Manufacturer:
FOGO Sp. z o.o.
ul. Święciechowska 36,
Wilkowice
Święciechowa 64-115, Poland

Portable power generators

For models:

HONDA
FH3001, F3001R, FH3541, FH4001, FH4001R, FH4541, FH6000, FH6000R, FH6540, FH6001, FH6001CRA, FH6001R, FH6001T, FH6001TE, FH6001TR, FH6001TRA, FH6001TRE, FH6541, FH8000, FH8000CRA, FH8000R, FH8000T, FH8000TE, FH8000TR, FH8000TRA, FH8000TRE, FH8220TW, FH8220TWE,
FH8220W, FH9000, FH9000CRA, FH9000R, FH9000T, FH9000TE, FH9000TR, FH9000TRA, FH9000TRE, FH9220TW, FH9220TWE, FH9220W, FH9540TR, FH9540TRA, FH9540TRE, FH9540

BRIGGS
FV10001CRA, FV10001TE, FV10001TRA, FV10001TRE, FV10300TWE, FV10300WE, FV11300TWE, FV11001CRA, FV11001TE, FV11001TRA, FV11001TRE, FV13000CRA, FV13000TE, FV13000TRA, FV13000TRE, FV13540TRA,
13540TRE, FV15000CRA, FV15000TE, FV15000TRA, FV15000TRE, FV15540TRA, FV15540TRE, FV17001CRA, FV17001TRA, FV17001TRE, FV20000CRA, FV20000TE, FV20000TRA, FV20000TRE, FV20540TRA, FV20540TRE

MISTUBISHI
FM6001, FM6001R, FM6001E, FM6001RE, FM8000, FM8000R, FM8000E, FM8000RE, FM8220W, FM8220WE, FM9000, FM9000R, FM9000E, FM9000RE, FM9220W, FM9220WE, FM6541, FM6541E, FM9540, FM9540RE

FOGO
F3001, F300R

User manual

HONDA

BRIGGS & STRATTON ®

MITSUBISHI

ORIGINAL MANUAL

Location of safety and identification stickers

When using the power generator, remember to observe safety precautions. Therefore, the device is provided with pictograms reminding about safety during operation. Their meaning is explained below. Stickers are an integral part of the power generator. If they become illegible or destroyed, contact your Authorized Dealer of FOGO Sp. z o.o. in order to replace them with new ones. We strongly recommend carefully reading and understanding the safety rules included in our manual.

1. Fuel filler cap
2. Silencer
3. Fuel tank
4. Oil drain plug
5. Oil dipstick
6. Air filter
7. Thermal switch
8. Operation time counter
9. Magneto-thermal circuit breaker
10. Battery
11. 230V 16A socket
12. 230V 32A socket
13. 400V 16/32A socket
14. Fuel gauge
15. Fuel valve
16. Fuel filter
17. Oil filter
18. Electric starter
19. Spark plug
20. Fuel pump

Dear Customer

Thank you for your trust in our equipment and purchase of high-quality FOGO® power generator. We are convinced that cooperation with world-leading manufacturers of components and application of innovative technological solutions, we have created a product that sets standards in terms of quality, safety and reliability. We hope that our product will meet your requirements in everyday use, ensuring long-lasting, trouble-free operation.

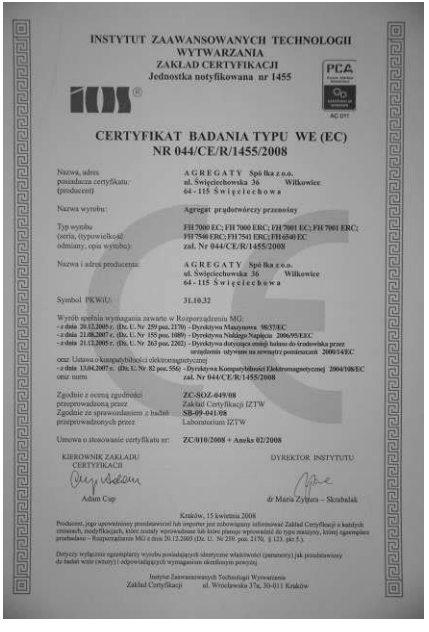
FOGO Sp. z o.o.

Before the first start of the device, it is absolutely necessary to read the manual !!

Safety of the user and all persons staying near to the device is very important. Therefore, before using the power generator, it is essential to read these instructions. The buyer of the power generator must ensure that this manual is always available for its operator and that every user reads the manual before starting any activities related to device operation.

Fogo power generators are designed and manufactured in accordance with current European directives, which we confirm by the declaration of conformity. In order to confirm that our generators meet EU safety requirements, we submit them to additional conformity assessment procedure, performed by a third party Notified Body.

FOGO® devices comply with the relevant European standards and other specific requirements in terms of the construction, operational safety and environmental protection. Each power generator is provided with CE declaration of conformity with the measuring sheet and technical specification of the unit.



INSTYTUT ZAAWANSOWANYCH TECHNOLOGII WYTWARZANIA
ZAKŁAD CERTYFIKACJI
Jednostka notyfikowana nr 1455

PCA
AC 011

CERTYFIKAT BADANIA TYPU WE (EC)
NR 044/CE/R/1455/2008

Nazwa, adres posiadacza certyfikatu: (producent): AGREGATY Spółka z o.o. ul. Święciechowska 36 Wilkowice 64 - 115 Święciechowa

Nazwa wyrobu: Agregat prądotwórczy przenośny

Typ wyrobu (seria, typowielkość odmiany, opis wyrobu): FH 7000 EC; FH 7000 ERC; FH 7001 EC; FH 7001 ERC; FH 7560 ERC; FH 7561 ERC; FH 6540 EC zał. Nr 044/CE/R/1455/2008

Nazwa i adres producenta: AGREGATY Spółka z o.o. ul. Święciechowska 36 Wilkowice 64 - 115 Święciechowa

Symbol PKWiU: 31.10.32

Wyrób spełnia wymagania zawarte w Rozporządzeniu MG:
- z dnia 20.12.2005 r. (Dz. U. Nr 259 poz. 2170) - Dyrektywa Maszynowa 98/37/EC
- z dnia 21.08.2007 r. (Dz. U. Nr 155 poz. 1089) - Dyrektywa Niskiego Napięcia 2006/95/EEC
- z dnia 31.12.2005 r. (Dz. U. Nr 263 poz. 2202) - Dyrektywa dotycząca emisji hałasu do środowiska przez urządzenia używane na otwartym powietrzu 2000/14/EC

oraz: Ustawa o kompatybilności elektromagnetycznej
- z dnia 13.04.2007 r. (Dz. U. Nr 82 poz. 556) - Dyrektywa Kompatybilności Elektromagnetycznej 2004/108/EC

oraz: norm zał. Nr 044/CE/R/1455/2008

Zgodność z oceną zgodności przeprowadzoną przez: ZC-SOZ-049/08 Zakład Certyfikacji IZTW
Zgodność ze sprawozdaniem z badań przeprowadzonych przez: SB-09-041/08 Laboratorium IZTW

Umowa o stosowanie certyfikatu nr: ZC/010/2008 + Aneks 02/2008

KIEROWNIK ZAKŁADU CERTYFIKACJI
Adam Cap

DYREKTOR INSTYTUTU
dr Maria Zyburta – Skrobalak

Kraków, 15 kwietnia 2008

Producent, jego upoważniony przedstawiciel lub importer jest zobowiązany informować Zakład Certyfikacji o każdych zmianach, modyfikacjach, które zostały wprowadzone lub które planuje wprowadzić do typu maszyny, której egzemplarz przedstawiono – Rozporządzenie MG z dnia 20.12.2005 (Dz. U. Nr 259, poz. 2170, § 123, pkt.5.).

Dotyczy wyłącznie egzemplarzy wyrobu posiadających identyczne właściwości (parametry) jak przedstawiony do badań wzór (wzory) i odpowiadających wymaganiom określonym powyżej.

Instytut Zaawansowanych Technologii Wytwarzania
Zakład Certyfikacji ul. Wrocławska 37a, 30-011 Kraków

CE

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1. Construction of power generator

Power generator is a device generating electricity by converting mechanical energy produced by the combustion engine into electricity produced in the alternator connected to the engine. Power generators are used as a source of power in case of power failure in the network or as an alternate power source in a building site, plot, workshop or at home.
When operating with automatic start-up, power generator is an excellent back-up device for private and public buildings to prevent uncontrolled power outages.

Technical specifications of power generators are defined for the altitude of 0 m ASL, ambient temperature of 20°C and 60% RH. When operating in other conditions, their performance is reduced: for altitude - the performance decreases by 1% each 100m, for temperature - the decrease is 2% per each 5°C. The power generator may be adapted for permanent use at high altitudes (above 1830 m above sea level) by necessary modifications in the engine introduced by an authorized workshop.

CONSTRUCTION OF POWER GENERATOR

The power generator, in its basic version, consists of a combustion engine and a three- or single-phase alternator, fixed together and installed on dampeners in a metal frame. As a standard solution, the power generator is equipped with necessary protection to enable its correct functioning, e.g. a sensor for pressure or engine oil, two- or four-pole over-current circuit breaker, electric starter and the battery. The optional accessories include working hour meter, grounding set, transport kit, a hose for the exhaust system, welding wires (units with a welding module), automatic start panel with ATS (for units with electric starter).

ENGINE

FOGO® portable generators are equipped with four-stroke, overhead valve engines fuelled by gasoline.
Mechanical stabilization of the engine speed is maintained at 3000 rpm and it operates independently of the load, ensuring optimal parameters for alternators. All the engines are air-cooled and can effectively work outdoors in ambient temperatures up to 40°C.
The engine operating indoors should be provided with fresh air inflow of at least 100 m^3/h (variable value depending on the type of unit - for correct selection of device and ventilation, please contact the customer service of Agregaty S.A.).

Engines are equipped with own exhaust systems ended with a silencer and with compatible exhaust hoses.
The user may use one of two types of start-up: manual with a retractable cord and electric starter (may operate with automation accessories). Engines with electric starter are equipped with a system that ensures proper charging of the battery.

SINGLE-CYLINDER (HONDA, MITSUBISHI, RATO)

Depending on the design of the motor, lubrication is carried out in different ways. For single-cylinder engines it is splash lubrication. Engines are protected against low oil level.
Single-cylinder engines are equipped with own fuel tanks, where fuel flows by gravitation into the combustion chamber. (optionally, fuel tanks may be replaced with tanks of larger capacity).

Two-cylinder (BRIGGS & STRATTON-COMMERCIAL POWER line)

In two-cylinder engines (fork-shaped), the lubrication is carried out using pressure. The engine has an oil pump that forces oil circulation - when engine is stopped may cause the oil pressure drop.

Two-cylinder engines are equipped with a vacuum pumps for drawing fuel from external tanks. FOGO® power generators are equipped with two-cylinder engines are provided with tanks of 45 litres, mounted on the frame above the motor. All fuel tanks used in FOGO® generators are equipped with fuel mesh filters to protect against ingress of dust particles or other contaminants into the carburettor.

ALTERNATOR

FOGO® generators operate with one- and three-phase synchronous and asynchronous AC alternators with different degrees of protection rating (IP).

Single-phase alternators have a system of voltage self-regulation provided by the inner winding coupled in circuit with the capacitor. It maintains voltage at the level of 10% with uniform load distribution. Three-phase alternators have a system of voltage self-regulation at the level of 6%, and those with AVR at the level of +/-2% at uniform load. The three-phase alternators may operate at uneven phase load, reaching 10 % of rated power, while the single-phase sockets of three-phase alternators provide up to 40% of the generator rated power. For some models, it is allowed to receive power from single-phase sockets above 40% (see technical data). When these values are exceeded, the electrical parameters (mainly voltage) of the alternator may deteriorate and windings may overheat resulting in their burning. For single- one and three-phase alternators, momentary overloads exceeding 10% of rated power are allowed, but they cannot be longer than 5 minutes in every 3 hours of device operation.

Single-bearing design and the flange connection to the engine ensure quiet and safe operation. The drive from the engine is transmitted through a tapered connection and threaded rod. Alternator housing is made of light aluminium alloys. Winding of the rotor and stator is insulated with a special epoxy varnish and is rated in insulation class H.

Alternators used in FOGO power generators have the protection degree of IP 23 or IP 54. Applying the protection degree of IP 54 extends the life of the alternator, as the bearings and winding are perfectly protected against harmful impact of external factors. IP 54 increases the range of applications in high humidity and dusty conditions.

Synchronous alternator (IP23) - used for inductive receivers, power tools and construction equipment with engines of high starting current. This alternator has windings on the rotor and is self-excited by capacitor that collects the remaining energy from residual magnetization or from additional excitation system consisting of the magnetic or electronic regulator. Cooling of these alternators is carried out mostly by forced air circulation in their interior (direct cooling of windings).

Synchronous alternator IP54

Synchronous alternators in special versions are equipped with electronic voltage regulators (AVR) with controlled voltage and current of all three phases. In these alternators the impact of heavily loaded phases on the stability of a phase with a low load is very small. AVRs ensure voltage stability of (+/- 2%) for SDI alternator (+/- 1%). These generators may operate at uneven phase load, reaching 10% of rated power, while cooling is carried out by forced air circulation in the slots outside of the generator.

Asynchronous alternator IP54

This alternator is highly durable and transfers no current to the moving parts through contacts, which eliminates arcing and wearing of brushes. The rotor has no visible windings, it uses a cage made of steel laminations isolated from each other with the addition of silicon.

For single- one and three-phase alternators, momentary overloads exceeding 10% of rated power are allowed, but they cannot be longer than 5 minutes in every 3 hours of device operation.

The electrical circuit of the rotor is made of non-insulated aluminium rods,
joined on both sides of the rotor with shorting rings. Asynchronous alternator provides active power, but consumes reactive power necessary for magnetizing the machine. To compensate the consumed inductive reactive power, the output of the power generator is equipped with capacitors. Constant speed of the alternator rotor is maintained by the combustion engine.

When load changes, the speed varies only in the range of the machine slip. It has relatively high voltage instability at terminals of the alternator. Some alternators have additional windings (connected with a capacitor) to support excitation of the generator. Cooling in these alternators is carried out by forced air circulation in slots outside the alternator.

Alternator with welding module IP23

Alternators in some models are equipped with welding modules for working with electrodes of each type, having a diameter of max. 5 mm (FH 8220 W (TW, TWE) and 6 mm ((FV 11300 TWE, FV 11400 TWE) in the cycle of 35%, i.e. 3.5 minutes in every 10 minutes of operation.

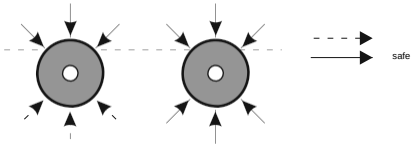
PROTECTION CLASS IP 23 and IP 54

First digit: protection against foreign objects.
Second digit: protection against the ingress of water.

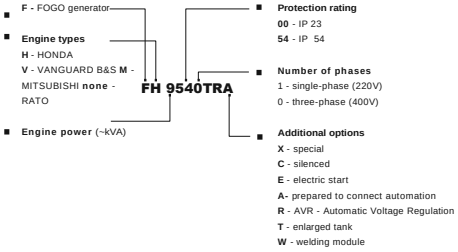
Ingress protection rating of IP23 or IP54

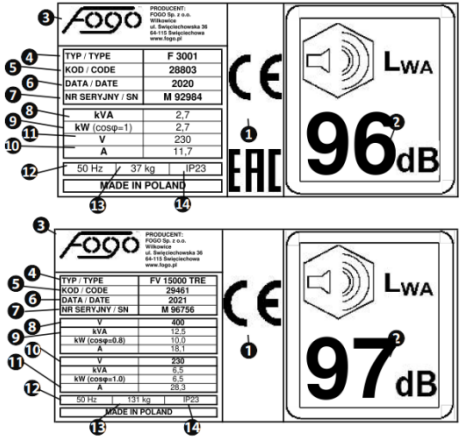
First digit: Protection against foreign objects and touch	Second digit: Protection against water ingress
0- without protection	
1 - foreign bodies > 50 mm	0 - no protection
2 - foreign bodies > 12 mm	1 - vertically falling water drops
3 - foreign bodies > 2.5 mm	2 - water dripping up to 5 from the vertical
4 - foreign bodies > 1 mm	3 - water splashing obliquely up to 60° from vertical
	4 - water spouting from all directions

Figure 1. Description of ingress protection IP symbols



MARKING OF THE POWER GENERATOR





DESCRIPTION OF THE NAMEPLATE

MARKING OF THE POWER GENERATOR

NAMEPLATE

1 - CE mark confirming compliance with the requirements of the European Directives
2 - Noise level emitted to the environment, acc. to Directive 2000/14/EC,
3 - Name and address of the manufacturer,
4 - Model / Type,
5 - Manufacturer's code
6 - Year of production,
7 - Serial number,
8 - Nominal power [kVA],
9 - Nominal power [kW],
10 - Voltage [V],
11 - Current [A],
12 - Frequency [Hz],
13 - Weight of power generator [kg],
14 - Protection class IP

2. Safety rules

Safety of the user and all persons staying near to the device is very important. Important information is included in the manual and on the power generator set - it must be read carefully. The information indicates and warns of potential danger for user and third parties.

The power generator produces enough power to cause a serious electrical shock in case of improper use. Make sure that the power generator is grounded when connected receivers are grounded. For grounding the power generator, use a copper conductor with cross section equal or larger than the conductor used to connect receivers. If you connect the receivers having the grounding, a grounding cable must be used. Grounding rod is present in every Fogo generator - on the crossbar of the frame under the engine and marked.

•- Before starting the power generator, read its manual and make sure that you understand all its recommendations. Every person using the power generator must read its manual.

CAUTION ! During operation of the device, the silencer reaches high temperatures and remains hot for some time after stopping. Allow the engine to cool before storing it indoors.

•- Do not operate the generator in an enclosed space without sufficient ventilation. Exhaust gases are toxic (contain large amounts of odourless carbon monoxide [CO]) -
RISK OF POISONING OR EVEN DEATH!!!

During the operation, the engine should be provided with fresh air inflow of at least 100 m³/h (variable value depending on the type of the device - for the correct selection of ventilation, please contact the customer service of AGREGATY S.A.). When using the power generator unit with additional ventilation indoors, observe the additional requirements for explosion protection.

- Do not fill the fuel tank while the engine is working - **RISK OF EXPLOSION!!!**
- Do not start the power generator in case of fuel spillage. Restarting is permitted after removing of the spilled fuel - **FIRE RISK!!!**

- Do not run the generator in an environment with escaping gas, paint vapours, solvents or other combustible materials - **RISK OF EXPLOSION!!!**
- Do not smoke and do not use open flames near the fuel canisters or containers **RISK OF EXPLOSION!!!**

- Do not operate the generator in forest areas or similar without a spark arrester
- RISK OF FIRE!!!

- Do not operate the generator, when it is wet or damp
- RISK OF ELECTRIC SHOCK OR EVEN DEATH!!!

- Before starting the operation, check the technical condition of the device, especially guard covers the cable insulation.

- Do not touch the rotating parts during operation

RISK OF INJURIES OR HEALTH DAMAGE!!!

- During operation of the power generator, pay attention to children and animals present in its vicinity

- Do not transport and do not leave the power generator in closed rooms immediately after the operation
- RISK OF FIRE!!!

- Do not place any objects on the operating generator. Pay attention to any objects near the generator - its parts heat up to high temperatures during operation **- RISK OF IGNITION!!!**

- During operation, and a long time after its inactivation, do not touch the exhaust system and silencer shields - **RISK OF BURNS!!!**

- Do not operate or stop the generator under load - **RISK OF DAMAGE!!!** (of the generator and the connected receivers)

- Do not adjust the engine speed by yourself **- RISK OF ELECTRIC SHOCK OR ALTERNATOR DAMAGE!!!**(failure of alternator's winding or generating a high voltage).

- Do not fill the generator with non-compatible fluids, fuel or with oil of inadequate quantity and quality (check oil level daily or every 8 hours of operation, in case of oil loss - refill with oil of the same parameters)
- RISK OF DAMAGE AND GUARANTEE LOSS!!!

- Ensure that the device is not tilted by more than 20 degrees during transport or operation. Larger tilt may cause fuel leakage or poor engine lubrication - **RISK OF DAMAGE!!!**

- Do not use non-original spare parts and fuel of unknown origin - **RISK OF DAMAGE AND GUARANTEE LOSS!!!**

- After ending the operation, close the fuel tap. When the tap is left open it may cause fuel to enter the oil pan, reducing lubricating properties of the oil - RISK OF ENGINE DAMAGE OR SEIZURE!!!

Do not fill the fuel during operation of the power generator! Refuel only in well-ventilated areas. Never unscrew the fuel cap when the engine is running or when it is hot. If you spill fuel, move the power generator to another place and wait before starting the engine. Fuel must evaporate.

Read the manual.

Use safety goggles.

Use hearing protection

Any work on electrical system may only be carried out by qualified electricians who have the appropriate permissions SEP (Association of Polish Electrical Engineers).
It is strictly forbidden for unauthorized persons to work on the distribution box.

. After ending the operation, always close the fuel valve. Avoid repeated or prolonged contact of fuel with the skin, as well as inhalation of vapours.

DO NOT CONNECT THE POWER GENERATOR TO ANY SOURCES OF ELECTRICITY

Connecting the power generator as a source of emergency power supply may be made only by a qualified licensed electrician. When connecting, consider operational requirements of the generator in conditions for supplying domestic networks in accordance with applicable standards.

- Do not overload the power generator and its power cord. Protect the power cord from heat, oil, sharp edges and moving parts. Damage to the power cord increases the RISK OF ELECTRIC SHOCK.

- If you work outside enclosed rooms, use extension cords intended for use outdoors. Using suitable extension cords reduces the RISK OF ELECTRIC SHOCK.
Using plugs and cables must not be damaged even in the slightest degree
- RISK OF ELECTRIC SHOCK

OPERATING THE POWER GENERATOR.

The power generator is a reliable device, designed to ensure safety. It facilitates the work and rest, but note that there is a risk of electric shock if basic instructions contained in the manual are not observed.

- Never connect the generator to the outlets in the building.
- Do not connect any receivers to the power generator before starting it.
- Do not change the internal wiring in the power generator.
- Never connect the three-phase sockets of the generator to a single-phase distribution box
- Do not adjust the rotation of the engine: current voltage and frequency are directly dependent on the engine speed - the adjustment is made by the manufacturer.
- Supply only those devices, where the voltage on the rating plate is identical with the voltage of the generator.
- Protection against electric shock depends on the fuse, which rating must be properly selected for the model of the power generator. If the fuse needs to be replaced, it must be replaced with a fuse having identical rating/specifications.
- Due to its increased resistance to mechanical damage, a multicore cable in rubber sheathing should be used.
- Connect only devices in good working condition; most of the portable electrical equipment is rated in Class II (double insulation). Devices that do not meet the requirements of this class (tools in a metal housing) must be connected with a three-wire cable.
- Grounding of the neutral conductor of the generator may be carried out only by a qualified electrician, who applies an additional shock protection measures. (PN-EN 60364-4-41).

2. Safety rules

- Where the power generator is used for supplying an existing network, e.g. at home or workshop, check the effectiveness of electric protection used in this network. Additional protection may be necessary due to the low short-circuit current of the power generator. Connecting the unit to such a network may be only performed by a qualified and licensed electrician.
- Electrical cables must be carefully selected, adjusted and serviced. Good technical condition of the insulation ensures the safety of the user. Cables must be inspected periodically and in case of damaging, they must be replaced (not repaired).
- Adjust the length and cross-section of the cable according to the needs:
- Depending on the cable length, there is a voltage and current drop. We recommend the use of extension cords with a core cross-section of 1.5mm2 or more, and the total length not exceeding 60 m.

Observe the following rules:

- Do not use the cables of unknown origin,
- expand the cable completely to avoid kinks in cable insulation,
- use cables in accordance with the manufacturer's instructions,
- Power generators without AVR (Automatic Voltage Regulation) are not designed to power sensitive electronic equipment, e.g. TV, hi-fi equipment, computers. These devices may not be compatible with the power generator.
- Do not overload the power generator. To ensure proper operation and long life of the power generator, observe the following rules:
- total power of current receivers must not exceed the power stated on the nameplate.
- some current receivers (in particular electric motors, compressors, etc.), during their start-up, draw power greater than their rated power. For more detailed information, contact an authorized dealer of FOGO Sp. z o.o.
- do not exceed the maximum power of connecting sockets of the power generator.
- Do not apply the nominal power to the power generator in conditions different than the nominal conditions. Rated power is specified for specific operational conditions - (atmospheric pressure of 1 bar, air temp. of 20°C, air humidity of 60%). Power drop caused by the air temperature or pressure drop (due to the location altitude) may in adverse conditions exceed 10%.
- Information on the construction of the power generator - electrical connection. Generator windings are not connected to the ground. As a result, the device is safe and eliminates the risk of electric shock. When the power generator is used to supply power to receiving networks in TN or TT system, it is necessary to connect the neutral point of the generator winding to a PE terminal and to ground the device in accordance with PN-EN 60364-4-41 standard, as well as to provide additional shock protection - RCD with tripping current not exceeding 30 mA. The installation of this equipment must be carried out by a qualified electrician. The RCD acts as a protection against insulation damage. It cuts off the power after detecting insulation failure (leakage) between the voltage line and any part of the grounding (casing) on the output side of the RCD.
- 3-phase power generators (230/400V), single-phase outputs (230V) are connected in parallel with the winding in order to withstand the full load. Power of single-phase output (230V) indicated on the nameplate and in the technical data is only available for these outputs under the condition that other three-phase receivers are not connected to the socket. Caution!!! Never connect the three-phase sockets of the generator to a single-phase distribution box. When using both: single-phase 230V current and three-phase 400V current, the current value per phase must not exceed the value indicated on the nameplate of the power generator.
- Thermal or magneto-thermal circuit breaker. Power generators are equipped with a thermal circuit breaker, which acts as overload protection. If the power supply is interrupted during operation, it may be caused by automatic activation of the thermal overload switch.

If this happens, wait for a while, eliminate the cause of the overload, then reconnect the switch by pressing it.

The switches are selected according to the technical parameters of the generator; if you need to replace them in case of damage, use only original parts of with identical current ratings.

SELECTING PROPER POWER GENERATOR FOR THE RECEIVER

Devices with electric motors.

Star connection - power of the power generator may be up to 3 times higher than the rated power of the receiver.

Delta connection - power of the power generator may be up to 9 higher than the rated power of the receiver.

Star / delta connection (softstart)- the power of the generator, up to 3 times higher than the rated power of the receiver.

With inverter, the power of the generator - up to 1.5 times higher than the rated power of the receiver.

Commutator connections (power tools) - the power of the generator at least 1.2 times higher than the rated power of the receiver.

Heating equipment

Power of the generator at least 1.2 times higher than the rated power of the receiver.

Lighting

Incandescent - power of the generator is up to 1.2 times higher than the rated power of the heaters.

Sodium - power of the generator is up to 5 times higher than the rated power of the bulb.

UPS

Power of the generator up to 1.7 times larger than the power rating of connected receivers.

Electronic devices

Power of the generator at least 1.2 times larger than the rated power of receivers.

NOTE: In order to accurately select the power generator for the receiver, a qualified electrician must perform electrical measurements of the electrical switchboard, at the start-up of the device.

Voltage of idle gear of generators is max. 253 V. At the rated load, the voltage should not fall below 207 V.

NOTE: Receivers sensitive to too low or too high voltages may be damaged when powered from power generating sets.

ENVIRONMENTAL PROTECTION

Symbol indicating the selective collection of waste electrical and electronic equipment. Used electrical appliances are secondary raw materials

- do not dispose of them with household waste, as they contain substances harmful to human health and the environment!

Actively help to responsibly manage natural resources and protect the environment by passing the used device to the point dedicated for used electric appliances. To reduce the waste amount, it is necessary to reuse, recycle or recover materials in a different form.

4. Delivery, unloading, storage

For transport purposes, the power generator is protected against the influence of weather. After unpacking, remove the packing materials in a way safe for the environment. Detailed information on waste handling is defined in the Regulation of the Minister of Economy and Labour of 14 December 2013 - Dz.U. of 2013, item 21.

UNLOADING

The recipient of the power generator is responsible for its unloading and safety. To unload the power generator, observe the general safety rules and H&S regulations.

In particular, observe the following:

- for unloading always use equipment dedicated for this purpose (crane, forklift) with a suitable lifting capacity
- all hooks must be safely attached to dedicated lugs - carry out unloading on a properly hardened surface, which is suitable to withstand the weight of the power generator and unloading equipment.

STORAGE

When the power generator is to be stored for a longer period, follow the basic rules:

- store it in properly prepared room (dry and ventilated)
- adequately secure power generator against dust and corrosion
- clean the power generator from any dirt

Detailed recommendations are presented in manuals provided by manufacturers of the engine, alternator and other essential components.

The generator should be handled using dedicated lugs, which form also the frame of the device. Observe H&S regulations when handling the power generator. In case of handling heavy loads, it is necessary to use suitable equipment.

DISPOSAL

The purpose of disposal / recycling is reduced use of natural resources and minimizing amount of waste. According to the Waste Act of 11 September 2015 on electrical and electronic equipment waste, term "recycling" means a recovery, which involves re-processing of substances or materials contained in the waste to maximize re-use of these materials, including minimizing of expenditures for their processing, which protects natural resources used for their manufacture and further processing.

CAUTION! Both the generator and materials used for its construction and operation may cause considerable damage to the environment when improperly disposed of. By re-using of materials or other forms of using old appliances, you make an important contribution to protecting our environment.

5. Disposal

CAUTION! Do not dispose the generator and consumables at the end of their operational life as household waste! All waste is a potential source of danger and environmental pollution.

It is categorically forbidden to cause environmental pollution by used materials or devices. All materials must be collected, sorted, recycled and used in accordance with the applicable national regulations. Information on the appropriate disposal of used devices is available from local authorities.

After the end of the operational life of the power generator or any of its parts, dispose them in accordance with regulations. The following materials must be provided to the official disposal sites, as they may be hazardous waste. Hazardous waste includes used objects, solids and liquids other than wastewater, generated in households, commercial facilities, unsuitable for the place and time in which they have been generated and burdensome for the environment.

It applies in particular to:

- fluids (engine oil, coolant, etc.)
- filters
- starter batteries
- a mixture of water and antifreeze agents
- any material soaked with operational fluids or diesel oil - materials used for cleaning (e.g. greasy, fuel-soaked or contaminated with chemicals cleaning cloth).
- These materials must be provided to organisations authorised to purchase, collect and dispose them. Do not pollute the environment, or store the materials together with normal household waste.

If the generator is no longer used, it must be delivered to the organization officially involved in disposal of industrial machinery.

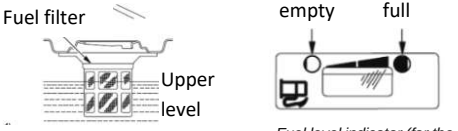
The used power generator may be delivered to the manufacturer of power generators - FOGO company.

STARTING OF THE POWER GENERATOR

① **Fill the tank with "fresh" fuel** (unleaded petrol PB 95 / 98). Refuelling must be carried out in well-ventilated areas with the engine switched off. Do not to smoke and do not use devices with open flame or generating sparks in the location of refuelling and in fuel storage areas. Do not overfill the tank - the fuel surface must be lower than 2 cm from the upper edge of the tank. After each refuelling check if the container is properly closed

2 Pour oil into the power generator, optionally - check the oil level and refill. The oil level must be checked when the generator stands on a level surface. To check the condition of the oil, unscrew the filler cap or take out the oil dipstick, wipe it, reinsert and take out again to check the oil level on the dipstick. In the case of a screw-cap, insert it into the hole without screwing and check the oil level. If the level is too low, add oil to reach the maximum level. Do not fill oil above the maximum level mark. Use oils provided by engine manufacturers.

Fig.1 Checking oil level in a single-cylinder engine Honda, Mitsubishi, Rato



Fuel level indicator (for the aggregates with enlarged fuel tank "T")

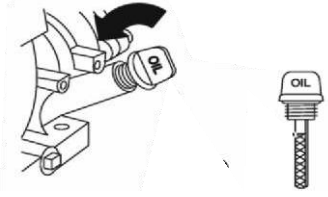


Fig.2 Checking the oil level in HONDA, MITSUBISHI, RATO engine (single-cylinder)

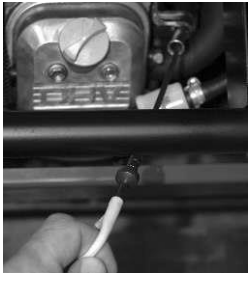


Fig. 3 Checking the oil level - B&S engines (two-cylinder)

For power generators with **Honda, Mitsubishi, Rato engine** acc. to API as SG, SF, CC or CD **(SAE10W30)** Tab. 1.

Oils shown in Table may be used if the average ambient temperature is within the indicated range.

For Briggs & Stratton "Vanguard" SE, SF, SG **(SAE30) oils may be used** Tab. 2.

Depending on the temperature, for Vanguard engines we recommend oils specified in Table 2. SAE 30 oil used below 4°C may impact starting-up of the engine and may cause damage to the cylinder due to insufficient lubrication. Air cooled engines heat-up more than liquid-cooled automotive engines. Using synthetic multigrade oils (5W-30, 10W-30, etc.) at temperatures above 4°C will lead to increased oil consumption and may cause engine damage. If you use this type of oil, it is advisable to check oil level more frequently.

For **Honda, Mitsubishi, Rato engines – use SAE 10W30 or SAE10W40 oil, which is recommended for general in the widest range of temperatures.**

The amount of oil for each engine is indicated in technical specifications. Do not use oils for two-stroke engines and insoluble oils, as they affect the life of the engine and may lead to damage. When the amount of oil in the oil pan is insufficient or excessive, oil level or oil pressure sensors may be activated, consequently stopping of the engine, or preventing its start.

⚠ **Providing the engine with oil sensor absolutely does not relieve the user from checking the oil level every day.**

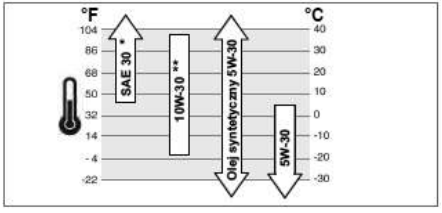


Table 1. Selection of engine oil for HONDA, MITSUBISHI RATO

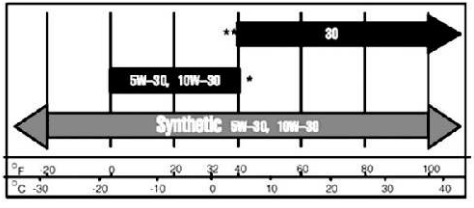


Table 2. Selection of engine oil for BRIGGS & STRATTON

③**Check the air filter for contamination/dirt.** Clean, when dirty/contaminated. Using a dirty air filter, results in improper air-fuel ratio, causing the engine to work unevenly, choke or to emit black exhaust gas and finally its complete stop. This is particularly dangerous in case of power generators, as a drop of engine speed changes the frequency of the current provided in the power outlet socket. Using other forms of air filtration or using the device without the air filter may cause device malfunction or even serious damage (e.g. scratching the cylinder walls, contaminating the carburettor etc.).

Do not start the engine without the air filter installed, as it leads to quick engine wear.

4. CONNECTING THE BATTERY

(Only for engines fitted with electric starter)

The battery pack should have a nominal voltage of 12V and a capacity of at least:

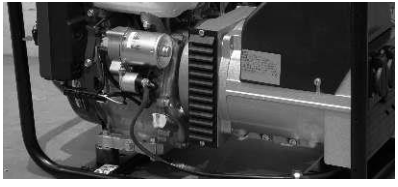
- 18Ah (built-in and non-built-in single-cylinder generators)
- 30Ah (non-built-in two-cylinder generators)
- 35Ah (-built-in two-cylinder generators).

Connecting the battery to the engine may be performed after ensuring that this action will not result in uncontrolled starting of the power generator. To prevent this, the engine fuel valve should be closed and the ignition key must be in "STOP / 0 / OFF" position.

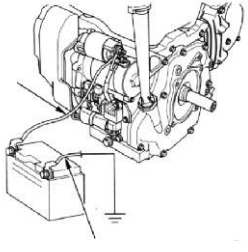
The cables must be connected as follows:
First, connect the terminal ("+ " red line) of the starting device to (+) pole of the battery.
Connect terminal of "ground wire", attached to the body of the engine or the entire housing of the power generator, with (-) pole of the battery. Tighten terminals firmly to prevent their loosening during engine operation.
Make sure that the cable ends are not corroded. Any signs of corrosion must be removed and cable ends must be slightly greased with technical Vaseline.

WARNING

The battery produces exploding gases, therefore open flames, cigarettes and spark-producing devices are prohibited near the battery.



Positive (+) cable of the battery

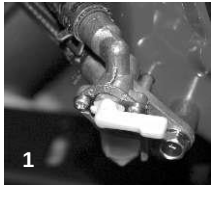


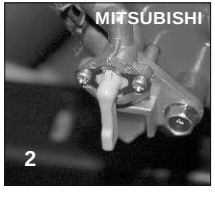
Negative (-) cable of the battery

CAUTION!!!
Do not connect a cable with unknown polarization.

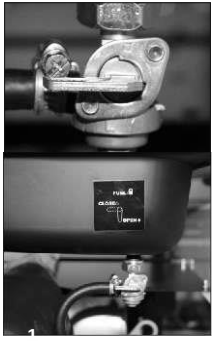
CAUTION!
All engines with electric starter are equipped with a system that ensures proper charging of the battery. Short circuit in the system or in connection of the battery with faulty (reversed) polarity will automatically switch off the engine (in Honda engines). The green indicator in the switch indicates that the switch is turned off. Remove the cause of switch tripping and then re-attach it by pushing it down.

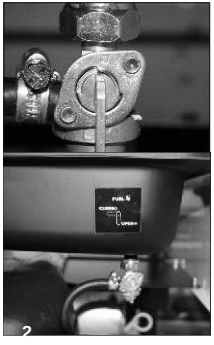
⑤ Turn the fuel tap to "ON" in power generators with tank on the engine



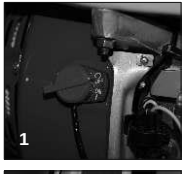


⑤ Turn the fuel tap to "OPEN" position in power generators with the tank on the frame





Set the ignition switch in ON position "1"



When the engine is cold, activate choke switch, do not use the choke when the engine is hot. When the engine cannot stabilize its speed after start and works unevenly, this means that the fuel-air mixture is too rich and the choke function must be switched off.

6. Operation

Make sure the connected receivers are turned off or disconnect the receivers for the start-up period.

⑥ MANUAL START

Pull the starter cord gently until a slight resistance (at this point the starter clutch engages with the attaching basket located placed on the engine flywheel). Vigorously pull the cord. If the start-up fails, repeat until it is successful. If the starter cord is pulled by engaging clutch, this will cause a strong collision of coupling elements with the engaging basket, which may lead to the rupture of the starter cord or damage of clutch components. Pulling the cord to its end may damage the return spring of the starter.

After starting the engine, do not release the cord freely, but control its retraction by gradually releasing it. When you release cord freely, it will be rapidly retracted by the return spring and the handle will hit the housing.

NOTE: When the unit warmed up, it is recommended to apply the minimum load equal to 30% of the rated load. The power generator should be loaded evenly in 3 phases.

⑦ ELECTRICAL START-UP

In models with electric starter

- insert the key into the ignition and turn to (1) or ON position
- turn the key to START position or
- after engine starts, release the key which automatically returns to (1) or ON position and remains there during operation of the power generator.

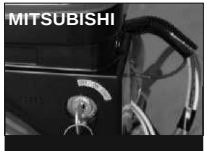
CAUTION!! The starter should not work for more than 5 seconds. Between consecutive start-up attempts, wait approx. 10 seconds.

NOTE: Never attempt to start the operating or not fully stopped engine. There is risk of damage to the starter (breaking teeth of the starter and flywheel).

When the engine is running evenly, return the choke to its initial position. After stabilizing the engine speed, power receivers may be activated.

⑧STOPPING THE POWER GENERATOR

- Unplug the receiver from the socket or turn off the receiver,
- After removing the receivers, leave the working power generator at idling speed for 3 minutes to cool the condenser coils.
- For power generators fuelled by petrol, set the ignition switch in OFF position ("0"), whereas for power generators with electric starters, turn the ignition key to OFF position ("0").



- Close the fuel tap. For single-cylinder engines, leaving the fuel valve open may cause fuel to penetrate the carburettor and overflow it. Excessive amount of fuel flows into the combustion chamber, and from there it enters the oil sump, mixing with oil. This mixture loses the lubricating properties, slowly seizing the engine (connecting rod, crankshaft, rings and cylinder). As the engine uses splash lubrication, too high level of the oil-fuel mixture may overflow the piston and immobilize the engine. In such cases, remove the spark plug, drain oil, clean the combustion chamber with compressed air and change the oil.

CAUTION! When the piston moves with the spark plug removed, the oil accumulated over the piston is ejected with a great force to a considerable distance.

- If the power generator is to be stopped for longer than 30 days, its fuel tank should be completely emptied. Drain the fuel from the fuel tank (not by turning the device over), then use the remaining fuel by starting the device and waiting for its automatic shutdown due to lack of fuel.

- Wait until the power generator is completely cooled.
- Leave the unit in a dry, well-ventilated and roofed area
- In emergency situations requiring immediate stop of the engine, set the ignition switch in the OFF position ("0").
- after a long stop, with fuel in the carburettor, weathered fuel must be drained by removing the screw in the bottom part of the float chamber (the screw is always installed at an angle)

POWER GENERATOR WITH WELDING MODULE

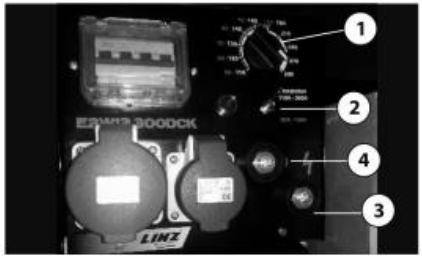
DESCRIPTION OF THE CONTROL PANEL:

1. Selection of welding current
2. Selection of welding current range
3. Negative welding socket
4. Positive welding socket

CAUTION!!! Do not weld and use the generator at the same time

To use the device as a power generator:

- Set the switch (2) to "GEN"
- Proceed as in "Starting power generators" section



To use the device as a welder:

- Plug the grounding cable to the socket (3)
- Connect the grounding cable to the welded item,
- Insert the plug of the cable with the electrode handle to the second positive socket (4).
- Set the range of welding current with switch (1), (2),
- Proceed as in section "Starting the power generator" without connected receivers.
- Start welding.

NOTE: Do not switch the welding current switches (1 and 1a) during welding

NOTE: During the welding, voltage is present on the power outlet sockets, but its voltage is low and unstable. It is recommended to unplug the devices connected to the socket for their safety.

NOTE: The welder may provide the maximum welding current only for a few minutes, then it should be left to cool down (see the table on the control panel) - therefore if the work with high welding currents triggers the thermal switch (welding stops, the electrode is 'sticking') let the power generator work for a few minutes without load in order to cool it down.

Recommended diameters of welding cables:

Table 1 Recommended diameters of welding cables

Length	Welding current		
	30-100 A	100-200 A	200-300 A
15-30 m	25 mm^2	35 mm^2	50 mm^2
15-30 m	25 mm^2	50 mm^2	70 mm^2
30-60 m	35 mm^2	70 mm^2	90 mm^2

examples of welding currents:

TAB.2	Welding current				
Electrodes	Acidic	Rutile	Cellulose	Basic	Semi-basic
1.5 mm		20-50A			20-30A
2.0 mm		40-65A		20-50A	30-60A
2.5 mm	60-110A	60-100A	50-90A	70-100A	50-80A
3.25 mm	90-150A	70-130A	70-130A	90-130A	60-100A
4.0 mm	140-210A	120-160A	90-170A	110-170A	100-140A
5.0 mm	200-290A	190-250A	140-210A	175-220A	130-180A

7. Repair, maintenance

LIST OF SERVICE OPERATIONS

The schedule presents a list of operations performed every day, after the first 8 hours of operation of the device, and then subsequently every 50, 100 and 300 hours of operation.

MAINTENANCE ACTIVITIES

Cleaning and checking the alternator, each time before starting the power generator inspect visually connections of individual elements of the alternator, check for damage in insulation of wires, poor contacts, etc. In case of longer storage in unfavourable climatic conditions, especially at high humidity, it is recommended to measure the insulation resistance of the alternator, using a megohmmeter of 500 V. The insulation resistance should be not less than 1 M Ω. If it is lower, then the alternator's winding should be blown with dry and warm air.
After blowing with dry and warm air, repeat the insulation resistance measurement.

Checking oil - *see section OPERATION and START-UP*

Changing the oil - drain the used oil when the engine is hot –this ensures its quick and complete drainage. Unscrew the filler cap and the drain plug. Drain the oil into a vessel prepared earlier.

Periodic inspection /Service work	Every day	Every month or after first 8 hours	Every 3 months or every 50 hours	Every 6 months or every 100 hours	Every 12 months or every 300 hours
Cleaning the alternator*	■				
Checking the oil level	■				
Oil change **		■	■		
Replacing the oil filter **			■		
Checking the air filter *	■				
Cleaning the air filter *			■		
Replacing the air filter					■
Cleaning the spark plug				■	
Checking and adjusting the valve clearance ***					■
Adjustment of engine speed ***					■
Cleaning the fuel sump				■	
Cleaning the fuel tank ***					■
Checking the fuel system	Every 2 years				
Measuring insulation resistance	Every 6 months				

(*) In dusty conditions the air filter and the alternator should be cleaned every day, and if necessary even at shorter intervals.

(**) If the power generator is operated under severe conditions and in high temperatures, change oil every 25 working hours, including the oil filter.

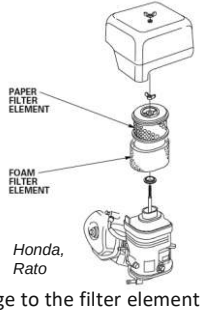
(***) The work must be performed by an authorized servicing workshop/apartment.

CAUTION!

Use only original spare parts to ensure good quality of repair and correct operation of the engine and alternator, enabling full guarantee of the seller. Seller (and the Guarantor) shall not be responsible for engine damage arising from the use of spare parts that are not original or not supplied by the Distributor.

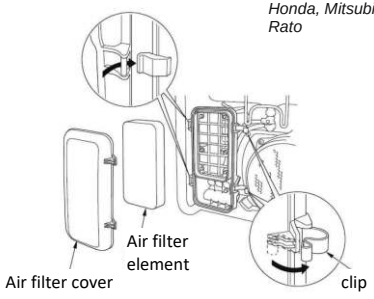
NOTE!!! Handle the used oil in a manner safe for the environment. Deliver it in an airtight container to the nearest gas station or a recycling plant. Do not pour oil into the wastewater or to the ground. Replace the drain plug and check its tightening. Fill new oil through the filler opening and observe instructions specified in section OPERATION and START-UP

Check and clean the air filter -
When cleaning the air filter never use fuel or other agents with a low flash point, as this could cause an explosion or fire. Loosen the wing nut or pull spring and remove the cover. Remove the filter element and separate the paper element from the foam element.



Honda, Rato

. Check both elements for damage.
. When you notice any damage to the filter element - replace it. Clean the foam element thoroughly in hot water with a liquid detergent. Using detergent powders results in deposition of powder particles on the filter and their penetration to the carburettor and the combustion chamber, which may cause accelerated engine wear

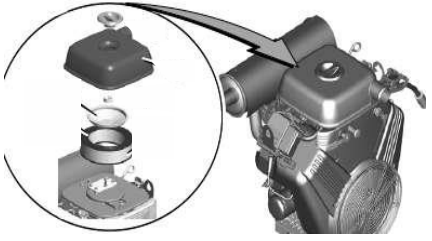


Honda, Mitsubishi, Rato

. Then rinse it thoroughly and dry. After drying, the filter element must be soaked with a small amount of engine oil (moist it, but oil must not drip). Too much oil remaining in the filter may cause troubles with engine start-up.

Vanguard 18HP, 21 HP

Clean the paper element by tapping it against a hard surface to remove larger dirt and particles and then blow with compressed air (pressure not greater than 30 psi). Never use a brush for cleaning, as instead of removing dirt, the brush will press the dirt into the filter paper or damage the paper coating. If cleaning is ineffective, the filter element must be replaced immediately.


Vanguard 18HP, 21 HP

If the filter is contaminated with oily material and generator sucked own exhaust gases, immediately replaced the filter with a new one.

Replacing the oil filter - only the power generators with VANGUARD two-cylinder engines. -
Replace the oil filter every 100 operating hours, or every season. Before installing the new filter, moisten the oil filter seal with clean engine oil. Tighten the filter by hand until the seal touches the oil filter adapter. Tighten by 1/2 - 3/4 turn. Start engine and let it work at idle gear to check for oil leaks. Stop the engine. Recheck the oil level and add oil if necessary
.

Vanguard

Checking the spark plugs - check the technical condition of spark plug after
100 hours of operation of the power generator or after every season. If it is impossible to maintain the distance between the electrodes (HONDA, RATO, MITSUBISHI 0.7-0.8 mm, VANGUARD 0.76 mm) the spark plug must be replaced. Do not clean the carbon deposits on the electrodes using sandpaper. For this purpose, use a wire brush and a clean cloth. Pay attention to the condition of the high voltage cable and the cap. When the cord sparks, replace it with a new one.
- **Checking and setting the valves** - this activity must be performed by an authorized workshop/service.

Cleaning the fuel sump - HONDA, VANGUARD, RATO engines. Set the fuel valve at "OFF" position - closed. Remove the fuel sump together with the sealing O-ring, rinse thoroughly with a non-flammable cleaning agent and allow drying.

Cleaning the fuel sump - MITSUBISHI engines. Set the fuel valve at "OFF" position - closed. Remove the fuel sump together with the sealing O-ring (a fine mesh is installed above it to stop even finest dirt particles from the tank), rinse thoroughly with a non-flammable cleaning agent and allow to dry.

Then, install the fuel sump in the reverse order and tighten it. Open the fuel valve (set in "ON" position) and check connection of fuel sump for leaks. Running the engine with a leaking fuel sump is illegal and dangerous to the user.

Cleaning the fuel tank - this activity must be performed by an authorized workshop/service.

Cleaning the spark arrester - the spark arrester must be inspected every 100 hours to maintain its full efficiency. Loosen the screws and remove the silencer protector. Remove the screws from the spark arrester and remove it from the silencer. Use a wire brush to remove deposits from the spark arrester mesh. Make sure the spark arrester mesh has no holes or tears. If it is damaged, replace the spark arrester.

FAULT	CAUSE	REMEDY
The engine does not start	1. Lack of fuel. 2. Do not choke lever pulled out. 3. Oil level too low 4. The fuel tap closed 5. Dirty spark plug 6. Defective ignition system	1. Fill fuel 2. Check and pull out if necessary. 3. Check and refill if necessary 4. Check and open if necessary 5. Check the spark plug, replace if necessary. 6. Report to the Servicing Department
The engine runs unevenly	1. Low fuel level in the tank 2. Choke lever not pressed-in 3. Dirty air filter 4. Contaminated fuel or old fuel	1. Check and refill if necessary 2. Check and press if necessary. 3. Check and replace if necessary 4. Replace with new fuel
No excitation	1. Defective excitation capacitor or AVR system, blown fuse 2. Defective winding of the alternator 3. Engine speed too low	1. Report to the Servicing Department 2. Check the condition of windings or report the fault to the Servicing Department 3. Report to the Servicing Department
Voltage too high after applying load	1. The capacitance of the capacitor is too high 2. Excessive engine speed 3. Damaged excitation system	1. Check and replace if necessary 2. Report to the Servicing Department 3. Report to the Servicing Department
Voltage too low after applying load	1. Damaged diode of alternator rotor 2. Damaged winding of the rotor 3. The capacitance of the capacitor is too low 4. Load is to high 5. Engine speed too low	1. Check and replace if necessary 2. Check winding 3. Check and replace if necessary 4. Check, decrease if necessary. 5. Report to the Servicing Department
Voltage fluctuations	1. Loose contact on the alternator 2. Uneven engine speed	1. Check the terminals, tighten if necessary. 2. Report to the Servicing Department
Noisy operation of the alternator	1. Damaged bearing of the alternator 2. Loose mechanical connection	1. Replace bearing, tighten the pin 2. Check, correct if necessary.
Too much vibration of the alternator	1. Damaged shock absorber of the engine 2. Loose screw connection 3. Uneven floor	1. Check and replace if necessary 2. Correct, tighten 3. Level the power generator
Incorrect voltage range	1. Report to the Servicing Department	1. Report to the Servicing Department

8. Maintenance

CAUTION!!! During engine operation, the silencer becomes hot and stays hot for some time after stopping the engine. Do not touch the silencer when it is hot. Allow it to cool before performing maintenance activities. - Engine speed control - this activity must be performed by an authorized workshop/service. - Checking the fuel system - action performed in an authorised workshop

LIST OF MAINTENANCE PARTS

List of spare parts is available at website: www.fogo.pl or via phone: +48 65-534-11-80

HONDA

GX160-GX200		
Air filter	1	17210-ZE1-505
Spark plug	1	98079-56841
Oil	1	500006
GX270		
Air filter	1	17210-ZE3-505
Spark plug	1	98079-56841
Oil	2	500006
GX270 (ELECTROSTART) - GX390		
Air filter	1	17210-ZE3-505
Spark plug	1	98079-56841
Oil	2	500006

GX390VKER		
Air filter VKER	1	17211899000
Spark plug	1	98079-ZE3-505
Oil	2	500006

MITSUBISHI

GT600		
Air filter	1	LA40074AA
Spark plug	1	LE41014BA
Oil 0.6 L	1	100005
GM231		
Air filter	1	KA40057AA
Spark plug	1	KE41005AA
Oil 1.0 L	1	100007E
GM301/GM401		
Air filter	1	KA40059AA
Spark plug	1	KE41005AA
Oil 1.0 L	1	100007E

VANGUARD

B & S		
Air filter	1	394018S
Preliminary air filter	1	272490S
Fuel filter	1	691035/4
Oil filter	1	492932S
Spark plug	2	496018E
Oil 1.0 L	2	100007E
B&S 20/22HP/31HP		
Air filter	1	692519
Preliminary air filter	1	692520
Fuel filter	1	691035/4
Oil filter	1	492932S
Spark plug	2	496018E
Oil 1.0 L	2	100007E

FOGO

R210		
Air filter VKER	1	17210-ZE1-505
Spark plug	1	98079-ZE3-505
Oil	1	500006

DEFECTS

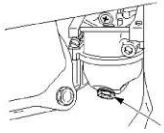
National service network of FOGO offers professional advice, supplies spare parts and performs maintenance or repair services. Please use only original spare parts. Only original parts meet the requirements of precision and quality.

To obtain guarantee service for complete devices, please contact the dealer from whom you purchased the device or the nearest authorized service centre of FOGO Sp. z o. Find more information at www.fogo.pl. or call +48 (0-65) 534 11 80. For guarantee services of Briggs & Stratton engines, contact authorized service centres indicated at: **www.chabin.pl, www.briggsandstratton.com or call +48 (42) 684 98 72**

The guarantee obligations of FOGO Sp. z o.o. shall be valid only for engines subject to periodic inspections carried out only by authorized service centres of FOGO Sp. z o.o., Briggs & Stratton, Honda, Mitsubishi, Rato. Inspections must be performed at least once a year and be confirmed in the guarantee card (maintenance table) or in the maintenance log-book supplied with the documentation of the power generator.

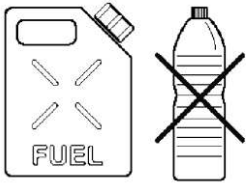
TRANSPORT AND STORAGE

During transport of the power generator, set the engine switch and the fuel valve at "OFF" position. To prevent spillage of fuel transport the device horizontally.
Fuel vapours and/or spills may ignite.
Contact with hot engine or exhaust system can cause serious burns or fire. Cool down the engine before transporting or storing. Prevent dropping or hitting the device during transport. Do not place heavy objects on the device.
If the power generator is to be stopped for longer than 30 days, its fuel tank should be completely emptied. Drain the fuel from the fuel tank (not by turning the device over), then use the remaining fuel by starting the device and waiting for its automatic shutdown due to lack of fuel.
Wait until the power generator is completely cooled.
Leave the power generator in a dry and clean place - In emergency situations requiring immediate stop of the engine, set the ignition switch in the OFF position ("0"). - After a long stop, with fuel in the carburettor, weathered fuel must be drained by removing the screw in the bottom part of the float chamber (the screw is always installed at an angle). Environmental protection: contaminated fuel is a major source of environmental pollution. Do not pour fuel into the ground or into drains. Store fuel in containers or canisters designed for storing hydrocarbons. This will prevent contamination of fuel by



container ingredients dissolving in hydrocarbons, which would reduce the engine performance. Free repair during the guarantee period is not provided to carburettors and fuel valves clogged with old or contaminated fuel. The quality of unleaded petrol is falling very quickly (sometimes even after 2, 3 weeks). Do not use fuel older than 1 month. Store a minimum amount of fuel required. For a very long storage:

1. Drain the fuel from the carburettor to a suitable container by loosening the drain plug. Fuel is extremely flammable and explosive under certain conditions. Perform the above activities in a well ventilated area and with the engine stopped. Do not smoke and protect working area against open fire and sparks.
2. Change the engine oil.
3. Remove the spark plug and pour into the cylinder a tablespoon of clean engine oil. Rotate the crankshaft several times to distribute the oil and re-tighten the spark plug.



4. Pull the starter handle slowly until you feel resistance. At this point, the piston starts the coupling stroke, during which both valves, inlet and exhaust are closed. Storing the engine in this position will help to protect it from internal corrosion.

Table of recommended maintenance

Storage time	Recommended maintenance procedure - ensures easier start after storing the power generator
Less than 1 month	Additional maintenance not required
1-2 months	Fill with fresh fuel, adding a conditioner.
2 months - 1 year	Fill with fresh fuel, adding a conditioner. Drain the fuel from the carburettor float chamber and sump
1 year or longer	Fill with fresh fuel, adding a conditioner. Drain the fuel from the carburettor float chamber and sump Remove the spark plug. Pour a tablespoon of engine oil into the cylinder. To distribute the oil, slowly turn the motor shaft using the starter cord. Reinstall the spark plugs. Change the engine oil. After storage period, drain fuel from the tank to a suitable container and refill fresh fuel before starting.
Use fuel conditioners for extending the storage period. Prior a long-term storage, make sure that the storage location is not overly dusty and/or damp.	

9. General commercial terms

SALE

FOGO Sp. z o.o. sells its products only through a network of authorized partners.

DELIVERY

In Poland, FOGO® products are delivered to distributors at the expense of the manufacturer. FOGO Sp. z o.o reserves the right to select the forwarding agent for its deliveries.

In case of exporting goods outside Poland, the delivery is performed Ex-works from the manufacturer's warehouse.

GUARANTEE PERIOD

FOGO® portable generators are covered by a basic guarantee of:

- 36 months for Honda engines, B&S line VANGUARD Mitsubishi
- 12 months for Rato engines (extendable to 24 months)

The guarantee obligations of FOGO Sp. z o.o. shall be valid only for engines subject to periodic inspections carried out only by authorized service centres. Inspections must be confirmed in the guarantee card. List of maintenance operations and their intervals is presented in 'Operation' section.

OPTIONAL EQUIPMENT:

- Overcurrent circuit breaker protects the alternator from excessive overload.
- Grounding set increases safety in case of voltage presence on metal parts of the power generator. It is also recommended for power generators equipped with other types of electrical protection.
- Hose for exhaust system, required when working indoors or on a vehicle, length of 2.5 m. The hose is compatible with the output of the exhaust system of power generators with "T" marking. For other power generators use adapters suitable for specific type of engine
- Transport set to increase work comfort in case of handling/moving the power generator
- Working hour meter for proper control of operation time and maintenance intervals
- Automatic start panel for power failures in the network. It allows user to adjust the response times. LED display for monitoring the operating parameters and maintenance intervals. It disables the power generator when the temperature is too high, when oil pressure is too low or too high and when engine speed is too high. It has the option of constant battery charging. Universal panel - may be used with all power generators equipped with electric start and marked with "TA" label.
- Welding cables are available in two standard lengths of 5m or 10m (200-300A)
- Remote control for welding module. It is particularly useful when working at heights or in trenches. The standard length is 10m.

REPAIR ORDER NO.	RECEIPT DATE	DATE OF RETURN	DESCRIPTION OF FAILURE REPAIR	COMMENTS

Complaint notification card

(Completed by the user)

Manufacturer:
FOGO Sp. z o.o.
ul. Święciechowska 36, Wilkowice
Święciechowa 64-115, Poland

SPECIFICATIONS:

Power generator model: .....

Power generator number: .....

Date of sale: .....

Invoice number: .....

Company selling the power generator: .....

Indication of working time counter: .....

Description of the fault: .....

.....

.....

.....

.....

If the power generator is covered by a guarantee, the claim is to be considered only when the original guarantee card is provided.

Failure to provide the guarantee card is equivalent to a rejection of guarantee claims.

CUSTOMER DETAILS

Name:.....

Company Name: .....

Address: .....

NIP..... **Phone No:**

STATEMENT:

I agree to cover the cost of repairs and transportation of the device if guarantee claims are rejected.

I also agree for payable replacement of consumable parts (filters, spark plugs, motor oil). Only proper inspections ensure the correct functioning of the device.
All goods and services are provided according to the current pricelist of Fogo Sp. z o.o.

Please provide prior valuation of repair costs:

YES / NO

DATE:
.....

NAME AND SURNAME:
.....

SIGNATURE:
.....

.....

11. Complaint notification card

Manufacturer:
FOGO Sp. z o.o.
ul. Święciechowska 36, Wilkowice
Święciechowa 64-115, Poland

Complaint notification card

(Completed by the user)

SPECIFICATIONS:

Power generator model: . . . . . .

Power generator number: . . . . . .

Date of sale: . . . . . .

Invoice number: . . . . . .

Company selling the power generator: . . . . . .

Indication of working time counter: . . . . . .

Description of the fault: . . . . . .

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If the power generator is covered by a guarantee, the claim is to be considered only when the original guarantee card is provided. Failure to provide the guarantee card is equivalent to a rejection of guarantee claims.

CUSTOMER DETAILS

Name:. . . . . .

Company Name: . . . . . .

Address: . . . . . .

NIP. . . . . . **Phone No:**

STATEMENT:

I agree to cover the cost of repairs and transportation of the device if guarantee claims are rejected.

I also agree for payable replacement of consumable parts (filters, spark plugs, motor oil). Only proper inspections ensure the correct functioning of the device.
All goods and services are provided according to the current pricelist of Fogo Sp. z o.o.

Please provide prior valuation of repair costs:

YES / NO

DATE:
. . . . . .
NAME AND SURNAME:
. . . . . .
SIGNATURE:
. . . . . .

Confirmation of periodic technical inspections and oil change by authorised workshop

Type: . . . . . .

Engine No:. . . . . . .

Power generator No.: . . . . . .

Inspection: . . . . . .

Interval: . . . . . .

Counter indication: . . . . . .

Materials	Part No.
Oil	
Oil filter	
Air filter	
Fuel filter	

Additional maintenance performed:

. . . . . .

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Date: . . . . . .

Stamp and signature of authorised workshop. . . . . .

Type: . . . . . .

Engine No:. . . . . . .

Power generator No.: . . . . . .

Inspection: . . . . . .

Interval: . . . . . .

Counter indication: . . . . . .

Materials	Part No.
Oil	
Oil filter	
Air filter	
Fuel filter	

Additional maintenance performed:

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Date: . . . . . .

Stamp and signature of authorised workshop. . . . . .

We reserve the right to introduce changes as a part of continuous improvement of our products. All information in this publication is based on product data available at the time of printing. As a result of continuous improvement of our products, some modifications may be introduced, which will be described in future versions of the manual by the services responsible for the change. If you find any transcription errors or inconsistencies in the manual, plese report them using the enclosed notification form, or by e-mail: d.zacharski@fogo.pl or tel. (65) 534 11 80. No part of this publication may be reproduced without written permission of Fogo Sp. z o.o. This manual is an integral part of the device and must be kept with it, even in case of any resale or disposal of the device.

2021.04