Kam Controls Incorporated®
simple precision™

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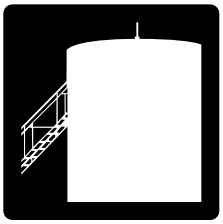


TANK INTERFACE DETECTION

THE KAM® OWD™ SENSOR

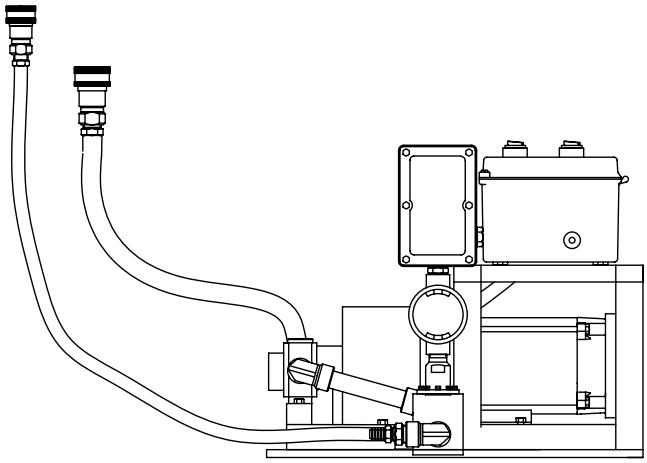
PROBLEM: Current interface detection is completed manually with sampling from up to 30 draw-off valves followed by lab testing. The current method is extremely costly in terms of time (productivity loss), man hours, and lab work.

SOLUTION: By installing a series of MOV's on the sample lines prior to the manifold and a KAM® OWD® skid after the manifold, operators are able to automate the entire process. Water concentrations are measured from each sample line sequentially, providing a complete picture of the vertical distribution of fluids in the tank. Data is provided to a PLC or MODBUS interface. Accumulated data can be used to optimize storage and create an industry best practice.

AUTOMATION AND OPTIMIZATION

- Real-time monitoring of tank oil layer, emulsion layer, and water layer levels
- Eliminates need for manual sampling and associated costs and safety concerns
- Eliminates costs and time associated with lab testing
- Reduced tank corrosion
- Increased productivity
- Maximum chemical efficiency
- Maximize heat/energy efficiency
- No costly shutdowns

FLEXIBILITY AND EASE OF INSTALLATION



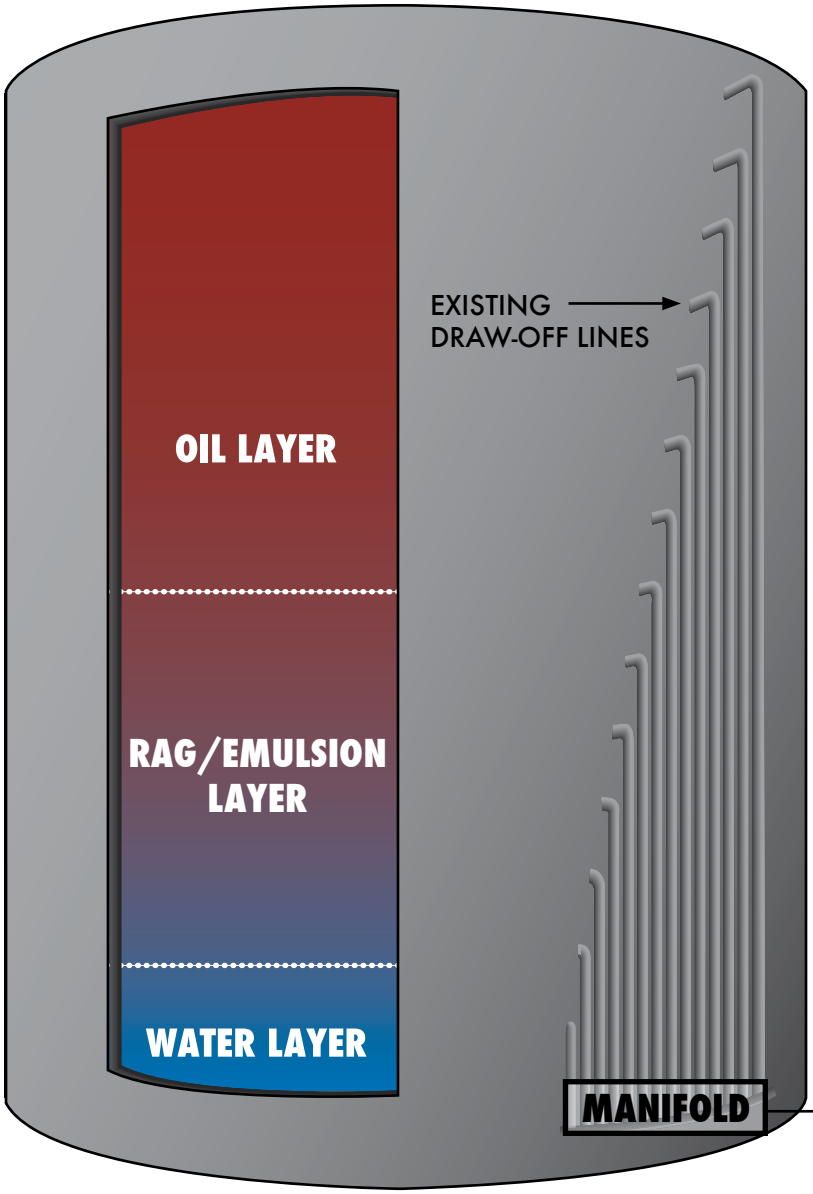
KAM® PORTABLE OWD® SKID

KAM® OWD™ OIL WATER DETECTOR FLOW THROUGH, and integrated **KAM® SMS®** STATIC MIXING SPOOL, and **KAM® CSM™** CIRCULATING SAMPLE MIXER

- Connects to pipeline via quick connects installed on full-opening ball valves
- Outputs include: selectable 4–20 mA with adjustable range or 0–5 VDC, RS232 Communication interface for calibration, Modbus interface, connection to a PLC

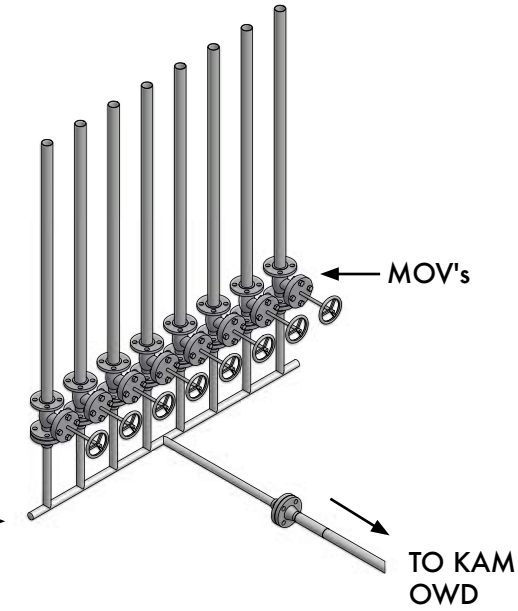
TANK INTERFACE DETECTION

THE KAM® OWD™ SENSOR

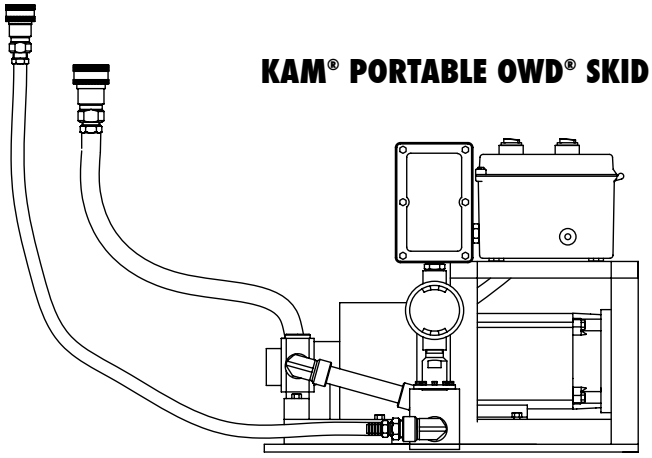


Existing draw-off lines descend in an even, vertical distribution to a common manifold. MOV's (Motor Operated Valves) are placed on the draw-off lines prior to the manifold.

The MOV's automatically open and close sequentially, creating a series of representative samples from the tank.



KAM® PORTABLE OWD® SKID



A KAM OWD skid is placed downstream of the manifold. OWD measurement is timed with the MOV's and measures the oil/water concentration of each sample separately. Data from the OWD is then sent to a PLC where it is used to create an accurate, real-time representation of the vertical distribution of oil, emulsion and water. Samples are recirculated to the tank inlet.

TANK INTERFACE DETECTION
THE KAM® OWD™ SENSOR

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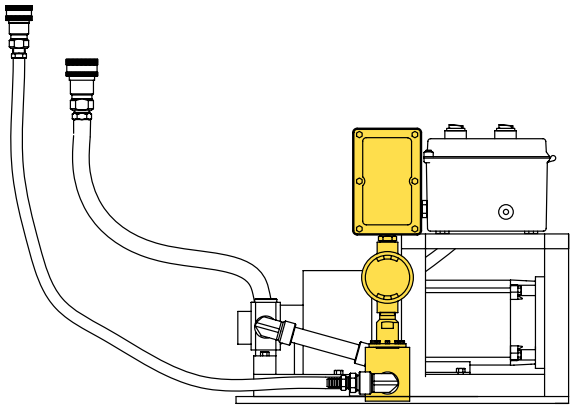
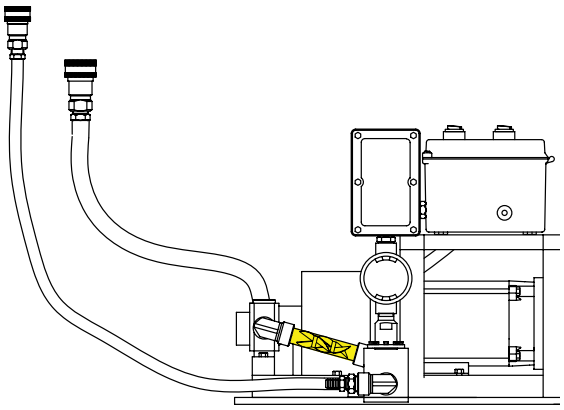
SYSTEM ELEMENTS

KAM® OWD® OIL WATER DETECTOR
Integrated FT Flow Through Model



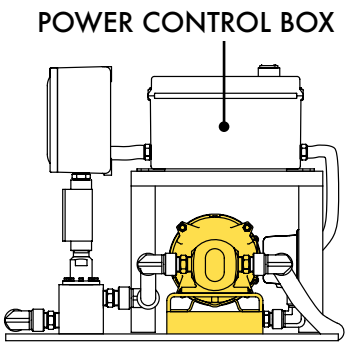
- Automatically corrects for effects of density, sulphur, and salinity
- Automatically detects transitions between oil continuous and water continuous modes and monitors both modes simultaneously
- 1% of full scale accuracy
- No salinity offset required

KAM® SMS™ STATIC MIXING SPOOL



- Creates homogenous mixture for accurate oil/water measurement
- High efficiency enables shorter spool with low pressure drop
- Creates uniform density and temperature
- No moving parts or outside energy source required

KAM® CSM™ CIRCULATING SAMPLE MIXER



SYSTEM CONNECTIONS