

Technical description.



Vertical Drill Rig Model

MDT 80 VEG

MDT 80 VEG is designed to be highly manoeuvrable, uses the most advanced mechanical technologies at drilling's disposal.

MDT 80 VEG's design consider recurrent necessities of the construction site, for accomplishing vertical, sub-vertical and radial drilling.

It is suitable for **Geothermal purpose**.

The applied system puts at the first place the safety of workers. Such consideration is evidenced by some peculiar features of the product:

- Use of portable remote control which helps to avoid risks concerned to operations of loading/unloading, placement, drilling, and allows to the operator a total view of zone of work.
- Automatic power distribution improving features of drilling machine, which determine the decrease of wasted time in favour of the high performance.
- Static and dynamic measurement of the structure of the rig takes into account safety coefficients up to 6.

The drilling machine meets European Union's safety standards CE

Main Frame

The frame is made of electro welded steel; crawler truck and hydraulic oil tank are the integral part.

Diesel propulsion unit is installed in the longitudinal position; main pumps are positioned on the flywheel axis; and the supplementary power take-off of the engine supplies energy to auxiliary hydraulic pump, arranged for the secondary services of the drilling rig.

A group of distributors are maximum easily reachable, thanks to their position on the side of the rig body. The rig compartment of diesel unit is covered with sound-absorbing lagging: the drilling machine is sound-proof up to standard about noise emission imposed by the latest European Union's directive.

The electric battery is appropriately positioned out of the engine unit, in the special spot. Four independent hydraulic stabilizers allow the correct placement of the rig, and an optical indicator facilitates the placement.

BASIC UNIT		
MDT 80 VEG		
Weight of the drilling rig in the working condition	kg	11.500



Power Unit

The hydraulic system with an open circuit is carried out with electrically controlled **Danfoss** distributors, in particular, rotary, pull-back commands are proportional, for the fine adjustments of speed from the portable remote control.

The heat exchanger has a heat dissipation equal to 30% of the installed diesel engine power.

Optical and acoustic alarms to control the lower level, the high temperature of the hydraulic oil and hydraulic oil's filter blockage, make easier the ordinary maintenance.

Hydraulic oil tank capacity	Litre	250
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Commands

Portable remote control

All functions of, movement-stabilization of the drill rig, mast placement and work are operated by remote control in order to reduce wasted time of travel and placement.

Main selection device activates alternatively functions of **rig movements, mast positioning, work operation.**

Remote control is connected by a multipolar socket to the machine, where there is a low-voltage electrical connection that meets imposed safety standards.

Standard unit previews a connection cable of 15 m. STOP emergency switch is also installed on the remote control panel.

It is possible to use a panel stand that permits to work without having to carry a remote control panel over one's shoulder.

The remote control panel, despite it has all functions for the control of the drill, has a modest size and weight (≈ 4 kg).

All hydraulic functions are controlled from the remote control panel by means of joysticks **friction lock with memory**, for thrust-pullback and rotation, remain operations are piloted by **multi functions selector.**

A selection made through the **main function selector** turns on alternatively selectors and switches on the remote control board, to specific functions related to **rig translation – stabilizing, mast positioning and work operation**, this avoids undesired rig movements which contradict the selected function.



Working pressure control devices and adjustment panel

The machine is provided with two gauges to monitor working pressure with two pressure control devices for the rotary and thrust force. Other control devices can be added, if required (optional).

- Thrust balance regulator with its pressure gauge;
- Clamping pressure regulator for both clamps;
- Pressure control device with two regulators for separate managing of the pressure of the two clamps. (Optional)

Electric control panel, hermetically lock, is positioned in the back part of the machine, incorporated into a body structure, in the zone, protected from drilling operations.

A control panel includes a multipolar socket for the connection of the remote control.

Depending on installed Optional Accessories there can be also:

- A mud pump flow rate regulator;
- The switch to start up alternatively a water or mud pump;
- Jet grouting timer selector for timed rod pullback.

Power unit

The engine is installed in the back part of the machine, on the anti vibration supports.

The propulsion unit is equipped with alarms signing:

- Air filter clogging;
- Water high temperature;
- Engine oil low pressure;
- Fuel level

Control of the engine accelerator is carried out electrically through the remote control panel.

Diesel Engine	Type and model	Deutz TCD2013 L04
Maximum power ISO TR 14396	Hp (kW) @ rpm	162 (119) @ 2.200
Cooling	Type	Water
Diesel fuel tank capacity	litre	140

Soundproof casing

The power unit has an easily opened and removed soundproof casing which respect the level required for compliance with the CE noise emission directive and allows the rig to be used in residential area.



Crawler

A Crawler truck is integrated with a frame for the most sturdiness of the structure. Crawlers in steel are moved by two hydraulic motors with planetary reduction gears provided with negative multi-disc brakes.

Every engine is supplied by an independent hydraulic circuit.

Width	mm	1.800
Overall length of undercarriage	mm	2.440
Wheel base	mm	1.840
Track shoes width	mm	400
Wheel	n°	7 + 1
Maximum speed	km/h	1,5
Maximum longitudinal gradeability	% (°)	32 (18)
Maximum lateral gradeability	% (°)	5 (3)

Stabilizers

During the work the unit is stabilized by four stabilizers, two placed frontally and two in the back of the machine. All cylinders are provided with blocking valves

Mast

The mast made with high yield value steel;

The jack piston activate the chain, moving a rotary head trolley.

Rotary stroke with double rotary system	mm	3.000
Overall mast length (with a winch)	mm	7.675
Mast rotation	deg.	+/- 6°
Mast longitudinal translation	mm	800
Thrust force	N	60.000
Pullback force	N	120.000
Rotary travel speed	m/min	8,5
Rotary trolley maximum speed	m/min	40



Clamps unit GM340MX3

The clamps unit is composed of three independent clamps, flanged in the base of the mast.

- Lower fixed clamp.
- Middle clamp provided with a breakout ram.
- Top fixed clamp.

Clamps are of the open type at the front to allow:

- Rod installation
- Jaw replacement
- Movement of the rig away from the bore hole if the rod gets stuck in the hole

Clamping diameter (min-max)	mm	60 – 340
Clamping diameter (min-max) with spacer kit	mm	38 - 300
Clamping force	daN	23.700
Break out torque	daNm	4.800

Rotary Head TR15000-90-2M (Up side)

The rotary is equipped with two hydraulic engines of variable displacement that, being put together, supply four speeds. A manual selector placed on the rotary permits to set a gear low or high and a remote control allows choosing between two gears.

A rotary stub-shaft finishes with male thread 3”1/2 API and is floating type to protect thread during installation or removal of drill rods.

The 2” internal stub-shaft passage avoids build up of counter pressure of drilling fluid (air/other)

The hub has a 2 inches passage (hole) inside.

Low	1st Speed	Nm	12.500	rpm	0 – 44
	2 nd Speed		6.250		0 – 87
High	2 nd Speed		6.250		0 – 87
	3th Speed		3.125		0 – 173

Swivel joint GG50B

High speed swivel joint for the low pressure fluid adduction up to 50 bar with a joint of 2”. Air/water adduction system is accomplished with 2 hoses of 1¼ fed through the zinc-plated steel hose carrier along with the hydraulic hoses.

Maximum working pressure (bar)	50
Type of drilling fluid	Air, water, foam, bentonite



Rotary Head TR32000-114-3M (Down side)

The rotary is equipped with three hydraulic engines of variable displacement that, being put together, supply four speeds. A manual selector placed on the rotary permits to set a gear low or high and a remote control allows choosing between two gears.

A rotary finishes with a flange where preventer is fixed.

Low	1st Speed	Nm	22.500	rpm	0 – 17
	2nd Speed		13.700		0 – 33
High	3rd Speed		10.300		0 – 33
	4th Speed		6.900		0 – 53

Hydraulic winch VE2000B tilting type.

The winch is positioned on the top of the mast, it is provided with an hydraulic connection with quick joints for easier disassembly. One jack piston is installed to reach the drilling axle.

Speed control is regulated proportionally by a lever positioned on the remote control panel. A kit that contains pulley sheave with Teflon pulleys, easy to replace, towing hook, balancing weight to support a rope in tension when it is rewinded without loading.

The useful height between hook and ground level is approx. 7,5m. This permits lifting of casing tubes which are double the length of the rig stroke.

Pulling force	N	20.000
Drum capacity	m	46
Standard rope length	m	30
Rope speed	m/min	40 / 53

Rotary trolley for double head CDT- 1

A rotary trolley is provided with 24 bearings, sixteen of which are adjustable towards the rolling guides, in order to avoid dangerous rotary surging.

Particular attention was paid to making the lubrication process and bearings replacement very easy.

Preventer PRV1

Preventer complete with 2 exit by 4" to permit the evacuation of drilling result.

OPTIONALS on request



Hydraulic-control air/mud valve VA60I

2" Air/mud valve with a activated through hydraulic jack with electrohydraulic control. It is operated by a remote control and permits also a partial opening that allows a flow rate regulation.

Depress valve VAS1

Automatic depressing valve

Thrust balance kit KBC

A hydraulic device to balance the thrust force for coring use.

Clamping limiting device RFSM-1

The device permits to control hydraulically the maximum clamping force, avoiding rods' or casing's lesions.

The adjustment is for both clamps at the same time.

Clamping limiting device RFSM-2

The device permits to control hydraulically the maximum clamping force, avoiding rods' or casing's lesions.

This adjustment have effect for the two separate clamps individually.

Line Oiler OL60

Line oiler for the emission of nebulised oil into the air line; including air valves, check (backflow) valve, oil flow regulator.

Capacity	l	8,5
Maximum operating pressure	bar	23
Maximum air flow	l/min.	20.000

Mud pump PFV200-14

Screw type mud pump driven by an hydraulic engine for drilling operation

The pumping flow rate (rotation speed) is controlled by remote control

The pump is provided including a suction hose and filter

Maximum flow rate	l/min	200
Maximum pressure	bar	14



Mud pump PFV550-12

Screw type mud pump driven by an hydraulic engine for drilling operation

The pumping flow rate (rotation speed) is controlled by remote control

The pump is provided including a suction hose and filter

Maximum flow rate	l/min	550
Maximum pressure	bar	12

Mud pump PFT200-40

Triplex mud pump driven by an hydraulic engine, for drilling operation

The pump is activated through the remote control panel

Moreover, it is possible to control liquid outflow rate, through the command positioned on the main control panel

The pump is provided including a suction pipe and filter

Maximum flow rate	l/min	200
Maximum pressure	bar	40

Hydraulic connection PIP80

Hydraulic extra source for mud pump application

CM500 Magnetic loader

Located on the top of the mast included a 200 kg. winch capacity with moveable, by a jack piston, harm to easy positioning to load casing and drill rods simultaneously.

Rotary head TR32000-114-4M

The Rotary head is equipped with four hydraulic orbital engines of double displacement. A combination of double displacement with series-parallel power supply of the engines allows to obtain three different rotation speed and relative maximum torques. A manual selector placed on the rotary permits to set up a series or parallel power supply, while electrical selector, situated on the remote control desk, allows to choose between maximum or minimum displacement. A rotary stub-shaft has the 2 inches internal passage and finishes with a cone-shaped male thread 4"½ A.P.I. R., is characterised by the possibility of free or "floating" movement, useful for protecting rod threads during drilling manoeuvres.

Thanks to free passage of 120mm, once a floating stub-haft is removed, it is possible to install a hydraulic chuck (MP90-114) that may house Jetting rods with diameter of 90 or 114 mm.



Low	1st Speed	Nm	32.000	rpm	0 – 21
	2 nd Speed	Nm	16.000	rpm	0 – 38
High	2 nd) Speed	Nm	16.000	rpm	0 – 38
	3rd Speed	Nm	8.040	rpm	0 – 78

Preventer PRVT1

Low Preventer complete with 1 exit by 4" to permit the evacuation of drilling result.

DSR1

Casing floating system

Carriage rubber protection VU80

Movable rubber pad to prevent soil damage

Water pump PAT150-15T

Triplex high pressure water pump complete with filter on water inlet line for use as de-coring pump and for washing operation

The pump includes a water filter on the suction line

The pump is activated from the remote control panel

It cannot be used for bentonite and abrasive fluids

Maximum flow rate	l/min	15
Maximum pressure	bar	150

Water pump PAT50-50

Triplex water pump driven by hydraulic engine it is provided with a suction filter

The pump is activated from the remote control panel.

Water capacity	l/min	50
Maximum pressure	bar	50