



MD-2 Dual-Deck Shaker

More decks. More options. Less space.



MD-2 Dual-Deck Shale Shaker: Dual-deck, flat-bed shaker with full- contact composite screen technology

As a result of increased economic and regulatory pressures, well construction costs continue to rise. Therefore, today's shale shakers must be capable of both maintaining optimum drilling fluid properties to maximize efficiency and eliminate non-productive time (NPT) as well as significantly reducing waste volumes and associated costs.

Ideally suited to many onshore and offshore drilling rigs, the combination of the MD-2[†] dual-deck shale shaker and patented DURAFLO[†] composite screens forms an unmatched solids control package that provides nearly double the capacity of a standard single-deck shaker. Even so, this compact solids control package delivers with only a minimal increase in energy consumption. In addition, the rugged construction and optimal solids control performance of the MD-2 shaker with composite screens reduces system maintenance, the number of shakers required on location and the need for redundant solids control equipment.

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The unbeatable combination for ultra-efficient solids control and lower cost of ownership

Features

- Dual-deck design with full primary and half-width scalping decks
- Progressive and balanced modes of elliptical motion
- Durable pretension composite screens
- Flexible fluid distribution
- Modular platform
- Select components are fabricated with durable stainless steel materials
- Adjustable deck angles
- +7 G's operating mode
- Can accommodate most gas detection devices
- Two screen vibratory motors
- Pneumatic screen clamping/sealing system
- Vapor recovery hoods
- CE compliant

Benefits

- Delivers high processing capacities
- Adjusts instantly to changing drilling conditions
- Provides longer screen life
- Generates drier cuttings
- Enhances overall solids control efficiencies
- Conveys solids quickly out of fluid pool
- Decreases NPT
- Promotes easy deck adjustments
- Requires only marginally more power than single-deck unit
- Removes harmful vapors
- Reduces maintenance
- Reduces drilling, waste disposal costs
- Helps ensure environmental compliance
- Raises HSE profile

With the uniquely engineered MD-2 dual flat-deck shaker with DURAFLO composite screen technology, M-I SWACO, a Schlumberger Company, has taken the solids control process to an entirely new level of efficiency. In providing primary solids removal from both oil and water-base drilling fluids, the MD-2 dual-deck shaker delivers high-capacity separation efficiency and operational flexibility in a value-added footprint. Capable of easily switching between balanced elliptical and progressive elliptical motions, the MD-2 shaker adapts instantly to the continual changes in drilling conditions.

To further enhance its performance the dual-deck MD-2 shale shaker is engineered to unlock the full solids control potential of the strong and efficient M-I SWACO DURAFLO family of composite-frame screens. Compared to conventional shaker screens, the productive life of our DURAFLO pre-tensioned composite screens is considerably longer and the overall screening area appreciably larger.

The extended useful life of composite screens in tandem with the higher capacity of a single dual-bed, flat-deck shaker assures a cost-effective and high-performing solids control package.





Drilling conditions change quickly. So does the MD-2 Shaker.

Obviously, drilling conditions and cuttings volumes change constantly during the course of constructing a wellbore. And, with every change, an immediate and flexible solids-control solution is essential. That's what separates the MD-2 shale shaker from conventional single-deck shakers.

Different conditions require different acceleration rates and deck angles. Not only does the MD-2 shaker dynamically manage fluid quality throughout the drilling process, it is uniquely engineered to respond instantly to changing conditions. At any point in the drilling process, a simple flip of a switch allows the MD-2 shaker to change between normal progressive and capacity balanced elliptical motions.

For fluid surges and heavy solids loading, the MD-2 shaker is run in the capacity mode. This +7 Gs balanced elliptical motion

is set when larger cuttings volumes require higher acceleration and thin ellipse motion across the entire screen deck. Compared to the progressive elliptical mode, the higher acceleration of balanced elliptical motion increases the fluid capacity and conveyance rate.

When maximum cuttings retention is required, the MD-2 shaker can be switched to the normal or efficiency mode.

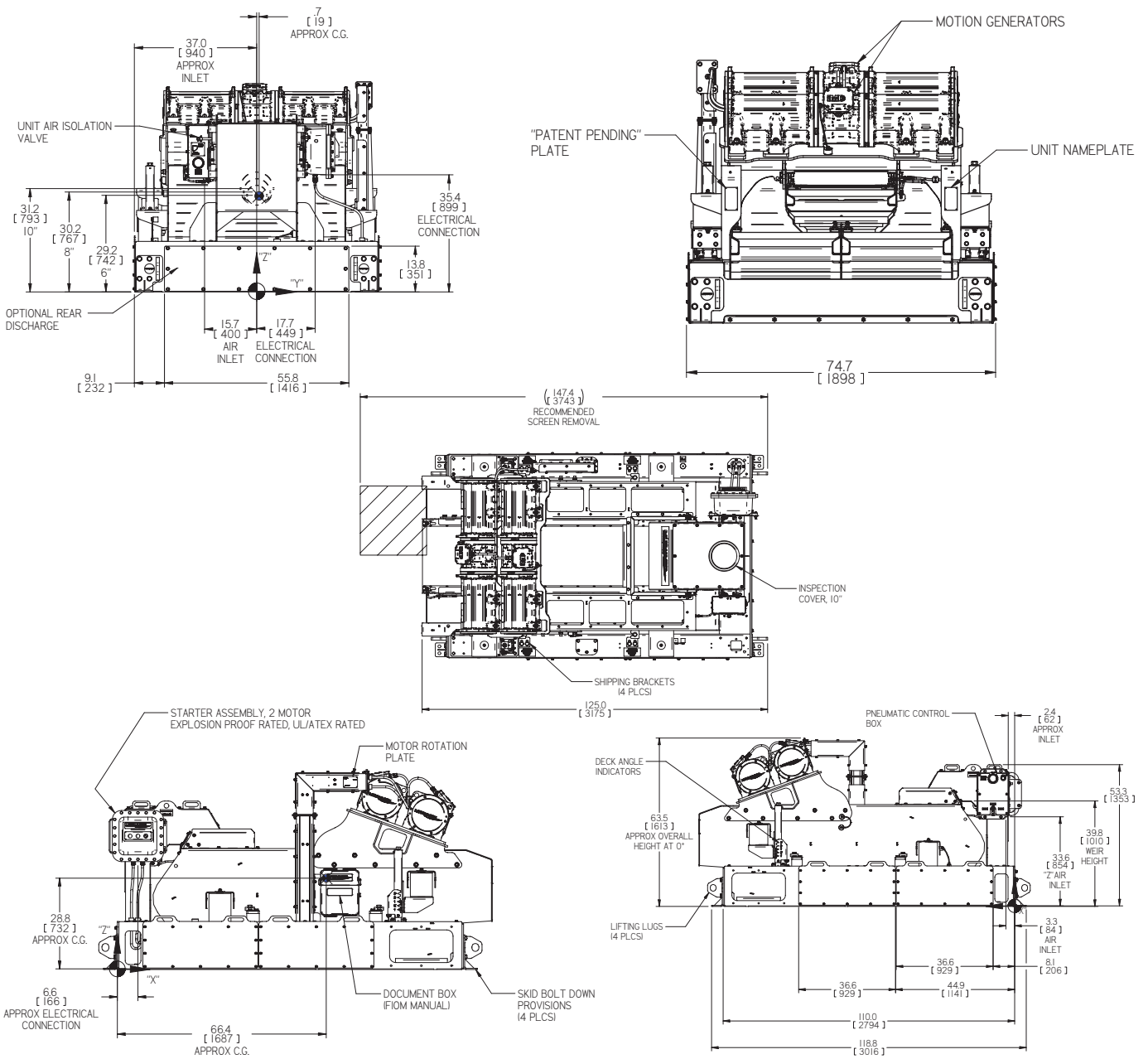
The 6.5 G acceleration of this progressive elliptical motion produces a thin ellipse motion that quickly removes solids from the mud, while a wide ellipse at discharge maximizes retention to produce drier cuttings. The lower acceleration of the progressive elliptical mode also extends screen life and reduces noise levels.

The angles of the two MD-2 shaker decks also are easily adjusted to changing drilling conditions, different fluid types and varying

solids. This allows for flexible control of both fluid pool depth and beach length. The scalping deck is adjustable between -1° to $+3^{\circ}$, while the primary deck can be adjusted between a net range of $+3^{\circ}$ to $+7^{\circ}$. If requested, the MD-2 shaker can be upgraded with a pneumohydraulic deck adjustment.

With its adjustable deck angle and the capability to immediately change acceleration ratings, the MD-2 shaker delivers the flexibility required to optimize fluid capacity, cuttings dryness, fluids recovery and solids discard rates. That means less waste volume, lower disposal costs and eco-sensitivity, all within a solids control package that fits well within tightly constrained workspaces.

MD-2 Shale Shaker Specifications



These renderings are for information purposes only and are not actual schematics.

Dimensions

- Length: 125.0 in. (3,175 mm)
- Width: 74.7 in. (1,898 mm)
- Height at 0°: 63.5 in. (1,613 mm)
- Weir height: 39.8 inch (1011 mm)
- Weight: 6,200 lbs (2,812 kg)

Screen Deck and Screens

- Gross screen area
 - Scalping deck: 16.9 ft² (1.6 m²)
 - Primary decks: 33.9 ft² (3.1 m²)
- Net (API) surface area
 - Scalping deck: 10.6 ft² (1.0 m²)
 - Primary decks: 21.1 ft² (2.0 m²)
- Deck-adjustment system
 - Scalping deck: -1° to +3°
 - Primary decks: +3° to +7°

Vibratory Motion Type

- Normal mode: 6.5 G
- Capacity mode: +7.0 G

Motor Specifications

- Voltage: 220-690 VAC
- Speed: 1800RPM/60Hz; 1500RPM/50Hz
- Certifications: UL/cUL, CE, ATEX rated

Key features of the MD-2 Dual-Deck Shale Shaker

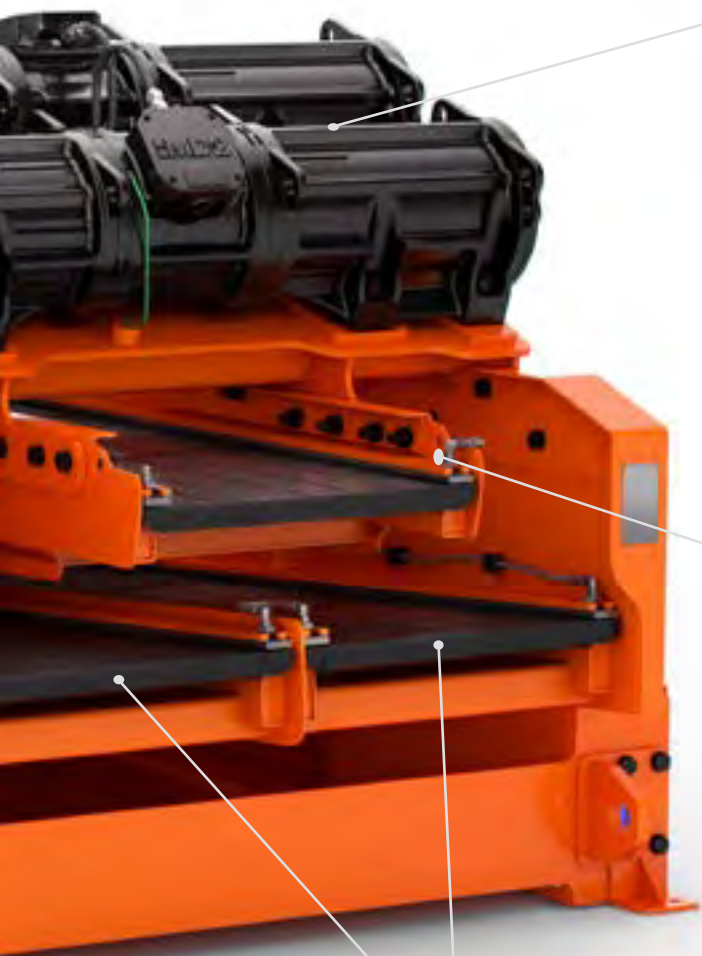


Open access to easily inspect scalping and primary deck screens



Deck angle can be adjusted while processing fluid .
Adjustment Range:
- Scalping deck: -1° to $+3^{\circ}$
- Primary deck: $+3^{\circ}$ to $+7^{\circ}$

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Two oilfield proven 3.7 HP motion generators



U-shape screen clamping actuators designed with continuous toggle to allow installation from discharge end of shaker



Composite lightweight MD series screens with self latching mechanism and integrated seal with the following gross screen area:

- Scalping deck: 16.9 ft squared (1.6 m²)
- Primary deck: 33.9 ft squared (3.1 m²)

The added benefits of composite screen technology

With their reduced space and lower maintenance requirements, dual-deck shakers are not new to the onshore and offshore drilling markets. However, unlike those earlier designs, the MD-2 shaker is engineered specifically to capitalize on the longer life and enhanced performance of longer-lasting composite-frame screen technology.

Screens are highly consumable items and extending their productive life represents a major cost-saving opportunity. The MD-2 shaker is the only dual-deck shaker engineered to capitalize on the operational and economic benefits of M-I SWACO patented DURAFLO composite screens. Unlike its metal-framed counterparts, DURAFLO three-layer composite screens combine a polypropylene frame with an internal reinforcing cage made of high-strength steel. This rigid and novel design extends the screen while delivering higher conveyance rates.

All this translates into less stress on the shaker, increased fluid capacity and fewer screen change-outs. Being fully pre-tensioned, DURAFLO also delivers a large usable flat-deck screen area that remains in continuous contact with the fluid, providing significantly greater separation performance than crown-deck shakers that utilize corrugated screens.

When replacements are required, the patent-pending MD-2 shaker's pneumatic screen clamping and sealing system allows for simple and fast screen installations. The system contains no moving parts and, since the screens are self-latching, no tools are required for installation.

With the novel pneumatic screen clamping and sealing system, the seal is integrated into the frame and the U-shape allows screen-to-screen sealing on three sides. The screen retention track, which is fabricated with rugged 316-L stainless steel material for enhanced durability, is designed with a sloped bottom that prevents solids buildup and makes for easy clean-up. A check valve ensures clamping pressure maintained in the event of compressed air loss.

Safety at core of MD-2 shaker DURAFLO screen combination

Complementing its efficient and flexible design, the MD-2 shaker incorporates a number of features designed to protect both the operator and environment. Along with the feeder designed to accommodate most gas detection devices, the MD-2 shaker can be equipped with an optional fume extraction system for removing harmful gases. Optional vent hoods can be easily installed on the MD-2 shaker to protect the operator from the health hazards of noxious vapors.

Perhaps the most notable HSE benefit of the MD-2 shaker is however derived from its companion DURAFLO composite screens. Their efficiency and long-life result in fewer screen changes, fewer instances of manual handling and significantly decreased opportunities for safety-related incidents.

Put the MD-2 shale shaker to work for you

To find out more about how our MD-2 dual deck shale shaker is working for our other customers worldwide, contact your local M-I SWACO representative.





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MD-2 Dual Deck Shale Shaker proves itself in the field

South Texas: Single MD-2 shaker effectively takes over for dual shakers

The Situation

As the international drilling contractor prepared to drill a 22-in wellbore in the Eagle Ford, the two competitor shakers on the rig would be unable to cost-effectively meet the aggressive drilling requirements. Without an alternative, rates of penetration (ROP) would be restricted and waste haul-off costs excessive.

The Solution

M-I SWACO recommended the contractor replace the two existing units with a single MD-2 dual-deck shale shaker with composite screen technology. Capable of switching on-the-fly between balanced elliptical and progressive elliptical motions as drilling conditions change, the MD-2 shaker routinely exhibits high-capacity separation, producing drier cuttings and reducing both operational demands and costs.

The Results

The MD-2 shale shaker effectively handled 100% of the flow throughout the top-hole section. Though well below its maximum flow-rate capacity, a comparative evaluation showed that the MD-2 handled 658 gpm with only 60% screen coverage on the primary deck, and at a zero-degree deck angle. Though the deck angle could have been raised to 3°, it was maintained at zero to effectively use more screen area and prolong screen life. The dual competitor shakers, on the other hand, had been able to handle only 164 gpm with 75% screen coverage on the primary deck, while running at the units' maximum 4.5° deck angle. Consequently, the M-I SWACO MD-2 shale shaker allowed the client to maximize flow rate and reach the desired ROP, while at the same time reducing haul off costs appreciably.



ONLINE RESOURCES

Solids Control

www.miswaco.com/solidscontrol

Shakers

www.miswaco.com/shakers

MD-2 Dual-Deck Shale Shaker

www.miswaco.com/md2

DURAFLO Screens

www.miswaco.com/screens



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