南华® WNM® 皖南电机®

皖南电机

YVFEJ、YXVFEJ、YE3VFEJ、YE4VFEJ 系列
变频制动三相异步电动机

YVFEJ、YXVFEJ、YE3VFEJ、
YE4VFEJ SERIES
VARIABLE SPEED BRAKE THREE-PHASE
ASYNCHRONOUS MOTORS

使 用 说 明 书

Operation Manual

安徽皖南电机股份有限公司
Anhui Wannan Electric Machine Co.,Ltd

衷心感谢您选购、使用皖南电机。

在使用电动机之前，请扫码仔细阅读本说明书，以便您正确的使用和维护。

执行标准	Q/WN.604-2023
功率范围	0.18 ～ 200kW
绝缘等级	F 级绝缘
工 作 制	连续运行 S1
电动机防护等级	IP54 或 IP55
制动器防护等级	IP21

一．产品概述

YVFEJ、YXVFEJ、YE3VFEJ、YE4VFEJ 系列变频制动三相异步电动机为全封闭、外扇冷、鼠笼型电动机。它是由变频电动机、制动器和冷却风机三部分组成。在变频器的驱动下能实现很平滑的无极调速和准确的制动、定位，广泛应用于要求快速停止、准确定位、往复运转、低频恒转矩、高频恒功率的场合，有着显著的节能效果。

二．制动器（失电制动）的工作原理

当电机与三相电源接通后，电机定子产生旋转磁场，同时制动器线圈得到励磁电流，产生磁拉力，将衔铁板（6）吸合，压缩弹簧（7）；使制动盘（4）脱开磨擦面，制动力矩消失，电机即开始运转。

当切断电源后，旋转磁场和电磁铁的电磁拉力同时消失，衔铁在压缩弹簧的压力作用下，压迫制动盘，使之与电机端盖的磨擦面接触，产生摩擦力矩，使得电机很快停止转动。

***）为实现电机的准确制动，制动器必需要和变频器同步动作。**

三．安装前的准备

1．检查电机铭牌数据和安装型式是否符合要求。

2．仔细检查电机紧固件是否松动或脱落。

3．用 500 伏兆欧表测量电机和风机及制动器的绝缘电阻，其值不得低于 5 兆欧，否则应进行干燥处理，干燥温度不允许超过 120℃。

四．手动操作

80-180 机座号电机带有手动释放装置。失电时，如需用手拨动电机转轴，则应扳动手动释放装置（5），即手动解除制动，便于传动轴的安装与调节。松开手动释放装置（5），手动杆复位，则制动器恢复制动状态。

五．检查及试运转

1. 电机应妥善接地。

2. 接通电源进行空载试运行，若电机接入电源后制动器仍未脱开，此时电机处于制动状态，必须立即切断电源，以免烧坏电机，检查电磁制动器的励磁电路，并予以纠正，再投入试运行。在电机空载运行中有任何不正常现象和声响，应立即停车检查，并作必要的调整和修复，然后再进行负载运行。

3. 制动器试验

按接线指示图接线，接通电源，则制动器线圈得电，制动器打开，此时用手拨动电机转轴，应能灵活旋转，不应有拨不动的现象。然后对制动器输入电源进行开合操作，重复数次，制动器衔铁应能保持同步吸合，声音应轻脆、明确，吸合应灵活，不应存在卡住现象。

如果制动器吸不上，或出现“嗒嗒”的噪声，则应作如下应检查：

3.1 电源连接是否正确。

3.2 制动器械间隙“δ”是否均匀。

3.3 弹簧压力（序号 7）是否太大，或弹簧压力是否均匀。

4. 风机试验

按风机铭牌确定其电源电压和相数，输入电源后，风叶的旋转方向应与箭头方向一致，冷却风流吹向电机轴伸端。

六．运行与维护

1. 使用环境应经常保持干燥，电机在使用过程中应注意清洁。

2. 电机运转时，用钳形表测三相电流，电机和风机都不能缺相运行。

3. 电机运转时，如发现有异常噪声、振动、过热或焦臭味等不正常现象时，应立即停车检查。

4. 电机运转时，如发现制动器打不开导致电机堵转或超载运行，应立即停车检查，不得继续使用。

5. 电机运行时，如果出现制动器失灵，刹车刹不住，则应停车检查，调整间隙“δ”。

6. 电动机存放过久，可能会导致油脂硬化，在刚启动时会有异响。需空载运行半小时以上，使油脂润滑。

七．制动器间隙和制动力矩的调整及拆装步骤

1. 制动器的磨擦面经过长期使用后，将受到磨损，而使间隙增大，引起电磁铁与衔铁间的气隙增大和弹簧工作长度的增加，降低了弹簧压力，减小了制动力矩，同时由于气隙的增大，使衔铁吸合时电流值上升，严重时将使衔铁不能吸合，导致电机堵转、烧坏。因此需经常检查气隙，进行调整或更换摩擦片。

2. 间隙“δ”的调整

2.1 拆去操作杆（5）和风机（9）。

2.2 调节螺栓（10），移动静铁心（8），调整“δ”。

2.3 重新装上风机及操作杆，调整完毕。

3. 制动力矩的调整

3.1 拧紧螺母（10），压缩弹簧（7），增大磨擦压力，从而使制动力矩增大；但是力矩不能调整得太大，否则会引起制动器打不开。

3.2 拧松螺母（10），放松弹簧（7），则制动力矩减小。

3.3 调整时应使三只弹簧产生的弹力保持相同，以免产生衔铁板（6）受力不均。

4. 更换摩擦片

摩擦片属易损件，当单边磨损 2.5mm 毫米以上时，就需要更换新的摩擦片，步骤如下：

4.1 取下释放柄

4.2 取下冷却风机（9）。

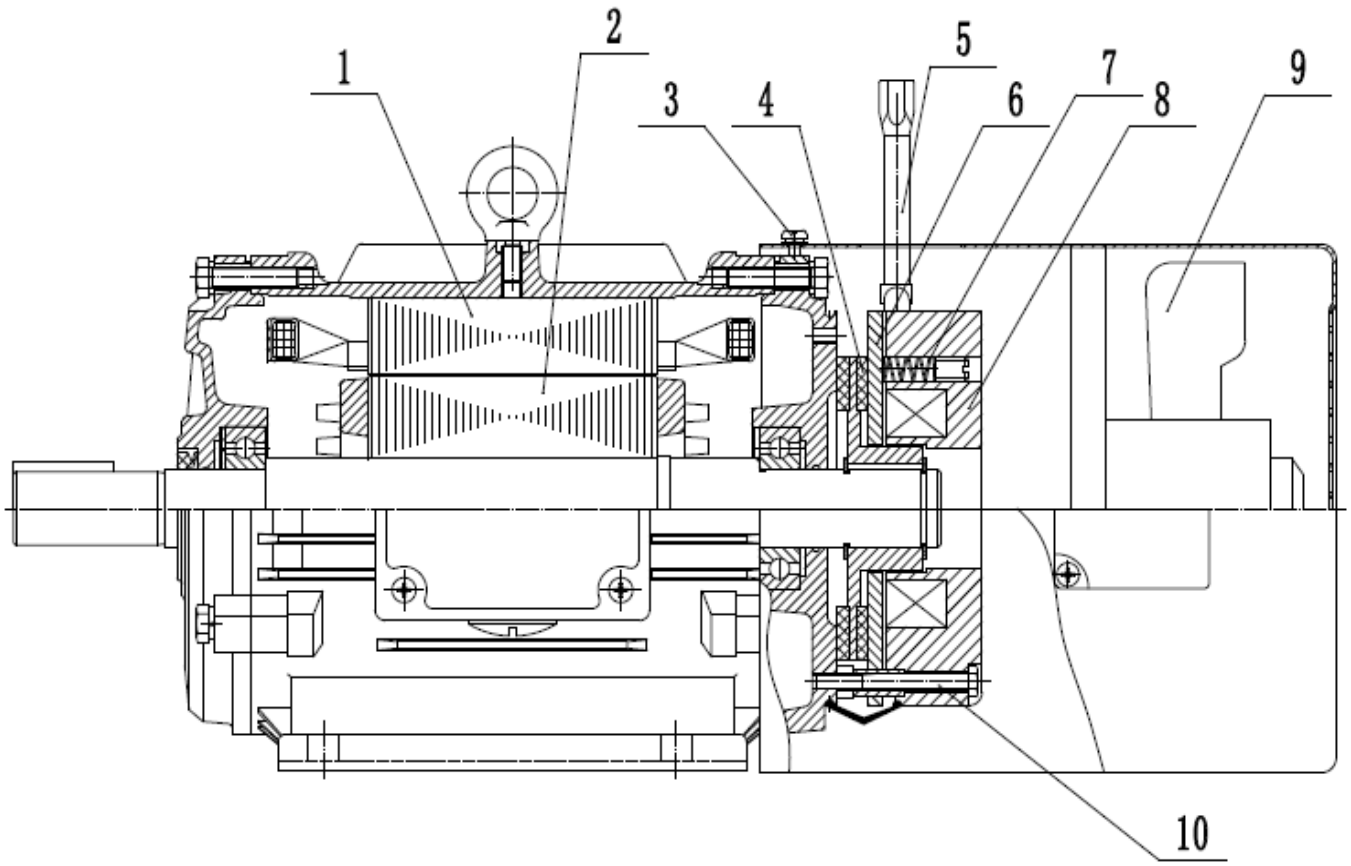
4.3 松开螺母（10），和螺栓。

4.4 旋下螺栓。

4.5 将制动器线圈引接线拆下。

4.6 将电磁铁和衔铁一同拆下。

4.7 取下制动盘（4），便可更换摩擦片。



1、定子　2、转子　3、螺钉　4、制动盘　5、手动释放机构
6、衔铁　7、弹簧　8、电磁铁　9、冷却风机　10、调节螺母

八．一般故障及消除方法

故障情况	故障原因	处理方法
电动机空载时不能起动	1- 接法错误 2- 定子绕组有一相开路 3- 定子绕组匝间及相间短路 4- 变频器参数设置不当 5- 制动器未动作	1- 按铭牌上规定的接法和接线图，查出定子绕组接法，纠正错误联接 2- 检查定子绕组，查出断路处，加以修复 3- 测量定子绕组每相电阻和各相空载电流是否平衡，查出原因，加包绝缘 4- 检查变频器参数，进行调整 5.- 检查制动器及其电器
电动机在负载时不能起动	1- 过载保护的设定值太低 2- 定子绕组有匝间短路 3- 过载	1- 重新设定 2- 检查各相电阻和各相电流 3- 检查电机负载电流
电动机温升过高	1- 过载 2- 缺相运行 3- 电动机接法错误 4- 电机定子绕组匝间短路 5- 定、转子相擦 6- 通风不畅 7- 变频器的 V、f 参数设置不当，使电动机低速轻载时出现过激励，电流大于额定值 8- 制动器动作迟缓	1- 用电流表测量定子电流，发现过载，应减轻负载 2- 检查电动机定子接线，并加以修复 3-Δ 接法误接成 Y 接法或相反，必须立即断电改接 4- 检查找出短路和通地的部分，进行修复 5- 检查轴承装配有无松动，定转子装配有无不良情况，加以修复。 6- 检查风叶是否损坏，风道是否阻塞。 7- 调整 V/f 的参数设置 8- 检查制动器间隙和直流励磁电压
三相电流不平衡	1- 匝间短路 2- 接法错误 3- 三相电源电压不平衡	1- 修理绕组 2- 改正接线 3- 改善供电质量
绝缘电阻低或击穿	1- 绝缘老化或损伤 2- 不清洁 3- 绕组或接线板受潮 4- 电机过热	1- 检修绝缘 2- 用干燥的压缩空气吹净内部 3- 拆开烘干或处理后再使用 4- 停机检修、防止继续发热
故障情况	故障原因	处理方法
轴承发响或过热	1- 轴承损坏 2- 轴承润滑脂 过多、过少或有杂质 3- 轴承与轴、轴承与端盖配合过松、过紧 4. 皮带安装过松或过紧，或联轴器装配不良。	1- 更换轴承 2- 调整或更换润滑脂 3- 检查轴承和前后端盖的装配情况，修整到合适的配合 4- 调整到合适的安装状态，调整皮带松紧或联轴器的安装
制动失灵	1- 摩擦片磨损较大 2- 弹簧失效 3- 动作迟缓 4- 直流器损坏 5- 制动线路故障	1- 调整气隙 2- 调换弹簧 3- 调整气隙 ，检查励磁电压 4- 调换整流器 5- 排除控制线路故障
变频电动机起动后转速低于额定转速	1- 变频器的输出频率与输出电压设定不当 2- 负载过重	1- 按使用要求重新设定 2- 检查负载传动装置是否正常

注：对疑难故障，当采用上述建议无法找到解决办法时，请向专业技术人员请教或直接与制造厂商联系。

We are truly grateful for your purchasing of Wannan Motors. Before using the motor, please scan the QR code to read the manual so as to use and maintain the motor in a right way.

STANDARD	Q/WN.604-2023
POWER RANGE	0.18 ～ 200kW
INSULATION CLASS	F
DUTY	S1
PROTECTION CLASS	IP54 ～ IP55(Frame)
	IP21 (Brake)

Ⅰ. Summary

YVFEJ、YXVFEJ、YE3VFEJ、YE4VFEJ series variable speed brake motors are totally enclosed, fan-cooled, squirrel cage motors. These series motor which features on step-less speed-regulation, accurate break-down are consist of three parts: variable-frequency high efficiency motor, brake and cooling fan. The series motor can be used for various operation systems by which fast braking, constant torque in low frequency and constant power in high frequency is needed.

Ⅱ. Operational principle of the brake (power off braking)

When switch on, there will be a rotating magnetic field in the winding, which will produce field current in coil immediately, as a result the magnetic force will be generated and then pull up the iron plate (6), compress spring (7). Then the brake disc (4) gets away from friction face, braking torque disappear, motor start to work.

When switch off, rotating magnetic field and magnetic force will disappear at the same time, so iron plate will press on the braking disc under the pressure of the spring, and grind the motor's bracket; friction torque will stop the motor quickly.

Ⅲ. Prepare before installation

1. Check the nameplate date and mounting type to see whether they are consistent with actual requirement.

2. Check and ensure fastener parts are all in good condition.

3. Measure the insulation resistance of the motor and the brake with 500V Meg-Ohmmeter, the resistance should be no lower then 5MΩ; otherwise the motor should be dried with temperature lower than 120℃

Note: Brake must work in the same pace with frequency converter to ensure accurate braking

Ⅳ. Manual operation

The motors of frame 80 ~180 have the manual release device If the motor's shaft need to be

rotated by hand for installation or adjustment when power off, the manual release set （5）should firstly be pulled for releasing the brake Don't forget to reset the manual release set （5）before motor restart, keeping the brake device in braking status.

Ⅴ. Inspection and test running

1. Check and ensure that motor is safely grounded.

2. Switch on the power for no-load test running. If the brake cannot work or be released when power on, switch off the power immediately since the motor will be easily damaged or even burned. Check the field circuit of the brake and remove the failure then re-start the motor for the test running once again.

3. Braking test

Connect the brake in according with connection diagram, switch on the power, and then the brake will be open. Rotate the motor's shaft by hand to check its rotation, and the rotation ought to be flexible and quick. Switch on and switch off the brake by several times, check and make sure whether the iron plate can work in the same pace with the motor.

If the iron plate cannot close or the sounds "Ta-Ta" occurs, following are the possible causes:

3.1 Whether the power line is correctly and properly connected or not.

3.2 Whether the gap "δ" between the brake is balanced or not.

3.3 Whether the pressure on spring is too large or unbalanced (7).

4. Blower test

Direction of rotation must be the same as the arrow. The cooling air ought to flow to the motor.

Ⅵ. Operation and maintenance

1. Keep the motor clean good and in good ventilation.

2. Measure 3-phase current by clamp meter. Non-full phase operation is strictly prohibited.

3. If any abnormal problems like strange noise, vibration and overheat occur, stop the motor and solve the problems immediately.

4. If the motor is kept in braking status or overloaded running as result of braking failure, the motor should be stopped and checked immediately.

5. In case the brake malfunctions during operation, shut down the motor and adjust the gap δ of the brake.

6. Grease may harden in long-time idling. When abnormal sounds occur at the beginning of operation, the motor need to be operated without load for half an hour so as to soften grease and restore its function.

Ⅶ. Adjust the operating stroke of the brake (δ)

1. After a period operation, the friction face of the brake will be worn down, the gap between electromagnet and iron plate will get larger, the pressure of the spring will be smaller and the braking

torque will be reduced accordingly. Larger gap (δ) will cause higher brake current, and also the iron plate cannot to be sucked in, and caused the locked rotor and even the broken of the motor finally. So it is necessary to check the gap (δ) periodically, adjust or replace the iron plate in time.

2. Adjust the gap (δ) in the following steps: (take the reference of the drawing)

2.1 Take down the handle rod (5) and fan (9).

2.2 Adjust the bolts (10), take off the static core (8), adjust the "δ".

2.3 Fix on the fan cover and handle rod.

3. Adjust braking torque

3.1 Screw down the nut bolts (10), press the spring (7), increase friction pressure to increase braking torque. But torque cannot to be too large, otherwise the brake will failed to be released (open).

3.2 Screw down the nut bolts (10), release the spring (7), the braking torque will be reduced.

3.3 Check and make sure the same pressure on the three springs so as to avoid the unbalanced pressure on the iron plate (6).

4. Replace the friction plate

Friction plate is vulnerable part, if it losses large than 2.5mm in single way, it should be replaced immediately as following steps.

4.1 Take down the handle rod.

4.2 Take down the fan (9)

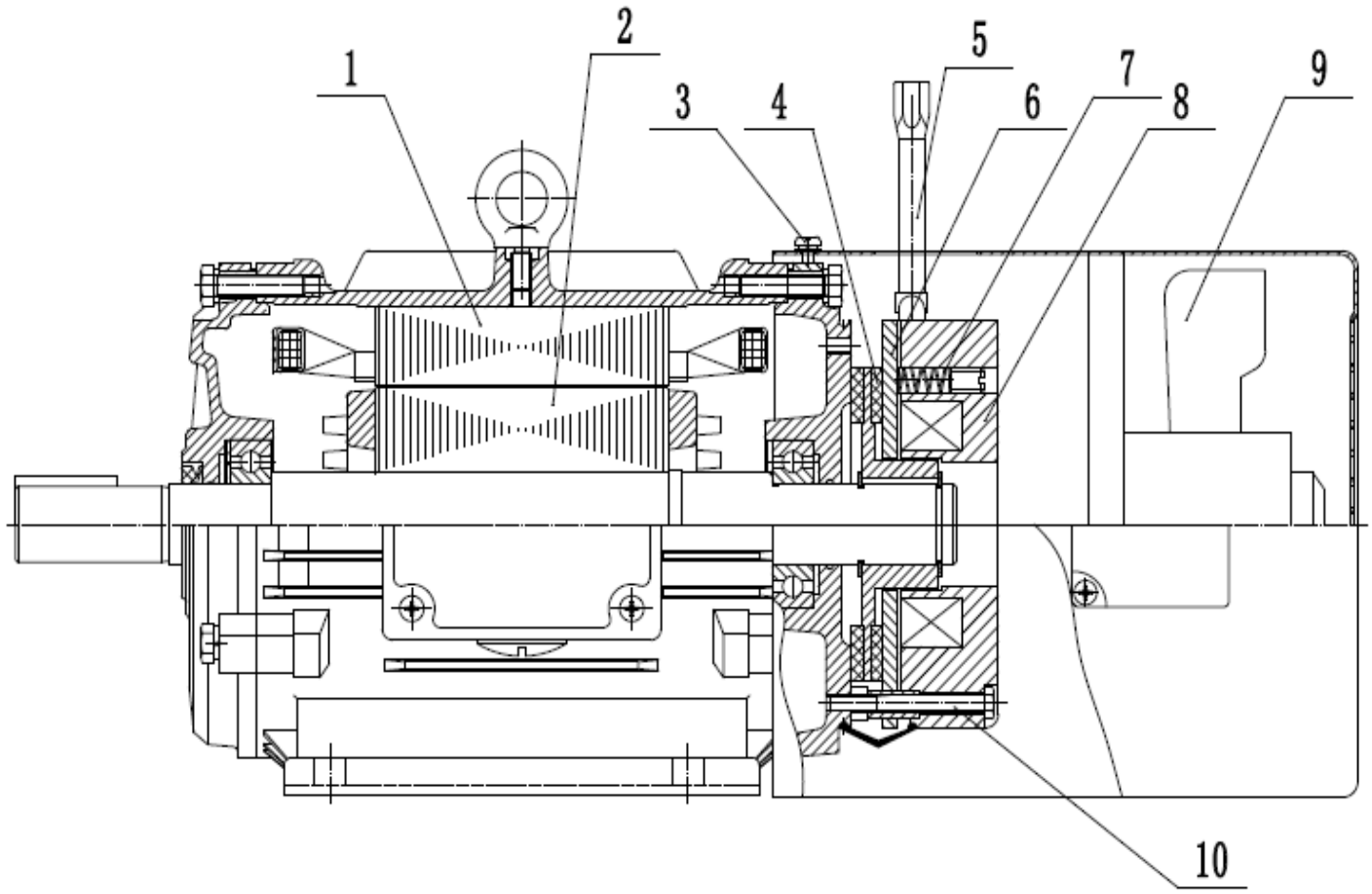
4.3 Loose the nut (6) and bolts

4.4 Take down the bolts

4.6 Take down the coils of the brake.

4.7 Take down the electromagnet together with iron plate.

4.8 Take down the braking disc (4), replace a new one.



1. stator 2. rotor 3. bolt 4. brake 5. hand release lever 6.armature
7. spring 8. magnetic core 9. fan 10. brake spring regulating screw

Ⅸ Troubleshooting chart

TROUBLE	POSSIBLE CAUSE	WHAT TO DO
Fails to start without load	1-incorrect connections 2-open circuit in one phase 3-interturn and interphase short-circuit of stator winding 4-improper parameter in frequency converter 5-brake failure	1-check and correct the winding connections according to the nameplate and diagram 2-check stator windings for open circuit and repair 3-check the resistance of stator winding and no-load current of phase and repair. 4-check the parameter and adjust 4.-check the brake and motor
Fails to start with load	1- rated value of the overload protection is too low 2-interturn short-circuits of stator winding. 3- overloading	1-reset 2-check phase resistance and current 3-check loading current.
Higher temperature rise	1- overloading 2-non-full phase operation 3-incorrect connections 4-interturn or interphase short-circuit of stator winding 5-friction between stator and rotor 6-poor ventilation 7- 8-brake delay	1-measure stator current with ammeter(make sure whether or not) 2-check connections of stator windings, and repair. 3-star connection is mal-connection as delta type and vice versa. Power off and correct connections 4-find out short-circuit, and repair. 5-make sure whether bearing is loose or not, or check stator and rotor for improper assembling and repair. 6-make sure whether blade is damaged and whether ventilation channel blocked or not. 7-check the air gap of brake and DC excitation voltage.
Unbalance current	1-interturn short-circuit 2-incorect connections 3-three phase power supply voltage unbalance	1-repair winding 2-correct the connection 3- improve power supply
Insulation resistance is low or broken down	1-insulation aging or damaged 2-uncleanness 3-winding or terminal board dampness 4- motor overheat	1-repair insulation 2-clean off with dry compression air 3-dismantle to dry or fix dismantle and repair
Being overheated	1- bearing damage 2- excessive, insufficient and contaminated bearing grease 3-the clearance between bearing and shaft or between bearing and end cover too wide or too narrow 4-belt is too loose or tight, or improper coupling assembly	1-replace bearing 2-fill or replace grease 3-refit 4- refit and adjust the belt or coupling
Brake failure	1- friction disc worn 2- spring failure 3- brake delay 4- rectifier damaged 5- brake circuit failure	1-adjust air gap 2-replace spring 3-adjust air gap and check the excitation voltage 4-replace rectifier 5-properly check brake circuit failure
Rotation speed lower than rated value	1-frequency converter output frequency is not consistent with voltage 2-overload	1-reset as requirement 2-check the transmission equipment

敬告用户：

请您按照本使用说明书的规定，正确地使用和储存电动机，我们将为您提供优质、快捷的服务。

在电动机使用过程中，您如有什么疑惑请与我们联系，我们将及时给予您满意的解答；您有什么良好的建议请向我们提出，以便我们改进，为您提供优质、快捷的服务。

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Dear user,

Please use and store the motor right following the instruction of the manual. We will make our effort to provide you with high-quality and prompt service. Contact us if you had any questions in application, and we will offer you timely and effective resolution; let us know if you had any advices or suggestions, with which we can improve ourselves and make service better. Anhui Wannan Motor Co., Ltd. reserves the right of final interpretation of the user manual. No copy, disclosing or using of the content of this user manual to third parties prior to written permission from Anhui Wannan Motor Co., Ltd.

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