GPE™

YQSJL-YN TRI-PHASE METERING SYSTEM

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- High accuracy to measure the oil, water and gas of single oil well or multiple wells!
- High efficiency to separate the liquid and gas and high accuracy to analyse water cut!
- Real time to measure the produce of the oil, water and gas!
- Separate efficiency of the liquid and gas up to 98%!
- Analyse accuracy of water cut better than 5%!
- This system is automatation operation!
- Signals can be transmitted to any dept. of oilfield!

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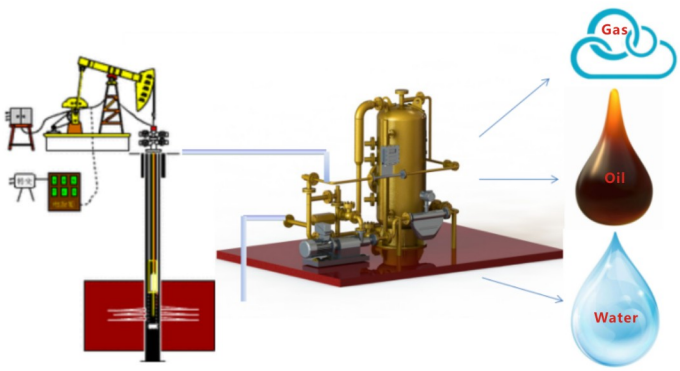
Tri-phase Metering System

I. Overview

1.1 Tri-phase Metering System Introduction

During the process of petroleum exploitation, the fluid from the oil well is composed of petroleum together with water and associated gas. Generally, the fluid consisting oil, water and gas is called three-phase flow. Tri-phase Metering System can precisely measure the flow rate and content of each component in the three-phase mixture. Tri-phase Metering System features powerful oil/gas separation capacity and high precision oil & gas content measurement. As a result, the field production of oil, water and gas can be accurately measured in real time. Thus Tri-phase Metering System can help to improve the management of oil field, solve the problems on measurement of single well, many wells and well stations.



1.2 Working Principle

Gas from mixed medium will get separated from liquid by going through gas-liquid separating unit, including hydrocyclone separation, colliding to break gas, and gas separating regulator etc. to ensure a thorough liquid/gas separation. The separation is better than 98%. Then gas goes to ultrasonic gas flowmeter and liquid goes to coriolis mass flowmeter with DSP technology that can get water-ratio by its water-oil density difference analysis. The water content accuracy ⩽ 5%. After processed by the PLC controlling unit, the measured signals are converted to the data of liquid volume, oil percentage, water percentage, gas percentage, system pressure and temperature. The full automation of Tri-phase Metering System is realized by the PLC which controls the whole System. The control cabinet has TFT display to show real-time status, and it can also be equipped with remote communication via internet.

1.3Features

1. Accuracy
   - Liquid relative error: ⩽ 2.5%
   - Water ratio relative error: ⩽5%
   - Gas relative error: ⩽ 2%
2. Flowrange
   - Liquid flow range: 0-9000 m^3 / d (0-117938bpd)
   - Gas flow range: 0-3000m3 / d
   - Water content: 0-100%
   - Gas content: 0-100%
3. Medium: for all flow pattern;
4. Liquid viscosity: ⩽10000mPa.s
5. Pressure loss: ⩽0.1MPa;
6. Medium temperature:0 to 120℃;
7. Working pressure: ⩽4.0MPa (as request);
8. Ambient temperature: -20℃~+60℃;
9. Data process
   - Display for Instantaneous flow and total flow of liquid, gas, water and oil;
   - Real time status for system and device;
   - Journal sheet;
10. Remote monitoring (as user's request)

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Tri-phase Metering System

II.Specification for variable type

1

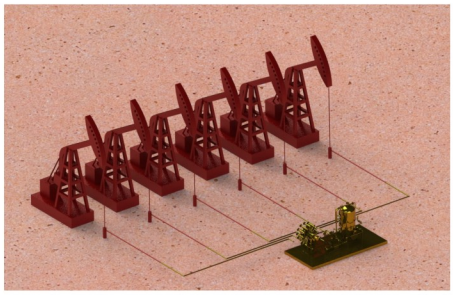
Standard Single well type

Application	Accuracy
Used for all the oil condition. And it is installed at the single well station.	Liquid：1% Gas：1.5% Water cut off：3%
Working range	
Daily liquid capacity ⩽120m³/d Daily gas capacity ⩽3600m³/d	

Main parts	Option parts
Standard separator	Electric tracing+ Heating
Coriolis mass flowmeter	Tracing pipe+Heating
Ultrasonic gas flowmeter	Container housing
Pump for oil & gas	Color steel plate housing
PLC Control system	
Displaying	

2

Measuring station type



Application	Accuracy
Used for all the oil condition, and especially for the replacement of measuring station building.	Liquid：1% Gas：1.5% Water cut off：3%
Working range	
Daily liquid capacity ⩽120m³/d Daily gas capacity ⩽3600m³/d	

Main parts	Option parts
Standard separator	Electric tracing+ Heating
Coriolis mass flowmeter	Tracing pipe+Heating
Ultrasonic gas flowmeter	Container housing
Pump for oil & gas	Color steel plate housing
PLCControl system	
Displaying	
Multi way valve	

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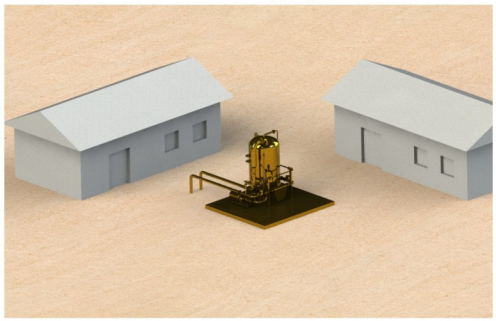
Tri-phase Metering System

3

Gathering type



Application	Accuracy
Used for all the oil condition, and it's installed at the place of multi well gathering	Liquid : 1% Gas : 1.5% Water cut off : 3%
Working range	
Daily liquid capacity ≤10000m³/d Daily gas capacity ≤50000m³/d	

Main parts	Option parts
Big volume separator	Electric tracing+ Heating
Coriolis mass flowmeter	Tracing pipe+Heating
Ultrasonic gas flowmeter	Container housing
Pump for oil & gas	Color steel plate housing
PLC Control system	
Displaying	

4

Mobile single well type

Application	Accuracy
Used for all the oil condition, and it's used for well transition.	Liquid : 1% Gas : 1.5% Water cut off : 3%
Working range	
Daily liquid capacity ≤120m³/d Daily gas capacity ≤3600m³/d	

Main parts	Option parts
Standard separator	Electric tracing+ Heating
Coriolis mass flowmeter	
Ultrasonic gas flowmeter	
Pump for oil & gas	
PLC Control system	
Displaying	
Mobile car	

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Tri-phase Metering System

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Single well type for light crude oil

Application	Accuracy
Liquid =100mpas (light crude oil) , and it is installed at the single well station.	Liquid : 1.5% Gas : 2% Water cut off : 5%
Working range	
Daily liquid capacity ≤120m³/d Daily gas capacity ≤3600m³/d	

Main parts	Option parts
Standard separator	Electric tracing+ Heating
Coriolis mass flowmeter	Tracing pipe+Heating
Ultrasonic gas flowmeter	Container housing
PLC Control system	Color steel plate housing
Displaying	

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Floating ball single well type

Application	Accuracy
Liquid=100mpas (light crude oil) , and it is installed at the single well station.	Liquid : 1.5% Gas : 2% Water cut off : 5%
Working range	
Daily liquid capacity ≤50m³/d Daily gas capacity ≤700m³/d	

Main parts	Option parts
Standard separator	Electric tracing+ Heating
Coriolis mass flowmeter	Tracing pipe+Heating
Ultrasonic gas flowmeter	Container housing
Level meter	Color steel plate housing
Displaying	

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Single well type for light crude oil

Application	Accuracy
Liquid≤100mpa·s（light crude oil）, and it is installed at the single well station.	Liquid: 2.5% Gas: 2% Water cut off: 5%
Working range	
Daily liquid capacity ≤20m³/d Daily gas capacity ≤50m³/d	

Main parts	Option parts
Small volume separator	Electric tracing+ Heating
Coriolis mass flowmete	Ultrasonic gas flowmeter
	Displaying
	Container housing

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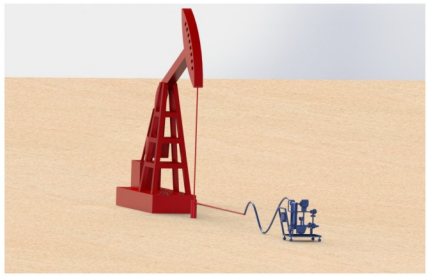
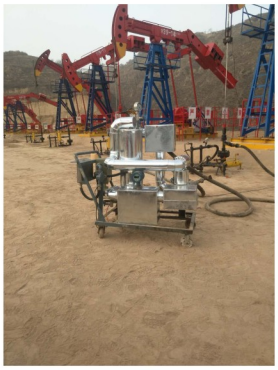
Portable type



Application	Accuracy
Liquid ≤100mpa·s（light crude oil）, and it is installed at the single well station	Liquid: 2.5% Gas: 2% Water cut off: 5%
Working range	
Daily liquid capacity ≤10m³/d Daily gas capacity ≤20m³/d	



Main parts	Option parts
Small volume separator	Electric tracing+ Heating
Coriolis mass flowmeter	Ultrasonic gas flowmeter
	Displaying

Tri-phase Metering System

III. Certificate

IV. Model Selection

Model	1 Type	2 Daily liquid capacity	3 Daily gas capacity	4 Option parts	5 Nominal pressure	Note
YQSJL-YN-						Tri-phase metering system
	D					Single well type
	DWF					Single well type （Floating ball ）
	DCZ					Single well type （Vehicular type）
	DX					Single well type （Light crude oil）
	DK					Single well type （Fast open type）
	DBY					Single well type （Portable type）
	DY					Single well type （Mobile type）
	L					Gathering type
	J2					Measuring station type, 2 well
	J3					Measuring station type, 3 well
	⋮					Measuring station type, 3~20 well
	J21					Measuring station type, 21 well
	J22					Measuring station type, 22 well
		Y10				Max.Daily liquid capacity 10m³
		Y20				Max.Daily liquid capacity 20m³
		⋮				Max.Daily liquid capacity 30m³~90m³
		Y100				Max.Daily liquid capacity 100m³
		Y200				Max.Daily liquid capacity 200m³
		⋮				Max.Daily liquid capacity 300m³~9800m³
		Y9900				Max.Daily liquid capacity 9900m³
		Y10000				Max.Daily liquid capacity 10000m³
			Q700			Max.Daily gas capacity 700m³
			Q3600			Max.Daily gas capacity 3600m³
			Q9000			Max.Daily gas capacity 9000m³
			Q15000			Max.Daily gas capacity 15000m³
			Q30000			Max.Daily gas capacity 30000m³
			Q50000			Max.Daily gas capacity 50000m³
				N		None
				W		Wireless
				G		GPRS Communication
				B		Heating
				F		Housing
				X		Container
				S		Twin rotator screw pump
				T		Customized
					16	PN：1.6MPa
					25	PN：2.5MPa
					40	PN：4.0MPa
					63	PN：6.3MPa

Example: YQSJL-YN-J11Y1000Q700W16
Note: YQSJL-YN Tri-phase Metering System, for Multiple wells, switched for 11 wells, max.liquid capacity 1000m³ per day,max. gas capacity 700m³ per day,with wireless communication, and nominal pressure is 1.6Mpa

Ordering Information Table of Shanghai Yinuo Multi Phase Flow Meter

*Design pressure (MPa)		*Max. working pressure (MPa)		*Gas capacity (MMSCFD or m3/day)		Gas capacity (MMSCFD or m3/day)		*Inlet & Outlet connection size (inch or mm)	
*No. of wells for metering		*Require multiport valve?		*Medium temperature range(℃)		*Medium temperature range(℃)		*Liquid viscosity @temperature	
*Heat& insulation requirement	☐ Without jacket ☐ Heat by electricity ☐ With prefabricated housing ☐ With insulation jacket ☐ Heat by water ☐ With container					*Communication mode			
Impurities content(wax, gelatine,etc)		H2S Content		*Communication mode		GVF(Gas Volume Fraction) (%)		*Qty.	
Other details	1.Well test location: 2.Certfication requirement								

Note: * means mandatory information