

ESMER Multiphase Meters

Technology Overview

ESMER meters measure the flow rates of individual phases in oil, condensate and wet gas production lines without the need for separation or complex sensor technologies.

ESMER systems are founded on a combination of traditional fluid flow theory and modern signal processing and neural network techniques.

ESMER systems work with signals emitted by oil and gas industry standard sensors and do not require nuclear source sensors (only available as an option). The signals are processed in low power consumption computer installed on the flow line and the measurements are transmitted via the SCADA interface.



Further information about ESMER technology can be found in our open literature publications.

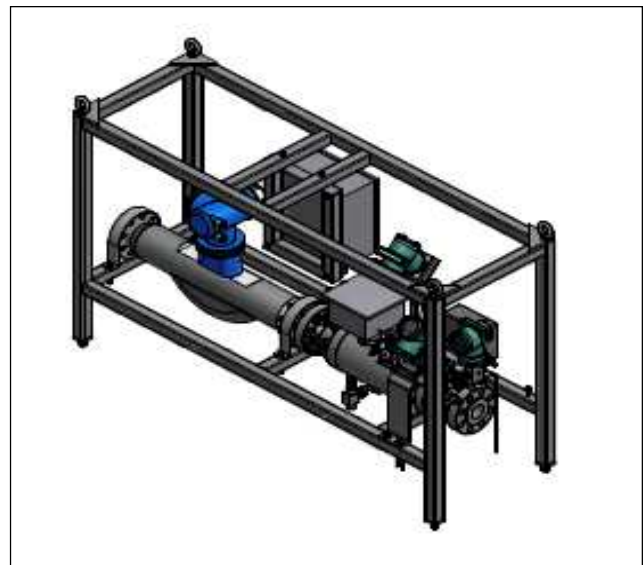
Electro - Mechanical System

ESMER spools are designed for compactness, durability, ease of maintenance and flexibility. The system comprises a number of modular sub-spools which are selected to suit given application and process requirements.

The **Cone Spool** contains two DP transmitters (one across the cone, the other measuring recovery pressure downstream), one AP transmitter and an RTD. The Cone also acts as a capacitance sensor for oil external applications and as a conductance sensor for water external applications. The spool is normally installed horizontally and the flow passes through the spool in a straight line with very low pressure drop.

The **Coriolis Spool** carries out mass flow rate and fluid density measurements independently (corrected by feed-back from the Cone Spool for multiphase effects).

The **Gamma Ray Spool** (available as an option) employs a dual low energy source system. Gamma Ray spool is capable of measuring water cut and GVF at the same time and replaces the impedance function integrated into the Cone Spool.



Dimensions and Weight

Size (600# RF)	ID mm	L mm	H mm	W mm	Weights kg
2"	50	1417	1185	515	150
3"	74	1822	1230	560	225
4"	97	2338	1290	625	350
6"	146	3136	1376	706	725

All ESMER sensors are industry standard sensors chosen specially for rugged use. Further information about the sensors used in ESMER can be found in detailed data sheets which are available on request.

Application Areas

ESMER meters are ideally suited for well testing and allocation applications. The meters can be configured for use under a variety of fluid and flow regimes. The technology is equally well suited for heavy or light oil multiphase flow or wet gas / condensate measurement by the relevant combination of sensors and calibration algorithms. The meters can be deployed as mobile or fixed skids.

Specification

Operating Envelope

- Gas (actual): 0 - 24,000 m³/d
- Liquid: 20 to 2700 m³/d
- Water Cut: 0 – 100%
- GVF: 0 – 100%
- Pressure: up to 150 bar
- Temperature: up to 120 °C
- Meter sizes: 1" to 6"

Measurement Uncertainty

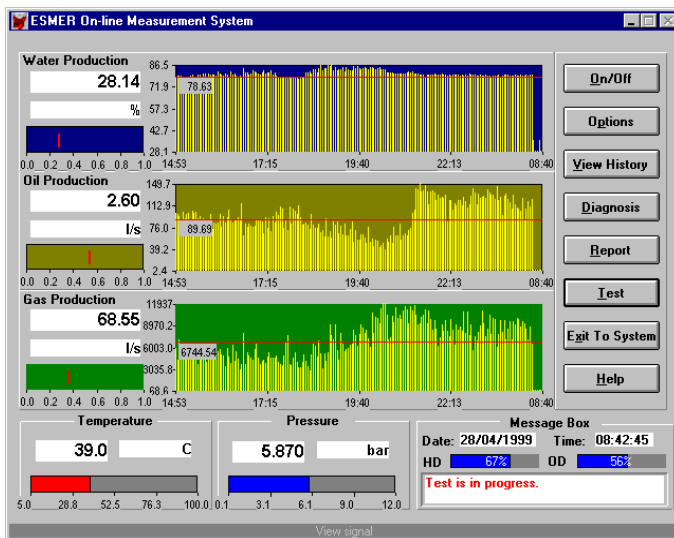
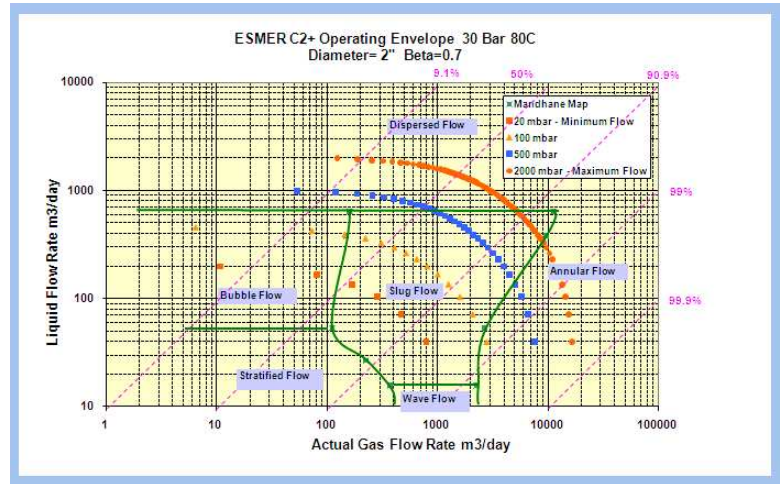
- Liquid flow rate: +/- 5% (relative)
- Gas flow rate: +/- 10% (relative)
- Water cut : +/- 3% (abs)
- Quoted at 95% confidence level.
- Accuracy will depend on GVF, water composition and field tune-up capability.

Mechanical and Electrical Component

- Materials: SSL/ Carbon Steel / Hastelloy / as per customer specification.
- Flanges and Schedule: ANSI, API / as per customer specification.
- Transmitters: Impedance / DP / AP / RTD / Coriolis / Gamma Ray
- Certification: EEx ia IIB T4
- Power Supply: 24 VDC / 110/220 VAC / 20 W

Flow Computer and Software

- Hazardous Area: Beckoff Microprocessor
- Software: ESMEER / Windows
- Safe Area: Beckoff Industrial PC
- Communication: RS232/RS485/Ethernet/MODBUS



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