# Ersa Rework System

# HR 100 A

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# 1.    Introduction

We would like to thank you for purchasing this high quality Rework System. With the HR 100A Ersa offers a microprocessor controlled cutting edge handheld rework system for standard and lead-free rework applications. It is intended for use in industrial manufacturing, repairs and laboratory applications.

The combination of radiant and convection heat with contactless transfer to the components, is characteristic for the hybrid technology. Due to its optimal heat transfer this technology is most suitable for all SMT-Rework processes.

Three modes of operation enable optimal adaptation to the required purpose of use:

- Time base

- Time base with temperature measurement

- Programmable temperature control (control either through base station or with *IRSoft* via PC.

An integrated laser pointer facilitates exact positioning of the heat source. With the straightforward menu guidance settings can be comfortably edited and saved.
A rotary encoder with momentary contact function serves the purpose of programming and operation.

The extensive range of accessories enables you to set up a flexible and modern Rework-System for highest quality demands.

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# 2.  Technical data

| Hybrid Rework-System HR 100A, base station | | |
|---|---|---|
| **Designation** | **Value** | **Unit** |
| Mains voltage | 220-240 | VAC |
| Mains frequency | 50-60 | Hz |
| Fuse (slow blow) | 2 | A |
| Mains voltage | 110-120 | VAC |
| Mains frequency | 50-60 | Hz |
| Fuse (slow blow) | 4 | A |
| Secondary voltage | 13 | VAC |
| Maximum heating power | 200 | W |
| Safety class | I | - |
| Permissible ambient temperature | 0-40 | °C |
| Temperature range at outlet | 30-550 | °C |
| **Air volume** | | |
| With hybrid adaptor AD1 | 15...35 | l/min |
| With hybrid adaptor AD2 | 6...11 | l/min |
| With hybrid adaptor AD3 | 3...9 | l/min |
| **Miscellaneous** | | |
| Function display | LED display | |
| PC interface | Mini USB | |
| Supply cable 2m, PVC, with appliance connector | | |
| Operation via rotary encoder with momentary contact function | | |
| Antistatic surface, suitable for use in ESD-environment, EMC-tested*. | | |
| Vacuum | -0,2...-0,4 | bar |
| Conformity | CE | |
| Dimensions WxHxD | 211 x 220 x 188 mm | |
| Weight | 4,5 | kg |

# 2. Technical data

| Hybrid Tool | | |
|---|---|---|
| Length of supply cable | 1,35 | m |
| Dimensions WxHxD | 230x25x25 mm | |
| Weight | approx. 300 | g |
| **Laser** | | |
| Class | II | - |
| Wavelength | 660-680 | nm |
| Output | max. 1 | mW |

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# 2. Technical data

| Heating plate IRHP100A | | |
|---|---|---|
| **Designation** | **Value** | **Unit** |
| Mains voltage | 220-240 | VAC |
| Mains frequency | 50-60 | Hz |
| Fuse (slow blow) | 4 | A |
| Mains voltage | 110-120 | VAC |
| Mains frequency | 50-60 | Hz |
| Fuse (slow blow) | 8 | A |
| Control voltage | 5 | Vss |
| Maximum heating power | 800 | W |
| Safety class | I | - |
| **Miscellaneous** | | |
| Supply cable 2m, PVC, with appliance connector, control cable with RCA (Cinch) connector. | | |
| Antistatic surface, suitable for use in ESD-environment, EMC-tested. | | |
| Conformity | | CE |
| Dimensions WxHxD | 200 x 260 x 53,5 mm | |
| Height of tool suspension | 214,5 mm | |
| Dimension of holder for printed circuit board W x D | 330 x 250 mm | |
| Weight | 2,5 | kg |

**\*** Strong signals in the frequency range of 80...230 MHz can cause interferences in the base station display!

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# 3. Concerning your safety

Ersa products are developed, manufactured and tested in compliance with general requirements concerning health and safety.

**However, residual risk do remain!**

You should therefore read this instruction manual before you start to operate the device for the first time. It will help you to learn the functions of the device and to use it in the most optimal way. Keep this instruction manual at a place that can be accessed by all users at any time!

## 3.1 Explanations on pictograms and symbols

In this instruction manual pictograms are used to highlight dangers.

Special information or mandatory instructions and prohibitions with the aim of preventing personal injury or extensive damage to property are identified by a pictogram, followed by hierarchically structured text with words written in bold:

**Warning!** Is used for warnings of immediate danger. Consequences may be death or personal injuries.

**Attention!** Is used for warnings of possibly dangerous situations. Consequences may be personal injury, damage to property or environment.

**Caution!** Used for application related recommendations. Negligence may result in material damage.

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In addition to the hierarchically structured warning notes described above, we use the following symbols:

Used to highlight any texts containing explanations, information or hints.

■ This symbol identifies

- action that is strictly required, or

- instructions that must be strictly complied with.

## 3.2 Intended use

Thermal tools from Ersa must only be used for the processing of soft solder. However, if explicitly described in the operating instructions of the respective thermal tool, some thermal tools may, in exceptional cases, be used for the processing of plastic materials.

In case of unintended use and tampering with the device, any warranty and liability claims of the buyer against the manufacturer will become null and void.

## 3.3 Target group of readers

This instruction manual addresses persons with knowledge in the field of reflow soldering.

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## 3.4    Safety notes

**Attention!** Check all components before each use. Have damaged parts only repaired by a specialist or the manufacturer. Unprofessional repairs cause a risk of accident. Always use original Ersa spare parts for possible repairs.

**Attention!** Thermal tools get very hot. Before heating up the device check whether the tool insert (e.g. soldering tip, modelling insert, etc.) is correctly connected with the thermal tool. The hot tool insert should never come in contact with skin, hair or any heat-sensitive and combustible materials. Make sure you use a sufficiently heat proof work base.

**Attention!** Keep unauthorized persons at a safe distance. Make sure that unauthorized persons, especially children, have no access to the thermal tools.

**Attention!** Fire hazard. Before heating up the thermal tool remove any combustible objects, fluids and gases from the working range of the thermal tool. Always place the thermal tool into the storage stand provided for this purpose. Disconnect the thermal tool from the mains supply after use. Do not leave your hot thermal tool unattended. Please remember that it will take quite same time for the tool insert to cool down to a harmless temperature, after the device has been switched off.

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**Attention!** Lead containing solders are toxic. Lead containing solders entering into the organism will have a toxic effect. Eating, drinking and smoking is therefore strictly prohibited. For the reasons mentioned above you should always wash your hands thoroughly after having worked with lead containing solder.

**Attention!** Ventilation and extraction. Working and auxiliary materials may put your health at risk. Ensure sufficient ventilation or extraction. Follow the relevant safety data sheets.

**Warning!** Protect the supply cables. Do not use the power supply cable to pull out the plug or to carry the device. Keep power supply cables clear of heat, oil or sharp edges. Damaged power supply cables may cause fire, short circuit or electric shock and must therefore be replaced.

**Attention!** Consider environmental influences. Protect your device against any type of fluid and moisture. Otherwise there is a danger of fire or electric shock.

**Caution!** Take care of your thermal tool. Always keep your Ersa product in a safe and dry place, out of the reach of children. Follow the maintenance instructions. Check your device in regular intervals. Use only original accessories and spare parts from Ersa.

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# 3.  Concerning your safety

**Attention!** Laser beam! The device contains a class II laser radiation source. Do not look into the direct laser beam and do not direct the laser beam towards the eyes of other people!

**Attention!** Physically and/or mentally handicapped persons must only use the device under the supervision of trained expert personnel! Children are not allowed to play with the device!

National and international health and safety regulations as well as occupational health and accident prevention regulations must be complied with.

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The device is delivered in a sturdy cardboard box. Please use only the original packaging for transportation and intermediate storage. Strictly avoid jerky movements, impacts or putting down. The device must be adequately protected against weather influences like rain, fog or sea air, etc. For longer storage in high humidity environments the device must be packed up air tight, together with a dehumidifying agent. Damage caused by unprofessional transport or storage are not covered under warranty.

Notes on waste disposal acc. to the directive 2002/96/EG of the European Parliament and the Committee from 27th of January 2003 for for used electric and electronic appliances:

Products marked with a crossed out waste bin must not be disposed of together with unsorted domestic waste. The municipalities established special collecting points for this type of waste. Please consult your council and ask for available possibilities for the separated collection of old appliances. You thereby contribute to the reuse or other forms of use of old appliances, with the aim of protecting the environment and human health.

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# 5.  Start-up

Before start-up: Please check the contents in the package for completeness. Should any of the listed components be damaged or incomplete, you should immediately consult the supplier.

## 5.1  Scope of delivery

### 5.1.1  Hybrid Rework System HR100A (0IRHR100A)

- HR 100A digital control unit with power supply cable, vacuum pipette with suction elements, these operating instructions

- Hybrid Tool with connecting cable, Hybrid adaptor AD1, AD2, AD3 and adaptor changer.

- Optional accessory: Option: Stand 0IRHR-ST050, please read paragraph [Spare Parts and Accessories].

### 5.1.2  Hybrid Rework System HR100A with heating plate (0IRHR100A-HP)

- HR 100A digital control unit with power supply cable, vacuum pipette with suction elements, these operating instructions.

- Hybrid Tool with connecting cable, Hybrid adaptor AD1, AD2, AD3 and Adaptor changer.

- 800 W IR-heating plate complete with tool suspension for Hybrid Tool and holder for printed circuit boards, Flexpoint TE-holder and AccuTC thermocouple.

- Software package *IRSoft* on CDRom, USB cable.

For further accessories please refer to chapter 9.

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## 5.2    Control elements, displays and connections

### 5.2.1    Front view of base station

The base station contains the following control and display elements:
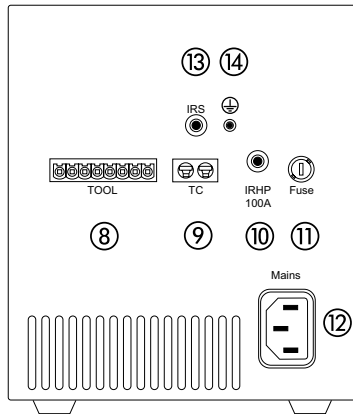
① Mains switch

② Display

③ Connection for vacuum pipette

④ Rotary encoder with momentary contact function

⑤ Vacuum pipette

⑥ Switch for vacuum pump

⑦ Hybrid Tool

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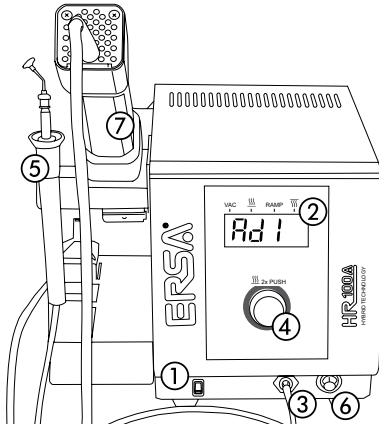
## 5.2.2    Rear view of base station

The following connections and the mains fuse are arranged on the back of the device:

⑧    Connection for Hybrid Tool

⑨    Connection for Accu TC thermocouple

⑩    Connection for Rework heating plate

⑪    Fuse holder with mains fuse

⑫    Mains supply connection

⑬    Connection for IR-sensor

⑭    GrounStart-up connection for ESD-protection

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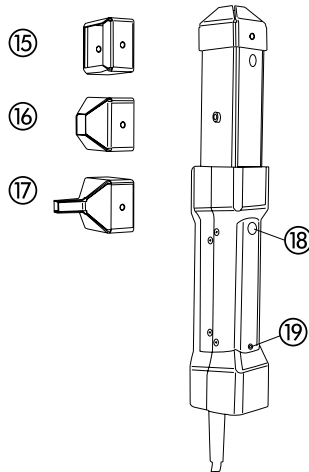
### 5.2.3    The Hybrid Tool

The Hybrid Tool is equipped with a control and display element:

⑱    Start / Stop button

⑲    LED as operation indicator (orange)

The following Hybrid adapters are included in the scope of delivery:

⑮    Hybrid adaptor AD1

⑯    Hybrid adaptor AD2

⑰    Hybrid adaptor AD3

## 5.3    Placing and connecting the device

- ▪ Place the base station on a level surface, possibly on a heat resistant base.

- ▪ Connect the Hybrid Tool with the station (socket ⑧) and place it into the storage stand.

- ▪ Connect the vacuum pipette with connection ③. Place the vacuum pipette into the storage stand.

- ▪ Connect the AccuTC thermocouple or the IR-temperature sensor (both options) with the socket ⑨ or ⑬.

- ▪ Stand the Rework heating plate (option) next to the base station and connect it with socket ⑩. Switch off the mains switch on the Rework heating plate. Connect the mains supply cable with Rework heating plate and mains supply socket.

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## 5.4  Switching on

- Before switching on, make sure that the mains voltage complies with the value specified on the type plate.

- Switch off the base station by the mains switch ①.

- Connect the power supply cable with the base station and the mains supply socket.

- Switch on the base station by the mains switch ①.

## 5.5  Firmware

After the base station has been switched on the firmware version, e.g. $\boxed{130}$ will first be displayed, followed by an approx. 2 second switch on dialog $\boxed{\text{Er5}}$. After this the program selected last, e.g. $\boxed{\text{Ad1}}$ will be displayed and the station is ready for operation.

ⓘ These operating instructions refer to firmware 1.3.0. For service purposes the number of the firmware may be of help, you should therefore make a note of it and keep it ready, as you may need it when asked by our Service Department.

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# 6. Description of function

## 6.1 Notes on operation

### 6.1.1 Base station

The **base station** is operated by a rotary encoder with momentary contact function:

- In order to select a program after switching on, turn the rotary encoder clockwise or anti-clockwise, until the desired program $\boxed{Ad0}$, $\boxed{Ad1}$, $\boxed{Ad2}$ or $\boxed{Ad3}$ is displayed by flashing.

- Press the rotary encoder to open the setting level of the selected program.

- The programs $\boxed{Ad1}$, $\boxed{Ad2}$ and $\boxed{Ad3}$ have two setting levels each.

- The program $\boxed{Ad0}$ has up to seven setting levels.

- If no input is made within a period of 8 seconds, the display will automatically change to the previously selected program, $\boxed{Ad0}$, $\boxed{Ad1}$, $\boxed{Ad2}$ or $\boxed{Ad3}$ is displayed.

> (i) Your input will be durably saved in the station, even after switching off. Settings within the programs are not possible during the heating phase.

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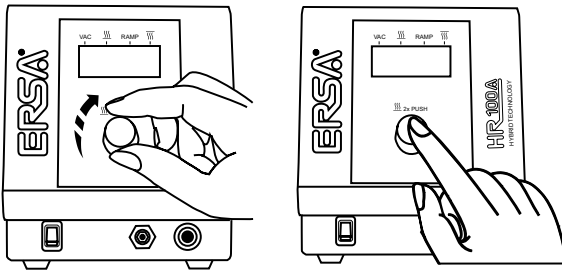
## 6.1.2   Hybrid tool

The **Hybrid Tool** is operated by the Start / Stop button in the handle.

- Press the Start / Stop button to start the heating process - during the heating phase the LED in the handle lights or flashes orange.

- Press the Start / Stop button again to stop the heating process and to start the cooling phase - the LED goes out.
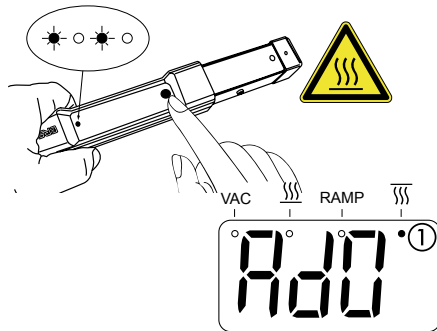
- During the heating phase, the LED $\overline{\text{\S\S}}$ ① in the display is lit or flashes.

ⓘ During the cooling phase, the blower always runs at top speed. If the cooling phase is not interrupted by re-heating, it is automatically stopped after 5 minutes. This time is set permanently and cannot be changed.

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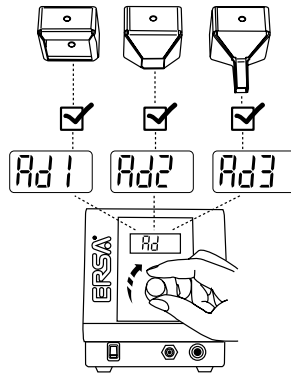
### 6.1.3    The three programs AD1, AD2, AD3

The scope of delivery includes three Hybrid adaptors, AD1, AD2 and AD3. Depending on the application and the size of the parts, you will use these Hybrid adaptors, whereby a suitable program $\boxed{Ad1}$ $\boxed{Ad2}$ and $\boxed{Ad3}$ is available for any of the adaptors. Optimal parameters for work with the corresponding adaptor have already been stored in the base station in the factory. These values cannot be changed. However, you can adjust the heating time for each adaptor individually between 10 and 320 seconds. With the Rework heating plate connected you can additionally set the energy level for the heating plate. Please refer also to chapter [Factory settings] in this manual.

Always use the appropriate program for the corresponding Hybrid adaptor. You thereby avoid overheating of the Hybrid Tool and poor working results. In case of a wrong selection the system may be prematurely be switched off by the temperature switch.

### 6.1.3.1 Heating time Hybrid Tool and heating plate

Parameter [Run time] 5
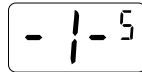
- In this level you can set the maximum heating time for the Hybrid Tool. If a Rework heating plate (option) is connected, it will also be heated over the set time. Press the rotary encoder to open the parameter [Run time] - 1- 5 :

  The connected heating plate is only switched on if the energy level for the heating plate has been set to ≥ 1. Please read paragraph [Heating Plate Energy Level]. Moreover, the heating plate has an indicator light which lights up during the heating process.

- The setting range is 0 10 5 to 320 5 seconds. Turn the rotary encoder clockwise or anti-clockwise, until the desired value is displayed, e.g. 100 5 . Then press the rotary encoder to save the adjusted value and to exit the parameter [Run time]. The display shows - 1- 5 again.

  **Caution!** Do not switch off the base station during a heating phase. This could damage the Hybrid Tool. During the cooling phase allow the Tool to cool down for a few seconds. Then switch off the base station. In case of a power failure or a fault during the heating phase you may hold the Hybrid Tool up, for unobstructed heat dissipation.
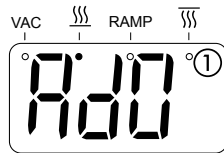
## 6.1.3.2 Heating plate energy level

Parameter [Energy Level IRHP100A] $\xi$
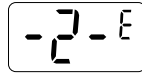


- In this level you can set the energy level for a connected Rework heating plate (option). Press the rotary encoder to open the parameter [Energy Level] $-2-\xi$:

- The setting range is $000^\xi$ to $015^\xi$. Turn the rotary encoder clockwise or anti-clockwise, until the desired value is displayed, e.g. $010^\xi$. Then press the rotary encoder to save the adjusted value and to exit the parameter [Energy LevelIRHP100A]. The display shows $-2-\xi$ again.



- As soon as an energy level ≥ 1 has been set, the heating plate can also be switched on manually by quickly pressing the rotary encoder twice. During the heating phase, the LED ①  in the display is lit. Press the rotary encoder again to switch off the heating plate. If an energy level > 5 is set, the heating plate is switched off automatically after 5 minutes.

## 6.1.4 The expert program AD0

This program enables you to match the working mode of the station exactly to your requirements.

**Caution!** You should only make adjustments if you have sufficient knowledge in the field of Reflow Soldering. Incorrect settings may cause overheating and lead to poor working results.
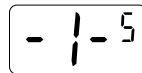
**Programming**

- Press the rotary encoder to open the setting levels of the expert program. The program has seven setting levels:

### 6.1.4.1 Heating time Hybrid Tool and heating plate

Parameter [Run time] S

- In this level you can set the maximum heating time for the Hybrid Tool. If a Rework heating plate (option) is connected, it will also be heated over the set time. Press the rotary encoder to open the parameter [Run time] - 1 - S:

- The setting range is 0.10 S to 320 S seconds. Turn the rotary encoder clockwise or anticlockwise, until the desired value is displayed, e.g. 100 S. Then press the rotary encoder to save the adjusted value and to exit the parameter [Run time]. The display shows - 1 - S again.
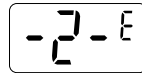
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### 6.1.4.2 Heating plate energy level

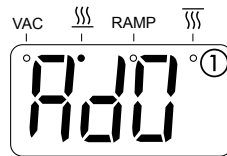Parameter [Energy Level IRHP100A] $\xi$

(i)  This function is only possible, when the Rework heating plate HP100A (option) is connected.

- In this level you can set the energy level for a connected Rework heating plate. Press the rotary encoder to open the parameter [Energy Level IRHP100A] $-2-\xi$ :

- The setting range is $000^\xi$ to $015^\xi$. Turn the rotary encoder clockwise or anti-clockwise, until the desired value is displayed, e.g. $010^\xi$. Then press the rotary encoder to save the adjusted value and to exit the parameter [Energy Level IRHP100A]. The display shows $-2-\xi$ again.

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# 6. Description of function

VAC · ≋ · RAMP · ≋

**AdO** ①

■ As soon as an energy level ≥ 1 has been set, the heating plate can also be switched on manually by quickly pressing the rotary encoder twice. During the heating phase, the LED ≋ ① in the display is lit. Press the rotary encoder again to switch off the heating plate. If an energy level > 5 is set, the heating plate is switched off automatically after 5 minutes.

T (°C)

470
420
370
320
270
220
170
120
70
20

1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  Level

Characteristic: Endtemperature of heating plate at the corresponding energy level after approx. 10 minutes heating-up time, measured at the surface of the glass plate.

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### 6.1.4.3 Energy level Hybrid Tool
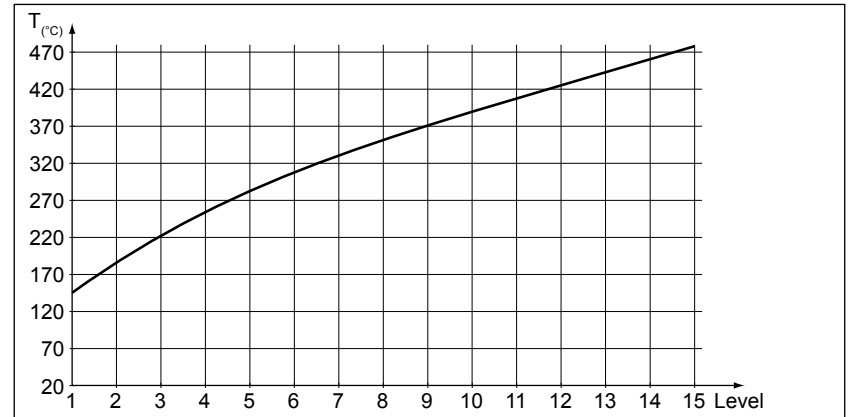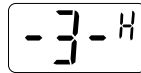
Parameter [Energy Level Tool] $\mathbb{H}$

$\boxed{-\exists-\mathbb{H}}$
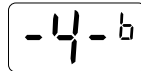
- In this level you can set the energy level for the Hybrid Tool. Press the rotary encoder to open the parameter [Energy Level Tool] $\boxed{-\exists-\mathbb{H}}$:

- The setting range is $\boxed{000^{\mathbb{H}}}$ to $\boxed{015^{\mathbb{H}}}$. Turn the rotary encoder clockwise or anti-clockwise, until the desired value is displayed, e.g. $\boxed{010^{\mathbb{H}}}$. Then press the rotary encoder to save the adjusted value and to exit the parameter [Energy Level Tool]. The display shows $\boxed{-\exists-\mathbb{H}}$ again.

⚠️ **Caution!** If necessary match the blower speed to the Hybrid adaptor used. With a high energy level and a low blower speed or low air flow there is a risk of overheating!

### 6.1.4.4 Blower speed Hybrid Tool

Parameter [Blower speed] $\mathbb{b}$

$\boxed{-4-\mathbb{b}}$

- In this level you can set the blower speed for the Hybrid Tool. Press the rotary encoder to open the parameter [Blower speed] $\boxed{-4-\mathbb{b}}$:

- The setting range is $\boxed{001^{\mathbb{b}}}$ to $\boxed{015^{\mathbb{b}}}$. Turn the rotary encoder clockwise or anti-clockwise, until the desired value is displayed, e.g. $\boxed{010^{\mathbb{b}}}$. Then press the rotary encoder to save the adjusted value and to exit the parameter [Blower speed]. The display shows $\boxed{-4-\mathbb{b}}$ again.

ⓘ During the cooling phase the blower always runs with highest speed.
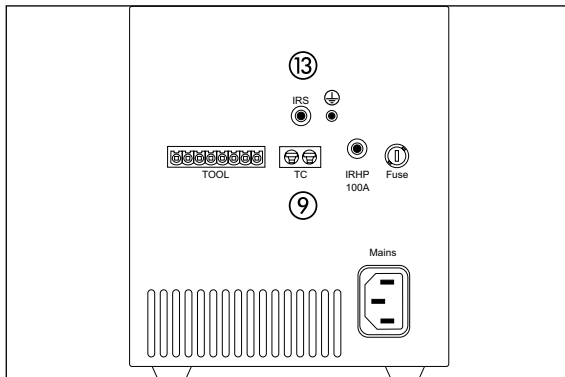
### 6.1.4.5 Selecting the temperature sensor

Parameter [Alternative sensor] A

$\phantom{}$

The temperature sensors are needed for the following functions:

- For the temperature monitoring, read also section 6.1.4.7.

- For the [Ramp] function, read also section 6.1.4.6.

- In this level you can select the connected sensor to evaluate the process temperature. Press the rotary encoder to open the parameter [Alternative sensor] -S-ᴬ:

- You can choose the following

- SE1ᴬ Choose this setting, if you have used socket ⑬ to connect the IR temperature sensor.

- SE2ᴬ Choose this setting, if you have used socket ⑨ to connect the AccuTC thermo couple.

- Turn the rotary encoder clockwise or anti-clockwise, until the desired value is displayed, e.g. SE2ᴬ. Then press the rotary encoder to save the adjusted value and to exit the parameter [Alternative sensor]. The display shows -S-ᴬ again.

### 6.1.4.6 Heating power rise speed

Parameter [Ramp] ⌐

The following prerequisites must be met to be able to use this function:

- Either the thermocouple or the IR sensor must be connected to the base station.

- The connected sensor must be set in parameter [Alternative sensor] $\boxed{-5-^R}$.

- Thermocouple or IR sensor must be placed near the component to be processed.

- In the parameter  [End temperature] $\boxed{-7-^c}$ a value for the permissible end temperature must be set.

- You can now use this level to set the heat output rise speed (ramp) on the Hybrid Tool. Press the rotary encoder to open the parameter [Ramp] $\boxed{-6-⌐}$:

$$\boxed{-6-⌐}$$

- The setting range is $\boxed{000⌐}$ to $\boxed{030⌐}$. Turn the rotary encoder clockwise or anti-clockwise, until the desired value is displayed, e.g. $\boxed{0.10⌐}$. Then press the rotary encoder to save the adjusted value and to exit the parameter [Ramp]. The display shows $\boxed{-6-⌐}$ again.

(i) You can set the rate of rise in defined steps of 0.5°K per second. The control will then automatically compute the required energy level. Please pay attention to the example on the next page.

# 6.    Description of function
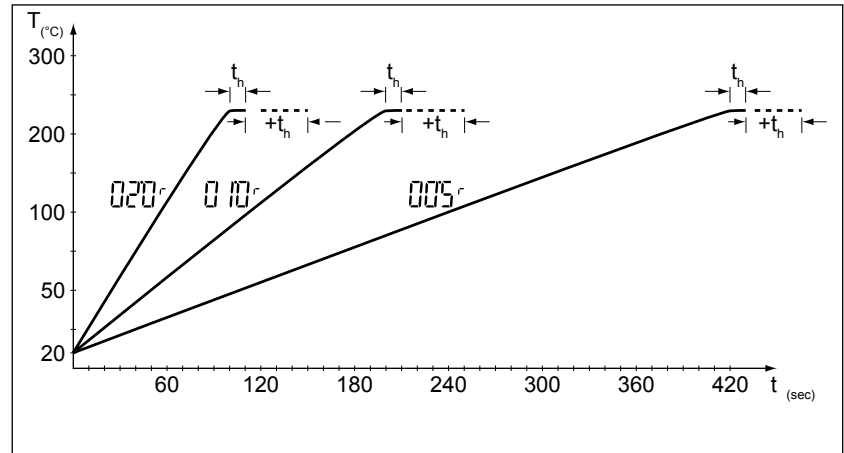


**Example 1**: If you set the value 2.0K/sec. at an end temperature of T = 220°C, heating will take place at a rate of 2K per second and the end temperature is in this case reached after approx. 100 seconds. The control keeps this temperature over the duration of the dwell time [t h] = 10 seconds. Then the cooling phase is started. If you require a longer dwell time, you must extend this time in the parameter [Run time] accordingly. In this example the dwell time is to be extended by 40 seconds (+th). The [Run time] was therefore set to 150 seconds.

**Example 2**: If you set the value 1.0K/sec. at an end temperature of T = 220°C, heating will take place at a rate of 1K per second and the end temperature is in this case reached after approx. 200 seconds. The control keeps this temperature over the duration of the dwell time [th] = 10 seconds. Then the cooling phase is started. If you require a longer dwell time, you must extend this time in the parameter [Run time] accordingly. In this example the dwell time is to be extended by 40 seconds (+th). The [Run time] was therefore set to 250 seconds.

**Example 3** shows the characteristic for a ramp of 0.5K/sec.

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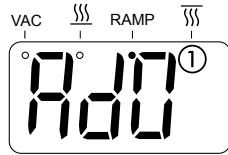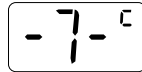
If the resulting heating up time is longer than the heating time set in the parameter [Run time] $-1-5$, the heating time will automatically expanded accordingly.

VAC    RAMP



- As soon as a value > 0 has been set for the ramp function, the LED [RAMP] ① is lit in the display.

### 6.1.4.7 Temperature monitoring Hybrid Tool

Parameter [End temperature] $^C$

ⓘ This function is only possible when thermocouple or IR sensor are connected, otherwise this level cannot be accessed.

▪ In this level you can set the temperature monitoring of the Hybrid Tool. Press the rotary encoder to open the parameter [End temperature] - 7- $^c$:

▪ The setting range is 030° to 300°. Turn the rotary encoder clockwise or anti-clockwise, until the desired value is displayed, e.g. 240°. Then press the rotary encoder to save the adjusted value and to exit the parameter [End temperature]. The display shows - 7- $^c$ again.

- 7- $^c$

Temperature monitoring includes two functions:

• Pure monitoring of the process temperature

• Control of the [Ramp] function

**Temperature monitoring:** The thermocouple/IR sensor detects the process temperature. If the adjusted value is exceeded, a bleep sound is emitted. When the temperature drops below the set temperature again, another bleep will sound.

**Control of the [Ramp] function:** The thermocouple/IR sensor detects the process temperature and supplies the actual temperature value to control this function.

ⓘ **Special function** of the rotary encoder during the heating phase: When the rotary encoder is pressed, the display shows the measured temperature of the connected temperature sensor. Pressing again changes back to the display of the heating time.

# 6.    Description of function

## 6.2    Changing a Hybrid adaptor

■  Press the button on the Hybrid Tool to switch off the heating, the orange LED goes out.

■  Wait for about ten seconds, until the Tool has sufficiently cooled down.

■  Use the adaptor changer to pull the Hybrid adaptor off the Hybrid Tool.

■  Wait until the Hybrid adaptor has cooled down to a harmless temperature, then remove the adaptor from the adaptor changer.

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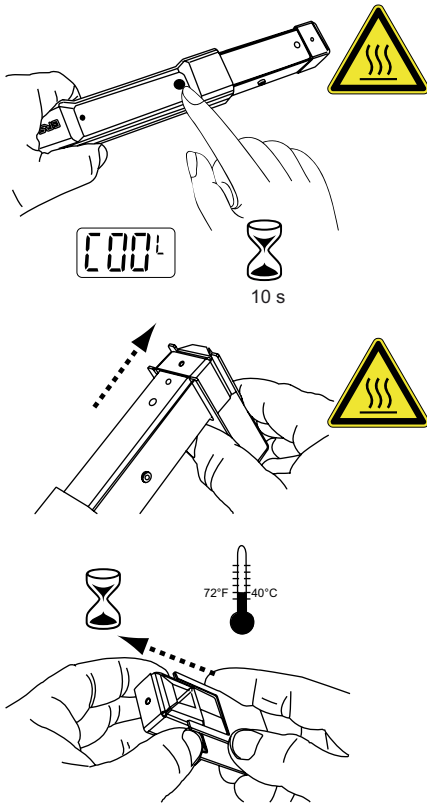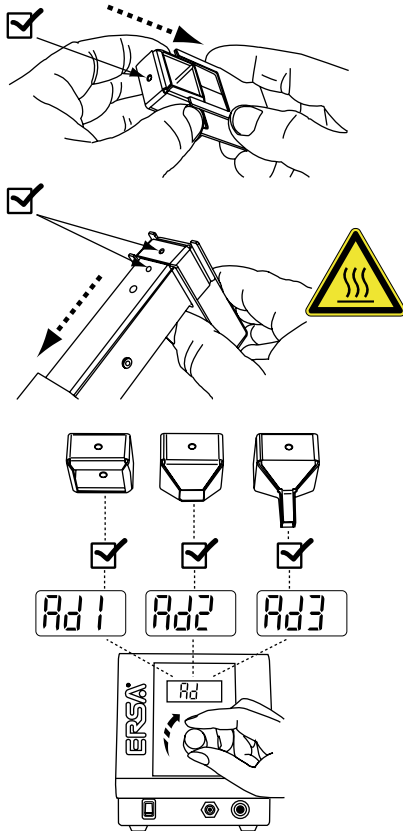
■ Plug another Hybrid adaptor onto the adaptor changer. Check correct fit of adaptor and position of bore.



■ Slide the adaptor over the Hybrid Tool, until the lobe engages in the bore.



■ Use the rotary encoder to select the program matching the adaptor. Then press the button on the Hybrid Tool to switch on the heating.

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## 6.3    Working with the Hybrid Tool

(i)  For lead-free processes we recommend the additional use of the optionally available Rework heating plate IRHR100A. If the thermocouple or the IR sensor is used for processing monitoring purposes, position the sensor in the working range of the Hybrid Tool.

### 6.3.1    Soldering and desoldering

■  Choose a suitable Hybrid adaptor and mount it to the Hybrid Tool. Then choose the program matching the adaptor.

■  **Soldering:** Prepare the soldering joint on the printed circuit board with soldering flux and/or soldering paste. Then position the component.

■  Press the Start / Stop button on the Hybrid Tool. The set time is started and the Tool is heated up. During this process move the Tool with small circular movements over the component, to achieve uniform heating up of the component. The display will first show the reading $\boxed{run}$, followed by the elapsed heating time, e.g. $\boxed{0\ 10^s}$. During the last ten seconds of the heating time a reminding signal will sound every second. Once the complete time has elapsed, the heating time is finished and the cooling phase starts. The display shows the reading $\boxed{cool}$.

■  Once the solder has melted, press the Start / Stop button to stop the heating process and to start the cooling phase.

⚠  **Caution!** Adjacent areas will also be heated and must therefore protected against heat.

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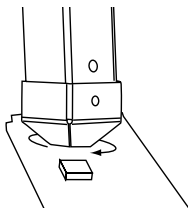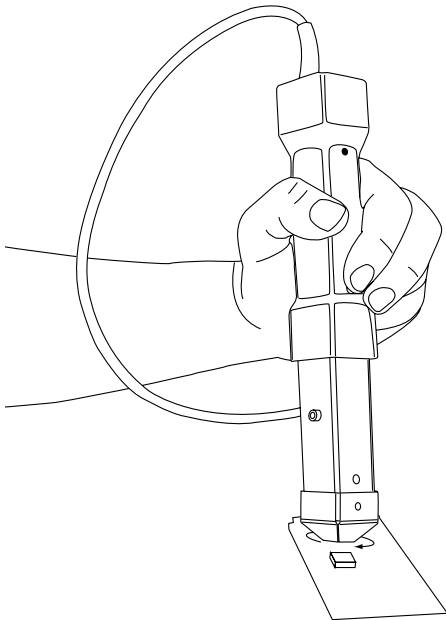
# 6. Description of function

- **Desoldering:** Hold the Hybrid Tool over the component to be desoldered (distance 5...20mm), until the desired area is illuminated by the laser beam.

- Once the solder has melted, remove the component with a suitable tool or a vacuum pipette. Press the Start / Stop button to stop the heating process and to start the cooling phase.

**Caution!** Always wait for the end of the process before placing the tool into the holder or start the cooling phase manually. Otherwise the heating continues while the tool is in the holder.

We recommend the use of a solder smoke extraction device.

## 6.3.2    Using the vacuum pipette

The vacuum pipette is delivered with two types of suction elements:



- Black, plastic ①, not heat resistant. To be used with cold components, not suitable for use in the effective range of the Hybrid Tool.

- Transparent, silicone ②, heat resistant. To be used with hot components, suitable for use in the effective range of the Hybrid Tool.

- ◼ If higher force is required, for very small components or under extremely high temperature you should use tweezers ③.

  ⓘ Alternatively, a spring-loaded vacuum pipette can also be attached permanently to the stand (option). Please read paragraph 6.4.1.
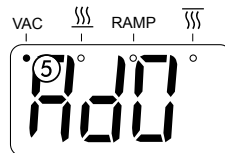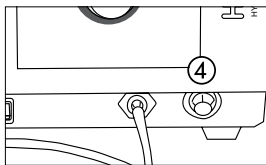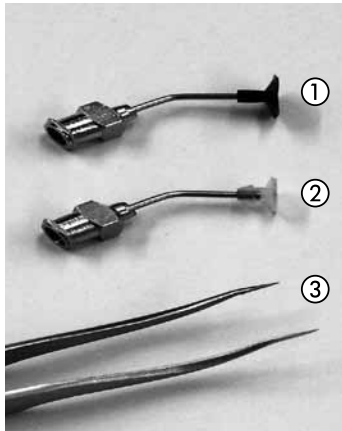
- ◼ Switch on the vaccuum pump with the pushbutton ④.

- ◼ If the pump is switched on, the LED [VAC] ⑤ in the display is lit.

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## 6.4 Working with tool holder

### 6.4.1 Soldering and desoldering

- Fasten the Hybrid Tool to the tool holder, for this purpose loosen the knurled screws ① and open the mounting angle ②. Push the Hybrid Tool into the receptacle ③. The housing of the Hybrid Tool must rest on the area ④.

- Fasten the mounting angle with the knurled screws. This locates the Tool.

- Choose a suitable Hybrid adaptor and mount it to the Hybrid Tool. Then choose the program matching the adaptor.

- Lay the printed circuit board into the holder, fasten it and position it above the heating plate.

- Use the height adjustment feature to position the Hybrid Tool above the component to be desoldered (distance 5...20mm). Loosen the knurled screw ⑤ and adjust the height. Watch the height adjustment also on the scale ⑥. Finally move the frame, until the desired area is illuminated by the laser beam.

⚠ **Caution!** Adjacent areas will also be heated and must therefore protected against heat.

- **Soldering:** Prepare the soldering joint on the printed circuit board with soldering flux and/or soldering paste. Then position the component.
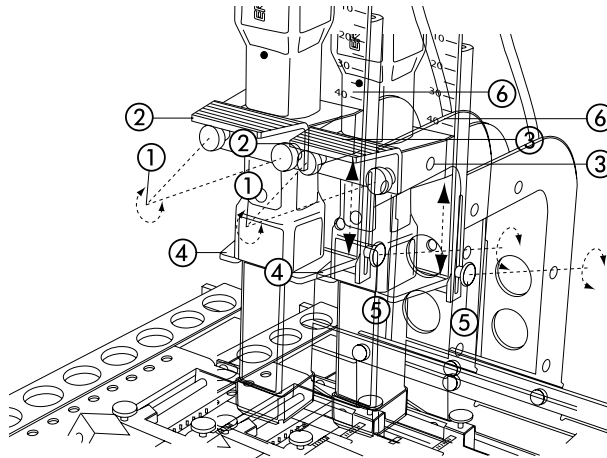
■ Press the Start / Stop button on the Hybrid Tool. The set time is started and the Tool is heated up. The display will first show the reading `run`, followed by the elapsed heating time, e.g. `0 10ˢ`. During the last ten seconds of the heating time a reminding signal will sound every second. Once the complete time has elapsed, the heating time is finished and the cooling phase starts. The display shows the reading `COOᴸ`.

■ Once the solder has melted, press the Start / Stop button to stop the heating process and to start the cooling phase.

■ **Desoldering:** Press the Start / Stop button to start the heating process.

■ Once the solder has melted, remove the component with a suitable tool or a vacuum pipette. Press the Start / Stop button to stop the heating process and to start the cooling phase.

■ If a vacuum pipette is used which is attached permanently to the stand: after the solder has been molten, position the component under the pipette and lift the component with the pipette.

(i) We recommend the use of a solder smoke extraction device.



## 6.5 Connecting a PC

Via the USB-port the base station can be linked to a Windows PC and operated with the software *IR-Soft*. Read the *IR-Soft* User Manual. The USB-port is located on the right side of the base station housing at display level.

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## 6.6 Sensitive components

Some components may suffer damage when being exposed to electrostatic discharge (please follow the warnings on the packages or ask the manufacturer or supplier). An ESD-safe (ESD = Electrostatic Discharge) workplace provides sufficient protection for such components.

The station can be easily integrated into such an environment. With the ground terminal on the back of the base station ① the Hybrid Tool can e.g. be connected to a conductive work base. The base station is fully antistatically equipped.
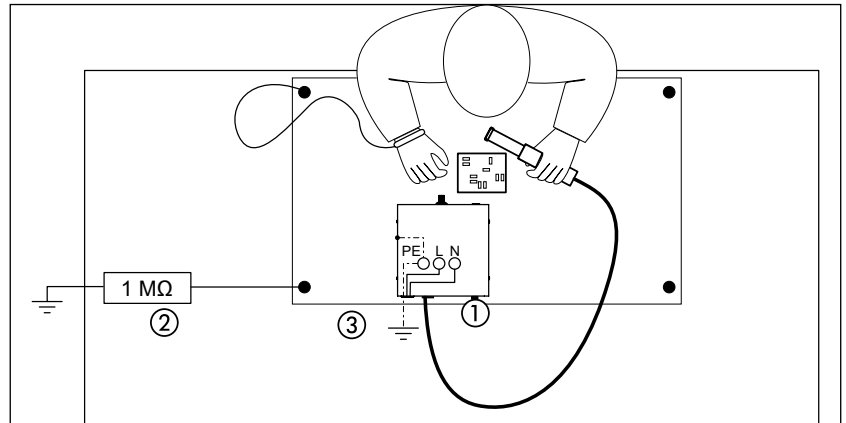


Integration into an ESD environment ①, connection by 4mm banana plug. ②: Personal protection resistor element provided by customer, if required. The housing of the base station is connected to the PE-conductor of the mains supply via the mains supply line for non-heating appliances ③.

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## 6.7   Brief instructions

| During basic mode: | 2x | Switch on or off the bottom heater IRHP100A |
|---|---|---|
| During parameter setting: | | Return to basic mode |

| At run time: change display between time or temp. 1x | Free parameters for all adaptors | * | * | * |
|---|---|---|---|---|
| **Set adaptor** | *Ad0* | *Ad1* | *Ad2* | *Ad3* |
| **Change to parameter** 1x | Set  *- 1-* to *- 7-* | *- 1-* to *-2-* | *- 1-* to *-2-* | *- 1-* to *-2-* |
| **Change to values** 1x | **Set value** | | | |
| *- 1-S* Run time | *0 10S  -  320S* | | | |
| *-2-E* Energy IRHP100A | *000E  -  0 15E* | | | |
| *- 3-H* Energy tool | *00 1H - 0 15H* | Parameter 3 - 7 only on pos. *Ad0* | | |
| *-4-b* Blower speed | *00 1b - 0 15b* | | | |
| *-5-A* Alternative sensor | *SE 1A* (IRS) *SE2A* (TC) | | | |
| *-6-r* Ramp | *000r - 030r* | Parameter 6 - 7 only with connected Sensor (IRS or TC) | | |
| *- 7-C* End temp. | *030C - 300C* | | | |

**Operation indicators:**
VAC = Vacuum pump
∭ = Bottom heater IRHP100A
RAMP = Ramp control
∭ = Heater Tool

VAC  ∭  RAMP  ∭
*320S*

**\* Please use the recommended adaptor setting for best results !**

## Attention ! Important safety instructions !

*Never switch off power supply before end of cooling phase !*
*Let the heat pipe head upwards*
*on any power failure during operation.*

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## 7.1    General faults

If the station does not operate as expected, check the following items:

- Is main voltage present? Correctly connect the mains lead to the device and socket.

- Is the fuse defective? The fuse can be found at the rear side of the device in the mains connecting socket.

- Note that a defective fuse may also indicate a more severe cause of fault. Simply changing the fuse therefore generally does not suffice.

- Is the Hybrid Tool correctly connected with the base station?

## 7.2    Other faults

Other faults may occur, which could point to defects on the soldering tool. These are:

- The Hybrid Tool does not heat up, no effect of the Start / Stop button. The LED does not light, the display permanently shows $\boxed{\text{COOL}}$. This is caused by an impermissibly high Tool temperature. Allow the Hybrid Tool to cool down for a while. Work can be continued after the Tool has sufficiently cooled down.

  (i)   Always use the appropriate program for the corresponding Hybrid adaptor. You thereby avoid overheating of the Hybrid Tool and poor working results. In case of a wrong selection the system may be prematurely be switched off by the temperature switch.

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## 7.3 Table of error codes

| Error code | | |
|---|---|---|
| **Display** | **Cause** | **Remedy** |
| 007 | When ramp function activated: Thermo couple defective, not connected or open | Check connection or replace thermo couple |
| 009 | EEPROM - values damaged | Switch the station off and then on again. If the error occures again, change the control board. |

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## 7.4 Factory settings [Default]

The following table contains information about the settings of the base station upon delivery. You can restore this delivery state:

- ▪ Press and hold the rotary encoder before switching on

- ▪ Switch on the station, hold the rotary encoder depressed for approx. two seconds. The current firmware version appears in the display, e.g. [1.2.3]. Then release the rotary encoder. The factory settings have been restored.

| Factory settings | | | | | |
|---|---|---|---|---|---|
| Parameter | Prog. 0 `Ad0` | Prog. 1 `Ad1` | Prog. 2 `Ad2` | Prog. 3 `Ad3` | Unit |
| [Run time] `- 1 - S` | 120 | 120 | 90 | 80 | s |
| [Energy Level] `- 2 - E` | 10 | 10 | 10 | 10 | - |
| [Energy Level tool] `- 3 - H` | 15 | 15* | 15* | 15* | - |
| [Blower speed] `- 4 - b` | 10 | 1* | 5* | 15* | - |
| [Alternative sensor] `- 5 - A` | SE2 | SE2* | SE2* | SE2* | - |
| [Ramp] `- 6 - r` | 0 | 0* | 0* | 0* | °K/s |
| [End temperature] `- 7 - c` | 240 | 240* | 240* | 240* | °C |
| Global settings (can only be changed with IRSoft) | | | | | |
| Temperature unit | | | | | °C |
| Buzzer settings | | | | | Low |

\*     These parameters are not changeable.

## 8.1    Important service tasks

The following points must be complied with to achieve a long lifetime of the station:

Only used original consumables and spare parts from Ersa, to keep up the safe and reliable function and warranty!

**Warning!** Dangerous electric voltage! There are no serviceable parts inside the device!

Occasionally clean the device with a damp, soft cloth. Steam or high pressure cleaners, scrubbing sponges, abrasive cleaners, solvents like alcohol or gasoline must not be used!

Running and sliding surfaces on the holder for printed circuit boards (option) and the height adjustment for the tool suspension should be wiped with an oil soaked cloth or cotton buds two times per year. Use only acid free oil or an oil quality suitable for precision mechanics.

The glass top of the Rework heating plate can be cleaned with a conventional scraper for Ceran hobs and care products for CERAN hobs.

# 9. Spare parts and Accessories

| Base station HR 100 A | |
|---|---|
| **Designation** | **Article number** |
| VacPen (Vacuum pipette) | 0VP020 |
| Suction cups for vacuum pipette, not heat resistant | 0SVP13A |
| Suction cup, Silicone, 7mm, transparent, heat resistant, for vacuum pipette | 0SVP07S |
| **Rework heating plate IRHP100A** | |
| Control cable for HP100 A | 0IRHP100A-12 |
| **Accessories** | |
| Hybrid adaptor 20x20 mm (AD1) | 0IRHR100A-14 |
| Hybrid adaptor 10x10 mm (AD2) | 0IRHR100A-15 |
| Hybrid adaptor 6x6 mm (AD3) | 0IRHR100A-16 |
| Adaptor changer | 0IRHR100A-24 |
| Cooling Fan for PCBs | 0IR5500-13 |
| AccuTC sheath thermocouple | 0IR6500-01 |
| TC holder Flexpoint | 0IR5500-35 |
| Pipette | 0IRHP100A-13 |
| Stand (see figure left side) | 0IRHR-ST050 |
| Extension for Flexpointholder | 0IR5500-36 |
| Thermo couple wire K-type with plug | 0IR4510-02 |
| Cable USB Type USB A - Mini USB | 3ET00264 |
| PCB-holder set | 0IR6500-17 |
| PCB-holder | 0PH100 |

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# 10. Warranty

Heater, Hybrid adaptor or vacuum pipette are wear items which are not covered under warranty. Any return of goods must be accompanied by a written description of the material or construction fault that has occurred as well as a confirmed purchase invoice.

Ersa created these operating instructions with greatest care and attention to detail. However, no warranty can be granted with respect to content, completeness and quality of specifications in this manual. The content is continuously updated and adapted to current conditions.

All data published in this manual, including specifications concerning products and procedures, were determined by us to the best of our knowledge and ability, and using cutting edge technical aids. These specifications are non-binding and for information only; they do not relieve the user from his responsibility of carrying out his own check before operating the device. We do not assume liability for violations of patent rights of third parties for applications and procedures without previous express and written confirmation. We reserve the right for technical modifications with the intention of improving the product.

Within the scope of legal possibilities, liability for immediate damage, including direct and indirect damage, which results from the acquisition of this product, is ruled out.

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