SHERMAN DIGIMIG 200 PULSE INSTRUCTIONS MANUAL



WARNING! FOR SAFETY REASON PLEASE READ AND UNDERSTAND THE FOLLOWING INSTRUCTIONS BEFORE FIRST USE OF THE DEVICE.

1. General instructions

Read the operating instructions!

The operating instructions provide an introduction to the safe use of the products. An incorrectly performed installation can result in material damage and injure persons as a result. For this reason, we do not accept any responsibility or liability for losses, damages or costs arising from incorrect installation, improper operation or incorrect usage and maintenance or any actions connected to this in any way.

- Read the operating instructions for all system components!
- Observe accident prevention regulations!
- Observe all local regulations!
- Confirm with a signature where appropriate.

2. Safety instructions

DANGER!

Electromagnetic fields!

The power source may cause electrical or electromagnetic fields to be produced which could affect the correct functioning of electronic equipment such as IT or CNC devices, telecommunication lines, power cables, signal lines and pacemakers.

- Observe the maintenance instructions! (see Maintenance and Testing chapter)
- Unwind welding leads completely!
- Shield devices or equipment sensitive to radiation accordingly!
- The correct functioning of pacemakers may be affected (obtain advice from a doctor if necessary).

Do not carry out any unauthorised repairs or modifications! To avoid injury and equipment damage, the unit must only be repaired or modified by specialist, skilled persons! The warranty becomes null and void in the event of unauthorised interference.

• Appoint only skilled persons for repair work (trained service personnel)!

Electric shock!

Welding machines use high voltages which can result in potentially fatal electric shocks and burns on contact. Even low voltages can cause you to get a shock and lead to accidents.

- Do not touch any live parts in or on the machine!
- · Connection cables and leads must be free of faults!
- Switching off alone is not sufficient!
- Place welding torch and stick electrode holder on an insulated surface!
- The unit should only be opened by specialist staff after the mains plug has been unplugged!
- Only wear dry protective clothing!
- Wait for 4 minutes until the capacitors have discharged!

WARNING!

Risk of injury due to radiation or heat!

Arc radiation results in injury to skin and eyes.

Contact with hot workpieces and sparks results in burns.

• Use welding shield or welding helmet with the appropriate safety level (depending on the application)!

• Wear dry protective clothing (e.g. welding shield, gloves, etc.) according to the relevant regulations in the country in question!

• Protect persons not involved in the work against arc beams and the risk of glare using safety curtains!

Explosion risk!

Apparently harmless substances in closed containers may generate excessive pressure when heated.

• Move containers with inflammable or explosive liquids away from the working area!

• Never heat explosive liquids, dusts or gases by welding or cutting!

Smoke and gases!

Smoke and gases can lead to breathing difficulties and poisoning. In addition, solvent vapour (chlorinated hydrocarbon) may be converted into poisonous phosgene due to the ultraviolet radiation of the arc!

• Ensure that there is sufficient fresh air!

- · Keep solvent vapour away from the arc beam field!
- Wear suitable breathing apparatus if appropriate!

Fire hazard!

Flames may arise as a result of the high temperatures, stray sparks, glowing-hot parts and hot slag produced during the welding process.

Stray welding currents can also result in flames forming!

- · Check for fire hazards in the working area!
- Do not carry any easily flammable objects such as matches or lighters.
- Keep appropriate fire extinguishing equipment to hand in the working area!

• Thoroughly remove any residue of flammable substances from the workpiece before starting welding.

• Only continue work on welded workpieces once they have cooled down.

Do not allow to come into contact with flammable material!

Connect welding leads correctly!

Risk of accidents if these safety instructions are not observed! Non-observance of these safety instructions is potentially fatal!

· Carefully read the safety information in this manual!

• Observe the accident prevention regulations in your country.

• Inform persons in the working area that they must observe the regulations!

Danger when coupling multiple power sources!

Coupling multiple power sources in parallel or in series has to be carried out by qualified personnel and in accordance with the manufacturer's guidelines. Before bringing the power sources into service for arc welding operations, a test has to verify that they cannot exceed the maximumallowed open circuit voltage.

• Connection of the machine may be carried out by qualified personnel only!

• When decommissioning individual power sources, all mains and welding current leads have to be safely disconnected from the welding system as a whole. (Danger due to inverse voltages!)

• Do not couple welding machines with pole reversing switch (PWS series) or machines for AC welding, as a minor error in operation can cause the welding voltages to be combined.

WARNING!

Hazards due to improper usage! Hazards may arise for persons, animals and material objects if the equipment is not used correctly. No liability is accepted for any damages arising from improper usage! • The equipment must only be used in line with proper usage and by trained or expert staff!

• Do not modify or convert the equipment improperly!

CAUTION!

Installation site!

The machine must not be operated in the open air and must only be set up and operated on a suitable, stable and level base!

• The operator must ensure that the ground is non-slip and level, and provide sufficient lighting for the place of work.

• Safe operation of the machine must be guaranteed at all times.

Equipment damage due to dirt accumulation!

Unusually high quantities of dust, acid, corrosive gases or substances may damage the equipment.

• Avoid high volumes of smoke, vapour, oil vapour and grinding dust!

• Avoid ambient air containing salt (sea air)!

Non-permissible ambient conditions!

Insufficient ventilation results in a reduction in performance and equipment damage.

• Observe the ambient conditions!

• Keep the cooling air inlet and outlet clear!

• Observe the minimum distance of 0.5 m from obstacles!

1. Technical specification

	1
Power supply	AC 230V / 50Hz (1ph)
Welding processes	MIG/MAG, MMA, TIG DC Lift
Technology	IGBT
Welding current MIG/MAG	24A - 200A
Welding current MMA	20A - 200A
Welding current TIG	10A - 200A
Duty cycle	100% (155A) / 60% (200A)
Current regulation	Stepless (fluent)
No load voltage	59V
Wire spool weight	5 kg
Compatible wire diameter	0.8 / 1.0 / 1.2 mm
Minimum fuse	20A
Protection class	IP21S
Weight	12 kg
Wire feeder	2 rollers

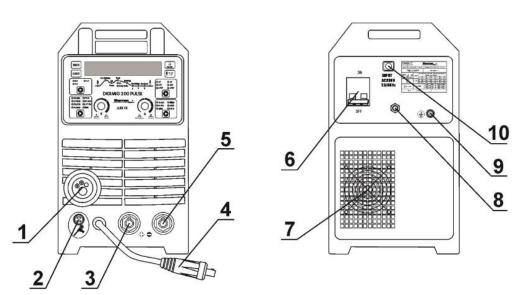
2. Applications

Device is intended for light industry applications and works with material thickness not greater than 10 mm depending on conditions and type of material. Welding process that can be conducted using the device is manual coated electrode welding (MMA) and semi-automatic arc welding with synergic settings (MIG/MAG) or a tungsten electrode welding with direct current (TIG DC Lift). The device works with wide range of material from mild steel, stainless steel and aluminium.

The manufacturer is not liable for damage caused by improper use of the device.

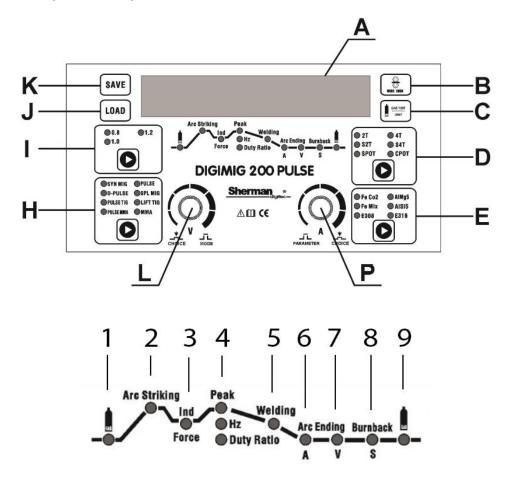
3. Welding machine description

3.1 Front and back view



- 1. Torch socket Euro type
- 2. Spool gun connector socket
- 3. Positive polarization (+) socket
- 4. Polarization selector plug
- 5. Negative polarization () socket
- 6. ON/OFF Switch
- 7. Cooling fan
- 8. Shield gas inlet
- 9. Ground connection
- 10. Power cord

PLEASE NOTE! Polarization selector plug must be fitted into one of the sockets depending on the welding method used.



- A Parameter display
- B Wire feeding button
- C Gas flow test button
- D Torch operating mode quick selector
- E Material type quick selector
- H Welding mode quick selector
- I Wire diameter selector
- J Loading previously saved set of parameters
- K Saving a set of parameters in memory

1 - Gas pre flow

- 2 Hot start (only in MMA/Pulse MMA)
- 3 Inductance in MIG / Arc Force in MMA
- 4 Peak current / Pulse freq. / Pulse duty
- 5 Welding current / Advanced menu

P – Right adjustment knob. Short press on the knob selects next available parameter.Turning it adjusts the value.

L – Left adjustment knob. When 'welding' parameter (pic. 3.2.5) is active the left knob adjusts voltage. Pressing it enters advanced menu with further parameters. Please note that to enter advanced menu the 'welding' parameter (pic. 3.2.5) must be selected and a corresponding light must be on

6 – End current value / End current time. Available only in S2T and S4T modes. End current time (**Endt**) can be accessed by selecting the End current (**EndU**) and pressing the left knob.

- 7 Arc characteristics for End current EndU
- 8 Burnback correction
- 9 Gas post flow

4. Menu and functions description

4.1 Selecting welding mode

Welding mode can be selected using a quick selector (pic. 3.2.H). Further available parameters of each mode are accessible in advanced menu by pressing the left knob (pic. 3.2.L). Please note that to enter advanced menu the 'Welding' parameter (pic. 3.2.5) must be selected and a corresponding light must be on

Quick selector	Info	
SYN MIG	Predefined programs for MIG	
PULSE	Predefined programs for MIG with automatic pulse	
D-PULSE	Predefined programs with adjustable dual pulse	
SPL MIG	Welding with spool gun	
PULSE TIG	Welding TIG DC Lift with adjustable pulse	
LIFT TIG	Welding TIG DC Lift	
PULSE MMA	Stick welding with adjustable pulse	
ММА	Stick welding	

Full list of modes

4.2 Selecting predefined program

Selecting predefined programs takes place by pressing a quick selector button (pic. 3.2.E). Please note that predefined programs are only available in MIG modes (SYN MIG, PULSE, D-PULSE).

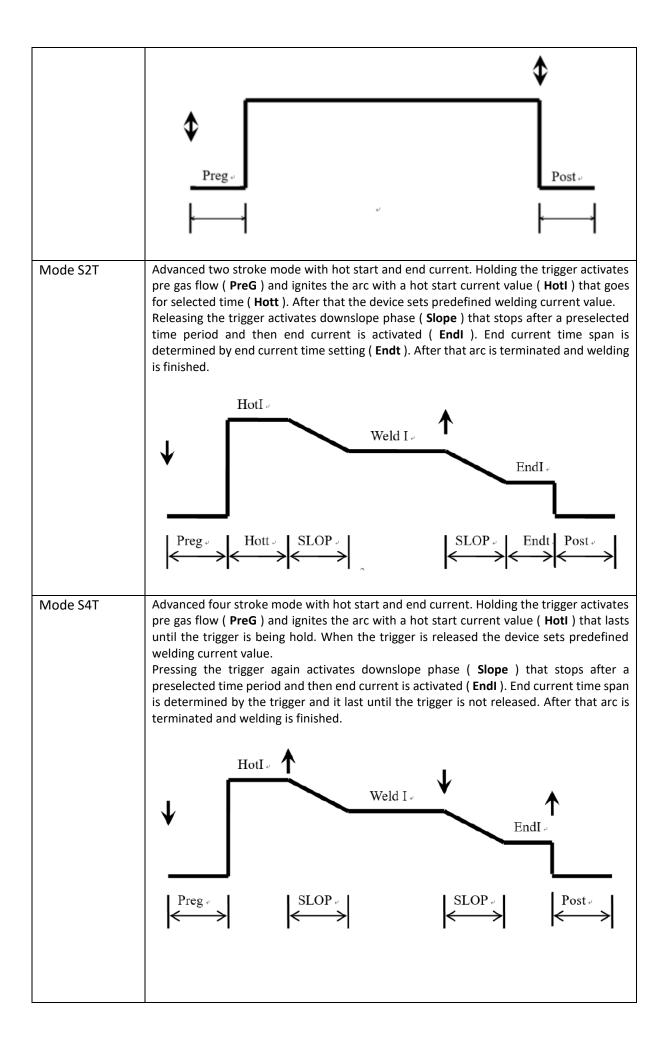
Full list of predefined programs

Quick selector	Wire diameter (Size)	Info
Fe CO2	0.8mm / 1.0mm	Mild steel with CO2
Fe Mix	0.8mm / 1.0mm	Mild steel with Ar-82%/CO2-18%
AlMg5	1.0mm / 1.2mm	Al with 5%-Mg alloy, Ar-100%
AlSi5	1.0mm / 1.2mm	Al with 5%-Si alloy, Ar-100%
E308	0.8mm / 1.0mm	Stainless steel with Ar-98%/CO2-2%
E316	0.8mm / 1.0mm	Acid-resistant steel with Ar-98%/CO2-2%

4.3 Functions description

Selecting an appropriate function takes places either by pressing right knob (pic. 3.2.P) and selecting it on the welding process diagram or by pressing the left knob (pic. 3.2.L) and entering advanced menu. Please note that to enter advanced menu the 'Welding' parameter (pic. 3.2.5) must be selected and a corresponding light must be on

Advanced menu	Info	
Burn	Burn back range (-50% - 50%)	
StFd	Soft start wire feed range (1m/min – 15m/min)	
Preg	Pre gas flow time range (0s – 10s)	
Post	Post gas flow time range (0.1s – 50s)	
Tick	Available material thickness. Varies depending of material type	
FORC	ArcForce regulation (range: 0A – 200A)	
Freq	Pulse frequency. When in D-PULSE (range: 0.5Hz – 5Hz), when in TIG and MMA (range: 0.1Hz – 99Hz)	
Duty	Pulse duty. When in D-PULSE (range: 20% - 80%), when in TIG and MMA (range: 5% - 95%)	
Ір-р	Peak current value. D-PULSE: (range: 5% - 50%), TIG: (range: 1% - 500%), MMA: (range: 1% - 50%)	
PU	Arc length correction at peak current. (range: -50% – 50%)	
BU	Arc length correction at base current. (range: -50% $-$ 50%)	
IND	Inductance regulation. (range: -90% – 50%)	
Mode 2T	Two stroke operating mode. Holding the trigger continues welding however releasing it ends welding $Preg_{\nu}$	
Mode 4T	Four stroke operating mode. Pressing and realising the trigger ignites the arc. Pressing and releasing it again ends welding.	



ModeSPOT	Basic spot welding. Pressing the trigger activates pre gas flow (PreG) and ignites the arc with a defined welding current. Arc lasts for a specified time (Sptt) and after that time the arc is terminated. Pressing the trigger again repeats the process.	
ModeCPOT	Advanced/continuous spot welding. Pressing torch trigger ignites the arc that last for a predefined time defined in parameter 'spot time' (Sptt). After that time device terminates the arc and a pause begins that lasts for a time predefined in parameter 'stop' (Stop). Parameter 'stop' last for a defined period from 0.1s to 25.5s. Following that phase device ignites the arc again and the whole process repeats until the torch trigger is not released.	
Endl	End current (crater filling). Parameter is only available in S2T and S4T.	
EndU	Arc length correction at the end current. This parameter allows to determine what arc length percentage of the basic arc length is preferred. Parameter is only available in S2T and S4T. (range: -50% – 50%)	
Endt	End current time. It determines for how long the device keeps the 'end current' value.	
Hotl	Hot start current value. Available in MMA mode or in MIG S2T / MIG S4T modes as a start current.	
Hott	Hot start time. It determines for how long device keeps 'Hot start' current value (Hotl). In MMA (0s – 99s), in MIG S2T (0s – 50s)	
HotU	Arc length correction when Hot start (Hotl) is active. Only in S2T and S4T. (range: -50% – 50%)	
Sptt	Spot welding arc time span. Available only in SPOT and CPOT. (range: 0.1s $-$ 9.9s)	
Stop	Pause duration when spot welding. Only in CPOT. (range: 0.1s – 25.5s)	
Slop CC	Basic MMA mode	
Slop CP	Welding in MMA mode using cellulose electrodes	
VRD	Voltage reduction device	
Save	Saving predefined settings in memory	
Load	Loading predefined settings from memory	

5. Detailed technical specification

5.1 MMA welding process

Welding current (A)	20A – 200A
Arc Force (FORC)	0A – 200A
Hot Start current (HotI)	0A – 200A
Hot Start time (Hot)	0s – 0.099s
Arc characteristics (Slop)	CC – basic characteristics CP – characteristics for cellulose electrodes
VRD feature (VRD)	ON / OFF

5.2 TIG DC Lift / TIG DC Lift with pulse welding process

Welding current (A)	1A – 200A
Pulse frequency (Freq)	0.1Hz – 99Hz
Pulse balance (Duty)	5% – 95%
Peak current (Ip-p)	1% – 500%

5.3 MIG/MAG welding process with single pulse

Welding current (A)	24A – 200A
Material thickness	0.8mm – 4.5mm Material thickness range varies depending on material type and other parameters
Inductance regulation (Forc)	0% - 100%
Torch control mode (Mode)	2T, 4T, S2T, S4T, Spot, Cpot
Burn back time (Burn)	-50% - 50%
Hot Start time (Hott)	MMA: 0s – 99ms, MIG: 0s – 50s
End current time (Endt)	0s – 50s
Spot welding time (Sptt)	0.1s – 9.9s
Start feed range (StFd)	1m/s – 15m/s
Spot welding pause duration (Stop)	1m/s – 15m/s
Pre gas flow time (Preg)	0s – 10s
Post gas flow time (Post)	0.1s – 50s

5.4 MIG/MAG welding process with dual pulse

Pulse frequency (Freq)	0.5Hz – 5Hz
Pulse balance (Duty)	20% - 80%
Peak current (Ip-p)	5% – 50%
Arc length at peak current (PU)	-50% - 50%
Arc length at base current (BU)	-50% - 50%

6. Operating device memory

Device is equipped with 35 memory slots in which parameters can be stored.

Saving a predefined set of values conducts by pressing button **Save** (pic. 3.2.K) and selecting required memory slot with right knob (pic.3.2.P). To confirm saving press right knob until SaveData sign displays.

The same process must be repeated when trying to recall previously saved values. In that case a button **Load** (pic. 3.2.J) must be selected following by required slot from available list and confirmed with appropriate knob.

7. Working with Spool gun type torch

Device is compatible with spool gun type torch (not included in the set). To work with spool gun the torch must be connected to Euro connector on the device front and a torch control plug fitted to appropriate socket depicted with spool gun picture. In wire spool compartment there is a switch that determines which torch type the device work with. In case of spool gun it must be switched to position depicted with spool gun picture.

8. Preparing the device to work

- Before use please make sure that electric network you are going to use is corresponding to technical specification of the device. Power supply voltage and frequency is provided in the technical specification section of this manual.
- Please check if the power supply connection is grounded. Check if the fuse is sufficient and not less than 20A.
- In case of changing the plug follow the instructions to connect the green/yellow wire to the ground line in your socket.

9. Connecting welding cables and torch

- Before connecting welding cables make sure the device in not connected to power supply.
- Check if the ground cable is connected with ground clamp
- Ground plug should be connected to negative polarization socket (pic. 3.1.4). Insert plug and turn it to tighten. Loosely connected plug may cause sparks and damage to socket.

In MIG/MAG process ground plug should be connected to negative socket (-) the other empty socket must connected with polarization selector (pic. 3.1.4)

Please remember that you can't leave empty sockets as the circuit won't be closed and welding won't be possible.

- Make sure the contact tip and torch liner are compatible with the wire you are about to use.

10. Mounting wire spool into the feeder

- Please make sure that the roller installed in the drive assembly is corresponding to the type and diameter of the wire.
- Attach the wire spool on the spool mount, taking care to ensure that the wire unwinding direction was in line with entering of the feeder mechanism.
- Lock the spool by tightening the nut.
- Release roller locking mechanism on wire feeder to allow wire to enter the feeder.
- Insert the end of the wire into the guide located in the back of the feeder and carry it out over the drive rollers into the welding torch. Make sure the wire is straight and has no imperfections that may cause it to jam inside torch liner.
- By adjusting pressure on the locking mechanism you can either tighten or loosen wire against roller grooves. It allows you to correct wire feeding if irregular feed occurs.
- Prepare torch before inserting welding wire. Torch cable must be put in straight line to allow the wire to smoothly go through the liner. Remove the gas nozzle the contact tip to allow the wire to exit the torch.
- By pressing the left knob (pic.3.2.5) activates wire feeder to insert the welding wire until it pulls out of the tip of welding torch.
- Attach appropriate contact tip corresponding to wire diameter. Put the gas nozzle back on and remove excessive wire.
- Turn the device ON.

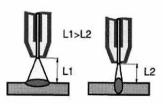
- Adjust the downforce of the feed roller by turning the pressure knob. Too low contact force, causes sliding of the drive roller. Too much force increases the resistance in the feeder and can deform the wire.

11. Connecting shield gas bottle

- Place the shield gas bottle close the device.
- Attach a gas regulator type depending on shield gas type.
- Connect the regulator outlet with gas supply connector at the back of the welder using a gas hose.
- Open gas bottle valve and a gas regulator valve. After the welding is finished close the bottle valve to terminate gas flow.
- Please notice to avoid using the welder in windy conditions as it may cause the gas shield to dissipate.

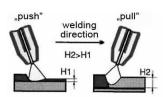
12. MIG/MAG welding tips

- Welding horizontal butt joints of thin materials should be carried out using push technique. However for thick material it should be a pull technique.
- For vertical butt joints of thin elements place the joint from up to down.
- Horizontal corner joints should be carried out using push technique compensating by placing the torch at an appropriate angle towards welding material.
- In case of filling wider joints carry the oscillating move of the welding tip.
- During the welding torch tip should be placed at an appropriate angle. If the angle is not right it may cause air to be sucked into welding puddle resulting in joint imprefections. The proper angle is lower or equal to 10 degrees for vertical position.



Too long or too short arc can result in unstable arc and joint imprefections.

L1, L2 - arc length



The penetration depth can differ according to welding technique and torch position

H1, H2 - penetration depth

13. Welding using MMA process

The welding device can also be used for a stick electrode welding. To use that process choose setting MMA/TIG Lift on quick selector. Connect the electrode holder plug into the positive socket (+) and the ground cable plug into the negative socket (-) leaving the polarization selector unconnected. Using the welding current regulation knob (pic.3.2.5) set the desirable welding current.

Please note that different electrode manufacturers may advise other polarization connections. In such case please refer to electrode manufacturers information.

14. Cleaning and maintaining the device

The protection class of this device is IP21S. Do not use the device in the rain, nor expose it to extensive moisture.

WARNING!

Device based on electronic components. Metal grinding and cutting close to the welder may cause contamination of the inside of the device, thus causing its damage.

The damage mentioned above is not covered by the warranty. If you need to work in such an environment, please clean device before use by blowing the inside of the welding machine with compressed air.

To prolong the life and reliable operation of the device, several rules must be observed:

- 1. The device should be placed in a well-ventilated room where there is free air circulation.
- 2. Do not place the device on a wet surface.
- 3. Use a wire diameter and spool weight according to the table.
- 4. Check the technical condition of the device and welding cables.
- 5. Remove any flammable materials from the welding area.
- 6. Use suitable protective clothing for welding: gloves, apron, safety boots and welding helmet

15. Troubleshooting

Symptoms	Possible cause	Remedy
Wire feed does not feed the wire or feeding is irregular (feeder motor is working)	 Feeding roll grooves are dirty Contact tip is damaged Locking mechanism is not tighten 	 Clean or change roll Change contact tip Tighten the locking mechanism
	 Torch liner is stuck with debris Feeder roll type is wrong Contact tip diameter is wrong 	 Clean or change the liner Mount appropriate roll Check the contact tip and change for a right one if needed
Wire feed does not feed the wire (feeder motor is not working)	 Faulty feeding motor Control module failure 	 Turn directly to the service centre
Arc is not igniting	 Ground clamp not connected or connected improperly Polarization selector cable not connected 	 Check the connection of the ground clamp Plug the selector to the appropriate socket
Arc is too long and irregular	 Welding current is to high Wire feed is too slow 	 Adjust the current value Change wire feed speed
Arc is too short	 Welding current to low Wire feed to fast 	 Adjust the current value Change wire feed speed
ON/OFF button does not light up	No electric supply Fuse failure Switch malfunction	Check the power connections Replace the fuse Replace the switch

16. Transporting and storage

Always store the devices in a dry, ventilated place, out of reach of children and bystanders. Protect the device against vibrations and shocks during transport.

17. Recycling

The packaging and device materials are suitable for recycling use. Disposal of the packaging and device must be done in accordance with local regulations. The packaging materials should be protected against children as they are potential source of danger.

18. Warranty

The manufacturer of the device provides full warranty service for the power supply unit within 24 months from the day device was purchased. An individual warranty card is issued for each device. Warranty is valid only if all conditions listed in the instructions manual were fulfilled. If the device was used inappropriate or against instructions the warranty becomes invalid. Service centre does not cover the postage cost for sending the device for repairs or sending it back after repairs.

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