

Dualstream I *advanced* Topside

Background

Wet gas measurement is now an integral part of most gas condensate field developments. Dualstream wet gas flow meters have been utilized in over 100 projects since the early 1990's and have been a key factor in enabling marginal field development providing wet gas allocation measurements and enhancing reservoir data.

Dualstream I *advanced* (Topside)

Solartron ISA's advanced version of the Dualstream I meter includes an additional differential pressure measurement to enable on-line detection of changes in liquid fraction. This system can be used to reduce periodic well testing or to calculate liquid flow rates in real time thus alleviating the requirement for well testing altogether. For this reason Dualstream I *advanced* is particularly applicable to reservoir management and allocation applications on unmanned wellhead platforms and as an economic method of water breakthrough detection.

Topside Experience

Dualstream I meters have been implemented topside since the early 1990's and are now considered the benchmark system for wet gas measurement. Hundreds of topside Dualstream I meters are now operational for most operators around the globe. Meters are being used to allocate gas into third party flow lines or on a 'per well' basis to optimize production.

Key Benefits

- Intelligent on-line measurement
- Simple and Robust flow spool
- Standard Instrumentation
- Simple Data Acquisition System
- Significantly reduced operational costs
- Large installed base including allocation systems

Applications

Reservoir management

- Optimise production
- Remote well monitoring

Production Allocation

- Royalty allocation
- Essential for economic development of marginal fields
- HC gas and condensate flow rate
- Water breakthrough detection



Dualstream I *advanced* Topside

Measurement Technique

- Dualstream Venturi, Pressure loss ratio measurement, wet gas correction algorithm and PVT calculation

Mechanical Specification

- Standard Line Sizes- 2" NB to 24" NB (larger sizes on request)
- Pressure Class ANSI Class 150 lb – 2500 lb / API ratings on request
- Process Temperature Range -20 to 120°C (-4 to 248°F) (higher range on request)
- Meter Body Material Duplex uns S31803 as standard
- Weight dependent on NB/Pressure rating
- Overall length 5D (typical)

Installation Requirements

- Upstream Straight lengths – 3D to 10D (typical) (calibrated spool supplied for allocation systems)
- Downstream Straight lengths – None (5D calibrated spool supplied with thermowell for allocation systems)
- Horizontal Orientation

Performance

- Uncertainty
 - Gas Mass Flow Rate $\pm 2\%$ (typical)
 - Liquid $\pm 10-20\%$
 - Condensate PVT calculation
 - Water $\pm 1 \text{ am}^3/\text{h}$ (water or oil continuous flow)
- Repeatability
 - Gas Mass Flow Rate $< 0.15\%$
 - Liquid Mass Flow Rate $< 1.5\%$
 - Water Sensitivity $\pm 0.2 \text{ am}^3/\text{h}$ (water or oil continuous flow)
- GVF Range 98 – 100%
- Turndown 3:1 or 8:1 (typical)
- Pressure Loss Specific to application ($< 1\text{bar}$)
- Salinity effects negligible

Instrumentation

- 2 off DP Transmitter (Yokogawa EJA)
- 1 off GP Transmitter
- 1 off TT transmitter 4 wire RTD/Solartron ISA TT transmitter

Data Acquisition (Safe Area)

- Option A – Solartron 7955 Flow Computer – Power Supply 20-30 VDC, 40W
- Option B – Industrial PC – Power Supply 90-260 VAC, 50-60 HZ or 24 VAC
- Input Protocol 4-20 mA, Hart or MODBUS
- Output Protocol 4-20 mA or MODBUS
- Electrical Interface RS232C/RS485
- PVT Package – (Optional)
- Typical Output Data –
 - Gas Mass Flow Rate
 - Liquid Mass Flow Rate
 - Condensate Mass Flow Rate
 - Water Mass Flow Rate
 - Gross & Nett Volume
 - Line Pressure
 - Line Temperature
 - Gas Volume Fraction
 - Gas Mass Fraction

Data Acquisition (Hazardous Area)

- Industrial PC
- Area Classification II 2G, EEx de(ib) IIB T6
- Power Supply 90-260 VAC, 50-60 HZ or 24 VAC
- Input Protocol – 4-20 mA, Hart or MODBUS
- Output Protocol – 4-20 mA or MODBUS
- Electrical Interface RS232C/RS485
- PVT Package optional
- Typical Output Data – As per Safe Area option

User Required Inputs

- Gas and Liquid Density
- Compositional Data



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