

DINA POLARIS



Introduction

The Dina Polaris is a 2017 build, DP2 vessel, specially designed for offshore installation services in harsh weather conditions. The Dina Polaris is an ice class vessel constructed according to Baltic rules allowing her to operate in cold climate environments in ice thickness up to 0.8m. Certificated Clean Design she was designed and built to minimise her working footprint on the environment. Geoquip Marine's twin derrick fully heave compensated GMTR120 drilling rig has been installed over the 7.2m² midship moon pool. At 99m length and 21m beam she is one of the largest geotechnical vessels currently available in the industry, creating an extremely stable platform, allowing seabed PCPT equipment and ROV to be mobilised alongside the GMTR120.

Positioning

DP2 System Installed: ICON by Rolls-Royce (Autoposition, Auto Track, Follow Target, Joystick System), Reference Systems (DGPS, CyScan, RADAscan, HiPAP501)

Key Features:

- Class 2 Dynamic Positioning
- Clean design vessel minimising carbon footprint
- Ice class vessel
- Heave compensated deep water drilling rig
- Combined water and borehole depth of 2,500m
- Downhole push/piston sampling
- Downhole APvdB Piezocone Penetration Testing (PCPT)
- Comprehensive on board soils testing laboratory
- 97 berths, 5 offices and one conference room
- Built in hangars for WROV, port and starboard

On Board Laboratory

The Dina Polaris has been fitted with Geoquip Marine's soil laboratory. The laboratory is equipped with the necessary tools to conduct standard soil testing experiments. Routine sample handling, photography, classification and storage are part of the everyday work process in the laboratory. The scope of work performed on the sample can vary depending on the client or project. Lab experiments that can be performed include:

- Water content, bulk and dry density
- Qualitative carbonate content
- Laboratory vane
- Fall cone
- Torvane
- Pocket penetrometer
- Unconsolidated Undrained (UU) triaxial
- Point load (determination of $I_{s(50)}$ for rock)

Recovered samples are stored in a temperature controlled environment prior to shipment to an onshore facility.



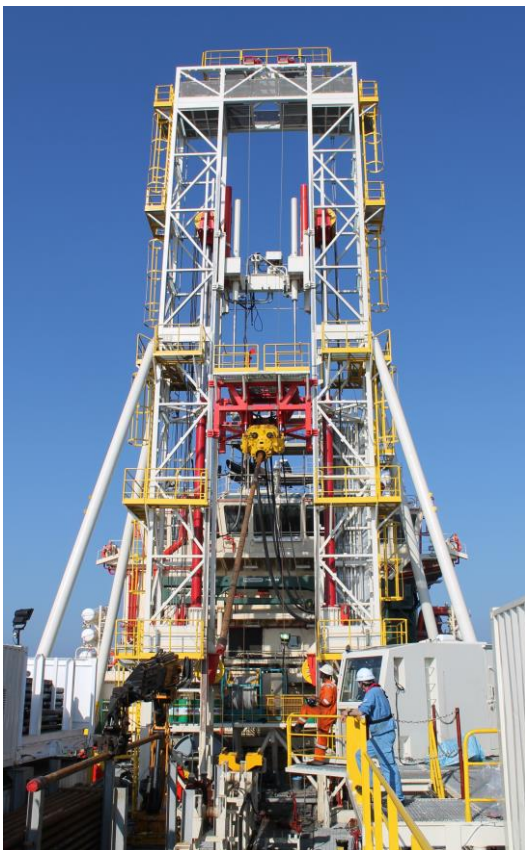
DINA POLARIS	
Flag, IMO, Call Sign	Norway, IMO: 9765031, Call Sign: LAXB7
Class	DnV + 1A1, SF, E0, OFFSHORE SERVICE VESSEL, DK(+), HL(2,8), CLEAN DESIGN, NAUT OSV(A), RECYCLABLE, BWM-T, ECA(SOx-A), LFL(*), COMF V(3)C(3), DYNPOS AUTR, SPS, ICE 1A, WINTERISATION BASIC
Built	Besiktas, Turkey # 75, 2017
Tonnage	GRT 6966 NRT 2089 Deadweight at 7,08 m 6018 t
Principal Dimensions	LOA 98.90 m Breadth (moulded) 21.00 m Depth (to main deck) 8.60 m Draft (max) SF 7.08 m
Fuel Capacity	3000 m ³
Fresh Water Capacity	1060 m ³
Machinery	Main Engines 4 x MTU-16V 4000 M63L-2240 kW, 900-1800rpm, Total 8960 kW-12185 bhp Generators 4 x 2240 kW 575/690V Harbour Generator 1 x 350 Kw 2 x Tunnel 970 kW-CPP Bow Thrusters 1 x AZIMUTH 883 KW-FP 2 x Azipuli 120 CPP, Azimuth Propellers 2200 kW, Ø3000 mm
Environmental Features	Ballast water treatment system, Exhaust Gas Cleaning by Selective Catalytic Reduction Converter with 95 % NOx reduction. Rolls Royce SaveCube for Energy Optimisation. LED lighting fitted where possible.
Deck Machinery	Capstans 2 x 10 t Tugger Winches 2 x 15 t Mooring Winches-aft 2 x 10 t 0-16 m/min Anchor windlass 2 x 21 t 0-38m/min Deck Crane STB 5t@13,5 m, 2t@24 m, foldable, manriding Anchors 2 x Stockless Anchor Chain Ø52 mm Garbage Incinerator Fitted
Navigation Equipment	Navigation Control RR Unified Bridge Joystick Rolls Royce DP Rolls Royce ICON References Rada Scan (1), CyScan (1), MRU (3), DGPS (2) Wind Sensor (2), HiPap 501 (follow Sub.) 1 x 10cm. 1 x 3 cm Radar (ARPA) Fitted Sat. Navigator Fitted Navtex Fitted Wind Sensors 3 Gyro 3 Electronic Charts TECDIS
Accommodation	Single Cabins: 17 2 bunk Cabins: 32 (64 bunks) 4 bunk Cabins: 4 (16 bunks) Gymnasium 1, Treatment Room 1, Dayroom/Lounges 3, Messroom/duty mess 2, Conference room 1, Offices 5 All cabins with separate WC/Shower, fully airconditioned. Local area Network CAT 7 in the entire accommodation.

GMTR120 - Innovative Design

The design has maintained the advantages of light construction, low centre of gravity and hoist loads whilst utilising a more efficient method of heave compensation, delivering greater sensitivity, resulting in improved core recovery and sample/data quality. In addition the design introduces a number of new safety features, including mechanical pipe handling and use of nitrogen as a compensator buffer gas.

Drilling Monitoring and Downhole Tools

The geotechnical drilling rig is fully instrumented for the electronic display of drilling parameters; torque, bit weight, mud pressure, mud flow rate and rotation speed. A comprehensive range of wireline downhole sampling and testing tools is available including PCPT (Piezocone Penetration Test), piston sampling, push sampling, wireline core barrel and percussion (hammer) sampling. All downhole tools (coring, sampling, dilatometers, p-s logging) are fully compatible within the 5.5" API drill string. A range of drag and specialised coring bits are provided. Large diameter drill pipe can also be used to allow large diameter cores to be taken.



GMTR120	
Drilling System	Ram hoist system with twin wire suspension giving safe, efficient and compensated handling of the drill string and all in-hole tooling
Heave Compensation	6m stroke passive heave compensation (semi active under development) using nitrogen gas as compensation buffer with Olmsted valve slingshot protection. Seabed frame compensation 0.0 to 7.0m
Top Drive/Power Swivel	Top Drive / Power Swivel-Edeco swivel 19,400 N/M 0-120 rpm and 5,000 N/M 400 RPM breakout torque 22,500 N/M. Load capacity 120t capacity.
Seabed Frame	Up to 20t submerged, with hydraulic clamps
Pipe Handling	Single range two drill pipe handling using a proprietary mechanical handling system utilising pipe handling crane and pipe grapple; remote operated iron rough neck and spinner; proprietary catwalk system. Handles pipe with minimum manual intervention and hence improved safety
Hydraulic System	2x electro hydraulic power packs of 310kW each. Hydraulic distribution from a control module beneath the centralised control cabin
Mud System	Project-specific modular mud systems installed as required
Rig Winches	Seabed Frame: 3,500m, 36mm wire rope; SWL 32t / Head Line: SWL 3t, Tail Line: SWL 3t / Sampling: 3,000m, 10mm wire rope; SWL 1.5t
Drill Control Cabin	Proprietary designed control cabin for remote control via hydraulic/electric interface of all drilling and sampling operations. 3 man cabin for driller, assistant driller and PCPT operator giving coordinated control of all drilling/sampling operations. Rig specific DMS recording
Transport	Derrick sections and modular components designed to be transported within standard open-top shipping containers
Capability	Utilising a standard geotechnical drill string of BHA, drill collars and 5½" API drill pipe the 120t SWL gives a combined bore hole and water depth capacity up to 2,500m. Use of a aluminium drill string would increase this capability
Sampling <i>in situ</i> Testing	Can utilize 6½" API drill string to allow large diameter coring. Fitted with AP v. d. Berg downhole PCPT / push/piston sampling equipment and wireline coring equipment. Presently 1,200m PCPT umbilical and winch capacity – can be extended to 1,600 m
Soil Testing Laboratory	Installed on board as per project requirements
200kN Seabed CPT	As an option Geoquip's GMC201 20t seabed unit can be deployed through the vessel moonpool using the rig derrick and compensation system