The Revolutionary ERSA *i*-CON and *i*-Tool: *i*ntelligent and Performing Power for the Ultimate *i*nnovation in Hand Soldering

ERSA GmbH

Soldering Division: Tools & Inspection Systems

ERSA *i*-Tool: The World's Most *i*ntelligent Professional Soldering Iron

THE WORLD OF ERSA *i*NNOVATION

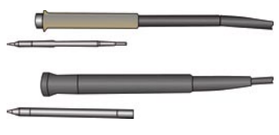
i-Tool® *i*-CON®

Guaranteeing quality in a Lead-Free environment will put the greatest demands on hand soldering applications. How well the iron recovers or puts back the heat lost at the tip, and how long the tip remains on the joint ultimately determines the actual joint temperature. Slow recovering irons will lead to inconsistent joint temperatures. Today, soldering iron manufacturers are developing better performing irons, but many are based on the tip being attached to the heating element cartridge, which means the tip temperature can overshoot, and the tip price is very high! Such irons force companies to throw away a perfectly good and expensive heating element only because the small copper tip is worn out!

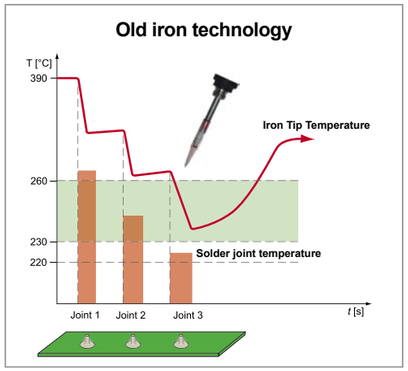
To meet the Lead-Free challenge, ERSA is introducing its newest technology for a state-of-the-art soldering station – the ERSA *i*-CON and *i*-Tool! Today at ERSA, "*i*" stands for *intelligent, innovative*, *intuitive*, *ingenious*, *interactive, informative* – simply *ideal!*

As process windows become smaller, the soldering task becomes more difficult. True *i*nnovation demands more than just a nice slogan, a catchy word. Today's soldering stations must be *i*ntelligent themselves but *i*ntuitive for the user. The *i*nteractivity between operator and station must be greater, and the *i*nteractivity between stations themselves must be greater. Truly *i*ngenious solutions are engineered to optimize process quality and productivity while at the same time reducing operating costs. These are the elements that make up today's *i*deal soldering station, and these are precisely the elements that make up the world's most *i*ntelligent soldering iron ever designed – the ERSA *i*-Tool!

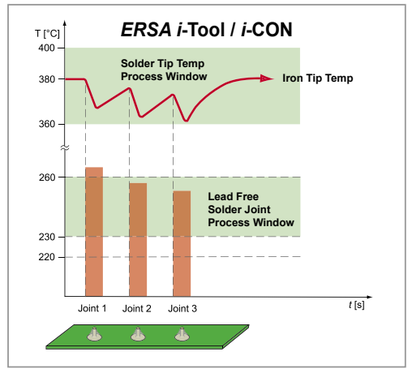
Expensive heating cartridge tips



Micro power soldering irons offer performance and ergonomic advantages, but have the two major drawbacks of tip temperature overshoot and expensive heating cartridge tips.



Standard soldering irons where the sensor is located far away from the tip will lead to inconsistent solder joint quality. The tip looses temperature into the joints but does not recover fast enough before the next joint is made.



The i-Tool recovers so fast that all solder joints can be made with nearly the same temperature. The sensor measures the actual tip temperature very close to the tip extremity. The Process Window Alarm assists the operators in guaranteeing repeatable quality.

Highlights: ERSA *i*-Tool and *i*-CON

Actual size

The i-Tool has a highly advanced PCB integrated into the handle for a level of intelligence never before seen in a soldering iron.

Highest Power & Performance:

- 150 W micro heating element
- Ultra fast heat-up: from 30 °C to 350 °C in approx. 9 sec., Stand-by to 350 °C in approx. 3 sec.
- Ultra fast heat recovery time

Ultimate Innovations:

- Process Window Alarm Function alerts operator if tip temp is out of window
- Three power level settings to control overshoot
- *i*-Set Tool for quick & easy download of parameter settings to all stations
- ASM – Automatic Standby Motion Sensor
- Calibration of *i*-Tool itself, independent from station

Optimal Ergonomics & Ease of Use:

- Ultra short tip-to-grip: 45 mm, Ultra small: 155 mm, ultra light: 30 gr.
- Thinnest & lightest cable for maximum comfort
- Dual material grip with "Soft Pad" stays cool during use
- "One Touch" easy-to-use operation with new *i*-Op Control
- Ultra large, multi-functional display
- Small footprint W: 150 mm x L: 175 mm x H: 100 mm
- Automatic tool detection of 6 different soldering & desoldering tools

Lowest Running Costs:

- Low-cost, long-life, quick change *i*-Tips specially designed for lead-free
- Lowest maintenance, station programming and calibration costs
- Highest productivity in hand soldering

ERSA *i*-CON:
Solving the Industry's Toughest Hand Soldering Problems

1. *Low-cost i-Tip (Consumable, easy to change, long-life)*
2. *i-Tip fastener*
3. *Heating element (stick-on type, long-life)*

***i*-Tool Soldering iron:** *Ultra light (only 30 grams), ultra short (only 155 mm), and ultra short tip-to-grip (only 45 mm).*

*i*nnovative features of this technology

150 W micro heating element: allows for standard, long-life, low-cost tips to be removed without replacing the expensive heating element each time the tip wears out.

Ultra fastest heat-up and recovery of all soldering irons that have exchangeable, low-cost tips: room temperature to 350 °C in approx. 9 seconds; from stand-by to 350 °C in approx. 3 seconds.

"One Touch" easy to use operation: user friendly station software with large, multifunctional display has on-line Help Text and easy menu navigator with *i*-Op control.

Automatic Stand-by Motion Sensor: recognizes when the iron is being used and automatically goes into a stand-by temperature when the iron is put into its holder.

***i*-Set Tool:** This optional item allows for automatic download of station settings and lockout by acting as a type of USB stick. Simply upload the station settings from an *i*-CON into the *i*-Set Tool. The *i*-Set Tool is then plugged into any other *i*-CON station, and all set parameters are automatically downloaded in less than 5 seconds, and the station is locked out!

The fastest, safest programming and locking out of soldering stations for maximum quality control and documentation!

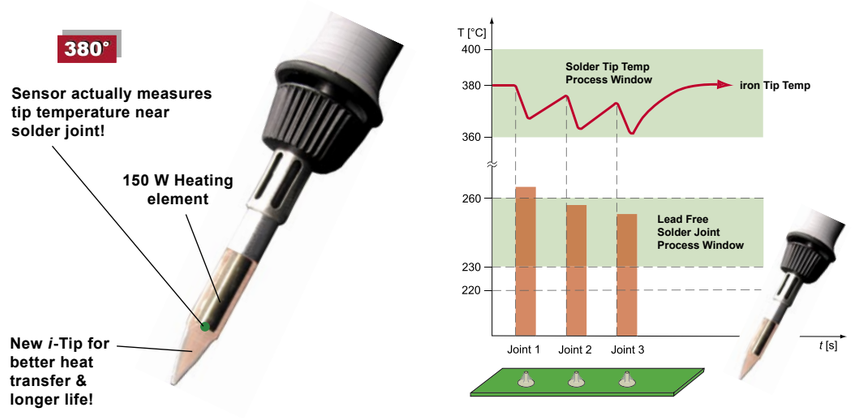
Process Window Alarm: informs operator with a visual and acoustic signal if the soldering iron tip gets too hot or too cold. QC can specify a process window in which the iron is allowed to work, and for the first time ever in the history of hand soldering, it is possible to guarantee that every solder joint is made with the proper temperature!

***i*-Tool calibration:** Unlike other systems, the microprocessor which stores the temperature calibration of the iron is actually located in the PCB handle. This now allows for each individual *i*-Tool to be calibrated independent of the soldering station meaning great time and cost savings. Only the irons need to be taken for calibration, which is much easier and faster!

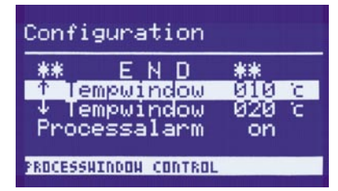
Lead-free *i*-Tips: The low-cost *i*-Tips are specially plated with the new ERSADUR-LF galvanic process lasting 2 to 3 times longer than standard tips!

Power level settings: allows for the use of three different power settings which control the heating element overshoot depending on the heat required. Thus, the operator can choose the right setting for the right job – either more power or more control! Power level "low" guarantees NO OVERSHOOT for maximum component safety!

Safe control is possible when temp sensitive components require NO OVERSHOOT! - power level "low"!



The i-Tool recovers so fast that all solder joints can be made with nearly the same temperature. The sensor measures the actual tip temperature very close to the tip extremity. The Process Window Alarm assists the operators in guaranteeing repeatable quality.



Operator is visually and acoustically alarmed if the tip temperature goes outside of the specified process window

The Ultimate *i*nnovation in Hand Soldering Process Control

Highest quality & repeatability:
This technology offers the world's first Process Window Alarm which notifies operator if they are working outside a specified process window. Each solder joint can now be made with the proper temperature. Overshoot is not possible, thereby reducing lifted pads and damaged components! All systems can be locked out, thereby guaranteeing repeatability. Individually calibrated *i*-Tools can follow an operator in order to deliver best results anywhere in the factory.

Highest productivity:
This technology offers ultra fast heat-up and recovery. Additionally, QC managers can use the optional *i*-Set Tool for the fastest station setting and lockout available on the market – less than 5 seconds! Finally, individual *i*-Tool calibration will greatly increase calibration productivity.

Lowest running costs:
This technology offers long tip life with low tip prices compared to all high powered soldering irons using expensive heating cartridge tips. Station setting, maintenance and calibration costs will be reduced dramatically.

ERSA *i*-CON2:
Multiple Soldering and Des oldering Tools for Maximum Flexibility

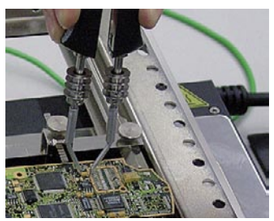
Chip tool
SMT desoldering pincette for low-temperature, safe SMD soldering

Fig. 0IC2000AC

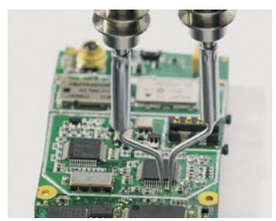
Today's PCBs are becoming more complex with smaller and more densely compact components. In order to meet these difficult hand soldering touch-up and repair challenges, ERSA continues to be a market leader in supplying special tools for special applications.

i-CON2 offers all the value-added features of the revolutionary *i*-CON in a double iron digital station with multiple soldering and / or desoldering tools for maximum flexibility.

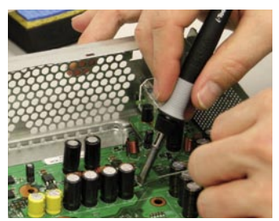
The Chip tool is based on a "Best Seller" in rework tools, but has been re-designed for improved ergonomics and precision repair. This newly designed heated pincette offer a wide range of SMT desoldering tips for safe and fast removal of the smallest chips (0201, 0402, etc.) up to medium size PLCCs. Even large PLCCs up to 84 pins can be safely removed when using the Chip tool in combination with the IRHP 200 heating plate (see page 10).



SMD removal application



Special tips for 0201 rework



High-mass SMD soldering in hard-to-reach areas

Fig. 0IC2000AXT

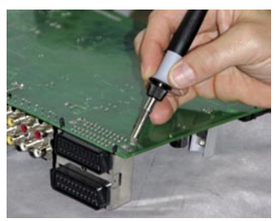
The X-Tool is an extremely high powered desoldering iron which has been specifically designed for the toughest through-hole desoldering applications on the heaviest of PCBs. Safe lead-free desoldering is much more challenging due to the higher process temperatures and will require a desoldering tool which can function effectively at the lowest possible temperature.

The ERSA X-Tool with 120 W can allow operators to conduct through-hole repair at the lowest and safest temperatures possible. The unique "Heat Reservoir" concept guarantees the shortest dwell times and the tip temperature control guarantees the fastest recovery. This unit must be used in combination with the CU vacuum unit.

Four versions of this new double station are offered standard and differ only in the tool packout:

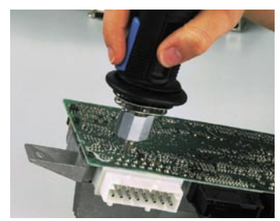
1. One *i*-Tool soldering iron
2. Two *i*-Tool soldering irons
3. *i*-Tool and Chip tool for SMD removal
4. *i*-Tool and X-Tool for TH desoldering.

The tools are automatically detected when inserted into the station and a pre-determined program is started.



High-mass through-hole soldering

Lead-free desoldering with heating plate (IRHP 200)



High-mass through-hole desoldering

X-Tool
High-power, low-temperature, safe through-hole desoldering

102 / 422 / 722
ERSADUR Long-Life Soldering and Desoldering Tip Series

102 Tip Series – i-Tool

0102PDLF02 — pencil point, 0.2 mm ø

0102PDLF03L ❶ — pencil point, extended, 0.3 mm ø

0102PDLF04 — pencil point, 0.4 mm ø

0102PDLF04L — pencil point, extended, 0.4 mm ø

0102PDLF05L ❶ — pencil point, extended, 0.5 mm ø

0102PDLF06 ❶ — pencil point, 0.6 mm ø

0102PDLF06L ❷ — pencil point, extended, 0.6 mm ø

0102PDLF07 — pencil point, 0.7 mm ø

0102PDLF08L ❶ — pencil point, extended, 0.8 mm ø

0102PDLF10 — pencil point, 1.0 mm ø

0102CDLF12 — chisel-shaped, 1.2 mm ø

0102CDLF16 — chisel-shaped, 1.6 mm ø

0102CDLF18L ❶ — chisel-shaped, extended, 1.8 mm ø

0102CDLF20 — chisel-shaped, 2.0 mm ø

0102CDLF24 — chisel-shaped, 2.4 mm ø

0102CDLF32 — chisel-shaped, 3.2 mm ø

0102CDLF50 — chisel-shaped, 5.0 mm ø

0102SDLF06 — pencil point, bent, 0.6 mm ø

0102SDLF06L — pencil point, bent, extended, 0.6 mm ø

0102SDLF08L ❷ — pencil point, bent, extended, 0.8 mm ø

0102ADLF13 ❶ — angled face, 1.3 mm ø

0102ADLF15 ❶ — angled face, 1.5 mm ø

0102ADLF20 — angled face, 2.0 mm ø

0102ADLF40 — angled face, 4.0 mm ø

0102WDLF16 — PowerWell with concave portion, 1.6 mm ø

0102WDLF23 — PowerWell with concave portion, 2.3 mm ø

0102WDLF35 — PowerWell with concave portion, 3.5 mm ø

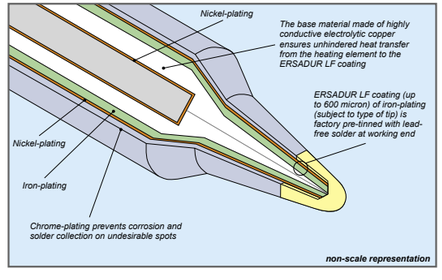
0102BDLF20 — PLCC blade

0102CDLF65 ❶ — chisel-shaped, 6.5 mm ø

0102CDLF100 — chisel-shaped, 10.0 mm ø

❶ Available as of March 2007
❷ Available as of April 2007

Cross-section of an ERSADUR soldering tip



422 Tip Series – ChipTool

0422FD10 — 4 mm, for e.g. SO 8 GT/14 GT/16 GT

0422ED — 6 mm, for e.g. SOIC 8

0422FD3 — 7.5 mm, for e.g. SOIC 12 / SOT 23

0422FD1 — 10 mm, for e.g. SOIC 16

0422FD4 — 12.5 mm for e.g. SOIC 20

0422FD2 — 15 mm, for e.g. SOIC 24

0422FD5 — 17.5 mm, for e.g. SOIC 28

0422FD6 — 20 mm, for e.g. SOIC 32

0422FD7 — 25 mm, for e.g. SOIC 40*

0422QD5 — 90°, length 10 mm, for e.g. PLCC 20

0422QD1 — 90°, length 12.5 mm, for e.g. PLCC 28

0422QD6 — 90°, length 15 mm, for e.g. QFP, TQFP and TQFP 0T25

0422QD3 — 90°, length 17.5 mm, for e.g. PLCC 44

0422QD4 — 90°, length 20 mm, for e.g. PLCC 52

0422QD2 — 90°, length 25 mm, for e.g. PLCC 68*

0422QD7 — 90°, length 30 mm, for e.g. PLCC 84*

0422RD1 — length 22.5 x 16.5 mm, for e.g. QFP 100*

0422RD2 — length 15 x 12.5 mm, for e.g. PLCC 32

0422MD — ellipse, for MELF and MINIMELF

0422SD* — for MICROMELF

722 Tip Series – X-Tool

0722ED0821 — ERSADUR, ID 0.8 mm, OD 2.1 mm

0722ED1023 — ERSADUR, ID 1.0 mm, OD 2.3 mm

0722ED1226 — ERSADUR, ID 1.2 mm, OD 2.6 mm

0722ED1529 — ERSADUR, ID 1.5 mm, OD 2.9 mm

0722EN0818 — nickel-plated, ID 0.8 mm, OD 1.8 mm

0722EN0823 — nickel-plated, ID 0.8 mm, OD 2.3 mm

0722EN1020 — nickel-plated, ID 1.0 mm, OD 2.0 mm

0722EN1023 — nickel-plated, ID 1.0 mm, OD 2.3 mm

0722EN1223 — nickel-plated, ID 1.2 mm, OD 2.3 mm

0722EN1529 — nickel-plated, ID 1.5 mm, OD 2.9 mm

0722EN1548 — nickel-plated, ID 1.5 mm, OD 4.8 mm

0722EN2332 — nickel-plated, ID 2.3 mm, OD 3.2 mm

0722EN2348 — nickel-plated, ID 2.3 mm, OD 4.8 mm

0722EN0615S — nickel-plated, ID 0.6 mm, OD 1.5 mm

0722EN1018S — nickel-plated, ID 1.0 mm, OD 1.8 mm

* Recommanded for use with IRHP 200

Special Care for ERSADUR Long-Life Soldering Tips

*The ERSA **Tip-Reactivator** allows the regeneration of oxidized soldering tips. It is environmentally safe, free of lead and halogens and functions even at low soldering tip temperatures.*

The ERSA Dry Sponge is included as a standard alternative to the wet sponge and can be beneficial especially for lead-free.

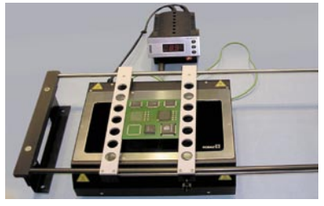
Hand soldering operators are happy when their soldering tips last a long time and continue to solder well. Soldering tips that do not allow the solder to melt rapidly due to excess oxidation clearly disrupt productivity! Lead-free soldering requires special care of the soldering tips in order to solder efficiently.

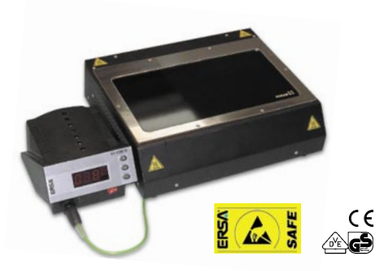
1. Always clean the tip by wiping on a slightly wet sponge after each use. Alternatively, tips can be dry cleaned using the dry sponge.
2. Always put fresh solder onto the end of the tip BEFORE putting the tip back into the iron holder.
3. Always use the lowest working temperature possible.
4. Never leave an iron “cooking” unattended for some time. Always set iron into automatic stand-by if possible or turn-off when not in use.
5. Never use excessive mechanical force when soldering.
6. Soldering tip oxidation can be easily removed if detected early. Early detection and removal will greatly increase tip life.
7. Tip oxidation removal or tip refurbishing is accomplished in 4 consecutive steps: a. clean on damp or dry sponge, b. clean with wire brush, c. using a tip reactivator chemical, and d. re-tinning using proper flux cored solder wire.

Dry cleaning of soldering tips offers substantial advantages. The soldering tips are not cooled abruptly and contaminated tips resulting from dirty sponges are avoided. Due to the slightly abrasive properties of the special wire mesh, passive layers that accumulated on the tip can easily be removed. Tip life is thus increased considerably in lead-free hand soldering.

ERSA IRHP 200: Infrared Rework Heating Plate

An optionally available PCB X-Y table (0IR5500-01) assists in board stability during preheating and rework, and the optional cooling fan (0IR550-13) gently cools the PCB after preheating.





The ERSA IRHP 200 integrates the proven safe medium wavelength infrared (IR) heating technology.

This table top unit has been designed as a compact temperature-controlled heating plate to preheat all SMD components as well as assemblies and substrates. By safely preheating an assembly before the use of repair tools, the actual repair procedure can take place faster and at lower temperatures. Lower repair temperatures and shorter repair dwell times translate into safer and more repeatable results! It can also be used to reflow solder one-sided SMD boards and for reballing BGAs.

The heating plate temperature can be adjusted continuously from 120 °F / 50 °C to 1,100 °F / 600 °C. The medium wavelength IR emitters guarantee uniform heat distribution ensuring non-contact, gentle heating of the assembly. The control station can be placed independently from the heating plate on the workbench in an ergonomically favourable way.

ERSA *i*-CON & *i*-CON2: Different Models

0IC1000A **ERSA *i*-CON with *i*-Tool**

Electronically temperature-controlled soldering station, antistatic, complete

consisting of:
- **0IC103A** Electronic station, 220 - 240 VAC / 50 Hz, 80 W
- **0100CDJ** *i*-Tool soldering iron with tip 0102CDLF16, 24 V, 150 W max.
- **0A48** Holder, antistatic

0IC1000A

0IC1000AC **ERSA *i*-CON with Chip tool**

Electronically temperature-controlled SMD desoldering station, antistatic, complete

consisting of:
- **0IC103A** Electronic station, 220 - 240 VAC / 50 Hz, 80 W
- **0450MDJ** Chip tool desoldering pincette, 24 V, 2 x 20 W, with tip 0422MD
- **0A43** Holder, antistatic

0IC1000AC

0IC1000AXT **ERSA *i*-CON with X-Tool**

Electronically temperature-controlled desoldering station, antistatic, complete

consisting of:
- **0IC103A** Electronic station, 220 - 240 VAC / 50 Hz, 80 W
- **0720ENJ** X-Tool desoldering iron, 24 V, 2 x 60 W, antistatic, with tip 0722EN1223
- **0A44** Holder, antistatic
- **0CU103A** Vacuum unit for X-Tool

0IC1000AXT

0IC2000A **ERSA *i*-CON2 with one *i*-Tool**

Electronically temperature-controlled soldering station, antistatic, complete

consisting of:
- **0IC203A** Electronic station, 220 - 240 VAC / 50 Hz, 120 W
- **0100CDJ** *i*-Tool soldering iron with tip 0102CDLF16, 24 V, 150 W max.
- **0A48** Holder, antistatic

0IC2000A

0IC2000AIT **ERSA *i*-CON2 with 2 *i*-Tools**

Electronically temperature-controlled twin soldering station, antistatic, complete

consisting of:
- **0IC203A** Electronic station, 220 - 240 VAC / 50 Hz, 120 W
- **0100CDJ** 2 x soldering iron *i*-Tool with tip 0102CDLF16, 24 V, 150 W max.
- **0A48** 2 x holder, antistatic

0IC2000AIT

0IC2000AC **ERSA *i*-CON2 with *i*-Tool and Chip tool**

Electronically temperature-controlled SMD soldering and desoldering station, antistatic, complete

consisting of:
- **0IC203A** Electronic station, 220 - 240 VAC / 50 Hz, 120 W
- **0100CDJ** *i*-Tool soldering iron with tip 0102CDLF16, 24 V, 150 W max.
- **0A48** Holder, antistatic
- **0450MDJ** Chip tool desoldering pincette, 24 V, 2 x 20 W, with tip 0422MD
- **0A43** Holder, antistatic

0IC2000AC

0IC2000AXT **ERSA *i*-CON2 with *i*-Tool and X-Tool**

Electronically temperature-controlled soldering and desoldering station, antistatic, complete

consisting of:
- **0IC203A** Electronic station, 220 - 240 VAC / 50 Hz, 120 W
- **0100CDJ** *i*-Tool soldering iron with tip 0102CDLF16, 24 V, 150 W max.
- **0A48** Holder, antistatic
- **0720ENJ** X-Tool desoldering iron, 24 V, 2 x 60 W, antistatic, with tip 0722EN1223
- **0A44** Holder, antistatic
- **0CU103A** Vacuum unit for X-Tool

0IC2000AXT

Technical data:

ERSA *i*-CON & *i*-CON2 Electronic Station	
Supply voltage; frequency:	220 – 240 VAC/50Hz; 110 – 120 VAC/60 Hz (option)
Admissible ambient temperature:	0 °C – 40 °C / 0 – 104 °F
Secondary voltage:	24 V~
Continuous rating:	80 W (120 W with *i*-CON2) protection class I (double insulation)
Weight:	2 kg / 4.4 lb
Control technology:	*i*-Tool: *i*-TRONIC control with digital PID algorithm and multiple sensors; X-Tool: SENSOTRONIC control system with digital PID algorithm; Chip tool: RESISTRONIC control system
Temperature range:	continuous 150 °C – 450 °C / 300 °F – 842 °F
Display:	blue LCD display
Operation:	one-touch operation by means of a rotary type push button
Supply line:	2 m / 6.5 ft PVC with connector
Antistatic:	antistatic design suitable for operation in an ESD environment. MIL-SPEC/ESA standard
Non-operative temperature fluctuation:	less than +/-2 °C / +/-36 °F
Tip to ground resistance:	less than 2 Ω
Tip leakage:	less than 2 mVeff, VDE, EMV checked
Fuse rating:	800 mA, slow-blow (1.25 A, slow-blow with *i*-CON2)
Connectable soldering and desoldering tools:	*i*-Tool, Chip tool, X-Tool

ERSA *i*-Tool soldering iron	
Voltage:	24 V~
Maximum heating power:	150 W +/- 10 %
Mean heating power:	80 W
Heating time:	approx. 9 s to 350 °C / 662 °F
Weight (without supply line):	approx. 30 g / 1 oz
Supply line:	1.5 m / 5 ft highly flexible, heat-resistant, antistatic
Antistatic:	antistatic design suitable for operation in an ESD environment. MIL-SPEC/ESA standard

ERSA Chip tool desoldering pincette	
Voltage:	24 V~
Maximum heating power:	PTC 2x30 W / 280 °C / 536 °F; 2x20 W / 350 °C / 662 °F
Heating time:	subject to the desoldering tip
Weight (without supply line):	approx. 75 g / 2.6 oz
Supply line:	1.2 m ultra-flexible, heat-resistant, antistatic
Antistatic:	antistatic design suitable for operation in an ESD environment. MIL-SPEC/ESA standard

ERSA X-Tool desoldering device	
Voltage:	24 V~
Maximum heating power:	2 x 60 W at 350 °C / 662 °F
Heating time:	subject to the desoldering tip
Weight (incl. supply line and tip):	approx. 240 g / 8.5 oz
Heating elements:	2, 60 W each at 350 °C / 662 °F
Temperature measurement:	Ni-CrNi thermocouple
Starting vacuum:	up to 800 mbar
Distance from handle to soldering tip:	approx. 70 mm / 27.6 in
Antistatic:	antistatic design suitable for operation in an ESD environment. MIL-SPEC/ESA standard

ERSA Vacuum Unit	
Voltage / Power:	230 V~, 50-60 Hz, 5 W; 115 V~, 60 Hz, 5 W (option)
Noise level:	approx. 55 db (A)
Weight:	550 g / 19.4 oz
Ultimate vacuum:	approx. 800 mbar
Throughflow:	approx. 4.5 l/min
Antistatic:	antistatic design suitable for operation in an ESD environment. MIL-SPEC/ESA standard

Learn more under www.ersa-i-tool.com or contact ERSA directly.

ERSA GLOBAL CONNECTIONS

www.ersa.com

More than 70 ERSA representatives in over 65 countries.

Headquarters
ERSA GmbH
Leonhard-Karl-Str. 24
97877 Wertheim / Germany
Phone: +49 (0) 9342 / 800-0
Fax: +49 (0) 9342 / 800-100
e-mail: info@ersa.de
www.ersa.de

America
ERSA North America
A Division of KURTZ North America Inc.
1779 Pilgrim Road
Plymouth, WI 53073
USA
Phone: 800 363 3772
Fax: +1 920 893 3322
e-mail: infoersa@kna.net
www.ersa.com

Asia
ERSA Asia Pacific
A Division of KURTZ Far East Ltd.
Suite 3505, 35/F.,
China Resources Building
26 Harbour Road, Wan Chai
Hong Kong
Tel.: +852 2331 2232
Fax: +852 2758 7749
e-mail: kurtz@kfe.com.hk
www.ersa.com

Room 601, 6th Fl. Beethoven Plaza
1158 Chang Ning Road
Shanghai 200051
China
Tel.: +86 (21) 5241 6000
Fax: +86 (21) 5241 9918
e-mail: kurtz@kurtz.com.cn
www.ersa.com

Kurtz

Industrial Technology Companies