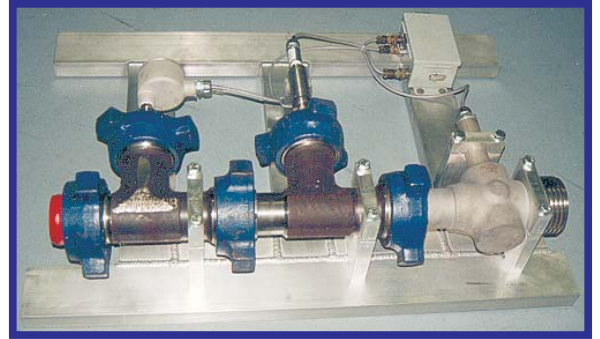


HOFFER FLOW CONTROLS'

Flow Note



Industry: Oil and Gas Field Services

SIC Code: 1389

Application: There are a number of companies worldwide that provide oil and gas well field services. One of the services offered provides for enhanced output from the well. The service company injects various additives to the well head. Turbine flowmeters are commonly used to meter the liquid and gas additives. A specific application identified by Dowell Schlumberger of Sugarland, Texas is for monitoring high pressure gaseous nitrogen at pressures of 0 - 10,000 PSI. During the injection process, Dowell Schlumberger monitors a number of process variables to ultimately improve the output of the well.

System Requirements: Accurate over pressure range 0 - 10,000 PSI.
Rugged to withstand harsh field conditions of oil fields.
Lightweight for transportation between sites.
Totalize output of nitrogen gas in mass units.
Provide compensated analog output for data acquisition system.

Solution: Hoffer Flow Controls, along with Dowell Schlumberger, has designed a metering skid that incorporates a turbine flowmeter and mass flow computer. The skid consists of the following:

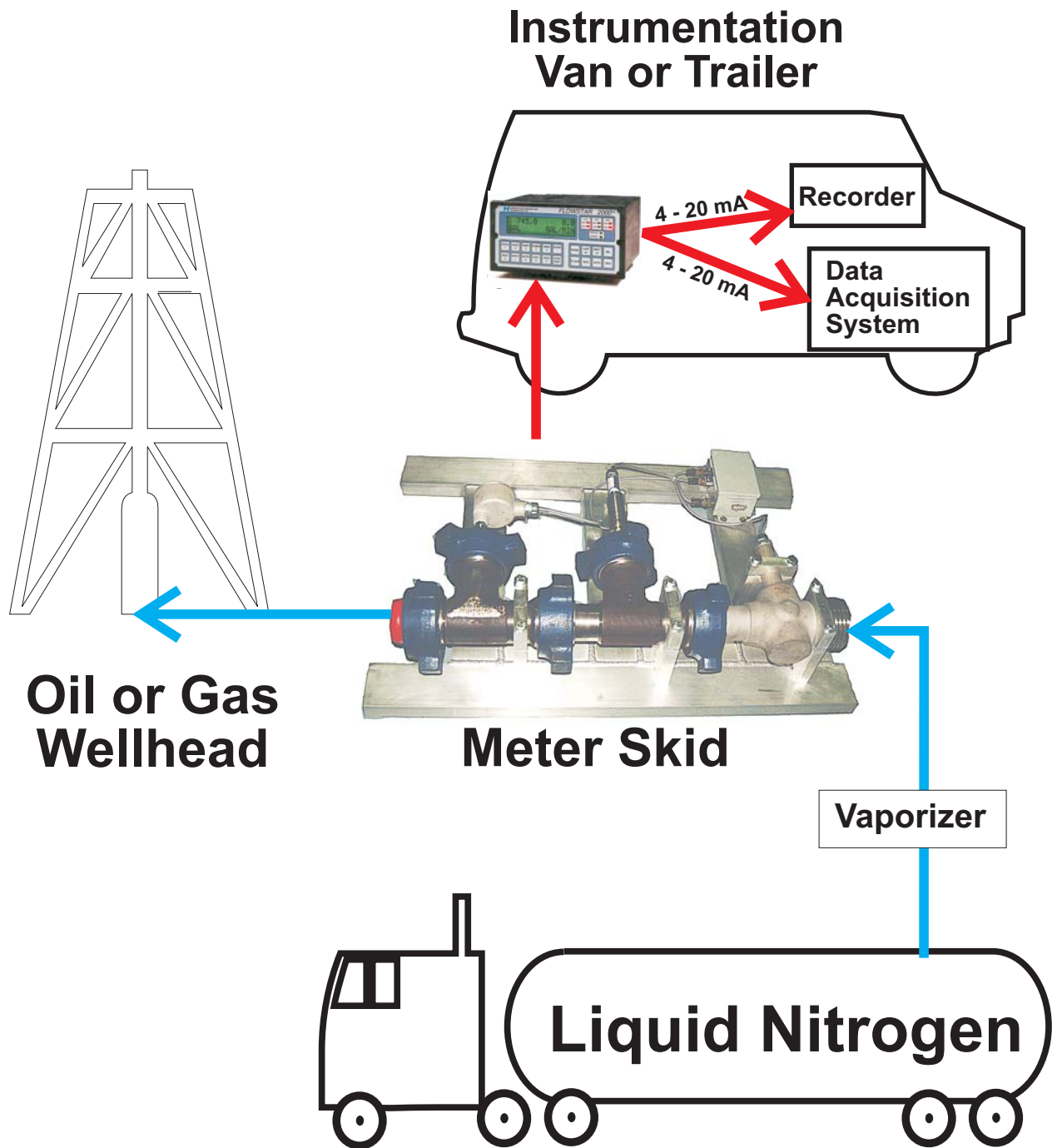
Wingnut turbine flowmeter designed for pressures up to 15,000 PSI.
Wingnut housings to accommodate installation of high pressure temperature and pressure transducers.
Mass flow computer.
Aluminum frame supports meter run and is used to carry the meter run.
A manifold collector box that accepts independent signal inputs from flowmeters, temperature transmitter, pressure transducer. Collector box provides for one cable assembly that carries all process signals to the remote mass flow computer.

Hoffer Advantage: Wingnut turbine flowmeter is rugged and designed for oil field conditions.
Flowmeter provides wide operating flow range is usable over wide operating pressure range.
Mass flow computer provides mass flow calculations and corrects for temperature, pressure and compressibility.
Flow computer incorporates "high alarm" to monitor for flow rates that could over range the turbine flowmeter.
Flow computer improves flowmeter linearity via linearization.

Summary: The flow system allows the customer to accurately monitor mass flow during the well treatment. Based on the information obtained from the system they can adjust the treatment of the well head to provide for optimum product output.

Thanks to Joel Clinkscales from Dowell Schlumberger for his technical assistance with this application.

Application: Oil and Gas Well Servicing



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The quality system covering the design, manufacture and testing of our products is certified to International Standard ISO 9001.

