LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE

Low Voltage Alternators - 4 pole

Installation and Maintenance

LEROY-SOMER™

Nidec
All for dreams

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

This manual Corresponds to the AC Generator which you have just purchased.

The latest addition to a whole new generation of AC Generator, this range benefits from the experience of the leading manufacturer worldwide, using advanced technology and incorporating strict quality control.

SAFETY MEASURES

Before using your machine for the first time, it is important to read completelly this installation and maintenance manual.

All necessary operation and instructions on this machine must be performed by a qualified technician.

Our technical support service will be pleased to provide any additional information you may require.

The various operations described in the manual are accompanied by recommendations or symbols to alert the user to potential risks of accidents. It is vital that you understand and take notice of the following warning symbols.

WARNING

Warning symbol for an operation capable of damaging or destroying the machine or surrounding equipment.

Warning symbol for general danger to personnel.

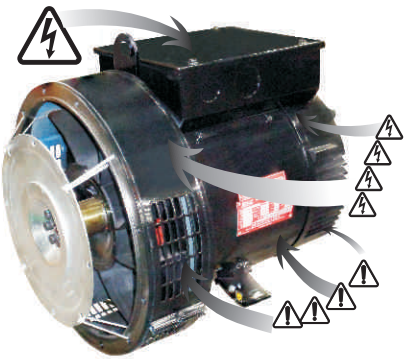
Warning symbol for electrical danger to personnel.

Note: LEROY-SOMER reserves the right to modify the characteristics to its products at any time in order to incorporate the latest technological development. The information contained in this document may therefore be changed without notice.

We wish to draw your attention to the contents of this maintenance manual. By following certain important points during installation, and servicing of your AC Generator, you can look forward to many years of trouble-free operation.

WARNING SYMBOLS

Locations at which warning symbols shoud be positioned is shown in the sketch below. User may install these for safety purposes. (the stickers of symbols are generally not supplied with the machine).



LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

1- RECEIPT

1.1.Standards and safety measures

Our ac generators comply with most international standards and are compatible with IS 4722 and' the recommendations of the

International Electrotechnical Commission. IEC 34-1

Before using your generator for the first time, read carefully the contensts of this installation and maintenance manual, supplied with the machine. All operations performed on the generator should be undertaken by qualified personnel with specialist training in the commissioning, servicing and maintenance of electrical and mechanical machinery. This maintenance manual should be retained for the whole of the machine's life and be handed over with the contractual file. The various operations described in the manual are accompanied by recommendations or symbols to alert the user to potential risks of aciddents. It is vital that you understand and take notice of the different warning symbols.

1.2 Inspection

On receipt of your alternator, check that it has not suffered any damage I transit. If there are obvious signs of knocks, contact the transporter (you may able to claim on their insurance) and after a visual check, turn machine by hand to detect any malfunction (double bearing).

1.3 Identification

The ac generator is identified by means of a nameplate fixed on the frame.

Make sure that the nameplate on the machine conforms to your order.

1.3.1 Nameplate

You can identify your machine quickly and accurately, we suggest you fill in its specifications on the nameplate below.

Mention name plate details on all your correspondence.

1.4 Storage

Prior to commissioning, machines should be stored away from humidity ; In case of relative humidity of more than 90%, the machine insulation resistance (IR) can drop very rapidly, just above zero at around 100% humidity Monitor the state of the anti-rust protection on unpainted parts. For storage over an extended period, the machine can be placed in a sealed enclosure (heatshrunk plastic) with dehydrating sachets inside, away from significant and frequent variations in temperature to avoid the risk of condensation during storage. If the area is affected by vibration, try to reduce the effect of these vibration by placing the generator on a damper support (rubber disc or similar) and turn the rotor a fraction of a turn once a fortnight to avoid marking on bearing rings.

LEROY-SOMER™

BRUSHLESS SYNCHRONOUS GENERATOR

Type		M/CNo.					
kVA		Insul.Class		Encl.		Conn.	
kW		Direction DE		Hz		Altitude	
Volts		Ambient °C		P.F.		RPM	
AMPS.		SAE / Disc		Duty		Wt.	Kg.
Phase		Excitation	VOLTS		AMPS.		
AVR		Bearing	DE.	NDE.		IEC 34.1 / IS: 13364/60034	

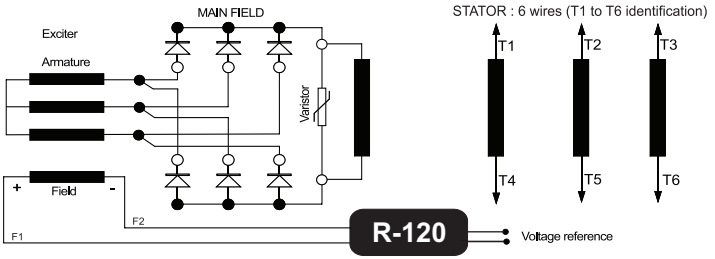
NIDEC INDUSTRIAL AUTOMATION INDIA PRIVATE LTD.
BENGALURU - 562 162. INDIA

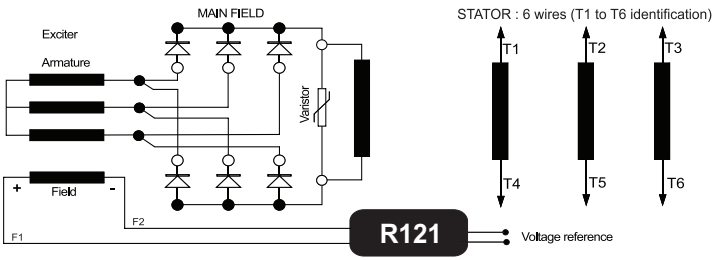
LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

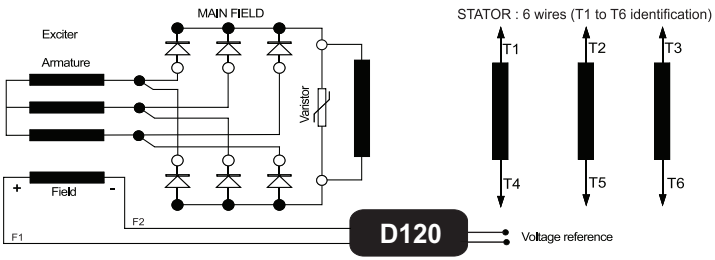
2 - TECHNICAL CHARACTERISTICS

2.1 Electrical characteristics

The LSAP alternator is a machine without sliprings and revolving field brushes, will have"2/3 pitch", 6-wire, with class 'H' insulation and a field excitation system available in either "SHUNT" or "AREP" version.







2.1.1 Options

- Stator temperature detection probes.
- Space heaters.

2.2 Mechanical Characteristics

- Steel frame
- End shields in cast iron
- Greased ball bearings
- Mounting arrangement

Md35;
Single bearing with standard feet and SAE flages/coupling discs.
B34

Two-bearing with SAE flange and standard cylindrical shaft extension.

- Machine, self-cooled
- Degree of protection; IP 23

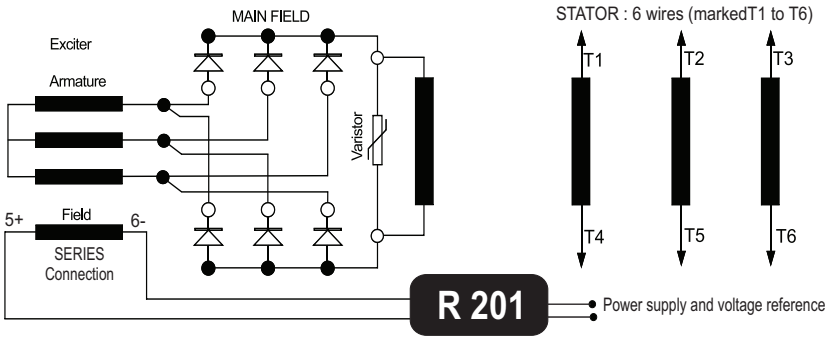
2.3 Options

- Protection against harsh environment.
- Air input filter, air output labyrinth cowling. Alternators fitted with air inlet filters should be derated by 5% (power)
- To prevent excessive temperature rise caused by clogged filters, it is advisable to fit the stator winding with thermal sensors (PTC or PT 100).

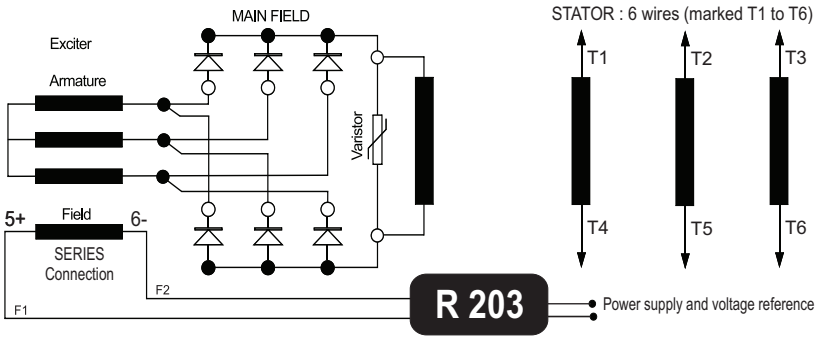
2.4 - SHUNT system with R201/R203 AVR

R201 AVR for LSAP42/43/44: R203 AVR for LSAP40

LSAP42/43/44 SHUNT version



LSAP40 SHUNT version



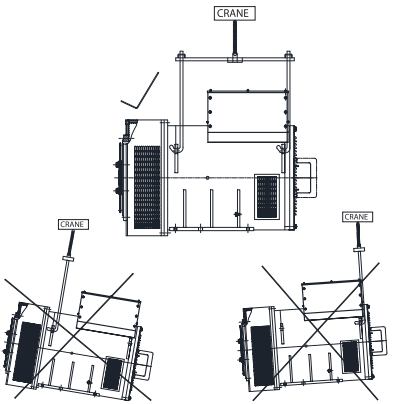
LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

3 -INSTALLATION
3.1 Assembly

All mechanical handling operations must be undertaken using approved equipment. While being handled, the machine should remain horizontal.

3.1.1 Handling

The generously- sized lifting rings are for handling the AC Generator alone, They must not be used to lift the genset. Choose a lifting system which respects the positioning of the rings.



3.1.2 Coupling

3.1.2.1 Single bearing ac generator

Before coupling to the prime mover, check that both are compatible by:
- Undertaking a torsional analysis of the transmission.
- Checking the dimensions of the flywheel and its housing, the flange, coupling discs and offset.

WARNING

When coupling with ac generator to the prime mover, the holes of the coupling discs should be aligned with the flywheel holes by cranking the engine. Do not use the alternator fan to turn the rotor.

Tighten the coupling discs screws to the recommended torque and check that there is lateral play on the crankshaft.

3.1.2.2 Double bearing ac generator

-Semi-flexible coupling
Careful alignment of the machines by measuring the concentricity and parallelism of the two parts of the coupling is recommended, the difference between the readings should not exceed the pecified values (say 0.1 mm)

WARNING

This ac generator has been balanced with a ½key.

3.1.3 Location

Ensure that the ambient temperature in the room where the ac generator is place cannot exceed 40° C for standard power ratings (for temperatures above 40° C, apply a derating coefficient). Fresh air, free from damp and dust, must be able to circulate freely around the air input louvers on the opposite side from the coupling, It is essential to prevent not only the recycling of hot air from the machine or engine, but also exhaustfumes.

3.2 Inspection prior to first use
0.2.1 Electrical checks

Under no circumstances should an ac generator, new or otherwise, be operated if the insulation value is less than 1 megohm for the stator and 100,000 ohms for the other windings.

There are two possible methods for restoring the above minimum values.
a) Dry out the machine for 24 hours in a drying oven at a temperature of approximately 110°C.
b) Blow hot air into the air input, having made sure that the machine is rotating with the exciter field disconnected.
c) Run in short-circuit mode (disconnect the AVR)
- Short-circuit the output phases using connections capable of supporting the rated current (try not to exceed) 6A/mm2)
- Insert a clamp ammeter to monitor the current passing through the short-circuit connections.
- Connect a 48 Volt battery in series with a rheostat of approzimately 10 ohms (50 Watts), to the exciter field terminals, respecting the polarity.
- Open fully all the ac generator louvers.
- Run the ac generator a rated speed. Adjust the exciter field current using the rheostat to obtain the rated output cuttent in the short-circuit connections.

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

Note: Prolonged standstill: In our order to avoid these problems, we recommend the use of space heaters, as well as turning over the machine from time to time. Space heaters are only effective if they are working continuously while the machine is stopped.

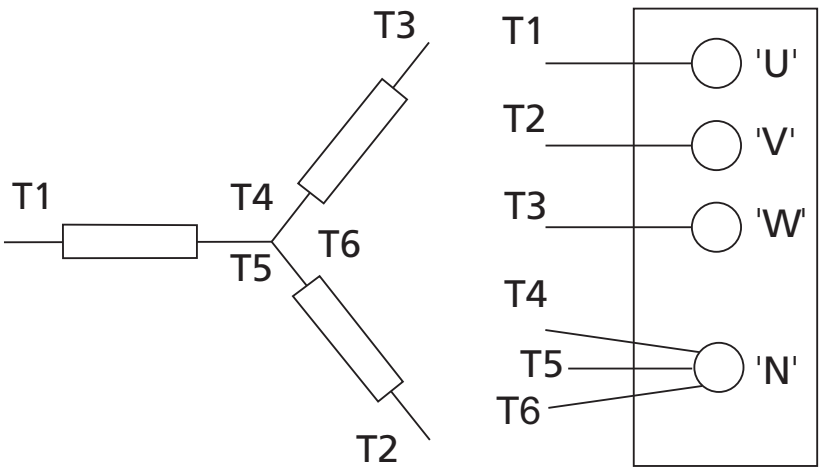
3.2.2 Physical and visual checks

Before starting the machine for the first time, check that:
- the fixing bolts onthe feet are tight
- the cooling air is drawn in freely
- the protective louvres and housing are correctly in place
- the standard direction of rotation is clockwise as seen from the shaft and (Phase rotation in order 1 - 2 - 3). For anticlockwise rotation, swap 2 and 3.
- the winding connection corresponds to the site operation voltage.

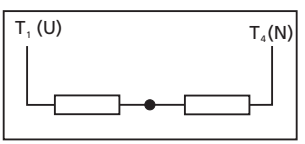
3.3 Terminal Connection diagrams

To modify the connection, change the position of the terminal cables, Consult the factory for this.

Any intervention on the ac generators terminals durin reconnection or checks should be performed, with the machine stopped.



Dedicated Single phase Wiring diagram.



Note : Above connections Diagrams are for explanation only

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

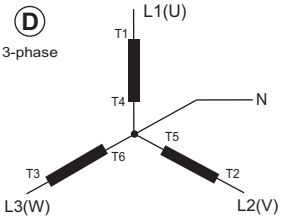
3.3.1 - Mechanical checks

Before starting the machine for the first time check that :
- the fixing bolts on the feett are tight.
- the cooling air is drawn in freely.
- the protective grilles and housing are correctly in place.
- the standard direction of rotation is clockwise as seen from the shaft end (phase rotation in order 1-2-3). For anti-clockwise rotation swap 2 and 3.
- the winding connection corresponds to the site operation voltage (see section 3.3)

3.3.2 - Terminal connection: 6 wire

Connection codes

D 3-phase

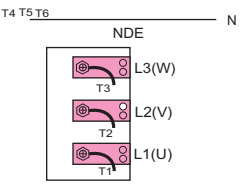


Voltage L.L

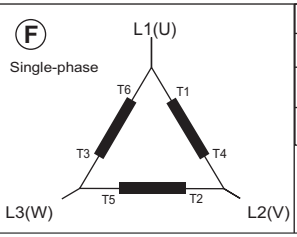
Winding	50 Hz	60 Hz
6	380-415	480

R201/ voltage sensing:
U=>(T1) / V=>(T2)
N =>N
R203/ voltage sensing:
0=>(T1) / 200V=>N

Factory connection

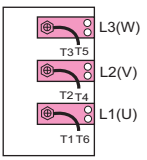


F Single-phase



Winding	50 Hz	60 Hz
6	220-240	240

R201/203 voltage sensing:
0 => (T3) / 220 V => (T2)

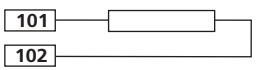


Operating phases :L2(V), L3 (W) single phase

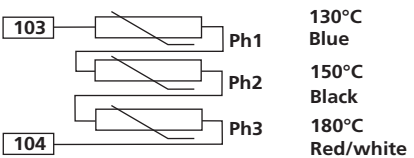
In case of reconnecting, ensure that AVR voltage sensing is correct!

3.3.3 - connection diagram for options

Anti condensation heater



Thermistor (PTC) temperature



LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

3.3.4 Connection checks

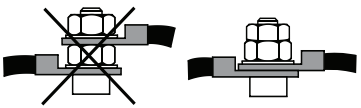
Electrical installations must comply with the current legislation in force in the country of use.

Check that:
-the differential circuit-breaker confirms to legislation on protection of personnel, in force in the country of use, and has been correctly installed on the ac generator power output as close possible to the ac generator.

- any protective devices in place should not be tripped.
- if there is an external regulator, the connections between the ac generator. and the cubicle are made in accordance with the connection diagram.

- there is no short-circuit between phases or phase neutral between the alternator output terminals and the generator set control cabinet (part of the circuit not protected by circuit-breakers or cubicle relays)

The machine should be connected with the terminal lugs on top of one another as shown in the terminal connection diagrams.



3.4 Commissioning

The machine can only be started up and used if the installation is in accordance with the instructions and advice defined in this manual.

The machine is tested and set at the factory. When first used with no load, make sure that the drive speed is correct and stable (see the nameplate). On application of the load, the machine should maintain its rated speed and voltage however, in the event of abnormal operation, the machine setting can be altered. If the machine still operates incorrectly, the cause of the malfunction must be located.

3.5 Setting up

The various adjustments during tests must be made by a qualified engineer. Take care that the drive speed specified on the nameplate is reached before commencing adjustment. After operational testing. Replace all access panels or covers.

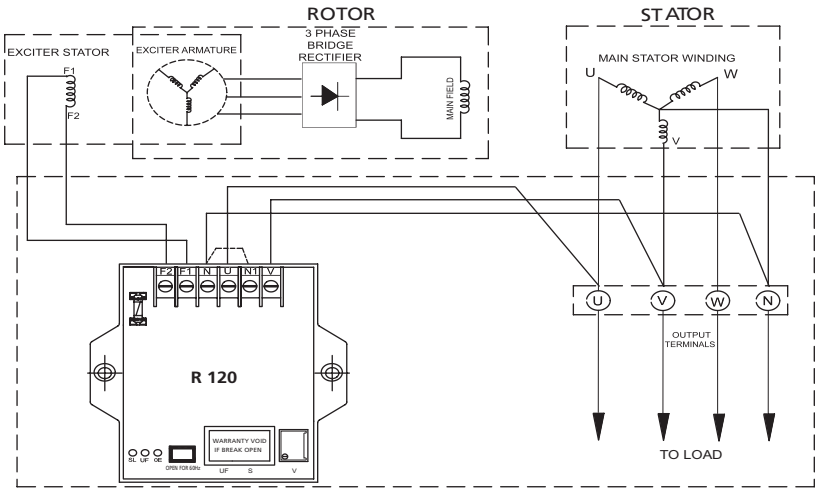
4. AVR

4.1 R 120 / R 121 / D 120

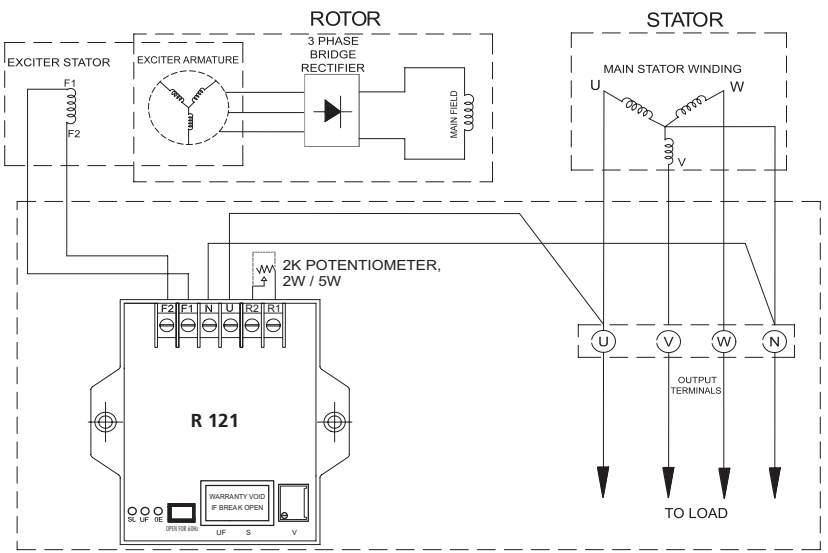
LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

4.2 AVR CONNECTION DIAGRAM

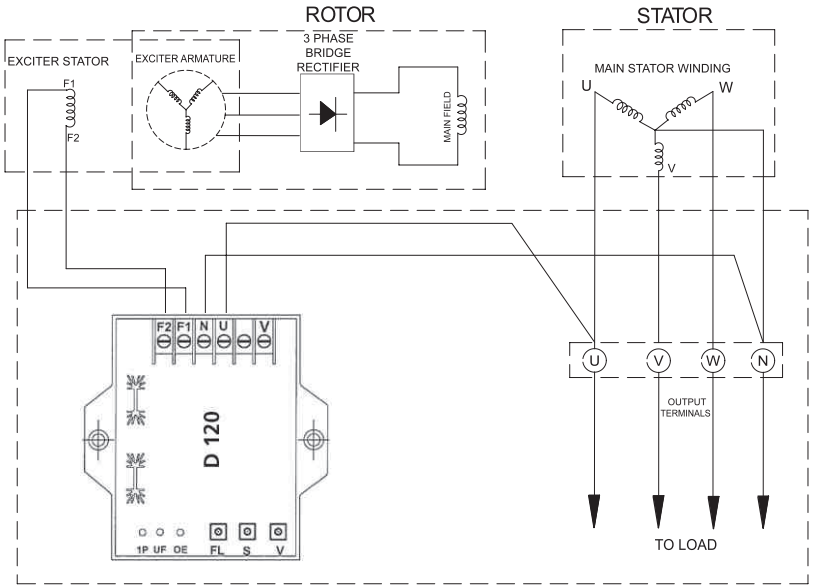
The AVR or Automatic Voltage Regulator type R-120 is state - of the -art advanced electronic voltage regulator which ensures high voltage regulation within ±1%. It has an excellent dynamic response and the recovery time of 1sec. on application of full load. The AVR is potted so that it can operate even in humid and corrosive atmosphere. It provides factory set under-speed protection for the ac generator by U/f function. The AVR is mounted on anti-vibration dampers for long life.

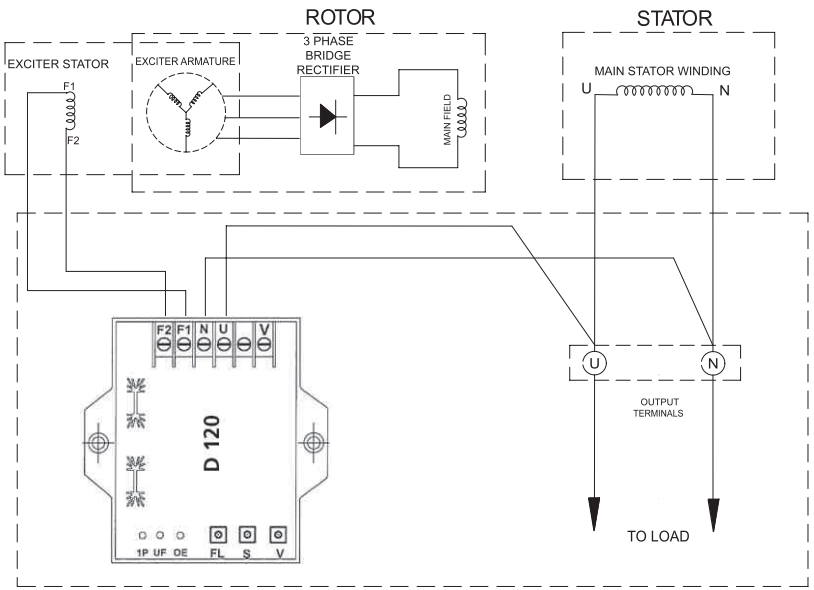


Note : For 1 Phase connection connect, between U & N Put short link between N & N1



LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS





4.2a AVR PARAMETER

SL. No.	PARAMETER	R-120	R-121	D-120
1	Voltage adjustment	✔	✔	✔
2	Stability adjustment	✔	✔	✔
3	Under frequency roll off adjustment	✔	✔	☒
4	Remote voltage adjustment	☒	✔	☒
5	Remote voltage indication	☒	☒	☒
6	Accessory (DC input)	☒	☒	☒
7	Quadrature Droop	☒	☒	☒
8	Sense Loss indication	✔	☒	☒
9	Over excitation indication	✔	✔	✔
10	Under frequency roll off	✔	✔	✔
11	Frequency roll of indicator	✔	✔	✔
12	Flickering Adjustment	☒	☒	✔
13	1ph Indication	☒	☒	✔
14	Phase shift Adjustment	☒	☒	✔

Characteristics

- Voltage regulation: ± 1%
- Supply range/voltage detection
  230V (50HZ)
- Response time (1sec.) for a transient
  voltage variation amplitude of ± 20%
- Voltage setting: V
- Stability setting : Sealed

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

4.3 - R201 & 203

4.3.1 AVR introduction

Sensing Input

Voltage	170~260 VAC or 370~460VAC, 1 phase 2 wire jumper selectable
Frequency	50 / 60 Hz, Jumper selectable

Power Input

Voltage	80 ~ 260 VAC, 1 phase 2 wire

Output

Voltage	Max. 90 VDC @ 240 VAC input
Current	Continuous 5A Intermittent 10A for 10 sec
Resistance	Min. 9 ohm

Voltage Regulation

< ±1% (with 4% engine governing)

Voltage Build-up

Residual voltage at AVR terminal > 5 VAC

Thermal Drift

0.03% per ºC change in AVR ambient

External Volts Adjustment

± 8% with 1K ohm 1 watt trimmer

Unit Power Dissipation

Max. 10 watt

Under Frequency Protection (Factory Setting)

60 Hz system presets knee point at 57 Hz

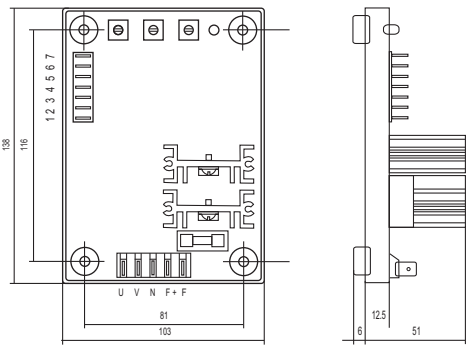
50 Hz system presets knee point at 47 Hz

Soft Start Ramp Time

2 sec.

Dimensions

138mm Lx 103mm W x 53mm H



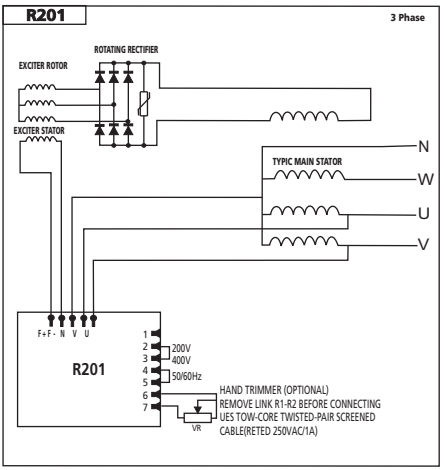
4.3.2 Notice of use

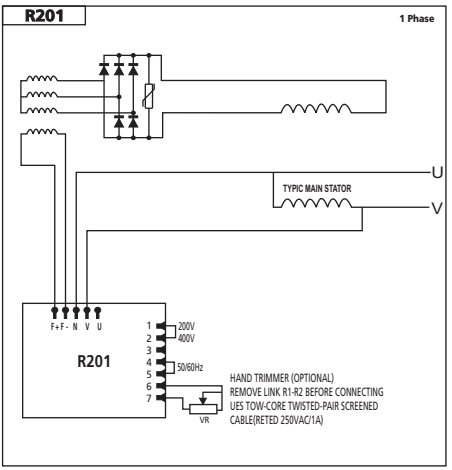
The R201 AVR can be mounted in various place, like generator control panel, switchgear cabinets, etc. But prevent high temperature, high moisture, or severe vibration places. See figure 1 for mounting dimensions. The R201 AVR surface temperature will be over 60ºC when operations. Do not touch the heat sink.

Startup Procedure

1. Ensure all the wire of the regulator are correctly connected and the proper fuse (5A250V) is installed.
2. Turn voltage potentiometer full anticlockwise (lowest voltage level).
3. If used, turn external voltage potentiometer to the middle position.
4. Turn stability potentiometer full clockwise (highest stability level).
5. Connect a 110VDC meter across the field F+, F- terminals.
6. Connect a 500VAC meter across line U to line V of generator.
7. Start and run the generator at no load and rated speed. The generator output voltage should build up to a minimum level, If the voltage does not build up, it may be caused by low residual voltage of generator. Refer to field flashing section in generator manual.
8. Slowly adjust voltage potentiometer clockwise until the generator voltage reach the proper value.
9. Turn stability trimmer clockwise until the output voltage is not stable, carefully turn stability trimmer anticlockwise until rated stable voltage is reached. That is the match point between AVR and generator.

4.3.3 AVR DIAGRAM





4.3.4 AVR PARAMETER

4.3.4(a) Frequency Roll-Off Adjustment

Connect a jumper from 4 to the 5 terminal for 50Hz operation, or leave the two terminals unconnected for 60Hz operation. To reset the frequency roll-off, proceed as follow :

1. Startup engine and build voltage
2. Adjust the prime mover RPM to the desired frequency compensation (corner frequency roll-off) point.
3. Adjust the front panel FREQ control until the output voltage low about 5V than nominal voltage.

(For 50Hz application, the frequency "roll-off" is factory preset to 47Hz, for 60Hz operation, the frequency is 57hZ).

4.3.4(b) Voltage Adjustment

1. Adjust the front panel VOLT to vary the generator nominal voltage.
2. If used, a 1kW 1watt potentiometer may be connected to terminals VR and VR, refer to Figure4,5.

4.3.4(c) Stability Adjustment

1. Adjust the front panel STAB control the system stable.
2. Rotation of the front panel STAB control in the counter-clockwise (CCW) direction will speed response time, F rotated too for CCW, the generator voltage may oscillate (shunt)
3. Rotated the front STAB control CCW until the system start oscillating and then rotate cw just past the point where oscillation occurred.

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

5 - SERVICING, MAINTENANCE

These instructions apply to the alternator of which you have just taken possession. We would like to draw your attention to the contents of this maintenance manual.

5.1 SAFETY MEASURES

Before operating your machine, you must have read this installation and maintenance manual completely.

All operations this interventions to be carried out to operate this machine will be carried out by qualified personnel.

Our technical support service is at your disposal for all the information you need.

The various operations described in this manual are accompanied by recommendations or symbols to make the user aware of the risks of accidents. It is imperative that you understand and respect the various

ATTENTION

Safety note for an intervention that can damage or destroy the machine or the surrounding equipment.

Safty instruction for general danger to personnel.

Safty instruction for electrical danger to personnel.

SECURITY INSTRUCTIONS

We would like to draw your attention to the following 2 safety measures:

A) During operation, prohibit the parking of any person in front of the air outlet grills due to a possible risk of material projection.

B) Do not allow children under the age of 14 to be approached by air outlets A sticker sheet of the various safety instruction is attached to this maintenance manual. They will be positioned according to the drawing and when the machine is completely installed

WARNING

The alternators shall not be put into service until the machinery in which they are to be incorporated has been declared in conformity with the EC Directives and any other applicable directives. These instructions must be transmitted to the end user the range of electrical alternators and related products manufactured by us or on our behalf comply with the technical requirements of the Customs Union (EAC) Directives.

5.2 Electrical faults

Fault	Action	Effect	Check/Cause
No Voltage at no load on start-up	Connect a new battery of 4 to 12 volts to terminal E- and E+. respectively for a time period for 2 to 3 seconds	The alternator builds up but its voltage does not reach the rated value when the battery is removed The alternator builds up but its voltage disappears when the battery is removed.	- Lack of residual magnetism - Check the connection of the voltage reference to the AVR - Faulty diode - Armature short-circuit - Faulty AVR - Field windings open circuit (check winding) - Main field winding short-circuited
Voltage too low	Check the drive speed	The speed is corrected.	- Check the AVR connections (possible AVR failure - Field windings short-circuited - Rotating diodes burn out. - Main field winding short circuited - check the resistance - Increase the drive speed
Voltage too High	Adjust AVR voltage potentiometer	Speed too low Ineffective adjustments.	(Do not touch the AVR voltage pot. (P2) before running at the correct speed.) Faulty AVR
Voltage oscillations	Adjust AVR stability potentiometer	If not effect, try normal fast recovery modes (St2)	- Check the speed : Possibility of cyclic irregularity - Loose connections - Faulty AVR
(*) Warning : During single-phase operation, check that the sensing wires from the AVR are connected to the correct output terminals.			
Voltage disappear during operation	Check the AVR. surge suppressor, rotating diodes and replace any defective components.	The voltage does not return to the rated value.	- Exciter winding open circuit - Faulty exciter armature - Faulty AVR - Main field open circuit or short-circuited

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

5.3 Checking the winding

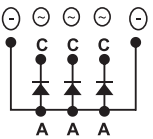
You can check the winding ins insulation by performing high voltage test. In this case. You must disconnect all AVR wires.

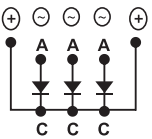
WARNING

Damage caused to the AVR in such conditions is not covered by our warranty.

5.4 Checking the diode bridge

A diode in good working order must allow the current to flow from the anode to the cathode.



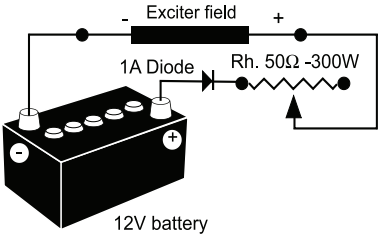


5.5 Checking the windings and rotating diodes using separate excitation

During this procedure, make sure that the ac generator is disconnected from any external load and inspect the terminal box to check that the connections are fully tightened.

1) Stop the unit, disconnect and isolate the AVR wires.
2) There are two ways of creating an assembly with separate excitation.

Assembly A : Connect a 12 V battery in series with rheostat of approximately 50 ohms 300 W and a diode on both field wires (+) and (-).



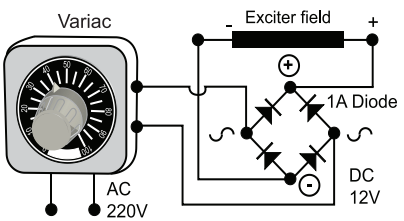
Assembly B : Connect a "Variac" variable power supply and diode bridge on both exciter field wires (+) and (-). Both these systems should have characteristics which are compatible with the machine field excitation power (see the nameplate).

3) Run the unit at rated speeds.

4) Gradually increase the exciter field current by adjusting the rheostat or the variac and measure the output voltages on U,V, W checking the excitation voltage and current at no load and on load (see the machine nameplate or ask for the factory test report).

When the output voltage is at its rated value and balanced within 1% for the rated excitation level, the machine is in good working order. The fault therefore comes from the AVR or its associated wiring (ie. sensing auxiliary, windings).

ASSEMBLY B



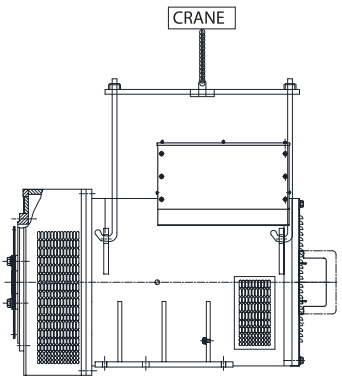
LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

6- DISMANTLING, REASSEMBLY

During the warranty parlod, this operation should only be esrried out in an approved workshop or in our factory, otherwise the warranty may be invalidated.

WARNING

Whilst being handled, the machine should remain norizontal



6.1 Tools required

- 1 ratchet spanner + extension
- 1 torque wrench
- 17 mm flat spanner
-18 mm flat spanner
-110 mm flat spanner
-112 mm flat spanner
-18 mm socket
-110 mm socket
-113 mm socket
-15 mm Allen key
-16 mm Allen key
-1 puller

6.2. Screw tightening torque

IDENTIFICATION	SCREWØ	Torque N.m
Field term. block screw	M4	4N.M
Field screw	M6	10N.m
Diode bridge screw	M6	5N.m
Diode nut	M5	4N.m
Assembly rod	M8	20N.m
Earth screw (if installed)	M6	5N.m
Balancing bolt	M5	4N.m
Discs/shaft screw	M10,12,16	66,110,250
Lifting screw	M8	4N.m
Grill screw	M6	5N.M
Cover screw	M6	5N.m

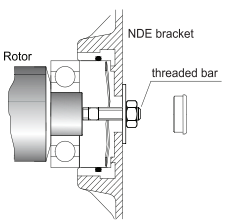
6.3 Accessing, checking and replacing diodes

6.3.1 Dismantling

- Remove the terminal box cover
- Remove the air intake louver
- Unscrew the fixing clamps on the power output cables, disconnect E+, E-on the exciter
- Remove the 4 nuts on the studs
- Remove the NDE bracket using an extractor.
- Remove the surge suppressor
- Remove the 4 fixing screws from the diode bridges on the armature.
- Disconnect the diodes.
- Check the 6 diodes using either an ohmmeter or a battery lamp

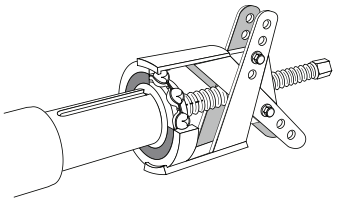
6.3.2 Reassembly

- Replace the diodes, respecting the polarity
- Replace the surge suppressor
- **Insert a new O ring in the bearing housing.**
- Refit the NDE shield and pass the bundle of wire between the top bars of the flange.
- Refit the air intake louvre
- Refit the terminal box cover



6.4 Replacing the NDE bearing on a single bearing machine

6.4.1 Dismantling



6.4.2 Reassembly

- Heat the inner slipring of a new bearing by induction or in a drying oven at80°c (do not use an oil bath) and fit it to the machine.

- Place the preloading wavy washer in the flang and fit a new O ring seal.

- Replace the NDE bracket

6.5 Replacing the DE bearing on a two bearing machine

6.5.1 Dismantling

- Uncouple the alternator from the prime mover.
- Remove the 8 assembly screws.
- Remove the DE flange.
- Remove the NDE shield.
- Remove both bearings using a puller.

6.5.2 Reassembly

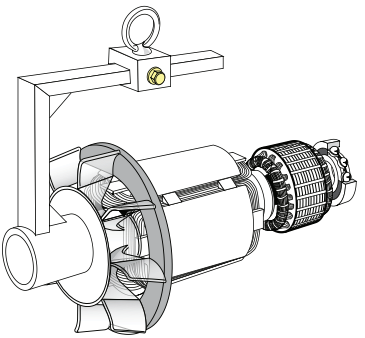
- Fit new bearings after heating them by induction or in a drying oven at 80°C (do not use an oil bath).
- Check that both the preloading wavy washer and new O ring seal have been fitted on the NDE shield Replace the DE flange, and tighten the fixing screws.
- Check that the whole machine is correctly assembled and that all screws are fully tightened.

6.6 Accessing the main field and stator

6.6.1Dismantling

Follow the procedure for dismantling bearings.

- Remove the coupling dies (Single-breaing machine) or the DE flange (two-bearing machine) and insert a tube of



the corresponding diameter on the shaft end or an support made according the following bellow.

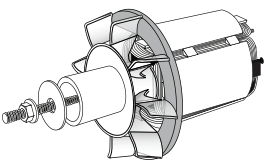
- Rest the rotor on one of its poles, then slide it out, Use the tube as a lever arm to assist dismantling.
- After extraction, be careful with the fan. It is necessary to replace the fan in case of disassembling.

NOTE: If intervention is required on the main field (rewinding, replacement of components), the rotor assembly must be rebalanced.

6.6.2 Reassembly

- Follow the dismantling procedure in reverse order. Take care not to knock the windings when refitting the rotor in the stator.

If you replace the fan, respect the assembly guide according the following bellow. Use a tube and a screw.



Follow the procedure for reassembling the bearings

After final adjustments, the access panels or cover should be refitted

7 - SPARE PARTS

7.1 First maintenance parts

Emergency repair kits are available as an option.
They contain the following items :

Description	Qty.
Voltage regulator (R-120)	1
Diode bridge assembly	1
Surge suppressor for 44.3 and above	1

7.2 Description of bearings LSAP 40/42.2/42.3/43.2/44.2/44.3/46.2

(a) Single bearing

Sl. No.	Frame	NDE Bearing No	Qty.
1	LSAP 40	6305 2RS C3	1
2	LSAP 42.2	6305 2RS C3	1
3	LSAP 42.3	6306 2RS C3	1
4	LSAP 43.2	6307 2RS C3	1
5	LSAP 44.2	6309 2RS C3	1
6	LSAP 44.3	6308 2RS C3	1
7	LSAP 46.2	6315 2RS C3	1

(b) Double bearing

Sl. No.	Frame	NDE Bearing No	DE Bearing No	Qty.
1	LSAP 40	6305 2RS C3	6309 2Z C3	2
2	LSAP 42.3	6306 2RS C3	6310 2Z C3	2
3	LSAP 44.3	6308 2RS C3	6314 2RS C3	2
4	LSAP 46.2	6315 2RS C3	6316 2RS C3	2

7.3 Product support

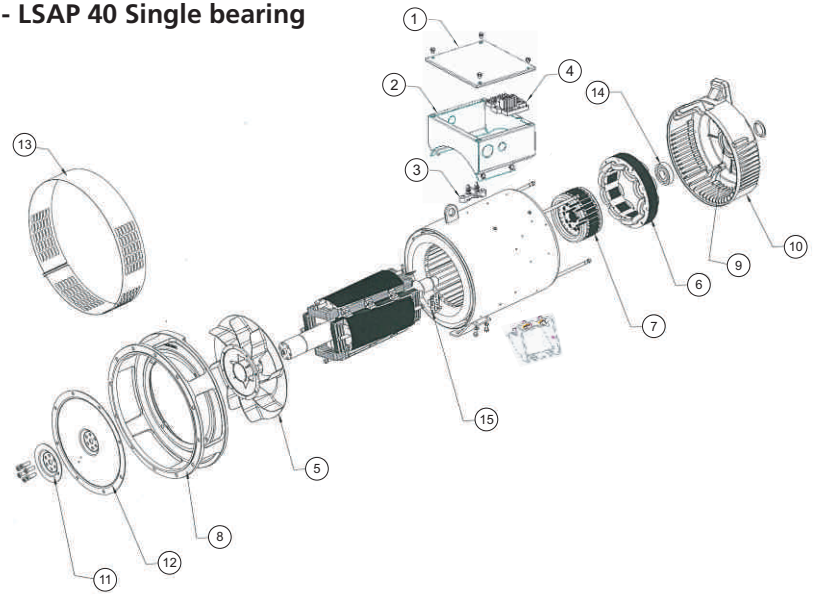
Product support group at our works will be happy to provide any information required by you.

When ordering spare parts, you should indicate the complete machine type, its serial number and the information indicated on the nameplate.

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

8 - Exploded view, parts list and tightening torque

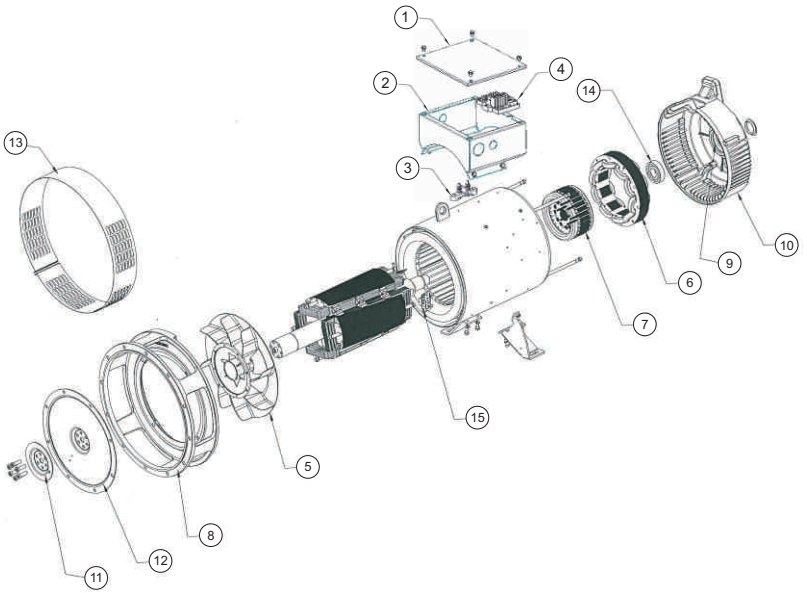
8.1 - LSAP 40 Single bearing



SL. No.	DESCRIPTION	QUANTITY
1	Terminal Box top cover	1
2	Terminal Box	1
3	Terminal Bar	1
4	AVR	1
5	Fan	1
6	Wound Exciter Stator	1
7	Wound Exciter Rotor	1
8	DE Adaptor	1
9	O Ring	1
10	NDE Flange	1
11	Pressure Plate	1
12	Disc (10”)	1
13	DE Slotted Surround	1
14	Ball Bearing (J.Nitrile 140°) 6305 2RS C3	1
15	Diode Bridge Rectifier	2

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

8.2 - LSAP 42.3 Single bearing



SL. No.	DESCRIPTION	QUANTITY
1	Terminal Box top cover	1
2	Terminal Box	1
3	Terminal Bar	1
4	AVR	1
5	Fan	1
6	Wound Exciter Stator	1
7	Wound Exciter Rotor	1
8	DE Adaptor	1
9	O Ring	1
10	NDE Flange	1
11	Pressure Plate	1
12	Disc (10”)	1
13	DE Slotted Surround	1
14	Ball Bearing (J.Nitrile 140°) 6306 2RS C3	1
15	Diode Bridge Rectifier	3

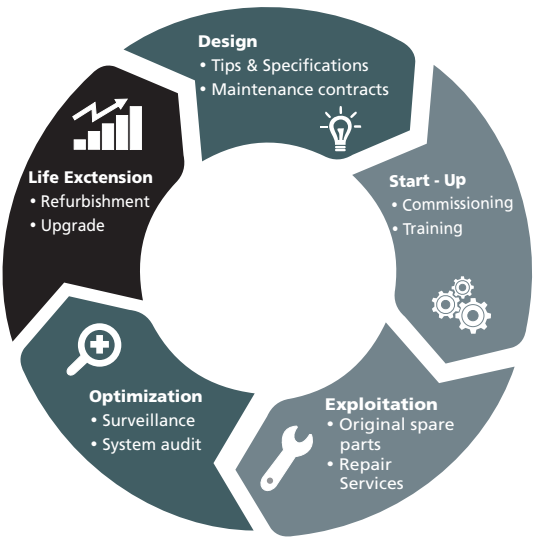
Service Support

Our network of international service of more than 80 instllations is at yourdisposal. This local presence guarantees fast, efficient tracking, support and maintenance services

Trust the power generation experts for the maintenance and support of your alternator. Our field staff is qualifed and perfectly trained to work in most environments and on all types of machines.

Our in-depth knowledge of alternator operation ensures optimal service to reduce your operating costs.

We are able to help you in the following areas



To Contact us:
Americas: +1 (507) 625 4011
Europe & International: +33 238 609 908
Asia-Pacific: +65 6250 8488
China: +86 591 88373036
India: +91 80 6726 4867

service.epg@leroy-somer.com

Scan the code or go to the page:
www.lrsm.co/support

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

Disposal and recycling instructions

We are committed to limiting the environmental impact of our business. We constantly monitor our production processes, our raw material supplies and the design of our products to improve the ability to recycle them and reduce our carbon footprint These instructions are provided for information purposes only. It is the user's responsibility to comply with local waste disposal and recycling legislation

Recyclable Materials

Our alternators are mainly composed of cast iron, steel and copper, which can be upgraded by recycling. These materials can be recovered via a set of dismantling, mechanical separation and melting processes. Our technical support can give you detailed instructions on disassembling products on request

Waste and hazardous materials

The folllowing components and materials require suitable treatment and must be removed from the alternator prior to the recycling process the electronic materials in the terminal box, including the automatic voltage regulator (198), the current transformers (176), the interference suppression module (199) and the other semiconductors.

- the diode bridge (343) and the varistor (347), assembled on the rotor of the alternator the main plastic components, such as the structure of the terminal box on certain products. These components usually have a symbol indicating the type of plastic used.

All the materials listed above must suitably processed to separate the waste from the recoverable materials and must be entrusted to the valorization companies.

The oil and grease used for bearing lubrication must be considered as hazardous waste and treated in accordance with local legislation

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

11. WARRANTY CERTIFICATE

Ref No. Date:

This is to certify that the AC Generator mentioned here under is warranted against inherent manufacturing defects under normal use and preventive maintenance. The AC Generator its components will be repaired free of cost if failed due inherent manufacturing defects within a period of 12 calendar months from the date commissioning or 18 calendar months from the date of dispatch whichever is earlier.

FRAME	kVA/ PHASE	RPM	MACHINE NO	ENGINE MAKE & TYPE

The above machine conforms strictly to the specifcation referred and if it is found defective during the above period, it will be rectifed / replaced / repaired free of cost by us / by our authorized service center on receipt of the defective product.

Refer Warranty Clause for more details

For Nidec Industrial Automation India Private Ltd.

Authorized Signatory

Name & Address of the OEM/Dealer: (Seal)

Name & Address of Customer

OEM's Invoice No:

Date of commissioning:

12. WARRANTY CLAUSE

1. The AC Generator will be repaired free of cost with in the warranty period, if it goes out of order due to inherent manufacturing defects.
2. The period of warranty is for TWELVE calendar months from the date of commissioning or EIGHTEEN calendar months from the date of dispatch whichever is earlier.
3. The warranty is subject to conditions that the AC Generator is returned to our works or authorized service center as directed, intact and without any alterations/additions/repairs done or attempted.
4. The warranty is applicable for AC Generators under normal use and preventive maintenance.
5. The warranty does not cover normal wear and tear or damages caused by accidents or wrong handling or due to improper installation and maintenance.

NOTE :- In order to provide effcient & correct services, our authorized technician should be allowed to inspect, analyse and assess the failure/ causes of failure at the site. Your co-operation in this regard helps us to serve you better.

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

This sheet to be sent for availing the warranty to the address below.

13. AC GENERATOR REGISTRATION FORM (ARF)-

1. Name and Address of user (s) : - _____

_____

_____

PIN::_____

Ph:_____

2. Rating and M/c Number of the AC GENERATOR:

a. Rating _____ kVA b. Machine Number _____

3. Name and address of the agency from which you have purchased the AC Generator.

Name: _____

_____

_____

PIN:_____Ph:_____Fax: _____

1. Date of Commissioning d ☐ m ☐ y ☐

2. Nature of power application from the AC Generator
(Please tick in the appropriate box)

Standby / Emergency power generation ☐ Captive Power Generation ☐ Others (Please specify below) ☐

3. Whether the voltage buildup was proper or not? Yes ☐ No. ☐

4.QualityofpoweravailablefromtheBrushlessACGenerator:Satisfactory ☐ Unsatisfactory ☐

If unsatisfed, please elaborate:

Signature Name & Company of Commisioning Engineer

Signature of Customer

Date:

Place:

BOOK - POST

To.

Nidec Industrial Automation India Private Ltd.
#45, Nagarur, Huskur Road, Off Tumkur Road,
Bengaluru - 562 162, India
T: +91 80 6726 4800 / F: +91 80 23717808
www.leroy-somer.in

Postage Stamp

LSAP 40 / 42.3 / 44.3 / 45 / 46.2-4 POLE A.C. GENERATORS

SERVICE HISTORY CARD

Date	Type Complaint	Action Taken	Parts Replaced	Result	Repair work Done by	Date of Completion

CLIMATE AND ENVIRONMENT

1) Anti-Condensation heaters (SPACE HEATERS)

Space heaters are recommended in areas of high humidity. Condensation will form on all surfaces which are cooler than ambient temperature. To avoid this, anti-condensation heaters can be fitted which will ensure the winding temperature remains a few degrees above the ambient temperature and hence no condensation will form. Note that the anti-condensation heaters should be on only when the D.G Set is OFF, and they should be switched off while the D.G set is in use.

2) Air Filters

Under site conditions where the air may be heavily laden with fine dust or sand we strongly recommend the fitting of inlet air filter. The sizing of these is important to avoid airflow restrictions and advice should be sought from the works.

Recommended deration to be considered for machines fitted with air filters.

LEROY-SOMER™

www.leroy-somer.in

twitter.com/Leroy-SomerIndia
linkedin.com/Leroy-SomerIndia

Nidec Industrial Automation India Private Ltd.
#45, Nagarur, Huskur Road,
Off Tumkur Road,
Bengaluru - 562 162, India
T: +91 80 6726 4800
F: +91 80 2371 7808
www.leroy-somer.in

Nidec Industrial Automation India Private Ltd.
64/A, Main Road,
Tarihal Industrial Area,
Tarihal, Hubli - 580 026. India
Tel. : 0836-2310408, 2310513/516/517
Fax : 0836-2310349
www.leroy-somer.in

Nidec
All for dreams

PS2000001200
R1