



User manual

M - WATT

Single phase and Three-phases power generator



250-AVR-1500	270-CCL-3000	350-AVR-1500	420-AVR-1500
500-AVR-1500	600-AVR-1500	850-AVR-1500	



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1. INTRODUCTION

Dear consumer,

company ALFA IN a.s. thanks you for purchasing our product and believe, that you will be satisfied with our product. Congratulations on choosing a professional equipment for independent power generation based on the P.T.O. drive. This equipment is designed for demanding applications, and it is made from the highest quality components according to strict quality management system, certified according to EN ISO 9001. Through the combination of professional P.T.O. connectors, top quality LINZ alternators, professional electrical and mechanical design and careful craftsmanship and assembling process, you get an equipment, which is ready for a long-term, demanding and dynamic operation in standard or nonstandard working conditions.

We reserve the rights of adjustments and changes in case of printing errors, change of technical parameters, accessories etc. without previous notice. These changes may not be reflected in the user manuals in paper or electronic form.

Advantages of P.T.O. power generators M-WATT series:

- powerful maintenance-free alternators
- fixed mounting of the generator in one construction block
- solid, ergonomically designed tubular frame
- long-term full load possibility
- customization possibility
- single-phase and three-phase operation (1 x 230/ 3 x 400 V)
- long-time current overload protection
- service background

2. SAFETY WARNING

Please read the following safety precautions and conditions carefully to ensure safe operation. The following safety precautions and conditions always must be observed, when handling the device and during its operation. Ignoring of WARNINGS may cause injury or property damage. Ignoring NOTES, WARNINGS may also cause equipment damage, reducing its performance or worse operating performance.

Photos in text are for illustration only.

WARNINGS - are used for indication of the risk, which in the case of ignore can cause minor or serious injury or death of operators or other persons and damage to property.

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



WARNING! RISK OF FIRE OR EXPLOSION!
Flammable and explosive fuels can cause fires or serious burns.

Petrol is extremely flammable and its fumes can explode if ignited. Please store the fuel only in suitable containers, in well-ventilated and uninhibited areas away from open fire, hot surfaces, electrical conductions or sparks. Do not refuel the device while operating. Spilled petrol can ignite due to contact with hot surfaces or if the electrical wiring is short-circuited. Never use gasoline or flammable substances as a cleaning agent.

WARNING! RISK OF INJURY BY ROTATING PARTS!

Rotating parts may cause serious injuries.

To prevent injury do not touch and keep a safe distance of the hands, feet, hair and other parts of your body, clothing, tools and work aids away from moving parts. Never operate the equipment without any cover, canopy or guards. Never operate the device while covers, fairings or protective parts are removed.

WARNING! RISK OF BURNS!

Do not touch the device while it is operating or when it just stopped.

Parts of the machine may be hot during operation (especially the exhaust, engine block, generator body, cover of muffler, frame machines for exhaust). Do not touch these hot parts while the engine is running or immediately after stopping to prevent serious burns. Never operate the device while covers, fairings or protective parts are removed.

WARNING! RISK OF CHEMICAL BURNS!

Electrolyte in the battery for devices equipped with an electric starter contains sulfuric acid. Prevent skin contact with electrolyte to avoid chemical burns.

WARNING! RISK OF ELECTRIC SHOCK!

Do not touch the electrical installation and the parts of the equipment when it is operating.

Electrical appliances can be connected and disconnected from the generator only in the switched OFF mode. Do not modify electrical wiring of the device. Do not operate the device, if it is damaged or in case of any suspicions of internal damage (eq. after flooding equipment, mechanical damage). Risk of electrical shock.

WARNING! RISK OF POISONING BY EXHAUST GASES!

Exhaust gases contain substances, which can cause serious intoxication or death in the case of inhalation, and also contains substances considered as carcinogenic and teratogenic. Avoid inhaling exhaust gases and never run the engine in closed or poorly ventilated areas.

WARNING! RISK OF INJURY OF CHILDREN AND INCOMPETENT PERSONS!

Keep the device out of reach of children or incompetent persons. Operate the device only by qualified personnel instructed according to this manual. It is prohibited to operate the device by persons under 15 years of age.

Winding of the alternator is not connected to the ground. It is a separate power supply system. This ensures the safety of the device with regard to the possibility of an electric shock injury to the operator. It is strictly prohibited to ground any working conductor in the alternator winding circuit, except when electrical circuit is equipped with residual current circuit breaker with tripping sensitivity 30 mA. These installations must be carried out only by a specialist with required electro qualification.

Residual current circuit breaker will secure safe operation and protects the operator in the event of damage of the insulation, of the alternator and connected appliances. Residual current circuit breaker disconnects the electrical circuit in the event of an electrical current difference between the alternator power output and parts of the circuit connected to the ground at the output of the residual current circuit breaker.

PE and N conductor must not be connected together to final one PEN conductor!

3. OPERATING CONDITIONS

- **COMPLIANCE WITH SAFETY STANDARDS.** The device is manufactured in compliance with European safety standards. It may not be fully complied with some national standards.
- The device must be operated at maximum tilt of 15 degrees to the horizontal position.
- The device must be protected from humidity and rain, chemically aggressive areas, mechanical damage, excessive overloading - exceeding the tech. parameters and to uncaredful handling.
- **OVERLOADING. Each user must know the maximal rated output power of the power generator, which must not be exceeded.** Generator is equipped by a thermal fuse for 230V voltage, which serves as a long-term overload protection. If the power output is interrupted during the use, it can be caused by breaking of the fuse due to long-term overloading. In this case, wait a short time period, and then fix the overload reason and switch-on the fuse again by pressing the button near the sockets. Thermal fuses have trigger values corresponding to each type of power generator. In case of the replacement, use original spare parts. **Thermal fuse cannot secure strong short-term overloads exceeding the rate output power of the generator. It can cause serious damage of the alternator. In that case the**

company takes no responsibility for any consequences.

- It is necessary to respect technical parameters of the power generator and connected electric devices when connecting electrical machines and devices to the generator. In case of any doubts, please contact your dealer or the manufacturer of the power generator.
- Below mentioned coefficients determines the approximate multiple exceeding power of the label-rated power of powered appliances, which may occur in short-time during the operation, especially during start-up of the device. Most of appliances has a coefficient 1 except the following cases (the list is not complete; it is indicative only).

The powered device	Coefficient
Pressure washers	3
Fridge	3,5 -5
Concrete mixers, handheld 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

- All interventions into el. device, as well as repairs may only be carried out by authorized personnel.

4. DESCRIPTION OF THE EQUIPMENT



5. SPECIFICATION

	Electrical output 3P [kVA]	Voltage regulation	Min. PTO output power [kW (HP)]	Min. RPM [min ⁻¹]	Total weight [kg]	Rated current [A]
M-Watt – three phases alternator, 3000 RPM						
MW 270-CCL-3000	27,0	capacitive/compound	25(33)	403	186	39
M-Watt – three phase alternator, 1500 RPM						
MW 250-AVR-1500	25,0	Automatic	23(31)	403	255	36,1
MW 350-AVR-1500	35,0	Automatic	32(43)	403	242	50,5
MW 420-AVR-1500	42,0	Automatic	38(50)	403	310	60,6
MW 500-AVR-1500	50,0	Automatic	45(60)	403	360	72,2
MW 600-AVR-1500	60,0	Automatic	54(72)	403	377	86,6
MW 850-AVR-1500	85,0	Automatic	75(101)	403	480	122,6

6. INSTALATION AND OPERATION

The power generator is electrical device, which must be handled, installed, put into operation and checked by qualified persons only.

The power generator is mechanically connected by P.T.O. to another machine. The responsible person (operator) must ensure, that surrounding area of all rotating and electrical parts during the operation are secured against unsafe contact with anything.

Conditions for connection the power generator to the three phases electrical circuit 3 x 400/230V as backup electricity source.

In case of connection of power generator to the three-phase electrical system as backup source of electricity, it is necessary to respect **at least** following conditions:

The connection must be carried out only by technician with electrical qualification, who has also appropriate knowledge concerning of the connected installation.

- Circuits connected to the power generator **must be safely separated from the grid and other possible sources of electricity, which are not subjects of the backup.**
- The power generator can be connected to five-core, three-phase circuit by separate PE and N wire. The connection to old four-core – three phases installation (with PEN wire) is possible, but after making necessary changes in back up electrical circuit, which are necessary to consult with the producer of the power generator.
- The power generator **must be connected to the backup circuit via its circuit breakers.** Their over current and short circuit protection must be kept.
- The connection of power generator with load circuit **must be always realized by five-core cable only** (3 phases + Neutral wire + PE wire). If the conditions are not followed, the correct operation of the residual current circuit breaker will not be ensured, the risk of electric shock and the risk of damage to appliances connected to the back-up installation will increase.
- The power input of the connected appliances, must not exceed the power output of the used power generator.
- (***Other conditions follow valid local standards***)

PE and N conductors must not be connected together to final one PEN conductor!

In case of any doubts please call to the producer of the power generator.

The first start procedure

- read this user manual carefully
- remove information labels from the device
- remove all parts of transport packaging

- check the oil level, and eventually fill up
- visually check the surface of the device and make sure that the equipment is not damaged
- check, that all safety features and covers are installed properly and are securely tightened
- check, whether the connected devices are switched off and unplugged

Procedure before any further start

- check the oil level, if the level is under the MIN, refill, do not overfill over MAX
- visually check the surface of the device, make sure that the device is not damaged
- make sure, that all safety features and covers are installed properly and are securely tightened
- check, whether the connected devices are switched off and unplugged

Before start of the device check:

- that, safety cover of P.T.O. is correctly mounted and without any damages.
- the generator shaft and P.T.O. connection is correctly aligned with the tractor's drive unit
- all joints are perfectly fixed and secured.
The wrong fixation of power generator can cause its rollover and may cause serious injury to the operator.
- The gearbox must be filled with oil (0,5 l) before the first start and the oil must be changed after the first 50 operating hours. After this period, the oil level must be checked periodically. In the version with check window, the oil level should be near the center of the window. In the version without the check window, release the lower cover until the oil starts flow out. Release top and bottom cover of gear box for the faster oil change. Use only SAE 90EP gearbox oils. For the disposal and collection of used oil, please contact only specialized centers and follow the relevant regulations of your country.
- Check that all connections are ok and there is nothing to impend the rotation of moving parts before the start. Make sure that access to the cooling inlet and exhaust pipe is clear.
- Follow the appropriate safety standards for electrical connection. Check, whether the label data of the power generator are in compliance with the characteristics of the connected devices. Make sure, that the maximum permitted rate load of the individual outlets is not exceeded.
Ground the machine by using a grounding pin, clamped to the shell of the structure.
- **Check, that the switches are in the OFF position and all protections are installed correctly and ready for operation on the generator and on the tractor too.**
- It is recommended to measure insulation resistance of the power generator in case, that it was not turned on for a long time.

User instructions for launching

Rotating electrical machine contains dangerous parts, partially under voltage, so in case of:

- improper use
- removal of protectors (covers) and elimination of fuses and circuit breakers
- lack of checks and maintenance

it can cause a lot of property damages or injuries of persons.

Therefore, any handling with the electrical or mechanical parts requires a qualified specialist.

During all stages of disassembly, maintenance, lubrication and assembly of the P.T.O. connection (P.T.O. protective rubbers), the personal safety of the operator must be secured due to rules of accidents prevention.

1. Tighten the connections of the power generator and the tractor by 3 connection joints by using pins and plugs. Possible faults in installation, can cause serious damage of property or injury of persons, for which the constructor is not responsible.
2. Secure the P.T.O connection ring between the generator and the tractor in the turned off mode and make sure they are perfectly connected. There cannot appear any vibrations, when the machine is running at idle or at full power.
3. **Make sure, that the frame of the generator lies firmly on the ground. Never switch ON the generator in an elevated position.** Vibrations can cause malfunction of the alternator and increase the risk of injury.
4. Start the tractor, engage the generator and progressively increase the RPM till reaching of frequency 52 Hz (shown on the display) without load.

5. Connect plugs to the corresponding sockets.

Notice:

- Make sure that appliance connected to power generator socket has suitable voltage.
 - Make sure, that load power is suitable
 - **Make sure, that there is nobody around rotating parts of the power generator and the tractor.**
6. Turn ON switches, circuit breakers and residual current protections.
 7. Contact with rotating parts, can cause many accidents and injuries.
It is strictly prohibited to stand beside of the P.T.O. connection when the machine is running. Make sure, that nobody is too close of moving parts or parts under voltage, while the alternator is running.

Switching off and stopping

1. Turn OFF connected appliances (begin with lowest load)
2. Turn main switch to the OFF position.
3. Stop tractor engine and disconnect plugs from sockets

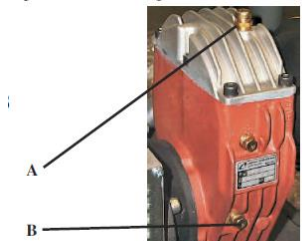
WARNING:

If the permitted speed of the power generator is exceeded, the engine or alternator can be damaged.

7. MAINTENANCE**INSPECTIONS**

Please follow the steps below to check oil level or for adding the oil to the gearbox:

1. unscrew and remove hole caps
2. fill in oil via top hole (A) till the oil starts leak from hole (B).
3. screw caps back to holes

**MW 270-CCL-3000**

Alternator with brushes – lifetime of brushes app. 2000 hours

MW 250-AVR-1500, MW 350-AVR-1500, MW 420-AVR-1500, MW 500-AVR-1500, MW 600-AVR-1500, MW 850-AVR-1500

brushless alternators

MAINTENANCE - schedule

Never work on the running power generator, either with your hands or with tools. Before any maintenance make sure, that the power generator is stopped and disconnected from the tractor or the tractor is turned off and the ignition key is removed and all switches are in the OFF position.

- If there is any malfunction on the machine, make sure, that the reason is not caused due to lack of routine maintenance.
- Mechanical checks:
 - Check once a month or whenever during each start of the machine, for any unusual noises or vibrations. Check that the alternator air inlet tubes are not blocked.
 - Check the oil level in the gearbox periodically. Change the oil after every 500 hours of operation or at least once a year.
- Electrical checks:
 - Check the circuit breaker monthly or anytime when machine is turned on by pressing test button (circuit breaker must switch off). Also check grounding condition.

- Every 500 hours of machine operation, and at least once a year, check the wear of the brushes, piping and the proper operation of the control panel measuring systems, check their measurements with a standard measuring device.
- Never wash the power generator with direct or high-pressure water jets or with aggressive cleaning agents.
- Never leave containers with liquids or flammable materials on the power generator surface.
- Keep the device away from sources of heat or humidity and never install it in explosive areas.
- In case of fire, use a powder-based fire extinguisher.

Service interventions, excluding interventions described in this manual, must be realized by an authorized service.

The generator does not require any service or maintenance interventions from the customer.

Description of the protection function

The circuit breaker can switch off in two cases:

- If there is higher current consumption from connected equipment, then adjusted current value of circuit breaker – reduce the load
- During short circuit – eliminate the short circuit

The residual current circuit breaker will disconnect the electrical circuit in case of its insulation damage. This protection (together with grounding) guarantees the best protection against getting electricity shock.

If any further service interventions are required, please contact your service partner.

8. STORAGE OF THE DEVICE

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

9. TRANSPORT OF THE DEVICE

The device can be transported in horizontal position only, to prevent oil leak. Use appropriate lift equipment with enough lifting capacity for handling the device. Protect the package from mechanical damage, rain and humidity influence. Store the equipment on dry, clean place which is protected from humidity. It is recommended to measure insulation resistance of the equipment in case of long-term switch off position of the device.

10. FAULTS AND NON-STANDARD STATES

In case that any failure or non-standard status will appear, first check the simplest cases according to the table below. In case, that a fault or status is not shown in the table, or if it is not possible to solve the problem by these recommended solutions, please contact your service partner. Do not repair parts of the equipment which are not subject of standard inspection and maintenance routine.

Possible reason Issue	Wrong oil level	Device overload	Dirty air channels	Alternator overload	Fastening – loosen screws etc.
Loses power	X	X	X		
Works irregularly		X	X		
Non-standard noise		X			X
Overheating	X	X	X		
No output		X		X	
Repeated failures of alternator protection		X		X	

11. WARRANTY AND POST-WARRANTY REPAIRS

Warranty and post-warranty repairs are provided by the manufacturer or a local authorized service.

12. WARRANTY

We guarantee to our customers, that the original MEDVED brand device, is and will be free of manufacturing defects of materials and workmanship by the time of two years from the date of purchase, in case that it is operated in accordance with this user manual and other documentation provided together with the product and under appropriate operating conditions and with standard using. According to this warranty there is provided free service support, except of service of damaged equipment caused by improper handling or operation in improper operating conditions or spare parts, except subjects of standard change (filters, spark plugs, fuel, oil, etc.). All warranty repairs must be carried out by the manufacturer or a certified service partner. All unauthorized repairs, interventions and changes of the equipment made out of the periodic maintenance and over warranty conditions, will cause loss of the warranty. All warranty rules apply to the final customer and the ones not mentioned above are governed by the actual law of the Czech Republic and other relevantly related regulations. The warranty list is a proof of purchase (invoice) which contains the serial number of the product.

13. DECOMMISSIONING OF THE DEVICE

If the machine has to be decommissioned, follow these steps:

- drain the oil from the gearbox and dispose of it as old oil
- separate plastic and metal parts and take them to authorized disposal companies.

14. SERVICE BOOK

Interval	every start	every 500 hours of operation or yearly
Activities		
Presence of excessive vibration	x	
Transmission oil level check	x	
Electric connection check		x
Rotor brushes wear check		x
Transmission oil exchange		x

RECORDS OF POWER GENERATOR SERVICE CHECKS

Activity	Presence of excessive vibration	Transmission oil level check	Electric connection check	Rotor brushes wear check (if brushes are installed)	Transmission oil exchange	Signature of technician, firm, stamp
Date:						