

ALPHA STAR



The Alpha Star (DSSTM38) semi-submersible drilling rig is a cost effective drilling unit designed with drilling equipment suitable for drilling well, work over (completion and intervention), exploration drilling as well as development drilling. It embodies the collective past experience of new builds and conversions of semi-submersible units, which results in a rig, which is optimized for offshore operations, environmental protection and safety aspects. Distinguishing this rig is the high level of environmental protection built into the operational case. The Alpha Star is environmentally friendly, designed for maximum uptime while minimizing emissions and discharge. Crew requirement is optimized on the drill floor as the rig is outfitted with automated pipe feed and stabbing as well as pipe-handling functions.

The Alpha Star (DSSTM38) and equipment have been designed to operations in environmental conditions of the Gulf of Mexico, West Africa, South East Asia, Brazil and similar conditions up to 9,000 ft. (2.743 m) water depth, and can drill up to 24,600 ft. (7.500 m) from RKB with a variable drilling load of up to 9,622 ton (10,606 sh ton).

Special consideration for the Campos and Santos Basins environmental conditions is taken into account in the design to guarantee adequate and satisfactory operations in the Brazilian offshore.

The hull structural steel material has been designed for ambient temperature of -10°C. Maximum ambient temperature has been established at 40°C. Seawater temperature shall be based on 0° to 32 °C.

The vessel is designed to keep station with eight azimuth thrusters utilizing a dynamic positioning system to meet ABS Class requirements for DPS2 and Petrobras specification. The DP-system have been designed to keep the vessel on location according to the Campos Basin 1-year environmental conditions with the riser connected and under drilling operations.

TECHNICAL SPECIFICATIONS

GENERAL

Name: Alpha Star
Flag: Panama
Year Built: 2009
Builder: Keppel Fels, Singapore
Design: Gusto DSS-38, DP2
Classification: ABS Maltese Cross, A1, Column Stabilized Drilling Unit, AMS, DPS-2

MAIN DIMENSIONS

Length: 103.5 m (Overall), 69.5 (Main Deck)
Breadth: 69.5 m
Depth: 8 m main deck
Columns: 4 x (15 x 15 m) (Square)
Pontoons: 103.5 x 15 x 9 m (Length x Breadth x Height)
Deck Area: 69.5 x 69.5 m (Main Deck)

DESIGN OPERATING CONDITIONS

Maximum Water Depth: 9,000 ft.
Drilling Depth Capacity: 24,600 ft.
Operating Draft: 20.50 m

Transit Draft: 8.70 m
Survival Draft: 16.50 m
Operational Displacement: 39,327 ton
Transit Displacement: 35,677 ton

ELECTRIC SYSTEM AND DIESEL MOTORS

Main Power: Ten EMD, Model 20-710-G7B, 39.5 MW, 900 rpm
Main Generators: Ten Baylor AC Generator, 4091 KW, 900 rpm, 11,000 Volts
Power Distribution: Keppel Norway
Emergency Power: One Caterpillar, Model 3508B, 750 KW, 1,800 rpm

PROPULSION/THRUSTERS

Thrusters: Eight Flowserve azimuth thrusters, 3,000 KW, driven by electric motor, variable speed / VFD controlled, 2 each pontoon end
Dynamic Positioning System: Kongsberg Simrad / SDP SBC500, position reference DGPS, hydro-acoustic

MAXIMUM OPERATING / ENVIRONMENTAL CONDITIONS

Normal drilling
Draft / Displacement: 20.5 m / 39,327 ton
Variable Deck Load: 9,622 ton (drilling), 4,896 ton (transit)
Wave height (maximum): 10.7 m, peak period: 13.70 s
Wind Speed (maximum): 19.63 m/sec
Current Speed (maximum): 1.61 m/sec
Heave (maximum): 6.2 m
Pitch (maximum): 2.6 degrees
Roll (maximum): 2.85 degrees

DRILLING EQUIPMENT:

Derrick: NOV, 185 x 43 x 40 ft. Nominal Hook Load 2,000,000 lb
Drawworks: NOV, SSGD-1000-6000-48-82-9, 6,000 HP driven by four AC motors (VFD), Baylor, CM632UUT
Rotary Table: NOV, RST, 60.5"
Top Drive: NOV, TDS 1000A, 2,000,000 lb
Traveling Block: NOV, 7 x 72" sheaves, 2,000,000 lb
Motion Compensator: NOV crown mounted compensator, 1,000,000 lb, 25 ft. stroke
Mud System:
- Mud Pumps: Four NOV, 14P220 triplex, 1,230 HP, driven by two AC motors Baylor
- Five Brandt Cascade Shakers, LCM3D/CM2
- One Brandt Shaker with Mud Cleaner/Desilter/Desander, LCM3D

RIG STORAGE CAPACITIES

Upper Deck: Pipe Racks 2,500 kg /m²
Riser Bay (vertical) / Riser Pipe Rack (horizontal): 100x75' / 2.5ton/m²
Miscellaneous Storage Area: 1.3 ton /m²
Bulk Bentonite / Barite: 169.9 m³
Bulk Cement: 226.53 m³
Sack Storage Area: 90 m²
Liquids: Drilling Mud: Active Tanks (6 ea.): 603 m³
Reserve Tanks (4 ea.): 373 m³
Slug Tanks (3 ea.): 33 m³
Sand Trap and Processing Tanks (5 ea.): 55 m³
Trip Tank (1 ea.): 6.4 m³
Stripping Tank (1 ea.): 1.2 m³
Brine Storage: 850.12 m³
Synthetic Mud Storage: 459 m³
Drill Water: 1,434 m³
Fuel Oil: 2,359 m³
Potable Water: 1,439 m³

SUBSEA SYSTEMS

Blowout Preventers (Trimmed for H₂S Services):
Hydril 18 3/4 " x 15,000 psi WP, One Single + Two Double ram units, with shear rams
Two Hydril GX Annular 18 3/4 " x 10,000 psi WP, both on LMRP BOP Handling: NOV BOP transporter rated for 400 ton with hang-off system
Control System: Hydril multiplex, blue/yellow cable reel, hot line hose reel
Hole Position Indicator: Kongsberg
Riser Angle Indicator: Hydril
Diverter: One Hydril FS21, 60 "x 500 psi working pressure, two diverter outlets of 16" OD
Drill Pipe: 5 1/2" TSDS-50
Drill Collars: 6 3/4" x 4 1/2" IF, 8" x 6 5/8" REG and 9 1/2" x 7 5/8" REG

CHOKE & KILL MANIFOLD

(Trimmed for H₂S Services):
WOM 15,000 psi manifold, 3 1/8" manual valves, trimmed for H₂S service
Two manual choke and hydraulic choke

MARINE RISER SYSTEM

Aker Kvaern Clip Riser - 21" OD x 75 ft long, with clip connectors
Riser and Guideline Tensioning System: Twelve NOV 250 Kips, 12.5 ft. stroke
Riser Running Tools: Aker Kvaern Clip Riser
Test Tool - Vetco 18 3/4", SG-5 universal plug type.
Flex Joints: Oil States 19 3/4" x 5,000 psi WP

MOORING SYSTEM

Winches: Two Broil, electrical, 2,200 kN stalling pull, 6,010 kN braking hold capacity
Anchor chains: Two 3" x 400 m stud Link RQ4 chain, API specification 2F
Anchors: Two of 12 ton Flip Delta type

CRANES

Two Kingpost Deck Cranes, Patriot, series 240, Model 200, 64 ton
One Knuckle Boom Crane, NOV, 12 ton

DRILL FLOOR

27 m (Length) x 16.4 m (Width), hookload capacity of 2,000,000 lb, setback capacity of 523 ton, simultaneous setback/hookload capacity of 1,228 ton

MOON POOL

39.87 m x 9.0 m

SPECIAL FEATURES

Risers in vertical storage: 75 ft. x 40 ton and NOV riser handling crane for vertical riser
NOV Monorail Overhead Cranes, 2 times 125 ton for BOP + 1 x 20 ton for maintenance on BOP, 2 times 50 ton for Xmas tree
One Knuckle Boom Crane for tubular handling on the aft deck
Data Acquisition System NOV SDI System
Manual controls have been added to override automated functions, for operational backup
Helideck for Sikorsky S-92
Accommodations for 130 people are provided with galley, training and recreation areas, and sick bay