



## User's manual

### ARCTOS

Single-phase power generator



3000	3500	5000	8000	9000
------	------	------	------	------



**CONTENT:**

1. INTRODUCTION .....	2
2. SAFETY WARNING .....	3
3. OPERATING CONDITIONS .....	4
4. DESCRIPTION AND EQUIPMENT ARRANGEMENT .....	4
5. SPECIFICATION .....	5
6. OPERATION .....	9
7. MAINTENANCE .....	12
8. STORAGE OF EQUIPMENT .....	15
9. TRANSPORT OF EQUIPMENT .....	15
10. FAULTS AND NONSTANDARD STATE .....	15
11. WARRANTY AND POST-WARRANTY REPAIRS .....	15
12. WARRANTY .....	15
13. SERVICE BOOK .....	16

**1. INTRODUCTION**

Dear consumer,

Company ALFA IN a.s. thanks you for purchasing our product and believe that you will be satisfied with our machine. Congratulations on choosing a professional machine for independent power generator based on the gasoline engine. This equipment is designed for demanding applications, and it is made from the highest quality components under strict quality management system certified according to ČSN EN ISO 9001. With the combination of professional gasoline engine HONDA, or VANGUARD, top of alternators LINZ or SINCRO, professional electrical and mechanical design and careful craftsmanship and assembling process, you get a device that is ready for a long-term, demanding and dynamic operation in normal or nonstandard working conditions.

**Advantage of gasoline power generator series ARCTOS:**

- professional single-cylinder air-cooled, four-stroke OHV engine with automatic mechanical speed control
- powerful maintenance free alternators
- fixed mounting of motor - generator in one constructional part
- double antivibration support of generator sets
- solid, ergonomically designed tubular frame
- MAGIMOUNT™ - mounting system chassis and accessories
- robust manual starter
- low noise and fuel consumption
- use a commercially available fuel
- the possibility of long-term full load
- optional electric starter, electronic voltage regulation (AVR), counter operation's hours, chassis, upper fairing, larger tank
- the possibility of customization
- single-phase operation (1x 230V)
- long-term protection against current overload (thermal fuse)
- service background

## 2. SAFETY WARNING

To ensure safe operation, please carefully read the following provisions. The following safety precautions must always be observed when handling the equipment device and its operation. Ignoring WARNING may lead to injury or property damage. Ignoring of NOTES, CAUTION may lead to equipment damage, reducing its performance or worsening operating performance.

Photos are for illustration only.

**WARNING - is used to indicate the risk, that if the warning is ignored causes or may cause minor or severe injury or death to operating and bystanders person and damage to property.**

**NOTES - are used to notify of important information for the installation, operation and maintenance of equipment.**



### **WARNING ! RISK OF FIRE AND EXPLOSION !**

Flammable and explosive gasoline can cause fires or serious burns.

Gasoline is extremely flammable and its vapors can explode if ignited. Fuel must be only store in approved containers, in well ventilated and unoccupied buildings, away from open flame, hot surfaces, electrical wiring or sparks. Refuel when the engine is hot or running, since spilled fuel may be ignited by contact with hot surfaces or sparks from electrical shock. Never use gasoline or flammable sharp as a cleaning medium.

Risk of explosion gases produced during charging (models with electric start)

Charge the battery only in a well-ventilated area away from sources of ignition (open flame, hot surfaces, sparks). Keep the battery out of the reach of children. During maintenance battery, remove all jewelry. Before disconnecting the negative terminal, make sure that the engine key switch is in the OFF position (in the ON position would have occurred the spark when disconnecting that could cause an explosion if hydrogen gas generated during charging the battery or gasoline vapors are present).

### **WARNING ! RISK OF ROTATING PARTS!**

Rotating parts may cause severe injury.

Do not touch or keep a safe distance of the hands, feet, hair and other body parts, clothing, tools and working materials from moving parts to prevent injury. Never operate the equipment with any cover, shrouds, or guards.

### **WARNING ! RISK OF BURNS!**

Do not touch the equipment when it is in operation or when it just stopped.

Parts of the machine may be hot during operation (especially the exhaust, engine block, body generator, cover of muffler, frame machines for exhaust). Do not touch these areas while the engine is running or immediately after stopping prevent severe burns. Never operate the equipment with any cover, shrouds, or guards.

### **WARNING ! RISK OF CHEMICAL BURNS!**

Electrolyte of battery for devices equipped with an electric starter contains sulfuric acid. Prevent skin contact with electrolyte.

### **WARNING ! RISK OF ELECTRIC SHOCK!**

Do not touch electrical wires equipment when it is in operation.

Electrical appliances connect and disconnect from the generator if generator is always switched off. Do not tamper with electrical wiring devices. Do not operate the equipment if it is damaged or is suspected of internal damage (eq. after flooding equipment, mechanical damage). Risk of electrical shock.

### **WARNING ! RISK OF POISONING EXHAUST GASES!**

Exhaust gases contain substances which, when inhaled, can cause serious intoxication or death and substances considered carcinogenic and teratogenic. Prevent inhaling exhaust gases, and never run the engine in closed or poorly ventilated areas.

### **WARNING ! RISK OF RANDOM STARTS!**

Random start of motor can cause severe injury. Before attempting any maintenance, disconnect the spark plug cable and devices equipped with an electric starter negative terminal of the battery. Before disconnecting, make sure that the starter box is in the OFF position (in the ON position would spark created when disconnecting to ignite or explode if spilled fuel).

### **WARNING ! RISK OF INJURY OF CHILDREN AND INCOMPETENT PERSONS!**

Keep out of reach of children or incompetent persons. Operate equipment by qualified person according to this manual knowledgeable. Do not operate the equipment children under 15 years.

Winding of the alternator is not connected to the ground - it is also isolated system power supply. This ensures the safety of the device with respect to the possibility of injury to the operator an electric shock. It is strongly prohibited to earth some of working conductor in generator circuit except when electrical circuit is equipped with residual current device tripping sensitivity 30 mA. These installations must be carried only by a specialist with electro qualifications.

Residual current circuit protector will provide safe operation and protect the operator in the event of damage to the insulation alternator. Residual current circuit breaker disconnects the electrical circuit in the event of a discrepancy between the electrical force-output alternator and parts of the circuit connected to ground at the output of the circuit breaker.

**Must not be combined PE and N !**

### 3. OPERATING CONDITIONS

- **COMPLIANCE WITH NATIONAL SAFETY STANDARDS.** The device is manufactured in compliance with European safety standards. May not be complied national standards.
- Devices operate at maximum heeling 15 degrees to the horizontal.
- The machine must be protected from humidity and rain, chemically aggressive environments, mechanical damage, excessive overloading - exceeding the tech. parameters rough treatment.
- **Each user must know its maximum rated power generator, which must not be exceeded.** Generator is equipped with a thermal fuse , which serves as a protection against prolonged overloads. If the power is interrupted during the use, it can be caused by breaking the fuse due to constant overloading. In this case, wait a short period of time, remove the cause of overloading and then switch on the fuse again by pressing the button located near the outlets. Thermal fuses have values corresponding to the values of each type of generator. If the replacement is necessary, use original spare parts. **Thermal fuse can not secure single very strong overloading exceeding several times the rated power generator. It can result in severe damage to the alternator, for which the manufacturer does not bear any responsibility.**
- When connecting electrical machines and appliances to the generator it is essential to observe the technical parameters of electric powered and connected devices. If in doubt consult your dealer or the manufacturer of power generators.
- Coefficient determines the approximate multiple increase "label" the power of powered devices, which may occur short-term during the operation, especially during start-up equipment. Most equipment has a coefficient of 1 except for the following (the list is not complete, it is indicative only).

The connected powered device	Coefficient
Pressure washers	3
Fridge	3,5 -5
Concrete mixers, angle grinders, circular saws	2,5
Machine tools and electric grinders	2
Submersible pumps	3
Washing machines	4
Compressors	3,5-5
Drilling and milling machines	3
Halogen lamps and fluorescent lamps	1,5
Crushers, grass trimmers, brush cutters, fence cutters, mowers and chain saws	2

- It is necessary to observe all the provisions of the used motor, which are listed in the user manual or the user manual engine.
- All interventions in el. equipment, as well as repairs must be performed only by authorized personnel.

### 4. DESCRIPTION AND EQUIPMENT ARRANGEMENT



## 5. SPECIFICATION

ARCTOS		3000 H	3000 V	3500 H	3500 V
Alternator	Power [kVA]	3,0	3,0	3,5	3,5
	Voltage [V]	230	230	230	230
	Current [A]	13,0	13,0	15,2	15,2
	Frequency [Hz]	50	50	50	50
	Stability U/Hz [%]	6/1	6/1	1/1	1/1
	Power factor - cos $\varphi$	1	1	1	1
	Voltage regulation	CCL	CCL	AVR	AVR
Motor	Type	Honda GX200	Vanguard 13H3	Honda GX200	Vanguard 13H3
	Volume (cm3)	196	205	196	205
	Power [kW/HP]	4,1 / 5,5	4,9 / 6,5	4,1 / 5,5	4,9 / 6,5
	Cooling	air	air	air	air
	Starting	manual	manual	manual	manual
	Noise (A) [dB]	96	96	96	96
	Consumption [l/h]	1,2	1,2	1,2	1,2
	Fuel tank capacity [l]	3,1	3,8	3,1	3,8
	Oil	10W 40 (-18°C - 50°C), 5W 40 (-40°C - 0°C)			
	Fuel	unleaded > 91			
Accessories	IP Protection	IP23	IP23	IP23	IP23
	Thermal protection (230V)	yes	yes	yes	yes
	Oil sensor	yes	yes	yes	yes
	Voltage indication	optional	optional	optional	optional
	Counter operation's hours	optional	optional	optional	optional
	Chassis	optional	optional	optional	optional
	Small bodywork	optional	optional	optional	optional
	Dimensions [mm]	600x460x475	600x460x475	600x460x475	600x460x475
	Weight [kg]	44	46	44	46

ARCTOS		5000 H	5000 B	5000 H	5000 V
Alternator	Power [kVA]	4,2	4,2	4,5	4,5
	Voltage [V]	230	230	230	230
	Current [A]	18,2	18,2	19,5	19,5
	Frequency [Hz]	50	50	50	50
	Stability U/Hz [%]	6/1	6/1	1/1	1/1
	Power factor - cos $\varphi$	1	1	1	1
	Voltage regulation	CCL	CCL	AVR	AVR
Motor	Type	Honda GX270	Briggs 1450	Honda GX270	Vanguard 20H3
	Volume (cm3)	270	306	270	305
	Power [kW/HP]	6,0 / 8,0	7,5 / 9,0	6,0 / 8,0	7,5 / 9,0
	Cooling	air	air	air	air
	Starting	manual	manual	manual	manual
	Noise (A) [dB]	96	96	96	96
	Consumption [l/h]	1,6	1,6	1,6	1,6
	Fuel tank capacity [l]	5	5,3	5	4,1
	Oil	10W 40 (-18°C - 50°C), 5W 40 (-40°C - 0°C)			
	Fuel	unleaded > 91			
Accessories	IP Protection	IP23	IP23	IP23	IP23
	Thermal protection (230V)	yes	yes	yes	yes
	Oil sensor	yes	yes	yes	yes
	Voltage indication	optional	optional	optional	optional
	Counter operation's hours	optional	optional	optional	optional
	Chassis	optional	optional	optional	optional
	Small bodywork	optional	optional	optional	optional
	Dimensions [mm]	695x510x577	695x510x577	695x510x577	695x510x577
	Weight [kg]	66	68	66	68

ARCTOS		8000 H	8000 B	8000 H	8000 V
Alternator	Power [kVA]	6,0	6,0	6,0	6,0
	Voltage [V]	230	230	230	230
	Current [A]	26,0	26,0	26,0	26,0
	Frequency [Hz]	50	50	50	50
	Stability U/Hz [%]	6/1	6/1	1/1	1/1
	Power factor - cos $\varphi$	1	1	1	1
	Voltage regulation	CCL	CCL	AVR	AVR
Motor	Type	Honda GX390	Briggs 2100	Honda GX390	Vanguard 2454
	Volume (cm3)	389	420	389	392
	Power [kW/HP]	8,2 / 11,0	9,7 / 13,0	8,2 / 11,0	9,7 / 13,0
	Cooling	air	air	air	air
	Starting	manual	manual	manual	manual
	Noise (A) [dB]	96	96	96	96
	Consumption [l/h]	2,1	2,1	2,1	2,1
	Fuel tank capacity [l]	6	6,6	6	7,1
	Oil	10W 40 (-18°C - 50°C), 5W 40 (-40°C - 0°C)			
	Fuel	unleaded > 91			
Accessories	IP Protection	IP23	IP23	IP23	IP23
	Thermal protection (230V)	yes	yes	yes	yes
	Oil sensor	yes	yes	yes	yes
	Voltage indication	optional	optional	optional	optional
	Counter operation's hours	optional	optional	optional	optional
	Chassis	optional	optional	optional	optional
	Small bodywork	optional	optional	optional	optional
	Dimensions [mm]	800x564x577	800x564x577	800x564x577	800x564x577
	Weight [kg]	79	79	79	79

ARCTOS		9000 H	9000 B	9000 H	9000 V
Alternator	Power [kVA]	8,0	8,0	8,0	8,0
	Voltage [V]	230	230	230	230
	Current [A]	34,7	34,7	34,7	34,7
	Frequency [Hz]	50	50	50	50
	Stability U/Hz [%]	6/1	6/1	1/1	1/1
	Power factor - cos $\varphi$	1	1	1	1
	Voltage regulation	CCL	CCL	AVR	AVR
Motor	Type	Honda GX390	Briggs 2100	Honda GX390	Vanguard 2454
	Volume (cm <sup>3</sup> )	389	420	389	392
	Power [kW/HP]	8,2 / 11,0	9,7 / 13,0	8,2 / 11,0	9,7 / 13,0
	Cooling	air	air	air	air
	Starting	manual	manual	manual	manual
	Noise (A) [dB]	96	96	96	96
	Consumption [l/h]	2,1	2,1	2,1	2,1
	Fuel tank capacity [l]	6	7,1	7	7
	Oil	10W 40 (-18°C - 50°C), 5W 40 (-40°C - 0°C)			
	Fuel	unleaded > 91			
Accessories	IP Protection	IP23	IP23	IP23	IP23
	Thermal protection (230V)	yes	yes	yes	yes
	Oil sensor	yes	yes	yes	yes
	Voltage indication	optional	optional	optional	optional
	Counter operation's hours	optional	optional	optional	optional
	Chassis	optional	optional	optional	optional
	Small bodywork	optional	optional	optional	optional
	Dimensions [mm]	800x564x577	800x564x577	800x564x577	800x564x577
	Weight [kg]	82	82	82	82



## 6. OPERATION

### ***Procedure for the first start***

- read this instruction manual carefully
- remove information labels from the device
- remove residues of the transport packing
- check the engine oil level, or top up
- fill the fuel tank (3-4 l)
- check visually the mask air intake cooling to the engine and the alternator and the surface of the device, make sure that the equipment is not damaged
- make sure all safety devices and guards are installed and securely tightened
- check if the powered device is off and unplugged

### ***Procedure before any further start***

- check oil level, top up, if the level is below the MIN, do not overfill above MAX
- check the fuel level, or top up
- check visually the mask air intake cooling to the engine and the alternator and the surface of the device, make sure that the equipment is not damaged
- make sure all safety devices and guards are installed and securely tightened
- check, if the powered device is off and unplugged

### ***Use of generator to power appliances***

1. Start the generator according to the instructions below.
2. Connect the appliances to the plugs, make sure not to exceed the maximum rated load of the outputs.
3. Make sure that the thermal fuse is ON.

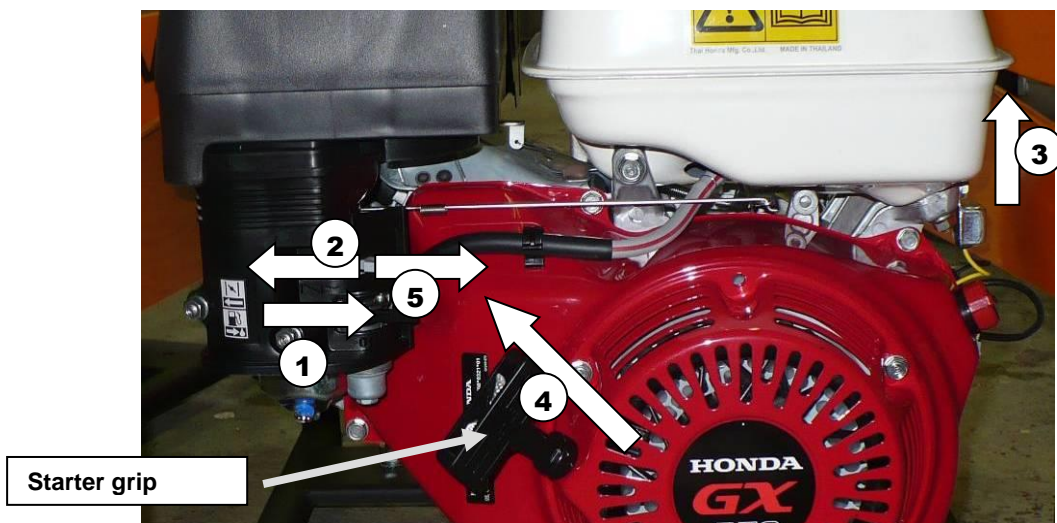
## Starting

### Manual starter - H Models - HONDA engine



1. Turn fuel valve to the ON position (1).
2. Place the choke control to the ON position (2). For a warm engine choke is not required.
3. Move the switch of the ignition switch to the ON position (3).
4. Pull slowly the starter grip until resistance shows. Then smoothly, but fast enough pull the starter handle (so as to avoid excessive stress on the starter rope guide pulley and starter) (4). Repeat until the device does not start.
5. After starting the device handle you return to its initial position.
6. After a few seconds you turn the choke to the OFF position (5) - work equipment picks up speed, and its operation is fluent.

*NOTE: In the case of break rope starter have it replaced with a original HONDA spare part.*

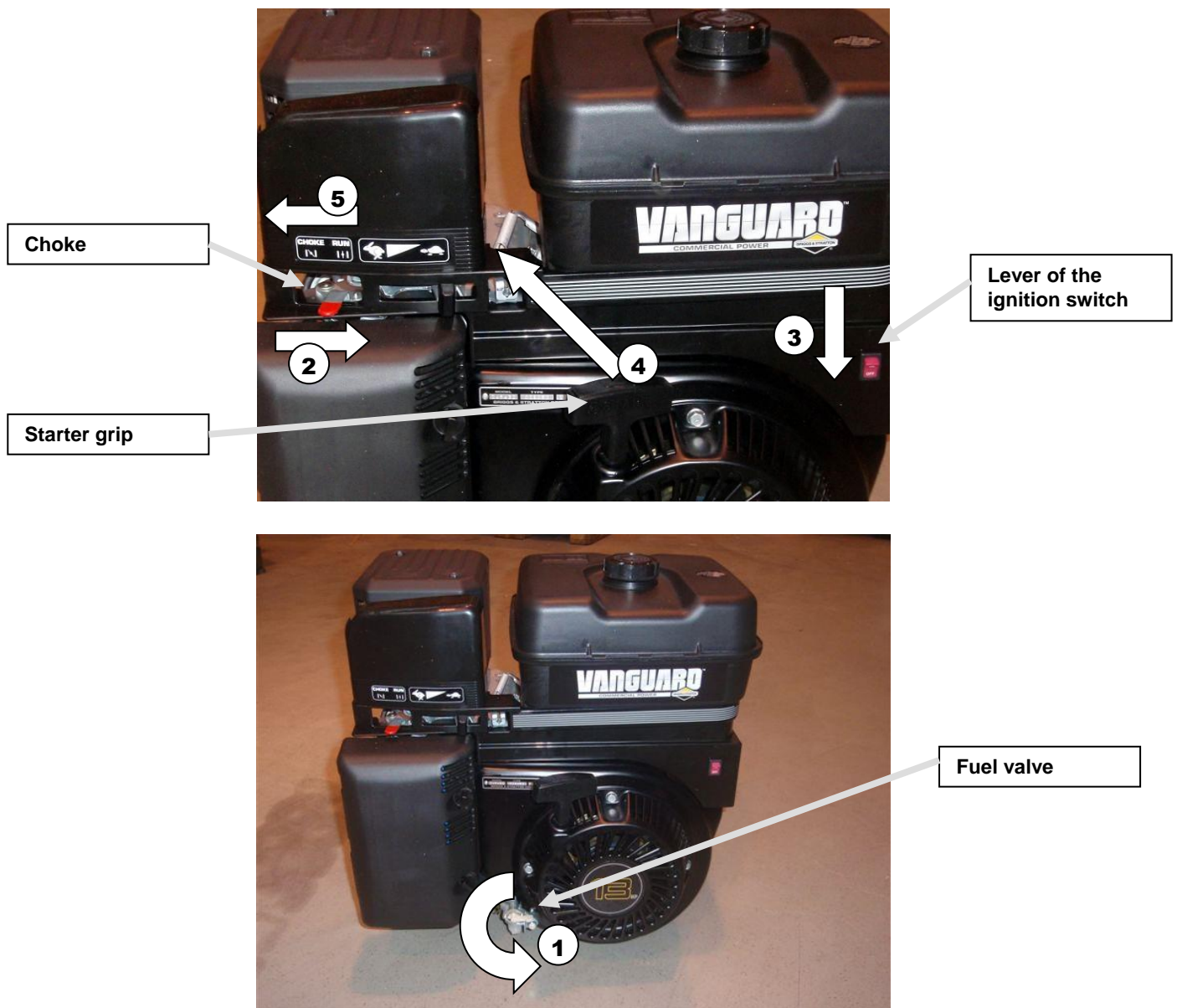


## Manual starter – V Models – VANGUARD engine



1. Turn fuel valve to the ON position **(1)**.
2. Place the choke control to the ON position **(2)**. For a warm engine choke is not required.
3. Move the switch of the ignition switch to the ON position **(3)**.
4. Slowly pull the starter grip until resistance shows. Then smoothly, but fast enough pull the starter handle (so as to avoid excessive stress on the starter rope guide pulley and starter) **(4)**. Repeat until the device does not start.
5. After starting the device handle you return to its initial position.
6. After a few seconds you turn the choke to the OFF position **(5)** - work equipment picks up speed, and its operation is fluent.

*NOTE: In the case of break rope starter have it replaced with a original VANGUARD spare part.*



### Electric starter – optional accessories

1. Turn the fuel valve to the ON position.
2. Turn choke to ON position. In the case of a warm engine choke is not required.
3. Switch starter to START position. Release the key to the ON position when the engine starts.
4. Set choke to the OFF position after a few seconds when the machine takes the high speed and its operation is fluent.

*NOTE: Do not operate starter continuously for more than 10 seconds. In the event that the device does not start, wait a stop and try again after 60 seconds. Failure to comply with these rules may lead to burning or mechanical damage to the starter.*

*NOTE: If the starter motor does not rotate, switch it immediately off and do not attempt to start the engine further. In the event that further starter does not work, contact your service partner.*

*NOTE: In case of cold or freezing weather, be sure you use oil suitable for the conditions. Warm starter battery has a larger capacity than a cold.*

### Decommissioning

1. Unload motor by disconnecting all load.
2. Let the engine run for 30 to 60 seconds flat.
3. Turn the engine switch to the OFF position.
4. Fuel valve switch from ON to OFF position.

## 7. MAINTENANCE

**For engine maintenance - detailed service procedures are listed in the user manual or the user manual engine.**

**Maintenance, excluding maintenance described in this manual should be made by an authorized service partner for engine maintenance by authorized service HONDA or VANGUARD. The generator does not require any servicing or maintenance by the customer.**

### Maintenance - schedule

#### WARNING! RISK OF RANDOM START!

Random start of engine by maintenance can cause severe injury. Disconnect the spark plug cable before attempting any maintenance and disconnect negative terminal of the battery in devices equipped with an electric starter.

Activity	Periodicity
Check, if necessary Top up the fuel tank	daily or before every start
Checking the oil level	daily or before every start
Check air filter <sup>1</sup>	daily or before every start
Control of air sampling openings and cooling surfaces <sup>1</sup>	daily or before every start
Cleaning foam air filter	every 25 hours of operation
Replacing the air filter <sup>1</sup>	every 50 hours of operation
Changing the oil	every 100 hours of operation (Vanguard – 50h).
Removing the covers cooling and cleaning <sup>1</sup>	every 100 hours of operation
Check the wear of the spark plugs and cable	every 100 hours of operation
General inspection of equipment <sup>2</sup>	every year or every 300 hours of operation

<sup>1</sup> Periods shorten up to ½ when the equipment is operated in extremely dusty or dirty environments

<sup>2</sup> Let make an authorized service partner

## Check oil level / top up oil

Oil	10W 40 (-18°C - 50°C), 5W 40(-40°C - 0°C)
-----	---

1. Make sure, that the device has not running, the starter position is OFF, it is in a horizontal position and is chilly, allow the oil to drain into the oil pan.
2. Clean the area around the oil cap throat to prevent possible oil contamination when opening the oil cap throat.
3. Remove the oil cap stopper
4. The oil level should be up to the upper edge of the throat, but it would not leak.
5. In the event that the oil level does not reach the upper edge of the throat. Top up oil (by oil throat) so that the oil level reached to the upper edge of the throat.

## Checking maintenance and replacement of the air filter and air system

Daily or before starting, check the air filter. Check the dirt and debris around the air cleaner. Keep this area clean. Also check for loose or damaged. Replace all bent or damaged air cleaner components.

*NOTE: Operating the engine with loose or damaged air cleaner components could allow unfiltered air into the engine causing premature wear or damage.*

### Maintenance foam air pre-filter

Wash and re-oil the pre-filter every 100 hours of operation (more often if the equipment is operated in dusty or dirty conditions). Foam pre-filter, keep the following manner:

1. Release the cover screw and remove the air filter cover
2. Remove foam pre-filter air filter paper
3. Wash the pre-filter in hot water (by hand) with soap, detergent or other detergent. Thoroughly wash the pre-filter so it does not contain any detergent. Squeeze excess water (do not wring) and let the pre-filter to air dry.
4. Let soak up the pre-filter with clean engine oil. Squeeze out excess oil.
5. Place the pre-filter through a filter paper
6. Replace the air filter cover and securely tighten the cover screw
7. In the case of having to replace the pre-filter use only original HONDA or VANGUARD spare parts

### Maintenance paper air filter

Every 100 hours of operation (more often if the equipment is operated in dusty or dirty conditions), replace the paper air filter as follows:

1. Remove the air filter cover and remove the cover. Remove the wing nut and remove the air filter with pre-filter. Remove the pre-filter from the paper air filter and clean if necessary.
2. Do not wash the paper element or use pressurized air to prevent damage. Replace a dirty, bent, or damaged element with a new original spare part - HONDA or VANGUARD. With a new filter, handle carefully, do not use if the sealing surfaces are bent or damaged.
3. When servicing the air cleaner, check the air filter. Make sure it is secured and not cracked or otherwise damaged. Also check the cover for damage or improper fit. Replace all damaged air cleaner components.
4. Replace back all components.
5. If it is necessary to replace the paper filter, use only original spare parts - HONDA or VANGUARD.

### Air inlet for cooling areas

To ensure correct cooling, make sure the grass screen, cooling fins, and other external surfaces of the engine are kept clean at all.

Every 100 hours of operation (more often if operating in dusty or dirty conditions), remove the blower cover and other covers and clean them as well as other exterior surfaces if necessary. Make sure the vent caps are reinstalled and securely fastened.



*NOTE: Operating the engine with clogged or dirty grates and covers and / or cooling shrouds removed, can lead to damage to the engine by overheating.*

## **Change oil / oil level checking system (Oil Sentry)**

### **Change oil**

NEW MOTOR - first exchange after 20 hours of operation (Vanguard 8h). Thereafter, change oil every 100 hours of operation. Use only the recommended types of oil. Change the oil while the engine is still warm, the oil will drain and wash away more impurities. Make sure that when filling, checking or changing the oil is equipment in horizontal position.

Change oil as follows:

1. Make sure the equipment is not run, the starter position is OFF, it is in a horizontal position and is cold, allow the oil time to run to the sump.
2. Clean the area around the oil cap throat to prevent possible oil contamination when opening the oil throat.
3. Remove the oil filler stopper.
4. The oil level should be up to the upper edge of the throat, but it would not leak.
5. In the event that the oil level does not reach the upper edge of the throat. Top up oil (oil throat) so that the oil level reached to required height the upper edge of the throat.

*NOTE: Always use the recommended types of oil - to prevent excessive engine wear or damage. To avoid excessive wear or damage to the engine, you must always observe for correct oil level in the crankcase. Never operate the engine with low oil state*

*NOTE: When handling oil, follow the applicable legislation in the environmental field.*

### **Oil level checking system (Oil Sentry)**

The motors are equipped with checking the oil level. If the oil level falls below the safe level, the engine stops automatically. The engine can't be started until the oil fails to complete.

*NOTE: If the engine stalls or fails to start, turn the engine switch to the ON position and pull the starter handle, try to start the engine. If the oil warning, after a few seconds, blink- TURN OFF the motor. The amount of oil in the engine is not sufficient. Top up oil and start again.*

## **Checking / replacing the spark plugs and ignition**

This device is equipped with reliable electronic ignition system. Maintenance other than periodically checking / replacing the spark plugs is neither necessary nor possible. In case of problems with the ignition, which can not be solved by replacing the spark plugs, contact your nearest service partner.

Every 200 hours of operation, remove the spark plug, check condition, and adjust the gap or replace the spark plug with a new one. Standard spark plug is a Champion RC12YC or higher Champion Premium GOLD 2071. They are also applicable to other manufactures equivalent candles. Control, respectively. Replace the spark plug as follows:

1. Before removing the spark plugs clean the area to prevent dirt and debris out of the engine.
2. Remove the plug and check its condition. In the case of wear replace the spark plug.
3. NOTE: Do not clean the spark plug abrasive grit. Some grit could remain in the spark plug and enter the engine and cause excessive wear or damage.
4. Check the gap using a feeler gauge. Adjust the gap by carefully bending the ground electrode. The gap should be set to 0.7 – 0.8 mm.
5. Replace the spark plug back and tighten the 13/16 inch wrench to candle so that the sealing washer is compressed. When installing a new spark plug tighten a half turn after addition depositing in order bottoming washer. When reassembling the original spark plugs after landing tighten the 1/8 - 1/4 turn in addition in order to compress the washer.

#### **WARNING !**

Tighten too loosely spark plug can overheat and damage motor. Excessive tightened the spark plug can damage the threads in the cylinder head.

6. Connect the cable to the spark plug.

**If necessary, additional service actions, contact your service partner.**

## 8. STORAGE OF EQUIPMENT

The equipment can be stored in standard stock under standard storage conditions. Temperature +5-40 ° C, humidity <95%, it is suitable to store the machine on a dry surface.

## 9. TRANSPORT OF EQUIPMENT

The device can be transported only in a horizontal position, to prevent leakage of fluids. Fuel valve of the engine moved to the OFF position.

## 10. FAULTS AND NONSTANDARD STATE

In the case, that the effect of any failure or nonstandard state, first check the simplest causes in the table below. In the event, that a fault or state is not in the table, or not be removed by removing the causes, contact your service partner. Do not attempt to repair the equipment not subject to routine inspection and maintenance.

Possible reason Problem	No fuel	Wrong fuel	Fuel valve is not in the ON position	Dirt in the fuel system	Dirt on grilles	Wrong oil level	Overload equipment	Dirty air filter	Worn out spark plug	Cold engine	Overload alternator	Demagnetization condition alternator rotor
Not start	X	X	X	X		X	X	X	X			
Hard to start		X	X	X		X	X	X	X	X		
Suddenly stops	X		X	X	X	X	X	X				
Loses power		X	X	X	X	X	X	X	X			
Powered irregularly		X	X	X	X		X	X	X	X		
Strange noises		X	X		X		X		X	X		
Blackouts, irregular ignition		X	X	X	X			X	X	X		
Wounds from the exhaust			X	X			X	X	X	X		
Overheating				X	X	X	X	X				
High fuel consumption							X	X	X			
Dark smoke from exhaust						X				X		
The output is not a current											X	X
Repeated failures alternator protection											X	

## 11. WARRANTY AND POST-WARRANTY REPAIRS

Warranty and post-warranty repairs provided by the manufacturer or an authorized service location.

## 12. WARRANTY

We guarantee our customers that the original equipment marks MEDVED is and will be free from manufacturing defects in materials and workmanship for two years from the date of purchase, provided that it is operated in accordance with this user manual and other documentation provided with the product under appropriate operating conditions and in normal handling. VANGUARD engines to provide a guarantee of 3 years. Under this warranty will be provided free of charge any service support, except for service after being damaged by improper handling or operation in improper operating conditions and spare parts, except normal consumables associated with the product (filters, spark plugs, fuel, oil, etc.). All warranty repairs must be carried out either by the manufacturer or a certified service partner. Repair of other entities, as well as intervention in its own facilities outside the periodic maintenance leads to a breach of warranty and void your warranty. All rules regarding the warranty for the operation subject to the final consumer, and not mentioned above is further governed by the Civil Code, as amended and other relevantly related regulations.

### 13. SERVICE BOOK

Activity \ Periodicity	before every start	every 100 hours of operation	every 100 hours of operation (Vanguard 50h)	every 100 hours of operation	every year or every 300 hours of operation
Check, if necessary top up the fuel tank	x				
Checking the oil level	x				
Check air filter <sup>1</sup>	x				
Control of holes for air intake and cooling surfaces <sup>1</sup>	x				
Cleaning foam air filter		x			
Replacing the air filter <sup>1</sup>			x		
Changing the oil			x		
Removing the covers cooling and cleaning <sup>1</sup>			x		
Check the wear of the spark plugs and cable				x	
General inspection of equipment <sup>2</sup>					x

### RECORDS OF SERVICE CHECK

Activity	Check, if necessary top up the fuel tank	Checking the oil level	Check air filter	Control of holes for air intake and cooling surfaces	Cleaning foam air filter	Replacing the air filter	Changing the oil	Removing the covers cooling and cleaning	Check the wear of the spark plugs and cable	General inspection of equipment	Signature technician, firm, stamp
Date:											