

## Metering Stations



In order to grasp the production dynamics of oil wells, oil well product measurement should be performed at oil well metering stations. Each metering station has jurisdiction over 5 to 10 or more oil wells. The daily output of oil, gas and water produced by each oil well must be measured regularly and in rotation. The gas and liquid are separated in the metering separator and separately measured and then mixed into the oil collecting line metering separator, which is divided into two phases and three phases. The two-phase separator divides the oil well products into gas and liquid; the three-phase separator divides the high-water-containing oil well product into gas, free water and emulsified oil; then the volumetric flow rate is separately measured by a flow meter. The volume flow of water-containing oil must be converted to crude oil mass flow. The allowable error of oil well oil, gas and water measurement is  $\pm 10\%$ . There are many kinds of media and various characteristics.

### Challenges

Various types of media: crude oil, free water, emulsified oil, natural gas, sewage, slurry, etc.; most of the crude oil has high wax content, high freezing point, high viscosity, high physical interest complex; sewage, slurry and other particle impurities; unstable shock conditions brought by the external environment.

### Products

- **LBTC Positive Displacement Rotary Vane Flow Meter**

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LBTC positive displacement rotary vane flow meter belongs to volumetric flow meter, which is one of the more accurate instruments in modern industrial liquid measurement.

#### **Features**

1. Stable performance, no vibration, no noise
2. Insensitive to changes in upstream medium flow.
3. Almost unaffected by the viscosity of the medium.
4. High accuracy, max can be up to 0.2.
5. Withstand the high pressure, good applicability, long service life.
6. Convenient installation, no need of straight pipe section, rectifier and other ancillary equipment, not affected by elbow, valve and other pipe fittings.

#### ● **LWGY Liquid Turbine Flow Meter**

LWGY liquid turbine flow meter is a new generation of turbine flow meter with simple structure, lightness, high precision, good reproducibility, sensitive reaction, convenient installation, maintenance and use. Turbine flow meter is a kind of precision flow measuring instrument, which measures the flow rate and total amount of impurity free and corrosion free liquid.

#### **Features**

1. High accuracy: Generally can be up to 1% R、 $\pm 0.5\%$  R, high precision type can be up to 0.2% R.
2. Good repeatability, short-term repeatability can reach 0.05% R~0.2% R. It is precisely because of good repeatability, such as regular calibration or on-line calibration can get extremely high accuracy, it is the preferred flow meter in trade settlement.
3. Output pulse frequency signal, it is suitable for total measurement and computer connection, no zero drift and has strong anti-interference ability.
4. It can obtain very high frequency signal (3-4 KHz) and have a strong signal resolution.
5. Wide range, medium and large diameter can reach 1:20, the small diameter is 1:10.
6. Compact and lightweight structure, easy installation and maintenance, large circulation capacity.
7. It is suitable for high pressure measurement, the instrument body does not need to open holes, easy to make high pressure instrument.
8. Special sensors can be designed for various types according to the special requirements of users, such as low temperature type, two-way type, underground type and sand mixing type.
9. It can be made into insert type and suitable for the large caliber measurement with small pressure loss and low price. It can continuously flow out, easy installation and maintenance.

## ● LWQ Gas Turbine Flow Meter

LWQ gas turbine flow meter integrates gas turbine flow sensor and flow converter, its main performance index reaches the international advanced level. It is an ideal instrument for gas metering such as petroleum, chemical industry, electric power, metallurgical industry and civil boiler, as well as for urban gas and gas pressure regulating station metering and gas trade metering.

### Features

1. With new sensor, the initial flow rate is low, the pressure loss is small, the anti-vibration and anti-pulse fluidity is not easy to corrode, the reliability is good and the service life is long.
2. It adopts a new integrated chip with high performance and high precision, powerful function and superior performance.
3. It adopts advanced micro power consumption high and new technology, the whole machine power consumption is low. It can be operated by internal battery for a long time and by external power supply.
4. According to the flow frequency signal, the instrument series can be automatically modified in eight segments at most, and the calculation accuracy of the instrument can be improved according to the needs of users.
5. It adopts the EEPROM data storage technology, it has the function of storing and querying historical data, and three kinds of historical data recording methods can be chosen by users.
6. Flow meter head can rotate 180°C, easy to install and use.
7. High accuracy, it can be up to  $\pm 1.5\%R$ ,  $\pm 1.0\%R$ .
8. Good repeatability, short-term repeatability can reach 0.05% R~0.2% R. It is precisely because of good repeatability, such as regular calibration or on-line calibration can get extremely high accuracy, it is the preferred flow meter in trade settlement.
9. The temperature, pressure and flow rate of the measured gas can be detected, and the flow rate can be automatically tracked and compensated, and the gas flow rate under the standard transition state ( $p_n=101.325$  kpa,  $T_{pn}=293.15$  k) can be displayed. The data of temperature, pressure, time, date and so on can be also queried in real time.

## ● LG Orifice Plate

Flow element, also known as differential pressure flow meter, consists of a primary detection piece (flow element) and a secondary device (differential pressure transmitter and flow indicator). Flow element is the most stable and reliable of all flow meters, which has a history of more than 100 years. Its wide applicability, high reliability and accurate accuracy make it widely used in the measurement of gas, liquid and vapor.

Standard Orifice Plate: LG orifice plate with simple structure, easy installation, stable

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performance, high measurement accuracy is used in modern industry liquid, vapor and gas flow measurement. It is in line with GB/T2624-2006, ISO5167-1-2003, BS1042-1989, American Society for Mechanical Engineering standard and so on.

### **Features**

1. Structure is simple, easy to install, reliable to work, accuracy can meet the needs of engineering survey.
2. It has pure mechanical structure, according to the site high temperature and high pressure conditions to select appropriate structure and material. The highest pressure is 42 MPa and the highest temperature is 500°C.
3. Flow element has a long history of use, it has rich and reliable experimental data. Design and processing has been standardized. Standard orifice plate is no need to carry out the real flow calibration and maintenance.

### ● **UGB Vortex Flow Meter**

LUGB vortex flow meter is a kind of speed flow meter, widely used in petroleum, chemical industry, electric power, light industry, power heating industry. Our company's vortex flow meter production execution standard is vortex flow sensor (JB/T9249-2015) and verification regulation vortex flow meter (JJG10299-2007).

### **Features**

1. No moving parts, long-term stability, simple structure for easy installation and maintenance.
2. Sensor output is pulse frequency, its frequency is linear with the actual flow rate of the measured fluid, the zero point has no drift and the performance is very stable, structure style is diverse, there are pipeline type and plug-in flow sensor type.
3. High accuracy, usual liquid measurement accuracy is  $\pm 1.0\%$ ; gas measurement accuracy is  $\pm 1.5\%$ .
4. Wide measuring range, with the range of Reynolds number  $2 \times 10^4 \sim 7 \times 10^6$ , it can be up to 1:20.
5. Small pressure loss (about  $1/4 \sim 1/2$  of orifice flow meter), which belongs to energy saving flow meter.
6. Flexible installation method, according to the different field process pipeline, it can be horizontal, vertical and different angle tilt installation.
7. It adopts the anti-jamming circuit and anti-vibration sensor and it has certain anti-environmental vibration performance.
8. It uses ultra-low power single chip microcomputer technology, 1 section of 3 V10AH lithium battery can be used for more than 5 years.
9. Non-linearity of instrument coefficients is corrected by software to improve the measurement accuracy.
10. Use EEPROM for power-down protection of accumulated flow over a period of more than 10 years.

