

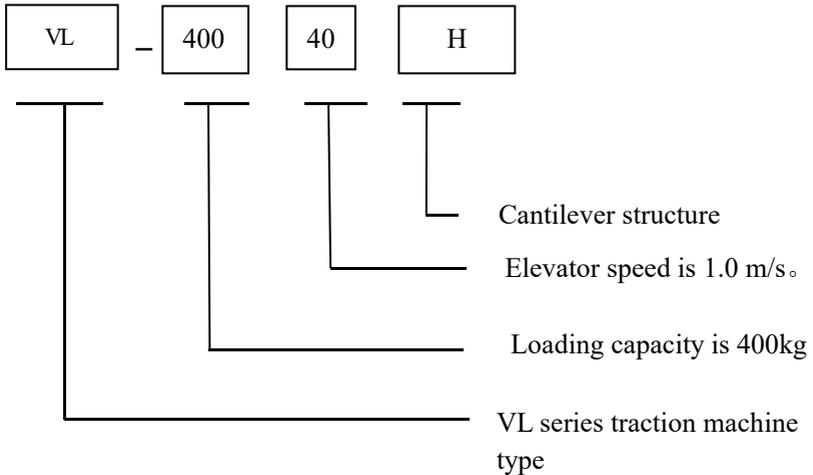
VL SERIES

GEARLESS PERMANENT SYNCHRONOUS TRACTION MACHINE OPERATION MANUAL

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The code of traction machine is composed of 4 parts, the meaning of each parts is as follows:



For example, VL-400-40-H refers to the load of 400 kg, with a speed of 0.4 m/s, rated voltage 380 V AC the traction machine. Its rated load and the speed date all are in the case of the roping is 2:1 .

General safety instructions

Only qualified personnel are allowed to perform any planning, transportation, installation, operation or maintenance work. The personnel must be trained for this job and must be familiar with the installation, assembly, commissioning and operation of the product. Sufficient knowledge in lift construction is essential.

In case of any damage to the machines and wounds to people, before installation, application and maintenance, one should read this manual carefully.

The installation, application and maintenance should accord with the manual strictly.

When rotating this series of traction machines by other motors, the traction machines will be working at generator condition, and the terminals will produce high voltage, so one should protect from getting an electric shock, and the peripheral equipments should be protected from that high voltage.

Strictly prohibit from unqualified people's operation. Only qualified personnel are allowed to perform any installation, operation and maintenance work.

The power of the traction machine must be from a driver with closed control type. Direct connection to the motor may destroy it.

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1. Product description

This series of traction machines are mainly consisted of permanent synchronous traction machine, brake system, traction sheave. Its principle is that the driver supplies 3 phase varied voltage and frequency power for the machine according to the feedback of encoder, then inside of the motor will generate rotary magnetic field, which will drive the permanent rotor rotating with synchronous speed. Through the friction between the traction sheave and ropes the car of the elevator can be up and down.

This series of traction machine's each designed performance and production are all accord with the regulation of 《GB/T 21739》. The performance of every machine was under strictly test before sending out, that means the quality and performance of the machine can accord with standard.

2. Application

This series of traction machine can be applied as a driver for upright hoisting of any kinds of passenger elevators, medical elevators and goods elevators.

3. Main advantages of products

- Environmentally Sensitive; ●Low Noise; ●Constant Torque;
- High Efficiency; ●Small Volume; ●Running steadily;
- Power Saving; ●Avoid maintenance; ●Safety and Reliable

4. Working Conditions and Environment

- Altitude should be less than 1000m.
- Temperature in the machine room should be between 5 and 40 degrees centigrade.
- The deviation between power supply and rated power should be less than $\pm 7\%$.
- Air should contain no corrosive and flammable gas.
- The comparative humidity should be less than 90%, monthly average lowest temperature should not exceed 25 degrees centigrade.
- Lubricant is not needed on the surfaces of traction sheave and ropes.
- Wrap angle of ropes on traction sheave should meet standard of GB/T 21739

5. Configuration form

Outline drawings refer to the latest sample.

6. Transport and Installation

6.1 Open the housing and Transport

In the process of opening housing, check the nameplate parameters and machine type; make sure it is the right type for using. Check the packing list first to make sure if all the components are ready after opening the housing and if the machine is damaged or not. If any damage has been occurred during transport, make a notice of claim to the forwarder or tell our company directly. Store the motors only in closed, dry, dust-free, well-ventilated. Make sure rope hook clasps the ring on the machine before suspending; keep steady and no crash during suspending. The eyebolts are designed for the specified machine weight. Suspension

of additional loads is not permitted.

Note: The eyebolts should be fully tightened while lifting, without any gap with frame surface.

6.2 Installation

Before installation one should use 500V Mega-ohm meter to test the winding's insulation resistance to the ground, the resistance should not less than $1M\Omega$, otherwise one should dry the machine first. The installation of the machine should accord with the arrangement of machine room, during installation one should not disassemble any parts of the machine arbitrary. If needed, the installation should carry out by professional personnel; and keep clean of the machine room.

Note : because the rotor contains permanent magnets, beside the traction machine no scrap iron can appear, in case of going into the machine.

6.3 Electrical Connection

See junction box wiring diagram for connection of tractor. The tractor is powered by a frequency converter. The diameter of the connection should be reasonably matched according to the rated current of the tractor. The connecting cable should be connected reliably with the terminal post; Motor internal embedded thermal sensing elements, for external connection with motor temperature monitor.

Thermosensitive switch: Thermosensitive switch has been preinstalled, according to the wiring diagram wiring.

Thermistor: Thermistor has been pre-installed, according to the wiring diagram wiring. The voltage applied between the two leading ends of the thermistor must not exceed 2.5V, otherwise the thermistor will be damaged.

6.4 Traction Machine Overload Protection Instructions

a) Overload protection mode: adopt thermosensitive switch or

thermistor for overheating protection.

b) Adopt thermosensitive switch for overheating protection: when the winding of the tractor overheats to the operating temperature of the thermosensitive switch, the thermosensitive switch will be disconnected. When the temperature drops to the recovery temperature, the thermosensitive switch will resume the connection state;

C) Adopt thermistor as overheat protection: when the winding of tractor overheat reaches the operating temperature of thermistor, thermistor resistance value increases sharply, and the power supply loop is cut off through external control;

6.5 Pulse voltage insulation structure

6.5.1 without energy feedback and non-AFE energy feedback, the insulation structure pluse voltage grade: Phase is IVIC C, Ground is IVIC B.

6.5.2 AFE energy feedback, the Max permissible peak-to-peak voltage is as follows:

- Allowable value of phase to pahse= $2 \times \text{DC bus voltage} \times \text{Overshoot factor}$
- Allowable value of phase to ground= $0.75 \times 2 \times \text{DC bus voltage} \times \text{Overshoot factor}$

	Phase to phase	Phase to ground
Overshoot factor (OF)	2	1.5

7. Inspection and Preparations Before Operation

Before operation, one should inspect the following items:

- 1) check if the electrical connection is right or not.
- 2) affirm there is no short circuit of exposed parts and no short circuit to ground.
- 3) affirm the connection of terminals, inserting connections and bolts are firm enough.

8. Installation and Application of Long-distance Releasing Device

The long-distance releasing device has been adjusted before leaving factory. Customers usually do not need to adjust;

8.1 Installation

- 1) Spread the steel cable.
- 2) Remove the former rope guard(the same outline as releasing bracket),and install the releasing bracket, adjust the distance between releasing bracket and outer diameter of traction sheave(about 5mm),screw down bolt(M16)and the spring washer.
- 3) Remove the turning handle of the brake and leave two rings for later use, put the turning handle inside the hole of the brake, then using pin shaft to fasten, and the two ends using rings to lock up.
- 4) According to the above drawing, put the steel cable inside the support of the bracket, and put flexible pin into one small round through hole, to stop the steel cable from slip off the support.
- 5) Put the pulling cable through the lever, enclose with washer, screw nut (M6), and frap the steel cable.
- 6) Fix bolt (M8) and spring washer.

 **Note : There should be some space leaving for curvature of pulling cable on fixing base**

8.2 Application

- 1) Remove bolt for locking plate.

- 2) Pull the lever upward, the lever rotates and the brake acts then the traction sheave can be rotated.
- 3) After releasing operation, lock the turn plate with bolt for locking plate in case of suddenness releasing.

If releasing results is not as expected, adjust nut (M6) little by little to get releasing function.

8.3 Notes

- 1) When fixing the long-distance releasing device, make sure the pulling cable arranged reasonably and glidingly, with no twist and knot or other situations affect torque transporting. If there need curve the cable, curved radius less than 400mm is advised.
- 2) The user should leave enough space for avoiding the curved radius too small when fixing the releasing base. The curved radius of pulling cable in this place should be less than 200mm; otherwise the release will be hard or even can not release and the cable broken.
- 3) The early fasten force of pulling cable cannot be too high, which can release but won't affect brake torque is ok. If it is too high, this may reduce the brake torque even makes the brake out of work.

9. Maintenance

The traction sheave end bearings are double sealed bearings too, which do not need to maintain.

10. Notes

Keep the machine room clean and dry.

Keep the traction machine clean.

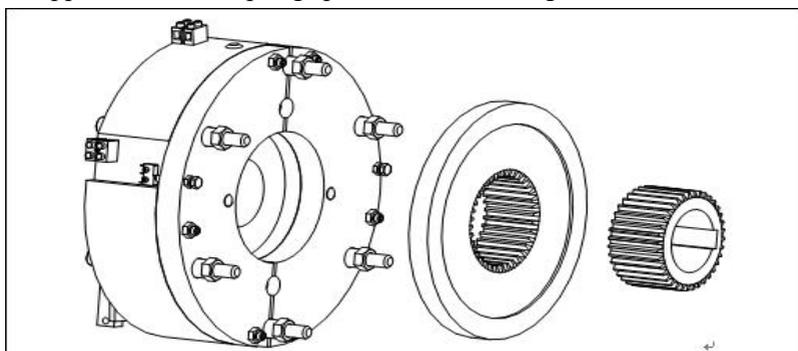
Affirm the brake system is reliable and fray or not.

The brake should do maintenance work each year.

11. Appendix 1 brake installation instructions

11.1 Structure and principle

The DSZ brakes consist of magnet body, armature, friction disk and hand-release parts. The brake is released electromagnetically and applies brake torque by compression springs. When the coil of magnet body is energized, the armature is drawn to the magnet body by the electromagnetic force, and the brake torque on the friction disk is disengaged. When the coil is de-energized, the electromagnetic force disappeared and the springs push the armature against the friction disk.

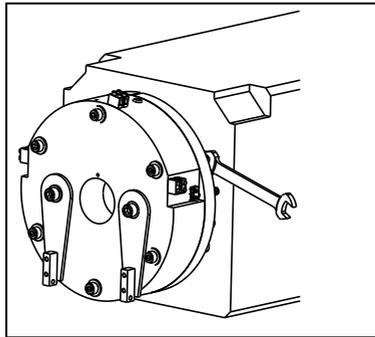
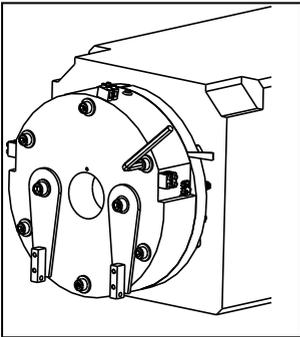
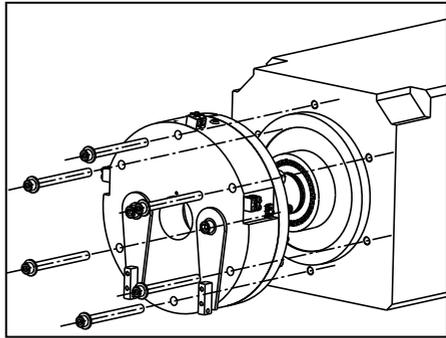
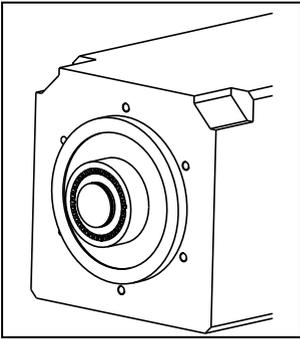


11.2 Main technical data (Type DB3-2X200)

Brake torque (N · m)	Voltage DC (V)	Power 20°C (W)	Duty ratio
≥2x200	DC110V	≤240W	S5-40% 240F/h

11.3 Installation

- Mounting the hub on the shaft.
- Mounting the friction disk on the hub.
- Keep the friction surface free of oil and grease.
- Screw the brake on the mounting face with screws.
- Tighten the screws evenly, and check the air gap(0.15~0.2mm) near the bolts by thickness gauge.



11.4 Maintenance

Check the gap(δ) between the friction plate and brake pulley .When the gap is $\leq 0.2\text{mm}$ or $\geq 0.3\text{mm}$, please adjust the brake. After finish the adjustment ,the 0.25mm feeler gauge should be able to enter. and the 0.3mm feeler gauge should not enter.

- Check the air gap and adjust if necessary.
- The friction plate is allowed to wear 3mm, the wear limit thickness is less than the following table, must be replaced.

Braking torque	Original brake disc thickness	Thickness of the wear limit
2X200	17	14
2x235	17	14

Tighten the mounting screws if necessary.