WTU

Heat Treatment of Orthodontic Stainless Steel Archwires

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OPERATIONS AND WARRANTY MANUAL



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WTU DEVICE FOR HEAT TREATMENT OF ORTHODONTIC STAINLESS STEEL ARCHWIRES Model WTU-1

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Attention! Before installation and beginning of operations with the device, please carefully read the instructions and warnings, contained in the present manual and keep the manual for a future reference during the entire service life of the device. They form an important guidance about the methods and safety of installation, operation and maintenance of the device.

I. DESCRIPTION OF THE DEVICE'S FUNCTIONS

The archwires heat treatment device WTU-1 is a source of a low voltage current. By running of current through the orthodontic stainless steel archwire, it is tempered through its heating and gradual cooling. The tempering of wires releases their internal stresses and fixes the shape formed in advance (shape of the arch, bends, loops, curves of Spee etc.), improves their tensile resistance and their strength. The heating process of the archwire is controlled by the user, until the material reaches a colour of "golden wheat" through several short pushes of the button for the tempering start (B). The waiting time for the archwire to cool down, while it is fixed in the tongs of the device (F) allows the tempering process to complete.

The heat treatment of archwires device WTU-1 is manufactured according to the requirements of Directive 2014/35/EC and standards EN 61558-1:2006, EN 61558-1:2006/A1:2009, EN 61558-2-6:2009. The device is designed and manufactured in Bulgaria.

II. TECHNICAL DATA

1. Supply voltage - 220-240V, ~50-60Hz.
2. Working voltage (of the tongs) - 6V.
3. Maximum power - 30VA.
4. Dimensions: device - 131mm x 138mm x 76mm; pad - 150mm x 240mm.
5. Weight - 2,600 g.
6. Tempering rate – LOW RATE (**L**), HIGH RATE (**H**).
7. Chromium nickel (CrNi) housing of the device.
8. Chromium nickel (CrNi) pad.
9. Copper tongs for archwire fixation.

V - Volt (unit of measure for electrical voltage)
Hz - Hertz (unit of measure for frequency)
VA - volt-ampere (unit of measure for power in electrical circuit)
mm - millimetre (unit of measure for length)
g - gram (unit of measure for weight)

III. COMPLETENESS

- heat treatment of archwires device -1 pcs.
- metal pad with screw - 1 pcs.
- spare fuse 0.25A - 1 pcs.
- operations and warranty manual - 1 pcs.

IV. SAFETY PRECAUTIONS

Similar to most of the technical devices, the proper functioning and the safe operation of the present device depend on the adherence by the user to the standard safety procedures, as well as to the specific safety recommendations, described in the present Operation manual.

1. The device can be operated under the strict adherence to the Operation manual and as intended. The manufacturer is not responsible for any damages caused by the usage of the present device for any other purposes.

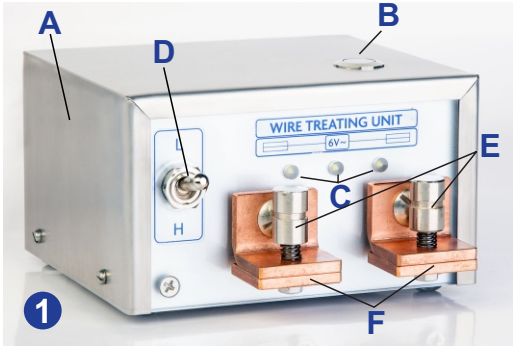
2. Before starting the device, make sure, that the working voltage, stated on the plate on the back of the device, matches to the voltage of your electrical grid. **Plugging the device in a socket with different voltage can damage it.**

3. The power supply should be provided by 3-wire electrical installation with "Schuko" sockets and residual current protection.

4. The following rules must be followed, when using the device, model WTU-1:

- always work with standard medical gloves, with no talc powder;
- never touch the device with wet hands;
- never place the device in water;
- never pull the powering cable in order to disconnect the plug from the socket;
- protect the device from elements (rain, sunshine etc.);
- do not leave kids unattended in order to make sure that they do not play with the device;
- the device can be permanently plugged in the electrical grid, but if you intend to not to use it for a prolonged period of time, it is recommended to unplug it from the socket;
- when performing any operations, related to cleaning and maintenance, always unplug the device from the socket;
- do not place the device on top of other objects and do not cover it;
- the device works with very low output voltage of 6 V and there is no hazard of electrical shock, even if you hold the both tongs **(F)** when the button for start of heat treatment is pressed. However, in case you have a pacemaker, make sure that you use gloves and do not touch both tongs, when the button **(B)** is pressed.
- during the tempering process of an archwire, when the button **(B)** is pressed, do not touch the wire, because it is being heated and it can cause burns;
- when the heat treatment of the archwire is completed, after several pushes of the button **(B)**, wait for 30 seconds for the wire to cool down in the tongs **(F)**, before touching it or releasing it from the tongs. The gradual cooling down allows for the tempering process to complete and the wire to remain in the desired shape. If the wire is removed from the tongs before it is fully cooled down, there is a chance for it to expand from the heat and to lose its initially set shape;
- no cleaning products should get into the device, as this may lead to short circuit or cause potentially hazardous environment;
- the opening and repair of the device can be performed only by service technicians, authorized by the manufacturer;
- when defective parts are replaced, only original spare parts of WTU-1 should be used. The warranty of the device does not cover the damages caused by the usage of non-genuine spare parts.
- neither the device nor any of its parts should be dismantled, when the device is connected to the electrical grid;
- **FRAGILE!** Be particularly cautious during transportation and storage!
- According to Directive 2002/96/EEC, the device should not be disposed of as a domestic waste at the end of its service life. The product should be taken to a specialized centre for separate collection of electrical and electronic equipment waste and in such a way to prevent adverse effects to the environment and human health!

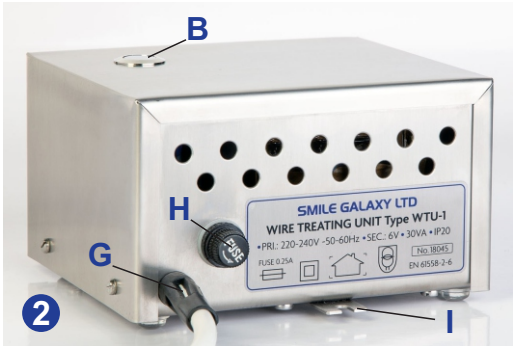




V. TYPE AND ELEMENTS OF THE DEVICE

Front view (Picture 1)

A - chromium-nickel (from stainless steel) housing
B - button for tempering START
C - signal LED lights
D - tempering rate key
E - spring buttons of tongs for ends of archwire fixation
F - copper tongs for ends of archwire fixation



Back view (Picture 2)

G - powering cable

H - fuse 0.25 A

I - plate for fixing to the metal pad

VI. PREPARATION FOR OPERATION

1. Place the metal pad of the set with the screw facing up on a flat surface on which you are going to work;

2. Place the device on the pad in such a way that the fixation plate **(I)** to be inserted under the head of the screw, installed on the metal pad;

3. Plug the power cable **(G)** in electrical contact with voltage, corresponding to the one, stated on the device;

4. Press the tempering START button **(B)**, in order to make sure that power supply is present. The LEDs **(C)** of the front panel should switch on, when the button **(B)** is pressed.

The preparation for operation of the device is completed and it is ready for work.

The device is intended for tempering ONLY of stainless steel archwires whit different section - round, rectangular etc.

The device has two tempering rates, controlled by the key (D), by switching it up or down:

· L (Low) - low tempering rate;

· H (High) - high tempering rate.

The tempering rate depends on the thickness and length of the archwire. It is recommended to test both of the rate modes with different archwires types.

The device works only when the tempering START button (B) is pressed and there is an archwire present in the tongs (F) with spring buttons (E). When the current runs through the archwire placed in the device's tongs (F), depending on the thickness and length of the wire, the brightness of the LEDs (C) can vary. For example, short and thick wires are with low electrical resistance and the light of the LEDs (C) can be very low or they may not lit at all (the LEDs (C) are bypassed by the wire). However, the device operates normally. When such wires are tempered, the colour of the wire should be observed and the pressings of the button (B) to be low in number (2-3) and short (milliseconds). It is recommended such wire types to be tempered only at L (low) rate.

Attention! Do not leave an archwire in the tongs if you are not tempering it!

VII. SEQUENCE OF OPERATION

1. After finishing the shaping of the archwire for a specific patient (making of bends, loops, Spee curve, forming the archwire shape from a template etc.) and removing the excessive ends, it is ready to be tempered.

2. Place firmly the two ends of the archwire (about 2 mm) in the tongs **(F)** by pressing the spring buttons **(E)**, so the wire stays passively fixed in them, without getting widened or narrowed. The passiveness is checked, when the archwire is placed in the tongs **(F)** and you press each of the spring buttons **(E)**, one after another, until you make sure that the archwire is not placed widened or narrowed.

3. Select the tempering rate: **L** - low or **H** – high. It is recommended to use low rate when you begin to work with the device and when you get more experienced, to start using the high.

4. Make several short and quick consecutive control pressings of button **(B)**, until the wire changes its colour to light yellow **"golden wheat"** colour.

Attention! Carefully observe the colour of the wire, because the colour is the criteria for enough tempering of the wire. The metal pad of the device is used for improvement of the contract.

Do not keep the button (B) pressed for a long time, because you might miss the right time for tempering and to burn out the wire, go red and then black. In such case, it loses its properties and is unfit for usage.

While keeping the button (B) pressed, the three indicator LEDs (C) on the front panel are lit. This shows that the device has established contact and is operational. When the device is switched on, with no wire, the light of the LEDs is very bright and when a wire is placed in the tongs, their light dims out. If the archwire is too short and with a large cross-section, it is possible for the LEDs to light up at all, although the device is in operational mode.

When the device is switched on, the button (B) is pressed and the LEDs do not light up or when there is an archwire in the tongs, and it is not getting heated, this may be due to a blown fuse (H). Unscrew the cover labelled "FUSE" located in the back of the device in the shown direction and replace it with a new 0.25A fuse, which is included in the set of the device.

As a result of touching the archwire with bare hands or leaving marks on it (i.e. with a permanent marker) some smoke might be expected. It is caused by the oil from your hands or the markings on the wire. The above does not interfere with the tempering process!

5. When the colour of the tempered wire reaches **"golden wheat"**, wait for **30 seconds** for the wire to cool down before touching it, in order not to get burnt and to eliminate the expansion, caused by the heating.

Note! When stainless steel archwires are heated, there is a tendency for them to expand in transversal direction. The tongs (F) of the device fix the ends of the archwire strong enough so to prevent its expansion. Despite of that, during the tempering process of stainless steel archwires, there is slight expansion in them. You can learn more about this phenomenon from the scientific article of *Cuoghi OA, Kasbergen GF, Santos PH, Mendoça MR, Tondelli PM, Brazil Oral Res. 2011 Mar-Apr; 25(2):128-34, "Effect of heat treatment on stainless steel orthodontic wires".*

6. When the wire has cooled down, press the spring buttons (E) in order to open the tongs (F) and to release the wire. It is ready to be used as intended.

Attention! Do not touch the wire immediately after the completion of the tempering process, as there is a risk of burns!

If a given wire has to be adjusted over time, the tempering process needs to be repeated. During the second tempering process, be careful not to burn out the wire and make it unusable.

VIII. MAINTENANCE

Before cleaning, unplug the device from the power socket. For cleaning of the device surface, spray with a cleaning spray for cleaning and maintenance of stainless steel surfaces over a piece of soft cloth or napkin and carefully wipe out. Do not spray the device directly with disinfectant or other solutions! Do not use abrasive cleaners!

IX. WARRANTY CONDITIONS

1. The warranty period of the device for heat treatment of archwires, model WTU-1 is **24 (twenty-four) months** from the date of purchase.

2. During the warranty period, the repairs of the device and replacement of defective elements are performed free of charge by the manufacturer.

3. If during the warranty period, the device has malfunctioned due to improper operation (mechanical, chemical, heating, electrical defects), unintended use, improper storage etc., caused by the end user, the repairs are carried out at their expense.

4. If damage to the electrical cables is noticed, they have to be immediately replaced at the service centre of the manufacturer. If water, solvents, aggressive and combustible materials or foreign objects have entered into the device, it must be opened and cleaned at the service centre of the manufacturer. In such cases, the warranty is void. No warranty claims will be accepted for damages caused by power surges, lightning storms, and failure to adhere to the electrical safety precautions or inappropriate building electrical installation.

5. In case of malfunction or limited functionality of the device, the manufacturer is not liable for any loss of profit, regardless of the reason.

6. No claims will be accepted for damages caused by careless transportation, unpacking, moving, operation and storage of the device. In case of an occurrence of any of the above events, the warranty is void.

7. In case of disputes about the application and interpretation of the present Operation manual, they will be settled according to the Bulgarian law in force.

8. In case of repairs, carried out by unauthorized parties, outside of the service centre of the manufacturer or if non-genuine spare parts are used, the user no longer have a right of free servicing within the warranty period.

Manufacturer and warranty service:

Smile Galaxy Ltd., Bulgaria, Plovdiv 4004, 23 Slaveevi gori Str., floor 1, office 5, +359 889 225501, www.smilegalaxy.net

WARRANTY 24 months of model WTU-1

Name: _____

Address: _____

Serial number: _____

Sale date: _____

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