

**ZP205 Rotary Table**

**User Manual**

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## 1. General Description

Rotary table is hoisting equipment for drilling service. During drilling, it can be used to rotate drilling string; during running drilling pipe and casing, it is used to support the weight of drilling string(or casing string). ZP205 usually is coordinated with drilling rig with depth of 3000m, 5" butt weld drilling pipe (or same level workover rig)

Main specifications:	ZP205
Bore diameter:	520.7mm(20.5")
Max. static load:	3000kN
Max. rpm:	300rpm
Transmission Ratio:	1:3.22
Weight:	5560kg

## 2. Structure ( Ref. to figure 1)

Rotary table mainly is comprised of base(1), rotary body(3), upper and lower bearing(5,36), gearwheel(4), pinion(9), shaft (17), control device(23), Master bushing and Kelly bushing(6,7), cover(2) etc.

Base is also housing of rotary table, of cast steel structure, which is welded of cast steel and plate. It is the function to support upper bearing, lower bearing and shaft assy, also be an oil bath sump to lubricate cone gear and bearing. It can bear max. static load.

Rotary body is a part of revolution, material ZG310-570. Gearwheel is bolted on rotary body. The rotary body is installed in the inner races of upper and lower bearings and is supported on the base through outer races of upper and lower bearings. The rotary body has a Kelly bushing seat on its upper section with Kelly bushing installed in. When the body is rotating, torque force is transmitted to Kelly via Kelly bushing to rotate drill string. The table is machined with a labyrinth groove in its upper section, forming 2 labyrinth seals with the base labyrinth groove after installation, to prevent slurry from entering the oil sump and oil spilling out from the oil sump. The body has a large bearing cover (32) and retainer (37) to prevent slurry from entering the oil sump from the lower section.

The upper and lower bearings are thrust ball bearings. When rotating, the upper bearing is mainly to bear axial force exerted by Kelly sliding down and radial force produced by engagement of cone gear pair. The lower bearing is used to stabilize the table, and to bear axial force produced by cone gear pair to prevent the table from jumping. The shim (35) is used to adjust axial clearance of the lower bearing.

The pinion is installed at the end of shaft, the shaft is installed in the bearing housing through a thrust roller bearing and an aligning roller bearing. The bearing cover (16) is fitted with oil seal, when the shaft assembly is installed in the base, its cave combines with the base cave to form a closed cavity.

Engaging clearance of cone gear pair is adjusted through the shim (22,34).

The base is equipped with a limit handle. Rotate the limit handle clockwise or

counterclockwise to brake the table.

### **3. Installation and Commissioning**

1. Clean rotary beam in substructure.
2. Adjust the position of rotary table: assure the disalignment between rotary center and wellhead center not more than 50mm; keep sprocket of rotary table and sprocket of chain case in a same surface.
3. Weld four “V” blocks on both side surfaces below rotary table to fix the rotary table. Upper V block should be welded with rotary table, while lower V block should be welded with rotary beam. V block is delivered together with rotary table.
4. Keep the disalignment between center of rotary input shaft with center of chain case not more than 1mm except that the universal joint is used, which allow more disalignment.

### **4. Operation and Maintenance**

#### **Preparation and inspection before operation**

- a) For newly rotary table, fill up N150 industrial gear oil (GB5903-86) into the oil sump and the oil level should be up to the max. height of the dipstick.
- b) Add lube oil at each point.
- c) Inspect that handle of the locking device is in its open position.
- d) Inspect that rotary body and outer bushing, inner and outer bushings are locked or not.
- e) Inspect that shaft spring seal ring is reliable or not.
- f) Rotate the table, inspect that running noise, oil reservoir temperature and bearings temperature are normal or not.

#### **Maintenance**

- a) After the rotary table impacted by heavy load, inspect that the running noise is normal or not.
- b) Regularly inspect the connecting flange in the shaft end for kicking or not, tighten the bolts of press plate if necessary.
- c) Regularly inspect the connecting bolts are loose or not.
- d) Regularly inspect the oil sump level at its specified level, and clean of oil.

### **5、 Lubrication**

the cone gear pair and all bearings are of oil splashed lubrication. Clean the oil sump thoroughly. Replace the lubrication oil once two months. Fill No. 90 industrial gear oil (SAE 90)

The lubrication of locking device pin shaft: once a week. Use SY1412-75, No.2 Li-base grease.

### **6、 Package, transportation and storage**

- a) The rotary table is shipped in nude package.
- b) For transportation and installation, 4 hanging eyes at 4 corners are used for

hanging. Direct pulling is not allowed.

- c) For long term storage, rotary tables should be placed in dry, air-vented place to prevent from rusting. For used rotary tables. Oil and residual deposit in the sump should be cleaned out, and the bearings, gears and all machined surfaces should be coated with anti-rust oil before storage.

## 7、 Spare parts of Rotary table

### 1. Bearing

Model	Description	Qty	MFR.
1687/650	Thrust ball bearing 650X880X140	1	
1687/620	Thrust ball bearing 620X780X102	1	
32626	Single row roller Bearing 130X280X93	1	
53626	Roller aligning bearing 130X280X93	1	

### 2. Specialized tools

Master bushing and Kelly bushing bail (1 set)

### 3. Spare parts list

Model	Description	Qty	Remarks
GB3452.1-82	O-ring, 400X7.0	1	
GB3452.1-82	O-ring, 128X3.55	1	
GB3452.1-82	O-ring, 830X8.6	1	
GB3452.1-82	O-ring, 615X8.6	1	
GB3452.1-82	Oil seal B15019015	1	

## 8. Delivered Documents

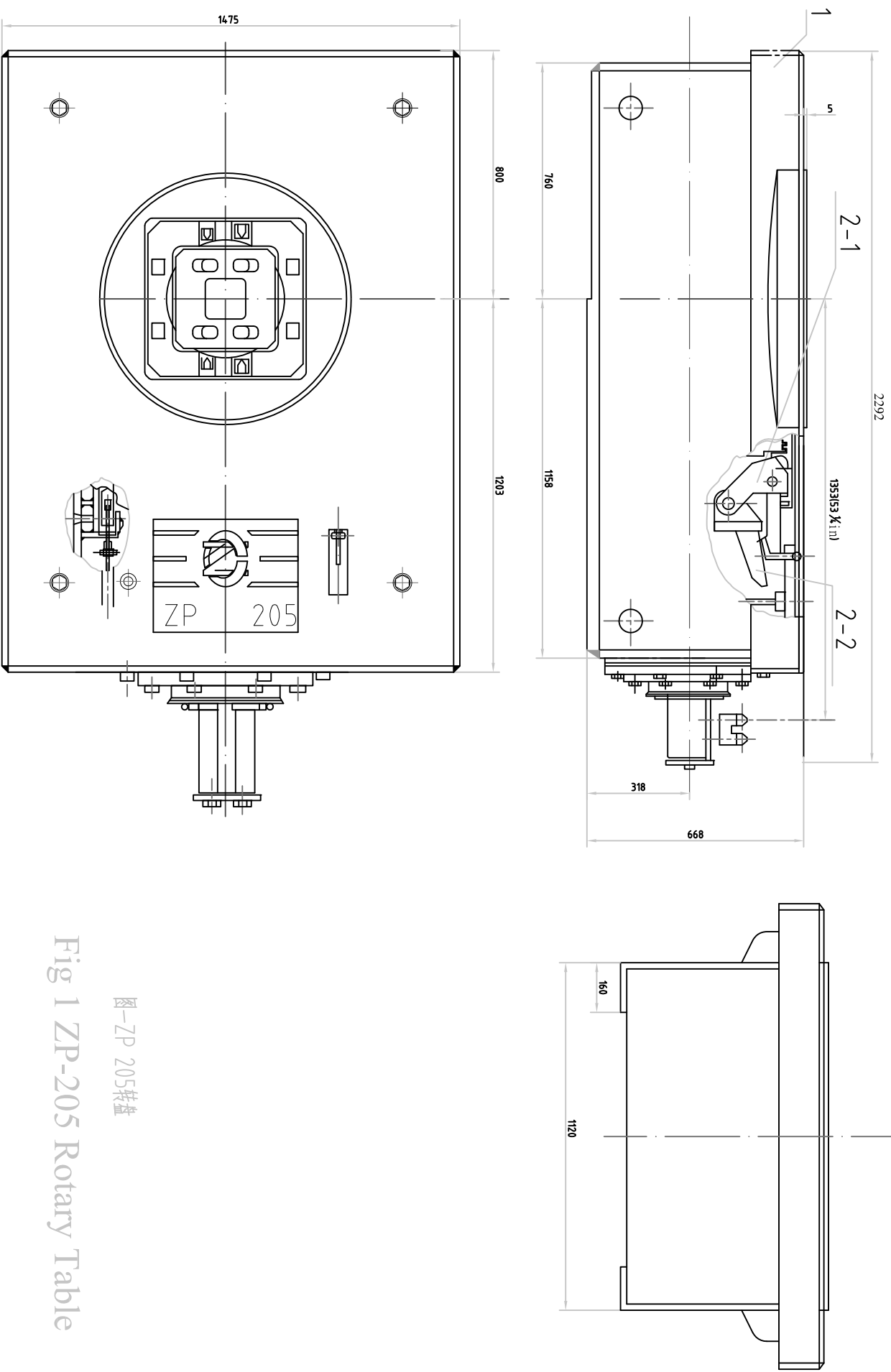
- a) User manual one copy
- b) Certificate one copy

## 9. Attached figure

Attached Figure 1: ZP205 rotary table

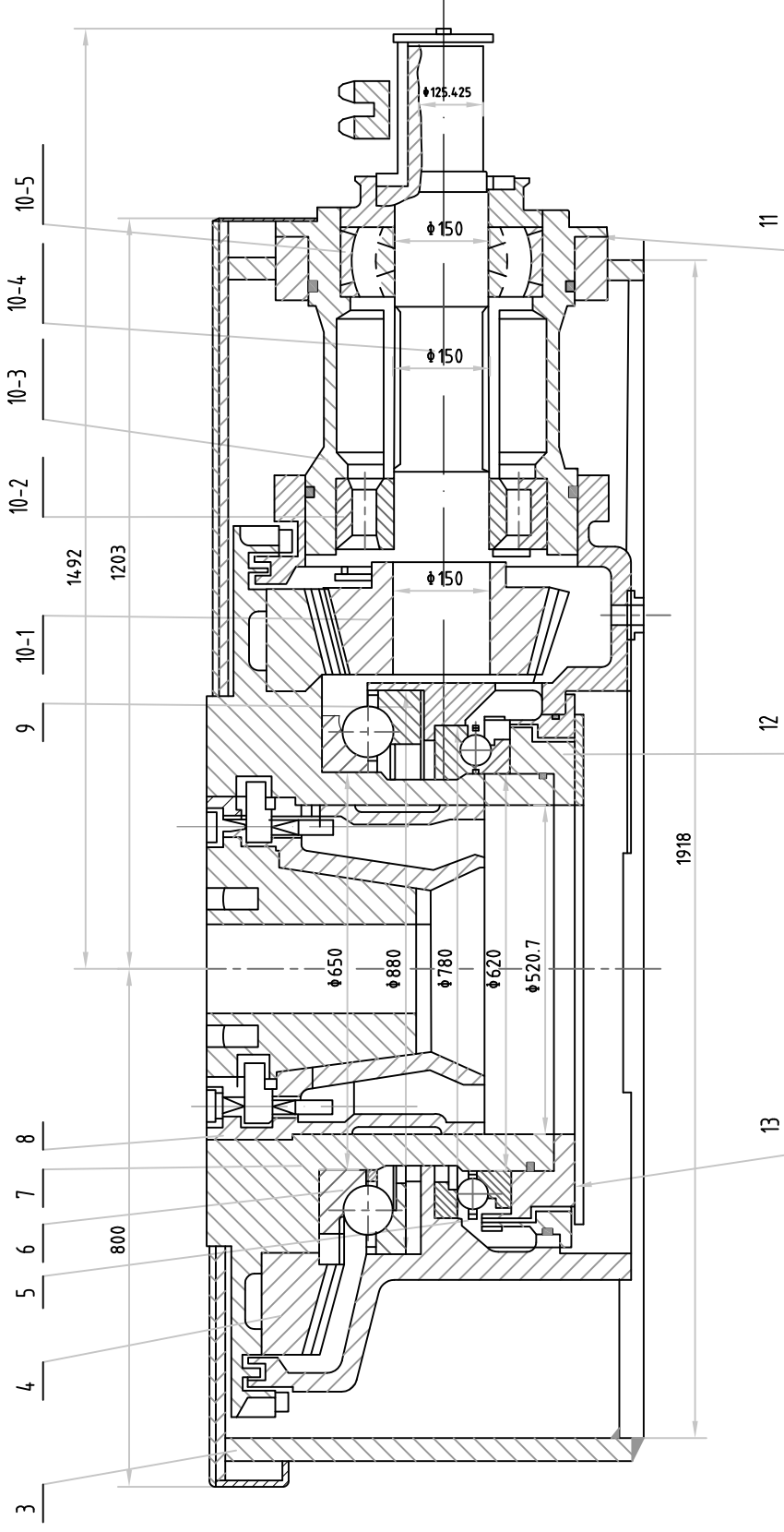
Attached Figure 2: Kelly bushing ( connection with master bushing)

Base
Cover
Gearwheel Z74
Thrust roller bearing 1687/650
Kelly bushing
Master bushing
Stop Block
Pinion Z23
Bearing cover
O ring 400X7.0
Alignment roller bearing 53626
Bearing case
Single row cylindrical roller bearing
Seal ring B150X180X15
Little bearing cover
Input shaft
key
O ring 128X3.55
Bearing liner
Adjusting washer
Adjusting washer
Brakes
Releasing plug
Key
Adjusting washer
Plug
Bolt M16X35
Gland
O ring 830X8.6
Seal gland
Lower bearing cover
O ring 615X8.6
Adjusting washer
Adjusting washer
Thrust roller bearing
Stop block
Dipstick
Plug



图一 ZP 205 转盘

Fig 1 ZP-205 Rotary Table



图二 ZP 205 转盘

Fig 1 ZP-205 Rotary Table