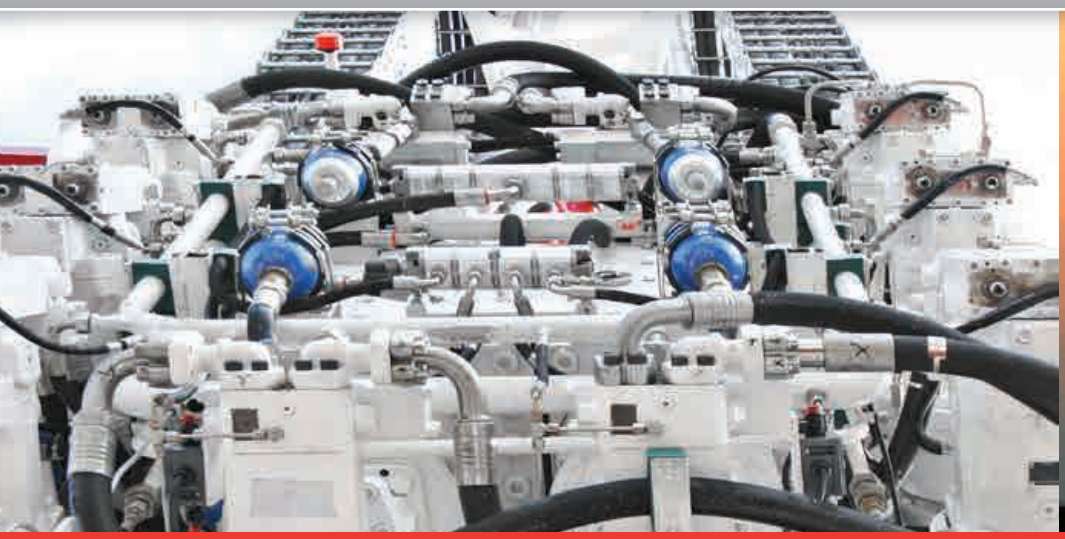
DrillTec DEEP DRILLING

- Modular construction
- Variable rig layout
- Low total height: only 31 m (102 ft) incl. substructure
- Small footprint: approx. 1,224 m² (13,176 ft²) of basic equipment
- Low noise emission
- Skiddable along the longitudinal axis
- Safety system DIN EN 61508

DRILLING RIG

VDD 370



VDD 370 Super Single Rig with Automated Pipehandling System

Hydraulic Top Drive
Top drive (rotary unit) and drawworks (carriage) are integrated in a carriage system. The carriage system is moved along the mast by a rack and pinion 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.

Optional
- Casing drilling

Max. Depth
- 5,000 m (16,400 ft)

Mast
- Welded box type with two integrated gear racks on the sides
- Clear working height: 16.7 m (54.8 ft)
- Max. working load: 3,700 kN (831,793 lbf)
- Standard working load: 3,300 kN (741,869 lbf)
- Overall height with substructure: 31 m (102 ft)

Substructure
- 6 modules in the size of 40' containers (3 modules on each side)
- Footprint incl. clearance of cellar: 8 x 12.2 m (26.3 x 40 ft)
- Substructure clearance: 3.12 m (10.2 ft)
- Height to bottom edge of rotary table support: 7.7 m (25.3 ft)
- Preventer stack lifting system: 2 x 44,063 lbf (2 x 196 kN)

Rotary Table
- Table opening: 957 mm (37 ½")
- Static capacity: 3,700 kN (831,793 lbf)
- Max. rpm: 10 min^{-1}
- Max. torque: 45,000 Nm (33,190 ft-lbs.)

Top Drive
- Manufacturer: MAX STREICHER GmbH & Co. KG aA
- Static capacity: 3,700 kN (831,793 lbs)
- Max. torque: 85,000 Nm (62,693 ft-lbs.)
- Max. rpm: 190 min^{-1}
- Max. circulation pressure: 345 bar (5,000 psi)

Tubular Handling Equipment
Pipehandler
- Tubular sizes: 2 ½" to 20", up to Range III

Iron Roughneck
- Manufacturer: Maritime Hydraulics AS
- Type: MH 4160
- Pipe diameter (OD): 2 ⅞" to 9 ½"
- Max. make-up torque: 84,000 Nm (61,955 ft-lbs.)
- Max. break-out torque: 108,500 Nm (77,444 ft-lbs.)

Trip Time
- Up to 400 m/h (1,312 ft/h)

Power Generation
VDD 370.1 Synergy I
- 4 x 1.065 kVA AC Generator ACG 1250-4-690

VDD 370.2 VarioRig
- 4 x 1.065 kVA AC Generator ACG 1250-4-690

VDD 370.3 Synergy II
- 4 x 1.065 kVA AC Generator MJB 400LB34

Optional: converter unit to connect rig to grid

Hydraulic System
- 1 power pack for top drive and iron roughneck
- 1 power pack for all auxiliary appliances

Fuel Storage
- 1 fuel tank: 20 m^3 (126 bbl) with automatic refill system for generators
- Optional: 2 x

Data Acquisition System
- Comprehensive system to acquire and digitally store all relevant drilling and operating parameters
- Remote diagnostic system for drilling rig

Blow Out Prevention Equipment (Example)

Stack Configuration
- 1 annular preventer Shaffer Spherical 13 5/8", 345 bar (5,000 psi)
- 1 double ram preventer Cameron Type Double "U" 13 5/8", 690 bar (10,000 psi) with 4 x 4 1/16" outlets, standard bore shear bonnets and large bore shear bonnets (with tandem booster), 2 7/8" to 5" VBR, 1 x blind shear rams
- 1 single ram preventer Cameron Type Single "U" 13 5/8", 690 bar (10,000 psi) with 2 x 4 1/16" outlets, 2 7/8" to 5" VBR

Accumulator Unit
- Manufacturer: Koomey
- Capacity: 260 gal
- Working pressure: 207 bar (3,000 psi)
- 1 remote control

Degasser
- Poor boy degasser, optional vacuum degasser

Choke Manifold
- Rated working pressure: 690 bar (10,000 psi)
- Nominal diameter: 3 1/16"

Drill Pipe
- Will be supplied as required by the customer

Mud System

Mud Pumps (Depending on the Rig)

VDD 370.1 Synergy I
- 2 x Wirth TPK 1600
- 12" stroke, 5 1/2" to 7 1/2" piston, 5 1/2" up to 350 bar (≈ 5,000 psi)
- input power for each pump: E-engine, 1.193 kW (1,600 HP)
- 2 centrifugal charging pumps, 55 kW (74 HP)

VDD 370.2 VarioRig
- 3 x STREICHER Hong Hua HHF 1600
- 12" stroke, 5 1/2 " to 7 1/2" piston, 5 1/2" up to 350 bar (≈ 5,000 psi)
- Input power for each pump: E-engine, 1,193 kW (1,600 HP)
- 3 centrifugal charging pumps, 55 kW (74 HP)

VDD 370.3 Synergy II
- 3 x STREICHER Hong Hua HHF 1000
- 10" stroke, 4 1/2" to 6 3/4" piston, 4 1/2" up to 350 bar (≈ 5,000 psi)
- Input for each pump: E-engine, 735 kW (986 HP)
- 3 centrifugal charging pumps, 55 kW (74 HP)

Mud Tanks
- Suction tank: VDD 370.1/3: 60 m³ (377.4 bbl) (divisible)
  VDD 370.2: 44 m³ (267.8 bbl)
- Mix tank: 40 m³ (251.6 bbl)
- Pill tank I: 9.5 m³ (59.8 bbl)
- Pill tank II: 9.5 m³ (59.8 bbl)
- Silo: 2 x 30 m³ (2 x 188.7 bbl)
- 1 hopper
- 2 mixing and transfer pumps NOV Magnum, 55 kW (74 HP)
- Optional extendable

Solids Control System
- 1 Derrick Flow-Line Primer
- 3 Derrick FLC 2000 4-panel shale shaker
- 2 Derrick DE 1000-FHD centrifuges
- 1 Derrick Flo-Divider
- 2 moineau pumps Bornemann EH 1500 to feed the centrifuge
- Optional: hydrocyclone desilter 16 x 4"

Air System
- 1 compressor: Atlas Copco GA 30C3
- Max. volume: 4.5 m³ (28.3 bbl)
- Max. pressure: 13 bar (188.5 psi)

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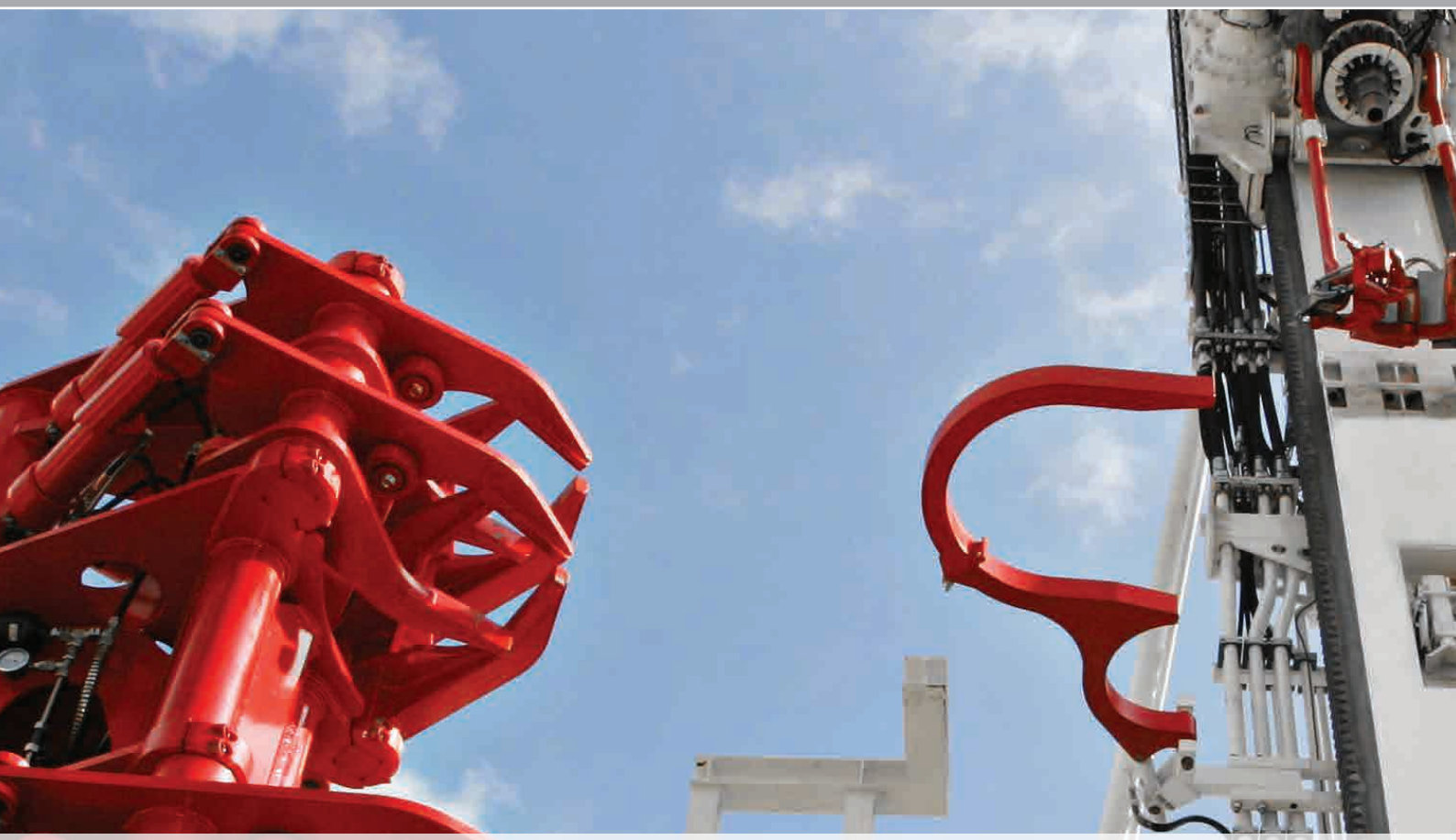
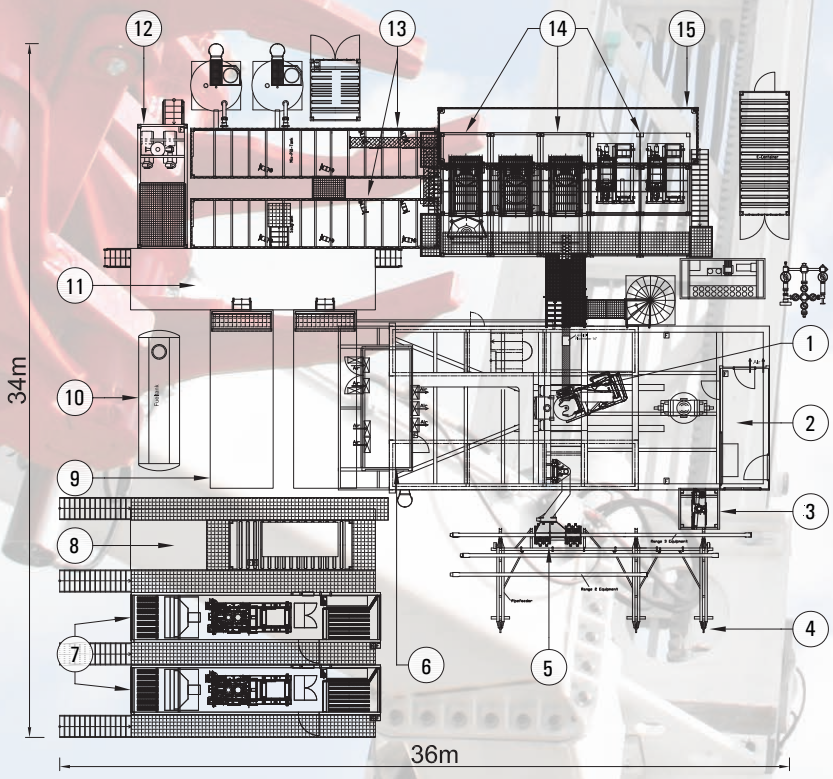


Layout example of drilling rig VDD 370.1



Rig Component	
1.	Mast
2.	Driller's Cabin
3.	Support Crane
4.	Pipe Rack
5.	Pipehandler
6.	Powerpack(s)
7.	Generators
8.	Powerhouse
9.	Mud Pumps
10.	Fuel Tank
11.	Manifold Mud Pumps
12.	Mixing Unit
13.	Mud Tanks
14.	Solids Control Unit
15.	Cutting Box

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STREICHER Group