

TESTING AND PRODUCTION SERVICES

RED EYE[®] MULTIPHASE METERING SYSTEM

Delivering consistent, accurate measurements with an advanced solution that combines compact gas separation and metering technologies



Weatherford[®]

TEST MULTIPLE PRODUCTION PHASES USING **ONE MEASUREMENT SOLUTION**

The Red Eye[®] multiphase metering system enables you to monitor your well—or field—for all phases.

At every step of production, measuring oil, water, and gas flow rates is vital to understanding your well. Our Red Eye multiphase metering system provides real-time flow rate information by combining compact gas separation technology with advanced liquid and gas metering. The system serves as a complete multiphase measurement solution that helps you to maximize production and optimize injection rates.

Designed and built to ANSI B31.3 piping code, the Red Eye multiphase metering system handles high wellhead or process pressures and temperatures. Depending on your requirements, we can also build the system under ASME Section VIII, Division 1 vessel code specifications.





OPERATION

The main components include a gas-liquid cylindrical cyclone (GLCC) separator, flow-metering instruments, and level control valves. The system creates a cyclonic flow pattern to induce bulk separation of the liquid and gas phases into separate pipes. After separation, conventional liquid and gas meters measure the individual streams. Then the system recombines the separated phases into a single pipe to transport them to the flowline.

FEATURES

- Non-nuclear components
- Conventional instrumentation
- Real-time data for well optimization
- 0 to +95% gas-volume-fraction (GVF) operating range (0 to 100% if the Alpha VSRD is added to the downstream unit)
- High accuracy*
 - ±5% volumetric gas measurement
 - ±5% volumetric liquid measurement
 - ±2% water cut over full measurement range
- Compact design option that fits in shipping containers and on offshore platforms

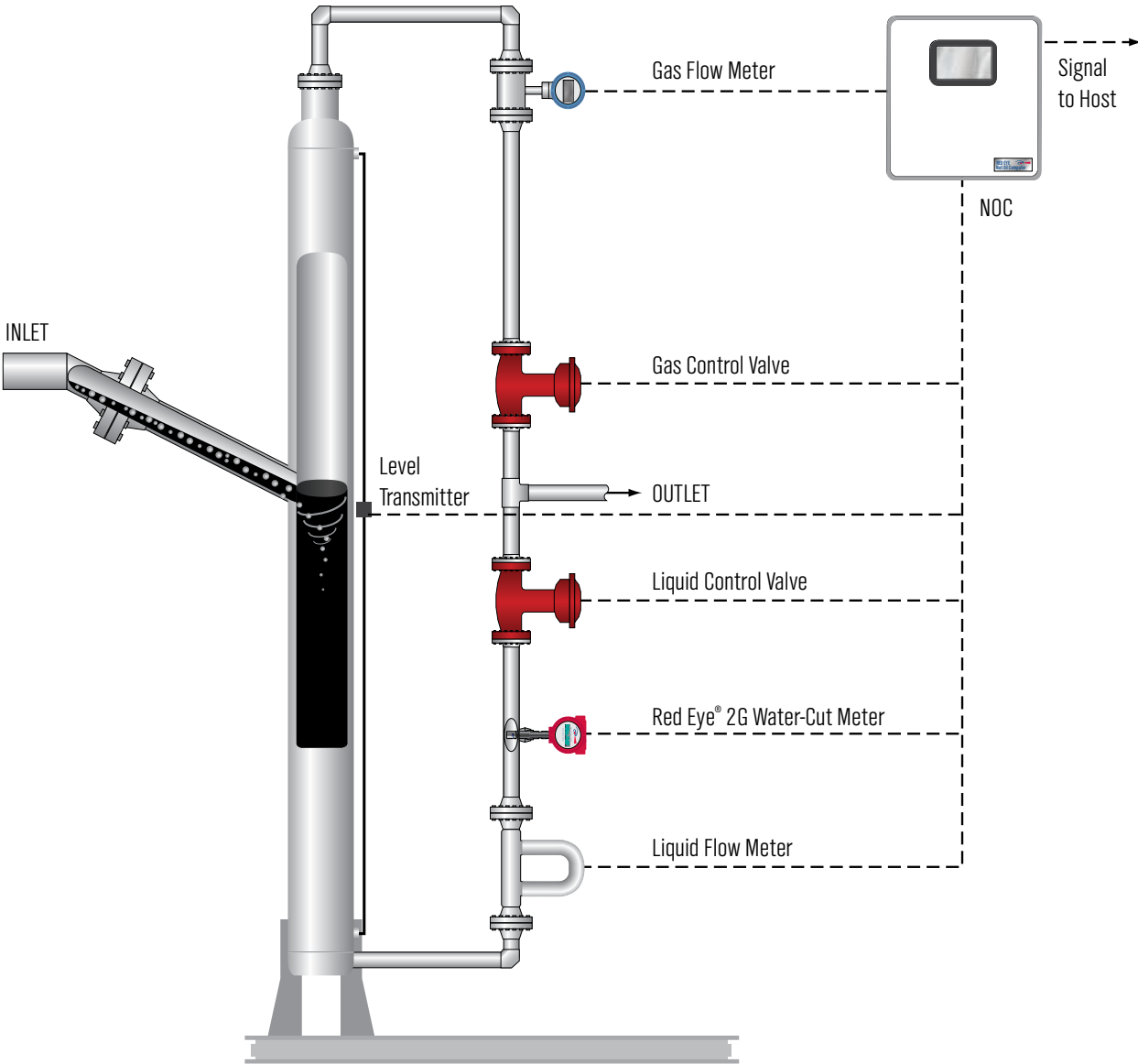
*These measurement values apply to standard well testing systems under normal flowing conditions.

ADVANTAGES

- Real-time data for continuous mode monitoring
- Lower operating cost compared to a conventional test separator
- Self-cleaning
- Standard conventional controls
- Full automation capability
- Slug handling capability approximately four times the maximum instantaneous liquid flow
- High turndown ratios of 100:1
- Not affected by the motion of the vessel or platform

SEPARATION METHOD

Our Red Eye multiphase metering system can handle any three-phase flow condition. Three-phase fluid enters the gas-liquid cylindrical cyclone (GLCC) through a narrow tangential inlet. The liquid and gas accelerate through the inlet and around the vertical axis of the GLCC, which creates a vortex. The centrifugal force generated by the vortex rapidly separates the gas from the liquid with no need for residence time.



FLOW METERING

The Red Eye multiphase metering system uses a liquid flowmeter and the Red Eye 2G water-cut meter to measure the oil and water flow rates. A gas flowmeter measures the gas rate, and then the system recombines the two phases or transports them in separate flow lines. A differential pressure transmitter monitors the liquid level inside the GLCC. Installed on the vessel, gauge pressure and temperature transmitters measure the process temperature and pressure conditions. Liquid and gas control valves maintain an optimal separation level inside the GLCC. The Red Eye remote terminal unit (RTU) receives the signals from all these instruments to control the separation and metering processes and display the well testing results.

The cyclone effect in the GLCC has some damping capability; and, when coupled with control valves on the gas and liquid legs, it produces an efficient separation system with a very wide operating range. The engineered system can handle the whole range of flow regimes—from steady state to slug flow.



RED EYE® 2G WATER-CUT METER

- Next-generation optical technology
- Excellent full-range accuracy
- Simple calibration
- Compatible with all oils and condensates
- Unaffected by salinity and dissolved gas
- Insensitive to entrained gas
- Easy installation and service



RED EYE® REMOTE TERMINAL UNIT (RTU)

- Supports all production testing modes
 - Semiautomatic
 - Automatic
 - Manual
- Provides a local graphical display of process data, flow rates, and test results
- Provides local test and raw data logging
- Certified for Class 1, Division 2 and Class 1, Zone 2 operation
- Supports serial or Ethernet connection options to host systems

TYPICAL APPLICATIONS

Production Testing

Our Red Eye system replaces conventional two- and three-phase test separators. The system has a smaller footprint compared to gravity-based separators and comes fully integrated from the factory. Real-time measurements increase the efficiency of well tests so that you can test your wells more often.

Individual Well Monitoring

The Red Eye system also enables you to monitor individual wells with real-time data to optimize any artificial lift system or gas-lift, water, and steam flood injection rates. Continuous real-time flow rate data provides the feedback needed to enhance production optimization efforts.

Client-Specific Requirements

We can build our units per your specifications. On request, we design systems that meet your expectations in terms of size, metering options, accuracy, redundancy, and integration with other existing equipment, such as choke valves or multiport selector valves. We can modify the mechanical design of the Red Eye system if you have space constraints, and we can customize the operating software to add inputs from additional instruments that you require for a particular application.

SPECIFICATIONS FOR DESIGN

Please contact a Weatherford representative to complete an application data sheet for review of your particular requirements.





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