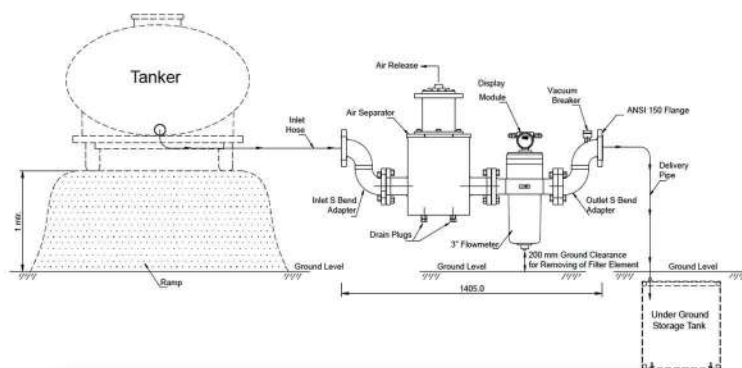
Total volume in flow stream = k factor * number of oscillations of piston

Design Variants

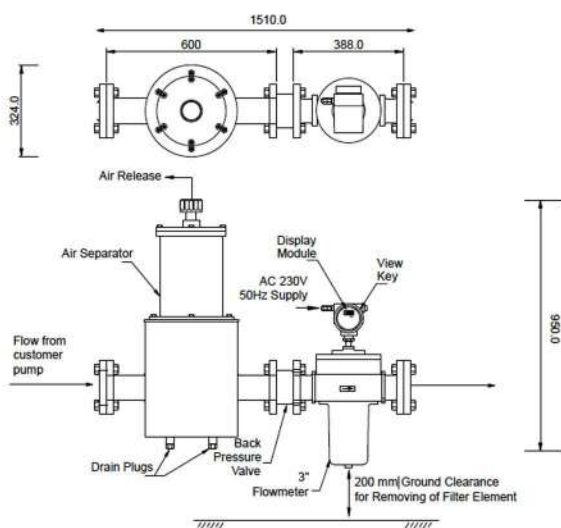
Complete Metering Skid with Pump



Decanting via Gravity Head



Decanting via Existing Pump



Features and specifications

Product headline

System approved for accurate decanting/unloading of containers carrying liquids

Customer motivation

An alternative to error-prone techniques like dip rods, weigh bridges and orifice flowmeters

Skid features

Cost-effective high precision metering skid with built-in 100% degassing system, direct measurement oscillating piston flowmeter, right-sized pump, vacuum breaker and strainer (50 micron). Low slippage characteristics, high repeatability and medium temperature compatibility - -20 deg C to +150 deg C

Nominal diameter range

DN40, DN50, DN80, DN100

Wetted materials

Pipework, Flowmeter – Aluminium LM04, Stainless Steel 316/316L, Mild Steel EN8
Gaskets – PTFE/Viton/EPDM/BUNA-N/Silicone

Pumps

Centrifugal
Positive Displacement
Discharge and head sizing on request

Flowmeter

Positive Displacement (Oscillating piston)

Two-phase flow type handling capacity

Bubble flow
Slug flow
Empty-full-empty flow
Liquid with entrained gas
Completely empty source (at end of decanting cycle)

Degassing System - Vapor Separator

Integrated vapor scrubber and release head
Large 35 L volume
Coalescer baffles with anti-surge nozzle
Level dampener

Degassing System – Back pressure valve

Poppet valve
Aerodynamic profiling for low pressure drop
Soft-seated bubble tight shut-off

Features and specifications

Vacuum breaker

Under 500 mbar vacuum activation

Poppet with 12 mm purge port

Measured variables

Instantaneous volume, volume flow, totalized volume

Metrological data

Accuracy – $\pm 0.1\%$ of measured volume (std), 0.05% (advanced)

Turndown – 1:10 (std)

Repeatability – Better than $\pm 0.005\%$

Resolution – 90 ml

Measuring range

0 to 60,000 LPH (0 to 16,000 GPH)

Medium temperature range

-20 deg C to +150 deg C

Transmitter

CT22 TM with outputs 4-20 mA, Modbus, 3 x DO, 1 x DI

Protection

Std – IP54, Option – IP65

Process connection

Flanged (ANSI/Table D,F, JS)

Special connection on request

User Interface

2-line backlight display with capacitive touch control, Configuration via local display possible

Safety features

Pressure switch

Empty compartment detection

Auto-pump control

Approvals

Legal Metrology (India)

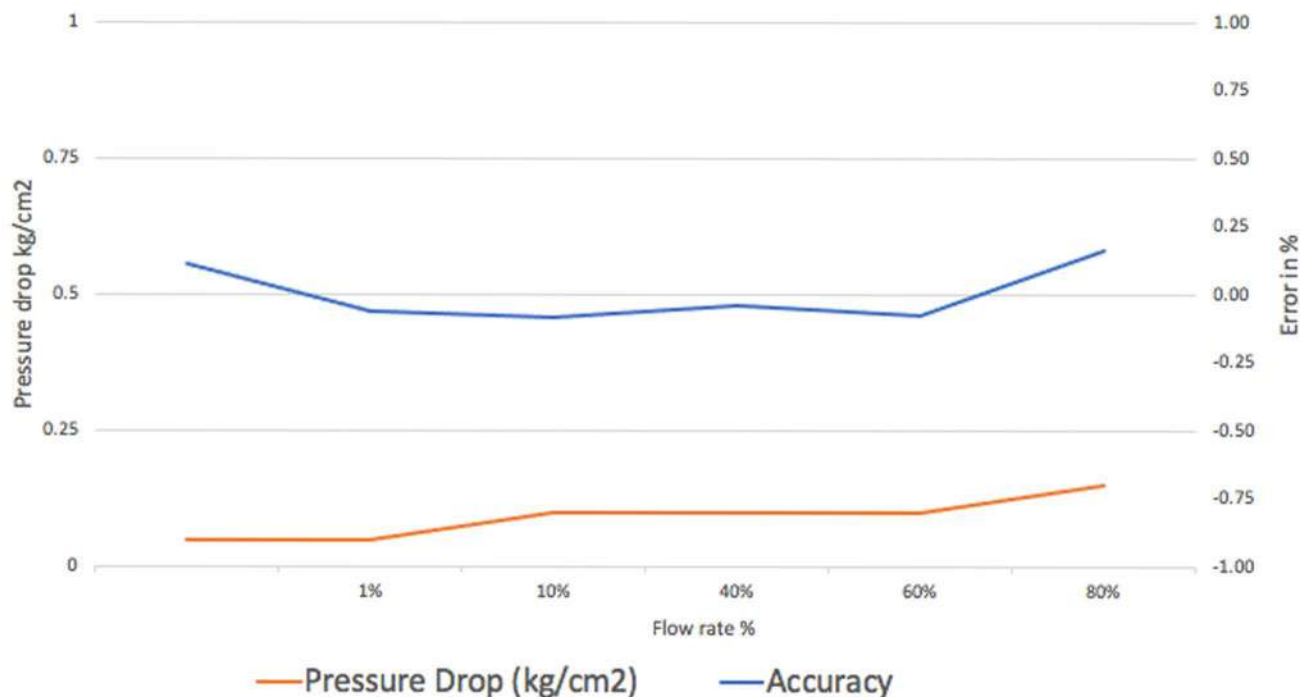
Calibration in accredited facilities (ISO 17025) PESO (India)

Ingress Protection IP66

ATEX/IECEx (under process)

Material certificates – 3.1

Typical Accuracy and Pressure Drop Curves



Accuracy and Pressure drop test conditions

Test liquid - HSD (Density = 0.822 at 25 deg C)

Skid size - DN80

Pump used - Centrifugal pump (5 HP motor, 20 metre discharge head, 500 LPM)

Typical Application 1- Diesel Unloading In Data Centers

Data Centers are tasked with delivering business continuity to their customers as defined in their SLA (Service Level Agreement). To guarantee uptime, one must have an infallible cascade of power sources through Diesel Generators. Diesel is unloaded from road tankers by dip rod technique.

Errors with dip rods

- Only have the mark of the **compartment volume** and nothing in between.
- Parallax viewing is a source of error
- Dip rods can be inserted with a tilt

In comparison, our 7100 Tanker Decanting System is the industry's preferred choice for measurement of actual quantity of decanted fuel versus billing amount and enables owners to save at least 1-2% on every decanting cycle.



Your Benefits

- Savings on every tanker decanted
- Precision measurement – 11,000 ppKL (pulse per kL)
- Automated process with empty tanker detection
- Reduce diesel decanting time of 30 kL tanker to under 40 mins
- Accuracy unaffected by thermal expansion
- Leave minimal amount of diesel behind

Typical Application 2 – Chemical unloading on mass

Although liquids are ideally traded on volume, industrial chemicals such as styrene, methanol and other solvents are most often commercially traded on mass. Weigh bridges are prone to erroneous measurement due to having Weigh bridge errors are marked as percentage of full scale and have large resolution.

Measure the facts!

The 7100 carries an ultra-high resolution of 90 ml and is rated on error of measured volume as opposed to full-scale. It can be used as a primary method of measurement to unload tankers as small as 6 kL.



Your Benefits

- Precision measurement – 11,000 ppKL (pulse per kL)
- True online unloading. No trip to the weigh bridge area
- No effect of thermal expansion, temperature on measurement accuracy
- Highest repeatability of 0.05%
- Volumetric reading correlates with weigh bridge (by instantaneous density calculation)
- Automatic pump control on detecting empty tanker

May we assist you with your metering skid application?

Contact your Fluidyne representative today to discuss your problem statement and experience our state-of-the-art product quality, accuracy, reliability and outstanding service.

Key people

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