

DIP **Multiphase Flow Meter**

The DIP Multiphase Flow Meter (DIP) is based on a vibroacoustic technology and has been designed to provide accurate measurement of flowing multiphase fluid. The fluid can contain gas, oil (or gas condensate), water and sand. Applications include oil and gas allocation, well management, production optimization, reservoir management and many more.

The main parameters the DIP can measure are mass and volumetric flow rates of gas, oil and water. It can also measure GVF, watercut, flow velocity, fluid density, liquid viscosity and sand content.

The standard DIP includes the Flow Computer and the Flow Sensor Spool. The DIP Flow Sensor Spool includes choke valve, differential pressure transmitter (or two pressure transmitters located upstream and downstream of the choke valve), accelerometer and temperature transmitter. The DIP Flow Computer can be equipped with an HMI for on-site control, a modem for data transferring and a solar power source.

The method of measurement is based on the analysis of vibroacoustic signals generated by the fluid flowing through the pipeline. Because of the multiphase composition of the fluid it flows turbulent, hence due to uneven speed inside and outside of the vortices local pressure drops come up. That fluctuation of pressure makes the pipe vibrate at resonant frequency. The intensity and distribution of such oscillation is used as a main source of information.



The vibroacoustic signal is measured by the accelerometer and after the filtering converted to the flow rate, GVF and watercut. That signal also contains fluid density and liquid viscosity information. A differential pressure transmitter is required to calculate accurate flow velocity.

The inconsistency in the signal is indicated, processed and, if meets the requirements, counted as a mass of the sand passed by.

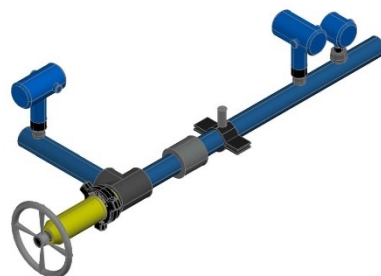
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The factory precalibrated DIP Flow Sensor Spool doesn't require the in-situ calibration and after the installation procedure can work through the whole well lifecycle without any changes.

The DIP Flow Sensors can be installed without the spool on the existing pipeline with a choke valve or different flow restriction, if the conditions are met.

Metrological and Operating Characteristics of the DIP MPFM:

- Gauge Pressure from 10 psi (from 70 kPa)
- Flow Temperature -65 to +250 °F (-54 to +121 °C)
- Flow Velocity from 5 ft/s (from 1.5 m/s)



All the calculations take place on site in the DIP Flow Computer. Data stored there can be accessed locally with a laptop web interface, optional display or via Modbus. The DIP Flow Computer has been designed to work with any SCADA system that supports Modbus communications.

The DIP Flow Computer can handle up to four DIP Flow Sensor Spools which means it can measure up to four wells with no data latency. That provides a significant CAPEX savings for a well pad measurement.

The DIP doesn't require maintenance, only visual checks, and its power efficiency makes it perfect for remote locations. If ongoing logging and remote monitoring are desired, SCADA Server can be provided by your request.

The DIP Multiphase Flow Meter provides critical information on performance of your well, this enables timely decisions and forecasting that will save you money.



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