ACCUFLOW

Proven Well Test Technology Solutions

ACCUFLOW

Product Pages

Get the Accuflow Advantage

Features

- Typically, Accuflow is made of pipe and piping components, and can be compliant to ASME B31.3 or pressure vessel code
- **Accuflow's design is simple; it has no moving parts and all components are commercially proven technologies**
- Accuflow is designed to perform continuous measurement, instead of batch process type measurement
- **Its overall pressure drop is very small (<3 psi, typical)**
- Integration with SCADA or RTU systems
- Low liquid inventory & fast response
- Auto density calibration available

Benefits

- Low equipment and maintenance costs
- Easy to install and operate
- Wide range of flow rates, high turn down ratio
- **Extremely accurate**
- Short and frequent well testing
- Applicable for 0 – 100% water cut
- Applicable for 0 – 100% GVF

Because the multiphase stream is completely separated into liquid and gas stream prior to measurement, the Accuflow system can operate in all flow regimes. It is applicable to the full range of gas fraction.

Low Pressure Drop

The Accuflow system typically has only one control valve, which is in the gas flow line. It controls the liquid level (not pressure). Some Accuflow models don't need any control valves at all!

Typically, there is no control valve in the liquid line, nor backpressure regulator in the gas line, hence the operating pressure rises and falls with the production line pressure.

Pressure drop across the entire metering system is typically less than 3 psi.

Low Liquid Inventory

When compared to conventional test separators, the Accuflow metering system has a significantly low liquid inventory. Consequently, frequent well testing is obtainable due to significantly reduced purge time.

No Vented or Flared Gas

Unlike the conventional test separator, the Accuflow system has a single inlet and a single outlet, thus no dedicated downstream gas line or gas facility is required. It supports zero or unnecessary gas venting or flaring.

With this feature, Accuflow is suitable for well teting anywhere from the well head to a gathering station.

Auto Density Calibration

The recently proven auto density calibration feature improves the density-based water cut determintation tremendously. The net oil uncertainty is improved as well.

2-PHASE SERIES

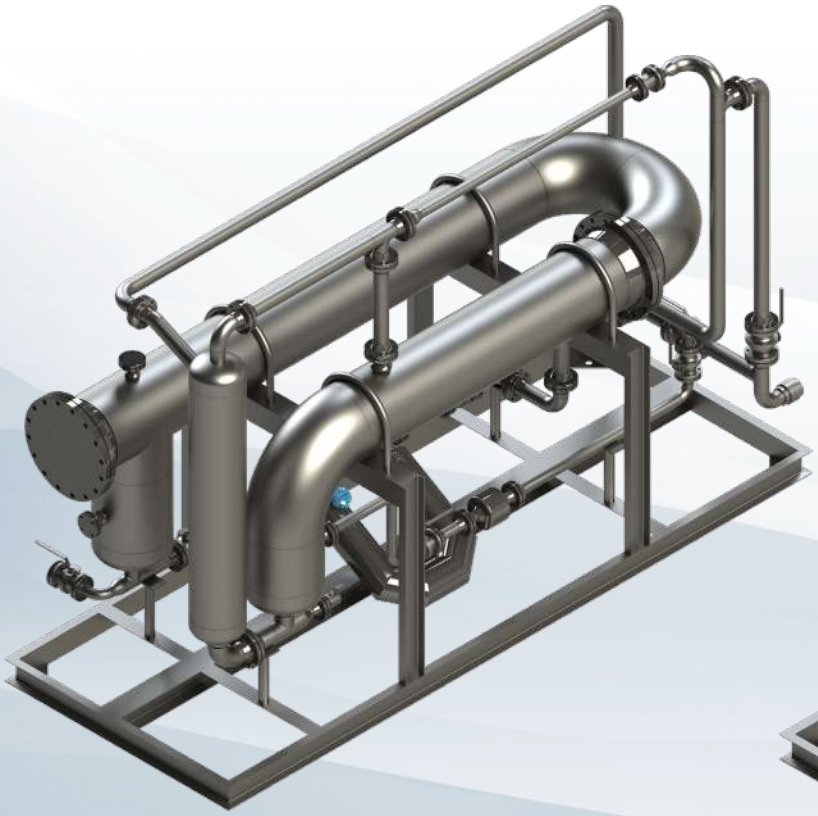
The patented Accuflow 2-phase Series multiphase metering system consists of a vertical pipe section and a horizontal pipe section connected together as shown. Multiphasic fluid (oil, water, gas) enters the vertical pipe tangentially, creating a cyclonic action in the pipe where the majority of the gas is separated and flows upward. The remaining gas is carried under with the liquid stream (oil and water) and enters the horizontal pipe where the gas is completely separated.

Liquid level in the horizontal pipe is controlled at the center of the pipe using a control valve located in the gas flow line. Large gas/liquid interface area, thin gas bearing emulsion layer, and quiescent flow in the horizontal pipe, all contribute to efficient removal of free gas bubbles from the liquid stream.

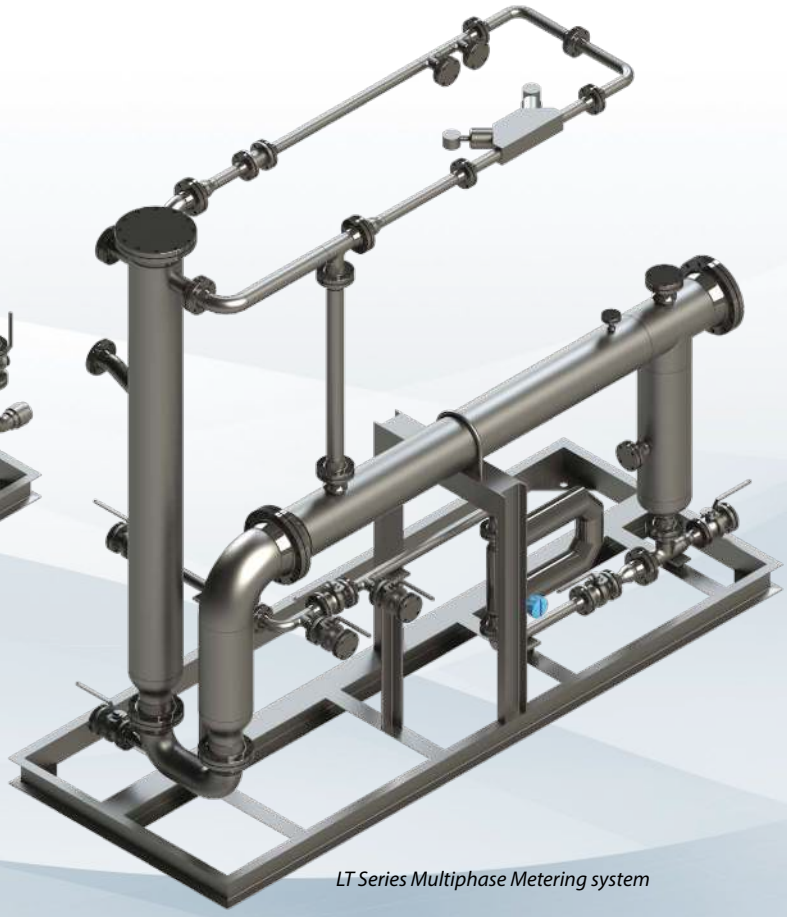
A conventional liquid meter (Coriolis, turbine, etc.) is used to measure liquid flow rate. Water cut measurement can also be obtained using conventional technologies or methods (density differential, microwave, etc.).

Gas flow is also measured using conventional technologies (vortex, turbine, ultrasonic, etc.). After measurement, the gas and liquid streams are recombined and returned to the multiphase flow line.

The compact LT Series is particularly suitable for space limited areas, such as offshore platforms.



SR Series Multiphase Metering system



LT Series Multiphase Metering system

Features

- Simple and compact design
- Entire system made of common steel pipes; no pressure vessels required
- All components are commercially proven technologies
- Very low pressure drop (<3 psi)
- Low liquid inventory and fast response

Benefits

- Low equipment cost
- Easy to transport, install, & operate
- Very low maintenance
- Accurate measurement
- Handles wide range of flow rates
- Applicable for 0 to 100% water cut
- Applicable for 0 to 100% gas fraction
- Frequent well testing

Anticipated Accuracy

Liquid flow rate: 1% of reading

Gas flow rate: 5% of reading

Water cut in liquid: 2% absolute

Specification

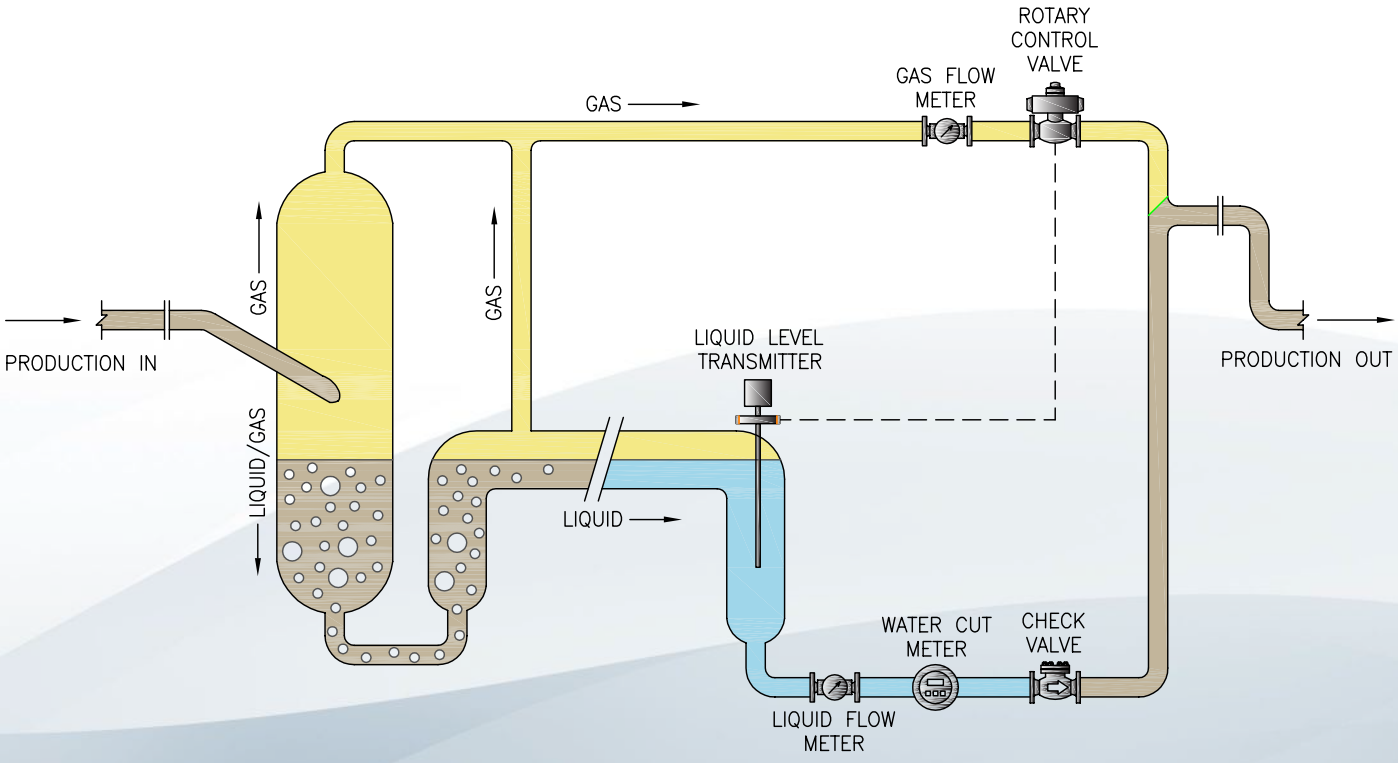
Footprint: 6'W x 15'L (typical)

Height: 12' (typical)

Liquid Rate: consult factory

Gas Rate: consult factory

ANSI rating: 150#, 300#, 600# and 900#



Compact design suitable for offshore duty

Truck mounted with operator control room for mobile applications

Accuflow SR for group or individual well testing

2-PHASE JR SERIES

The Accuflow 2-phase JR Series multiphase metering system consists of a vertical pipe section, a gas flow line, and liquid flow line as shown. Multiphasic fluid (oil, water, gas) enters the vertical pipe tangentially, creating a cyclonic action in the pipe where liquid and gas are separated into separate streams.

Once the liquid and gas are separated, each phase is measured independently using industry proven measurement devices. A conventional liquid meter (Coriolis, turbine, etc.) is used to measure liquid flow rate. Water cut measurement can also be obtained using conventional technologies or methods (density differential, microwave, etc.).

Gas flow is also measured using conventional technologies (vortex, turbine, ultrasonic, etc.). After measurement, the gas and liquid streams are recombined and returned to the multiphase flow line.

By properly designing the Accuflow JR, an active liquid level control system is NOT necessary. Liquid level in the vertical section is self-regulated and thus does not require the use of any control valves. It is the implementation of this technique that makes the Accuflow 2-phase JR series a truly low cost and efficient measurement system.

Features

- Simple and compact design
- Entire system made of common steel pipes; no pressure vessels required
- No control valves
- All components are commercially proven technologies
- Very low pressure drop (<3 psi)
- Low liquid inventory and fast response

Benefits

- Suitable for various production wells including gas condensate wells
- Low equipment cost
- Easy to transport, install, & operate
- Very low maintenance
- Accurate measurement
- Handles wide range of flow rates
- Applicable for 0 to 100% water cut
- Applicable for 0 to 100% gas fraction
- Frequent well testing

Anticipated Accuracy

Liquid flow rate: 1% of reading

Gas flow rate: 5% of reading

Water cut in liquid: 2% absolute

Specification

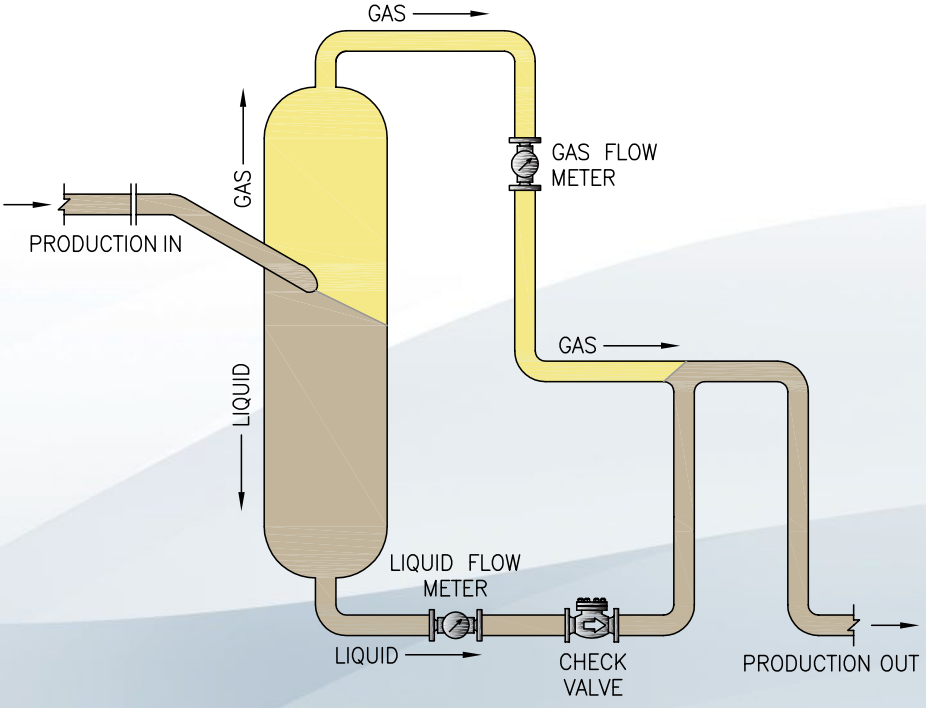
Footprint: 4'W x 8'L (typical)

Height: 12' (typical)

Liquid Rate: consult factory

Gas Rate: consult factory

ANSI rating: 150#, 300#, 600# and 900#



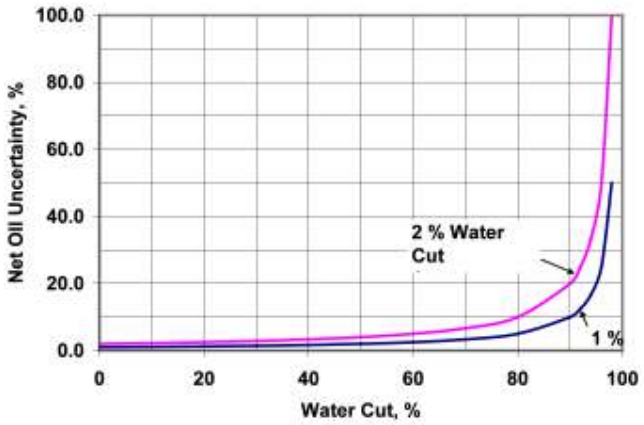
This metering skid is installed in a major oil company's oil field in California.

Rows of Accuflow JRs ready to go

Trailer mounted Accuflow JR

3-PHASE SERIES

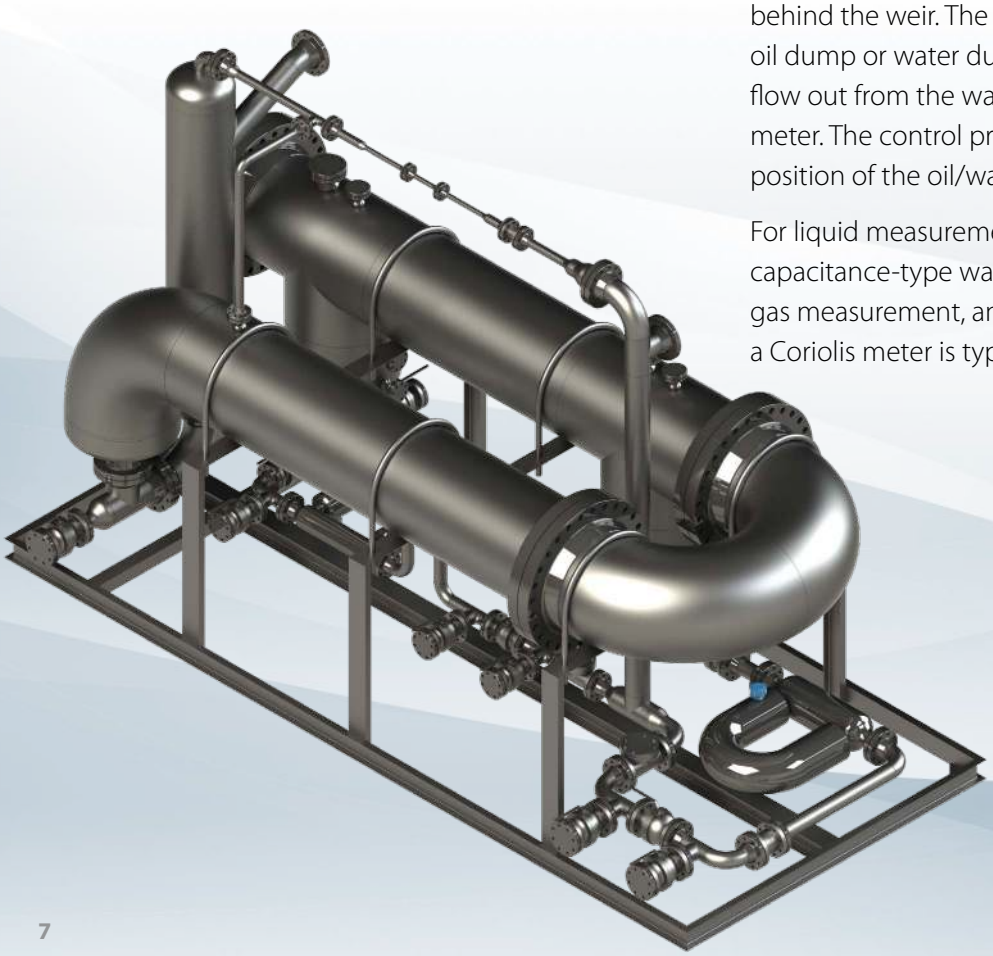
High water cut conditions can occur in water and steam flood productions as well as in maturing reservoirs. Measurement uncertainty of Net Oil using a 2-phase separator increases exponentially at high water cuts (>85%).



The Accuflow 3-phase separation metering system addresses this issue of measurement uncertainty at high water cuts by taking an additional step of separating water from oil. The Accuflow 3-phase Series consists of vertical pipe and a horizontal pipe sections connected together as shown. Production fluid (oil, water, and gas) enters the vertical pipe tangentially, creating a cyclonic action in the pipe where the majority of the gas is separated and flows upward to the gas flow line above. The remaining gas, in the form of small gas bubbles, is carried under with the liquid stream and enters the horizontal pipe.

As the liquid flows through the horizontal pipe, the remaining gas bubbles are completely separated. Meanwhile, the liquid phase is further separated by using a weir. The oil/water interface is controlled below the weir, allowing all free water to be collected in front of the weir. Oil is skimmed over the top of weir and collected behind the weir. The level of the interface determines the oil dump or water dump. This causes the free water to flow out from the water line and be measured by the flow meter. The control process repeats, depending on the position of the oil/water interface.

For liquid measurement, a Coriolis flow meter and a capacitance-type water cut meter are typical used. For gas measurement, an ultrasonic meter, a vortex meter, or a Coriolis meter is typically employed.



Features

- Simple and compact design
- Entire system made of common steel pipes; no pressure vessels required
- All components are commercially proven technologies
- Very low pressure drop (<5 psi)
- Low liquid inventory and fast response

Benefits

- Low operating cost
- Easy to transport, install, & operate
- Very low maintenance
- Accurate Net Oil measurement for very high water cut production
- Handles wide range of flow rates
- Applicable for 0 to 100% water cut
- Applicable for 0 to 100% gas fraction
- Frequent well testing

Anticipated Accuracy

Liquid flow rate: 1% of reading

Gas flow rate: 5% of reading

Water cut in liquid: 2% absolute

Specification

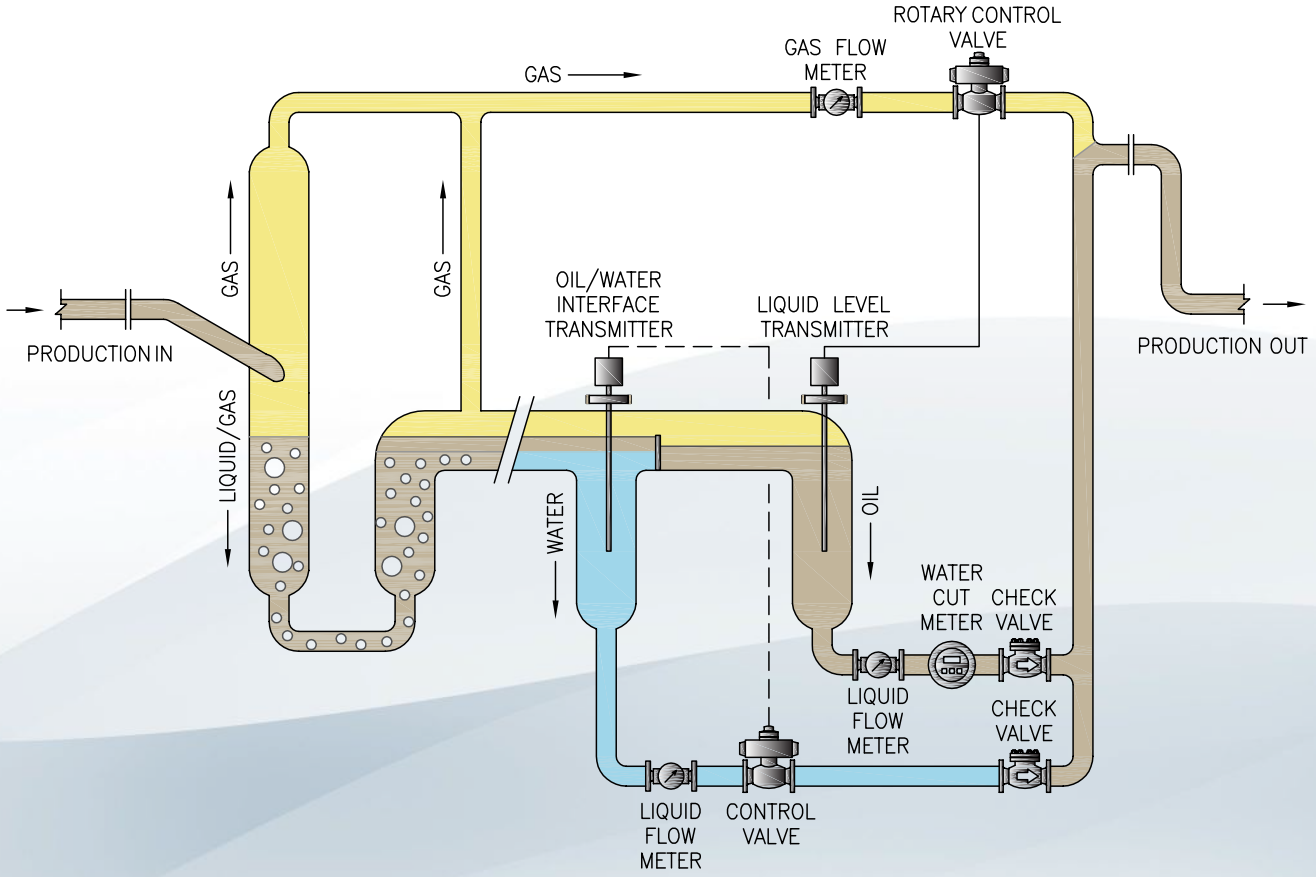
Footprint: 6'W x 20'L (typical)

Height: 12' (typical)

Liquid Rate: consult factory

Gas Rate: consult factory

ANSI rating: 150#, 300#, 600# and 900#



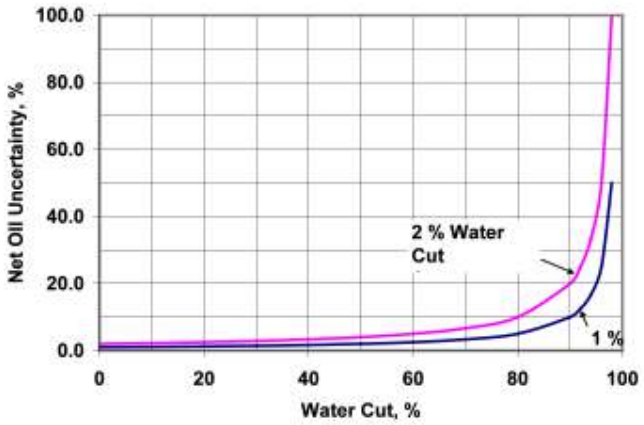
Accuflow 3 Phase for mobile application

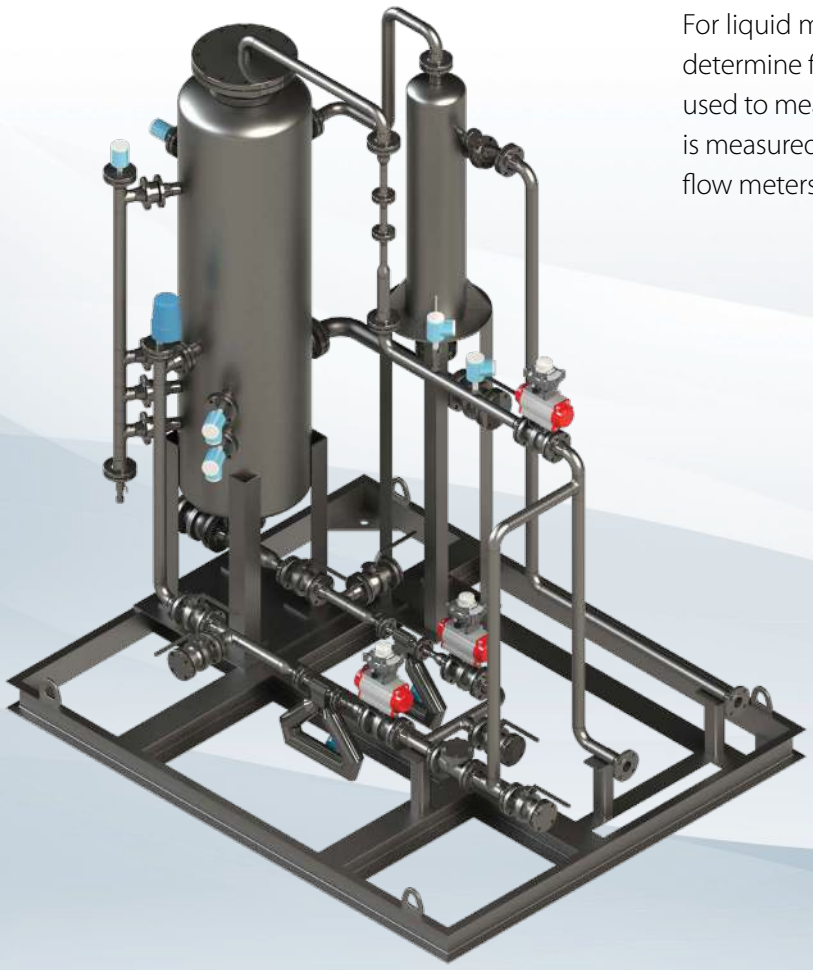
A typical Accuflow 3 Phase

Truck mounted 3 Phase

3-PHASE JR SERIES

High water cut conditions can occur in water and steam flood productions as well as in maturing reservoirs. Measurement uncertainty of net oil using a 2-phase separator increases exponentially at high water cuts (>85%).





The Accuflow 3-Phase JR separation metering system addresses this issue of measurement uncertainty at high water cuts, by taking an additional step of separating water from oil. The Accuflow 3-phase JR consists of a smaller vertical and a larger vertical pipe sections connected together as shown. Production fluid (oil, water, and gas) enters the first vertical pipe tangentially, creating a cyclonic action in the pipe where the majority of the gas is separated and flows upward to the gas flow line above.

The liquid then flows into a secondary vertical pipe section where free water is dropped out on the front side of a baffle plate. The baffle plate serves to prevent disturbance of the water/oil interface from the incoming fluid. On the back side of the baffle plate, oil/water interface is monitored. Water and oil control valves are toggled as necessary to control the height of the interface.

For liquid measurement, a Coriolis meter is used to determine flow rate and a water cut meter in the oil leg is used to measure any remaining water in the emulsion. Gas is measured by typically either ultrasonic, vortex, or Coriolis flow meters.

Features

- Simple and compact design
- Entire system made of common steel pipes; no pressure vessels required
- All components are commercially proven technologies
- Very low pressure drop (<3 psi)
- Low liquid inventory and fast response

Benefits

- Low operating cost
- Easy to transport, install, & operate
- Very low maintenance
- Accurate Net Oil measurement for very high water cut production
- Handles wide range of flow rates
- Applicable for 0 to 100% water cut
- Applicable for 0 to 100% gas fraction
- Frequent well testing

Anticipated Accuracy

Liquid flow rate: 1% of reading

Gas flow rate: 5% of reading

Water cut in liquid: 2% absolute

Specification

Footprint: 6'W x 8'L (typical)

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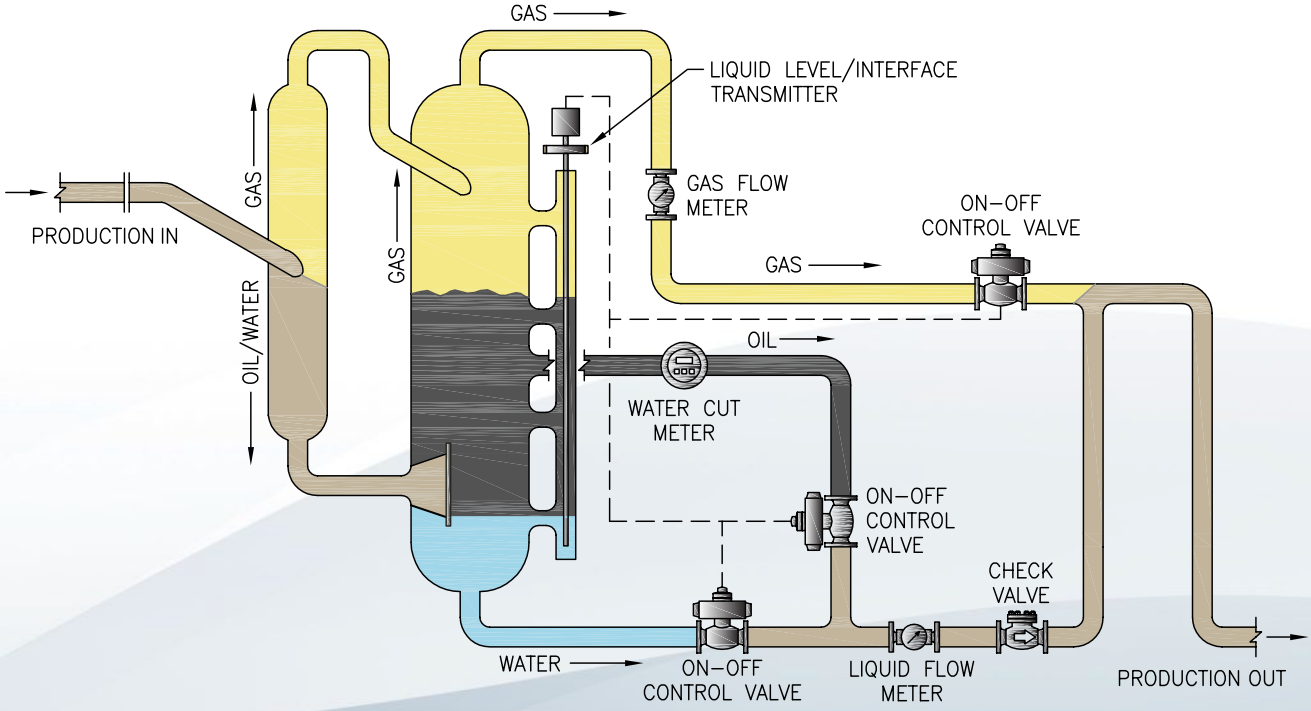
Liquid Rate: consult factory

Gas Rate: consult factory

ANSI rating: 150#, 300#, 600# and 900#



3-phase JR trailer mounted for mobile applications

3-phase JR in Duplex Stainless Steel

3-phase JR in the field

The Accuflow Story

Accuflow was founded in 1994 by Dr. KT Liu and is located in Bakersfield, California. Accuflow is recognized as a leading global supplier of well test measurement systems in the petroleum industry. Highly innovative and accurate, Accuflow brings a new set of standards to oil field measurement.

Dr. Liu has been part of the Oil & Gas industry for over 40 years doing research and development for flow measurement. He has pioneered the way for many of the current measurement technologies and applications and is regarded as one of the premier minds in his field. Many O&G vendors and service companies use the technologies and methodologies he developed, for their own systems, as well as algorithms he developed, that are now API standards.

The Accuflow has become recognized worldwide as a complimentary fit to a wide range of process flow conditions. The custom designed nature of the Accuflow allows for a great deal of flexibility during application design.

Accuflow constantly looks to improve upon itself by keeping up with its own research and development efforts as well as taking from extensive in field experience. The result is a system designed with accurate, reliable, and current technologies.

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