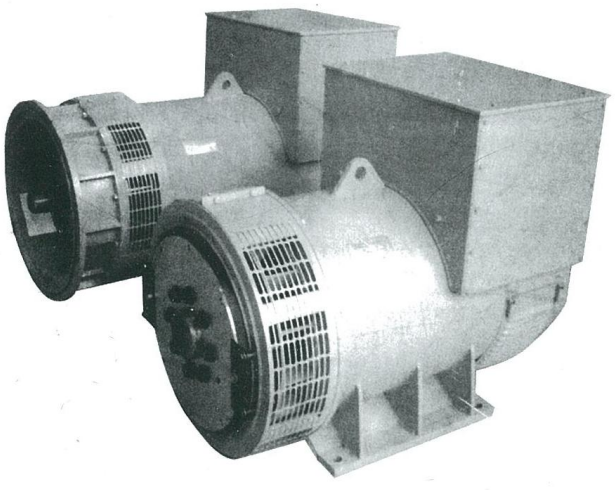
Maintenance Manual for brushless generator



Yangzhou gedexin mechanical and Electrical Equipment Co. , Ltd.

Safety measures

Before operating a generator, please read the electric generator manual and this generator manual for the unit, generator and related equipment.

Correct operation and maintenance of the equipment to achieve safe and effective operation.

Many accidents occur because basic rules and protective measures are not followed.

Electric shock can cause serious personal injury and even death.

Follow all warnings/warning signs.

ensure that the installation meets all applicable safety standards and local electrical standards. All installations shall be carried out by qualified electricians.

Do not run the generator when the protective cover or the junction box cover is open.

The engine start circuit should be cut off prior to maintenance.

cut off closed circuits to the power grid or other generators and place warning signs on the circuit breakers to prevent accidental closure.

Follow all important, caution, warning, and danger signs, which are defined as:

Yes! Dangerous or unsafe method or operation that results in damage to the product or related equipment.

Look out!	A dangerous or unsafe method or operation that results in injury to a product or person

	A dangerous or unsafe method or operation that results in serious personal injury or even possible death.

	The immediate danger of loss of life or injury.

The function of this manual is to let the user know how the Gedexin Generator works:

Standard generator design, installation and maintenance procedures, lack of protection or improper use of procedures can cause damage to equipment and/or injury to personnel, and special areas are marked with warning and/or warning signs, it is important to read and understand this manual before installing or using the generator.

Gedexin's service, sales and technical staff are ready to help and are welcome to contact us.

	Improper installation, operation, maintenance, or replacement of components can result in serious loss of life and/or damage to equipment. Maintenance personnel must be qualified for electrical and mechanical maintenance.

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Chapter One, Overview

1.1 overview

GDX series brushless three-phase synchronous generator (hereafter referred to as GDX generator) is Yangzhou gedexin mechanical and Electrical Equipment Co. , Ltd. absorbed the advantages and characteristics of similar products at home and abroad, and improved to improve, adopt computer program, optimize design and advanced processing technology, design and manufacture of novel alternator.

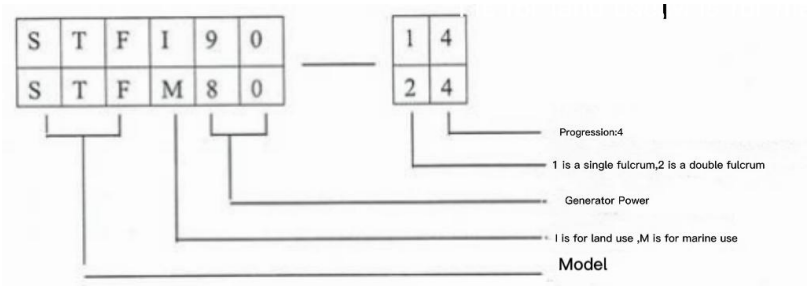
The GDX generator is single bearing, single and double fulcrum, H class insulation, brushless self-excitation, the frame adopts steel plate welding structure, the rotor adopts integral convex pole structure, the driving end connects flange and disk coupling, comply with international SAE connection standard.

GDX generator electrical performance: high efficiency, in line with the national GB755 rotary motor quota and performance, International Electrotechnical Commission recommended standard IEC60034-1 and other relevant national standards.

The GDX generator has a reasonable ventilation system, good cooling effect, large temperature rise margin, reliable operation, free space for assembling and disassembling the rotating rectifier and the junction box, convenient operation and maintenance, high rotor balance precision and low vibration, the voltage control system uses an improved Voltage regulator. High precision of voltage regulation, good dynamic performance, small distortion of voltage waveform, and with electromagnetic interference suppression, over-excitation, over-voltage protection functions.

The GDX generator can be matched with various domestic and imported diesel engines to form a fixed or mobile power station, for factories, shopping malls, hotels, buildings, hospitals, ports, oil fields, mines and post and telecommunications and other occasions as a power back-up lighting or common power use.

1.2 product model definition



1.3

- not exceeding 1000m above sea level
- ambient temperature-25 ℃-40℃
- relative humidity of cooled air 75(25℃)

If the use of the environment does not meet the above requirements, the generator rated output power should be in accordance with the provisions of GB755 correction

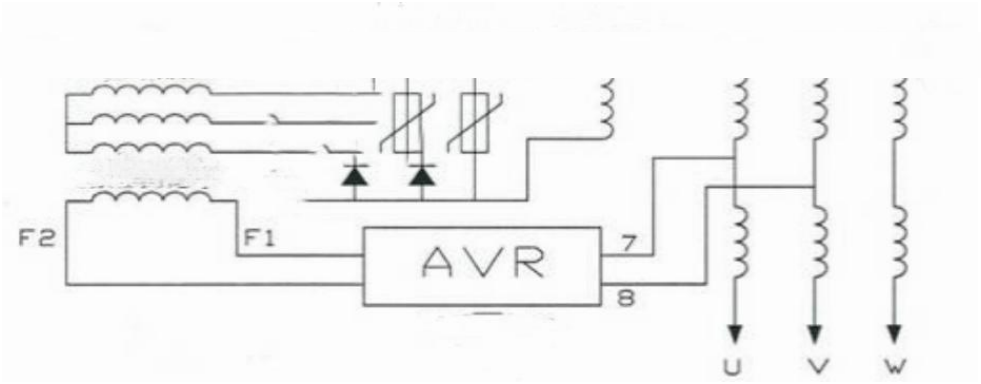
The generator can be made into a humid tropical type for use (when the user requests)

Environment according to GB12351 regulation

警告	Environmental factors are very important for the life of the generator. Please choose the best power generator according to the highest temperature and altitude. Improper selection will lead to the life of the generator, or even damage it.

The second chapter, the principle of work

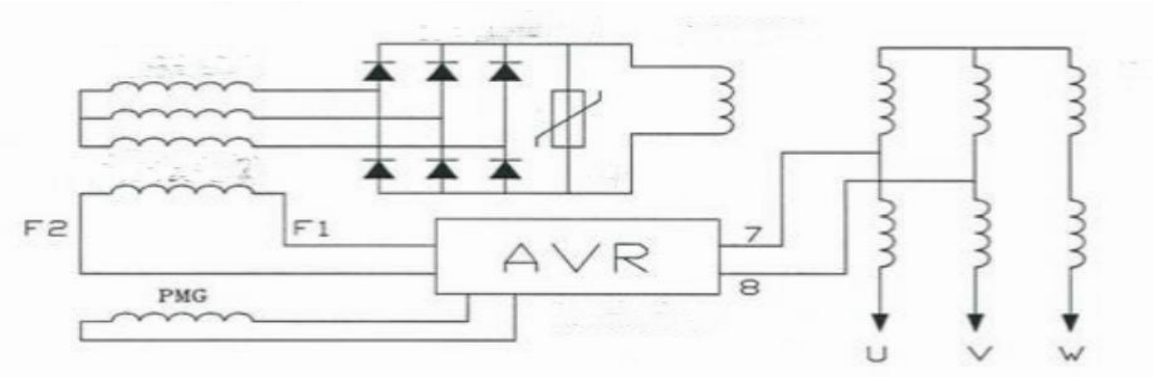
2.1 generator AVR control principle Self-excited AVR control generator



After the unit starts, the generator depends on its own residual magnetic voltage. After rectification, AVR provides excitation current to the magnetic field of the AC exciter, and the armature voltage of the AC exciter gradually increases, the AC voltage is sent to the main magnetic field after rotating rectification to establish the voltage of the main generator. When the rotational speed approaches the rated value, the Voltage regulator AVR causes the generator voltage to rise rapidly and stabilize at the rated value.

During the normal operation of the generator, if the terminal voltage of the generator tends to increase or decrease due to some reason, such as load change, speed change, winding temperature change, etc. , the AVR can detect this small voltage deviation and rapidly reduce or increase the excitation current, keeping the generator terminal voltage approximately constant.

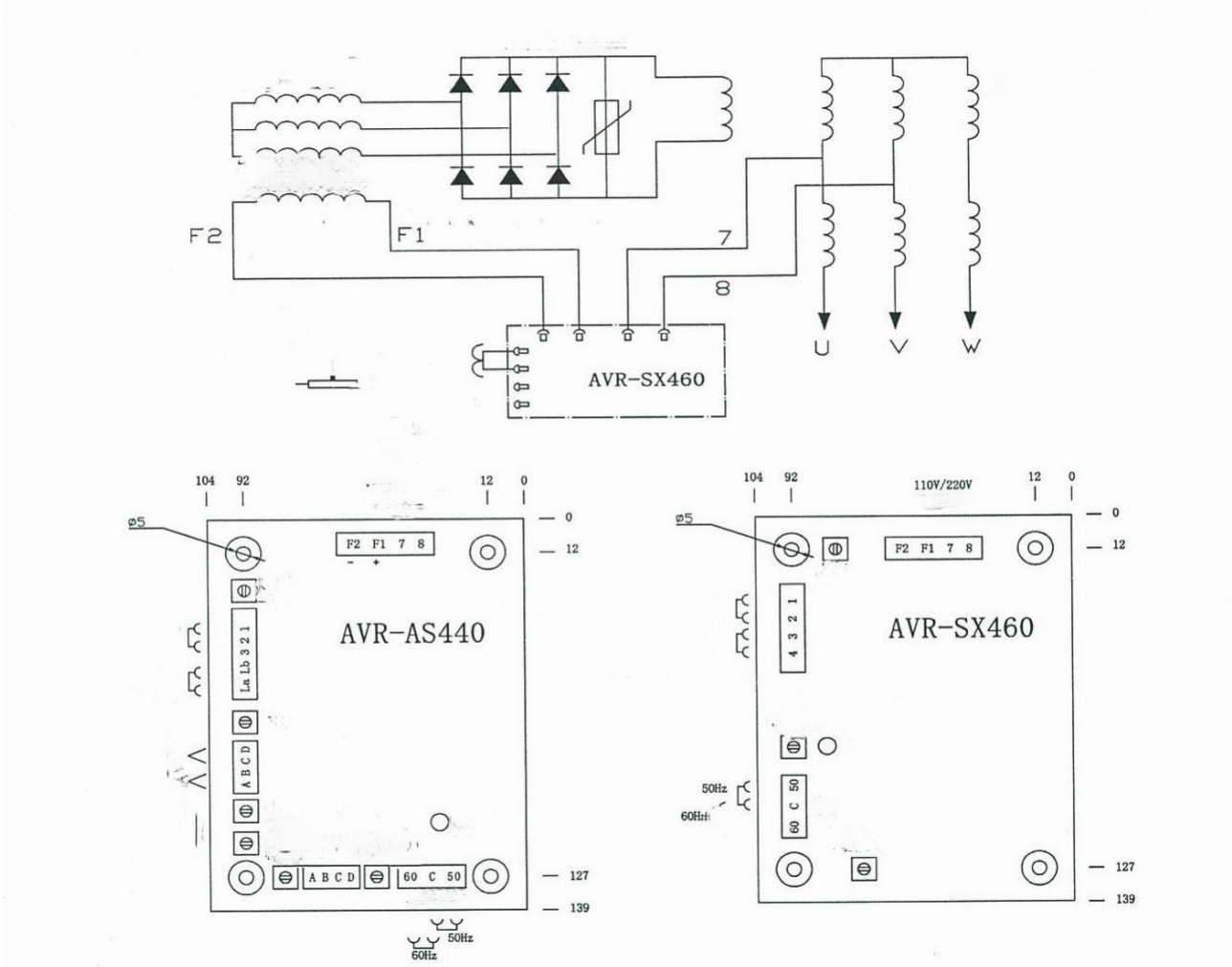
2.2 permanent magnet generator (PMG) excitation-AVR control generator



Permanent magnet generator provides excitation power to exciter through AVR, which is a control device to regulate excitation current of exciter. The AVR uses a transformer to feed back voltage-induced signals from the host stator windings, “By controlling low power to achieve control of the host magnetic field current requirements.”.

The permanent magnet generator system (PMG) provides a constant excitation power source independent of the stator load, which enhances the starting torque of the motor, and it has anti-interference to the waveform distortion of the host stator output voltage caused by the nonlinear load (for example, thyristor DC generator) .

2.3 AVR regulator instructions



Controller	Function	Description
Voltage regulation	Adjust the output voltage of the generator	Increase the output voltage clockwise
Stability	Prevent voltage swing	Increase stability clockwise
Low frequency protection	Set the low frequency protection point	Reduces the guard point frequency clockwise
Droop adjustment	Set the OPF to SAG to 5% when fully loaded	Increase sagging clockwise
PF control adjustment	Optimize the sensitivity to analog inputs	Add control over AVR with add-ons clockwise
Excessive incentive protection	Set over-excitation protection too value	Increase the protection point voltage clockwise

Transient response selection table

Connection selection	Power Range	Response speed
Connect B-D	< 100 kw	Slow
Connect A-C	< 100 kw	Fast
Connect B-C	100KW-500KW	Fast
Connect A-B	> 500 kw	Fast

2.4 rotating two-section tube rectifier assembly

The rotary rectifier used in this series of generators is disc structure, 6 rectifier elements (3 for anode, 3 for cathode) ,

They are respectively fixed on two semi-circular conductive plates to form positive and negative electrodes for rectification. Voltage-sensitive resistors are installed between the positive and negative poles to protect the bridge. The power supply of the bridge comes from the armature of the AC exciter, and its DC output supplies power to the magnetic field of the main generator.

The diodes on the rotating assembly can be measured with a multimeter, and the soft wires connected to the diodes should be disconnected at the terminals to measure their forward and reverse resistance, a good diode should have two very large reverse resistors and a very small forward resistor. A damaged diode will have full forward and reverse bias when measured at 1000Q or an infinite forward and reverse reading. On a digital multimeter, a good diode will have a smaller reading and a larger reading when measured in both directions.

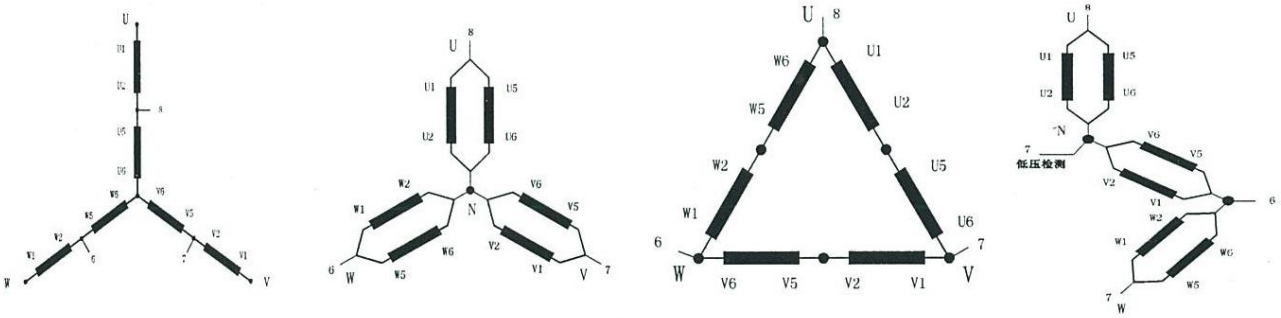
A surge suppressor is a metal oxide varistor connected to a diode by a conductive plate to prevent the diode from being damaged by an instantaneous reverse voltage in the winding, displays an infinite number of readings, both positive and negative.

The third chapter generator wiring diagram and voltage selection connection

3.1 main stator output terminal connection

Star series, three-phase four-line, star parallel, three-phase call line, triangle series, three-phase four-line“Zhi” zigzag parallel, single-phase three-line

Outlet terminals (U, V, W, n) outlet terminals (U, V, W, n) outlet terminals (U, V, W, n) outlet terminals (U, V, W, N)



Output voltage (L-L) output voltage (L-L) output voltage (L-L) output voltage (L-N)
400V/50Hz 200V/50Hz 230V/50Hz 220V/50Hz
450V/60Hz 225V/60Hz 260V/60Hz 220V/50Hz

警告	Incorrect wiring can cause damage to generators and appliances. Only professionals with an electrician maintenance qualification can operate or make adjustments.

Hint!	If you need more connection method, please call the factory sales service department to change the main stator connection method, the AVR connection method also needs to change, the wrong AVR connection method may lead to generator coil burn-out or AVR burn-out.

Chapter 4, installation

4.1 lifting

 警告	Incorrect lifting method or insufficient lifting capacity will result in serious personal accident or equipment damage. The minimum lifting capacity required has been indicated on the lifting tag. The rings on the generator can not be used to lift the whole unit.

For the safety of Transportation, a single-bearing generator is equipped with a shaft card at the shaft of the driving end. Once the shaft card is removed and the generator and the engine are combined, the rotor can rotate freely in the machine base. In the process of matching and alignment, attention should be paid to ensure that the generator base level.

4.2 docking assembly of the engine and generator

In the process of assembling the generator and the engine, the generator rotor and the engine crankshaft assembly must be carefully aligned and then rotated. During the process, the connecting screw is positioned, inserted and tightened. This rotation process is necessary for single-bearing and double-bearing generators.

In a single-bearing generator, the connecting hole of the generator flange plate must be aligned with the screw hole on the engine flywheel. It is suggested that two pins be placed on the two symmetrical screw holes of the flywheel first, the generator flange plate can conveniently slide into the final positioning of the engine flywheel stop. The pin must be removed and replaced with the south connecting screw before final tightening of all connecting screws.

The engine crankshaft must be rotated in the process of placing and tightening the connecting screws and tightening the connecting screws. Generator rotor assembly. In the rotation process, care and use the correct way to ensure that the screw placement in the middle of the machine and tighten the process of safe operation, and to avoid the use of more than the correct way to rotate the components caused by damage.

Engine manufacturers can provide appropriate tools specifically for rotating crankshaft damage. The tool must be used during unit assembly. By coupling a manual pinion with the starting ring gear of the engine flywheel to rotate the crankshaft the way is always right.

 危险	During centering and installation of the connecting screws, the entire rotating assembly must be carefully locked to ensure that it can not be rotated prior to internal operation of the generator.

4.3 double bearing generator

The double-bearing generator shall be fitted with an elastic coupling and shall comply with the specifications provided by the manufacturer of the coupling.

If the transition bushing, you must use the generator together with the engine method to check the machining surface alignment. If necessary, place a thin sheet under the bottom of the generator. After the installation, need to add the transition socket protection device. The unit without transition sleeve needs a suitable protective cover, which is provided by the manufacturer of the unit set.

Avoid axial load on generator bearings. If this is unavoidable, contact the manufacturer.

Look out!	Improper installation of transition bushings and/or a moderately incorrect alignment of generators will result in serious personal accidents and/or equipment damage.

4.4 single bearing generator

Single-bearing generators are very critical for moderate. If necessary, thin pads should be placed under the bottom of the generator to ensure a moderate alignment for processing.

And the engine supporting the basic procedures as follows:

For engines, check the distance from the flywheel fit surface to the flywheel housing fit surface. This tolerance should be within the 0.5 mm so that the generator or engine bearings are not subject to lateral thrust.

2. Check whether the bolts from the flange plate to the hub plate are tightened and fixed in place.

3. Remove the screen plate at the driving end of the machine to operate the coupling and transition socket bolts, check the fit surface is clean and no lubricant.

Check that the flange disc is concentric with the end of the transition socket. Concentricity can be in the fan and transition sleeve window to lift the rotor.

Bring the generator close to the engine. Notice that the flanges and flywheel cover stops are closed at the same time. Bring the generator closer to the engine until the flange plates touch the flywheel face, and the flywheel cover is just in place.

Look out!	Improper installation of transition bushings and/or a moderately incorrect alignment of generators will result in serious personal accidents and/or equipment damage.

4.5 output cable access

● careful wiring of generator outputs U. V. W. N mark, the output wiring can not be wrong

 警告	Faulty wiring can lead to damage to electrical appliances and other accidents.

● choose the area of output cable according to the rated current specified by nameplate

 警告	Failure to comply with the requirements of the cable output line will lead to terminal, wire heating.

● external cable to use 8.8 grade steel screws and shock-proof washers indentation terminal, need to be compressed not loose

● secure cable output lines to ensure a safe distance between cables.

4.6 grounding

When the generator leaves the factory, the neutral wire is not connected to the generator base, and there is a wiring terminal near the end of the main wire in the wiring junction, the user is required to connect the neutral terminal to the ground terminal using a grounded conductor

(which is cut in half of the lead cable) .

The generator base shall be securely fastened to the electric generator common chassis and, if a damping device is installed between the generator and the common chassis, the two shall be connected by a suitable grounding conductor.

 警告	Generators are not grounded when they leave the factory. They must be grounded correctly according to field regulations. Improper operation may result in equipment damage, electrical damage and/or casualties.

 警告	Please follow the local regulations to ensure the correct grounding method.

4.7 pre-run check

This series of generators have a good insulation structure, and after careful insulation treatment, unless excessive moisture, there is no need to dry before use, the main performance of the generator damp insulation resistance, it can be measured with a 500 volt Megohm meter.

Attention!	Disconnect the automatic Voltage regulator and rotating rectifier from the motor windings to avoid electronic component.

The insulation resistance of each winding of the generator should not be less than 04 Megohm in hot state (about 75' c) . If the resistance is lower than the above value, it must be dried. That is, hot air method or other methods to improve the insulation resistance.

The connecting wires between the generator, exciter and automatic voltage regulator are connected before leaving the factory, and can be checked again before running, and whether the contact points are firm and reliable. The connecting wires between the generator and the control panel should also be checked one by one, make sure it is correct.

The mechanical parts of the generator, the fastening bolts should not be loose, carefully check the generator internal foreign body exists, such as the surface of the coil or rotor dust, dry air or blow off with a hand bellows.

4.8 commissioning

1 starting the prime mover, accelerating to the rated speed, during which the generator should be self-excitation build-up voltage, voltage value should be close to the rated voltage, if there is any deviation, it can be adjusted by voltage trimming in the AVR or on the control panel. During the adjustment, you should pay attention to whether the voltage of the generator is stable, whether the three-phase voltage is balanced, and whether the electric generator is light, sound harmony.

2 close the air switch, respectively, to keep the load power because 1 and 0.8(lag) , gradually increase the load to full load, gradually reduce the load to no load, in the process, the steady-state voltage adjustment rate of the generator should not be greater than the specified value, observe whether the indicators are normal, check whether the generator parts are overheating phenomenon.

The generator can be put into normal operation after the satisfactory results of the

above-mentioned no-load and load debugging and checking.

 警告	When the engine needs to run-in at low speed, or when it has to run at low speed for a long time, the plug of the automatic Voltage regulator AVR should be removed to avoid damage caused by overload of the automatic Voltage regulator and the excitation windings for a long time.

4.9 generators run in parallel

It is important to know the following points for attention in cross-linking operation before installing and setting up the adjustment device. When the generator is connected with other generators or the power grid, the basic requirement is that the generator has the same phase sequence as the parallel generator or the power grid, and the following conditions must be met

1. The frequencies must be the same (with minimal margin of error) .

2. The voltage must be the same (with minimal error) .

3, the voltage phase must be the same (allow a small error) .

According to the different load, should use the following settings, the following values are rated current as a reference.

When the power factor is 0.8(rated current) sag value should be set to 3% of the rated voltage

Power factor of O (rated current) droop value should be set to 5% of the rated voltage

Setting SAG is most accurate at low power factor loads.

Note 1: reverse current transformer will increase the generator voltage with the increase of load. The SL-S2 position shown on the wiring diagram shall be switched.

Note 2: it is important to set the SAG of all generators to the same value. The accuracy of the SAG value is secondary.

Note 3: when a generator is running alone, the terminal S-BS2 needs to be shorted.

Yes! If the generator runs short of fuel, the generator will run in the motor state and the winding will be damaged, so it is necessary to install reverse power relay to cut off the main circuit breaker.

In order to cut off the main circuit, it is necessary to install a fault detection device because the generator will cause large current oscillation and the winding will be damaged

4.10 maintenance

Regular maintenance and regular maintenance can be found in time and correct the existence of abnormal phenomenon. This is very important for the safe operation of the generator and the prevention of accidents. All maintenance measures should be carried out regularly. Maintenance rules should be based on the use of regular maintenance planning, scheduled implementation.

1 general maintenance

1) the generator must not be damp. During the period of stop use should be covered with a cloth to prevent moisture intrusion;

2) no metal dust, water droplet dust, acid-alkali water vapor or other harmful gas shall enter into the inner part of the generator, no matter it is parked or running.

3) when the generator is running, the normal ventilation should be kept. The front and rear window lids and the top lids should be kept in the correct position. Do not cover the motor with anything to prevent obstruction of ventilation and heat dissipation. Do not cover the motor with any object to avoid affecting the ventilation of the Voltage regulator.

4) monitor the load of the generator. The load current shall not exceed the rated current of the generator. Note that when the load power factor is low, the excitation current of the generator should not exceed the rated value on the nameplate. When the three-phase load is unbalanced,

the current of the largest phase of the load should not exceed the rated current.

5) pay attention to the temperature of the generator bearing. Under normal circumstances, the temperature rise of the bearing should not exceed 55. OK

2 maintenance items

The insulation resistance of each winding shall be measured with a 500 V Megohm meter and shall be dried if the insulation resistance is less than 0.4 Megohm (in hot state) . If the insulation resistance can not be increased after drying, it means that the insulation has been aging, should replace the coil and insulation, and re-insulation treatment.

2) check the grease in the bearing room. If the color of grease discoloration or uneven color should be replaced grease, oil should be changed bearing and bearing cover all the old oil removed. Clean with clean refining oil thoroughly, and then re-add new grease, “Wet tropical type” for ZL-3 lithium bearing grease, “Ordinary” for Zgn-3 calcium-sodium base bearing grease, can also be ZL-3 lithium bearing grease. Different grades of bearing grease should not be mixed. The additional capacity should be 1/2 -1/3 of the capacity of the bearing chamber, should not be too much. Bearing grease too much, in the operation of the bearing will cause overheating. Use sealed bearings with grease, change bearings regularly or if abnormal bearing is found.

3) disassemble the motor and thoroughly blow the inside of the motor with a dry Compressed air. Pay special attention to blowing the dust between the terminals of the terminal board and on the automatic Voltage regulator to prevent electricity climbing. The surface of each coil, the inside of the fan and the ventilation channels should also be thoroughly cleaned to ensure effective ventilation and heat dissipation.

4) if the automatic Voltage regulator is damaged, we should ask professional engineers to repair it or order spare parts from our factory for replacement.

3 disassemble

3.1

1) remove the back bearing cover, remove the connection between the exciter stator and the main generator terminal board, then remove the bolts on the motor back cover can be removed with the back cover exciter stator.

2) for the single-bearing generator, the connection between the lead wire and the terminal board in the outlet box is removed first, and then the plate-type coupling steel plate is removed. Then the rotor can be lifted out of the stator slowly with the special spreader.

3) for double-bearing generator, it is necessary to remove the front bearing outer cover, then remove the bolts of the front end cover, and make the end cover exit the stop before removing the front end cover, and then the rotor can be lifted out of the stator slowly with the special spreader.

4) to remove the bearing, the spring ring should be removed from the bearing, and then pull the bearing out with a pull pin.

5) for the large capacity generator, the rotor is heavy, and the non-transmission end of the shaft is provided with screw holes, which can be connected into the sleeve to help hoisting.

3.2 assembly steps

The parts of the mating surface will be thoroughly wiped clean, and disassembly process is roughly the opposite step of assembly, pay particular attention to the rotor into the stator, do not touch the stator coil.

3.3 precautions for disassembly and assembly

1) when disassembling the connector, pay attention to the missing or indistinct mark of the thread head, and make the mark again.

2) the unloaded parts should be kept in good condition, the conduction direction of the rectifying element should be the same as the original one, the forward and reverse resistance should be measured with a multimeter, whether the silicon rectifying element is damaged or not. The forward (on-direction) resistance of the rectifier element should be small, less than a thousand euros as measured by a multimeter, and the reverse resistance should be large: generally greater than 1000 × 103 euros.

4) when changing the excitation windings of the generator, the polarity of the magnetic pole should be paid attention to. The magnetic pole coils should be connected in order of one positive and one negative. After insulation treatment, the rotor of the generator should be calibrated on the dynamic balancing machine. The method of correcting the dynamic balancing is to be weighted on the fan of the generator and the armature core of the non-transmission end of the alternator.

5) when removing the bearing cap and bearing, take care to cover the removed parts with clean paper to avoid dust fly in, if there is dust immersed in the bearing grease, should be replaced all the grease.

6) after the generator is assembled, gently lift the front end of the rotor, the rotor should be able to rotate flexibly, without any friction phenomenon.

4 failure and handling

Failure phenomenon	Cause of failure	Methods of inspection and handling
No electricity	(1) insufficient residual magnetism	Measure the E + and e-of the automatic voltage regulator, the correct voltage is about 10V, connect the 6V battery to the automatic Voltage regulator E + and e-and charge it for L-2 seconds.
	(2) connection error	Check and correct according to the circuit diagram.
	(3) the wrong polarity of the excitation windings of the main generator or exciter	Check the wiring of the excitation winding and correct it.
	(4) the rotating silicon rectifying element breaks down short circuit and turns on both positive and negative directions	Check the reverse resistance of the rectifying element with the multimeter and replace the damaged element.
	(5) the generator excitation winding is open	When the motor excitation winding is measured with a multimeter, the resistance is infinite when the circuit is open.
	(6) the windings of the main generator or exciter are seriously short-circuited.	Armature winding short-circuit, generally there is obvious overheating, excitation winding short-circuit, can be judged by its DC

		resistance value, replace the damaged winding.
No-load voltage is too low (E. G. Line voltage is only about 100 volts)	(1) the excitation winding of the exciter is broken	Check the excitation winding resistance of the exciter is infinite. Replace the broken coil or connect the coil circuit.
	(2) the excitation winding of main generator is seriously short-circuited	Exciter excitation winding current is very large. The excitation windings of the main generator have serious heating and vibration increase, and the DC resistance of the excitation windings is much smaller than the normal value. Replace the short circuit coil.
	(C) automatic Voltage regulator out of control	At rated speed, measure whether the output DC current of the Voltage regulator is equal to the no-load characteristic of the motor before leaving the factory, and repair the Voltage regulator automatically.
3. The no-load voltage is too high	(a) white Voltage regulator failure	No-load exciter excitation current too. Automatic Voltage regulator.
	(2) setting voltage is too high	Reset the voltage.
4, exciter excitation current is too big	(1) one or two of the rectifying elements are not open in either direction.	Check with the multimeter and replace the damaged components.
	(2) the excitation winding of the main generator or exciter is short-circuited.	The address current resistance of each pole coil is measured. Replace the coil with a short circuit fault.
5. Poor steady-state voltage regulation	There's something wrong with the Voltage regulator	Check and troubleshoot
6. High Vibration	(1) poor docking with prime mover	Check and correct docking. After each bolt is fastened, the axis of the generator and the prime mover are aligned and concentric.
	(2) the rotor dynamic balance is not good	Recalibrate the dynamic balance.
	(3) the excitation windings of the main generator are short-circuited	Measure DC resistance of each pole, find out short circuit. Replace the same line.
	(4) bearing damage	Generally have overheated bearing cover phenomenon, replacement bearings.

	(5) failure of prime mover	Check motive.
Overheating	(1) generator overload	Make the load current, voltage does not exceed the rated value.
	(2) the load power factor is too low	Adjust the load, the excitation current does not exceed the rated value.
	(3) the speed is too low	Adjust the speed to the rated value.
	(4) some windings of a generator are short-circuited	Find short circuit, correct or replace coil.
	(5) obstruction of ventilation ducts	Remove obstructions, disassemble the motor, and thoroughly blow out the air ducts.
8. Bearing overheating	(1) excessive wear of bearing after long time use	Change bearings.
	(2) the quality of lubricating oil and grease is not good, different brands of grease are mixed. There are impurities in the grease. Too much grease.	Remove old grease, clean and replace with new grease.
	(3) bad docking with prime mover	To win strictly, find the right concentric.

Chapter 5, spare parts and warranty conditions

1 spare parts list

Standard ex-factory generators are not equipped with spare parts, but in critical applications, generators should be purchased with an additional set of such spare parts.

1) a set of diode assemblies (6 diodes, 1 varistor)

VARISTOR model: ZL25D431 ZL40D821

Ask the factory if the AVR has specifications and if you need to add permanent Voltage regulator

3) bearings, two-bearing generator with two bearings, single-bearing generator with one bearing

2 guarantee period

The warranty period of the alternator is 18 months from the date of our notification of the goods being ready for shipment or 12 months from the date of the first commissioning of the generator (whichever is first) .

3 failure after delivery

Any failure of our products during this warranty period under correct use is found to be due solely to material and manufacture, and we shall choose (decide) to repair or replace it. The defective parts should be returned to the sales agent or our factory in a timely manner, and the freight has been paid. The ex-factory number and Mark should be intact.

We will not bear any expenses incurred in moving, replacing any parts sent to us for testing or installing any replacement parts supplied by us. For failure to follow the installation procedures recommended in the“Installation, use and maintenance manual” and“Application Guide” of our company, or due to improper storage, or repair by a non-authorized agent of our company, we shall not be liable for any damage caused by maintenance or replacement. For third party products or patented products not produced by our company, though they are supplied by us, their quality shall be guaranteed by the respective manufacturers (if any) .

Any claim under this warranty must include a detailed description of the fault, a description of the product, the date of purchase, the name and address of the supplier, and the serial number of the product (marked on the manufacturer's nameplate) . If spare parts are involved, please provide the order number of spare parts.

Our decision on all claims is final and conclusive, and users should accept our decision on all issues such as failure and replacement of parts.

Through the repair or replacement of the above parts, we have fulfilled all our responsibilities and in no case shall our responsibilities exceed the current prices for defective products.

This clause is to supplement the special quality guarantees and conditions of the product stipulated in the law, we are not responsible for any breakdown, any damage or loss (including the direct loss of the breakdown or any loss resulting from any other related work) in the products we have delivered, it does not matter whether the liability is based on contract, tort or other grounds.

Factory number	

To create a leading brand in the generator industry

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