河南宗久机电设备有限公司

ZDY

锥形转子
三相异步电动机

使用安装维护说明书

中文说明书

产品说明与使用前检查 02

安装使用与维护 03

故障分析与排除 04

河南宗久机电设备有限公司
Henan Zongjiu Electromechanical Equipment Co., Ltd.

01 产品与准备

产品说明与使用前检查

感谢您选用河南宗久机电设备有限公司产品。请在安装、使用和维护前仔细阅读本说明书。

本说明书适用于本公司 ZDY 系列锥形转子三相异步电动机。具体型号、额定参数及接线方式以产品铭牌和随机接线图为准。

制动工作原理

本电动机通电后，电磁轴向力使转子沿轴向移动，克服制动弹簧力，使制动摩擦副分离；断电后，弹簧使转子及制动部件复位，摩擦副接触并实现制动。安装和维护时，应保证规定的轴向移动空间。

工作条件

电源与接法	380 V / 50 Hz / Y 接
工作制	S4–40%
电压允许偏差	额定值的 ±10% / 380 V 时为 342～418 V
环境温度与海拔	−15 ℃至 +40 ℃ / 不超过 1000 m

具体额定参数及接线方式以产品铭牌和随机接线图为准。应按规定工作制使用，避免超出允许的负载及起动频次。

工作环境应干燥、洁净，电动机周围通风良好。本电动机不适用于有易燃易爆危险、熔化金属或酸碱类蒸汽的工作环境。

使用前检查

1. 开箱时检查包装及电动机有无损伤，核对随机文件和附件。检查紧固件有无松动或脱落，并核对型号、额定功率、电压、频率、工作制及接线方式是否符合配套设备要求。

2. 检查紧固螺栓是否拧紧、轴承润滑是否正常、电气接线是否符合要求，以及保护接地是否可靠。

3. 由具备相应能力的人员在切断电源、确认无电并隔离相关外接电路后，使用兆欧表（绝缘电阻表）检查绕组绝缘电阻。冷态绝缘电阻不应低于 5 MΩ；低于该值时，应查明原因并处理，复测合格后方可使用。测试电压和接线方法按产品检验或维修规程执行，测量后应充分放电。

运输与储存

搬运时应防止碰撞、翻滚和雨淋。电动机应存放在干燥、清洁、无腐蚀性气体的场所，避免受潮及堆放挤压损坏。

河南宗久机电设备有限公司 Henan Zongjiu Electromechanical Equipment Co., Ltd.

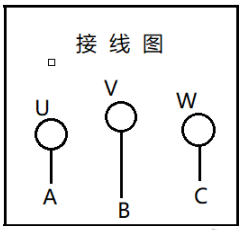
02 安装与运行

安装使用与维护

安装与电气连接

本系列电动机采用 B5 法兰安装。安装面及连接部位应牢固，联轴器与电动机轴应正确对中。连接电动机的电源线不宜过长、过细，以免线路压降过大，造成起动困难。

装配到主机后，电机轴的轴向运动应顺畅，不得因装配干涉、卡滞或联轴器顶死而受阻。应在接地标志处可靠连接保护接地线；露天使用时，应设置防雨措施。



接线示意图

运行检查与停机条件

起动运行后，应注意观察电动机、传动装置、拖动设备及线路电压。发现异常应立即停机，查明并排除故障后方可再次起动。接通电源后若电动机不转，应立即断电，避免烧坏电动机。

发生下列情况时，应立即停机处理：

A. 发生人身触电事故；

B. 电动机或起动装置冒烟、起火；

C. 电动机剧烈振动；

D. 电动机拖动设备损坏；

E. 电动机轴承严重发热；

F. 电动机发生扫膛、转速突然下降或温度异常升高。

轴向运动与润滑维护

应保证轴向窜动灵活，避免因装配同轴度误差或尺寸误差造成轴向窜动困难。制动环为易损件，磨损后会影响轴向位置。必须保证电机轴伸台阶（或卡簧）与联轴器平面有足够间隙，一般最小约 6 mm，防止轴伸台阶（或卡簧）顶死。

定期清理外部积尘，检查接线端子、紧固件和保护接地连接，并检查轴承运转声音及润滑情况。发现松动、过热、异常声音或绝缘损伤时，应停机处理。

轴承润滑脂一般每半年更换一次。更换时应清除陈脂、清洗干净，加入 3 号锂基润滑脂，装入量为轴承室容量的 2/3。轴承磨损严重时，须更换相同规格的轴承。

检修前应切断电源并防止误送电，妥善固定相关负载。制动部件及轴承配合部位应由具备相应能力的人员检修。维修后应按配套设备规程检查制动释放、复位、运行及制动性能，确认合格后方可投入使用。

河南宗久机电设备有限公司 Henan Zongjiu Electromechanical Equipment Co., Ltd.

03 故障检修

故障分析与排除

按故障现象查找可能原因与对应处理方法。

故障现象	可能原因	检查与处理
电动机不能起动	1. 电源未接通、缺相或电压异常。 2. 定子绕组故障。 3. 负载过大或传动机构卡住。 4. 控制设备接线错误。 5. 联轴器对中不良或顶死，影响制动释放。 6. 制动部件卡滞、抱死或摩擦面进水锈蚀。	1. 检查电源、开关、熔断器、触点及引出线。 2. 由维修人员检查绕组断路、短路或对地绝缘故障并修复。 3. 排除机械卡滞；确认无故障后，核对负载与电机额定能力。需换型时，同时核对安装尺寸、转速、工作制及制动性能。 4. 按接线图校正接线。 5. 校正对中，排除装配干涉。 6. 由维修人员检查制动部件，按规定工艺处理；损坏或超过磨损限值的部件应更换，修复后验证制动性能。
电动机外壳带电	1. 电源线与保护接地线接错。 2. 绕组受潮、绝缘老化，或引出线绝缘损坏后与接线盒接触。	1. 立即断电，由维修人员校正接线并检查保护接地。 2. 查明绝缘故障并处理；必要时更换绕组或引出线，检验合格后再使用。
运行时有异常杂音	1. 转子与定子或绝缘纸相擦。 2. 缺相运行。 3. 轴承损坏或润滑不足。	1. 检查内膛、绝缘纸及轴承配合，查明擦碰原因并修复。 2. 检查开关、熔断器、接触器及接线，排除缺相。 3. 检查轴承，必要时更换；按规定使用润滑脂。
温升过高或冒烟	1. 负载过大或超出规定工作制。 2. 缺相运行。 3. 风道堵塞或环境温度过高。 4. 定子绕组故障。 5. 电源电压异常。 6. 制动释放不充分。	1. 停机检查，按额定负载及规定工作制运行；换型前应核对配套条件。 2. 检查熔断器、开关及接触器触点。 3. 清理风道，改善通风和环境条件。 4. 由维修人员检修绕组。 5. 检查电机输入端电压。 6. 检查轴向运动及制动释放，排除卡滞或拖闸。
电动机振动大	1. 转子动平衡不合格。 2. 轴伸弯曲。 3. 安装松动。	1. 由维修人员校正转子动平衡。 2. 按修复工艺处理或更换转子。 3. 检查安装连接并紧固。
轴承过热	1. 轴承损坏。 2. 润滑脂质量不合格或填充量不当。 3. 轴承室或轴磨损、变形。	1. 更换相同规格的轴承。 2. 清洗后更换 3 号锂基润滑脂，装入量为轴承室容量的 2/3。 3. 由制造厂或具备能力的维修单位按工艺修复配合部位，并检验合格。
制动不可靠或刹不住	1. 联轴器顶死。 2. 转子轴向窜动间隙过大。 3. 制动环损坏或摩擦面异常。 4. 轴承损坏，影响轴向窜动。	1. 检查联轴器及相关机械，排除顶死。 2. 调整锁紧螺母，保证窜动间隙 2 mm。 3. 检查制动环和摩擦面，按配件结构更换制动环或制动轮总成，并验证制动性能。 4. 更换轴承并检查轴向运动。

河南宗久机电设备有限公司 Henan Zongjiu Electromechanical Equipment Co., Ltd.

HENAN ZONGJIU

Electromechanical Equipment Co., Ltd.

ZDY

Conical Rotor
Three Phase Induction Motor

Installation Operation
and Maintenance Manual

English Manual

Product information and pre-use checks 06

Installation operation and maintenance 07

Troubleshooting 08–09

河南宗久机电设备有限公司
Henan Zongjiu Electromechanical Equipment Co., Ltd.

01 PRODUCT AND PREPARATION

Product information and pre-use checks

Thank you for choosing a product from Henan Zongjiu Electromechanical Equipment Co., Ltd. Read this manual before installing, operating or maintaining the motor.

This manual applies to Zongjiu ZDY series three-phase induction motors with conical rotors. Refer to the product nameplate and the wiring diagram supplied with the motor for the specific model, ratings and connection arrangement.

Brake operating principle

When the motor is energized, the axial electromagnetic force moves the rotor against the brake spring and separates the brake friction surfaces. When power is disconnected, the spring returns the rotor and brake components to their original positions, bringing the friction surfaces into contact to apply the brake. Preserve the specified space for axial movement during installation and maintenance.

Operating conditions

Supply and connection	380 V / 50 Hz / Star (Y)
Duty	S4–40%
Voltage tolerance	±10% of rated voltage / 342–418 V for a 380 V motor
Ambient conditions	−15 °C to +40 °C / Altitude up to 1000 m

The product nameplate and supplied wiring diagram govern the actual ratings and connection. Operate within the specified duty, load and starting frequency.

Keep the operating environment dry and clean, with good ventilation around the motor. This motor is not suitable for environments with flammable or explosive hazards, molten metal, or acidic or alkaline vapours.

Pre-use checks

1. On unpacking, inspect the packaging and motor for damage and check the supplied documents and accessories. Check for loose or missing fasteners. Confirm that the model, rated output, voltage, frequency, duty and connection arrangement meet the requirements of the driven equipment.

2. Check that the fastening bolts are tight, the bearings are properly lubricated, the electrical connections are correct and the protective earth connection is secure.

3. A competent person shall disconnect the power, verify that the motor is de-energized and isolate the relevant external circuits before testing the winding insulation with a megohmmeter. The cold insulation resistance shall be at least 5 MΩ. If it is lower, identify and rectify the cause, then retest before use. Follow the product inspection or maintenance procedure for the test voltage and connections. Fully discharge the windings after testing.

Transport and storage

Protect the motor from impact, rolling and rain during handling. Store it in a dry, clean location free from corrosive gases. Prevent moisture ingress and damage caused by excessive stacking or compression.

河南省久机电设备有限公司 Henan Zongjiu Electromechanical Equipment Co., Ltd.

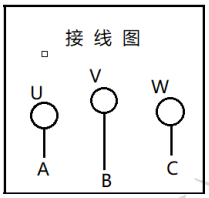
02 INSTALLATION AND OPERATION

Installation operation and maintenance

Installation and electrical connection

This series uses B5 flange mounting. Secure the mounting surface and connections, and align the coupling correctly with the motor shaft. Avoid supply cables that are excessively long or undersized, as excessive voltage drop can cause starting difficulties.

After fitting the motor to the driven equipment, ensure that the shaft can move axially without interference, binding or the coupling bottoming out. Connect protective earth securely at the marked earthing point. Provide protection against rain for outdoor use.



Wiring diagram

Operation and conditions requiring a stop

After starting, monitor the motor, transmission, driven equipment and supply voltage. Stop immediately if an abnormal condition occurs. Identify and eliminate the fault before restarting. If the motor does not rotate when power is applied, disconnect the power immediately to prevent winding damage.

Stop immediately and take corrective action if any of the following occurs:

A. A person receives an electric shock.
B. Smoke or fire occurs in the motor or starting equipment.
C. The motor vibrates severely.
D. The driven equipment is damaged.
E. The motor bearings become excessively hot.
F. The rotor rubs against the stator, the speed drops suddenly, or the temperature rises abnormally.

Axial movement and lubrication

Keep axial movement unobstructed. Assembly misalignment or dimensional errors must not restrict shaft movement. The brake ring is a wearing part; wear affects the axial position. Maintain sufficient clearance between the shaft-extension shoulder (or retaining ring) and the coupling face. A minimum of approximately 6 mm is generally required to prevent the shoulder or retaining ring from bottoming out.

Regularly remove external dust and check the terminals, fasteners, protective earth connection, bearing noise and lubrication. Stop the motor and rectify any looseness, overheating, abnormal noise or insulation damage.

Normally replace the bearing grease every six months. Remove the old grease and clean thoroughly before adding No. 3 lithium-based grease. Fill to two-thirds (2/3) of the bearing housing capacity. Replace severely worn bearings with bearings of the same specification.

Before maintenance, disconnect the power, prevent inadvertent reconnection and secure any associated load. Brake components and bearing fits shall be serviced by competent personnel. After repairs, check brake release, return movement, operation and braking performance in accordance with the procedure for the driven equipment. Return the motor to service only after these checks are satisfactory.

河南宗九机电设备有限公司 Henan Zongjiu Electromechanical Equipment Co., Ltd.

03 FAULT DIAGNOSIS

Troubleshooting

Starting faults electrical faults and abnormal noise

Symptom	Possible cause	Inspection and corrective action
Motor does not start	1. Supply disconnected, phase loss or abnormal voltage. 2. Stator winding fault. 3. Excessive load or a jammed transmission. 4. Incorrect control wiring. 5. Coupling misalignment or bottoming out prevents brake release. 6. Brake components bind or seize, or water has caused corrosion of the friction surfaces.	1. Check the supply, switch, fuses, contacts and leads. 2. Have maintenance personnel locate and repair open circuits, short circuits or winding-to-earth insulation faults. 3. Clear mechanical obstructions. Once faults are eliminated, check the load against the motor rating. If a different motor is needed, also verify mounting dimensions, speed, duty and braking performance. 4. Correct the wiring to match the wiring diagram. 5. Correct the alignment and remove assembly interference. 6. Have maintenance personnel inspect the brake and follow the specified repair procedure. Replace damaged parts or those beyond their wear limits; verify braking performance after repair.
Motor housing is live	1. Supply and protective earth conductors are incorrectly connected. 2. Damp windings, aged insulation, or damaged lead insulation allows contact with the terminal box.	1. Disconnect power immediately. Have maintenance personnel correct the wiring and check protective earthing. 2. Locate and rectify the insulation fault. Replace the winding or leads if necessary, and test before returning to service.
Abnormal noise during operation	1. The rotor rubs against the stator or insulation paper. 2. Phase loss. 3. Damaged bearings or insufficient lubrication.	1. Inspect the motor bore, insulation paper and bearing fits; identify and eliminate the cause of rubbing. 2. Check the switch, fuses, contactor and wiring; restore all phases. 3. Inspect the bearings and replace if needed. Use grease as specified.

河南宗久机电设备有限公司 Henan Zongjiu Electromechanical Equipment Co., Ltd.

03 FAULT DIAGNOSIS

Troubleshooting continued

Temperature vibration bearings and braking

Symptom	Possible cause	Inspection and corrective action
Excessive temperature rise or smoke	1. Excessive load or operation beyond the specified duty. 2. Phase loss. 3. Blocked air passages or excessive ambient temperature. 4. Stator winding fault. 5. Abnormal supply voltage. 6. Incomplete brake release.	1. Stop and inspect. Operate within the rated load and specified duty; check compatibility before changing the motor type. 2. Check fuses, switches and contactor contacts. 3. Clear the air passages and improve ventilation and ambient conditions. 4. Have maintenance personnel repair the winding. 5. Check the voltage at the motor terminals. 6. Check axial movement and brake release; eliminate binding or brake drag.
Excessive vibration	1. Rotor dynamic imbalance. 2. Bent shaft extension. 3. Loose mounting.	1. Have maintenance personnel dynamically balance the rotor. 2. Repair in accordance with the specified procedure or replace the rotor. 3. Inspect and tighten the mounting connections.
Bearing overheating	1. Damaged bearing. 2. Unsuitable grease or incorrect fill quantity. 3. Worn or deformed bearing housing or shaft.	1. Replace with a bearing of the same specification. 2. Clean and replace the grease with No. 3 lithium-based grease, filling to two-thirds (2/3) of the bearing housing capacity. 3. Have the manufacturer or a competent repair organization restore the fitting surfaces in accordance with the repair procedure and verify the result.
Unreliable braking or failure to stop	1. The coupling bottoms out. 2. Excessive rotor axial travel. 3. Damaged brake ring or abnormal friction surfaces. 4. Bearing damage restricts axial movement.	1. Inspect the coupling and associated mechanism; eliminate bottoming out. 2. Adjust the locknut to obtain 2 mm of axial travel. 3. Inspect the brake ring and friction surfaces. Replace the brake ring or brake wheel assembly as appropriate to the component design, then verify braking performance. 4. Replace the bearing and check axial movement.

河南宗久机电设备有限公司 Henan Zongjiu Electromechanical Equipment Co., Ltd.