

**FDP-450 HORIZONTAL DIRECTIONAL DRILLING RIG****1. Drilling rigs Thrust/Pulling Capacity**

Pinion and rack driven with two shifts adjustable step less. 0—7.5m/min@450MT 0—27m/min@130 MT

Six Sauer-Danfoss motors and Dinamicoil hydraulic reducer are adopted for its feed thrust and pulling. The drilling rigs equipped with tension limiter at the operation panel, feeding and pulling capacity can be adjustable according to the engineering.

**2. Rotation of Rig**

0—120000Nm@0 -42r/min 0—60000Nm@0 -84r/min Four motors in low speed & large torque from Poclain Industries made in France are adopted to get rotation by first gear reduction, which has bigger starting torque and less torque loss than that of high-speed motor with reducer mechanism. The drilling rigs equipped with torque limiter at the operation area, torque can be adjustable according to the engineering, drill rod damaged to ensure that the sudden damage to its torque during the construction. The feature is most obvious when using the drill rod whose diameter is much smaller, meanwhile provides a play space for the controller.

**3. Power of Rig**

The power of Rig consists of two 392kw@2100 r/min diesel engines which produced by Cummins Power Ltd. They can work alone, and can also run at the same time, which make the construction safer. Transfer case adopted Sibao Products in German; it has one input shaft and two output shafts. Hydraulic pump system adopts ten hydraulic pumps of Saou-Danfoss Co., USA; the efficiency of rig is high by making close-type system working together with the load sensing system.

**4. Drilling rigs forms**

In view of the heavy weight of the drilling rig, drilling rig is in dual tracks and splite-type structure, adopted two tracks. One of them equipped with the main machine equipment such as master, unit head clamps and so on, the total length is 16.5meters, meanwhile equipped with a 145KW diesel engine which used for the walk of the main machine, the total width is 3.15meters, and the total weight of rig is about 38 tons. The other main machine equipped with power system of rig, and has track-driving structure. Travel speed of main machine: 2Km/h Travel speed of power unit: 3Km/h

### 5. Drilling rig shackles

Drilling rigs shackles adopt three-jaw hold, automatic centering, reliable fastening ability, clamping force adopting standard movable petroleum fixture block adjustable to jaw block, shackles are full distance moving on the mast. Meanwhile clamping force can be adjustable according the engineering to reduce the wear and tear of drill rod and jaws. The largest shackles torque is 240,000Nm, and the largest make-up torque is 120,000Nm.

### 6. Drilling rig Crane

Drilling rig is equipped with a crane fixed on the anchor plate with the largest hoisting capacity as 4000Kg.

### 7. Control System

Adopting electric-hydraulic proportional method, long range control, separation from the main machine power, the rig is safe and reliable in its control system.

### 8. Operator's cabin

Operator's cab equipped with air-conditioner, the room is large. In the cab, you could read many technical parameters from the different kinds of meters, such as the system pressure of each part, torque pulling capacity and etc. visually and stably.

9. The main machine of drilling rigs does not equipped with mud system by the manufacturer, it will be configured by user. The attached equipments include drill pipe joints, hydraulic oil filter, transfer case (200MT, 500MT each) and so on.

Accessories attached to Equipment	Quick wearing joint	Output Shaft of Drill Head	2pcs	
	Joint	Coordinated with Transfer and Reamer	2pcs	
	Wear-resistant bushing		1pc	
	Clamper fixture block	Wearing parts	30pcs	
	Jaws Base	Used for clamping drilling rod	3pcs	
	Mud let-in Hose		2pcs	
	Pressure Meter	Measuring Range 60Mpa	4pcs	Liming Hydraulic Co.
	Electric control switch	For Drilling Operation Control	8pcs	
	Travel switch	For Drilling Operation Control	2pcs	
	Electronic meter	Measuring of Torque and Pulling Force	2pcs	
	Bobbin bracket	For Direction Wired-control	3pcs	
	Carbon Brush	Carbon Brush	6pcs	

### 10. Mast

Rack: made of high-quality alloy

Body: made and welded with shaped steel and steel plates.

The mast is equipped with a bracket for the assistance of loading and unloading drilling rods.

#### **11. Hydraulic system**

The main control valve: made by Saou-Danfoss Co., USA

Hydraulic hose: made by Manuli Hydraulics Co., Ltd. Italy

Hydraulic accessories: made by Liming Hydraulic Co. China

Cooling method: air cooling

With normal operating temperature of around 30-65°, the hydraulic system will operate in the best efficiency. In this case, the rig is equipped with a temperature control system. The cooling system will start up operation upon the hydraulic oil temperature higher than 60° and the heating system will start up operation as well as the temperature lower than 20° to ensure that the hydraulic system is operating at the best state. The above is only a protective measure. If the hydraulic system design is unreasonable for actual application, it will be useless even if with a larger capacity of hydraulic oil tank and radiator, because the whole system is heating. Thus it is not feasible for heat radiation and cooling passively. The key point lies on less heat caused from the hydraulic system and improving the efficiency of the hydraulic system.

**12.** This drilling rig is equipped with a wired-control system, water swivel device, threaded screw-off sliding device etc. to the power head. Threaded screw-off sliding device adopted the overall structure, high strength, events comfortable, has applied for national patent.

**13. Diesel Tank:** Three main machines are equipped with one tank, and the power station is equipped with two.