CUTTER SUCTION DREDGER 500

DREDGING

LIST OF STANDARD EQUIPMENT

HULL AND SUPERSTRUCTURE
- The dredger is dismountable in main pontoon, four side pontoons, operating cabin, cutter ladder, gantry and spud poles, which permits easy transportation by road, rail or ship to nearly any location
- Heavy duty coupling system with hooks at hull bottom and bolt connection on deck level, making disassembly on land or afloat possible in a very short time and in an easy way
- Three separate engine room hatches for optimal maintenance of engines and dredge pump
- Collision bulkhead at the aft of the main pontoon
- Double ballast on fore and aft and one single in the middle at each side of the dredger
- Store with large hatch, wooden floor and shelves, and lighting
- Chequered aluminium floor plates in engine room
- Removable railing made of stanchions and stainless steel spars
- Marine coating system and cathodic protection for inland and seawater use

OPERATING CABIN
- Very spacious operating cabin, easily accommodating 2/3 persons. The cabin is ergonomically designed according to the latest insights
- Standard equipped with air-conditioning and heating
- Mounted oil shock absorbers to minimise vibration and noise levels
- Constructed of steel and well insulated
- Two ergonomic designed control panels with a dredge master chair in between
- Dark tinted double glazed windows all around of which one can be opened, providing excellent view of all essential deck equipment
- Window wiper at front- and aft window

DREDGE EQUIPMENT
- High efficiency dredge pump, built up with Ni-hard4 wearing plates and pump casing and Bainitic Nodulair impeller
- The shaft is sealed using a mechanical seal
- Cutter shaft supported by roller bearings mounted in an oil filled casing
- The slow running hydraulic cutter motor is well protected in the cutter unit
- Well designed cutter with replaceable wear resistant pick points or chisels
- Straight suction pipe for optimal suction performance and low wearing characteristics
- Inspection piece with hatch in front of dredge pump

ENGINE ROOM MACHINERY
- Latest model Caterpillar engines, complying with IMO regulations
- Closed freshwater cooling system for engines with box coolers
- Engine can be started from control panel both in engine room and in operating cabin
- Dredge pump driven through a gearbox, with electric/hydraulic clutch operated from the operating cabin
- Various auxiliary equipment, such as generator, bilge-, cooling water pumps, electric driven fans

DECK MACHINERY
- Side wire winches operated with proportional constant tension system, guaranteeing a stable cutter process
- Very robust mooring deck equipment, navigation equipment, set of tools including impeller and hook and boatswain’s inventory
- Start up spare parts

LIST OF OPTIONAL EQUIPMENT

GENERAL
- Hull certification for sheltered waters
- De/increase cutter depth
- Anchor boom pontoon
- Spud carriage pontoon
- Dredge pump installation including jet water pump
- Sewel connection for discharge pipeline
- Jib crane for changing pump- and spare parts
- Anchors
- Day accommodation
- Toilet facility
- Navigation, search and deck lights for working at night
- Valves in dredge pipes
- Non-return valve in discharge pipe
- Hydraulic operated valve in suction/ discharge pipe
- Automatic vacuum relief valve in suction pipe

DREDGING INSTRUMENTATION
- Production calculation, existing of:
  - Velocity meter
  - Concentration meter
  - Yield indicator
  - Electronic revolution counter
  - Dredge pump indicator
  - Dredge Profile Indicator
  - Positioning/survey systems

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- Spud poles which are hoisted by hydraulic cylinders. Operation including slow fall from operating cabin. Slow fall operation is also possible manually, at the spud hoisting cylinders

HYDRAULIC INSTALLATION
- All hydraulic motors and cylinders are operated by two variable axial piston pumps driven by the auxiliary engine. The system includes: stainless steel tank, all required electric operated valves, filters, gauges etc.

ELECTRIC INSTALLATION
- The dredge pump engine is started by its own battery set. The set is charged by the alternator of the dredge pump engine. The other two 24 VDC battery sets are charged by the alternator of the auxiliary engine. One set for starting the auxiliary engine and the other for the instrumentation and emergency lighting. The 230/400 VAC installation for the general lighting, electric pumps, ventilation etc. is fed by the generator. The generator is driven by the auxiliary engine. The power distribution board is placed in the engine room. Communication between operating cabin and engine room is done over a PLC bus system. Electric connections between cabin and main pontoon with multi-pin socket for quick (dis) assembly without the possibility of wrong connections.

AUXILIARIES
- Mooring lines, life saving equipment, navigation equipment
- Set of tools including impeller hook and boatswain’s inventory
- Start up spare parts

LIST OF EQUIPMENT

CUTTER SUCTION DREDGER 500

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The DAMEN cutter suction dredger - model 500 - is one of the standard models within a range of well proven, dismountable cutter suction dredgers. There are several options possible to meet any operational requirement.

**BASIC FUNCTIONS**
- Maintenance dredging
- Capital dredging
- Mining

**STANDARD DESIGN FEATURES**
- Heavy duty robust design
- scantlings in excess of class regulations
- Spacious ergonomic designed operating cabin
- Well powered, to ensure simultaneous operation of all functions
- Highest quality of installed equipment and components to ensure continuous operation

**DREDGING FEATURES**
- Min / max dredging depth: 3 / 14 m (cutterladder angle of 5 / 45°)
- Dredging width at 40° swing angle: 42 m (at max dredging depth)
- Maximum mixture capacity, indicative: 4000 m³/hr

**DREDGE INSTALLATION**
- Dredge pump type: BP5045
- Impeller design: high efficiency, double curved, 4 bladed
- Impeller diameter / width / spherical passage: 1175 / 270 / 230 mm
- Diameter suction- and discharge pipe: 550/500 mm
- Cutter: 1625 mm
- Cutter power: 180 kW
- Cutter speed: continuously variable from 0-30 rpm
- Mooring system: two spud poles and two swing winches

**ENGINE INSTALLATION**
- Total installed power: 1299 kW
- Dredge pump diesel: Caterpillar 3512B SCAC-IMO Version
- Continuous power rating: 954 kW (A-rating) @ 1600 rpm
- Auxiliary diesel: Caterpillar 3406C DITA JWAC
- Prime power rating: 345 kW (Auxiliary) @ 1800 rpm
- Hydraulic installation: driving cutter, winches and spuds
- Electric installation:
  - 24 Volt DC for controls, emergency lighting, auxiliaries
  - 230/400 Volt AC for engine room ventilation, lighting, and auxiliaries

**PRINCIPAL DIMENSIONS**
- Length o.a. incl. ladder and spudkeepers: 38.50 m
- Length over pontoons: 24.00 m
- Beam o.a.: 7.95 m
- Depth: 2.00 m
- Draught (100% filled bunkers) approx.: 1.15 m
- Air draught (spuds removed/ladder up) approx.: 6.40 m
- Total weight approx.: 140 ton

**TANK CAPACITIES**
- Fuel oil: ± 2 x 11 m³ (for ± 100 running hours)
- Ballast water (fore and aft): 2 x 8 m³ and 2 x 8 m³
- Hydraulic oil: 2.5 m³

**DECK MACHINERY**
- Ladder winch (1x): 120 kN, 0-15 m/min
- Side wire winches (2x): 120 kN, 0-15 m/min
- Spud hoisting (2x): by hydraulic cylinder, stroke 1500 mm

**PROCESS INSTRUMENTATION**
- Electronic vacuum and pressure indicator
- Mechanical dredging depth indicator

**CUTTER SUCTION DREDGER 500**
**GENERAL ARRANGEMENT**

**CUTTER SUCTION DREDGER 500**
**PRODUCTION CURVES**

Production of in situ cubic meters versus discharge distance for various volumetric concentration for grain size 0.2 mm

Production of in situ cubic meters versus discharge distance for various grain sizes at concentration of 20%