

# **ZP275-2 转盘说明书**

**SERVICE MANUAL**

**105.10.00SM**

# 目 录

## Contents

(一)	Technical Specifications-----	技术规范
(二)	Construction-----	结构说明
(三)	Installation & Adjustment-----	安装调试
(四)	Maintenance & Services-----	维护保养
(五)	Lubrication-----	润滑
(六)	Transportation & Packing-----	运输包装
(七)	List of Bearing-----	轴承一览表
(八)	Special Tools-----	专用工具
(九)	List of Spare Parts-----	备件清单
(十)	Figures Attached	
	Fig.1 Fig.2-----	附图一，二

## 1. Technical Specifications

1. Diameter of opening 27-1/2"

2. Max. static load 4500KN

3. Distance between the center line of the rotary table and the center line of the inner teeth of the sprockets 53-1/4"

4. Max. speed 300rpm

5. Gear ratio 3.67

6. Overall dimensions:

Length	94"
Width	68.8"
Height	28"
Weight	13950lb

## (一) 技术参数

1. 通孔直径 698.5mm

2. 最大静电负荷 4500KN

3. 转盘中心至输入链轮第一排齿(内侧)中心之距离 1353mm

4. 最高转速 300rpm

5. 齿轮转动比 3.67

6. 外形尺寸:

长	2402 mm
宽	1670 mm
高	685mm
质 量	6163kg

## 2.Construction

The ZP275-2 rotary table(Fig.1,2) is mainly composed of housing (3),table(7),main bearing(6),hold-down bearing(5),ring gear(4),pinion shaft assembly(10),lock device(2),master bushing(8),and cover(1)

The housing (3)is made of steel casting and welded structures. The housing can be used as oil sump for lubricating the bevel gears and bearings.

The table(7)is a steel casting.Its opening is used for passing of drilling and casing strings.The master bushing(8)located in the table is used fore rotating the drilling string. The bearing support is fixed under the table with screws.

The table is mounted on the main bearing, a radial thrust ball bearing which bears the total load of the drilling and casing strings.

## (二) 结构说明

ZP275-2 转盘(附图一,二)主要由铸焊底座(3),转台装置(7)轴承(6) ,齿轮装置 (4) 快速轴总成 (10) ,锁紧装置 (2), 方瓦 (8) 和上盖(1)组成.

铸焊底座 (3) 是铸焊组合件, 由铸钢底座与金属结构件组焊而成,铸钢底座用做润滑伞齿轮和轴承的油池。

转台是一个铸钢件,为了旋转钻杆柱,转台的上部有方瓦,方瓦装在方座内。转台的下部用螺栓将轴承的下座圈固定。

转台装置将它所承受的钻杆柱、套管柱的全部负荷,通过轴承传到钻机底座上。

The hold-down bearing (5) is also a radial thrust ball bearing and fixed under the table with the bearing support. The hold-down bearing can bear the upward beating from the bottom hole.

The shims (13) between the table and bearing support can be used to adjust the axial clearance of hold-down bearing

The table is driven by a pair of bevel gears: a ring gear (4) mounted at the table and a pinion (10-1) mounted at one end of the shaft (10-4) which lies on the two bearings (10-2)、(10-5) located in the capsule (10-3): a radial short-roller bearing and radial spherical-roller bearing. The other end of the shaft is provided with single sprocket.

The shims (9) located under the main bearing and the shims (11) located on the capsule flange are used for adjusting the backlash of a pair of bevel gears.

轴承（5）是专用复合止推球轴承，由下座圈固定在转台下部，既承受向下的主负荷，又承受来自井底向上的跳动负荷。

位于转台和下座圈之间的垫片是用来调整轴承的轴向间隙的。

转台通过一对伞齿轮来传动。大齿圈（4）安装在转台上，小伞齿轮装在轴承套总成（10-3）的轴端上。两个轴承（10-2）（10-5）分别为短圆柱向心滚子轴承和向心球面滚子轴承。

为了调整一队伞齿轮付的啮合间隙，轴承下面垫有垫片（9），轴承套法兰处有垫片（11）。

At the top of the rotary table are mounted the lock assembly (2) to Stop the rotation of the table(to The right or left)

在转盘顶部装有锁紧装置以阻止转台左右转动。

For locking the table, the left or right lock pawl(2-1)is put into one of the 26 slots by the handle(2-1).

为了锁住转台，搬动操纵杆，将左、右掣子推入转台下的 26 个槽位中的任何一个。

The master bushing,(8)is of th spilt type.The master bushing can be removed out of the table by of means the two lift hooks.

方瓦能够通过两个起吊挂钩移出转台。

### 3.Installation and adjustment

#### 1. Assembling of the pinion shaft assembly

The fitting surfaces of shafts, bearings and capsule shall be cleaned and coated with lubricating oil prior to assembling.

The inner race of the roller bearing near the pinion shall be heated in oil tank before assembling,at the temper a true of 65-95℃(149-203°F)

The bevel pinion shall be heated in oil tank,before assembling,to the temperature of 260-310℃(500-590°F)

#### 2. assembling of the table

The upper race of the main bearing shall be heated in oil tank,prior to assembling,to the Temperature not lower than 150℃(302°F)

### (三)安装与调试

#### 1. 快速轴总成的安装

装配前,轴承的装配面、轴及轴承的配合面必须清洗干净,并涂以一层清洁的润滑油。

靠近伞齿轮处的滚子轴承,其内圈与轴的配合较紧,须加热装配。在油槽中加热,温度应控制在 65-95℃(149-203 华氏度)。

小伞齿轮与轴的配合为紧配合,须加热装配.在油槽中加热,温度应控制在 260-310℃(500-590°F)范围内。

#### 2. 转台总成的装配

轴承上坐圈与转台的配合为紧配合,须加热装配.在油槽中加热,油温不低于 150℃(302°F)。

The ring gear shall be heated in oil tank,prior to assembling,to the temperature of150℃(302-392°F)

The error in contact between the ring gear and the table shall be less than 0.10mm.The error in , contact between the main bearing or hole-down bearing and the housing plane shall be less than 0. 05mm(0.002in)

### 3. Assembling of the rotary table

Before the pinion shaft assembly is mounted into the housing,the fitting surface between the capsul and housing shall be cleaned and coated with lubricating oil.

After the pinion shaft assembly is mounted into the housing ,the shims on the capsule flange can be used to ensure that the distance between the pinion's small end and the center of the rotary table meets the requirement stamped on the small-end surface of the pinion. The shims can also be used finally to adjust the backlash of the pair of the bevel gears.

大齿圈与转台的配合为紧配合,须加热装配.装配前,在油槽中加热,温度应控制在 150-200℃(302-392°F)范围内。

大齿轮与转台必须贴紧,其间隙不得大于 0.01mm。主轴承或专用止推球轴承与铸焊底座之间的间隙不得超过 0.05mm。

### 3. 转盘的装配

快速轴总成在装入铸焊底座之前,轴承套、铸焊底座的配合面必须清洗干净并涂一层清洁的润滑油。

快速轴总成装入铸焊底座之后,为了确定快速轴总成的轴向位置,调整轴承套法兰上的垫片,使得小伞齿轮的小端端面到转盘中心的距离符合打印在小伞齿轮小端端面上的尺寸要求。此垫片也用于最后调整伞齿轮付的啮合间隙。



The checkplate fixed with screw on the sprocket end of the pinion shaft can be used to check up the gear backlash at the radius of 180mm(7 3/32")

The adjustment of the axial clearance of the hold-down bearing is as follows: after the hold-down bearing and the bearing support are mounted on the table, tighten the screw till there is no clearance at the hold-down bearing. And then the clearance between the table and the bearing support shall be measured with a feeler. The clearance is the total thickness of the shims needed. The screw shall be tightened with the torque wrench. The maximum torque is 69-83kg.m(500-600lb-ft).

Check the left and right lock pawls to make sure that they can be easily put into one of 26 slots by the handle and that they can stop the table reliably.

检查伞齿轮付的啮合间隙,在快速轴轴端固定一检验板,在检验板半径为 180mm (7 3/32")处,检查齿轮的齿侧间隙。

轴承间隙的调整如下:

将轴承和下座圈装入转台后,拧紧螺栓直到轴承间没有间隙。然后,将转台和下座圈之间的间隙量出一定空间,该间隙的厚度总和为垫片厚度。最后,将转台装置装入铸焊底座,拧紧螺栓。螺栓需用扭力扳手做预紧力安装,征收最大扭力为 69-83kg.m (500-600lb-ft)

检查左右掣子的工况,左右掣子操纵应灵活可靠,送入转台的制动槽,制动要可靠,从转台的制动槽退出也要可靠。

#### 4. Maintenance and services

Prior to drilling

(1)Check up the handle position. Before the rotary table is started, The handle shall be in the unlocked position,otherwise the parts in the rotary table could be severely damaged.

(2)Check the lock pawls and pins for reliable working.

(3)Check the oil level and oil condition in the oil sump in the housing to ensure that the oil level is at the top position of the oil dispstick.

(4)Check the oil seal on the pinion shaft assembly and make sure that it is properly sealed.

(5)Check the meshing of the bevel gears when rotating the rotary table .Any abnormal noise ,jamming or bumping is not permissible.

(6)Check the oil tank and the

bearings and make sure the temperature is normal.

#### (四) 维护保养

钻井前必须

(1)检查锁紧装置上的操纵杆位置,转盘开动前操纵杆应在不锁紧的位置,否则开动转盘回严重损坏转盘内零件。

(2)检查掣子销和销子是否安全工作。

(3)检查底座油池中的油位和机油状况。停止转动时,油池中的油面应在油标尺的两条刻线之间。机油变质,应即使更换。

(4)检查快速轴上的弹簧密封圈的密封性能,如有漏失及时更换。

(5)检查转盘转动的情况和伞齿轮的啮合情况,有任何反常的声音、咬齿和撞击现象都是不允许的。

(6)检查转盘的油池温升和轴承温升是否正常。

## **5. Lubrication**

(1)The bevel gears and all the bearings are splash -lubrication by the oil sump.The #90extreme-pressure gear-oil (sulphur-phosphorus type)shall be used as lubricant.The lubricating oil shall be changed every two months.

(2)The lock pawl pins shall be lubricated once a week with lithium base grease(SY1412-752 b means of grease gun.

## **6.Transportation and packing**

It is unallowable to tug or trail the rotary table on the ground. It shall be lifted by the four lower corners.

The rotary table is shipped integrally.

## **7.List of bearings**

## **(五) 润滑**

(1)伞齿轮付所有轴承是用油池内的油飞溅润滑的，润滑油为90 号硫磷型极压工业齿轮油（SAE90），每两个月更换一次。

(2)左、右掣子的销油是黄油润滑，用油枪注入 SY1412-752 号锂机基润滑油，每周一次。

## **(六) 运输包装**

吊转盘时只能吊住四个下角，不允许直接在地面上拖运。

转盘单个整体发运。

## **(七) 轴承一览表**

Drawing No.& type	Description Bearing	Q'ty per unit	Weight (kg)
1681/800	800×950×120	1	120
91682/800	800×1060×155	1	295
32630	150×320×108	1	45
3630	150×320×108	1	45

## 8. Special Tools

Drawing No.	Description	Q'ty
105K.06.21	Lift hook	2

## 9. List of spare parts

Drawing No.	Description	Q'ty per unit	Weight (kg)
D7-1-67	Oil seal 180×220×15	1	0.178
D4-5-73	O-ring 420×8.6	2	0.07
105.06.20	O-ring 1000×8.6	1	0.16
105.06.15	O-ring 800×8.6	1	0.14

## 10.Figures attached

图号及 型号	名 称 轴 承	单台 数量	质量 (kg)
1681/800	800×950×120	1	120
91682/800	800×1060×155	1	295
32630	150×320×108	1	45
3630	150×320×108	1	45

## (八) 专用工具

图号	名称	数量
105K.06.21	起吊挂钩	2

## (九) 建议备件清单

图号	名称	单台 数量	质量 (kg)
D7-1-67	Oil seal 180×220×15	1	0.178
D4-5-73	O-ring 420×8.6	2	0.07
105.06.20	O-ring 1000×8.6	1	0.16
105.06.15	O-ring 800×8.6	1	0.14

## (十) 附图

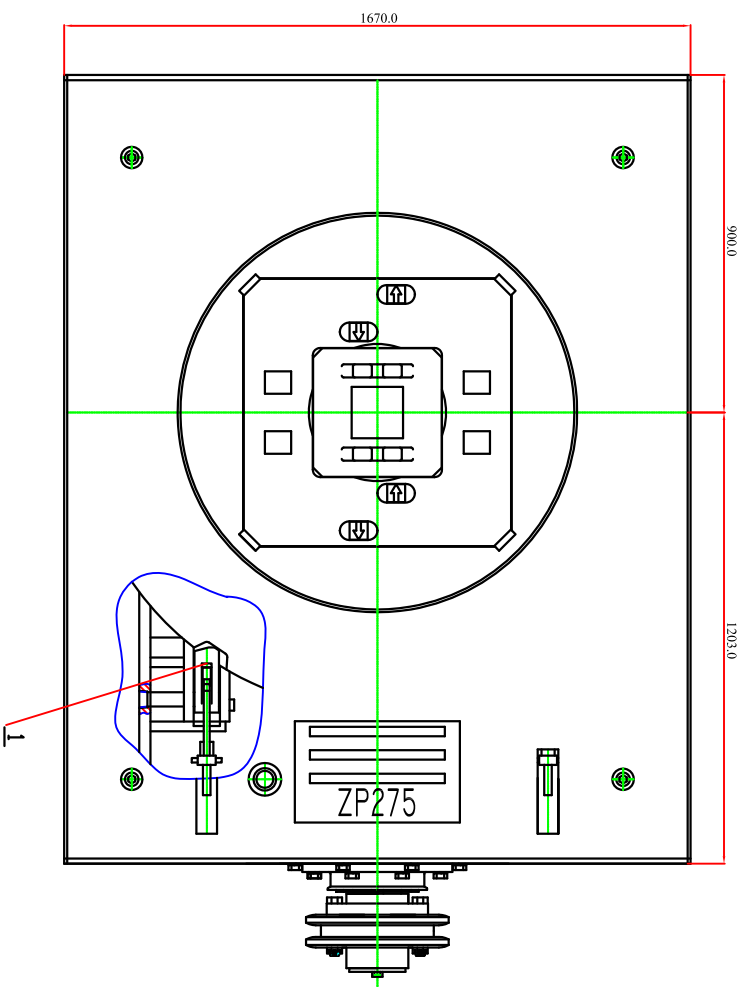
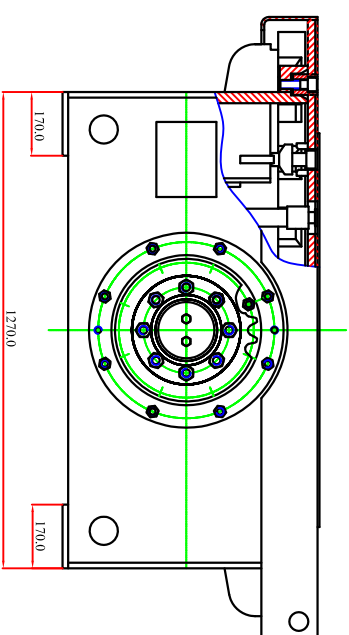
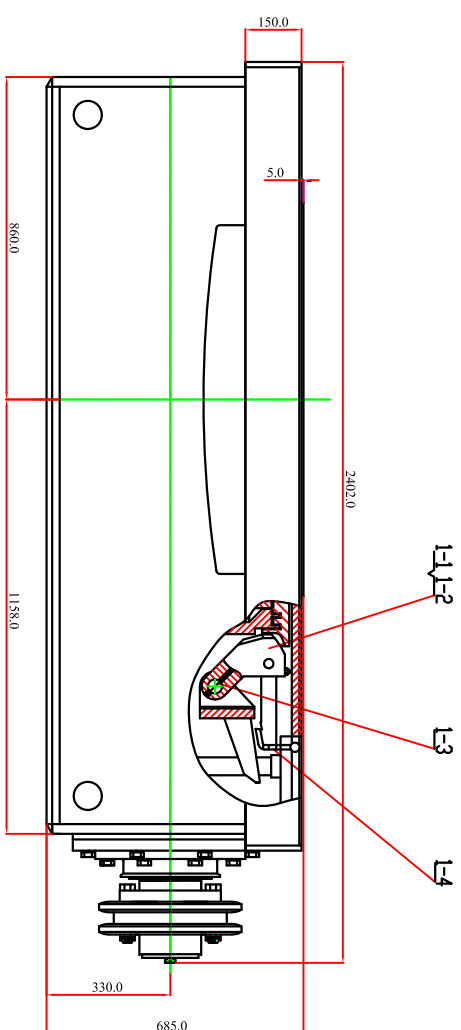
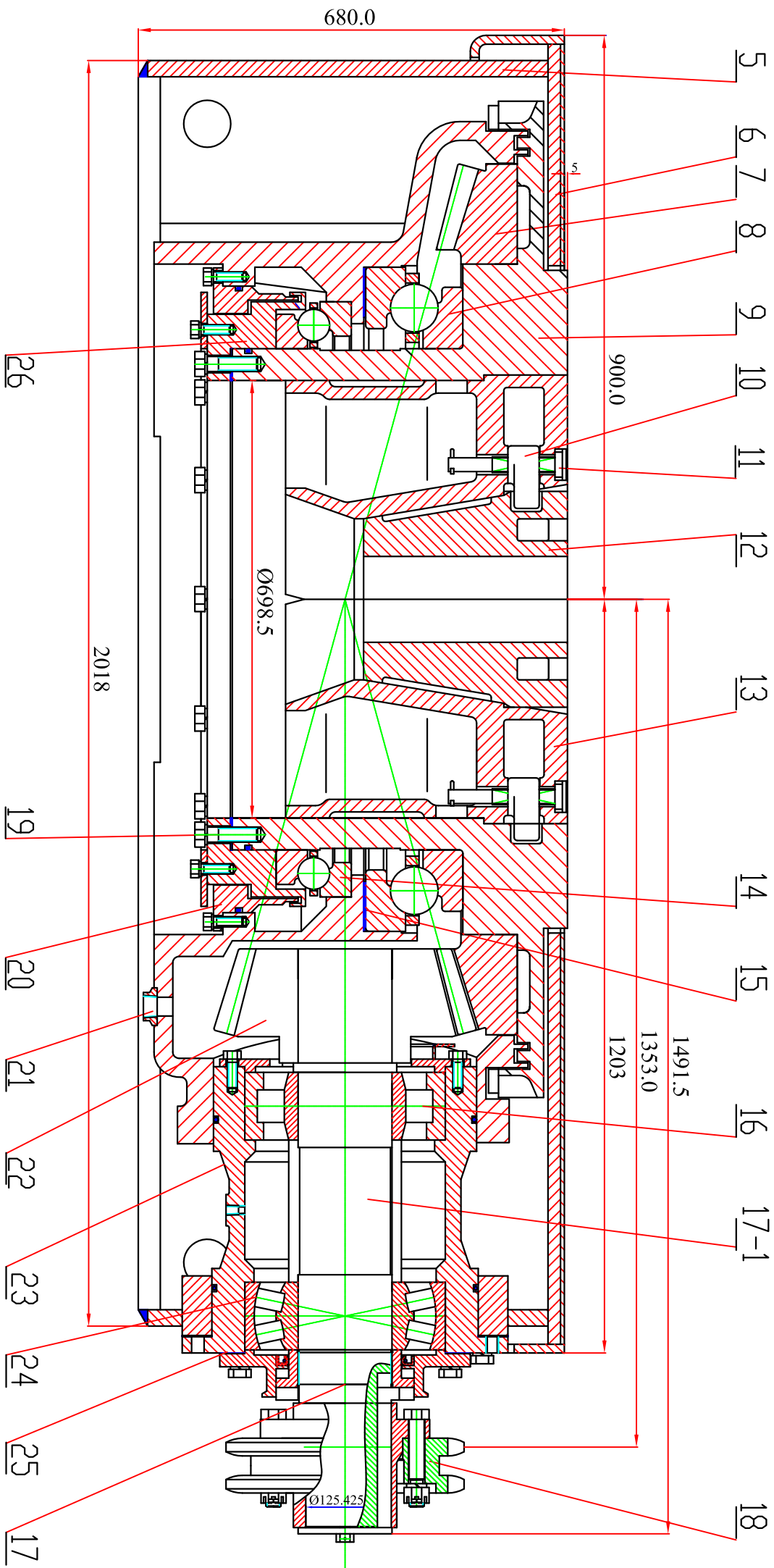


Fig 1 ZP-275 Rotary Table

附图一 ZP275转盘



附图二 ZP275 转盘 Fig 2 ZP-275 Rotary Table