



FMC Technologies LACT Skids

We put you first.
And keep you ahead.



Reliable and accurate measurement from oilfield production to trucks, rail, storage tanks and pipelines is a critical point to recognize revenue in custody transfer applications. A FMC Technologies LACT/ACT skid mounted unit ensures that the quantity and quality of the merchantable oil is accurately measured at the point in which the product ownership is transferred or the transportation fees are calculated. FMC Technologies broad range of measurement products and accessories along with our skid design experience ensures that all key components are properly packaged for the best accuracy performance and the lowest cost of ownership. Our measurement expertise and dedicated fabrication team can manage and advise on your project from initial design through startup and commissioning.

- » Standard designs for quick turnaround to meet rapidly changing project approvals and tight deadlines
- » Customizable solutions to meet unique regional or application requirements
- » FMC Technologies has over 80 years of experience in hydrocarbon measurement with an extensive understanding of all flow metering technologies, providing an accurate and reliable design
- » Quality design and fabrication to avoid penalties for delivering out-of-spec product
- » Direct, local factory service available from commissioning to aftermarket support ensures that there will be no startup delays, project time lines are met and the unit will always be up and running

LACT units allow dynamic custody transfer of merchantable liquid hydrocarbons by:

- Dynamically measuring all the key variables to determine the quantity (volume, temperature, pressure) and the quality (BS&W/water content, density and composite samples) of the product being transferred
- Rejecting product that is out of specifications by either recirculating back to tanks or back to processing for further treatment
- Directly controlling all equipment on the skid
- Interfacing to a dedicated or portable prover to verify the accuracy of the system under actual operating conditions

¹FMC Technologies skids are designed to all relevant ASME, API, ASTM, AWS and National Electric Code standards.

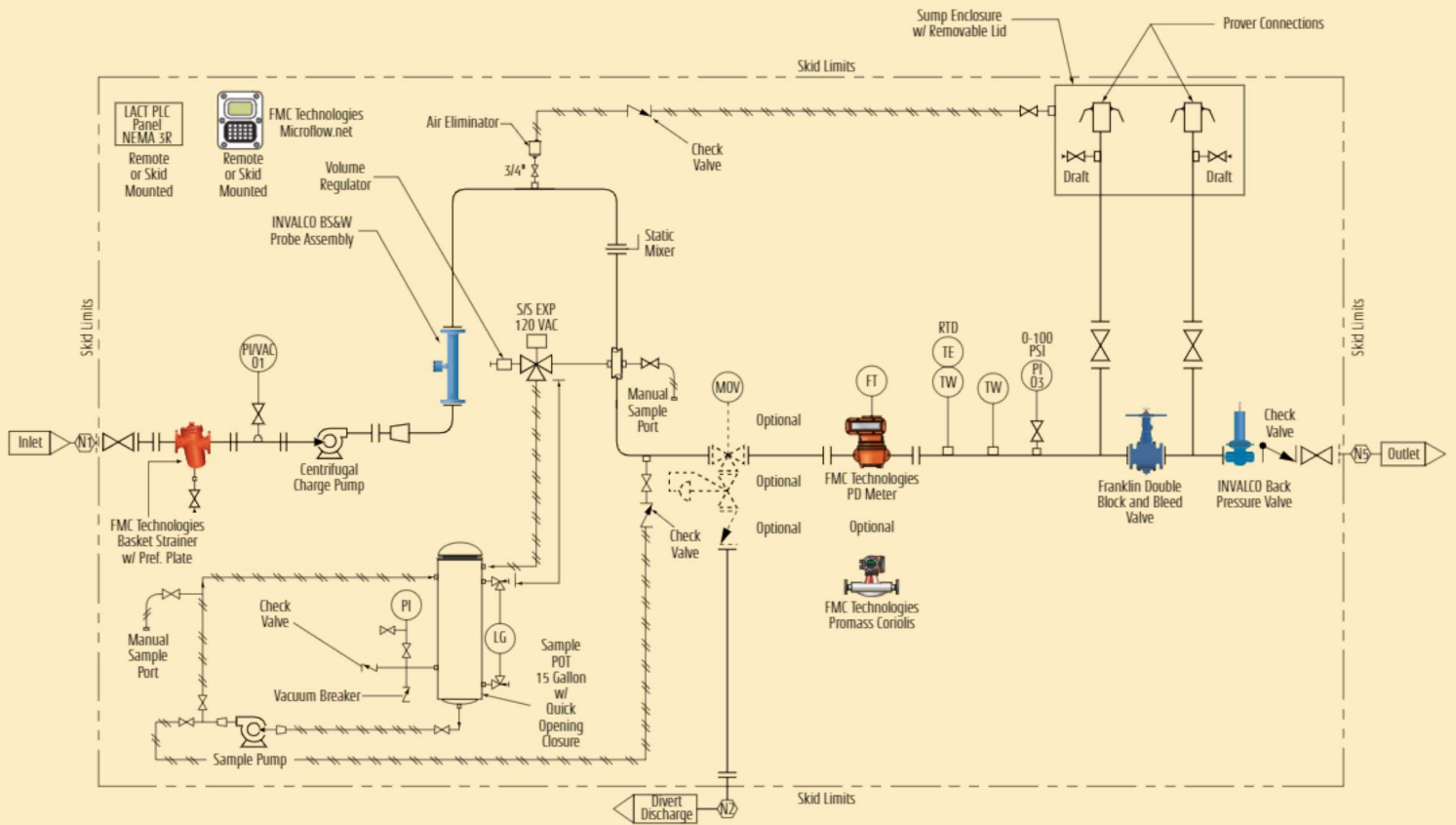
Note: Actual weights and dimensions may vary to accommodate special requirements and options

STANDARD LACT SKID SPECIFICATIONS ¹			
Skid Size	2" - 150#	3" - 150#	4" 150#
Operating Flow Rate	142 GPM (6,500 BPD)	365 GPM (16,700 BPD)	685 GPM (31,300 BPD)
Product	Crude Oil		
Density (Specific Gravity or °API)	30 - 70 API		
Operating Pressure (Min.)	30 psi		
Operating Pressure (Max.)	65 psi		
Operating Temperature (Min.)	40° F		
Operating Temperature (Max.)	120° F		
Length	14'	14.5'	15'
Width	6'	6.5'	6.5'
Height	6'	6.5'	7'
Estimated Weight	4,100 lbs.	4,600 lbs.	5,200 lbs.
Voltage at Final Destination	230/480 volt - 3 Phase - 60 Hz		

FEATURES AND BENEFITS

Standard Design - FMC Technologies offers a standard LACT unit design in 2", 3", and 4" sizes that meets the functionality requirements needed in the majority of applications.	Standardized designs provide a cost effective package with quick delivery times using field proven solutions.
Customizable Designs - Different regions, shale plays and corporate requirements often require unique functionality. FMC Technologies easily accommodates unique requirements through our dedicated design and fabrication team who can advise on how to meet your unique requirements.	Specific customer and market requirements are met with tailor made solutions. FMC Technologies design expertise ensure that the cost and delivery impact of these specific requirements are minimized.
Accuracy - With over 80 years of experience in the area of custody transfer measurement in the hydrocarbon industry, FMC Technologies is the premier supplier of accurate and precise measurement solutions. The basis for a good LACT unit design starts with the selection of the right flow meter for the application. The right flow meter ensures that accuracy is not only obtained at a given moment, but it is consistently kept in time and under changing operating conditions. Our full range of measurement technologies ensure that the right solution is proposed for your application.	Accuracy is a key element in minimizing monetary losses due to bad measurement. Even the smallest biased errors can accumulate to millions of dollars in losses in a year. Accurate measurement provides the best determination of the quantity and quality of product being transferred in a way that is fair for all parties involved in the transaction. Also, a well designed LACT unit using the right measurement technology and related equipment reduces the measurement uncertainty and the risk of potential disputes.
Quality Control - Quality is one of the FMC Technologies core values and we strive for zero defects in everything we do. The FMC Technologies skid team fully understands the implications of non-conformance and quality check points are present in all phases from the design, fabrication, startup, to commissioning, and all the way to aftermarket support.	Quality equipment means that all project requirements, time lines and expectations are met to full satisfaction.
Direct, Local Factory Support - FMC Technologies direct offices provide aftermarket, startup, commissioning and consultation services along with local equipment and spare parts inventory.	Quick response and local service close to your operations ensure maximum uptime and productivity.

STANDARD LACT UNIT DESIGN



FMC TECHNOLOGIES STANDARDIZED SKID DESIGNS PROVIDE A COST EFFECTIVE PACKAGE WITH QUICK DELIVERY TIMES USING FIELD PROVEN SOLUTIONS

FMC TECHNOLOGIES SPECIFIED EQUIPMENT

Meters

Smith Meter® Positive Displacement Meters (PD)

The Smith Meter PD meter sets the standard for measurement accuracy, performing with unsurpassed accuracy, durability, high measurement stability, low pressure drop, and unmatched record of reliable service. From petroleum production, transportation to marketing terminals, the Smith Meter PD meter is the most trusted name of positive displacement meters in the field.

- SC13 and SD30 (2" and 3") single case PD meters with standard trim, seals and 100% gearing/dummy calibrator
- C2, E3, E4, and F4 (2", 3", and 4") double case PD meters with standard trim and seals and 100% gearing/dummy calibrator



Units can be equipped with:

- UPT-1000 pulse transmitter
- RAD – Right Angle Drive to connect portable transmitters during proving
- SM-200 AB Horizontal non-reset counter (barrels) with stack monitor
- LNC counters and ticket printers

Proline® Promass Coriolis Meter

High accuracy, low pressure drop and diverse interface capabilities make the Proline Promass Coriolis meter the perfect solution for petroleum metering applications that demand custody transfer accuracy and repeatability.

- 2" – 83F50-A-AAS-A-9-N-1-B-B-C-M – ANSI 150 Promass
- 3" – 83F80-A-AAS-A-9-P-1-B-B-C-M – ANSI 150 Promass
- 4" – 83F1H-A-AAS-A-9-P-1-B-B-C-M – ANSI 150 Promass



Valves

DuraSeal™ Double Block and Bleed Valve – ANSI 150 RF flanges

The DuraSeal is a high integrity, double block and bleed valve that has been considered the standard of quality since 1951. Its reliable stem seal design provides improved performance and longevity.

- 2" D711-100 DBB Valve with Viton seals and DTR (Differential Thermal Relief)



- 3" D711-100 DBB Valve with Viton seals and DTR (Differential Thermal Relief)
- 4" D711-200 DBB Valve with Viton seals and DTR (Differential Thermal Relief)

INVALCO Back Pressure Valve – 510 Series ANSI 150 RF flanges

- 2" RDFG-201-510 (P/N-80006242) with 20-40# spring range
- 3" RDFG-301-510 (P/N-80006246) with 20-40# spring range
- 4" RDFG-401-510 (P/N-80006250) with 20-40# spring range



Strainers

Smith Meter® In-Line strainers protect the metering system against dirt and other contaminants. Meets design requirements of ASME B31.3 and NACE MR-01-75 compliance for products with hydrogen sulfide concentrations. The removable perforated plate basket design makes cleaning easy.

Inlet Strainer

- 2" Inline S2-1-ST-N-PP-00-0 with perforated plate basket
- 3" Inline S3-1-ST-N-PP-00-0 with perforated plate basket
- 4" Inline S4-1-ST-N-PP-00-0 with perforated plate basket

INVALCO BS&W Probe



The INVALCO Model 4528 Detector and Model CX-645 Probe provide a direct analog (0-5 Vdc or 4-20 mA) output of percent emulsified water as (S&W) in the process stream. This signal is designed to be used externally by the Model 4728 monitor or other control. The Model 4528 detector offers the flexibility of a high and low fail-safe that guarantees the quality of the output signal from the detector chassis and will sense over and under range conditions.

- 2" CX-645-2-00-BFP 2" ANSI 150 Probe 4528-5A Detector Card
- 3" CX-645-3-00-BFP 3" ANSI 150 Probe 4528-5A Detector Card
- 4" CX-645-4-00-BFP 4" ANSI 150 Probe 4528-5A Detector Card

Temperature Probe

Temperature Probe with explosion proof J-Box and Thermowell

- 2" Model - TP-W-4-1.5
- 3" Model - TP-W-4-2.5
- 4" Model - TP-W-4-2.5

Microprocessor Flow Computer



Smith Meter® microFlow.net is a flow computer for single product monitoring of continuous flow applications, offering run time displays, which provide all critical functions such as sampler pacing, flow and volume calculation including rate, batch volumes, BS&W

percentages (or pressure), and temperature. Average or instantaneous values can be shown or stored in memory for review. Up to four (4) meter factors at four (4) different flow rates can be handled by the microFlow.net.

- Model – ML-XP-MFL-1

OPTIONAL EQUIPMENT

Counters, Ticket Printer, and Pulse Transmitters

Large Numeral Counter (unit of registration Barrels)

Features large, easy-to-read, five-digit 600 Series or six-digit 900 Series reset counter numerals, with fine graduations on right-hand wheel for an additional digit resolution.

Ticket Printer*

The accurately-recorded printer ticket takes the uncertainty out of liquid transfers. The tamper-proof system seals the ticket into the meter register printer while the transfer is taking place. The ticket is mechanically printed before it can be removed from the printer. Errors, doubts, and disputes are eliminated and the customer receives a meter register printed receipt.

**Specify Zero Start or Accumulative for Printer*

LNC Pulse Transmitter 1PPR

The Model LNC (Large Numeral Counter) Transmitter provides a contact closure for signaling remote instrumentation. It chops a fixed level input voltage to form a square wave pulse (with minimum contact bounce) for use with transistorized circuits such as an electronic drive control.

The LNC Pulse Transmitter consists of a rugged die cast explosion-proof housing with a screw-type cover for easy access to the pulsing mechanism. The transmitter utilizes a dry reed switch, magnet, and gear train, synchronized to provide 1 or 10 contact closures per revolution of the right-hand wheel, as required.



Universal Pulse Transmitter

The Smith Meter® Model Universal Pulse Transmitter (UPT) is an infrared, quad-channel, high-resolution pulse generator driven by the output shaft of a positive displacement meter. It provides high-integrity pulse transmission and verification of signal and power for custody transfer measurement applications.

Truck Loading Options

For truck loading applications use Smith Meter® microLoad.net and add INVALCO 4728-5 Monitor with NEMA-4X Enclosure and 4528-5 Detector Card.

Additional Notes:

Skid design: Open frame concept

Flow: Left to right flow

Electrical: Class I Division II Area

Controls: Remote mounted electrical controls

Paint color options are available



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OTHER LACT SKID COMPONENTS

- Inlet – 2", 3", and 4" ball valve (full port)
- Charge pump – 2", 3", and 4" centrifugal with 230-460 VAC 3-phase motor
- Air release vent (top of loop) with check valve on vent line
- Static mixer on loop – 2", 3", and 4"
- Sample system - 2", 3", and 4"
 - Probe – 45° angle quill with 3-way explosion proof solenoid valve and 0-10 cc volume regulator.
 - Container (15 gallon) – Complete with quick closure, internal coating, level indicator, circulating pump, spray bar, pressure gauge, relief valve, and miscellaneous valves and fittings.
- Instrument spool – 2", 3", and 4" with pressure gauge and test thermowell with plug and chain
- Proving manifold – 2", 3", and 4" (3) valve with (2) ball valves (RP) with male cam lock couplings and dust caps complete with drip pan with cover
- Check valve – 2", 3", and 4"
- Outlet - 2", 3", and 4" ball valve (full port)

Electrical Control - Remote Mounted Panel:

- Main breaker disconnect panel – With motor starter and PLC controller
 - Lightning arrester
 - Tank level – Start/stop control
 - Divert control (option required)
 - Meter fail control
 - Hands-off – Auto pump control switch
 - Pilot lights
 - Power on (white)
 - Meter fail (red)
 - BS&W monitor fail (red)
 - Bad oil (red)
 - Good oil (white)

Options:

Divert valve – With back pressure valve and check valve – 2", 3", and 4"

Sample pot – Other sizes available – 5, 10, and 20 gallon

Class 1 – Division 1 electrical upgrade

Skid drip pan – Containment

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