河南宗久机电设备有限公司

YDE

实心转子制动
三相异步电动机

使用安装维护说明书

中文说明书

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

01 产品与选用

产品说明与主要配置

感谢您选用河南宗久机电设备有限公司产品。本说明书适用于本公司 YDE 系列实心转子制动三相异步电动机，供安装、操作和维护人员使用。安装和使用前，请阅读本说明书，并核对产品铭牌、随机接线图及配套设备要求。

本系列用于起重机大车、小车等运行机构。选型应核对实际负载、轮径、传动比、运行速度、工作制及制动要求。法兰尺寸或对应功率相同，不代表电机能够直接互换；主起升或其他用途需另行确认适用性。

软起动与制动原理

实心转子的电磁特性使电机具有较软的机械特性，可在匹配工况下直接通电实现平缓起动。实际加速过程取决于负载、传动惯量、电源和制动释放情况。软起动特性不代表允许持续堵转，也不代替过载、缺相等保护。

电机配有平面摩擦式电磁制动器。制动器获得规定励磁电源后，电磁力克服弹簧力，使摩擦副释放；制动电源切断后，弹簧使摩擦副压紧并产生制动转矩。该结构不依靠电机转子的轴向窜动来松闸。

系列主要配置

适用机构	起重机大车及小车运行机构
转子与制动	实心转子 / 平面摩擦式电磁制动
系列对应功率	0.2–3.0 kW / 具体规格见铭牌
极数与同步转速	4 极或 6 极 / 50 Hz 时分别为 1500 或 1000 r/min
工作制与绝缘等级	S4–40% / F 级
安装形式	B5 法兰安装 / IM3001
防护等级	IP44、IP54 或 IP55 / 按订货配置及铭牌
主电机供电	三相交流 / 电压、频率及接法按铭牌和随机接线图
制动电压标识	型录标称 220 V / AC 或 DC 及端子要求见制动标牌

同步转速不是额定运行转速；堵转电流和堵转转矩不等于额定运行电流和额定输出转矩。

具体功率、极数、防护等级和法兰规格以铭牌及订货配置为准。电机运行环境应清洁、干燥且通风良好；环境温度、海拔及特殊环境适用性按本型号确认资料执行。IP 防护等级不等于防爆认证。

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02 安装与调试

安装与电气连接

开箱与机械安装

开箱时检查包装和电机有无运输损伤，清点随机文件及附件，检查紧固件、接线盒、引出线和防护罩。核对型号、功率、极数、法兰、轴伸和制动配置。运输和储存时防止碰撞、雨淋、受潮及堆放挤压。

采用 B5 法兰安装。清洁定位面，确认安装孔、止口、轴伸和联轴器或齿轮的配合正确；紧固件按配套图纸要求锁紧。安装时不得敲击轴端或使联轴器顶死、向轴承施加异常轴向载荷。安装完成后，应确认转动部件和防护罩无干涉。

分别识别主电机与制动电源

主电机供电与制动器供电必须分别核对。主电机的额定电压、频率、接法，以及制动器和整流模块的输入输出要求，均以各自标牌和本型号随机接线图为准。不得把制动线圈直接按主电机线电压接入。

产品参数表中的“制动线圈电压 220 V”是电压标称信息，接线时还须确认 AC（交流）或 DC（直流）及其对应端子。整流器交流输入电压与制动线圈直流电压不是同一个参数；不得仅凭“220 V”判断能否直接接交流电。标识不清或接线资料缺失时，应先取得确认接线图。

回路或部位	接线前核对
主电机回路	核对电压、频率、接法及额定运行电流
制动输入回路	核对 AC 或 DC、输入电压及控制通断要求
整流模块与线圈	核对模块输入输出、线圈额定值及接线端子
保护接地	接至指定接地端子，不得作为工作电源回路

接线与绝缘检查

接线由具备相应能力的人员在断电、验电后进行。可靠连接保护接地，按确认图连接主电机、制动器及整流模块。保护装置应按铭牌额定运行电流和实际工况选配，不得用堵转电流替代额定电流整定。

绝缘检查前应将整流器、电子模块及其他不允许承受绝缘试验电压的电路与被测绕组隔离。测试电压、测量对象和合格判据按本型号检验或维修规程执行，测量后充分放电。不得将兆欧表试验电压直接施加于整流模块。

起停控制与试运行

控制回路应协调电机起停与制动器通断电：起动时制动器须充分释放，停车时须按设计切断制动励磁。调速或变频运行前，应确认电机及制动控制适配；不得未经确认从变频器输出端给制动整流器供电。

确认防护和配套控制装置齐全后，在可控工况下检查转向、制动释放、停车制动及运行电流；再按配套设备规程进行规定负载试验。观察有无拖闸、异常发热、振动和停车距离异常。电机不转、制动器不释放或制动异常时，应立即断电检查，不得反复强行起动。

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03 使用与保养

运行与制动维护

工作制与异常停机

按 S4–40%工作制及实际允许的起动频次运行，并控制负载和每次运行时间。负载持续率不能单独确定允许的每小时起动次数。不得将堵转作为正常工作状态，也不得把同步转速当作额定负载下的实际转速。

发生冒烟、焦味、严重振动、异常噪声、外壳带电、温度异常升高、制动释放不充分或停车制动异常时，应立即停机处理。恢复运行前必须查明原因并确认故障已排除。

日常检查

定期清理机壳及散热通道，检查电缆、端子、接地、紧固件及防护罩。记录异常声音、温度、制动释放和停车变化。巡检及检修周期应结合启停频次、负载、灰尘、湿度和磨损状况确定，恶劣工况应缩短检查间隔。

制动气隙和摩擦件

摩擦片磨损会改变制动器工作气隙，可能造成吸合困难或拖闸。应按本型号制动器维修图规定的测量状态、位置和限值检查气隙及磨损。仅在结构允许时，按对应工艺调整并锁紧；不得套用其他系列的转子窜动量、垫片层数或磨损尺寸。

制动力矩与气隙应分别核对，不得用过度压紧弹簧掩盖摩擦片损坏或污染。摩擦面应保持清洁，不得涂油或加润滑脂；出现损坏、油浸、严重磨损或无法达到制动要求时，按规定更换配套摩擦件。

轴承润滑

轴承应按实际结构维护。对可补脂轴承，润滑脂牌号、用量和周期按本型号润滑要求执行；对密封免维护轴承，不得擅自拆封加脂。轴承损坏时更换相同规格产品，并检查配合部位。

检修与恢复使用

检修前切断并隔离主电机与制动器全部电源，防止误送电并固定相关负载。制动器有弹簧储能，拆装和调节须由具备相应能力的人员按维修工艺进行。维修后检查松闸、复位、停止性能及防护恢复情况，按配套设备规程验收合格后使用。

制动调整以本型号维修图为依据，维修后必须验证制动释放及停止性能。

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04 故障检修

故障分析与排除

先区分电机故障、松闸故障与停车制动故障，再按对应回路检查。

故障现象	可能原因	检查与处理
电机不能起动	1. 电源未通、缺相或电压异常。 2. 制动器未释放。 3. 负载过大或传动机构卡住。 4. 绕组或控制接线故障。	1. 检查供电、保护装置及三相接线。 2. 分别检查制动电源、整流模块（如配有）、线圈及机械卡滞。 3. 排除卡滞，核对负载与选型。 4. 由维修人员检修；不得强行反复起动。
起动缓慢或运行转速异常	1. 负载或传动惯量与选型不匹配。 2. 电压异常或缺相。 3. 制动器拖闸。	1. 对照实际额定工况和既往运行状态检查加速过程，不以同步转速作判据。 2. 检查电机端供电及三相电流。 3. 检查摩擦副是否充分释放，排除拖闸。
温升过高或冒烟	1. 超负载、超工作制或起动过频。 2. 制动器拖闸。 3. 通风差、供电异常或绕组故障。	1. 立即停机，核对负载和运行循环。 2. 检查制动释放。 3. 清理散热通道，检查供电和绕组；排除故障后再运行。
制动器不能释放或吸合噪声大	1. 制动电源异常，整流模块或线圈故障。 2. 气隙过大或不均匀。 3. 吸合面异物、锈蚀、卡滞或弹簧预紧不当。	1. 按标牌分别检查输入和线圈端电压；更换匹配的故障部件。 2. 按本型号维修图检查气隙和摩擦片磨损。 3. 由维修人员清理、修复并复核调节量，验证完整松闸。
停车距离过大或制动不可靠	1. 摩擦片磨损、油污或损坏。 2. 弹簧损坏或制动力矩设置不合适。 3. 停车时制动电源未按设计切断。	1. 检查摩擦副，按规定更换污染或磨损的配套摩擦件。 2. 检查弹簧和制动力矩，按维修工艺处理。 3. 检查制动控制回路，确认失电施闸及停止性能。
振动异响或轴承过热	1. 安装松动、对中不良或机械干涉。 2. 轴承损坏或润滑不当。 3. 转子或传动件故障。	1. 检查安装、对中及配合，消除干涉。 2. 按轴承结构维护或更换。 3. 由维修人员检查转子及传动件，修复后复测。
外壳带电	1. 保护接地失效或接线错误。 2. 绕组、引出线绝缘受潮或破损。	1. 立即断电，检查保护接地和接线。 2. 查明并修复绝缘故障，检验合格后再投入使用。

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

HENAN ZONGJIU

Electromechanical Equipment Co., Ltd.

YDE

Solid Rotor Brake Motor
Three Phase Induction Motor

Installation Operation
and Maintenance Manual

English Manual

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01 PRODUCT AND SELECTION

Product information and configuration

Thank you for choosing a product from Henan Zongjiu Electromechanical Equipment Co., Ltd. This manual covers Zongjiu YDE series three-phase induction brake motors with solid rotors and is intended for installation, operating and maintenance personnel. Read it before installation or use, and check the nameplate, supplied wiring diagram and requirements of the driven equipment.

The series is intended for crane bridge and trolley travel mechanisms. Select the motor to suit the actual load, wheel diameter, transmission ratio, travel speed, duty and braking requirements. Matching flange dimensions or power ratings do not establish interchangeability. Suitability for main hoisting or other applications must be confirmed separately.

Soft starting and brake operation

The electromagnetic characteristics of the solid rotor give the motor a relatively soft torque–speed characteristic, allowing smooth direct-on-line starting in a correctly matched application. Actual acceleration depends on the load, reflected inertia, supply and brake release. This characteristic does not permit sustained stalling or replace overload and phase-loss protection.

The motor has an electromagnetic friction-disc brake. When supplied with its specified excitation, electromagnetic force overcomes the spring force and releases the friction surfaces. When brake power is removed, the springs press the friction surfaces together to produce braking torque. Brake release does not rely on axial movement of the motor rotor.

Series configuration

Application	Crane bridge and trolley travel mechanisms
Rotor and brake	Solid rotor / Electromagnetic friction-disc brake
Series power range	0.2–3.0 kW / Specific rating on the nameplate
Poles and synchronous speed	4 or 6 poles / 1500 or 1000 r/min respectively at 50 Hz
Duty and insulation	S4–40% / Class F
Mounting	B5 flange mounting / IM3001
Degree of protection	IP44, IP54 or IP55 / As ordered and nameplated
Motor supply	Three-phase AC / Voltage, frequency and connection as marked
Brake voltage designation	Catalogue nominal 220 V / Verify AC or DC and terminal markings

Synchronous speed is not rated operating speed. Locked-rotor current and torque are not rated operating current and output torque.

The nameplate and ordered configuration govern the specific power, pole count, protection degree and flange. Keep the operating environment clean, dry and well ventilated. Observe the confirmed limits for ambient temperature, altitude and special environments for the model. An IP rating is not an explosion-protection certification.

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02 INSTALLATION AND COMMISSIONING

Installation and electrical connection

Unpacking and mechanical installation

On unpacking, inspect the packaging and motor for transport damage. Check the supplied documents and accessories, fasteners, terminal box, leads and guards. Verify the model, power, pole count, flange, shaft extension and brake configuration. Protect the motor against impact, rain, moisture and stacking damage during transport and storage.

Use B5 flange mounting. Clean the locating surfaces and verify the mounting holes, pilot, shaft extension and coupling or gear fits. Tighten the fasteners as required by the mating drawings. Do not hammer the shaft end, allow the coupling to bottom out, or impose abnormal axial loads on the bearings. After installation, check that rotating parts and guards do not interfere.

Identify motor and brake supplies separately

Check the motor supply and brake supply separately. Follow the motor nameplate for rated voltage, frequency and connection, and the brake and rectifier markings and model-specific wiring diagram for their input and output requirements. Do not connect the brake coil on the assumption that it uses the motor line voltage.

The catalogue entry “brake coil voltage 220 V” is a nominal voltage designation. Before connection, identify whether AC or DC is specified and which terminals it applies to. The AC input voltage of a rectifier and the DC voltage of a brake coil are different ratings; “220 V” alone does not authorize direct connection to an AC source. Obtain a confirmed wiring diagram if markings or connection information are missing.

Circuit or component	Check before connecting
Motor circuit	Verify voltage, frequency, connection and rated operating current.
Brake input circuit	Verify AC or DC, input voltage and switching requirements.
Rectifier and coil	Verify module input/output ratings, coil rating and terminals.
Protective earth	Use the designated earth terminal, never as a supply return.

Connections and insulation checks

A competent person shall make the connections after disconnecting and verifying isolation of the power supply. Connect protective earth securely and wire the motor, brake and rectifier according to the confirmed diagram. Select protective devices using the rated operating current on the nameplate and the actual duty; do not use locked-rotor current as the rated-current setting.

Before insulation testing, disconnect the rectifier, electronic modules and any circuit that must not receive the insulation-test voltage from the winding under test. Follow the model-specific inspection or maintenance procedure for the test voltage, test points and acceptance criteria. Fully discharge after testing. Do not apply a megohmmeter test voltage directly to the rectifier.

Control and commissioning

Coordinate motor start/stop commands with brake energization and de-energization. The brake must release fully for starting, and brake excitation must be removed as designed for stopping. Confirm motor and brake-control compatibility before variable-speed or inverter operation. Do not supply a brake rectifier from an inverter output without an approved design.

With all guards and controls installed, check rotation, brake release, stopping and operating current under controlled conditions. Then carry out the driven equipment’s specified load tests. Check for brake drag, abnormal heat, vibration or excessive stopping distance. If the motor fails to rotate or the brake malfunctions, disconnect power and investigate; do not force repeated starts.

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03 OPERATION AND SERVICE

Operation and brake maintenance

Duty and abnormal conditions

Operate within the S4–40% duty and the permitted starting frequency, load and running time. The cyclic duration factor alone does not specify the permissible number of starts per hour. Do not treat stalling as a normal operating condition or confuse synchronous speed with actual rated-load speed.

Stop immediately if smoke, a burning smell, severe vibration, abnormal noise, a live housing, excessive temperature, incomplete brake release or abnormal stopping occurs. Identify the cause and confirm that it has been eliminated before restarting.

Routine inspection

Regularly clean the housing and cooling passages and inspect cables, terminals, protective earth, fasteners and guards. Record changes in noise, temperature, brake release and stopping. Set inspection and service intervals according to starting frequency, load, dust, humidity and wear, and shorten the intervals in severe conditions.

Brake air gap and friction components

Friction-lining wear changes the brake working air gap and may cause failure to release or brake drag. Check the gap and wear in the state, at the locations and against the limits specified in the brake service drawing. Adjust and lock only where the design permits, following its procedure. Do not adopt rotor-travel values, shim counts or wear dimensions from another series.

Check braking torque and air gap separately. Do not excessively compress the springs to compensate for damaged or contaminated friction linings. Keep friction surfaces clean and free of oil and grease. Replace the specified matching friction components if they are damaged, oil-soaked, excessively worn or unable to provide the required braking performance.

Bearing lubrication

Maintain bearings according to their actual construction. For relubricatable bearings, follow the model-specific grease type, quantity and interval. Do not open sealed-for-life bearings for regreasing. Replace damaged bearings with the same specification and inspect their fitting surfaces.

Servicing and return to operation

Before servicing, disconnect and isolate all motor and brake supplies, prevent inadvertent reconnection and secure the associated load. The brake contains stored spring energy; competent personnel shall dismantle and adjust it using the specified service procedure. After repair, check release, return, stopping performance and restoration of guards, and complete the driven-equipment acceptance checks before use.

Use the service drawing for the specific brake. Verify complete brake release and stopping performance after service.

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04 FAULT DIAGNOSIS

Troubleshooting

Motor starting and running faults

Symptom	Possible cause	Inspection and corrective action
Motor does not start	1. Supply disconnected, phase loss or abnormal voltage. 2. Brake fails to release. 3. Excessive load or jammed transmission. 4. Winding or control-wiring fault.	1. Check the supply, protective devices and three-phase connections. 2. Check the brake supply, rectifier if fitted, coil and mechanical freedom separately. 3. Clear obstructions and verify the load and motor selection. 4. Have maintenance personnel repair the fault; do not force repeated starts.
Slow starting or abnormal running speed	1. Load or reflected inertia does not match the motor selection. 2. Abnormal voltage or phase loss. 3. Brake drag.	1. Compare acceleration with the actual rated conditions and previous operation; do not use synchronous speed as the acceptance criterion. 2. Check the motor-terminal supply and all three phase currents. 3. Check that the friction surfaces release fully and eliminate brake drag.
Excessive temperature rise or smoke	1. Excessive load, duty or starting frequency. 2. Brake drag. 3. Poor ventilation, supply abnormality or winding fault.	1. Stop immediately and check the load and operating cycle. 2. Check brake release. 3. Clear cooling passages and inspect the supply and windings. Restart only after the fault has been eliminated.

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04 FAULT DIAGNOSIS

Troubleshooting continued

Brake faults mechanical faults and electrical insulation

Symptom	Possible cause	Inspection and corrective action
Brake fails to release or is noisy when energized	1. Brake supply, rectifier or coil fault. 2. Excessive or uneven air gap. 3. Foreign matter, corrosion, binding or incorrect spring preload.	1. Check the input and coil-terminal voltages separately against their markings. Replace faulty parts with matching components. 2. Inspect the air gap and lining wear using the model-specific service drawing. 3. Have maintenance personnel clean or repair the brake and verify the adjustment and complete release.
Excessive stopping distance or unreliable braking	1. Worn, oily or damaged friction lining. 2. Damaged springs or unsuitable braking-torque setting. 3. Brake power is not removed as designed on stopping.	1. Inspect the friction surfaces and replace contaminated or worn matching friction components as specified. 2. Inspect springs and braking torque and follow the service procedure. 3. Check the control circuit and verify brake application on de-energization and stopping performance.
Vibration noise or bearing overheating	1. Loose mounting, misalignment or mechanical interference. 2. Damaged bearing or incorrect lubrication. 3. Rotor or transmission fault.	1. Inspect mounting, alignment and fits; eliminate interference. 2. Service or replace bearings according to their construction. 3. Have maintenance personnel inspect the rotor and transmission, repair and retest.
Motor housing is live	1. Failed protective earth or incorrect wiring. 2. Damp or damaged winding or lead insulation.	1. Disconnect power immediately and inspect protective earthing and wiring. 2. Locate and repair the insulation fault, then test before returning to service.

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