

Desktop Melter

Model: Easy Melt - 0.5/1/2 kg

Part Number: UPT-016-500/510/520-00

User Manual



TABLE OF CONTENTS:

SECTION A:	GETTING STARTED GUIDE	4
A1:	SAFETY INSTRUCTIONS	4
A1.1	IMPORTANT NOTES	4
A1.2	SAFETY PRECAUTIONS	5
A1.2.1	ELECTRICAL SHOCK HAZARDS	5
A1.2.2	GROUNDING	5
A1.2.3	SAFETY AND PRECAUTION SYMBOLS USED IN THIS MANUAL	6
A2:	INSTALLATION AND STARTUP	7
A2.1	INSTALLATION PROCEDURE	7
A2.2	UNPACKING AND INSPECTION	7
A2.3	SELECTING THE DEVICE SITE	8
A2.4	COOLING REQUIREMENTS	8
A2.5	AC INPUT CONNECTION	8
A2.6	START-UP	9
A2.7	USING THE MACHINE	9
A3:	MAINTENANCE	10
A3.1	SCHEDULING	10
A3.2	PERSONNEL	10
A3.3	INSPECTION AND MAINTENANCE PROCEDURE	10
A4:	SERVICE	11
A4.1	GENERAL	11
A4.2	SERVICE CONTACT INFORMATION	11
SECTION B:	PRODUCT SPECIFICATIONS AND FEATURES	12
B1:	POWER SUPPLY SPECIFICATIONS	12
B1.1	OVERVIEW	12
B1.2	DEVICE SPECIFICATIONS TABLE	13
B1.3	CONNECTION DIAGRAM	14
B1.4	DEVICE SPARE PARTS DIAGRAM	15
B1.5	DEVICE ELECTRONOCS SPARE PARTS DIAGRAM	16
B2:	HEAT STATION SPECIFICATIONS	17
B2.1	PRODUCT OVERVIEW	17
B2.2	HEAT STATION SPECIFICATIONS	17
B3:	CONTROLS AND OPERATION	17
B3.1	CONTROL PANEL OVERVIEW	17
B3.2	CONTROLS AND INDICATORS	18
B3.3	REGULATION MODES AND SYSTEM STATUSES	19
B3.4	MENUS AND NAVIGATION	20
B3.4.1	Main Menu Navigation	20
B3.4.2	Heat ON Menu Navigation	21
B3.4.3	SYSTEM MENU Navigation	22
B3.4.4	EXTENDED MENU Navigation	24
B3.5	CONTROL MODES	26
SECTION C:	TUNING AND TROUBLESHOOTING	26

C1: LOAD TUNING GUIDE..... 26
C2: ALARMS, FAULTS AND WARNINGS..... 26
C3: ACCESSORIES 28

SECTION A: GETTING STARTED GUIDE

A1: SAFETY INSTRUCTIONS

A1.1. IMPORTANT NOTES

1. This manual is valid only for the Model and the associated Revision number(s) specified in the cover sheet of this manual. A Change Page may be included at the end of the manual. All applicable changes are documented with reference to the equipment Revision and Serial number. Before using this Instruction Manual, check your equipment nameplate to identify your Model and Revision number. If in doubt, contact your nearest Ultraflex Power Technologies (UPT Corp.) Representative;
2. This document contains information proprietary to UPT Corporation. All rights are reserved. No part of this document may be reproduced, transmitted, processed or recorded by any means or form, electronic, mechanical, photographic or otherwise, nor be released to any third party without the express written consent of UPT Corporation;
3. In this document period "." will be used as a decimal point delimiter.
4. Data subject to change without notice;
5. All Information contained in this manual is the latest information available at the time of printing. The right is reserved to make changes at anytime without notice. UPT Corp. makes no warranty of any kind with regard to this material and assumes no responsibility for any errors that may occur in this manual;
6. Safety First!



YOU AND NOT THIS MANUAL ARE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS.

This manual is for reference purposes only. Personnel should be trained on proper operation of this equipment before using. Only authorized personnel may perform any troubleshooting or repair on any UPT manufactured equipment. Failure to comply will void warranty.

Please, contact the UPT Service Department before servicing any UPT equipment.

Lethal voltages may be present in equipment surrounding and/or connected to this equipment. Read the following warnings carefully and study this entire manual before operating the system. Failure to observe warnings may result in equipment damage, serious personal injury, or death.

If the equipment is used in a manner not specified by this manual, the protection provided by the equipment may be compromised and damage to the unit may occur.

1. Only qualified persons who have been trained in the operation of this equipment and are familiar with the technology should be permitted to operate the system;
2. Installation, assembly, inspection maintenance and servicing are to be performed by authorized personnel only;
3. Always have the Power Supply completely powered OFF and locked out before performing any service, inspection or maintenance;
4. Even with the Power Supply OFF, live voltages still exist within the cabinet. Always power OFF and lock out the external power source to ensure no one can accidentally energize it;

5. Ensure that all external wiring conforms to applicable codes;
6. Obey all warnings and use good common sense;

A1.2. SAFETY PRECAUTIONS

A1.2.1. ELECTRICAL SHOCK HAZARDS

This manual is written for personnel familiar with the technology pertaining to the operation of induction heating equipment. Such personnel should be thoroughly familiar with the hazards associated with this equipment and electrical equipment in general, and they should have received proper safety procedure training.

Hazardous voltages are present within this product during normal operation. The product should never be operated with the cover removed unless equivalent protection of the operator from accidental contact with hazardous internal voltages is provided. Operators must be trained in its use and exercise caution as well as common sense during use to prevent accidental shock.



There are no operator serviceable parts or adjustments within the product enclosure. Refer all servicing to trained service technician.



Source power must be removed from the product prior to performing any servicing.



This product is designed for use with nominal a-c mains voltages indicated on the rating nameplate.

A1.2.2. GROUNDING

This product is a Class 1 device which utilizes protective grounding to earth to ensure operator's safety.



PROTECTIVE EARTHING CONDUCTOR TERMINAL -This symbol indicates the point on the product to which the protective grounding conductor must be attached.



EARTH (GROUND) TERMINAL -This symbol is used to indicate a point which is connected to the PROTECTIVE EARTHING TERMINAL. The component installer/assembler must ensure that this point is connected to the PROTECTIVE EARTHING TERMINAL.



CHASSIS TERMINAL -This symbol indicates frame (chassis) connection, which is supplied as a point of convenience for performance purposes. This is not to be confused with the protective grounding point, and may not be used in place of it.

A1.2.3. SAFETY AND PRECAUTION SYMBOLS USED IN THIS MANUAL



A WARNING symbol alerts you to a hazard that may result in equipment damage, personal injury, or death. Carefully read the instructions provided WARNING and follow all safety precautions.



A CAUTION symbol alerts you that the system may not operate as expected if instructions are not followed.

A2: INSTALLATION AND START UP

A2.1. INSTALLATION PROCEDURE

The installation procedure consists of the following steps:

- Unpacking the equipment;
- Selecting the site where the equipment will be used;
- Connecting the Heat Station (if remote Heat Station is provided);
- Connecting accessories or interfacing the system with other controls (if necessary);
- Completing the Power and Ground/Earth connections;



Power and ground/earth connections must be made last. Failure to do so will create a hazardous condition that may result in equipment damage, personal injury, or death.

NOTE: UPT Corporation has a staff of field engineers who are available to supervise the installation of the equipment. If installation service is required, contact our Technical Service Department for additional information.

Provisions for facility electrical power service are customer furnished. Requesting field engineering assistance before customer furnished provisions are installed at the equipment site could delay equipment installation and cause unnecessary expense.

A2.2. UNPACKING AND INSPECTION

This equipment has been thoroughly inspected and tested prior to packing and is ready for operation. After careful unpacking, visually inspect for shipping damage BEFORE attempting to operate. If any indication of damage is found, file an immediate claim with the responsible transport service and advise your sales representative.



Inspect equipment before installing. Damaged equipment may result in improper operation and create a hazardous condition resulting in personal injury or death.



Inspect equipment before installing. Damaged equipment may result in improper operation and create a hazardous condition resulting in personal injury or death.

A2.3. SELECTING THE DEVICE SITE

Consider the following when choosing a location for the device:

- Make sure the system is installed in a debris free zone;
- The device has to be connected to a power source and cooling water;
- The device have to be connected to cooling system with sufficient water flow;
- Make sure the device is easily accessible by the operator;
- Device has to be seated on a mechanically secure surface;

A2.4. COOLING REQUIREMENTS

The power transistors and rectifiers into the device are maintained within their safe operating temperature range by means of water cooling. The fan inlets must be kept clean from obstructions in order to insure proper air circulation. If installed in confined spaces, care must be taken that the ambient temperature (the temperature of the space immediately surrounding the device, does not rise above the limit specified as 40°C. Periodic cleaning of the device exterior is recommended. The following system components are directly dependent on water cooling: semiconductor's heat sinks, coils, tank capacitors, output transformers. To maintain the temperature on these components within safe limits, the following requirements apply to the inlet cooling water:

- Maximum allowable temperature – 95°F (35°C);
- Minimum allowable temperature - 58°F (14°C) (to avoid condensation);
- Minimum water flow is required – Refer to product specifications in Section B;
- Water (coolant) must be mechanically debris free;
- Water (coolant) must be chemically pure (distilled water is recommended);

A2.5. AC INPUT CONNECTION

The Power supply connects to the power network through an 6 ft (1.80m), power cord (supplied). Additional fuse or circuit breaker and residual current circuit breaker on that power branch is a good choice since it will provide extra protection in addition to the unit's internal protection. A mechanical switch is also recommended within the operator's range and vision and possibly closer to the Power Supply.

Only trained personnel should open the unit cover and operate the breakers.

Table A1: Wiring Color Code

Color	1-Phase Connection	3-Phase Connection
Brown	Line 1	Line
Blue	Neutral	Neutral
Green/Yellow	Ground/Earth	Ground/Earth

NOTE: Local codes may have stringent requirements. It is the customer's responsibility to be familiar with and to comply with all applicable codes concerning conductor ratings and wiring procedures. An electrician familiar with the local regulations should determine proper wiring connections

A2.6. START-UP

1. Connect the AC and ground connections as described in Section A2.5;
2. Connect the water cooling system to the device;
3. Turn the water Cooling System ON. Make sure there is no water leaks on outside connections;
4. Turn the Power Switch on to power the system. Check for any Fault or Alarm messages. If the status screen shows "80% Power" message, then the system is ready for operation;

See Section B of this Manual for Connections Diagrams

A2.7. USING THE MACHINE

1. Using a water hose connect the machine to the water source for the cooling. In the back of the machine you will find the connections: water in (fig. B2.1) and water out (fig. B2.2). The connection to a water tap is enough, but the used water will be thrown away. A connection to a water tank with a circulating pump is also possible as well as to a chiller with controlled temperature. Remember to tight strongly the hose on the connections with a clamp;
2. Connect the machine to the electric supply 220 V – single phase;
3. Crucible. Check that your crucible is good enough to make a melting. A too much used crucible can make the casting very slow. Check also that the bottom is not too thin, you risk that it brakes during the melting causing the metal going out;
4. Place the crucible in the melting chamber paying attention to the thermocouple positioned on the bottom. The purpose of the thermocouple is to read the temperature of the crucible. For this reason the crucible has a hole underneath to let the thermocouple to touch the graphite;
5. Switch on the machine pressing the main switch (fig. B2.4) positioned on the back of the machine;
6. On the control panel you have the possibility to adjust three parameters;
7. Power efficiency. This parameter determinate how fast the melting will be done. We suggest to use 80 % power in order to have a more homogenous melting;
8. Time. This timer will start to count the set time when the furnace will reach the set temperature. It is going from 1 to 30 minutes. At the end of the time a buzzer will ring for a half second, then the furnace will stop to heat. The purpose of this timer is to let the metal to be completely molten and mixed after the heating. If you don't like to use the timer, set it in "OFF" position;
9. Temperature. Set the melting temperature, the maximum suitable value is 1.300 °C;
10. Choice of parameters. In order to choose the parameters push the "SELECT"(fig. B4.10) button. The red light (fig. B4.6-7-8) will move to the parameter you want to modify. With the help of the arrows (fig. B4.9) you can increase or decrease the value till when you will find the desired value by checking on the display (fig B4.5);
11. Melting. Put the metal in the crucible and push the "START" (fig. B4.2) button;
12. In case you want to stop the machine push the "STOP" button (fig. B4.1);
13. If something is wrong the machine will go in "ALARM" and the red light (fig. B4.3) will go on;

14. The heating will start the light (fig. B4.4) will go on and the machine will heat according to the set power. It is possible to increase or decrease the power during the melting process by pressing the power button previously selected by the "SELECT" (fig. B4.10) button. During the cycle on the display (fig. B4.5) you will be monitoring the temperature;

A3: MAINTENANCE

A3.1. SCHEDULING

The Power Supply is designed for continuous service and minimum maintenance requirements. The frequency of any maintenance program is a function of environment, degree of equipment use, and product experience.

A3.2. PERSONNEL

Qualified personnel must perform inspection and maintenance procedures only. Personnel must read and be thoroughly familiar with all safety precautions discussed in this manual.

A3.3. INSPECTION AND MAINTENANCE PROCEDURE

Note: Always follow approved lock-out / tag-out procedures before performing any service, inspection or maintenance.

The following describes inspection procedures to be performed on a daily, weekly, and monthly basis.

Daily/Weekly Inspection: It is good practice to do a quick visual inspection of the unit, wiring and connections on a daily and/or weekly basis. Report any apparent changes in performance to responsible personnel so that potential problems can be investigated.

Monthly Inspection:

Perform the following on a monthly basis:

1. Ensure all wiring connections are secure. Visually inspect for any wear on cabling;
2. Verify that none of the enclosure's hardware has become loose;
3. Remove any build-up debris that may occur around the fan inlet using a cloth or a vacuum cleaner. Use of compressed air is not recommended;
4. Check the water (coolant) for mechanical debris or impurities. The water should be kept clean;
5. Wipe the Control Panel with a damp cloth to remove any dirt, prints or smudges;
6. Wipe the enclosure down with a damp cloth or paint friendly cleaner, if desired;
7. Unbolt water filter clean it and bolt carefully again;

A4: SERVICE

A4.1. GENERAL

If for some reason the unit fails in the field it is advisable that the unit be serviced by the manufacturer or its authorized service representative. Should that happen, please contact us immediately (see contact information in Section A4.2). Please have the following information about your unit available upon calling:

1. Unit Model and Revision (located on the label on the back of the unit);
2. Unit's Serial Number (located on the label on the back of the unit);
3. Line Voltage and frequency;
4. Detailed description of the problem encountered including – load, ambient temperature at the time of the failure;
5. Detailed description of the actions taken;
6. Approximate time in service;

If our technical staff is unable to help you over the phone, then a repair authorization number (RA#) will be issued for you. With this number enclosed in you return package you can ship the unit back for repair or request a service engineer to repair the unit on site.

A4.2. SERVICE CONTACT INFORMATION

For technical service questions, please call:

Europe and Asia: + 359 2 480 1900

USA and Canada: + 1 631 467 6814

You may also fax your questions or request:

Europe and Asia: + 359 2 480 1910

USA and Canada: + 1 631980 4065

Or e-mail us at: support@ultraflexpower.com

You can also send you request through our [web site](#).

Note: Please, include your contact information so that you can be easily reached if necessary.

SECTION B: PRODUCT SPECIFICATIONS AND FEATURES

B1: POWER SUPPLY SPECIFICATIONS

B1.1. OVERVIEW

The UPT-016-500/510/520 is a general purpose induction heating system designed to work with a large variety of custom coils. It consists of two main parts placed into the same cabinet. They are:

1. Power supply – generates RF power to supply the output circuit.
2. Heat Station – houses the output circuit and interfaces it with the load by means of an induction coil.

The unit is digitally controlled through a control panel located on front panel.



Figure B1 - Overall Device Dimensions

Notes:

- 1) A tool is required to gain access to the Power Supply. This is to prevent accidental exposure to the internal high voltages.
- 2) See section C of this Manual for optional equipment and Accessories.

B1.2. DEVICE SPECIFICATIONS TABLE

Table B1. UPT-016 Easy Melt Specifications Table

SPECIFICATIONS	RATING/DESCRIPTION			CONDITION
	UPT-16-500	UPT-16-510	UPT-16-520	
INPUT				
AC Voltage range	230 VAC ($\pm 10\%$)			Single Phase
Line Frequency	50/60 Hz			
Input Current maximum (RMS)	10 A	12 A	15.5 A	@ 230 VAC -10%
Input Power maximum	2 kVA	2.55 kVA	3.2 kVA	@ 230 VAC
Efficiency minimum	88%			@ full load
OUTPUT				
Control Modes	Constant Power			with voltage and current limit
Output Current maximum	13 A (sine wave)			@ 100% current reference
Output Voltage maximum	250V RMS			@ 230 VAC $\pm 10\%$ Input
Output Power maximum	1.5 KW	2.0 kW	2.5 kW	@ 230 VAC Input
Output Frequency range	30-60KHz			@ 2.0kW
Timer Resolution	1min/step			1 – 30 min.
PROTECTION				
Over-current	20 A (RMS)			Inverter output current
Over-temperature heat sink	55°C			Reset by depressing STOP
MISCELLANEOUS				
Temperature Ranges	32°F (0°C) to + 104°F (40°C)			Operating
	-4°F (-20°C) to + 150°F (65°C)			Storage
Humidity range	0 to 95%			RH Non-condensing Operating & Storage
PHYSICAL				
Cooling	Forced water			0.5GPM (2 LPM) minimum water flow
Module Dimensions	W x D x H in/(mm) 17.7 x 14.2 x 7.1 (450 x 360 x 180)			Overall dimensions with feet
Weight	38 lb (18 kg)			Net weight
Connections				

B1.3. CONNECTION DIAGRAM

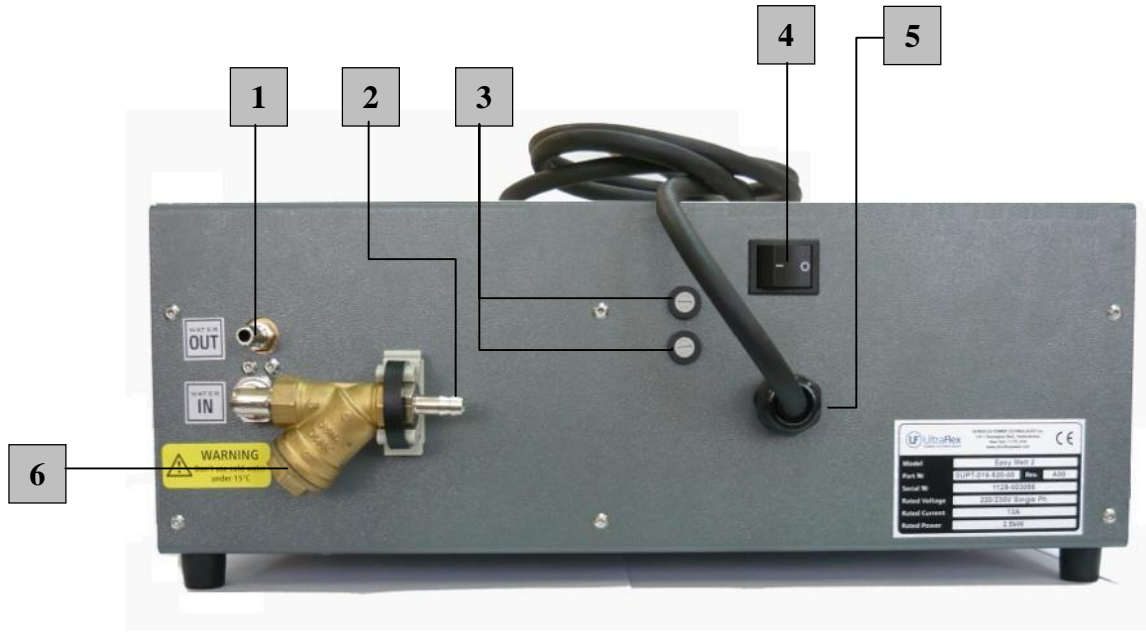


Figure B2 – Rear Panel Connections

Table B2: Rear Panel Connections Table

No	Description
1	Water outlet
2	Water inlet
3	Power line fuses
4	Power line switch
5	Power line cable
6	Water filter

B1.4. DEVICE SPARE PARTS DIAGRAM

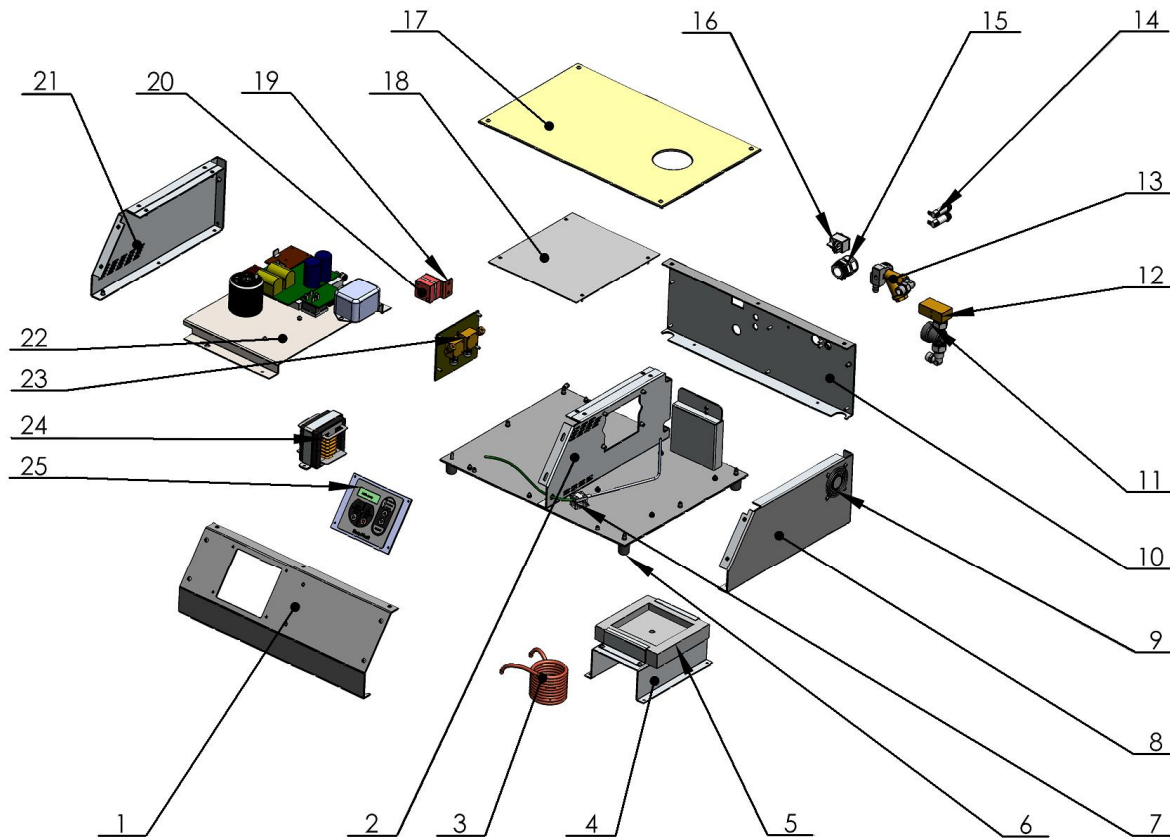


Figure B3 – Device Expanded View

Table B3: Device Spare Parts List Table

No	Name	Part Number
1	Front Side Easy	2MAS-016-500-AC
2	Partitioning Wall Easy	2MAS-016-500-AI
3	Induction Coil - UPT-016-520 UPT-016-500/510	1ASM-016-501-00 1ASM-016-502-00
4	Ceramic Plate base	2DET-016-500-KN
5	Refractory Ceramic Base	2DET-016-500-KL
6	Feet	4HVM-000-017-00
7	Thermocouple	3SNM-000-003-00
8	Left Side Panel Easy	2MAS-016-500-AE
9	Fan 60x60x15	3FAN-012-002-00
10	Rear Panel Easy	2MAS-016-500-AG
11	Flow switch	9VLO-000-054-00
12	Water Fittings	2DET-016-500-KM
13	Water Filter	9VLO-000-125-00
14	Main fuse holders	3FFT-000-016-00
15	Cable Gland	4KVT-000-021-00
16	Main Switch	3SBT-000-018-00

17	Refractory Protective Cover	2DET-016-500-KQ
18	Metal Protective Cover	2DET-016-500-KH
19	Bracket for Tank Cap	2DET-016-500-LB
20	Tank Cap	3CFM-105-001-01
21	Right Side Panel Easy	2MAS-016-500-AD
22	Electronic plate assembly	1ASM-016-500-00
23	Holder Coil	2MAS-016-500-AM
24	Output transformer - UPT-016-520 UPT-016-500/510	2MAS-016-500-DC 2MAS-016-501-DC
25	Control panel	1ASM-016-540-00

B1.5. ELECTRONIC PLATE ASSEMBLY SPARE PARTS DIAGRAM

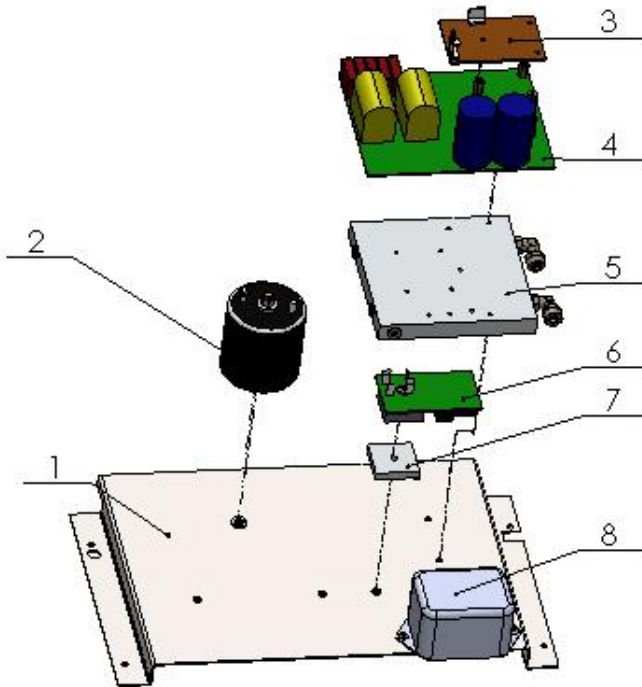


Figure B4 – Electronic Plate Assembly Expanded View

Table B4: Device Spare Parts List Table

No	Name	Part Number
1	Base electronics easy	2MAS-016-500-AK
2	Choke assembly	1ASM-722-169-00
3	Control board	1MOD-722-700-00
4	Inverter board	1MOD-751-220-00
5	Water heatsink	2DET-016-500-KV
6	Rectifier/inrush limiter	1MOD-751-600-00

7	Heartsink rectifier	2DET-016-500-KR
8	Line filter	3FTM-000-007-01

B2: HEAT STATION SPECIFICATIONS

B2.1. PRODUCT OVERVIEW

Heat Station – It is a part of the device placed into the same cabinet with HF power supply. It houses the output circuit and interfaces it with the load by means of an induction coil.

The Heat station consists of an output matching transformer with fixed transformer ratio. air cooled tank capacitor assembly. output terminals for mounting the coil and induction coil.

B2.2. HEAT STATION SPECIFICATIONS

Table B4. Heat Station Specifications Table

ELECTRO-MECHANICAL SPECIFICATIONS				
SPECIFICATIONS	RATING/DESCRIPTION			CONDITION
	UPT-016-500	UPT-016-510	UPT-016-520	
Cooling	Water cooled 2 LPM (0.5GPM)			Minimum required flow rate
Max Primary Current RMS I_{pmax}	13 RMS			
Output Frequency Range	30-50 kHz			
Output Volts RMS V_{omax}	250			
Output Transformer Ratio N_{tr}	21/3	21/3	18/3	Fixed
Tank Capacitor	capacitance 1.2 uF			

B3: CONTROLS AND OPERATION

B3.1. CONTROL PANEL OVERVIEW

The unit is digitally controlled through a control panel located on the front panel of device. The control panel utilizes the latest microprocessor technology. The control panels are designed to display vital parameters and alpha-numeric messages providing intuitive and informative visual feedback. The users can also navigate through easy to use service. diagnostics and setup menus.

B3.2. CONTROLS AND INDICATORS

The control panel has the following controls and indicators:



Figure B4 - UPT-016-500/510/520 Control Panel Layout and Controls

Table B5: Control Panel Components

No	Name/Function	Description	Indicator/Control
1	"Stop" Button	"Stop" Button – dual function - Stops the heating cycle. when the device is in "Heat on" state - Resets any faults. when the system is in "Alarm" state	CONTROL
2	"Start" Button	"Start" Button – activates the heat cycle	CONTROL
3	LED [Green] - when generator is heated ON	LED [Green] - Illuminated when HF generator is heated ON	INDICATOR
5	4 Large 7 segment LEDs display	4 Large 7 segment LEDs display: - Output set point (%) - Timer (min) or "OFF" - Temperature (°C) - Inverter current (Arms) - Inverter output voltage (Vrms) - Inverter output power (kW) - Output frequency (kHz)	INDICATOR
6	LED [RED] - timer status	LED [RED] - Illuminated when Indicator 4 shows timer status	INDICATOR
7	LED [RED] - output set point in %	LED [RED] - Illuminated when Indicator 4 shows output set point in %	INDICATOR
8	LED [RED] - output set point in %	LED [RED] - Illuminated when Indicator 4 shows output set point in % in °C	INDICATOR
9	"UP" and "DOWN" arrow buttons	"UP" and "DOWN" arrow buttons – dual function - changing value of parameters - scrolling through the menus	CONTROL
10	"SELECT" button	"SELECT" button: - scrolling through the parameters. entering menus and confirming parameter's value	CONTROL

B3.3. REGULATION MODES AND SYSTEM STATUSES

Device works in power regulation mode only.

B3.4. MENUS AND NAVIGATION

B3.4.1. Main Menu Navigation

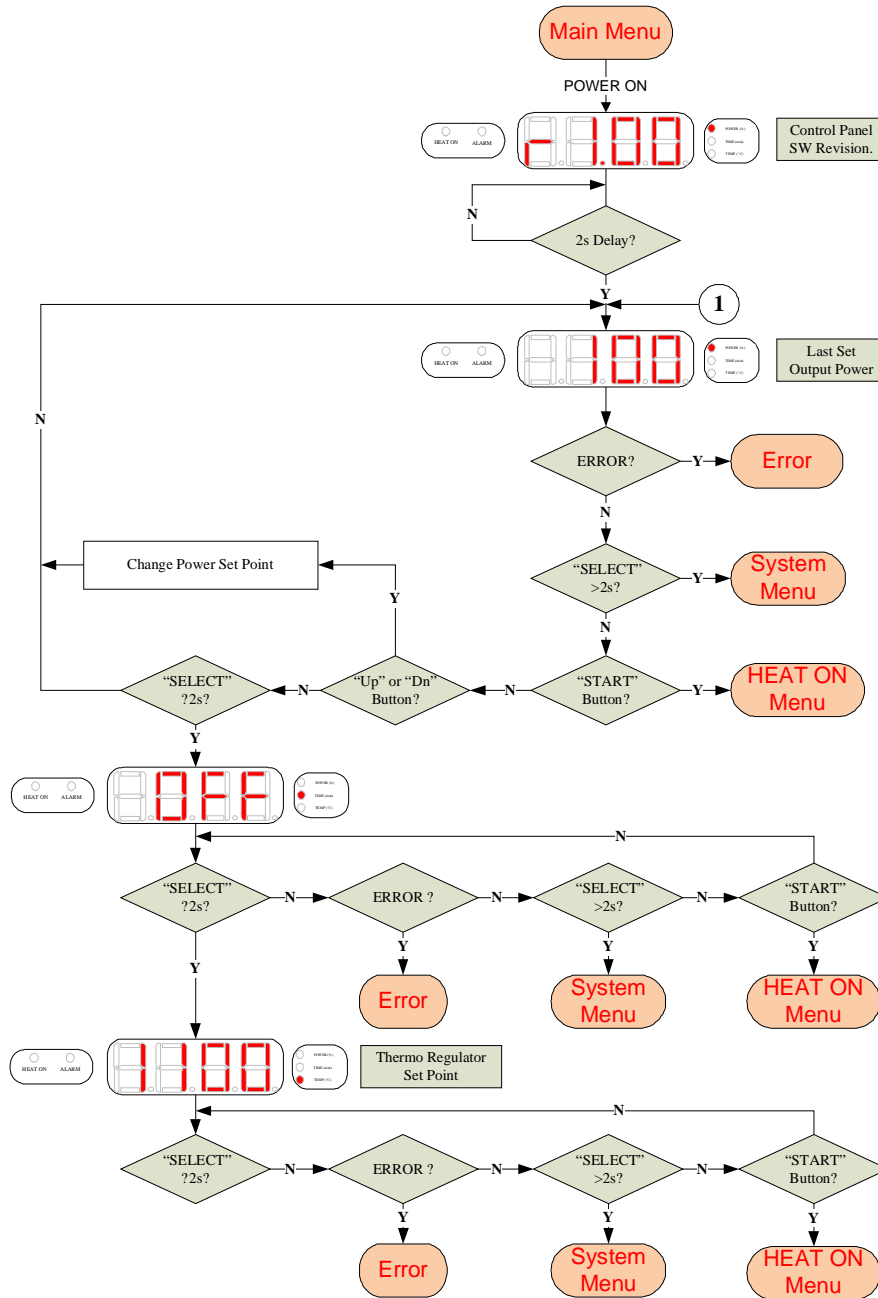


Figure B5 - Main Menu Structure

B3.4.2. Heat ON Menu Navigation

HEAT ON Menu is accessible from Main Menu. by pressing "START" button. It is shown on Figure B6.

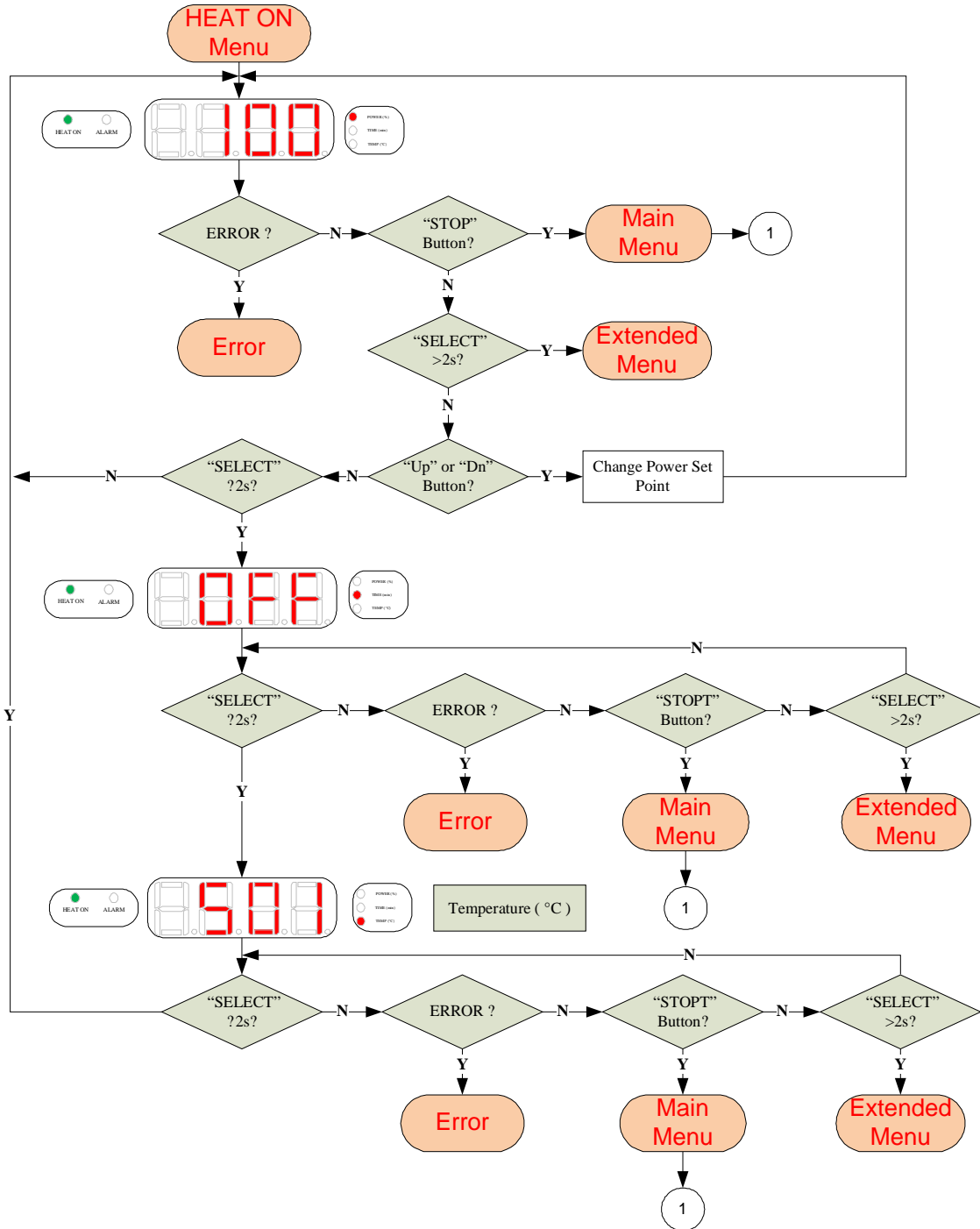
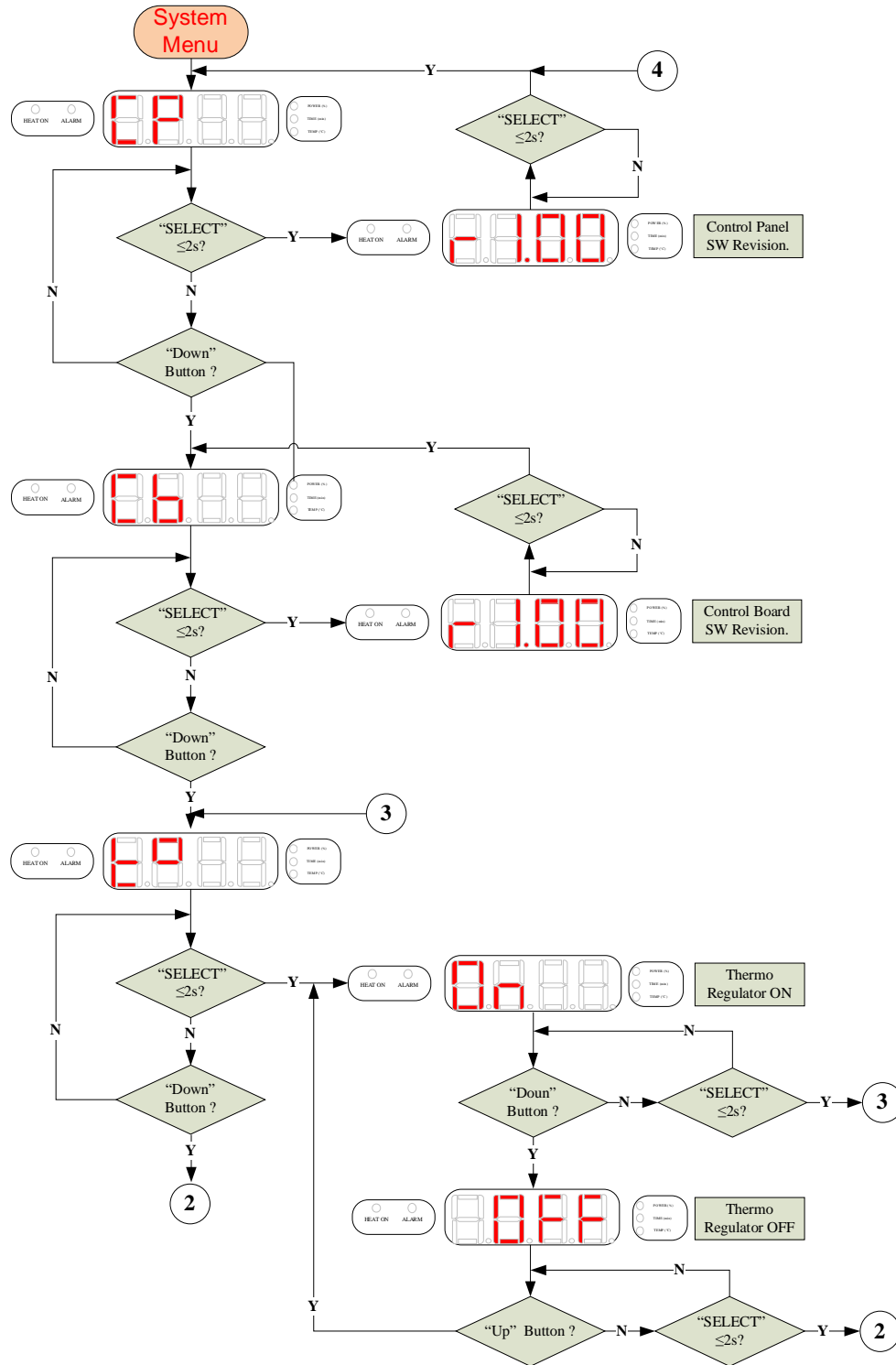


Figure B6 – HEAT ON Menu Structure

B3.4.3. SYSTEM MENU Navigation

SYSTEM MENU is accessible from Main Menu. by pressing "SELECT" button for 2 seconds. It is shown on Figure B7.



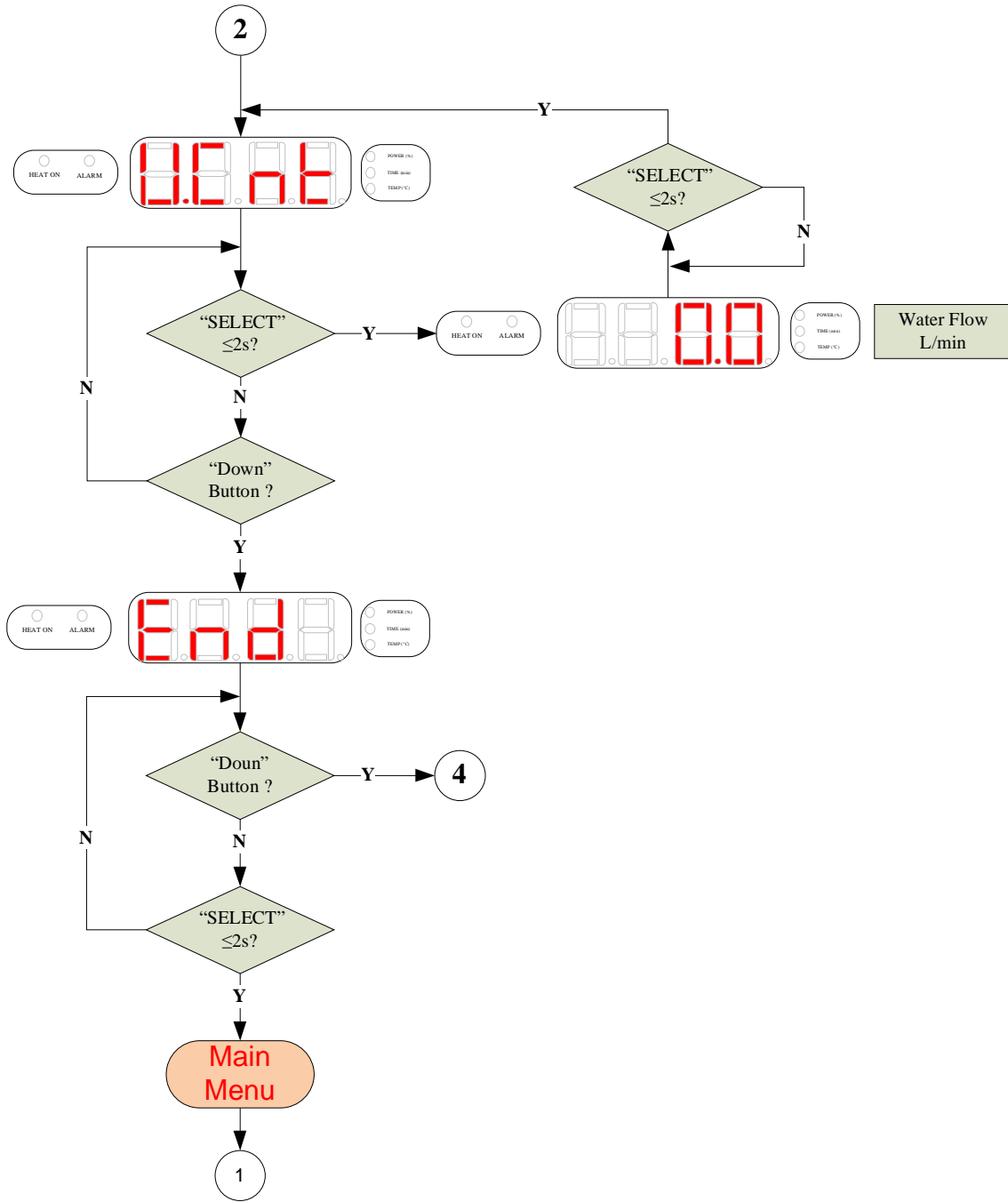
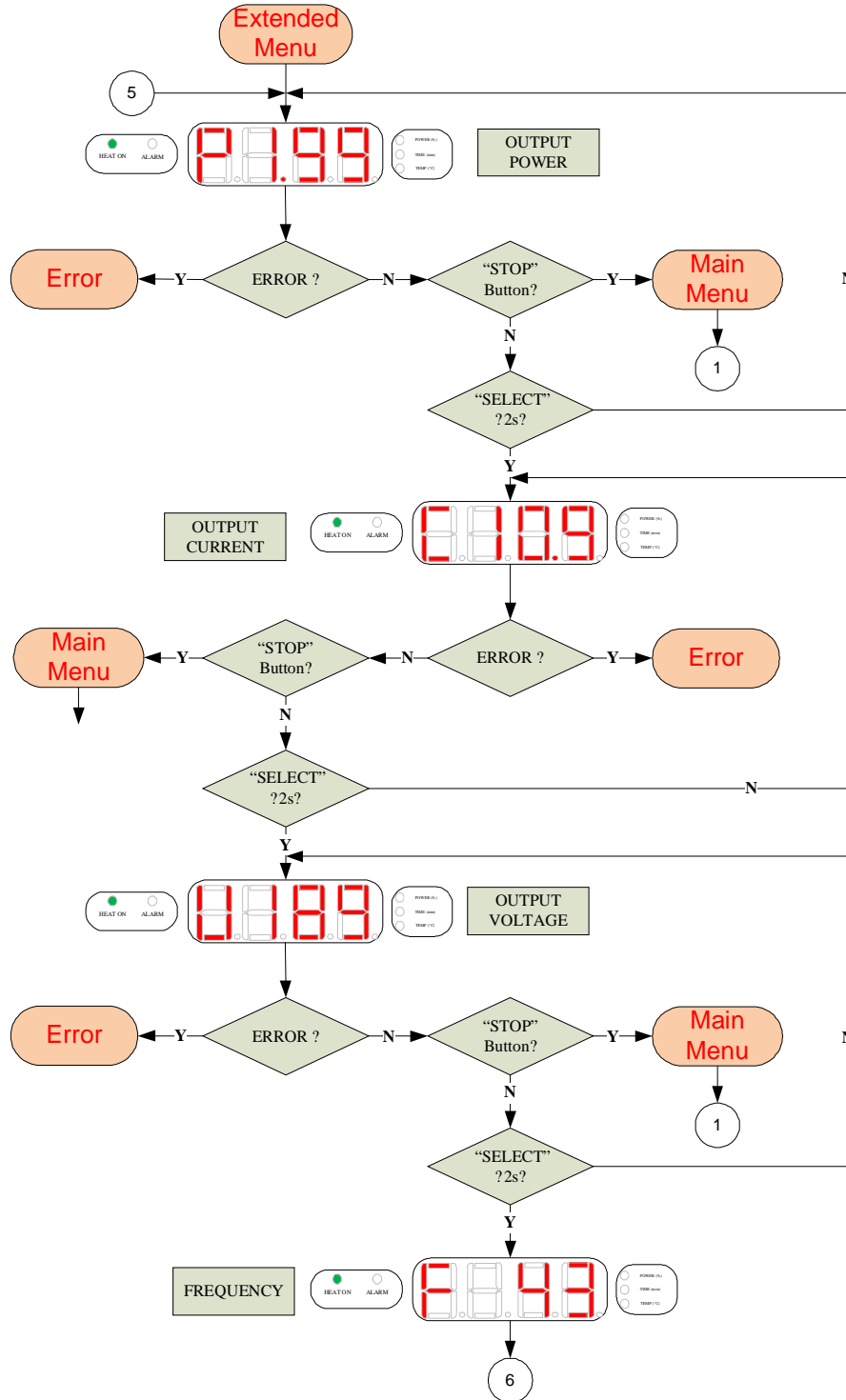


Figure B7 – SYSTEM Menu Structure

B3.4.4. EXTENDED MENU Navigation

EXTENDED MENU is accessible from Heat ON Menu. by pressing “SELECT” button. For 2seconds. It is shown on Figure B8. This menu allows additional basic inverter parameters to be shown – power. current. voltage. frequency.



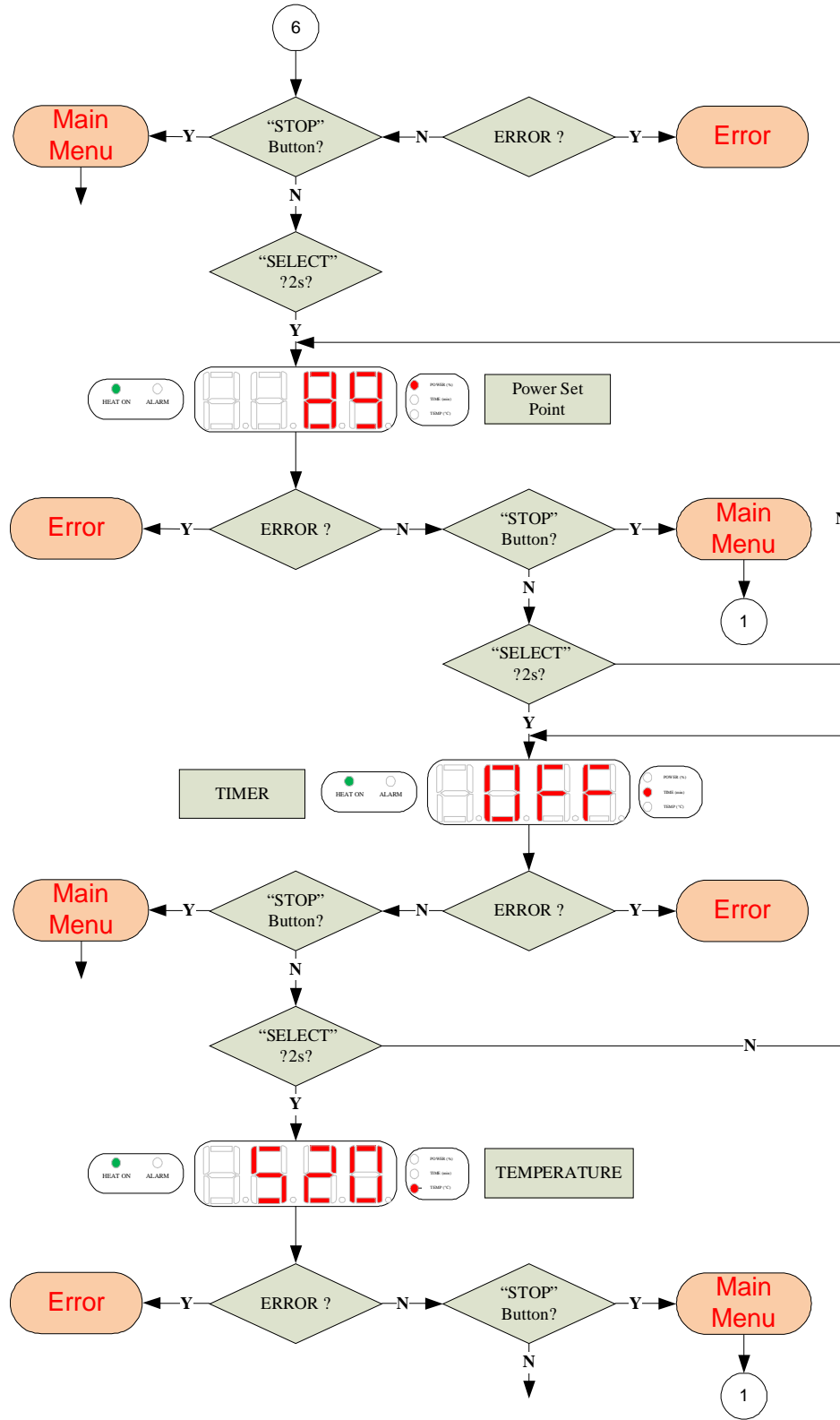


Figure B8 – EXTENDED Menu Structure

B3.5. CONTROL MODES

Control Modes of Operation

There are two control modes of operation:

[Auto] – In this mode device automatically holds up previously set temperature of the crucible. In this mode thermo regulator is switched ON (see Fig.B7).

[Manual] – In this mode it is supposed that there is not thermocouple mounted. Thermo regulator is switched OFF (see Fig.B7) and operator have to watch crucible temperature.

Note: When thermo regulator is switched OFF. the parameter “TEMPERATURE” is invisible on the 7 segment LED display.

SECTION C:TUNING AND TROUBLESHOOTING

C1: LOAD TUNING GUIDE

Because of fixed tank circuit and load (graphite crucible) device is factory tuned and doesn't need additional load tuning.

C2: ALARMS, FAULTS AND WARNINGS

For every ERROR which appears during normal working of the device. is valid flowchart shown on Fig.C1.

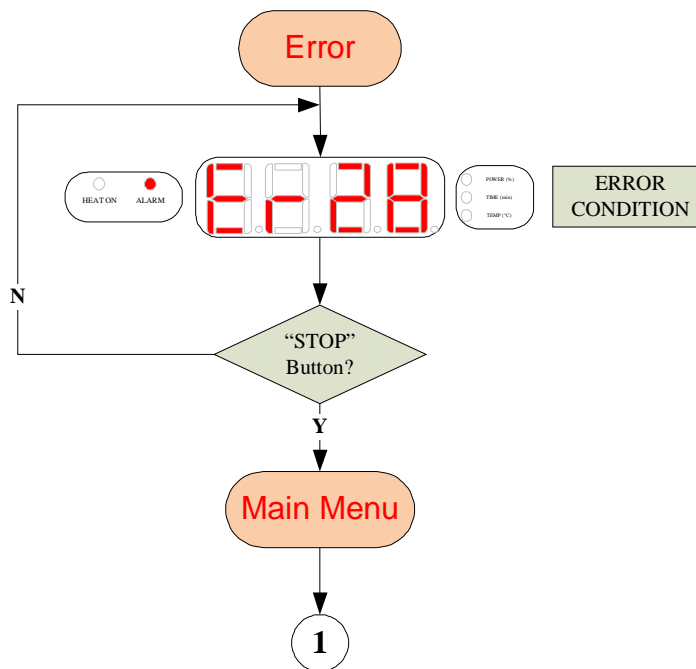


Figure C1 – ERROR Menu Flowchart

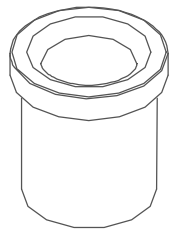
Table C1. Alarms and Fault Messages

<i>Flt. No</i>	Fault Description	Condition	Cause	Advice
<i>Er1</i>	Tuning Fault (Phase Fault)	Primary V & I out of phase	Can't find resonant frequency	Check resonant loop connections - load coil. tank capacitors. Transformer taps. Possible inverter board Part Number MOD-016-210 failure.
<i>Er2</i>	Current Fault	$I_{primary} > I_{Max}$	Output current exceeds the limit	Possible FET/IGBT failure in the Power supply. Contact our Service department
<i>Er3</i>	Frequency Fault	$F < F_{min}$ or $F > F_{max}$	Frequency goes out of the pre-programmed range during Heat On	Check resonant loop values. tank capacitors or control board. Check load coil for shorted turns.
<i>Er4</i>	PS Over Temperature	$T^{\circ}heat\ sink > 60^{\circ}C$	The heat sink of the power supply exceeds the max allowed T°	Check fans. blockages of the vents or fan filters. Cooling water temperature or water filters.
<i>Er5</i>	Auto tune fault	Appearance only in service mode after sweeping	Can't find resonant frequency, or the frequency is out of range.	Check resonant loop connections - load coil. tank capacitors. Transformer taps. Possible inverter board Part Number MOD-016-210 failure.
<i>Er9</i>	Communication Fault	Communication Error Between Panel and Control Board	No acknowledgment is received after the last command	Check cables and RS connectors between boards
<i>Er28</i>	Water Flow Fault	Water Flow < 2 l/min (0.5GPM)	Restricted or no water flow	Check cooling water flow rate and water pressure. Check hoses and external water filter for blockages. Check flow switch.
<i>T Hi</i>	Crucible Temperature Over Regulation	Temp. of the Crucible is $150^{\circ}C$ higher than Thermo regulator Set Point	Damaged thermocouple or thermocouple connections	Check Thermocouple and Thermocouple cables and connections

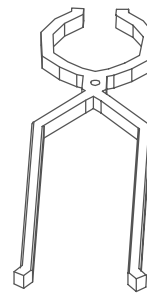
C3: ACCESSORIES

Table C2. Accessories Table

№	Part Number	Description	Melter		
			UPT-016-500	UPT-016-510	UPT-016-520
1	2DET-016-000-KA	0.5 kg gold Graphite Crucible	1	-	-
2	2DET-016-000-KB	1 kg gold Graphite Crucible	-	1	-
3	2DET-016-000-KC	2 kg gold Graphite Crucible	-	-	1
4	4HVM-000-102-00	Crucible tong	1	1	1



a)



b)

Fig. C2 - Accessories

Revision Table:

№	Ver.	Date	Remark	Create/Change by:
1	A0	01.2011	Original	L.Mihova
2	A1	07.2011	Add Water Filter (Unit Revision A10) Current Water Flow in System Menu (After Rev.1.10) Add Chapter A2.7 – Using the Machine	L.Mihova
3	1.0	12.2011	Add Electronic plate assembly spare parts diagram (B1.5) Add Table B4: Device Spare Parts List Table (B1.5) Minor changes in title and footer	L.Mihova
4	1.1	04.2012	New Design	D.Deneva
5	1.2	06.2012	Minor changes in heder and name Inverter board from 1MOD-016-210-00 to 1MOD-751-220-00	L.Mihova