

GEARLEC - TRACTELEC GT3 / TF3 / TM3

Low Voltage Alternator - 4 pole

Installation and maintenance

LEROY-SOMER™

Nidec
All for dreams

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

**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 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.

SAFETY INSTRUCTIONS

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).

© - We reserve the right to modify the characteristics of this product at any time in order to incorporate the latest technological developments. The information contained in this document may therefore be changed without notice.

This document may not be reproduced in any form without prior authorisation. All brands and models have been registered and patents applied for.

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

CONTENTS

1 - ACCEPTANCE.....	4
1.1 - Inspection	4
1.2 - Identification.....	4
1.3 - Storage	4
1.4 - Applications.....	4
1.5 - Usage restrictions	4
2 - TECHNICAL CHARACTERISTICS	5
2.1 - Operating principle	5
2.2 - Electrical characteristics	5
2.3 - Mechanical characteristics	5
2.4 - Voltage regulation with electronic regulator	6
3 - INSTALLATION AND COMMISSIONING	8
3.1 - Assembly	8
3.2 - Inspection prior to first use	8
3.3 - Settings	9
3.4 - Electrical diagram	9
3.5 - Commissioning	10
4 - SERVICING/MAINTENANCE	10
4.1 - Safety measures	10
4.2 - Routine maintenance	11
4.3 - Fault detection	11
4.4 - Mechanical faults	11
4.5 - Electrical faults	12
4.6 - Electronic faults	12
4.7 - Dismantling the gearbox	12
5 - SPARE PARTS	13
5.1 - Technical support service	13
5.2 - Exploded view and parts list GT3 / TF3 / TM3	14

Disposal and recycling instructions

Declaration of EC compliance and incorporation

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

1 - ACCEPTANCE

1.1 - Inspection

Upon receipt of your generator, check that it has not suffered any damage in transit. If there are obvious signs of damage, express your concerns to the transporter (it may be possible to claim via the transporter's insurance) and after a visual inspection, turn the generator by hand to detect any potential malfunction.

1.2 - Identification

GEARLEC/TRACTELEC are identified by a self-adhesive black/orange nameplate fixed on the machine's cowl.

Make sure that the name plate on the machine corresponds with your order.

GEARLEC/TRACTELEC incorporate alternators from the Low Voltage range that are adapted and set up for agricultural use.

The GEARLEC/TRACTELEC range consists of 2 products:

- the GEARLEC: GT3 is a product aimed at the builder of the genset or installer,
- the TRACTELEC is a finished product, ready for use, available :
 - as a fixed version: TF3 (unit without a 3-point chassis),
 - as a mobile version: TM3 (unit with a chassis used to fix the TRACTELEC to the tractor's 3-point linkage).

1.2.1 - Dimensions

The dimensions of the GEARLEC and TRACTELEC range are defined in our commercial catalogues.

1.3 - Storage

Whilst awaiting commissioning, the machines must be stored:

- away from moisture: in effect, at relative humidity levels above 90%, the machine insulation can drop very rapidly, to just above zero at around 100%; the condition of the anti-rust protection on unpainted parts should be monitored,
- if the area is affected by vibrations, try to reduce the effect of these vibrations 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 the bearing rings.

1.4 - Applications

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

1.5 - Usage restrictions

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

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

2 - TECHNICAL CHARACTERISTICS

2.1 - Operating principle

The GEARLEC or TRACTELEC is a generator towed by an agricultural tractor. A gearbox compensates for the difference in speed between the tractor power take-off shaft and the alternator. This oil gearbox is coupled to the alternator.

2.2 - Electrical characteristics

- class H insulation,
- overload capacity: the alternators are capable of starting electric motors whose starting current is 1.5 times the rated alternator current,

- voltage regulation: the voltage is proportional to the speed (U/F),
- automatic build-up on the remanent voltage.

2.3 - Mechanical characteristics

- steel frame,
- aluminium or cast iron shields,
- sealed ball bearings (permanently greased),
- mounting arrangements: two-bearing with feet, standard splined shaft extension,
- open machine, self-cooling,
- degree of protection: IP23,
- rotation speeds on the tractor power take-off shaft (see table):

TRACTELEC Three-phase 50 Hz	Emergency power KVA	Power take-off shaft speed (min ⁻¹)
TF3 / TM3 - 16.5	16.5	429
TF3 / TM3 - 20	19.5	429
TF3 / TM3 - 27.5	27.5	429
TF3 / TM3 - 30	30	429
TF3 / TM3 - 35	35	429
TF3 / TM3 - 40	40	420
TF3 / TM3 - 45	45	420
TF3 / TM3 - 50	50	420
TF3 / TM3 - 55	55	420
TF3 / TM3 - 66	66	420

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

GEARLEC Three-phase 50 Hz	Emergency power KVA	Power take-off shaft speed (min ⁻¹)
GT3 - 16.5	16.5	429
GT3 - 20	19.5	429
GT3 - 27.5	27.5	429
GT3 - 30	30	429
GT3 - 35	35	429
GT3 - 40	40	420
GT3 - 45	45	420
GT3 - 50	50	420
GT3 - 55	55	420
GT3 - 66	66	420

GEARLEC Three-phase 60 Hz	Emergency power KVA	Power take-off shaft speed (min ⁻¹)
GT3 - 16.5	21	514
GT3 - 20	24	514
GT3 - 27.5	34.5	514
GT3 - 30	37.5	514
GT3 - 35	44	514
GT3 - 40	48.5	504
GT3 - 45	55	504
GT3 - 50	62	504
GT3 - 55	69	504
GT3 - 66	82.5	504

2.4 - Voltage regulation with electronic regulator



The R120 is specially adjusted for use with the GEARLEC/TRACTELEC. If the regulator needs to be changed, follow the adjustment procedure below.

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

Setting up the R120

- For a 50 Hz application :

- Check that the strap U / F (marked Frequency) is in position 50 Hz

- Rotate the TRACTELEC so as to obtain a speed of 1500 min^{-1} / 50 Hz

- Adjust the voltage to 400V with potentiometer V

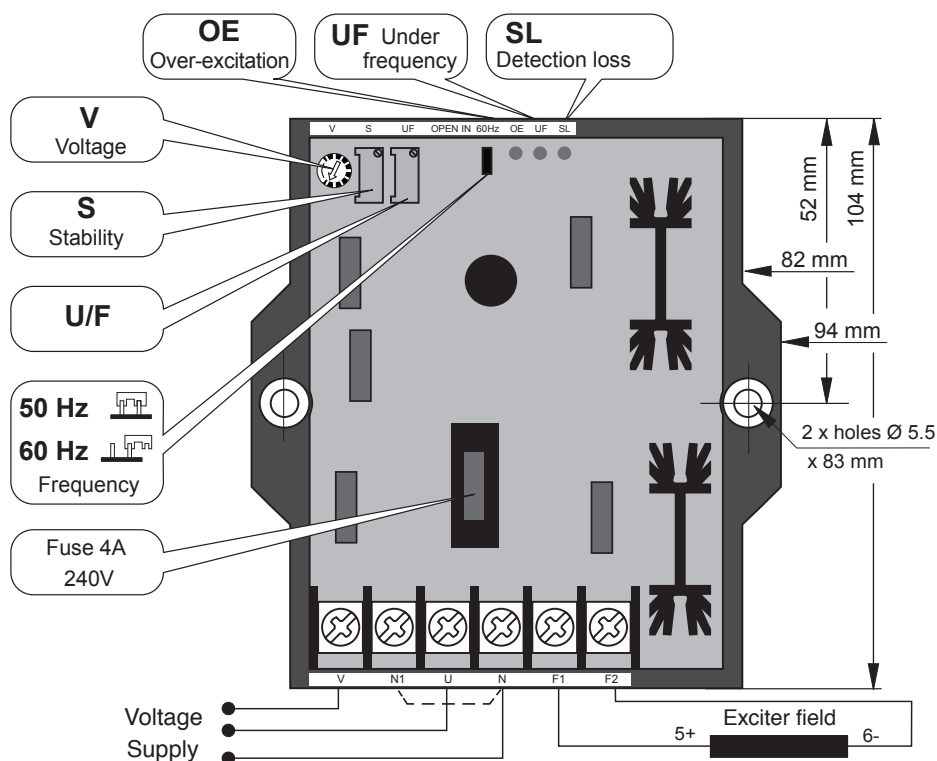
- For a 60 Hz application :

- Check that the strap U / F (marked Frequency) is in position 60 Hz

- Rotate the TRACTELEC so as to obtain a speed of 1800 min^{-1} / 60 Hz

- Adjust the voltage to 480V with potentiometer V

For other characteristics of the regulator, see manual ref. 5243.



GEARLEC - TRACTELEC

GT3 / TF3 / TM3

3 - INSTALLATION AND COMMISSIONING

Staff 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 and lifting operations must be undertaken using approved equipment and the machine must be horizontal. Check how much the alternator weighs before choosing the lifting tool.

3.1.1 - Coupling

The GEARLEC or TRACTELEC is coupled to the agricultural tractor by means of a universal joint (not supplied). A housing protects the splined shaft extension at the alternator end. The universal joint must incorporate a protective device.



Unsuitable or incorrectly or damaged fitted universal joint protection can cause serious accidents.

It is prohibited to park near the alternator while it is running as the charge demand may cause the alternator and chassis to jerk and move.

3.1.2 - TF3 version: TRACTELEC without 3-point chassis

Fix the TRACTELEC securely onto a raised baseplate for optimum alignment of the universal joint link with the tractor power take-off shaft.

3.1.3 - TFM3 version: TRACTELEC with 3-point chassis

The chassis is used to fix the TRACTELEC

to the tractor's 3-point linkage. Ideally, the TRACTELEC should be placed on the ground, raising it sufficiently to align the universal joint link with the tractor power take-off shaft.

WARNING

The TRACTELEC should be fixed to the tractor's 3-point linkage during operation. If transporting a Mobile Tractelec mounted onto a tractor's "3-point" fixing, wedge the reversing rods at the side to minimise vibrations.

3.2 - Inspection prior to first use

3.2.1 - Mechanical checks

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

- the fixing bolts on the feet are tight,
- the coupling is correct, and the universal joint link is aligned as closely as possible with the tractor power take-off shaft,
- cooling air is able to enter and exit freely through the machine vents,
- the protective grilles and housing are positioned correctly,
- the breather plug pin on the gearbox has been removed,
- the bearings have been inspected and the oil level of the gearbox is correct (see section 4.2).

3.2.2 - Electrical checks

Isolation measures and dielectric tests: see the alternator's maintenance manual.



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.

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

Connection checks

Check that:

- the TRACTELEC/GEARLEC is earthed (earthing rod),
- the residual circuit-breaker conforms to legislation on protection of staff 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 blue wire of the R 791 interference suppression module linking the neutral),
- the machine has been connected to the mains supply, according to the connection diagram,
- the connection of any cables and links conforms to the diagram included with the machine,
- any protection devices in place have not been tripped,
- the equipment to be supplied has its own switchgear or starter system for motors.



The earth must meet electrical standards and safety regulations in force in the country concerned.

The GEARLEC version must also be fitted with a control and protection unit enclosing all electrical accessories.

With configuration GEARLEC, in no case should the internal connections in the terminal box be subjected to stresses due to cables connected by the user.

3.3 - Settings

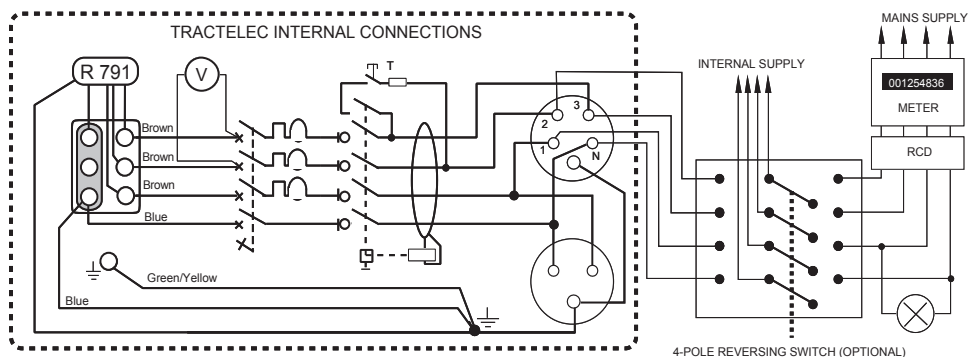
Your machine is preset and tested in the factory.

3.4 - Electrical diagram

The electrical diagram for the alternator, as well as terminal connections, is defined in the maintenance manual. With the TRACTELEC, the electrical connection must conform to the diagram below. Electrical installations must comply with the current legislation in force in the country of use.



A current reversing switch must without fail be placed between the mains supply and the GEARLEC fitted with a panel, or the TRACTELEC.



GEARLEC - TRACTELEC

GT3 / TF3 / TM3

3.5 - Commissioning



Before starting up, check that all preparations and safety procedures already mentioned in this manual have been observed.

Select a site which is sheltered from dripping water and dust, and is free from humidity;

- check that the switch is in the "TRACTELEC" position (standby),

- after engaging the power take-off shaft, accelerate gradually whilst keeping an eye on the voltmeter. The voltage must be 400V (50Hz) or 480V (60Hz), see section 2.3,

- start up a motor and check its direction of rotation. If necessary, reverse two phase wires on the "TRACTELEC" switch to obtain the opposite direction of rotation,

- switch on the various motors, start them in decreasing order of power, then start the other equipment to be used, and monitor the voltage reading on the voltmeter. This should be approximately 400V at 50Hz or 480V at 60Hz. If not, increase the tractor speed. If the voltage does not increase sufficiently, the "TRACTELEC" or tractor power is insufficient,

- in the case of a star-delta starter, wait for a clear motor start-up before switching to delta position. The voltmeter should return to approximately 400V at 50Hz or 480V at 60Hz. If not, increase the tractor speed,

- to break the "TRACTELEC" general power supply, switch off the electrical circuit and set the reversing switch to the mains "NORMAL" position. Stop the tractor motor.

WARNING

Please note that the power may be supplied to the electronic switchgear on condition that its current consumption does not exceed 40% of the rated current between phase and neutral.

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 condition.



All such operations performed on the alternator should be undertaken by staff 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 work is carried out 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.

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

4.2 - Routine maintenance

4.2.1 - Inspection after start-up

After approximately 20 hours of operation, check that all fixing screws on the machine are still tight, plus the condition of the gearbox (traces of oil) and the various electrical connections in the installation.

4.2.2 - Ventilation circuit

Ensure that the suction grilles are not blocked by foreign bodies (straw, feathers, wool, etc.).

4.2.3 - Bearings

The bearings are permanently greased (see the alternator manual). A quick check of all the generator bearings can be carried out by turning the shaft end by hand; the assembly should turn freely without sticking.

4.2.4 - Gearbox

The gearbox oil should be emptied and replaced after 50 hours of operation, then every 500 hours and in all cases, at least once a year. Quality of oil to be used: SAE 90 oil.

Quantity of oil for GT3, TF3, TM3 16.5 - 20 = 0.75 litre

Quantity of oil for GT3, TF3, TM3 27.5 - 66 = 1.5 litre

Before use, check the gearbox oil level [552], and top up if necessary.

Monitor the temperature rise in the gearbox, which should not exceed 60°C above the ambient temperature. Should this value be exceeded, the machine must be stopped and checks carried out.

4.2.5 - Servicing and storage

WARNING

Cleaning the machine using a water spray or a high-pressure washer is strictly prohibited.

Any problems arising from such treatment will not be covered by our warranty.

Store your machine in a dry, airtight place to avoid condensation.

4.3 - Fault detection

If, when commissioned, the alternator does not work normally, the source of the malfunction should be identified.

To do this, check that :

- the protection devices are switched on;
- the connections comply with the diagrams in the maintenance manuals supplied with the machine,
- the generator speed is correct, see section 2.3 (use a frequency meter rather than a revolution counter).

Repeat the operations defined in section 3.

4.4 - Mechanical faults

See the alternator maintenance manual. For the gearbox, follow the troubleshooting guide below. Mechanical faults should be noted with the machine disconnected from the mains.

Fault	Excessive gearbox temperature rise
Action	Check oil level
Source	Lack of oil or incorrect oil level

Fault	Abnormal gearbox noise
Action	Change the bearings
Source	Faulty lubrication

Fault	Significant gearbox vibration
Action	Stop the machine
Source	Faulty universal joint coupling

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

4.5 - Electrical faults



Electrical faults should be noted with the machine disconnected from the mains.

See the alternator maintenance manual. For the GEARLEC or TRACTELEC, follow the troubleshooting guide below.

Fault	Voltage too high or too low
Action	Check the speed
Source	Faulty voltmeter, speed incorrectly set

Fault	No voltage
Action	Check the alternator
Source	See the alternator maintenance manual

Fault	No voltage
Action	Check protection devices
Source	Circuit-breaker, reversing switch, sockets

Fault	No voltage
Action	Check connections
Source	Wire disconnected in the terminal box

4.6 - Electronic faults

See the regulator maintenance manual, reference 5243.

4.7 - Dismantling the gearbox



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

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

5 - SPARE PARTS

5.1 - Technical support service

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

For all spare parts orders or technical support requests, send your request to service.epg@leroy-somer.com or your closest contact, whom you will find at www.lrsom.co/support indicating the complete type of machine, its number and the information indicated on the nameplate.

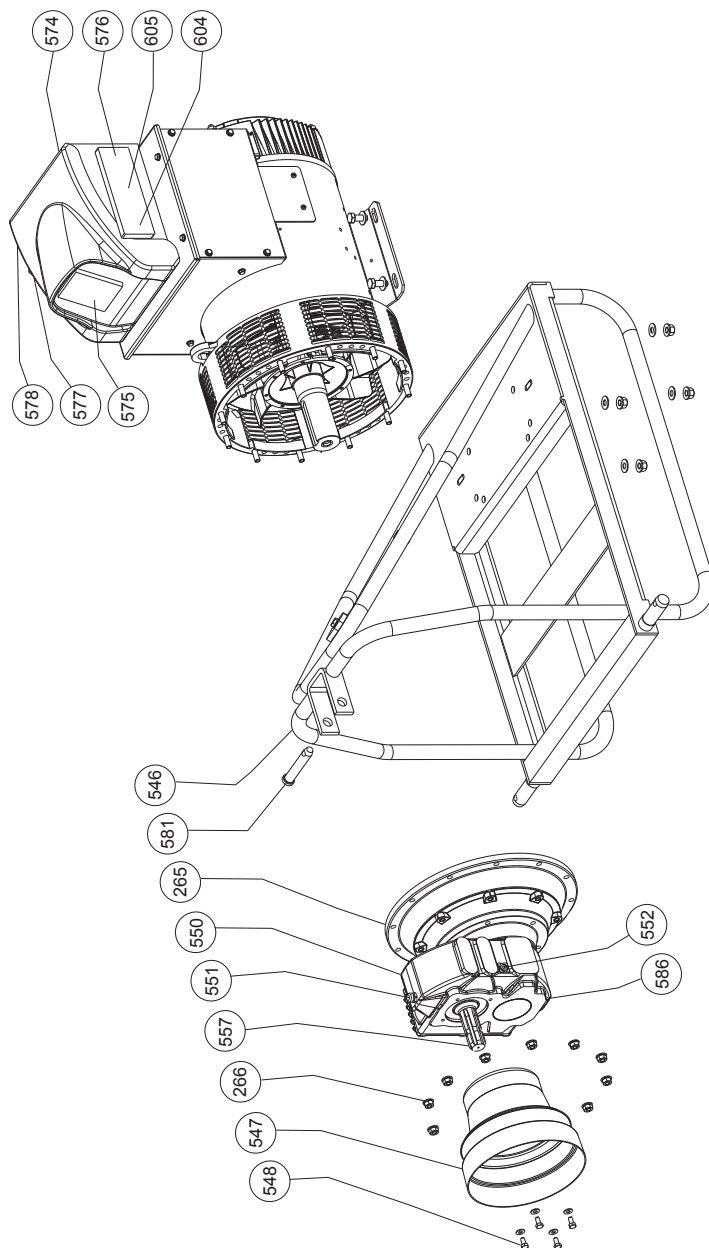
Part numbers should be identified from the exploded views and their description from the parts list.

To ensure that our products operate correctly and safely, 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.

GEARLEC - TRACTELEC **GT3 / TF3 / TM3**

5.2 - Exploded view and parts list GT3 / TF3 / TM3



GEARLEC - TRACTELEC

GT3 / TF3 / TM3

No.	Nbr.	Description	No.	Nbr.	Description
265	1	Connecting flange	574	1	Electrical unit (Tractelec)
266	12	Assembly nut	575	1	Control module (Tractelec)
546	1	Chassis (Tractelec)	576	1	30 mA residual current protection switch (3P+N) (Tractelec)
547	1	Universal joint protection	577	1	Three-phase male + female socket (3P+N+E) (Tractelec)
548	4	Fixing bolt	578	1	Single-phase male + female socket (2P+E) (Tractelec)
550	1	Gearbox	581	1	King pin (Tractelec)
551	1	Filling plug	586	1	Drain plug
552	1	Oil level	604	1	Two-pole circuit-breaker (1P+N) (Tractelec)
557	1	Splined input shaft	605	1	Four-pole circuit-breaker (3P+N) (Tractelec)

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

Disposal and recycling instructions

We are committed to limiting the environmental impact of our activity. We continuously monitor our production processes, material sourcing and product design to improve recyclability and minimise our environmental footprint.

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

Recyclable materials

Our alternators are mainly constructed from 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 how to dismantle products on request.

Waste & hazardous materials

The following components and materials require special treatment and must 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 information concerning the type of plastic.

All materials listed above need special treatment to separate waste from reclaimable materials and should be entrusted to specialist recycling companies.

The oil and grease from the lubrication system should be treated as hazardous waste and must be treated in accordance with local legislation.

GEARLEC - TRACTELEC

GT3 / TF3 / TM3

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, TAL046, TAL047, TAL049, 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 - 2017.05 / m

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

Electric Power Generation	Installation and maintenance	3472 en - 2019.05 / j
GEARLEC - TRACTELEC GT3 / TF3 / TM3		

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 have a deep understanding of alternator operation, providing the best value service to optimise your cost of ownership.

Where we can help:



Contact us:

Americas: +1 (507) 625 4011

Europe & Rest of the world: +33 238 609 908

Asia Pacific: +65 6250 8488

China: +86 591 88373036

India: +91 806 726 4867

Middle East: +971 4 5687431

service.epg@leroy-somer.com



Scan the code or go to:

www.lrsm.co/support

LEROY-SOMERTM

www.leroy-somer.com/epg

[Linkedin.com/company/Leroy-Somer](https://www.linkedin.com/company/Leroy-Somer)

[Twitter.com/Leroy_Somer_en](https://twitter.com/Leroy_Somer_en)

[Facebook.com/LeroySomer.Nidec.en](https://www.facebook.com/LeroySomer.Nidec.en)

[YouTube.com/LeroySomerOfficiel](https://www.youtube.com/LeroySomerOfficiel)



Nidec
All for dreams