FLC 513 and 514
Component Shaker System
Part of the Flo-Line® Cleaner Series
Derrick uses only the highest quality materials in the manufacturing of the Flo-Line® Cleaner 500 – one of the most powerful and versatile shale shakers in the world today. The single-side tensioning system shortens screen panel replacement time to less than one minute per panel and can be configured for operation on either the left or right side. All FLC 500 linear motion shale shakers are powered by two Super G® vibrating motors which enable the FLC 514™ (4-panel) to operate at an unprecedented continuous 7.3 G’s and the FLC 513™ (3-panel) at 7.0 G’s. This increase in G’s at the screen surface dramatically improves the conveyance rate of a shale shaker, enabling maximum cuttings removal efficiency.

**SUPER G® VIBRATING MOTOR**

- Produces 7.0 to 7.3 G’s of force.
- Continuous internal oil bath lubrication system reduces repair and maintenance costs.
- Sound output from the machines has been reduced to approximately 78 dBA.

**PYRAMID™ SCREENS**

- Offers 105% to 184% more screen area.
- Fluid handling capacity increases up to 125%.
- Enables the use of finer mesh sizes at higher capacities.

**SINGLE-SIDE TENSIONING SYSTEM**

- Effectively shortens screen panel replacement time to less than one minute per panel.
- Can be installed on either left or right side of the shale shaker for increased installation versatility.
- Utilizes tensioning fingers and two Quick-Lok, 1/2 turn tensioning bolts per screen to facilitate faster, easier and more reliable panel tensioning.
**Top Feed & Weir Feed**

- Traditional 40.9 gallon back tank with weir feed.
- Weir feed with bypass offers a valve that can be opened if the fluid needs to bypass the shakers.
- The top feeder evenly spreads the flow of mud across the shaker basket and eliminates excess mud volume.

**DESANDERS**

- Inline manifold holds between one and three 10” desander cones.
- Each cone can process 500 GPM.
- Makes a separation between 40 and 100 microns.

**DESILTERS**

- Round desilter manifold holds up to twenty cones and accepts 3” or 4” hydrocyclones.
- Each 4” cone can process 80 GPM.
- Makes a separation between 12 and 74 microns.
- The 4” hydrocyclone can be manufactured with a ceramic liner in the lower cone section for increased wear tolerance.
- Cones contain separate ball valves that can be individually shut off during operation to allow for increased control of flow capacities and ease of maintenance.

**FEEDERS**

- Traditional 40.9 gallon back tank with weir feed.
- Weir feed with bypass offers a valve that can be opened if the fluid needs to bypass the shakers.
- The top feeder evenly spreads the flow of mud across the shaker basket and eliminates excess mud volume.

**ADJUSTABLE WHILE DRILLING (AWD)**

- Easily and quickly raise or lower the screen basket from -1° to +5° on the FLC 513™ (3-panel), and -1° to +7° on the FLC 514™ (4-panel).
- Offers the capability to optimize shaker performance without interrupting operation.

**Derrick FLC 514™ with Optional Mud Cleaner Package**
Super G² Vibrating Motors
Derrick’s patented Super G² vibrators provide a continuous internal oil bath lubrication system which extends the life of the motor. Reduced repair costs and robust maintenance-free operation. A unique hydrodynamic cushioning effect is created on the bearing surface which reduces friction, wear, and heat generation. The motor will run longer and at a reduced decibel level (78 dBA) which greatly extends the life of the motor. The higher G-force produced by the Super G² motors has proven to dramatically increase liquid/solids separation due to superior conveyance characteristics. Two Super G² motors are standard equipment for the FLC 500.

Pyramid™ and Pyramid Plus “Three-Dimensional” Screens
Derrick’s patented Pyramid (PMD+™) screen consists of a standard sandwich construction featuring two fine mesh cloths layered with a coarse backing cloth. The three layers are bonded together, corrugated, and then bonded to a metal perforated plate. The resulting corrugations are 0.8” high on the Pyramid screen and 1.5” high on the Pyramid Plus (PMD+™), adding 105% to 184% more usable screen area than a standard flat, perforated plate panel. The three-dimensional Pyramid screens exceeded all expectations when the fluid handling capacity was found to increase up to 125%. Installation of Pyramid screens permits the use of finer mesh sizes at higher capacities, further optimizing the performance of the Derrick shaker. As with the Derrick flat, PWP™ screen series, the Pyramid screens are capable of making separations as fine as 43 microns. When fitted with Derrick’s Pyramid screens, the FLC 500 has the following area available for screening per API RP 13 C (ISO 13501): FLC 514 (4-panel) has 33.2 sq. ft. with the Pyramid screen and 46 sq. ft. with the Pyramid Plus. The FLC 513 (3-panel) has 24.9 sq. ft. with the Pyramid screen and 34.5 sq. ft. with the Pyramid Plus.

Single-Side Tensioning System
The single-side tensioning system shortens screen panel replacement time to less than one minute per panel and can be configured for operation on either the left or right side. A typical screen panel change requires a one-half turn of two Quick-Lok nut assemblies to relax the tensioning fingers. This system provides reliable and consistent panel tensioning throughout the life of the machine.

Adjustable While Drilling (AWD)
Derrick’s local/remote actuated AWD enables one person to quickly and easily raise or lower the screen basket from -1° to +5° on the FLC 513, and -1° to +7° on the FLC 514. As drilling rates and formation or mud properties change, the angle of the screen deck can be adjusted to achieve the proper solids conveyance and fluid end point. Increased capacity, longer screen life, and optimal solids removal efficiency are the results.

Hydrocyclones
Derrick offers a round desilter manifold mounted over the vibrating deck with the ability to hold up to twenty 3” or 4” hydrocyclones. This allows the FLC 500 to be used as either a high performance mud cleaner or as a means to reclaim the liquid discharged in the cone underflow. Each 4” hydrocyclone processes 80 GPM at 75 feet of head allowing for a maximum capacity of 1,600 GPM. The cone underflow is caught in the pan mounted over the vibrating basket and can be directed to the vibrating basket or discarded. Derrick’s uni-body 4” hydrocyclone can be manufactured with an optional ceramic liner in the lower cone section for increased wear tolerance.

Derrick desanders offer the flexibility of mounting either one, two, or three 10” desander cones over a cone underflow pan. Each 10” hydrocyclone processes 500 GPM at 75 feet of head, allowing for a maximum capacity of 1,500 GPM. The underflow can either be discarded or directed onto the vibrating bed for further processing.

Feeders
Derrick’s feeder designs offer the choice of a traditional weir feed, a weir feed with bypass, or a top feed. The weir feed consists of a 40.9 gallon tank where the mud flows over a weir and onto the shaker basket. The weir feed with bypass offers a quick opening gate that can be opened if the fluid needs to bypass the shakers. The top feed eliminates the settling of solids while minimizing footprint area. The top feed is designed to spread the flow of mud across the shaker basket while eliminating the excess mud volume that is normally held in traditional back tanks. Any of the feed systems can be used in conjunction with the Derrick Flo-Divider, a flow distribution device used with the FLC 500 series at the flow line.
Uses of the Flo-Line Cleaner 500

The FLC 500 can be configured for use as a main shaker, high performance (1,600 GPM) mud cleaner, or as a secondary drilled cuttings dryer. The FLC 500 allows the user to configure the shaker and its interchangeable components to fit specific needs for application, size, and capacity. The FLC 500 can be used in the following instances:

- **As a main shaker.** Two FLC 500’s with Super G² motors can be used in place of three or four standard shale shakers due to their exceptional fluid handling capability and superior solids conveyance. When coupled with Derrick’s Flo-Line Primer, two FLC 500’s can replace three or four stacked or cascade shakers.

- **As a mud cleaner to dry the underflow from desanders and desilters.** The FLC 500 is a useful tool in reducing the amount of liquid being discharged from desanders and desilters. This technique is effective when using an expensive drilling fluid. It also allows hydrocyclones to be a useful part of a “closed-loop” system.

- **As a cuttings dryer to recover oil base mud from drilled cuttings.** When utilized for secondary drilled cuttings drying, the FLC 500 can reduce the oil on cuttings to below 10% by weight.

The Results

The Derrick Flo-Line Cleaner 500 is powered by two Super G² vibrating motors for superior performance. While conventional shakers operate in the 3 to 5 G force range, the Derrick Super G² motors produce 7.3 G’s on the FLC 514 (4-panel) and 7.0 G’s on the FLC 513 (3-panel).

The higher G force generated by the Super G² motors combined with Derrick’s patented Pyramid screen technology have proven to be very effective in liquid/solids separation due to superior conveying characteristics and maximized available screening area. The FLC 513 shakers have processed in excess of 560 GPM with a 17.8 PPG mud over Pyramid DX-A140® screens. The FLC 514 shakers have processed upwards of 900 GPM with 9.1 PPG mud over Pyramid DX-A140® screens.

*DX-A140 replaces DX175 and DX210

The High G shaker system consisting of FLC 500 series shakers enables a drilling rig to use fewer shakers, or to screen finer with the same number of shakers, producing significant savings in drilling fluid and disposal costs. Its proven performance and durability are an asset for any drilling program.
### FLC 513 and 514 Dimensions

#### FLC 500 with standard sump & weir feeder

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<tr>
<th>OPTIONS</th>
<th>MODEL</th>
<th>Width</th>
<th>Length</th>
<th>Height</th>
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<td>72 3/8 / 1838</td>
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<td>67 13/16 / 1722</td>
<td>39 11/16 / 1008</td>
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<td>514</td>
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<td>103 / 2616</td>
<td>67 13/16 / 1722</td>
<td>41 7/16 / 1053</td>
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#### FLC 500 with standard sump, weir feeder, & pan with hydrocyclone package

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#### FLC 513 and 514 VE with box feeder

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*All weights and dimensions are approximate.

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**Derrick FLC 500 VE™ (Vapor Extraction)**

To avoid exposing personnel and surrounding equipment to vapors, the screening surface is covered with self-locking hood. An exhaust fan connected to the feeder creates a vacuum, which removes unwanted process vapors and creates a continuous flow of fresh (ambient) air into the machine. Screening surface inspection, panel change and maintenance are easily accomplished by lifting the hood doors up thus permitting full access to the screen bed. The FLC 513 VE is a 3-panel shaker (adjustable from -1° to +5°) while the FLC 514 VE is a 4-panel shaker (adjustable from -1° to +7°).