### Technical Facts

<table>
<thead>
<tr>
<th>Gas Carrying Pipes:</th>
<th>0.4 to 44 inches up to 35 mm wall thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid Filled Pipes:</td>
<td>1/4 inch to 225 inches up to 35 mm wall thickness</td>
</tr>
<tr>
<td>Pipe Sizes (Outer Diameter):</td>
<td>(if field calibrated)</td>
</tr>
<tr>
<td>Calibrated Accuracy:</td>
<td>± 0.5% of reading ± 0.03 ft/s (liquids and gases)</td>
</tr>
<tr>
<td>Repeatability:</td>
<td>± 1% of reading or ± 3% of reading ± 0.03 ft/s</td>
</tr>
<tr>
<td>Gases:</td>
<td>&gt; 3.5 l/h on 1/2 inch pipes (up to 1.5 inch pipes)</td>
</tr>
<tr>
<td>Liquids:</td>
<td>0.03 to 80 ft/s</td>
</tr>
<tr>
<td>Temperature Ranges:</td>
<td>-40 °C to +200 °C (-190 °C up to +400 °F are applicable)</td>
</tr>
</tbody>
</table>

### Unique Features of the FLUXUS®-HybridTrek

- Ruggedness and reliability: measurement outside the pipe wall and thus no maintenance required due to corrosion resistant ultrasonic transducers. The corrosion resistant ultrasonic transducers also mean measuring from the outside of the pipe. The corrosion resistant ultrasonic transducers also mean measuring from the outside of the pipe. The corrosion resistant ultrasonic transducers also mean measuring from the outside of the pipe.
- High operational safety with no risk of leaks - maintenance free: means measuring from the outside of the pipe. The corrosion resistant ultrasonic transducers also mean measuring from the outside of the pipe. The corrosion resistant ultrasonic transducers also mean measuring from the outside of the pipe.
- Accuracy and repeatable measurement: due to its HybridTrek technology, the acoustic method offers accurate and reliable measurements over an almost unlimited flow range, regardless of the medium or climate, mud, dust and so on. Moreover, the produced flows rarely come in one pure phase, but mostly are mixtures of gases, liquids, and entrained solids. Better don't touch.

FLEXIM uses active Linear Ultrasonic Probes (LUP) in a two-way process that sends a pulse and receives a signal back. FLUXUS®-HybridTrek technology allows for accurate and reliable measurement even in multilayer and challenging environments such as orifices, the acoustic method offers accurate and reliable measurements over an almost unlimited flow range, regardless of the medium or climate, mud, dust and so on. Moreover, the produced flows rarely come in one pure phase, but mostly are mixtures of gases, liquids, and entrained solids. Better don't touch.

### About FLEXIM

FLEXIM considers itself not only a manufacturer of measuring instruments, but also a pioneer in the non-intrusive flow measurement of liquids and gases. FLEXIM has been leading the way in ultrasonic clamp-on flow metering for more than 20 years. In order to maintain and further improve its position as an industry leader, FLEXIM continuously invests in research and development in order to keep its products at the forefront of technology. Year after year, the Berlin-based company continues its substantial investment in research and development in order to maintain and further improve its position as an industry leader. In testing new and old principles, FLEXIM has continuously improved its product range. Every generation of FLEXIM products has been improved and refined to ensure the highest metering accuracy and performance.

The FLEXIM Commitment to Customer Service

FLEXIM values its customers not only as a manufacturer of measuring instruments, but also as a partner in technical and consulting services. FLEXIM values its customers not only as a manufacturer of measuring instruments, but also as a partner in technical and consulting services. The company’s focus with dedication is directed towards providing the highest quality equipment with the best support and services possible.

FLEXIM AMERICAS

1190 Enterprise Drive
Boca Raton, FL 33487

Phone: (561) 352-2200

www.flexim.com

1-888-852-PIPE

### Upstream Solutions

**Liquids - Gases - Offshore - Onshore**

- Non-intrusive ultrasonic flow measurement with FLUXUS®

- **Rugged - Efficient**

- **FLUXUS** (G/L) - for liquids or gases - a wide variety of solutions for upstream applications.

- **FLEXIM Commitment to Customer Service**

- **Technical Facts**

- **Unique Features of the FLUXUS®-HybridTrek**

- **FLEXIM AMERICAS**

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- **Boca Raton, FL 33487**

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- **1-888-852-PIPE**

### Outlining Outliers

- Fine measurement with FLUXUS® makes measuring from the outside of the pipe easier. The corrosion resistant ultrasonic transducers are installed in rugged weightless bodies being fixed onto the pipe - thus no opening of pipes. This also minimizes down time and can be performed under hazardous working conditions and at any time of the day and night.

- Non-intrusive ultrasonic flow measurement with FLUXUS® is not only in production and reliability. The FLUXUS®-HybridTrek is a pioneer - characterized by its unique technology and the ability to measure flow in the most challenging environments. The unique technology and the ability to measure flow in the most challenging environments. The unique technology and the ability to measure flow in the most challenging environments. The unique technology and the ability to measure flow in the most challenging environments. The unique technology and the ability to measure flow in the most challenging environments.
Unrivalled advantages of the non-intrusive flow measurement with FLEXIM® in upstream applications.

- No process disconnections for recalibration
- Maintenance free for years read dead
- Designed for gas, steam injection (SIP) or oil, for asphalt emulsion coding (pipe lay-up in TSS current by nature)
- Field proven technology over many years of operation
- High performance, low drag design

Technical Facts

- Ultrasonic measurement technology
- High performance and low drag design
- Engineered for the reliable and accurate measurement
- Unaffected by gas wetness (LVF up to 0.5)
- Virtually free of wear and tear with matched transducers, integrated PVT (process variables and temperature) block

Engineered for the reliable and accurate measurement

The FLEXIM Commitment to Customer Service

FLEXIM considers itself not only a manufacturer of measuring instruments, but also a provider of technical and consulting services. FLEXIM is a pioneer in the non-intrusive flow measurement of liquids and gases, FLEXIM has been leading the way in ultrasonic clamp-on flow metering for more than 20 years.

FLEXIM is an active leader in many areas of process instrumentation. As a worldwide leading provider of technical and consulting services, laboratory analysis, project handling, training, commissioning, FLEXIM has offices located throughout North America.

FLEXIM AMERICAS

FLEXIM considers itself a provider of technical and consulting services. These services include on-site training, laboratory analysis, project handling, and digital signal processing. The company’s focus is on delivering the highest quality equipment with the best support and services possible.

Unique features of the FLUXUS®-Flowmeters

- Engineered for the reliable measurement of liquid and gas flows
- No pressure loss, no flow disrupting design
- Resin coated ultrasonic transducers, internal and external pressure process
- Improves process and safety by reducing measurement errors - main at the moratorium line and at the production site
- Highly cost efficient in comparison to intrusive measurement

Technical Details

- FLUXUS G series (gas flows)
- FLUXUS L series (liquid flows)
- FLUXUS F series (gas and liquid flows)
- FLUXUS W series (wetted instrumentation)
- FLUXUS Gaischek (gas flows)
- FLUXUS GUS (gas applications)

Outstanding outsiders

Outstanding outsiders

Upstream Solutions

- Liquids - Gases - Offshore - Onshore

Outstanding outsiders

Upstream Solutions

- Liquids - Gases - Offshore - Onshore

Upstream Solutions

- Liquids - Gases - Offshore - Onshore
**ULTRASONIC ADVANTAGES OF THE NON-INTRUSIVE FLOW MEASUREMENT WITH FLEXIM® IN UPSTREAM APPLICATIONS**

- **Rugged, reliable, and efficient**

  - Virtually free of wear and tear with fast measuring dynamics capturing certified operation within hazardous areas independent of pipe material, diameter, or flow conditions.
  - Engineered for high operational safety with no risk of gas wetness (LVF up to 10% content by volume).
  - Accurate and repeatable measurement unaffected by gas wetness.
  - Accurate and reliable metering permanent coupling with unique measurement stability and thus accuracy.
  - Unrivalled advantages of the non-intrusive flow measurement of liquids and gases. FLEXIM® flow meters: better don’t touch.

**Technical facts**

- **Easy installation and maintenance**
  - Quick and reliable measurement of liquid and gas flow rates.
  - Running cost efficient in comparison to traditional flow measurement devices.
  - No pressure losses, no line clogging.
  - No leaks.
  - No pressure losses, no line clogging.

**Unique features of the FLEXIM®-Flowmeters**

- **Unsurpassed flow measuring accuracy**
  - Field proven, flow measuring accuracy of less than 0.5% of reading ± 0.03 ft/s (liquids and gases).
  - ± 1% ... 3% of reading ± 0.03 ft/s (liquids).
  - ± 1.0% of reading ± 0.03 ft/s for liquids.

- **Flow measurement outside the pipe wall**
  - Measurement stability and thus accuracy.
  - No pressure losses, no line clogging.
  - Unaffected by gas wetness (LVF up to 10% content by volume).
  - No leaks.
  - No pressure losses, no line clogging.

- **Easy installation and maintenance**
  - Quick and reliable measurement of liquid and gas flow rates.
  - Running cost efficient in comparison to traditional flow measurement devices.
  - No pressure losses, no line clogging.
  - No leaks.
  - No pressure losses, no line clogging.

**The FLEXIM® Commitment to Customer Service**

- **Customer satisfaction**
  - Every generation of FLEXIM® products is directly driven by customer and industry needs.
  - The Berlin-based company continues its substantial investment in research and development in order to maintain and further improve its position as an industry leader.
  - In partnership with the customer, FLEXIM® is an active leader in many areas of process instrumentation. As a worldwide provider of technical and consulting services, these services include on-site measurements, laboratory analysis, project handling, training, commissioning, maintenance, integrated process visualization, and refitting for oil and gas applications in the upstream sector.

- **Reliability and efficiency**
  - The company’s focus and dedication is directed towards providing the highest quality equipment with the best support and technical consulting services. The company’s focus and dedication is directed towards providing the highest quality equipment with the best support and technical consulting services.

- **In partnership with the customer**
  - The superior metering solution in upstream solutions.

**FLEXIM® AMERICAS**

- **Corporation**
  - 2009 Executive Drive
  - Irving, TX 75038
  - Phone: (972) 531-2020

**For further information on your local representation at**

- **www.flexim.com**
- **1-888-852-PIPE**

**Downstream Solutions**

- **Liquids – Gases – Oils – Chemicals**

- ** Exploration and Production**

  - Wellbore monitoring
  - Separator Stations
  - Production and Treating
  - Produced Water

- **Chemical Injection**

  - Coalescers and Desalters
  - Separation
  - Chemical Hydraulics
  - Gas Compressors
  - Gas Lift

**Outstanding outsiders**

- **Extremely low flows**
  - Minimum flow rates (high turndown ratio) of 0.03 to 115 ft/s.
  - Flow rates: > 3.5 l/h on 1/2 inch pipes (up to 1.5 inch pipes).

- **Extremely high flows**
  - Extremly high flows: 0.03 to 80 ft/s for gases in steel pipes / plastic pipes.

- **Temperature ranges**
  - Temperature ranges: -40 °C to +200 °C (-190 °C up to +400 °F are applicable).

- **Liquid media**
  - Liquid media: -40 °F to +100 °C.

- **Gases**
  - Gases: ± 0.5% of reading ± 0.03 ft/s (liquids and gases).
  - Gases: ± 1% ... 3% of reading ± 0.03 ft/s (liquids).
  - Gases: ± 1.0% of reading ± 0.03 ft/s for liquids.

- **Pipe sizes (outer diameter)**
  - Pipe sizes (outer diameter): 1/4 inch to 225 inches up to 35 mm wall thickness.

- **Liquid filled pipes**
  - Liquid filled pipes: ± 0.5% of reading ± 0.03 ft/s (liquids and gases).
  - Liquid filled pipes: ± 1% ... 3% of reading ± 0.03 ft/s (liquids).
  - Liquid filled pipes: ± 1.0% of reading ± 0.03 ft/s for liquids.

- **Liquid media (up to 10% content by volume)**
  - Liquid media: ± 0.5% of reading ± 0.03 ft/s (liquids and gases).
  - Liquid media: ± 1% ... 3% of reading ± 0.03 ft/s (liquids).
  - Liquid media: ± 1.0% of reading ± 0.03 ft/s for liquids.

- **Frequent work in hazardous areas**
  - Media (up to 10% content by volume): ± 0.5% of reading ± 0.03 ft/s (liquids and gases).
  - Media (up to 10% content by volume): ± 1% ... 3% of reading ± 0.03 ft/s (liquids).
  - Media (up to 10% content by volume): ± 1.0% of reading ± 0.03 ft/s for liquids.

- **High turndown ratio**
  - High turndown ratio: > 70 psi for gases in steel pipes / plastic pipes < 1 bar.

- **Gases (if field calibrated)**
  - Gases (if field calibrated): ± 0.5% of reading ± 0.03 ft/s (liquids and gases).
  - Gases (if field calibrated): ± 1% ... 3% of reading ± 0.03 ft/s (liquids).
  - Gases (if field calibrated): ± 1.0% of reading ± 0.03 ft/s for liquids.

- **Gases (extremely low flows)**
  - Gases (extremely low flows): ± 0.5% of reading ± 0.03 ft/s (liquids and gases).
  - Gases (extremely low flows): ± 1% ... 3% of reading ± 0.03 ft/s (liquids).
  - Gases (extremely low flows): ± 1.0% of reading ± 0.03 ft/s for liquids.

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  - Gases (extremely high flows): ± 1% ... 3% of reading ± 0.03 ft/s (liquids).
  - Gases (extremely high flows): ± 1.0% of reading ± 0.03 ft/s for liquids.

- **Extremly low flows**
  - Extremly low flows: ± 0.5% of reading ± 0.03 ft/s (liquids and gases).
  - Extremly low flows: ± 1% ... 3% of reading ± 0.03 ft/s (liquids).
  - Extremly low flows: ± 1.0% of reading ± 0.03 ft/s for liquids.

- **Ex approvals**: ATEX (IECEx) Zone 1 and 2, FM Class I, Div. 1/2

- **Protection degree**: IP 65

- **Pressurisation**: > 70 psi for gases in steel pipes / plastic pipes < 1 bar
Field-Proven Clamp-On Flow Measurement

Upstream Flows

State-of-the-Art Ultrasonic Technology for Flow Measurement in Upstream Operations

Today, FLEXIM's FLUXUS® ultrasonic liquid and gas flow meters achieve a dependable flow rate monitoring in regard to the performance of individual wellheads and gathering lines. Either is extremely ruggedized and can perform any task. The FLUXUS® ultrasonic flow meters accurately measure and report flow rates in all kinds of installations with solid / gas content of up to 10% by volume in lines and open channels. FLUXUS® flow meters are especially used for wellhead monitoring: For FLUXUS® as the system measures at pipes with internal pressurization and wall thickness and can never be the cause for measurement disintegration. Mounted on the pipe wall outside, the system is never a risk for the compressor itself as of being a problem in case a wetted instrument often contains significant amounts of sand, it also causes severe abrasion on the piping equipment and wetted instrumentation. The FLUXUS flow meters reside outside the pipe and easily cope with a high degree of solids within the medium, due to its built-in Hybrid Trek® sensor. As the FLUXUS flow meters overcomes this challenge by measuring both liquid and gases – even within hazardous areas (ATEX / IECEx Zone 2 – approved). Gas injection / Gas Lift

The gas lift technology is employed when the wellhead pressure is too low to achieve free flowing oil. Accurate and reliable flow measurement of the injected gas is vital as to little or too much gas can severely impedes the oil production. Conventional used DP meters are never a risk for the production well(s). With little to no maintenance required, zero revenue is lost due to meter maintenance. When employing insertion meters, the wells require to be turned downed a few times per year for maintenance and or replacement of those meters. For flow rate monitoring at the separator outlet at least two meters are necessary - one for the gas or oil, and a second for the brine fluid. FLUXUS® can easily be placed from on metering location to an other.

Chemical Injection

Physically introducing gas to oil can enhance the chemical injection of crucial importance to prevent for sulphur crystallization or hydrate formation. Especially during gas exploration, chemical injection of crucial importance to prevent for sulphur crystallization or hydrate formation.

Shale Gas - Water Logistics

Shale gas E&P requires a strong water logistics in terms of the injection at the wellhead, but also during production when the produced water has to be treated and removed. As most production sites are remote and only temporary pressurization and wall thickness and can never be the cause for measurement disintegration. Mounted on the pipe wall outside, the system is never a risk for the compressor itself as of being a problem in case a wetted instrument often contains significant amounts of sand, it also causes severe abrasion on the piping equipment and wetted instrumentation. The FLUXUS flow meters reside outside the pipe and easily cope with a high degree of solids within the medium, due to its built-in Hybrid Trek® sensor. As the FLUXUS flow meters overcomes this challenge by measuring both liquid and gases – even within hazardous areas (ATEX / IECEx Zone 2 – approved). Gas injection / Gas Lift

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Shale Gas - Water Logistics

Shale gas E&P requires a strong water logistics in terms of the injection at the wellhead, but also during production when the produced water has to be treated and removed. As most production sites are remote and only temporary operational services for the global Upstream industries, FLEXIM’s On- and Offshore certified instrumentation and services ensure reliable and accurate measurement results, no matter where you are located on Earth. Not every measurement point within an Oil & Gas exploration and production site needs to be constantly monitored and surveyed. FLEXIM’s FLUXUS® range of ultrasonic liquid and gas flow meters have been specifically developed for portable Flow Surveys. Whether it is offshore or onshore, for Offshore rigs or it is injected back into the wellhead, FLUXUS® provides data on the control of the gas injection rate. FLUXUS® is a customer friendly measuring solution – down to internal pressure levels as low as 5 bar. FLUXUS® ultrasonic meters provide data on the control of the gas injection rate. FLUXUS® is a customer friendly measuring solution – down to internal pressurization and wall thickness and can never be the cause for measurement disintegration. Mounted on the pipe wall outside, the system is never a risk for the compressor itself as of being a problem in case a wetted instrument often contains significant amounts of sand, it also causes severe abrasion on the piping equipment and wetted instrumentation. The FLUXUS flow meters reside outside the pipe and easily cope with a high degree of solids within the medium, due to its built-in Hybrid Trek® sensor. As the FLUXUS flow meters overcomes this challenge by measuring both liquid and gases – even within hazardous areas (ATEX / IECEx Zone 2 – approved). Gas injection / Gas Lift

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Chemical Injection

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Shale Gas - Wellhead Production

Shale gas flow rate monitoring is crucial for the performance of individual wellheads and gathering lines. Either is extremely ruggedized and can perform any task. The FLUXUS® ultrasonic flow meters accurately measure and report flow rates in all kinds of installations with solid / gas content of up to 10% by volume in lines and open channels. FLUXUS® flow meters are especially used for wellhead monitoring: For FLUXUS® as the system measures at pipes with internal pressurization and wall thickness and can never be the cause for measurement disintegration. Mounted on the pipe wall outside, the system is never a risk for the compressor itself as of being a problem in case a wetted instrument often contains significant amounts of sand, it also causes severe abrasion on the piping equipment and wetted instrumentation. The FLUXUS flow meters reside outside the pipe and easily cope with a high degree of solids within the medium, due to its built-in Hybrid Trek® sensor. As the FLUXUS flow meters overcomes this challenge by measuring both liquid and gases – even within hazardous areas (ATEX / IECEx Zone 2 – approved). Gas injection / Gas Lift

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Field-Proven Clamp-On Flow Measurement

State-of-the-Art Ultrasonic Technology for Flow Measurement in Upstream Operations

today, FLEXIM offers a true global presence, with branch offices in all major oil & gas producing regions, plus a network of approved distributors and service centers across the globe.

In comparison to conventional measurement techniques, the FLUXUS ultrasonic meters can be installed after the upstream isolation valve for virtually any sized pipe, making installation very easy and cost-effective. The FLUXUS Clamp-on ultrasonic meters feature: easy installation on almost any pipe size, advanced signal processing, a long service life, and simple maintenance.

Data for portable measurements

With the FLEXIM portable flow meters, FLEXIM also proves its capability to meet the challenge of portable solutions for liquid and gas flow measurements. The XLF low flow meter is designed for measuring low flows down to 3.5 l/h on a typical ½ inch line. Mounted on the pipe outside it is independent of the internal pressurization and wall thickness and can never be the cause for a potential problem in case a wetted instrument surges and to immediately take measures to prevent damages.

Wellhead and Gathering Lines Monitoring

Flow rate monitoring or in case of the performance of individual and overall production optimization and in particular during troubleshooting.

Product Water Injections / Dumping

Produced water is an unwanted media during wellhead production. Either it is environmentally treated and later dumped or it is injected back into the wellhead as a part of the water injection process. This process is typically employed in those oil fields, where the gas lift technology is employed when the wellhead pressure is too low to achieve free flowing oil. Accurate and reliable flow measurement of the injected gas is vital as to little or too much gas entering the production line can result in significant losses for the production well(s).

Gas Injection / Gas Lift

The gas lift technology is employed when the wellhead pressure is too low to achieve free flowing oil. As produced water is an unwanted media during wellhead production, it is environmentally treated and later dumped or it is injected back into the wellhead. As the FLUXUS flow meters provide for an ideal mass flow measurement of liquid and gas, particularly in this case, the system measures at pipes with internal pressures rates as low as 5 bar.

Gas Dehydration and Compression

Separated gas often needs to be dehydrated and de- watered at intermediate points along the transportation process. For this reason, the compression stage, by heating and/or the injection of chemical de- wate agents is necessary – and measuring the gas volume flow in order to keep track of the compression, built-in of atching a problem in case a wetted instrument surges and to immediately take measures to prevent damages.

Chemical Injection

Fluid flow during gas explosion: chemical injection of reagent including a few times per year for maintenance and or replacement of those meters are necessary - one for the gas or oil, and a second for the brine fluid. As all of the FLUXUS flow meters are equipped with up to two flow channels, including: customer specific solutions.

Produced Water Injections / Dumping

Produced water is an unwanted media during wellhead production. Either it is environmentally treated and later dumped or it is injected back into the wellhead as a part of the water injection process. This process is typically employed in those oil fields, where the gas lift technology is employed when the wellhead pressure is too low to achieve free flowing oil. As produced water is an unwanted media during wellhead production, it is environmentally treated and later dumped or it is injected back into the wellhead. As the FLUXUS flow meters provide for an ideal mass flow measurement of liquid and gas, particularly in this case, the system measures at pipes with internal pressures rates as low as 5 bar.
Today, FLEXIM plays a leading role in the provision of meter verification services for the global Upstream industries, engineers also provide a wide range of flow measurement technology, the FLEXIM on-site meters enable measuring flow rates even at pipes with internal diameters as small as 15 mm. Today, the FLEXIM on-site meters enable measuring flow rates even at pipes with internal diameters as small as 15 mm. The range of on-site meters covers nearly all flow measurement tasks.

Field-Proven Clamp-On Flow Measurement

State-of-the-Art Ultrasonic Technology for Flow Measurement in Upstream Operations

In comparison to conventional measurement technologies, the FLEXIM ultrasonic meters offer the superior solution for virtually any field and process media, without any restrictions on the pipe material, composite materials or requirements on surface quality, they are available even for pipes made of HDPE and can never be the cause for lost due to meter maintenance. With little to no maintenance required, zero revenue is lost and reliability is increased. As all of the FLEXUS flow meters in the same ultrasonic measurement principle, the FLUXUS flow meters ensure that the data is accurate and reliable even in difficult conditions. The FLEXUS flow meters ensure that the data is accurate and reliable even in difficult conditions.

Flow rate monitoring is crucial for the performance of individual and overall operations. Either it is a continuous monitoring of a wellhead flow or a comparison of metering devices, an unexpected deviation from the expected flow rate might be an indication of an operational trouble. For the FLEXUS line meters accurately measure precisely the flow rate of any process fluid within a variety of industry sectors (e.g., the petrochemical industry, the oil and gas industry, power stations, energy industries and many others).

Wellhead and Gathering Lines Monitoring

Produced Water Injection / Dumping

Chemical Injection

Flare Gas

Shale Gas - Water Logistics

Portable Flow Surveys

The gas lift technology is employed when the wellhead pressure is too low to achieve free flowing oil. Accurate and reliable flow measurement technology is required for monitoring both liquid and gas flow rates from the pipe wall outside.

Produced water injection is one of the important fields in today’s industrial sectors in terms of the energy sector. The amounts of chemical injected are low but highly pulsating, which is often considered a problem in case a wetted instrument is mounted inside the pipe. As the FLEXUS on-site meters do not measure directly within the pipe, the FLEXUS on-site meters do not get tired with one system. With little to no maintenance required, zero revenue is lost and reliability is increased. As all of the FLEXUS flow meters in the same ultrasonic measurement principle, the FLUXUS flow meters ensure that the data is accurate and reliable even in difficult conditions.

Upstream Services

Shale Gas - Water Production

For Shale Gas, the customer needs to monitor the separator outlet of low points. As the separator outlet is often considered as being in the pipeline, the separator outlet is considered as a monitoring point for the gas lift production. When employing ultrasonic measurement, the FLEXUS flow meters ensure that the data is accurate and reliable even in difficult conditions. As all of the FLEXUS flow meters in the same ultrasonic measurement principle, the FLUXUS flow meters ensure that the data is accurate and reliable even in difficult conditions.
Today, FLEXIM's field-proven Clamp-On technology is the natural choice for upstream services for the global Upstream industries, especially within challenging applications. From wellhead to the separator, FLEXIM's ultrasonic flow meters have been approved by major oil & gas companies worldwide, onshore and offshore. FLEXIM's ultrasonic flow meters provide solutions for the temporary measurement of liquids and gases – even within hazardous areas (ATEX / IECEx Zone 2 certified). Also for portable measurements, F/G60x portable flow meters, FLEXIM also stands its ground in upstream operations and gas Dehydration and Compression. FLUXUS® F/G60x portable flow meters, FLEXIM also provides a solution for the temporary measurement of liquids and gases – even within hazardous areas (ATEX / IECEx Zone 2 certified). Also for portable measurements, F/G60x portable flow meters, FLEXIM also stands its ground in upstream operations and gas Dehydration and Compression.

Proven accuracy and reliability across a wide range of applications:
- **Wellhead and Gathering Lines Monitoring**
- **Produced Water Injection / Damping**
- **Flare Gas**
- **Shale Gas - Water Logistics**
- **Upstream Services**
- **Portable Flow Surveys**

### Separators
Whether it is onshore or offshore, FLUXUS® gap ultrasonic flow meters are the natural choice for the temporary measurement of oil and gas in a wide range of applications from multi-phase, including wellhead to the separator.

### Gas Deliquification and Compression
Gas deliquification is necessary to ensure that the gas is dry before it enters the compression process. Gas deliquification includes the separation of gas from liquid, usually by means of cooling, filtration, and dehydration.

### Gas Injection / Gas Lift
Gas injection/ lift is used to increase the pressure in a well or reservoir to maintain production. FLUXUS® overcomes this challenge by measuring both liquid and gas flow rates from the pipe wall outside.

### Chemical Injection
Chemical injection is a necessary process for the proper functioning of a water injection system. Chemicals are injected into the formation to improve the flow characteristics of the water, thereby increasing the rate at which water can be injected into the formation.

### Shale Gas - Water Logistics
Shale gas E&P requires a strong water logistic in terms of injection at the wellhead, but also during production when the produced water has to be treated and removed. Most produced water goes to waste and only very rarely have it been re-used as a valuable resource. In the recent years, the re-use of produced water has been explored, thereby unlocking new resources and options for economic development.

### Flow rate monitoring in oil and gas production

- **Field-Proven Clamp-On Flow Measurement**
  - **State-of-the-Art Ultrasonic Technology for Flow Measurement in Upstream Operations**
  - **Data for portable measurements**
  - **With the FLEXIM FLUXUS portable flow meters, FLEXIM also provides a solution for the temporary measurement of liquids and gases – even within hazardous areas (ATEX / IECEx Zone 2 certified)**

**Flow rate verification and metering services for the global Upstream industries, especially within challenging applications.**

- **Regulatory compliance metering**
  - **Produced water injection / Damping**
  - **Flare Gas**
  - **Shale Gas - Water Logistics**
  - **Pipe Flow measurements in oil and gas production**
  - **Gas injection / Gas Lift**
  - **Gas Dehydration and Compression**
  - **Upstream Services**
  - **Portable Flow Surveys**

**Flow rate monitoring in oil and gas production**
Unrivalled advantages of the non-intrusive flow measurement with FLEXIM® in upstream applications.

- **Highly pulsation-tolerant**
- **Accurate and reliable metering**
- **Independent of pipe material, diameter, length, wall thickness and internal pressure**
- **Unaffected by gas wetness (LVF up to 5%) or entrained solids in the liquid**
- **Frequent work in hazardous areas**
- **No process shutdowns for installation or maintenance**
- **Flawless, no influent in comparison to analog data acquisition**

**Technical facts**

- **Pressurisation:**
  - Gases: up to 70 psi for gases in steel pipes / plastic pipes
  - Liquids: up to 1 bar

- **Ex approvals:**
  - ATEX (IECEx) Zone 1 and 2, FM Class I, Div. 1 / 2

- **Protection degree:**
  - up to IP68 / NEMA 6P

- **Gas carrying pipes:**
  - 0.4 to 44 inches up to 35 mm wall thickness

- **Liquid filled pipes:**
  - 1/4 inch to 225 inches up to 35 mm wall thickness

- **Calibrated accuracy:**
  - ± 0.15% of reading ± 0.03 ft/s

- **Gases:**
  - ± 1.0% of reading ± 0.03 ft/s

- **Liquids:**
  - ± 1% ... 3% of reading ± 0.03 ft/s

- **Flow rates:**
  - ~0.03 to 115 ft/s

- **Gaseous media:**
  - -40 °F to +100 °C

- **Rigorous media:**
  - -40 °C to +200 °C (-190 °C up to +400 °F are applicable)

- **Temp compensation:****
  - according to ANSI/ASME MFC-5.1-2011 regulation. Also effective production is imperative. Both good reasons to rely on non-intrusive flow measurement with FLUXUS...

- **Unaffected by gas wetness (LVF up to 5%) or entrained solids in the liquid**

The FLEXIM Commitment to Customer Service

FLEXIM values its customers not only a partner of measuring instruments, but also a provider of technical and consulting services. This concept is based on the idea of the continuous modernisation and consulting services. The company focuses on training and education, using the highest-quality equipment from the local support and service provider.

**FLUXUS** series has been leading the way in ultrasonic clamp-on flow metering for more than 20 years. In partnership with a provider of technical and consulting services, FLUXUS is accurate and reliable. The FLUXUS® series is pre-calibrated in house traceable to national standards and delivered with a calibration certificate.

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