SPARTAN CONTROLS

TRUCK UNLOADING SYSTEM
Model TUS FB107

Spartan Controls Truck Unloading System is compliant with:

- AER Directive 17
- API Chapter 11.1 2004 calculations

Features

- Supports 1 truck unloading bay
- Based on FloBoss 107 Flow Manager
- Local operator interface
- Keypad or PC configuration
- 0-100% water cut measurement calculation
- Liquid volume correction for crude oil

By Design

The TUS FB107 is designed to monitor offloading from one truck bay for hydrocarbon fluids such as condensate or light to heavy density crude oil. The TUS FB107 system utilizes a Micro Motion Coriolis meter for volume flow measurement and water cut determination.

The meter provides three on-line measurements that include mass flow, density and temperature. The volume measurement is derived from the mass and density variables (volume = mass/density).

The meter can be used over a wide range of densities and volume flow rates providing custody transfer accuracy. The TUS FB107 system water cut determination is typically provided in the following methods:

1. 0-5% density compensated Phase Dynamics or Drexelbrook Cut Monitor
2. 0-100% or 5-100% net oil density comparison using Micro Motion
3. 0-100% microwave water analysis using Phase Dynamics (heavy oil unloading)

The TUS FB107 system incorporates patented density compensation for 0-5% monitoring and a patented Net Oil Density Comparison for the 5-100% water cut calculation. The density compensated water cut monitor is used to improve water cut resolution for pipeline specifications over the 0-5% water cut ranges.

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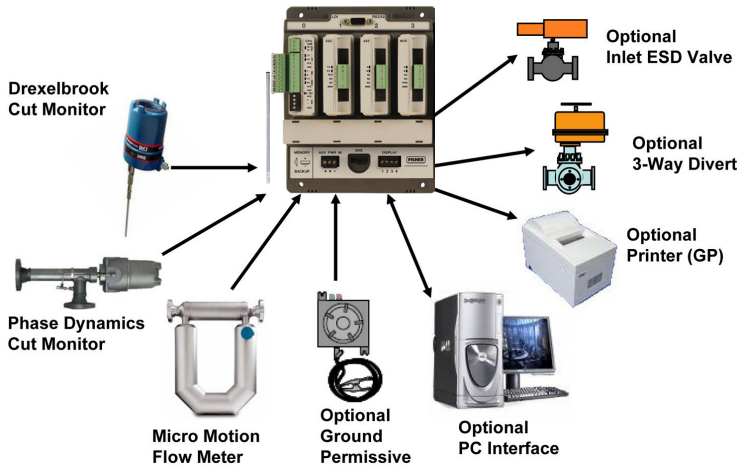
System Options

Common system options include ground permissive input (GPI), inlet ESD valve and 3 way divert valve control. The divert valve allows for clean oil to be diverted directly to a sales tank. This feature provides significant savings with the reduction of liquid processing costs.

Standard Specifications

Well Database	378	**Data Trending**	Yes
Truck Database	100	**Real Time Load Monitoring**	Yes
Historical Records	200	**Class 1, Div. 2 Option**	Yes
Unload Points	1	**3 Modes of Net Oil Calculations**	Yes
Unload Data Logs	8	**Autocomp Feature**	Yes
Meter Prove Records	30	**Cut by Microwave**	Yes
Tanks Alarm DI	4	**ESD Valve Control**	Yes
Tank Monitoring AI	2	**3-way Divert Control**	Yes
Daily Total Records	Yes	**Ground Permissive**	Yes
MODBUS Access	Yes	**Diagnostic Records**	Yes
Ethernet Access	Yes	**Volumn Test Case Calculations**	Yes
PC Configuration	Yes		

Typical System I/O



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Measurement Hardware

Micro Motion Coriolis Meter

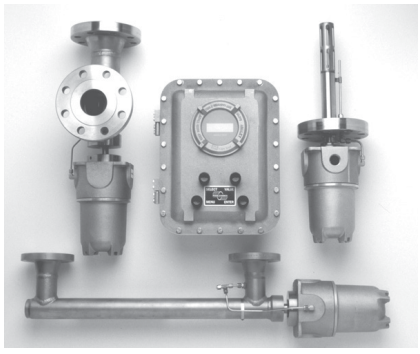
- Custody transfer approved
- No maintenance required
- Measurements provided:
  - Volume
  - Density
  - Temperature
- Provides measurement for 0-100% water cut calculation in conventional oil applications

Ametek Drexelbrook Water Monitor

- Digital calibration
- No maintenance probe design
- Provides measurement for high resolution 0-5% water cut calculation in conventional oil applications.
- When combined with a Coriolis meter the water cut ranges are:
  - Drexelbrook 0-5% water cut
  - Coriolis meter 5-100% water cut

Phase Dynamics Water Analyzer

- Digital calibration
- No maintenance design
- Provides measurement for 0-100% water cut calculation in heavy oil applications



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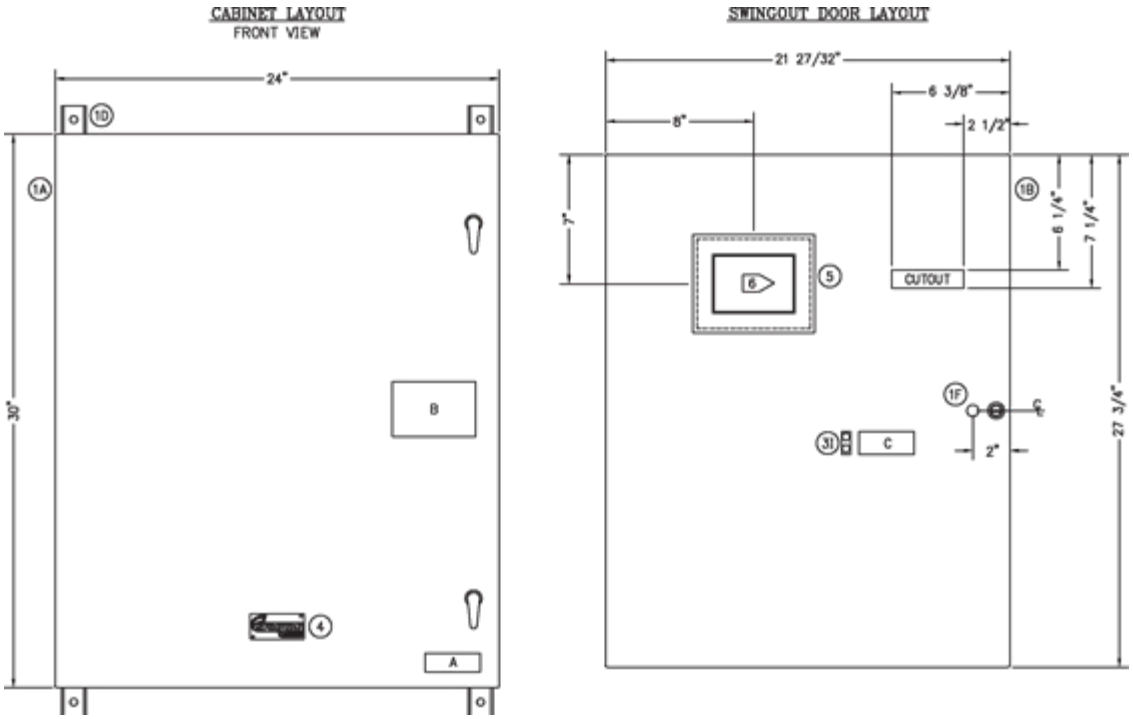
Typical Dimensions



Call us or request a quote online 24/7
+ 1 (877) 278-6404

British Columbia
Burnaby +1 (604) 422-3700 • Fort St. John +1 (250) 785-0285 • Prince George +1 (250) 960-9765

Alberta
Calgary +1 (403) 207-0700 • Edmonton +1 (780) 468-5463 • Fort McMurray +1 (780) 790-0440
Grande Prairie +1 (780) 539-1161 • Whitecourt +1 (780) 778-5445

Saskatchewan
Midale +1 (306) 458-2223 • Regina +1 (306) 721-6925 • Saskatoon +1 (306) 934-3484

Visit us online
www.spartancontrols.com | info@spartancontrols.com