

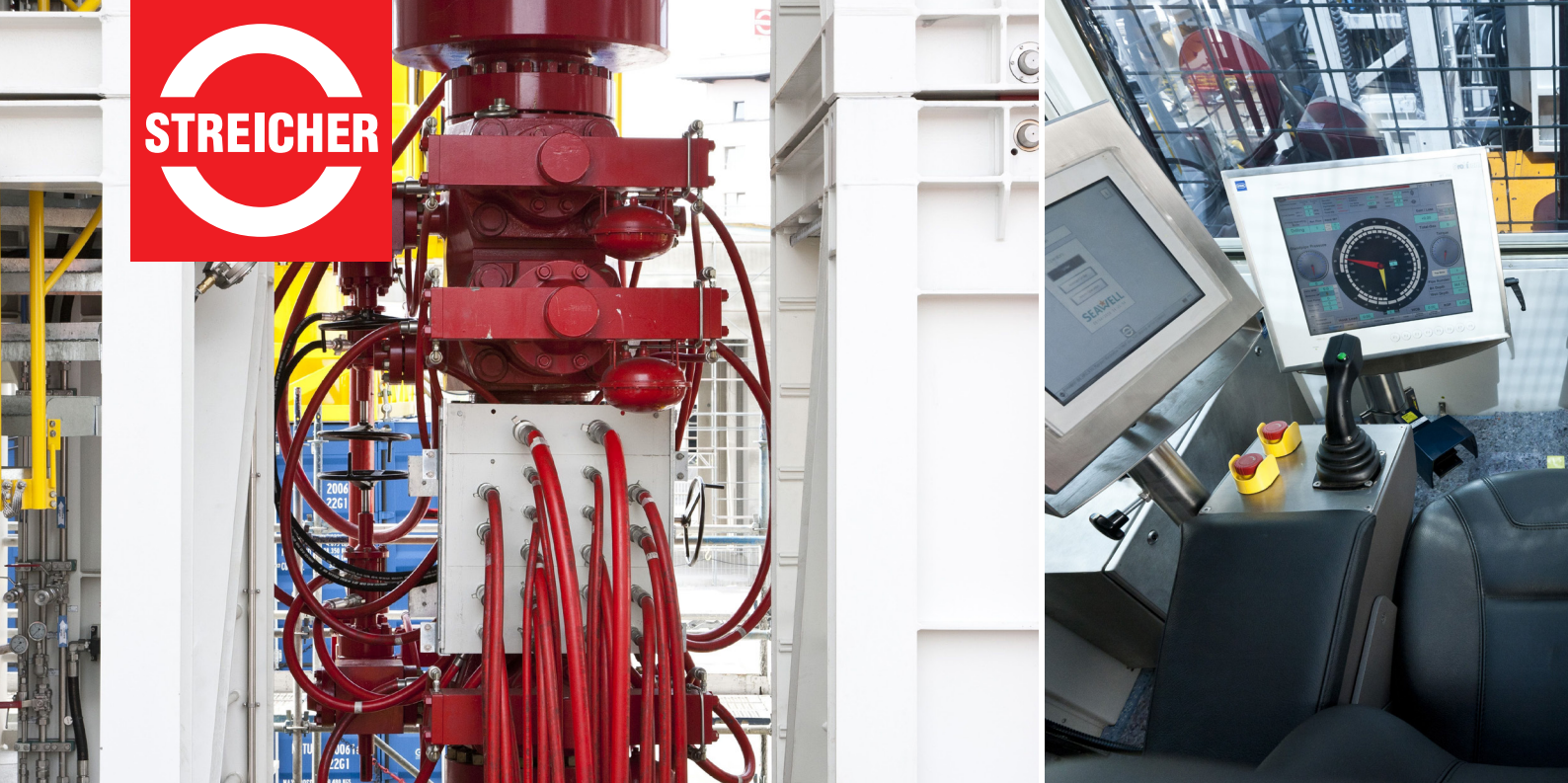


## DRILLING TECHNOLOGY

### DRILLING RIG VDD 400 OFFSHORE

- Super Single Rig (Range III)
- Fully Automated Offshore Drilling Rig
- Modular Construction
- Modules with a max. Weight of 24,251 lbs. (11 metric tonnes)
- Simple Rig Assembly and Disassembly under Offshore Conditions
- Two Direction Skidding
- Entire Footprint without Power  
Generation: 45.9 x 39.4 ft (14 x 12 m)
- Certified Functional Safety and
- Anti-Collision-System
- Hands-Off-Technology
- Automated Pipehandling System





### Hydraulic Top Drive

Top drive (rotary unit) and hoisting system (carriage) are integrated in a carriage system. The carriage system is moved along the mast by a rack system. Carriage loads and torque are transferred via the racks and the mast.

Additionally, the carriage system is directly engaged using gear racks which are integrated into the mast. The top drive is equipped with a specially designed brake/lock system which can prevent uncontrolled movement even if the lines or hoses fail or the hydraulic system breaks down.

### Max. Drilling Depth

- 16,400 ft (5,000 m) – Depending on Well Design

### Mast

- Welded Box Type with Two Integrated Gear Racks on the Sides
- Self Erecting Bootstrap Mast
- Clear Working Height: 62.3 ft (19 m)
- max. Hook Load: 400 short tons (363 metric tonnes)
- Auxiliary Winch: 8,800 lbs. (4 metric tonnes)
- Overall Height incl. Substructure: 131.2 ft (40 m)
- Safety Bails, Wind Sensor, Warning Lights for Airplanes

### Substructure

- STREICHER Modular Box-on-Box System
- Total: 9 Modules incl. Rig Floor
- Footprint: 19.7 x 19.7 ft (6 x 6 m)
- Substructure Inner Clearance: 10.2 ft (3.12 m)
- Electrically Driven BOP-Trolley
- Height to Bottom Edge of Rotary Beams: 29.5 ft (9 m)
- Quick Connectors for Module Stacking

### Rotary Table (Assisting)

- STREICHER Hydraulic Rotary Table
- Table Opening: 37 1/2" (957 mm)
- max. Rotary Load: 400 short tons (363 metric tonnes)
- max. Rotation Speed: 10 rpm
- max. Operating Torque: 33,190 ft-lbs. (45,000 Nm)

### Top Drive

- STREICHER Hydraulic Top Drive
- max. Hoisting Capacity: 400 short tons (363 metric tonnes)
- max. Pushing Force: 100 short tons (90 metric tonnes)
- Continuous Torque: 42,280 ft-lbs. (60,000 Nm)
- Intermittent Torque: 62,693 ft-lbs. (85,000 Nm)
- max. Speed Rating: 190 rpm
- max. Hoisting Speed: 148 ft/min (45 m/min)
- max. Circulation Pressure: 5,000 psi (345 bar)

### Tubular Handling Equipment

#### Pipehandler

- STREICHER Horizontal to Vertical Pipehandler
- Tubular Sizes: 2 1/2" to 20", up to Range III (max. 48 ft/14.6 m)
- max. Pipe Weight: 6,600 lbs. (3 metric tonnes)
- Without Modifications or Adjustment Work for Diameter Changes
- Fully Automated in Sequences

#### Iron Roughneck

- Tubular Connection OD Range: 2 3/8" to 20"
- max. Break-out Torque: 151,200 ft-lbs. (205,000 Nm)
- Integrated Spill Protection Equipment
- Automated Thread Cleaning and Lubrication
- Without Modifications or Adjustment Work for Diameter Changes





## VDD 400 OFFSHORE SUPER SINGLE RIG

### Automated Pipehandling System

#### Trip Speed

- approx. 1,312 ft/h (400 m/h)

#### Hydraulic System

- 2 Redundant Hydraulic Power Units for Top Drive, Hoisting System and for all Auxiliary Equipment (Pipehandler, Elevator, Rigfloor Crane, Auxiliary Winch, etc.)
- Soundproofed: 75 dB
- Output Frequency Controlled E-motor: 1,140 hp (850 kW)

#### Data Acquisition System

- Comprehensive System to Acquire and Digitally Store all Relevant Drilling and Operating Parameters
- Remote Diagnostic System

#### Mud System

##### Mud Pumps

- 4 x 750 hp (4 x 560 kW) AC-Drive (VFD controlled)
- Modules Include Charge Pump, Suction- and High-Pressure Dampener, Low- and High-Pressure Piping and Valves

##### Mud Tanks

- 5 Tanks in 4 Tank Modules
- Overall Tank Capacity: 660 bbls (105 m<sup>3</sup>)
- Suction Tanks: 176 bbls (28 m<sup>3</sup>) and 120 bbls (19 m<sup>3</sup>)
- Pill Tank: 44 bbls (7 m<sup>3</sup>)
- 2 Sand Traps: each 160 bbls (25.5 m<sup>3</sup>)
- Valve Control from Driller's Cabin
- Mixing and Transfer Pumps
- Conveying Screws in Two Directions for Cuttings

##### Mud Treatment

- 2 Shale Shakers
- 1 Vacuum Degasser
- 1 Mud/Gas-Separator
- Shaker Ventilation

#### Pressurized Enclosure

- Ventilators for Overpressurization
- The Entire Rig is Suitable for Operation in Ex-zone 2

#### Emergency Power Supply

- 2 Autonomous Sets of Accumulators for Supplying Power to the Basic Systems (without Drilling Operations)

#### Additional Options

- STREICHER Load-Torque-Cell:  
Direct Measurements with Tolerance < 1 %
- Catwalk
- Sound Proofing of Generator Packages
- Optional Fast Moving Transport System
- Third Party Inspections and Certificates
- Vacuum Degasser
- Centrifuges
- Well Control System
- Downhole Equipment
- Different Type of Roughneck
- Casing Drilling
- Additional Mud Pumps
- Power Generation
- Converter Unit to Connect Platform Grid
- Automated Fuel Supply

#### Applied Standards and Regulations

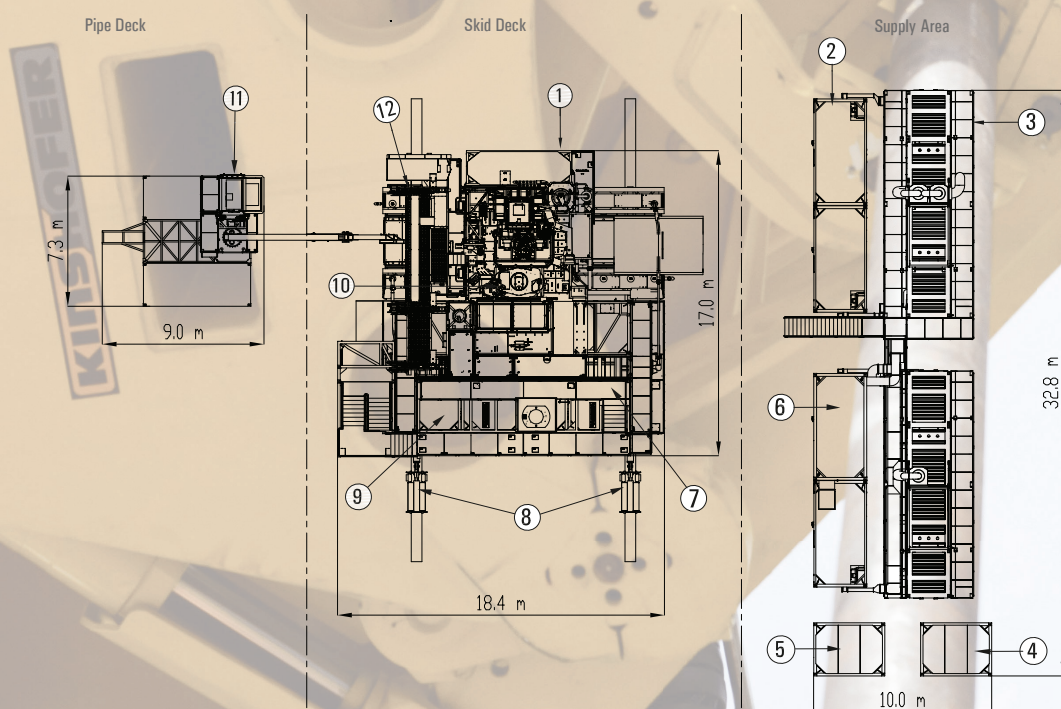
- Machinery Directive 2006/42/EC (CE – declaration of conformity)
- Pressure Equipment Directive 97/23/EC
- Explosion Proof Equipment Directive 94/9/EC (ATEX)
- Low Voltage Equipment 2006/95/EC
- Electromagnetic Compatibility 2004/108/EC
- Functional Safety IEC 61508
- Drilling and Well Servicing Structures API Spec. 4F
- Drilling and Production Hoisting Equipment API Spec. 8C
- GOST







## Footprint



### Rig Component

1. Drilling Rig
2. AC-Drive and Monitoring System (ACDM)
3. Generator Sets
4. SAS-CC-USV-Module
5. SAS-CC-Module
6. HVAC-Module
7. Hydraulic Power Unit
8. Skidding System
9. Solids Control
10. Pipehandler
11. Pipehandling Crane
12. Pipe Feeder

