Figures, descriptions, references and technical data contained in this manual are given as mere example and are not binding.

In pursuing a policy of constant product and safety improvement, DOMETIC reserves the right to effect changes at any time without undertaking to give prior notice or to update this manual every time.

Keep this document for future reference.

“The product is warranted in accordance with the enforced Law and regulations implementing the Directive 1999/44/EC.”

The Manufacturer’s warranty does not extend to Product failures, defects or damage arising from and/or attributable to a wrong installation.

The Consumer is entitled to let the Product be installed by an authorised dealer, not bound by Dometic. The warranty extends to failures or defects in the gen-sets which shall become apparent within the warranty period. The warranty shall cease to have effect if, during the two-year warranty period, the gen-set is used for more than 1,000 hours or if the recommended service schedule is not completed.

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Operation, Maintenance and
Installation manual
Generator

Libretto istruzioni per l'uso, la manutenzione e
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Bedienungs- und
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GB

1.1 Purpose of the manual

This manual has been made up by the Manufacturer and is an integrated part of the generator's equipment.
The information, if respected, will guarantee the correct use of the generator.
The part of the manual reserved for the users is indicated by the symbol while the part reserved for the experts installing the generator is indicated by the symbol

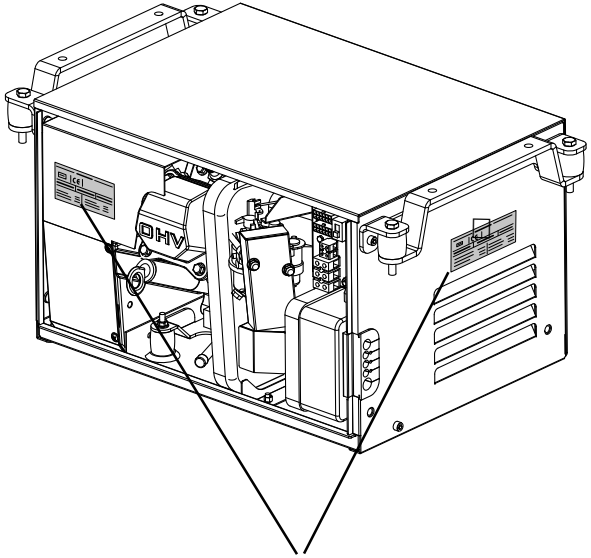
The following symbols have been used to highlight some parts of the text:

The operation can be dangerous.

Useful suggestions.

Information on the protection of the environment.

1.2 Data Plate



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The company Dometic is not responsible for any damage caused by generator malfunctions.

1.3 Safety

The generator is installed in a closed casing. Therefore, there is no danger of accidental contacts with moving parts or wires under voltage. The door is fitted with a key lock which shall be kept out of reach by children or non-authorised people.

Warning

- *Check the generator before using it every time. In this way it is possible to prevent accidents or damage to the motor.*
- *To prevent fire hazards and to keep the generator in an efficient working condition, do not close the same in a case or an enclosed space such as an alcove but install it in a well-ventilated area.*
- *Keep children and animals away from the generator when it is running, as it can heat up and cause burns and injuries, both directly and through the systems it is supplying.*
- *Learn how to turn the generator off quickly and how to use the controls. Never leave the generator in the hands of people who are not trained to use it.*
- *The generator must only be used with the generator door closed.*
- *Keep flammable substances away from the generator such as for example: petrol, paints, solvents etc.*
- *Make sure that the hot parts of the generator do not come into contact with materials that could catch fire.*
- *Change the LPG canister in a well-ventilated area and with the vehicle engine off. LPG is highly inflammable and can explode.*
- *The LPG canister must be changed by expert personnel. Check the integrity of the seal on the tap*
- *Exhaust gases contain carbon monoxide, an extremely poisonous gas, which is odourless and colourless. Avoid inhaling exhaust gases. Do not run the engine of the generator in a closed garage or room without very good ventilations.*
- *Do not touch the generator or the connections with wet hands.*
- *Do not replace fuses or thermal cutouts with others of a higher amperage.*
- *Any checks carried out on the electric parts should be done by authorised personnel with the engine turned off.*
- *Install the generator in a stable area. Do not incline the generator by more than 20° with respect to the vertical plane.*
- *Sudden braking or acceleration, or curves taken abruptly with the vehicle can cause problems in the pumping system of the generator and make it stall.*
- *When storing the generator up for a long period of time, start it at least once every 30 days and leave it running for at least 15 minutes.*
- *Leave the generator on for a few minutes without charge after use before switching it off.*

The generator is made to meet the safety regulations indicated in the declaration of conformity.

1.4 Noise

The generator has been tested for noise emissions at the qualified independent laboratory DNV Modulo Uno which has issued the EEC-certificate based on EC-DIRECTIVE 2000/14.

GUARANTEED AND MEASURED SOUND POWER LEVEL:

TEC29 LPG..... LwA 89

SOUND POWER LEVEL measured from 7mt .... dB(A) 54-59

GB

1.5 Description of the generator

Warning

The TEC 29 LPG generator has been designed and produced to be used only on caravans, motor homes and commercial vehicles. Therefore it has not been designed to be used on other types of vehicles or on any kind of watercraft. The company Dometic, as it is impossible to envisage every possible use and type of installation, declines any responsibility for every type of use and installation which is not explicitly mentioned.

The generator has been designed to produce alternating current at 230V and 50 Hz, capable of supplying power to various systems. Therefore it is fitted with an inverter, so that it can supply systems that are very sensitive to the quality of the energy supplied, such as personal computers for example.
The generator is installed in a sheet metal steel casing which is insulated and soundproofed with special soundproofing materials.

1.6 Recommandations for use

To use the generator in the best way it is a good idea to pay attention to even small overloads, which if prolonged, will cause the protective thermal cutouts to trip.
When running in it is important not to put the new engine under a load that exceeds 70 % of the nominal load, at least for the first 50 working hours; then we recommend a normal use of the generator with a load equal to roughly 3/4 of the maximum declared continuous load, this in order to prolong the life of the generator and maximize efficiency.
When the generator is hot we recommend starting by pushing the start button briefly, while when the generator is cold hold the start button down for longer.

1.7 Operation description

The main elements of the TEC 29 LPG generator are: an engine (a), a permanent magnet alternator (b), an inverter (c), an internal control panel (d), a terminal board (e) and an external control panel (f), an electromagnet (g), a stepper motor (h), the lock-off (i) and the LPG regulator (l).
When the engine runs it drives the alternator to which it is solidly connected, which in turn generates alternating current that supplies the inverter. The inverter “converts” the voltage supplied into a higher quality, perfectly stable voltage of 230 V and 50Hz supply.
The terminals, the socket where the extension of the external control panel is connected and the safety switch are located on the internal control panel.

The external control panel is equipped with:

- buttons to start and stop the generator
- a back lit LCD screen showing the main electrical properties, an indicator shows that the generator is working properly and an hour counter is also displayed. In the case of problem the alarm messages are displayed on this screen.
- LED indicators indicate low levels of petrol or oil.

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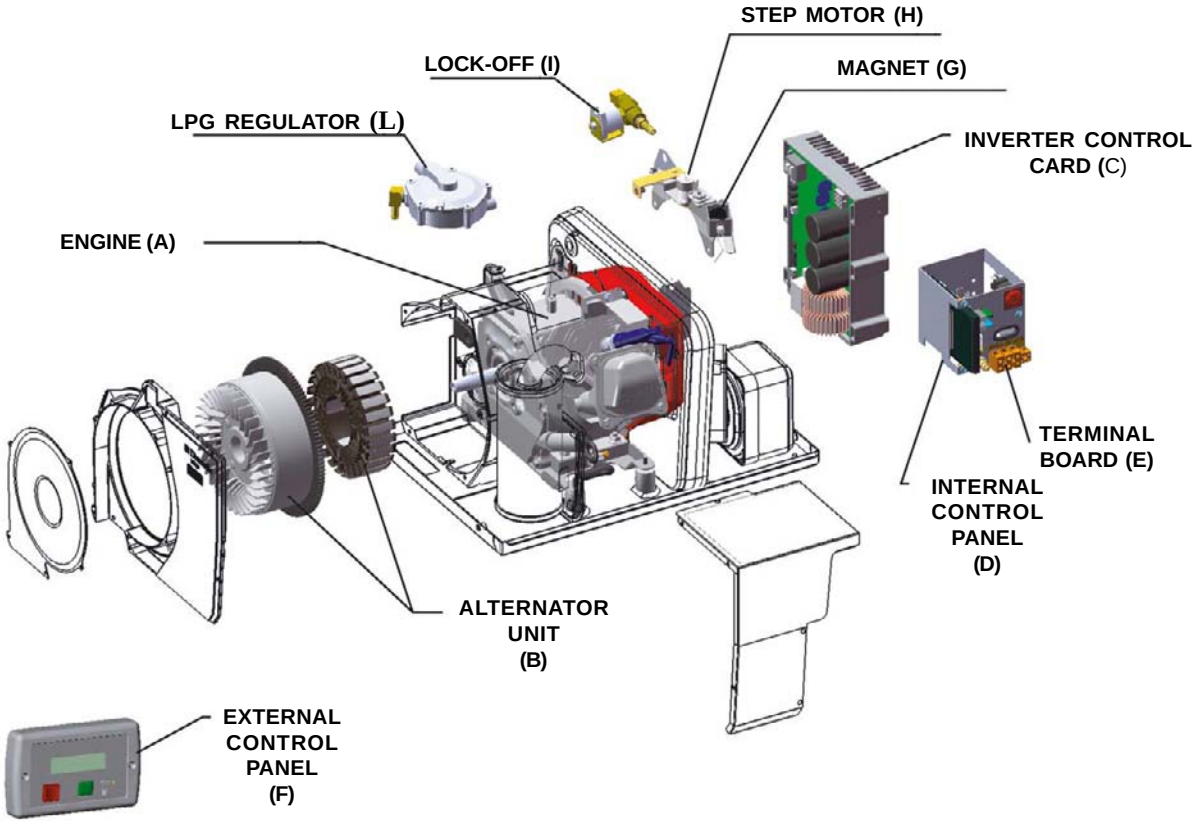
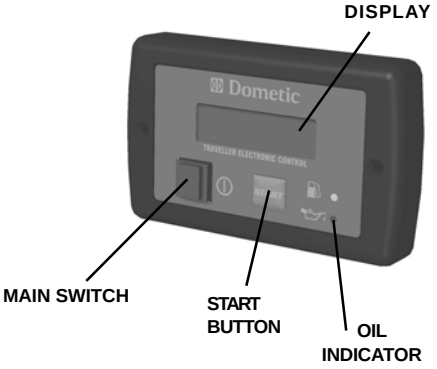
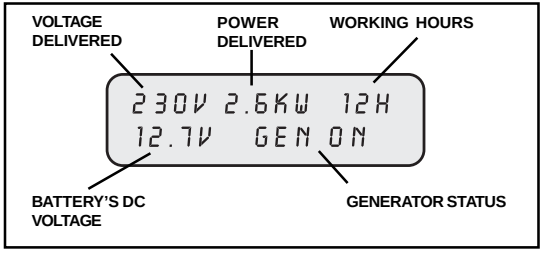

STEP MOTOR (H)
LOCK-OFF (I)
MAGNET (G)
LPG REGULATOR (L)
INVERTER CONTROL CARD (C)
ENGINE (A)
TERMINAL BOARD (E)
INTERNAL CONTROL PANEL (D)
ALTERNATOR UNIT (B)
EXTERNAL CONTROL PANEL (F)

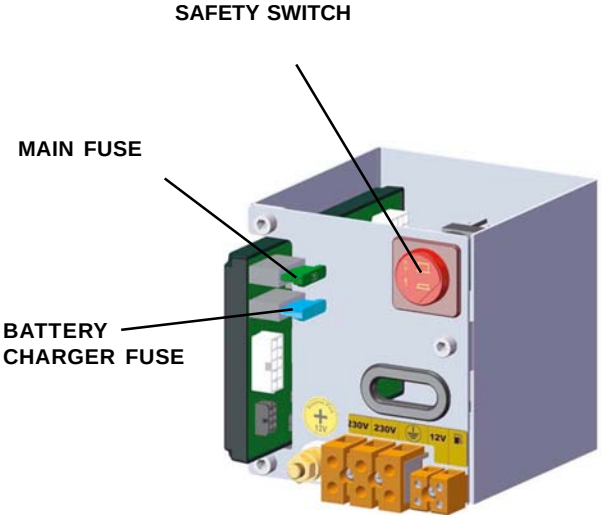
GB

1.8 External control panel





1.9 Internal control panel



Operation description

MAIN SWITCH:	turns the panel on/stops the generator
START BUTTON:	starts the generator
OIL INDICATOR:	indicates a low oil level in the engine
EMERGENCY STOP SWITCH:	stops the generator immediately in an emergency
CUT OUT SWITCH:	continuous current thermal cut out protection
BATTERY CHARGER FUSE:	thermal protection on the direct current
MAIN FUSE:	thermal protection on the alternating current

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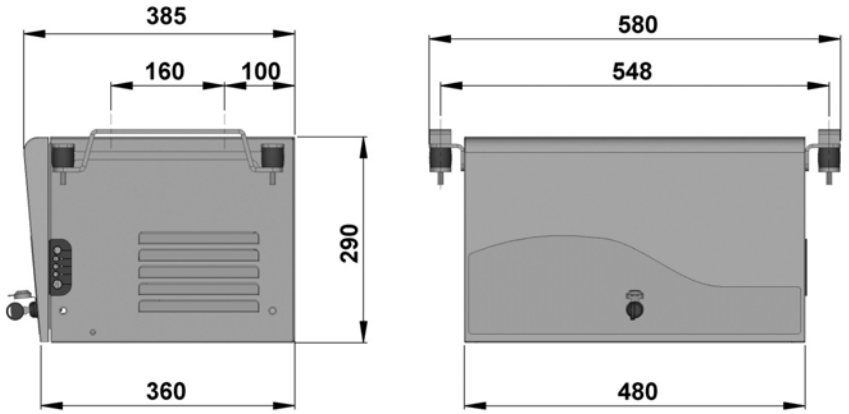
1.10 Technical data



DESCRIPTION	UNIT OF MEASURE	VALUE
VOLTAGE SUPPLIED	V	230 ± 10%
MAX CONTINUOUS POWER	W	2600 ± 5%
FREQUENCY	Hz	50 ± 1%
DIRECT CURRENT POWER	V / A	12 / 10
THD	%	1
CONSUMPTION	g/kW h	408
WEIGHT	kg	44

GB

1.11 Table describing the alarm messages appearing on the display

DISPLAYED MESSAGE	DESCRIPTION	GENERATOR BEHAVIOUR	ACTIONS
LOW BATTERY	Indicates that the battery voltage is below the minimum value necessary to start the generator (9V).	The generator does not start.	Check the efficiency of the battery before starting the generator.
OIL CHANGE	This message appears every time the hour counter of the machine reaches the service interval pre-set to change the engine oil.	The generator continues to run.	Change the oil (see p.21) before restarting the generator by holding the start button down for longer.
OIL ALERT	There is no more oil in the oil tank.	The generator stops.	Fill up (see page 11).
GENERATOR ALERT!	General alarm message; it is displayed for instance when the check ring of the carburettor throttle (step motor) is defective and the M110 module cannot check the motor speed	The generator stops.	SeeTroubleshooting table on page 19. If the problem persists, address to the nearest service centre.
OVERLOAD!	Indicates an output overload of the supplied systems.	the inverter cuts off so no power is supplied and the motor shuts down.	Reduce the amount of load connected and restart the generator.
SHORT CIRCUIT	Indicates an output short of the supplied systems.	the inverter cuts off so no power is supplied and the motor shuts down.	Check the integrity of the devices connected and restart the generator.
OVER TEMPERATURE	This message is displayed in the event of a thermal overload.	The inverter stops and voltage is no longer supplied. The engine continues to run for a correct cooling of the internal parts, then stops and the message displayed is “RESTART GEN?”.	Let the generator cool down, wait a few minutes and restart the unit.
LOW POWER ENGINE	Signals a reduction of the voltage supplied to the inverter.	The generator stops.	Reduce the connected load and restart the generator.
RESTART GEN?	This message appears after any stop of the generator.	The generator stops.	Press main switch button off and on and then push the start button if you want to restart the generator.
GEN CAL	This message appears at the generator start-up and indicates the calibration phase preceding any start-up. The generator does not produce current yet.	The generator run but voltage is not supplied.	Wait a few seconds.
GEN WAIT	Message displayed between one start attempt and the other.	The generator not run.	Wait until the message goes off before attempting a new start.
GEN ON	Indicates that the generator is running.		

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1.12 Routine maintenance

To perform these checks you should open the door of the generator taking the following precautions:

The generator must not be running and all of the parts must be cold.

Set the safety switch on the internal control panel to “O” (OFF).
Disconnect the positive pole (+) of the vehicle’s battery taking care not to earth it.

IMPORTANT: Use only genuine spare parts. The generator may get damaged if other than genuine parts having a different quality standard are used.

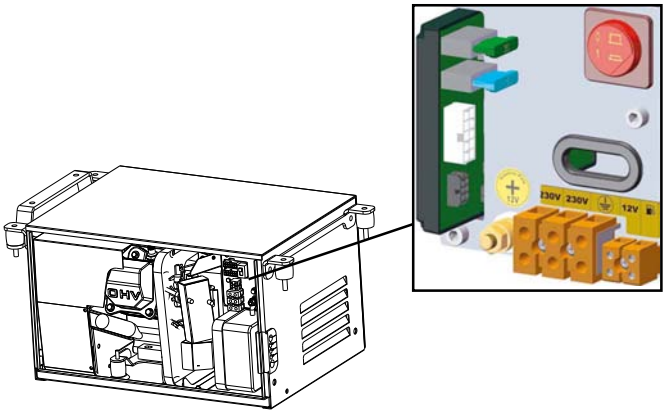
IMPORTANT:
Remember to reconnect the positive pole (+) of the vehicle’s battery and set the switch back to “I” (ON) once you have finished the checks.

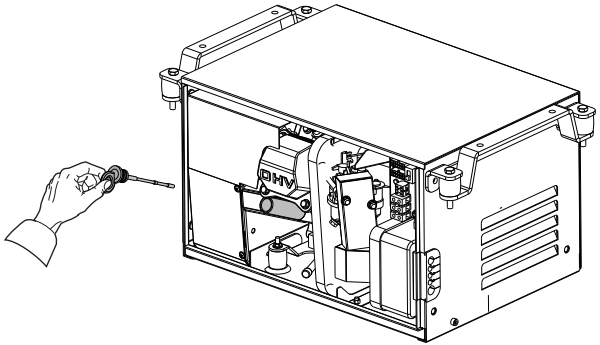
1.13 Checking the oil level

Remove the oil filler and clean the dipstick with a cloth.
Refit by screwing the dipstick.
Remove the dipstick and check that the oil level is between the two (min. and max.) marks.
Add oil if necessary through the filler. Use only the oil recommended by the manufacturer!

Refit the plug.

IMPORTANT:
Perform all of the checks making sure the generator is in a horizontal position.





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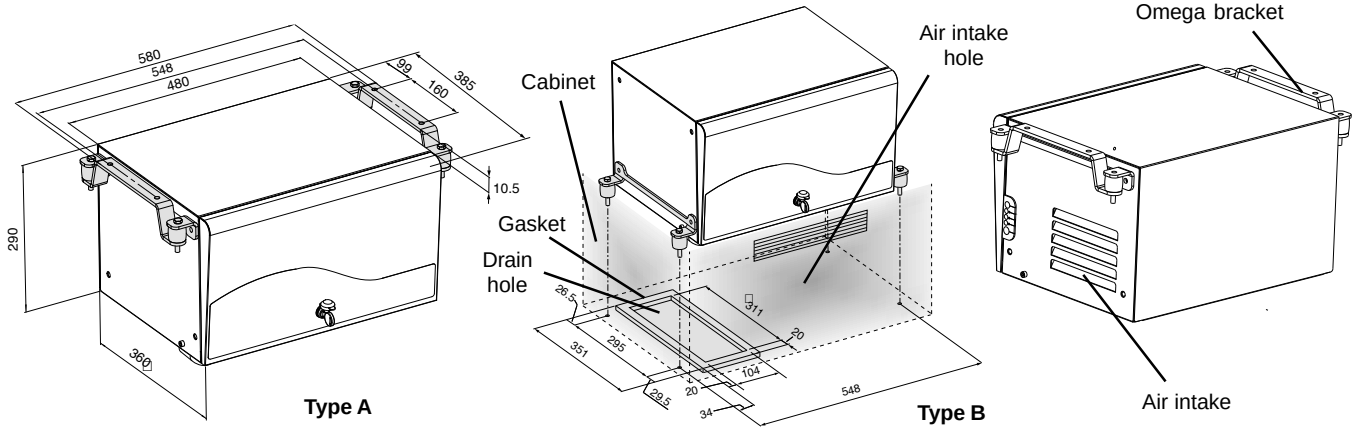
2.1 Instructions for fixing the generator

Warning

Make sure there is enough space around the casing of the generator for cooling, leaving at least 20 mm of free space between the casing and the surrounding walls or parts. If the air intake of the generator remains behind a wheel of the vehicle, make sure that in the case of rain the wheel will not spray water onto or into the generator taking preventing measures if necessary (ex. antispray guards).



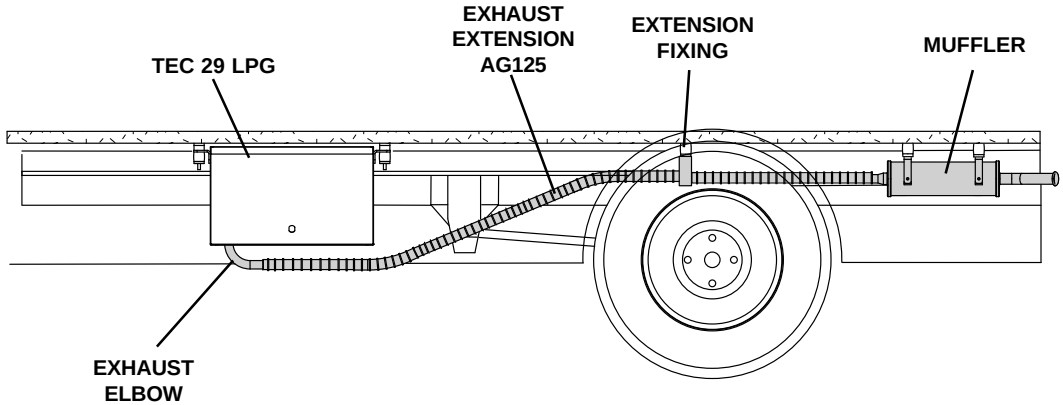
The brackets supplied make it possible to install the generator both externally (Type A) and internally (Type B).
"Type A " assembly (external installation) offers the following advantages: less internal space occupied, rapid installation, easy access for the routine and extraordinary maintenance. For the "Type A" installation you will have to use the "omega brackets" supplied to guarantee that the unit will be correctly fitted. If you decide to install the generator with the "Type B" installation (internal installation), you will have to prepare a sealed cabinet inside the vehicle (which can be further sound-proofed), being careful to respect the air space of 20mm between the generator casing and the surrounding parts, with the exhaust and air intake holes in the floor and door. The air intake must be at least 240 cm^2. Furthermore you should also install a fire-proof rubber gasket of at least 5mm between the floor and the base of the generator (available as accessory Ref. AG128).

GB

2.2 Instructions for installing the exhaust system

We recommend positioning the elbow of the exhaust pipe in line with the length of the casing (as shown in the figure) so more vibrations can be absorbed.
Use the exhaust extension (available as accessory Ref. AG125) to extend the position of the muffler. Fix the extension to the floor of the vehicle.

WARNING
Do not make any sharp bends in the hose which could obstruct the exhaust gas.



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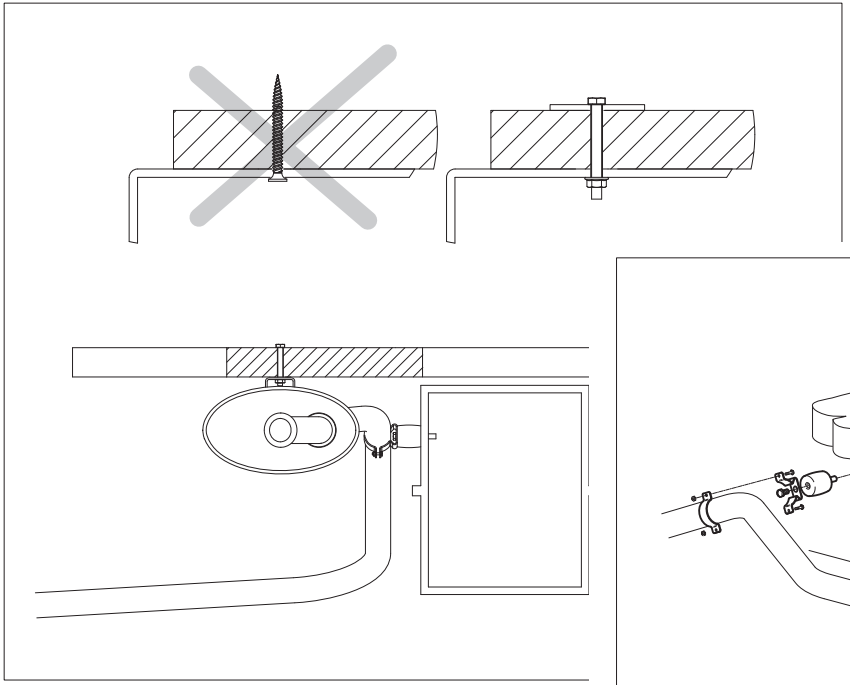
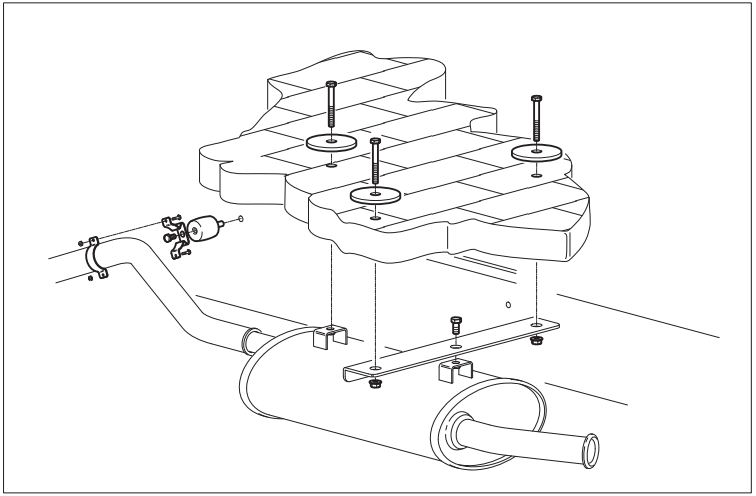
Instructions for installing the exhaust system





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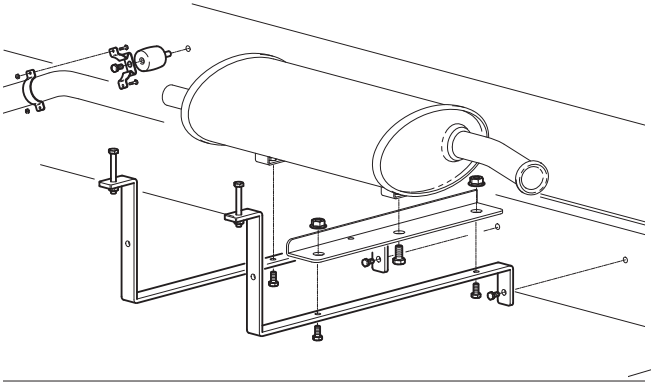
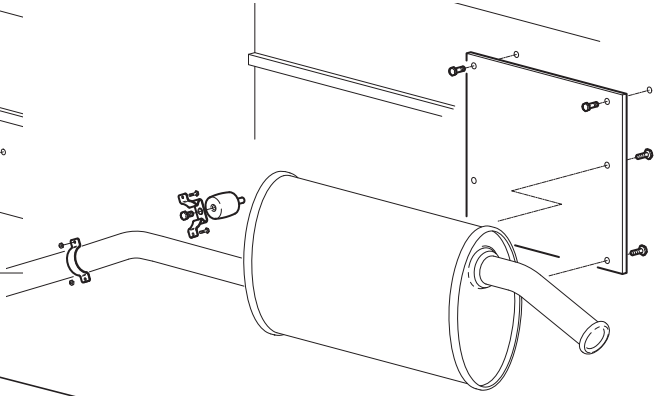
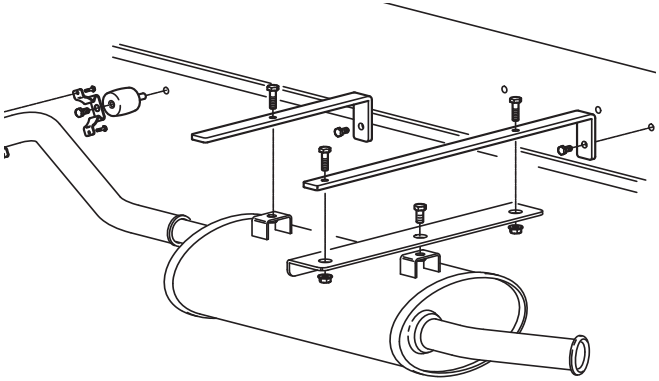
Instructions for installing the exhaust system







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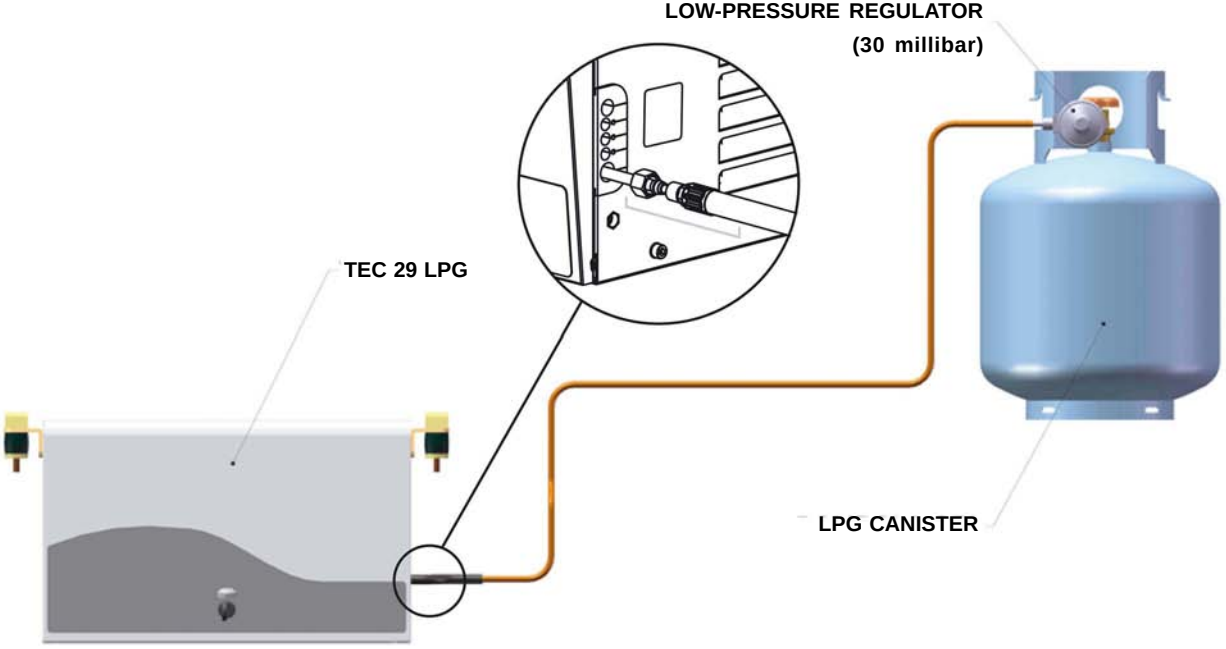
2.3 Instructions to connect the LPG canister

The generator must be connected to the low-pressure regulator (30 millibar) of the LPG canister.
Use of metal pipes is recommended.



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2.4 Instructions for the electrical connection

Make the electrical connections respecting all applicable laws and regulations.

Warning

You will have to install a relay or commutator in the vehicle's electrical system (ex. the accessory AG 102) in order to prevent damaging the generator when the external mains is connected; in this case we suggest connecting the generator so that it has priority over the external mains network as in diagram on page 28.

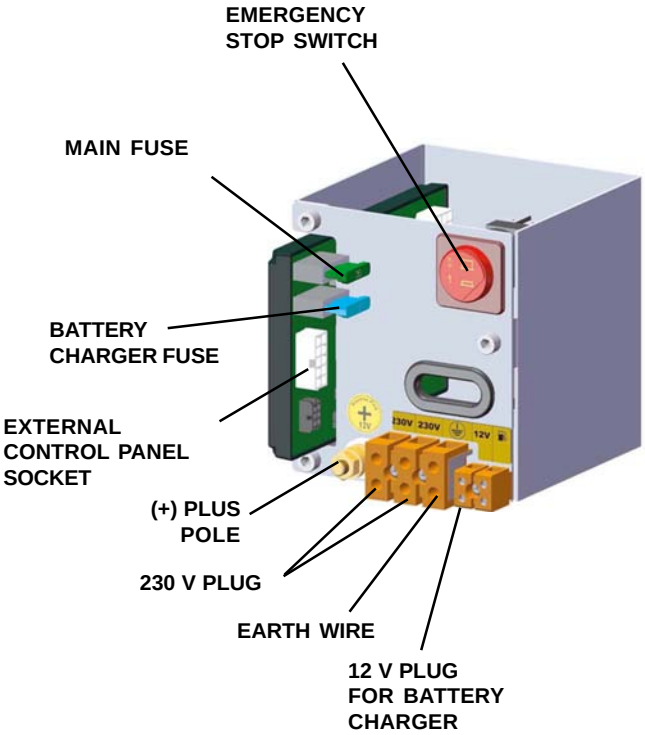
Electric wiring must be effected in conformity with the existing laws and regulations in force in the user's country.
For correct installation performed by the final user, use preventive technical assistance by your seller or by a skilled technician.

For the 230 V use a cable of a standard cross-section as shown in the table; insert it in the casing through the cable guide and connect it to the terminals. Connect the earth wire.

Cross-section mm² 230V (power cables)	Cross-section mm² 12V (battery charger)	Cross-section mm² Length up to 6m (battery connection)	Cross-section mm² Length > 6m (battery connection)
2.5	2.5	10	16

Electrical connection of the battery charger

Use a cable with a suitable cross-section as shown in the table, connecting it to the terminal and to the positive pole of the battery you want to charge. (See picture on page 18)



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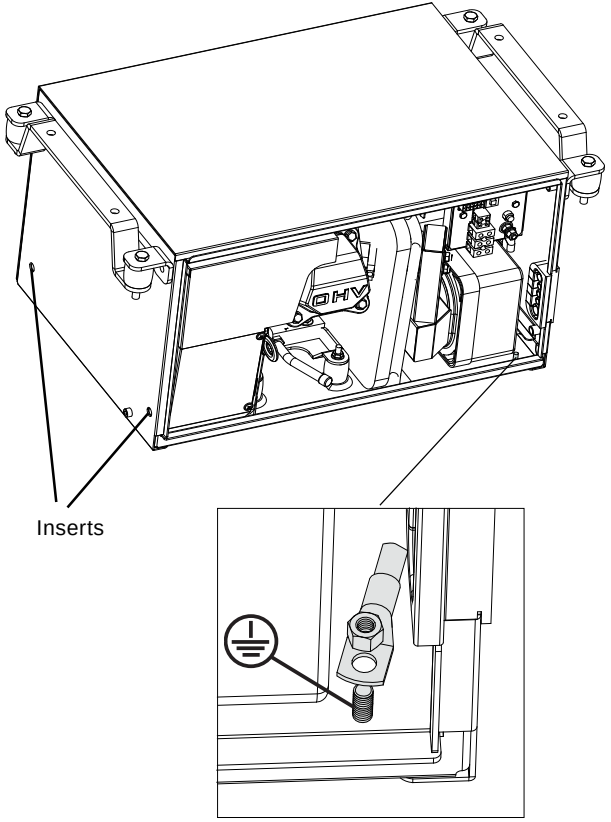
Battery connection

NB:Starting electrical input must be 12V DC.
Starting battery should be efficient and with minimum capacity of 60 Ah.

To start the generator, connect it to the positive pole of the vehicle's battery with a sheathed cable of a suitable cross-section as shown in the table. The ground cable must have the same cross-section and be connected or as shown in the figure to the side or from the inserts to the frame of the vehicle. Make sure that the contact is good. If necessary remove paint or rust from the surface of the frame and protect the connection with grease.
To protect the DC wiring use a 100Amp fuse closed to the plus pole of the battery.



External control panel connection

Choose the desired position inside the vehicle, use the extension lead (supplied) to connect the external control panel to the internal control panel of the generator.

GB

3.1 Faults, causes and solutions

CAUSE \ SOLUTION	The emergency stop switch is not to on	The starter is not powered up	The electrical cables are broken	The generator earth wire is broken	No fuel	The choke is not available	The throttle valvle is blocked	No current to the spark plug	*No fuel reaching carburettor*	The air filter is dirty	The Air intakes are obstructed	The inverter is damaged	Load over 2.6 kW	Low battery charge	The starter shaft is dirty	The stepper motor is down or disconnected	Too much oil in the engine
By operating the main switch, the panel does not switch on			●	●										○			
By pushing the start button, the generator does not start (the starting motor does not run)	○	●	●	●								●		○	○		○
The starting motor runs but the generator does not start			●		○			○	○		○	●					
The generator tends to stall						●			○	●	○	●	○				○
The generator runs but it does not produce current						●	●					●				●	
The generator starts, then stops and display “generator allert” message												●				●	
The produced current oscillates												●				●	

○ Operations to be carried out by the user

● Operations to be carried out by qualified technicians

GB

3.2 Check list and time intervals

Routine maintenance To be carried out at the scheduled intervals or after the given running hours according to that which occurs first		After every use	After the first month or 20 hours	Every 3 months or 50 hours	Every 6 months or 100 hours	Every year or 300 hours
Engine oil	Check	○				
	Change		●		●	
Air filter	Clean		●	●		
Spark plug	Check - clean				●	
Valve adjustment	Check - adjust					●
No oil leaks or LPG escaping	Check	○				
Vibration-proof fixing points	Check					●
LPG pipes	Check (replace if necessary)	Every 2 years ●				

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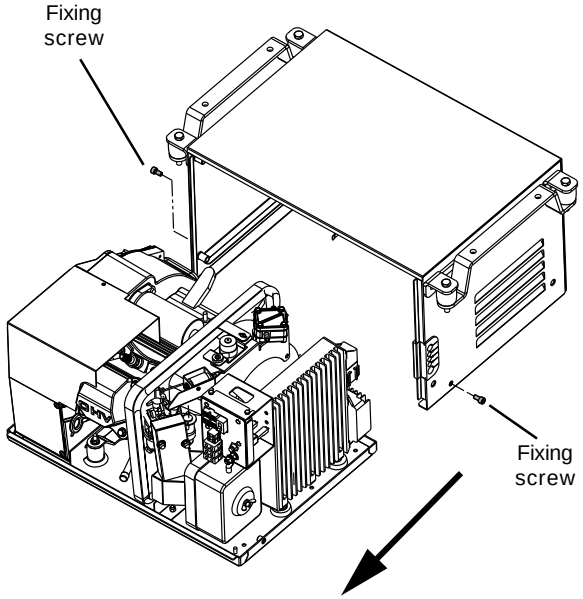
3.3 Extraordinary maintenance

For some maintenance operations there is the possibility of pulling the generator out by sliding the entire bottom of the generator on the guides fixed to the sidewalls of the casing. To free the bottom unscrew the fixing screws.



Changing the oil

Warning

- *Hot oil can burn your skin!*
- *Check the oil level with the engine turned off.*

Important

Old oil moust not be disposed of in the environment, but left to a station specialised in the disposal and/or recycling of the same, respecting the laws in the country where the operations are carried out.

Use API SG or SF oil for 4-stroke engines (this indication is on the oil can).
SAE 10W-30 oil is recommended for general use at all temperatures. If you use monograde oil, choose the appropriate viscosity on the basis of the average temperature of the place where the generator is installed.

To drain the old oil easier you should run the generator for roughly 3/5 minutes, in this way the oil is more fluid and will drain better through the drain tube when you remove the drain plug. Refill the generator with oil of the recommended type, through the oil filler.
The quantity of oil is:

0.6 Litres

GB

Air filter maintenance

Warning

Do not use diesel or solvents with a low evaporation point to clean the air filter element as it could catch fire or explode.

Important

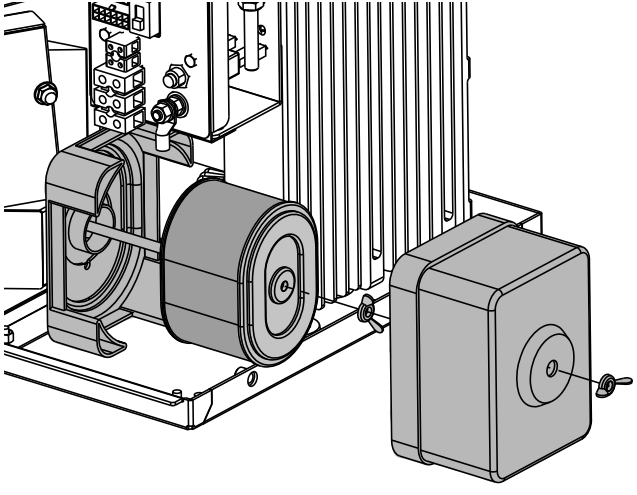
If the air filter is dirty this reduces the flow of air to the carburettor. Therefore, to prevent carburettor malfunctions we recommend checking the state of the filter periodically, and more often if you are using the TEC 29 LPG in particularly dusty areas.

Never use the engine without the air filter. The engine would wear quickly.

Carefully check the integrity of both the elements and replace them if they are damaged.

Sponge element: wash the element in a solution containing neutral detergent, rinse thoroughly. Let the element dry completely and immerge it in clean engine oil before wringing the excess oil out.

Paper element: lightly tap the element on a hard surface to remove the excess dirt, or blow the filter clean from the inside out with compressed air. Never brush the dirt off: in fact brushing pushes the dirt into the fibres of the paper element. Replace the paper element if it is very dirty.



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Spark plug maintenance

Warning

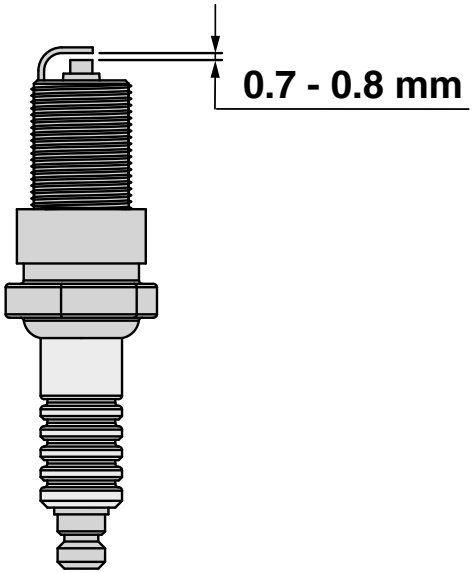
The spark plug must be properly tightened. A loose spark plug can become very hot and damage the engine.

Important

When fitting a new spark plug, tighten it by half a turn after it has started compressing the washer. If you are fitting a used spark plug, tighten it by between 1/8 to 1/4 of a turn after the same has started to compress the washer.

Never use a spark plug with a different heat rating:

1. Remove the cap of the spark plug and remove it using a wrench.
2. Check the spark plug by eye. Replace the spark plug if it is worn or the insulation is broken or chipped. If the spark plug is just dirty, clean it with a wire brush and if is still in a good condition, use it again.
3. Measure the distance between the electrodes with a feeler gauge. This distance must be 0.7-0.8 mm. If necessary adjust this distance by bending the electrode.
4. Check that the washer of the spark plug is in a good condition, if this is the case screw the spark plug in by hand, to avoid stripping the thread.
5. Once you have screwed the spark plug in by hand, tighten it with a plug wrench to compress the washer.



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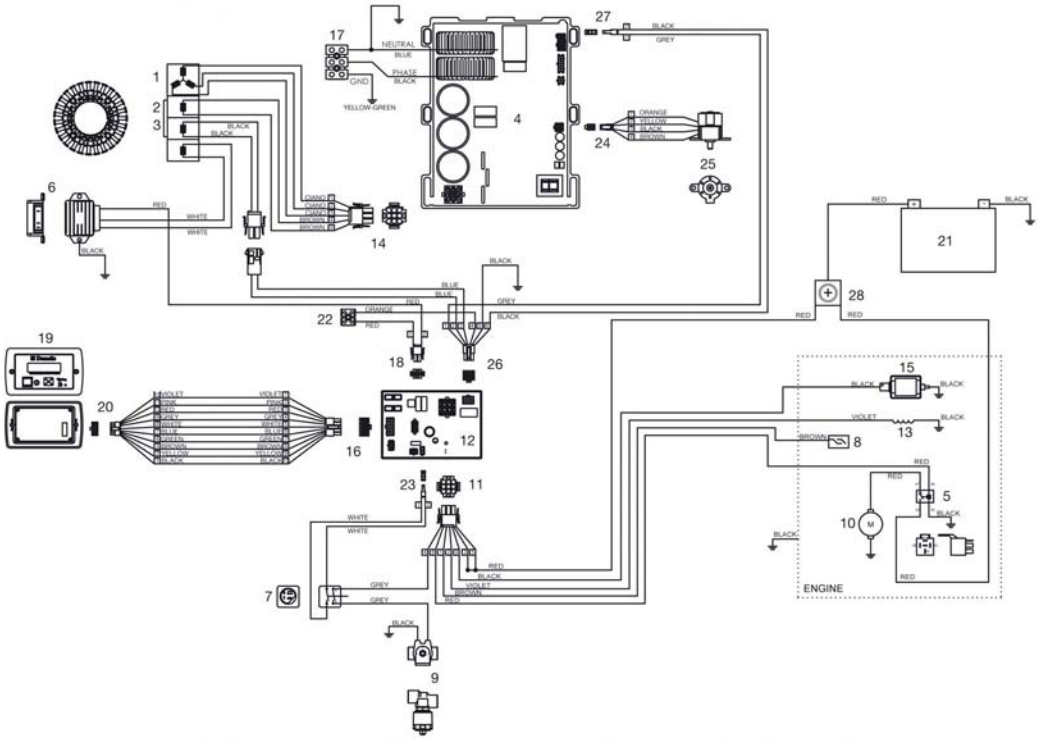

	DESCRIPTION
1	THREE-PHASE WINDING
2	AUXILIARY WINDING
3	AUXILIARY WINDING
4	INVERTER MODULE
5	STARTING RELAY
6	BATTERY CHARGER
7	EMERGENCY SWITCH
8	OIL ALERT
9	LOCK-OFF
10	STARTER
11	9 POLE CONNECTOR
12	INTERFACE CARD
13	MOTOR COIL
14	9 POLE CONNECTOR
15	ELECTROMAGNET
16	10 POLE CONNECTOR
17	TERMINAL BOX
18	2 POLE CONNECTOR
19	INTERNAL CONTROL PANEL
20	12 POLE CONNECTOR
21	BATTERY
22	TERMINAL BOX
23	2 POLE CONNECTOR
24	4 POLE CONNECTOR
25	STEPPER MOTOR
26	6 POLE CONNECTOR
27	2 POLE CONNECTOR
28	POSITIVE POLE TERMINAL

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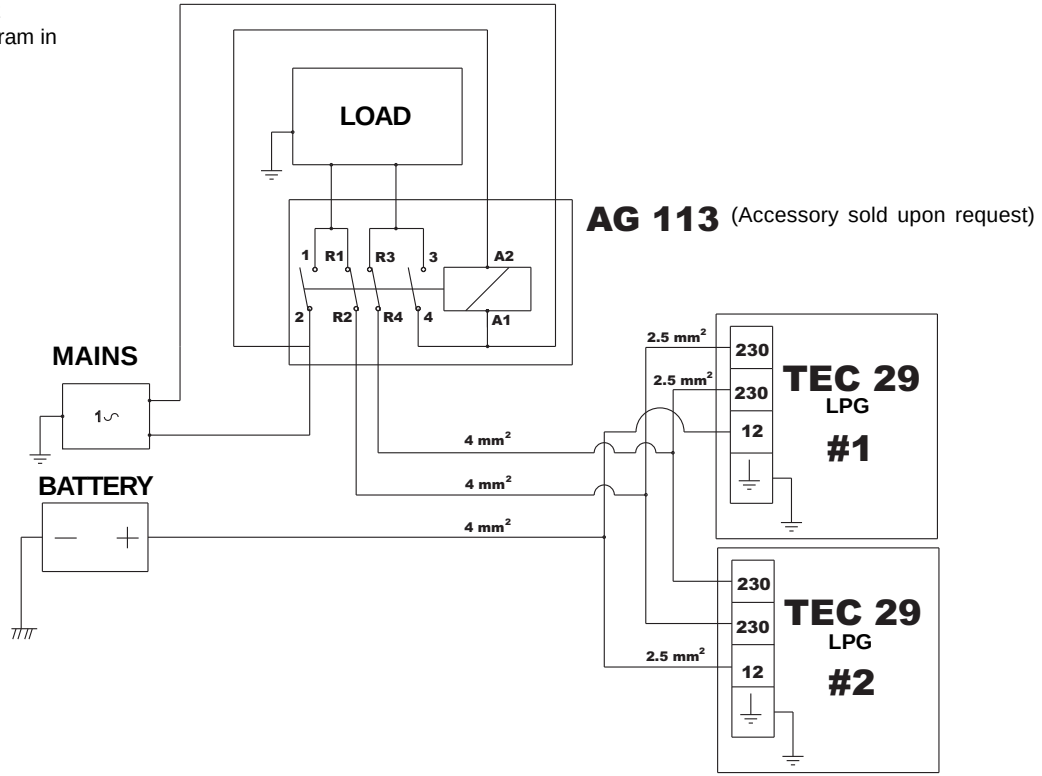
For parallel connection of 2 TEC29 LPG follow the diagram in the picture .



Compulsorily: use change-over switch AG113 to protect the units against accidental connection to the main electric line

WARNING!

All generators connected to the wiring system must be on off position before executing any maintenance operation!

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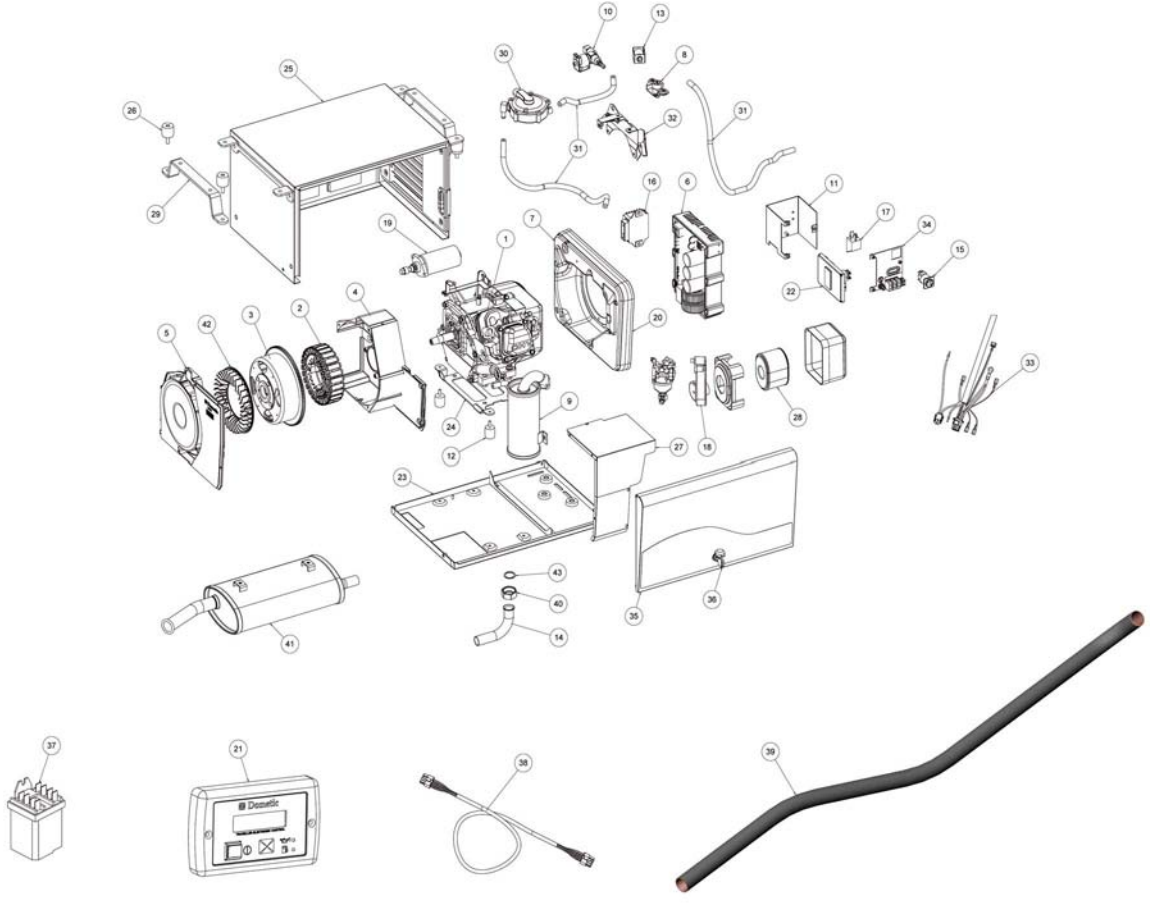

	DESCRIPTION
1	GX 160 MOTOR
2	COMPLETE STATOR
3	COMPLETE ROTOR
4	ALTERNATOR COVER
5	FAN CASING
6	INVERTER
7	MOTOR WALL
8	STEP-BY-STEP GEARMOTOR
9	EXHAUST
10	LOCK-OFF SOLENOID VALVE
11	INTERNAL CONTROL PANEL BOX
12	MOTOR SUPPORT ANTI-VIBRATOR
13	ELECTROMAGNET
14	EXHAUST CONNECTOR
15	0/1 SWITCH
16	12V REGULATOR
17	MOTOR STARTING RELAY
18	SUCTION COLLECTOR
19	STARTER MOTOR
20	MOTOR WALL GASKET
21	EXTERNAL CONTROL PANEL
22	INTERNAL CONTROL PANEL CARD
23	CASING BOTTOM
24	MOTOR SUPPORT CLAMP
25	GENERATOR CASING
26	CASING ANTI-VIBRATOR
27	EXHAUST PLATE
28	MOTOR AIR FILTER

	DESCRIPTION
29	CASING ANTI-VIBRATOR CLAMP
30	LPG REGULATOR
31	LPG PIPES
32	STEPPER MOTOR FIXING PLATE
33	WIRING
34	INTERNAL CONTROL PANEL
35	INVERTER GENERATOR CASING DOOR
36	LOCK
37	SWITCH
38	CONTROL EXTENSION
39	FLEXIBLE TUBE
40	EXHAUST CONNECTOR NUT
41	SILENCER
42	FAN
43	EXHAUST NUT WASHER

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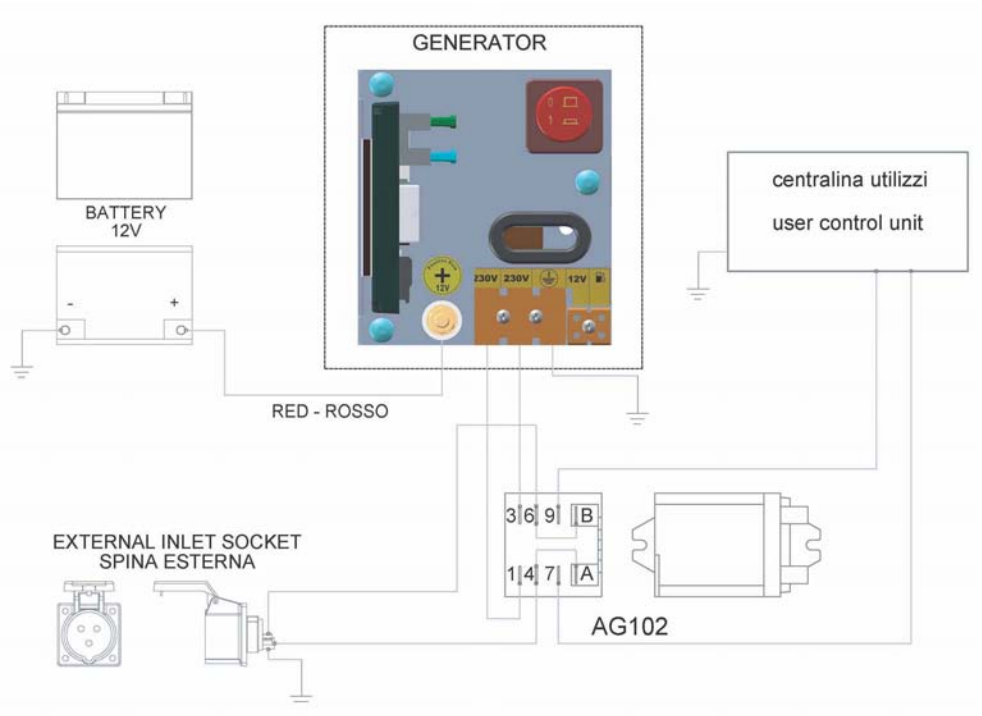

AG102 switch accessory (available on request)

1) Use wires of an adequate cross section (see table in paragraph on electrical connections).
2) Fix the AG 102 switch in a position to make an easy connection.
3) Switch off the mains input connecting wire at the circuit breaker in the control box to wire the connections according to the diagram.
4) Use Faston terminals to connect the wires to the switch; terminal A must be bridged with N°4 and B with N°6.
5) In positions N°1 and N°3 connect the wires coming from the 230V terminal board of the generator.