

Low Voltage Alternators - 4 pole

LSA 50.1 / LSA 51.2

Installation and maintenance

Leroy-Somer™


EMERSON™

LSA 50.1 / LSA 51.2

Low Voltage Alternators - 4 pole

**This manual concerns the alternator which you have just purchased.
We wish to draw your attention to the contents of this maintenance manual.**

SAFETY MEASURES

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

All necessary operations and interventions 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 this manual are accompanied by recommendations or symbols to alert the user to the potential risk of accidents. It is vital that you understand and take notice of the different warning symbols used.

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.

WARNING SYMBOLS

We wish to draw your attention to the following 2 safety measures which must be complied with:

a) During operation, do not allow anyone to stand in front of the air outlet guards, in case anything is ejected from them.

b) Do not allow children younger than 14 to go near the air outlet guards.

A set of self-adhesive stickers depicting the various warning symbols is included with this maintenance manual. They should be positioned as shown in the drawing below once the machine has been fully installed.

WARNING

The alternators must not be put into service until the machines in which they are to be incorporated have been declared compliant with Directives EC and plus any other directives that may be applicable.

This manual is to be given to the end user.

The range of electric alternators and their derivatives, manufactured by us or on our behalf, comply with the technical requirements of the customs Union directives (EAC).

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Disposal and recycling instructions

EC declaration of incorporation

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1 - RECEIPT

1.1 - Standards and safety measures

Our alternators comply with most international standards.

See the EC Declaration of Incorporation on the last page.

1.2 - Inspection

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

1.3 - Identification

The alternator is identified by means of a nameplate fixed on the machine (see drawing).

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

So that you can identify your alternator quickly and accurately, we suggest you fill in its specifications on the nameplate below.

1.4 - Storage

Prior to commissioning, machines should be stored :

- away from humidity (< 90%); after a long period of storage, check the machine insulation. To prevent the bearings from becoming marked, do not store in an environment with significant vibration.

1.5 - Application

These alternators are mainly designed to produce electricity in the context of applications involving the use of generators.

1.6 - Contraindications to use

Use of the machine is restricted to operating conditions (environment, speed, voltage, power, etc) compatible with the characteristics indicated on the nameplate.

Nameplate

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

The machine name is defined according to various criteria:

LSA 50.1 M6/4

- LSA : name used in the PARTNER range
- M : Marine
- C : Cogeneration
- T : Telecommunications
- 50.1 : machine type
- M6 : model
- 4 : number of poles

Puisissance		Cos φ		Δ	
Power rating	W	Eff.	%	Ph	Isolation
tr/min				Insulation	CI
RPM				PdB	WP
Service		Echauffement		Amb.	
Duty		Temperature rise			
Regulat.		Excitation		En charge	
A.V.R.		A vide		Rated load	
Date		No load			
Masse		Rit côté entraînement	DE BRG		
Weight		Rit côté opposé	NDE BRG		
Quant.		Avec			
Periodicité de graissage		With			
Grease every					
Graisser en rotation	Ou tous les 6 mois	Ou graisse équivalente	Or any equivalent grease		
Regrease in running	Or every 6 months	Graisser à mise en service - Regrease at the start up			
ALTERNATEUR		IEC 34		A.C. GENERATOR	
Made in France		MOTEURS LEROY- SOMER - DPT. ACEO 45005 ORLEANS CEDEX 1 (FRANCE)		PS 003 0367	

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2 - TECHNICAL CHARACTERISTICS

2.1 - Electrical characteristics

LSA 50.1 / 51.2 alternators are machines without sliprings or revolving field brushes, wound as «2/3 pitch», 6-wire, with class H insulation and a field excitation system available in either AREP+PMI or «PMG» version (see diagrams).

Interference suppression conforms to standard EN 55011, group 1, class B.

• Options

- Stator temperature detection probes
- Space heaters

2.2 - Mechanical characteristics

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

MD 35 :

single bearing with standard feet and SAE flanges/coupling discs.

B 34 :

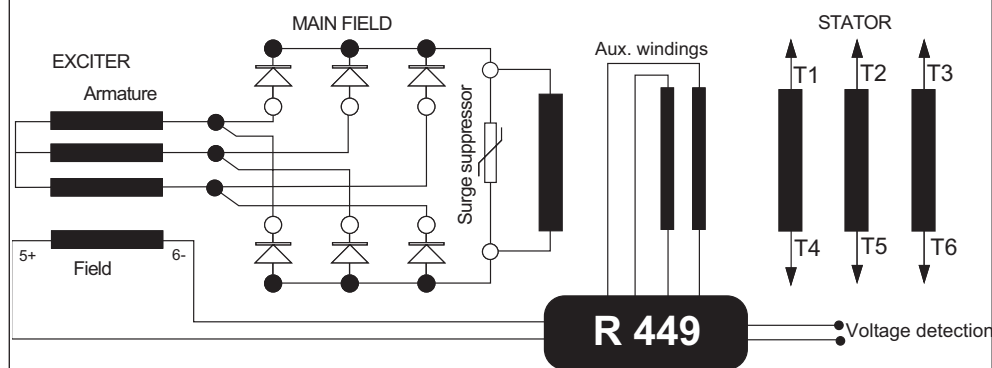
two-bearing with SAE flange and standard cylindrical shaft extension.

- Drip-proof machine, self-cooled
- Degree of protection : IP 23

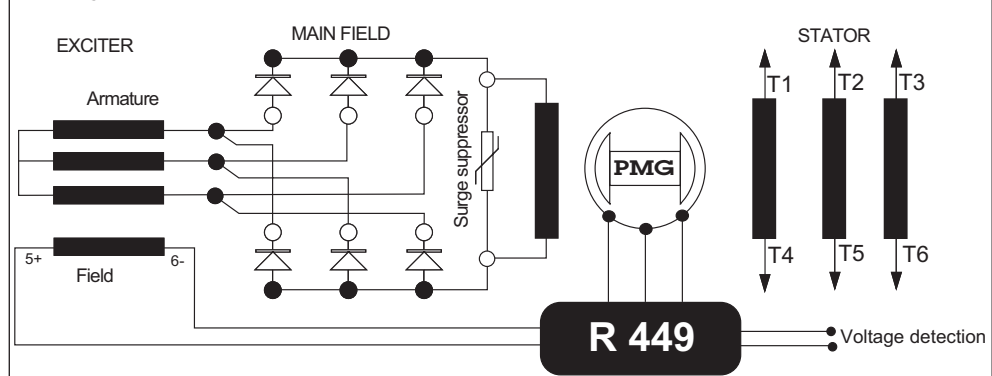
• Options

- Air inlet filter, air outlet filter

AREP+PMI system with R 449



PMG system with R 449



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3 - INSTALLATION

Personnel undertaking the various operations indicated in this section must wear personal protective equipment appropriate for mechanical and electrical hazards.

3.1 - Assembly



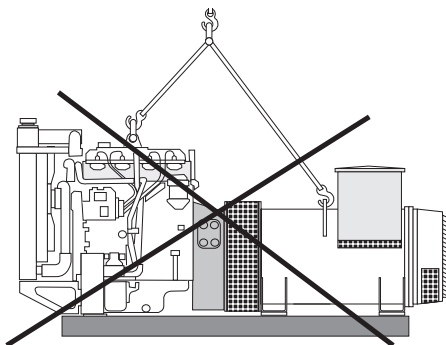
All mechanical handling operations must be undertaken using suitable equipment and the machine must be horizontal. Check how much the machine weighs (see 4.8) before choosing the lifting tool.

During this operation, do not allow anyone to stand under the load.

• Handling

The generously-sized lifting rings are for handling the alternator alone. They must not be used to lift the genset. The choice of lifting hooks or handles should be determined by the shape of these rings. Choose a lifting system which respects the integrity and the environment of the machine.

During this operation, do not allow anyone to stand under the load.



• Single-bearing coupling

Before coupling the machines, check that they 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 the alternator to the prime mover, do not use the fan to turn the alternator or rotor.

The holes of the coupling discs should be aligned with the flywheel holes by cranking the engine.

Make sure the machine is securely bedded in position during coupling.

Check that there is lateral play on the crankshaft.

• Double-bearing coupling

- Semi-flexible coupling

Careful alignment of the machines is recommended, checking that the lack of concentricity and parallelism of both parts of the coupling do not exceed 0.1 mm.

This alternator has been balanced with a 1/2 key.

• Location

The room where the alternator is placed must be ventilated to ensure that the ambient temperature cannot exceed the data on the nameplate.

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3.2 - Checks prior to first use

• Electrical checks



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

There are 2 possible methods for restoring the above minimum values.

a) Dry out the machine for 24 hours in a drying oven at a temperature of 110 °C (without the regulator).

b) Blow hot air into the air intake, having made sure that the machine is rotating with the exciter field disconnected.

Note : Prolonged standstill

In 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 really effective if they are working continuously while the machine is stopped.

WARNING

Ensure that the alternator has the degree of protection matching the defined environmental conditions.

• Mechanical checks

Before starting the machine for the first time, check that:

- all fixing bolts and screws 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 operating voltage (see section 3.3).

3.3 - Terminal connection diagrams

To modify the connection, change the position of the stator cables on the terminals. The winding code is specified on the nameplate.



Any intervention on the alternator terminals during reconnection or checks should be performed with the machine stopped.

In no case should the internal connections in the terminal box be subjected to stresses due to cables connected by the user.

Terminal connection diagram

Connection code		Voltage L-L													
<div><div><div>D</div><div>Star</div><div>3 PH</div></div><div><div><div><div><div>Ph1-L1</div><div>T1-U1</div></div><div><div>T4-U2</div><div>T6-W2</div></div><div><div>T5-V2</div><div>T3-W1</div></div><div><div>T2-V1</div><div>Ph2-L2</div></div><div><div>Ph3-L3</div></div></div></div></div></div>	<table><tr><td>Winding</td><td>50 Hz</td><td>60Hz</td></tr><tr><td>6 S</td><td>380 - 415</td><td>380 - 480</td></tr><tr><td>8 S</td><td>347</td><td>380 - 416</td></tr><tr><td colspan="2">AVR connector</td><td>0 - 380 V</td></tr></table>	Winding	50 Hz	60Hz	6 S	380 - 415	380 - 480	8 S	347	380 - 416	AVR connector		0 - 380 V	Factory connection	
	Winding	50 Hz	60Hz												
6 S	380 - 415	380 - 480													
8 S	347	380 - 416													
AVR connector		0 - 380 V													
<div><div><div>C</div><div>Delta</div><div>3 PH</div></div><div><div><div><div><div>Ph1-L1</div><div>T1-U1</div></div><div><div>T6-W2</div><div>T4-U2</div></div><div><div>T3-W1</div><div>T5-V2</div></div><div><div>T2-V1</div><div>Ph2-L2</div></div><div><div>Ph3-L3</div></div></div></div></div></div>	<table><tr><td>Bobinage</td><td>50 Hz</td><td>60Hz</td></tr><tr><td>6 S</td><td>220 - 240</td><td>220 - 255</td></tr><tr><td>8 S</td><td>200</td><td>220 - 240</td></tr><tr><td colspan="2">AVR connector</td><td>0 - 220 V</td></tr></table>	Bobinage	50 Hz	60Hz	6 S	220 - 240	220 - 255	8 S	200	220 - 240	AVR connector		0 - 220 V	Connection using optional kit Consult the factory	
	Bobinage	50 Hz	60Hz												
6 S	220 - 240	220 - 255													
8 S	200	220 - 240													
AVR connector		0 - 220 V													

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• Connection checks



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

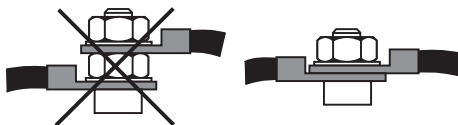
Check that:

- The residual circuit-breaker conforms to legislation on protection of personnel, in force in the country of use, and has been correctly installed on the alternator power output as close as possible to the alternator. (In this case, disconnect the wire of the interference suppression module linking the neutral).
- Any protection devices in place have not been tripped.
- If there is an external AVR, the connections between the alternator and the cabinet are made in accordance with the connection diagram.
- There is no short-circuit phase-phase or phase-neutral between the alternator output terminals and the generator set control cabinet (part of the circuit not protected by circuitbreakers or relays in the cabinet).
- The machine should be connected with the busbar separating the terminals as shown in the terminal connection diagram.



- The alternator earth terminal inside the terminal box is connected to the electrical earth circuit
- The earth terminal (ref 28) is connected to the frame.

The connections inside the terminal box must never be subjected to stress due to cables connected by the user.



3.4 - Commissioning



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

The machine is tested and set up at the factory. When first used with no load, make sure that the drive speed is correct and stable (see the nameplate). With the regreasable bearing option, we recommend greasing the bearings at the time of commissioning (see section 4.3).

On application of the load, the machine should achieve its rated speed and voltage; however, in the event of abnormal operation, the machine setting can be altered (follow the adjustment procedure in section 3.5). If the machine still operates incorrectly, the cause of the malfunction must be located (see section 4.5).

3.5 - Setting up



The various adjustments during tests must be made by a qualified engineer.

Ensure that the drive speed specified on the nameplate is reached before commencing adjustment.

After operational testing, replace all access panels or covers.

The AVR is used to make any adjustments to the machine.

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4 - SERVICING - MAINTENANCE

4.1 - Safety measures

Servicing or troubleshooting must be carried out strictly in accordance with instructions so as to avoid the risk of accidents and to maintain the machine in its original state.



All such operations performed on the alternator should be undertaken by personnel trained in the commissioning, servicing and maintenance of electrical and mechanical components, who must wear personal protective equipment appropriate for mechanical and electrical hazards.

Before any intervention on the machine, ensure that it cannot be started by a manual or automatic system and that you have understood the operating principles of the system.



Warning : During and after running, the alternator will reach temperatures hot enough to cause injury, such as burns.

4.2 - Routine maintenance

• Checks after start-up

After approximately 20 hours of operation, check that all fixing screws on the machine are still tight, plus the general state of the machine and the various electrical connections in the installation.

• Electrical servicing

Commercially-available volatile degreasing agents can be used.

WARNING

Do not use: trichlorethylene, perchlorethylene, trichloroethane or any alkaline products.



These operations must be performed at a cleaning station, equipped with a vacuum system that collects and flushes out the products used.

The insulating components and the impregnation system are not at risk of damage from solvents. Avoid letting the cleaning product run into the slots.

Apply the product with a brush, sponging frequently to avoid accumulation in the housing. Dry the winding with a dry cloth. Let any traces evaporate before reassembling the machine.

• Mechanical servicing

WARNING

Cleaning the machine using water or a highpressure washer is strictly prohibited. Any problems arising from such treatment are not covered by our warranty.

Degreasing: Use a brush and detergent (suitable for paintwork).


Dusting: Use an air gun.

If the machine is fitted with air inlet and outlet filters, the maintenance personnel should clean them routinely at regular intervals. In the case of dry dust, the filter can be cleaned using compressed air and/or replaced if it is clogged.

After cleaning the alternator, it is essential to check the winding insulation (see sections 3.2 and 4.7).

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4.3 - Bearings

In LSA 50.1, the bearings are regreaseable	Regreasing interval: 3600 hrs of operation DE bearing: amount of grease: 50 gr NDE bearing: amount of grease: 50 gr
Standard grease	LITHIUM - standard - NLGI 3
Grease used in the factory	MOBIL POLYREX™ EM : grade NLGI 2
In LSA 51.2, the bearings are regreaseable	Regreasing interval: 1700 hrs of operation DE bearing: amount of grease: 70 gr NDE bearing: amount of grease: 35 gr
Standard grease	LITHIUM - standard - NLGI 3
Grease used in the factory	MOBIL POLYREX™ EM : grade NLGI 2
 It is imperative to lubricate the alternator during operation and on first use. Before using another grease, check for compatibility with the original one.	

4.4 - Mechanical defects

Fault		Action
Bearing	Excessive overheating of one or both bearings (bearing temperature 80°C above the ambient temperature) (With or without abnormal bearing noise)	<ul style="list-style-type: none"> - If the bearing has turned blue or if the grease has turned black, change the bearing. - Bearing not fully locked (abnormal play in the bearing cage) - End shields incorrectly aligned
Abnormal temperature	Excessive overheating of alternator frame (more than 40° C above the ambient temperature)	<ul style="list-style-type: none"> - Air flow (inlet-outlet) partially clogged or hot air is being recycled from the alternator or engine - Alternator operating at too high a voltage (>105% of Un on load) - Alternator overloaded
Vibrations	Too much vibration	<ul style="list-style-type: none"> - Misalignment (coupling) - Defective mounting or play in coupling - Rotor balancing fault (Engine - Alternator)
	Excessive vibration and humming noise coming from the machine	<ul style="list-style-type: none"> - Phase imbalance - Stator short-circuit
Abnormal noise	Alternator damaged by a significant impact, followed by humming and vibration	<ul style="list-style-type: none"> - System short-circuit - Misparalleling <p>Possible consequences</p> <ul style="list-style-type: none"> - Broken or damaged coupling - Broken or bent shaft end - Shifting and short-circuit of main field - Fan fractured or coming loose on shaft - Irreparable damage to rotating diodes/AVR, surge suppressor

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4.5 - 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 terminals E- and E+, respecting the polarity, for 2 to 3 seconds	The alternator builds up and its voltage is still correct when the battery is removed.	- Lack of residual magnetism
		The alternator builds up but its voltage does not reach the rated value when the battery is removed.	- Check the connection of the voltage reference to the AVR - Faulty diode - Armature short-circuit
		The alternator builds up but its voltage disappears when the battery is removed.	- Faulty AVR - Field windings open circuit (check winding) - Main field winding open circuit (check the resistance)
Voltage too low	Check the drive speed	Correct speed	Check the AVR connections (possible AVR failure) - Field windings short-circuited - Rotating diodes burnt out - Main field winding short-circuited - Check the resistance
		Speed too low	Increase the drive speed (Do not touch the AVR voltage pot. (P2) before running at the correct speed.)
Voltage too high	Adjust AVR voltage potentiometer	Adjustment ineffective	Faulty AVR
Voltage oscillations	Adjust AVR stability potentiometer	If no effect : try normal / fast recovery modes (ST2)	- Check the speed : possibility of cyclic irregularity - Loose connections - Faulty AVR - Speed too low when on load (or LAM set too high)
Voltage correct at no load and too low when on load	Run at no load and check the voltage between E+ et E- on the AVR	Voltage between E+ and E- (DC) AREP / PMG < 10V	- Check the speed (or LAM set too high)
		Voltage between E+ and E- AREP / PMG > 15V	- Faulty rotating diodes - Short-circuit in the main field. Check the resistance. - Faulty exciter armature. Check the resistance.
Voltage disappears during operation	Check the AVR, the surge suppressor, the 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

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• Checking the winding

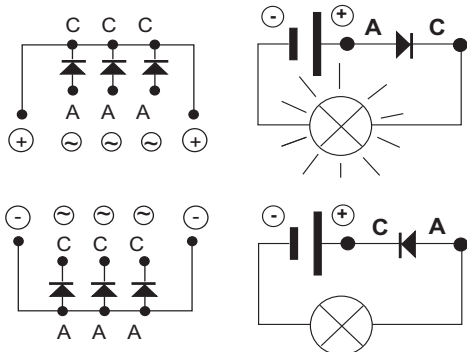
You can check the winding insulation by performing a high voltage test. In this case, you must disconnect all AVR wires.

WARNING

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



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



• Checking the windings and rotating diodes using separate excitation

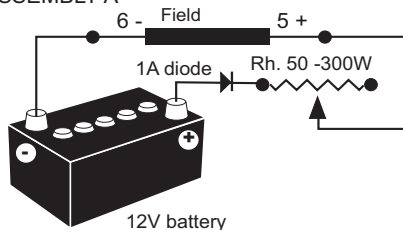


During this procedure, make sure that the alternator is disconnected from any external load and inspect the terminal box to check that the connections are fully tightened.

- 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 a rheostat of approximately 50 ohms - 300 W and a diode on both exciter field wires (5+) and (6-).

ASSEMBLY A

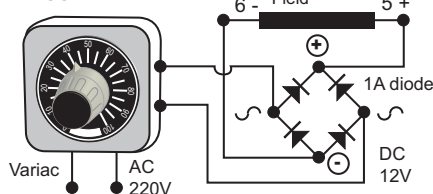


Assembly B: Connect a "Variac" variable power supply and a diode bridge on both exciter field wires (5+) and (6-). Both these systems should have characteristics which are compatible with the field excitation power of the machine (see the nameplate).

3) Run the unit at its rated speed.

4) Gradually increase the exciter field current by adjusting the rheostat or the variac and measure the output voltages on L1 - L2 - L3, checking the excitation voltage and current at no 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



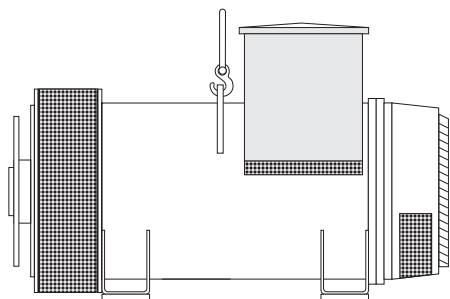
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4.6 - Dismantling, reassembly

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

Whilst being handled, the machine should remain horizontal.



• Tools required

To fully dismantle the machine, we recommend using the tools listed below:

- 1 ratchet spanner + extension
- 1 torque wrench
- 1 set of flat spanners : 8, 10, 18, 19 mm
- 1 socket set : 8, 10, 13, 16, 18, 19, 21, 24, 30 mm
- 1 socket with male ferrule : 5 mm
- 1 puller (U35) / (U32/350)

• Screw tightening torque

IDENTIFICATION	screw Ø	Torque N.m
Diode bridge screw	M 6	5.6
Diode nut	M 12	10
Shield / Frame screw	M 12	62
Discs / Sleeve screw	M 20	300
Earth screw	M 12	46
Grille screws	M 12	46
Terminal box screws	M 6	5.6
Stator connection nut	M 12	46

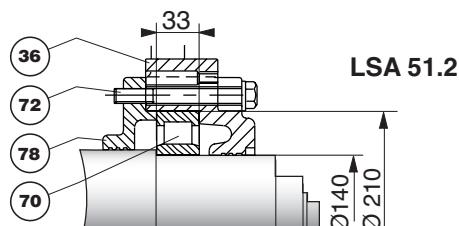
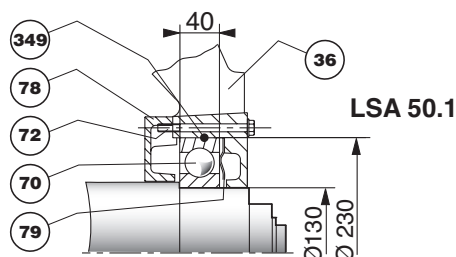
• Access to diodes

- Open the air intake grille (47).
- Disconnect the diodes and check them using an ohmmeter or a battery lamp.
- Reassemble and reconnect the unit.

• Access to connections and the regulation system

Access directly by removing the box lid (48) and the inspection door (59).

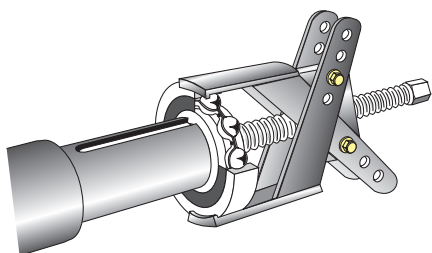
• Fitting and replacing the NDE bearing



- Remove the air intake grille (47).
- Disconnect the diode bridge (106): 5 leads.
- Remove the 3 screws of the diode bridge on the shaft.
- Remove the diode bridge.
- Remove the 4 screws (72) of the inner bearing retainer (78).
- Remove the 6 screws of the shield (36) on the stator (1).
- Tap off the NDE shield (36) together with the exciter field (90) of the stator (1).
- Extract the ball bearing (70) with a puller.
- Check the «O» ring seal (349) and the preloading wavy washer (79) and replace them if necessary.

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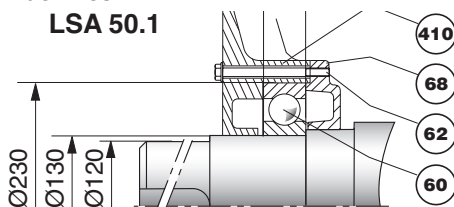
- Fit a new bearing, after heating it by induction system to 80°C maximum.

WARNING

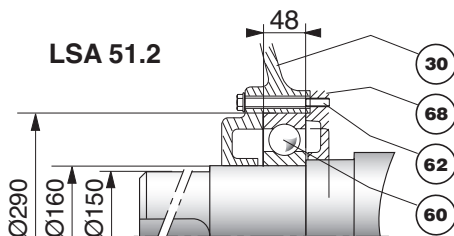
WHEN DISMANTLING THE MACHINE, ALWAYS CHANGE THE BEARINGS.

- **Replacing the DE bearing on two-bearing machines**

LSA 50.1



LSA 51.2



- Remove the 6 screws (411) and 4 screws (62).
- Tap off the DE shield (410) from the stator (1.)
- Extract the ball bearing (60) with a puller.
- Fit the new bearing, after heating it by induction system to 80°C maximum.

WARNING

WHEN DISMANTLING THE MACHINE, ALWAYS CHANGE THE BEARINGS.

- **Complete dismantling**

- Remove the 6 screws (411).
- Support the DE rotor (4) with a strap.
- Remove the NDE shield (36) (section 4.6)
- Support the rotor with a tube on the NDE shaft extension.
- Push the rotor out of the stator, with care.
- If necessary, dismantle the coupling system and the DE shield (410).

- **Reassembling the bearings**

- Place the «O» ring seal (349) and the preloading wavy washer (79) in the bearing seat (36).
- Fit the NDE shield (36) and the DE shield (410) on the stator (1).
- Tighten the 12 screws of the shield on the stator.
- Fit the inner bearing retainer with appropriate lubrication (68 and 78).
- Tighten the 4 screws on the bearing retainer (68 and 78).
- Refit and connect the diode bridge (section 4.6).
- Refit the air intake grille (47).

- **Reassembling the rotor**

WARNING

If the rotor has been fully rewound, it must be rebalanced.

Installation and maintenance of the PMG

The PMG reference for the 50.1/51.2 is PMG 4.

LSA 50.1 / LSA 51.2

Low Voltage Alternators - 4 pole

4.7 - Table of electrical characteristics

Resistances at 20°C (Ω)

LSA 50.1	STATOR L/N	ROTOR	Field	Armature
S2	0.0028	0.354	9.35	0.052
S4	0.00195	0.385	9.35	0.052
M6	0.0015	0.43	9.35	0.052
M7	0.0013	0.46	9.35	0.052
L8	0.0012	0.5	9.35	0.065
VL10	0.00095	0.556	9.35	0.065

Resistance of AREP auxiliary windings at 20°C (Ω)

LSA 50.1	Auxil wdg : X1, X2	Auxil wdg : Z1, Z2
S2	0.105	0.215
S4	0.105	0.170
M6	0.085	0.185
M7	0.085	0.15
L8	0.08	0.15
VL10	0.08	0.18

Field excitation current *i exc* (A)

Symbols : «i exc» : excitation current of the exciter field.

LSA 50.1	No load	At rated load
S2	1.05	5
S4	1.05	4.85
M6	1.1	4.9
M7	1.1	4.9
L8	1.3	5
VL10	1.3	5

For 60 Hz machines, the «i exc» values are approximately 5 to 10 % lower.

• LSA 51.2 characteristics

Resistances at 20°C (Ω)

LSA 51.2	STATOR L/N	ROTOR	Field	Armature
S55	0.001	0.42	8.7	0.04
M60	0.0008	0.45	8.7	0.04
L70	0.0006	0.5	8.7	0.04
VL90	0.00048	0.57	8.7	0.04
VL95	0.00049	0.59	8.7	0.04

Resistance of AREP auxiliary windings at 20°C (Ω)

LSA 51.2	Auxil wdg:X1, X2	Auxil wdg: Z1, Z2
S55	0.1	0.16
M60	0.08	0.16
L70	0.09	0.13
VL90	0.06	0.14
VL95	0.07	0.15

Field excitation current *i exc* (A)

Symbols : «i exc» : excitation current of the exciter field.

LSA 51.2	No load	At rated load
S55	1.5	6
M60	1.5	5.9
L70	1.6	5.5
VL90	1.5	5.3
VL95	1.4	5.4

For 60 Hz machines, the «i exc» values are approximately 5 to 10 % lower.

• Voltage of auxiliary windings at no load

LSA 50.1	Auxil wdg:X1, X2	Auxil wdg: Z1, Z2
50 Hz	90 ... 100 V	10 V
60 Hz	108 ... 120 V	12 V

LSA 51.2	Auxil wdg : X1, X2	Auxil wdg : Z1, Z2
50 Hz	90 ... 100 V	10 V
60 Hz	108 ... 120 V	12 V

• Table of the weights (kg)

LSA 50.1		LSA 51.2	
S2	2060	S55	3725
S4	2250	M60	4020
M6	2522	L70	4425
M7	2770	VL90	4975
L8	2955	VL95	5045
VL10	3251		

LSA 50.1 / LSA 51.2

Low Voltage Alternators - 4 pole

5 - SPARE PARTS

5.1 - First maintenance parts

Emergency repair kits are available as an option.

The **Emergency Kit** consists of a set of 6 diodes, a varistor, an AVR and 2 fuses, loose.

The **Rotating Diode Assembly** consists of the disk, the 6 diodes, and the varistor, assembled.

Rep	Description	Qty	LSA 50.1
	Emergency kit		ALT050KD002
	6 Diodes set		ALT050KD001
112	Varistor	1	18140275087
198	AVR	1	R 449
	Spare 16A fuses set	1	PEL016FG005
106	Rotating diode	1	DT0813938
	Others spare parts		
60	D.E. bearing	1	6226 C3
70	N.D.E. bearing	1	6226 C3

Rep	Description	Qty	LSA 51.2
	Emergency kit		ALT050KD002
	6 Diodes set		ALT050KD001
112	Varistor	1	18140275087
198	AVR	1	R 449
	Spare 16A fuses set	1	PEL016FG005
106	Rotating diode	1	DT0813938
	Others spare parts		
60	D.E. bearing	1	6232 MC3
70	N.D.E. bearing	1	NU 1028MC3

5.2 - Technical support service

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

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

Address your enquiry to your usual contact.

Part numbers should be identified from the exploded views and their description from the parts list.

Our extensive network of service centres can dispatch the necessary parts without delay.

To ensure correct operation and the safety of our machines, we recommend the use of original manufacturer spare parts.

In the event of failure to comply with this advice, the manufacturer cannot be held responsible for any damage.



After operational testing, it is essential to replace all access panels or covers.

LSA 50.1 / LSA 51.2

Low Voltage Alternators - 4 pole

5.3 - Exploded views, parts list

• Parts list

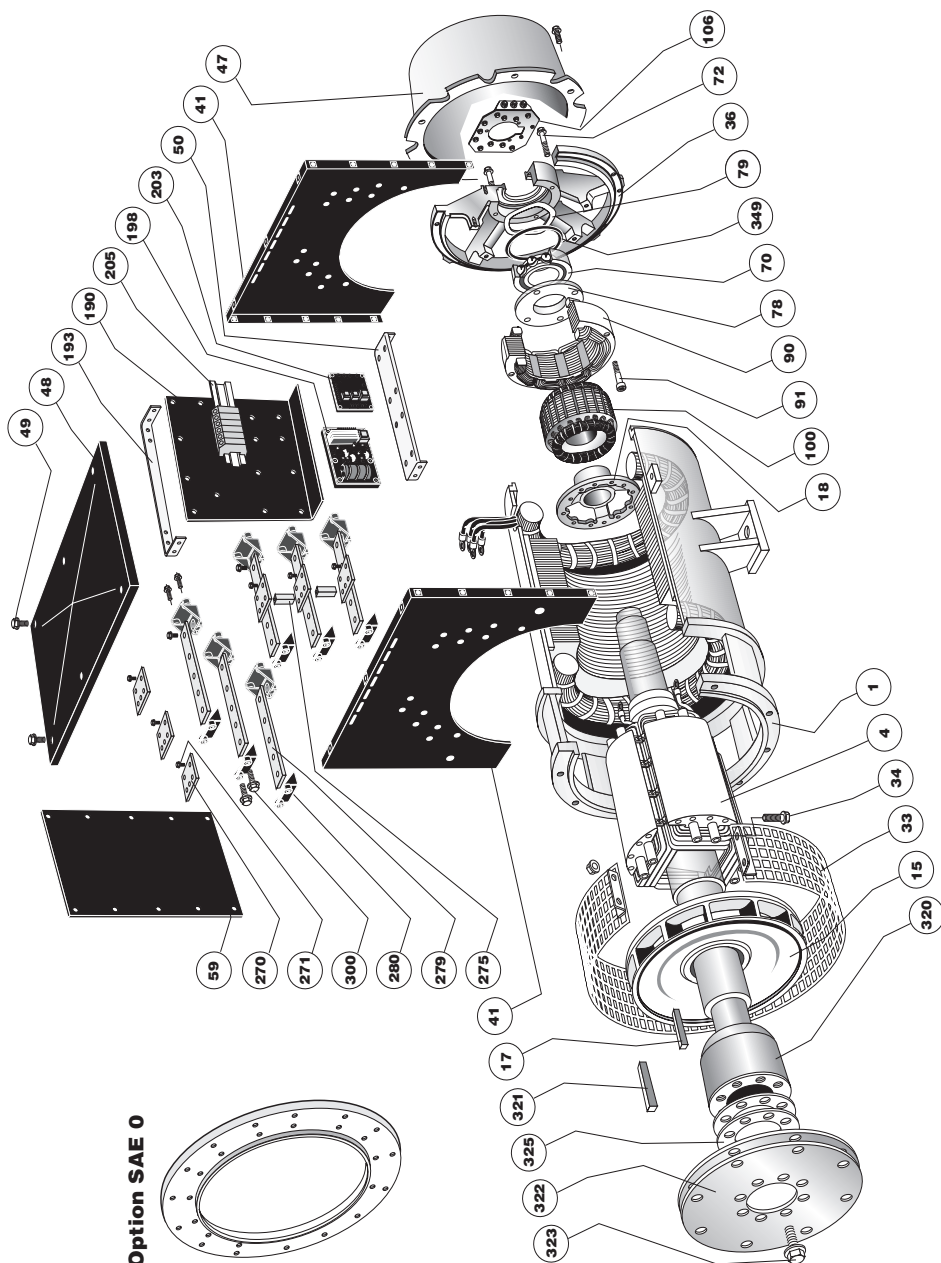
Ref.	Qty	Description
1	1	Stator assembly
4	1	Rotor assembly
15	1	Turbine
17	1	Fan key
18	1	Balancing disc
22	1	Key for 2-bearing shaft extension
33	1	Fan guard
34	1	Fixing screw
36	1	Bearing on exciter end
41	2	Cover front panel
47	1	Air inlet cover
48	1	Cover top panel
49	-	Cover screws
50	2	Cover spacer
59	2	Cover inspection door
60	1	DE bearing
62	4	Fixing screw
68	1	Inner bearing retainer
70	1	NDE bearing
72	4	Fixing screw
78	1	Inner bearing retainer
79	1	Preloading wavy washer
90	1	Exciter field
91	5	Fixing screw
100	1	Exciter armature
106	1	Rotating diode bridge assembly

Ref.	Qty	Description
190	1	AVR support
193	1	Cover spacer
198	1	Voltage regulator (AVR)
203	1	Optional module
205	1	Connector link
265	1	Air intake grille spacer
270	6	Connection plate
271	30	Vis
275	2	Neutral connection
279	6	Connection bar
280	12	Support
290	1	PMG housing
291	1	Adaptation shaft
292	1	Magnetic rotor
293	1	Stator
295	1	Tie rod
296	1	Cable gland washer + nut
298	5	Screws
299	5	PMG adaptor screws
300	24	Screws
320	1	Coupling sleeve
321	1	Sleeve key
322	4	Coupling disc
323	12	Fixing screw
325	-	Spacer shim
349	1	«O» ring
410	1	DE shield
411	6	Fixing screw

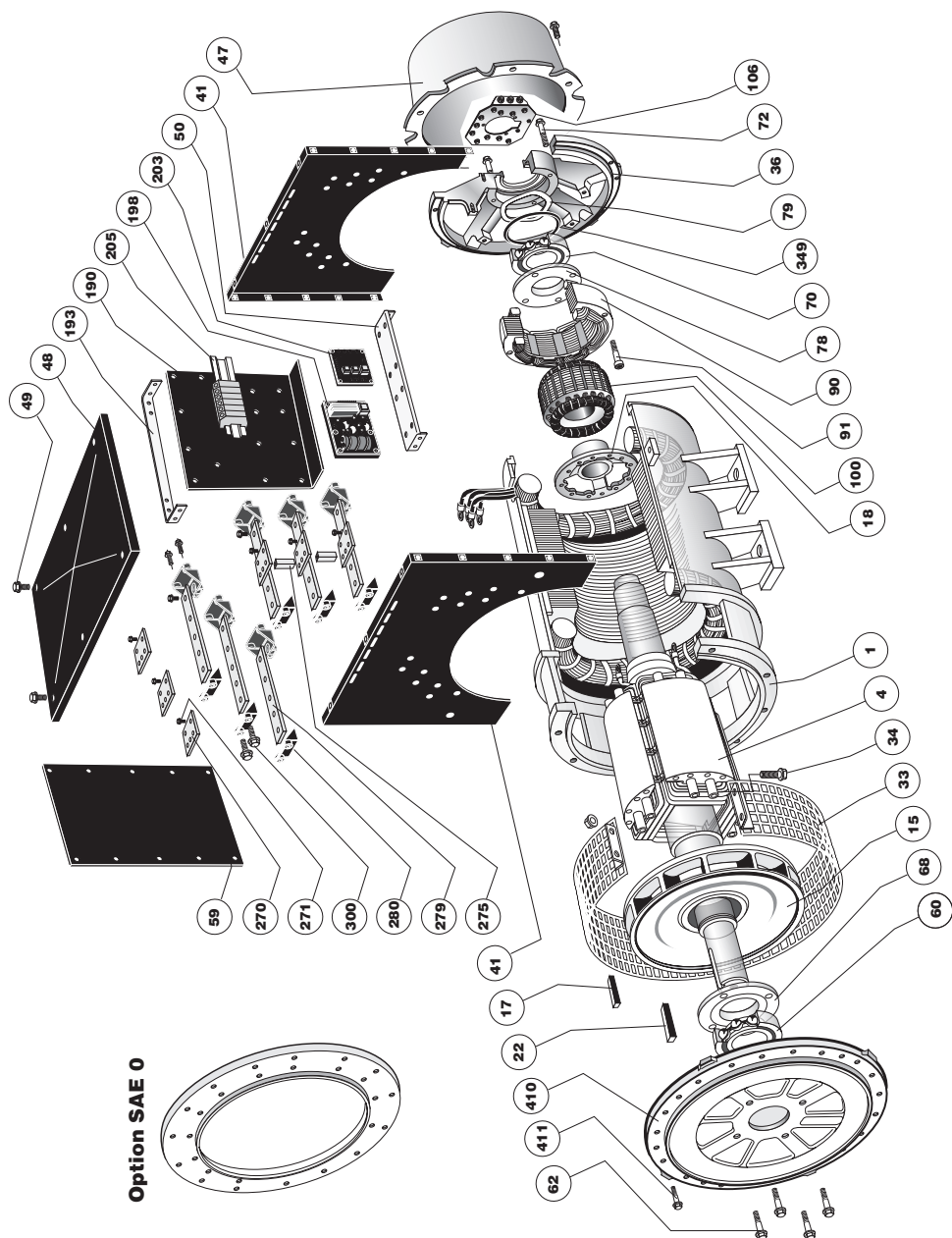
LSA 50.1 / LSA 51.2

Low Voltage Alternators - 4 pole

• Exploded view : single-bearing LSA 50.1



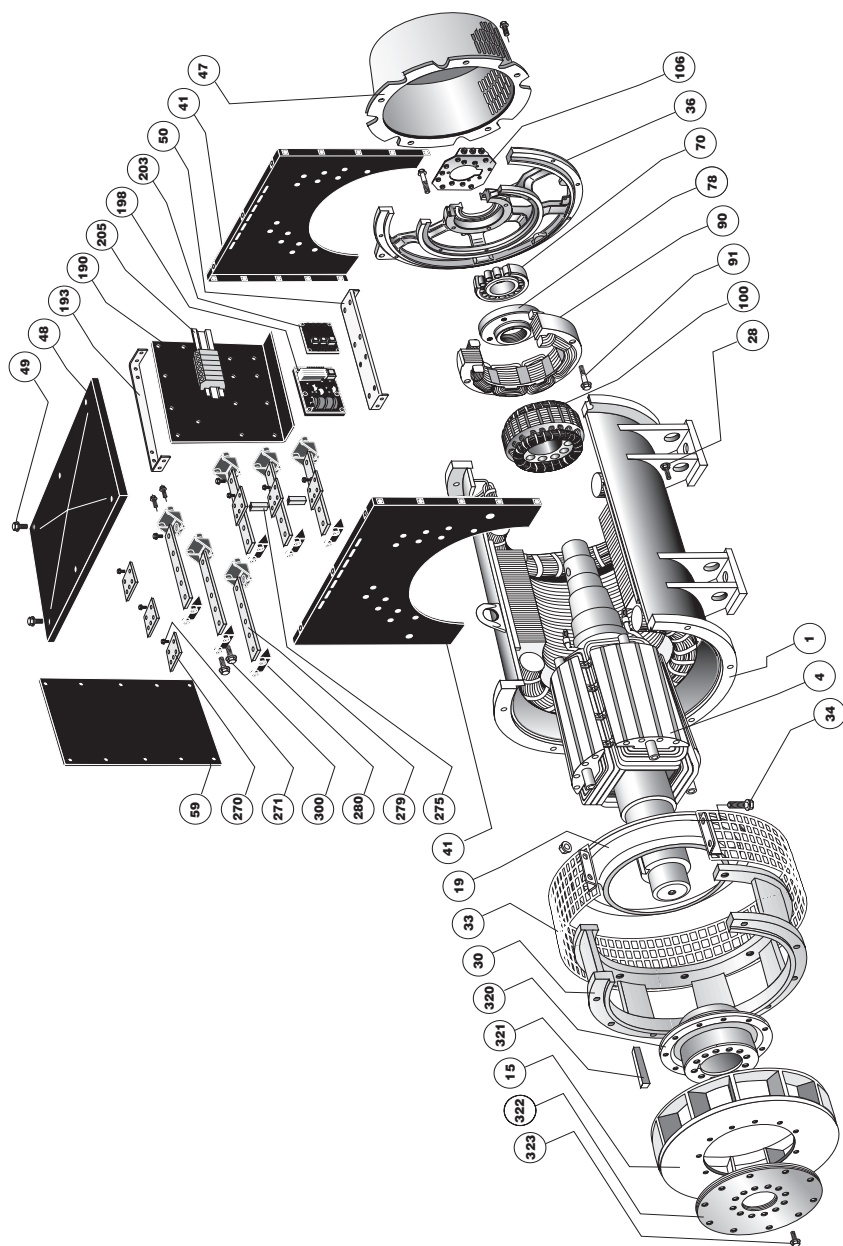
- Exploded view : two-bearing LSA 50.1



LSA 50.1 / LSA 51.2

Low Voltage Alternators - 4 pole

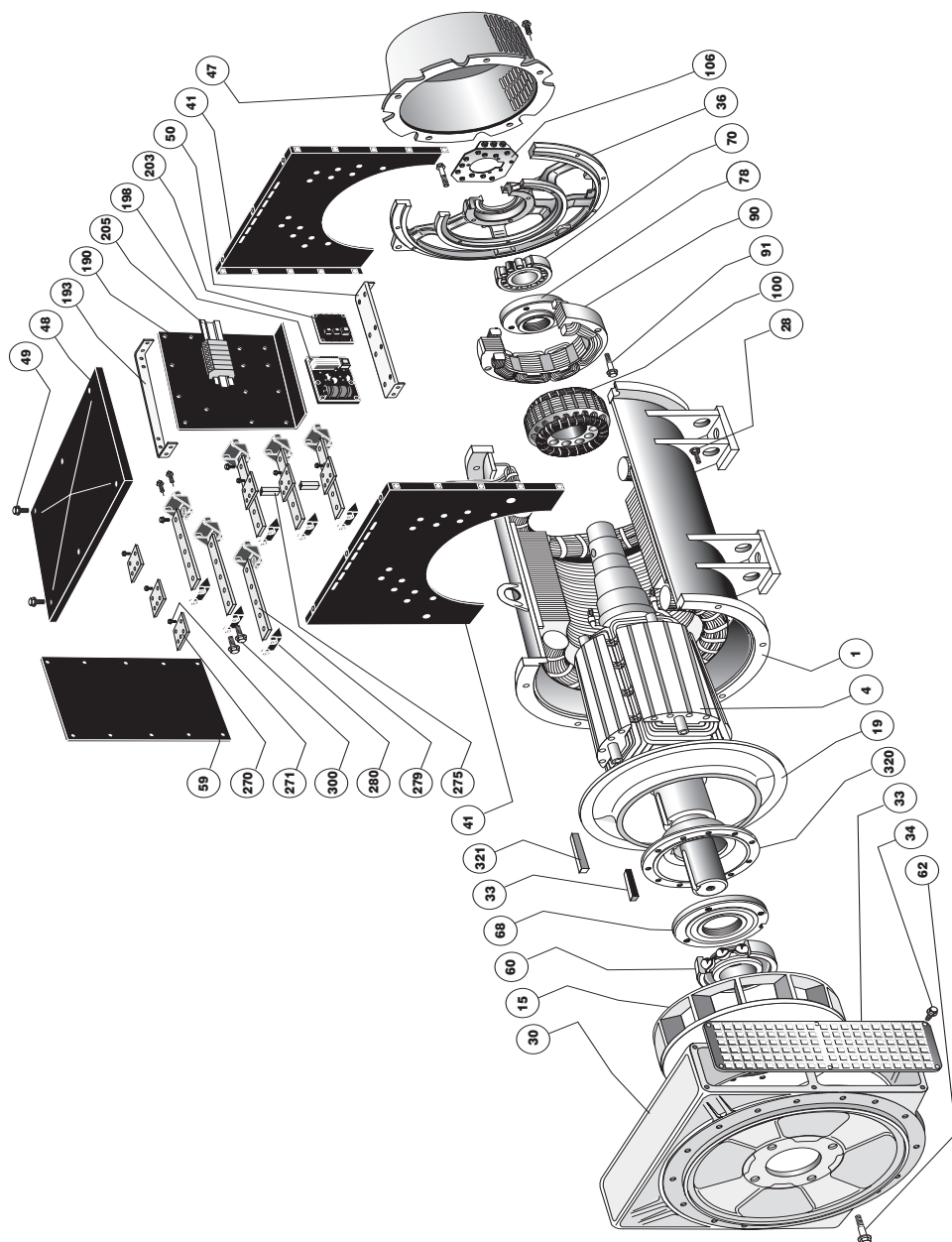
• Exploded view : single-bearing LSA 51.2



LSA 50.1 / LSA 51.2

Low Voltage Alternators - 4 pole

• Exploded view : two-bearing LSA 51.2



LSA 50.1 / LSA 51.2

Low Voltage Alternators - 4 pole

Disposal and recycling instructions

We are committed to limit the environmental impact of our activity. We continuously survey our production processes, material sourcing and products design to improve recyclability and diminish our footprint.

These instructions are for information purposes only. It is the user responsibility to comply with local legislation regarding product disposal and recycling.

The oil and grease from the lubrication systems should be considered as a hazardous waste and has to be handled according to local legislation.

Recyclable materials

Our alternators are mainly built out of iron, steel and copper materials, which can be reclaimed for recycling purposes.

These materials can be reclaimed through a combination of manual dismantling, mechanical separation and melting processes. Our technical support department can provide detailed directions on products dismounting upon request.

Waste & hazardous materials

The following components and materials need a special treatment and need to be separated from the alternator before the recycling process:

- electronic materials found in the terminal box, including the Automatic Voltage Regulator (198), Current Transformers (176), interference suppression module (199) and other semi-conductors.
- diode Bridge (343) and Surge suppressor (347), found on the alternator rotor.
- major plastic components, such as the terminal box structure on some products. These components are usually marked with plastic type information.

All materials listed above need special treatment to separate waste from reclaimable material and should be handed to specialized disposal companies.

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Leroy-Somer
Electric Power Generation



Declaration of EC compliance and incorporation

This Declaration applies to the generators designed to be incorporated into machines complying with the Machinery Directive Nr 2006/42/EC dated 17 May 2006.

MOTEURS LEROY-SOMER
Boulevard Marcellin Leroy
16015 ANGOULEME
FRANCE

MLS HOLICE STLO.SRO
SLADKOVSKÉHO 43
772 04 OLOMOUC
CZECH REPUBLIC

MOTEURS LEROY-SOMER
1, rue de la Burelle
Boite Postale 1517
45800 ST JEAN DE BRAYE
FRANCE

DIVISION LEROY-SOMER
STREET EMERSON
Nr4 Parcul Industrial Tetarom 2
4000641 CLUJ NAPOCA
ROMANIA

Declares hereby that the electric generators of the types:

LSA40 - LSA42.3 - LSA44.2 - LSA44.3 - LSA46.2 - LSA46.3 - LSA47.2 - LSA49.1 - LSA49.3 - LSA50.1 - LSA50.2 - LSA51.2 - LSA52.2 - LSA52.3 - LSA53.1 - LSA53 - LSA53.2 - LSA54 - LSA54.2 - TAL040 - TAL042 - TAL044, as well as their derivatives, manufactured by Leroy-Somer or on Leroy-Somer's behalf, comply with the following International Standards and Directive:

- EN and IEC 60034-1, 60034-5 and 60034-22
- ISO 8528-3 "Reciprocating internal combustion engine driven alternating current generating sets. Part 3. Alternating current generators for generating sets"
- Low Voltage Directive Nr 2014/35/UE dated 26 February 2014

Furthermore, these generators, designed in compliance with the Machine Directive Nr 2006/42, are therefore able to be incorporated into Electrical Gen-Sets complying with the following International Directives:

- Machinery Directive Nr 2006/42/EC dated 17 May 2006
- EMC Directive Nr 2014/30/UE dated 26 February 2014, as intrinsic levels of emissions and immunity are concerned

WARNING:

The here mentioned generators should not be commissioned until the corresponding Gen-Sets have been declared in compliance with the Directives Nr 2006/42/EC and 2014/30/UE, as well as with the other relevant Directives.

Leroy-Somer undertakes to transmit, in response to a reasoned request by the national authorities, relevant information on the generator.

Technical Managers
J.P. CHARPENTIER - Y. MESSIN

4152 en - 2016.05 / k

The contractual EC Declaration of Conformity and Incorporation can be obtained from your contact on request.

Electric Power Generation	Installation and maintenance	3281 en - 2016.05 / n
LSA 50.1 / LSA 51.2 Low Voltage Alternators - 4 pole		

Service & Support

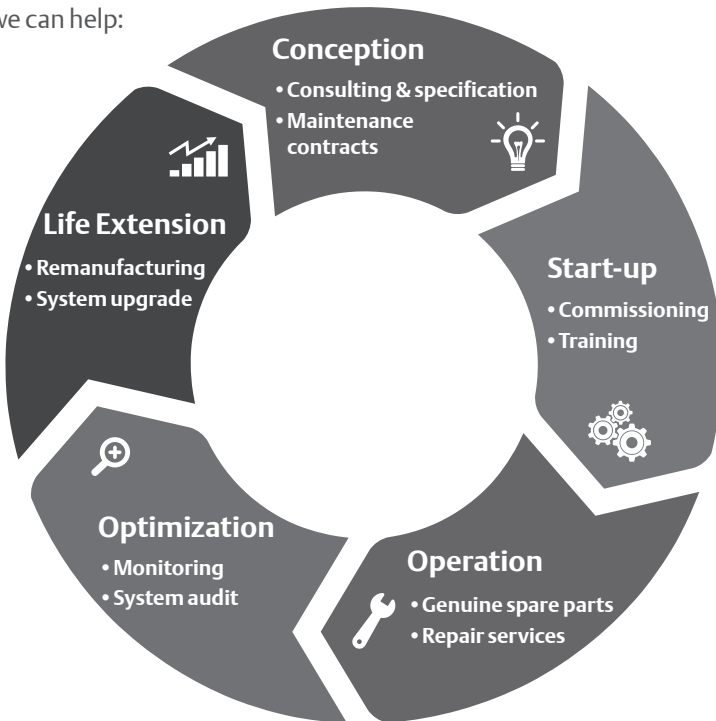
Our worldwide service network of over 80 facilities is at your service.

This local presence is our guarantee for fast and efficient repair, support and maintenance services.

Trust your alternator maintenance and support to electric power generation experts. Our field personnel are 100% qualified and fully trained to operate in all environments and on all machine types.

We know alternators operation inside out, providing the best value service to optimize your cost of ownership.

Where we can help:



Contact us:

Americas: +1 (507) 625 4011

Europe & International: +33 238 609 908

Asia Pacific: +65 6263 6334

China: +86 591 88373036

India: +91 806 726 4867

✉ service.epg@leroy-somer.com



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