Handbook for Electronics Tools: Soldering Irons and More (5)

Franz Höpfinger

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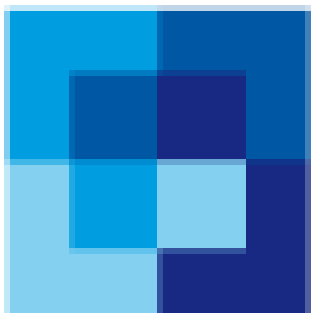
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myst: enable_extensions: [“colon_fence”] html_meta: “description lang=en”: “metadata description” “description lang=de”: “metadata description” “description lang=fr”: “description des métadonnées” “keywords”: “Sphinx, MyST” “property=og:locale”: “de”

- PDF Handbook

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1. Wiki 5: Tool & Measuring Equipment Handbook (Manufacturing, Measuring & Diagnostic Tools)



Meisterschulen am Ostbahnhof

1.1 Master Craftsman Schools at Munich East Station

🛠️ **Definition of Tools in our Documentation:**

By "tools" we mean the **entire range of workshop equipment** – not only production tools (soldering, crimping), but especially **all diagnostic and measuring tools** (oscilloscopes, multimeters, CAN testers, digital microscopes) as well as the **workshop infrastructure** (laboratory power supplies, ESD protection, compressors).

1.1.1 📋 This is stated in the curriculum (Framework Curriculum 2025)

Soldering, circuit board assembly, crimping techniques, and measuring instruments are the main practical skills of the Framework Curriculum 2025 for the production and repair of cable harnesses, connectors, control units, and mechatronic assemblies (LandBauMechMstrV of September 9, 2024, effective August 1, 2025).

- 📋 **This is in the curriculum – Tool & Craft Practice in the curriculum**
- 🔌 Crimping Techniques & Cable Harness Manufacturing (German/AMP, LE 1.3 / 40 teaching units)
- 🔪 Soldering Techniques, PCB Assembly & Rework (SMD/THT/Hotair, LE 1.3 & LE 2.2)
- 🔬 Measuring Instruments & Workshop Equipment (Oscilloscope/Lab Power Supply, LE 1.2 & LE 1.3)

Welcome to the documentation on electronic tools.
This documentation is part of the knowledge database of the master craftsman schools at Munich East Station.

- 📋 **This is in the curriculum (Curriculum 2025)**
- 🏠 Main Menu

- 🔍 Super Search (all wikis)
- 📄 Download PDF Handbook

!!! note Questions/Suggestions: Go here:
Discussion Forum
!!! note This project is under active development.

1.2 Contents

🏠 Main Menu | 🔍 Super Search (all wikis) | Quick Search (IEC 61499)

1.2.1 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 PCB Design & Assembly on ms-muc-docs.de

2. Welcome

3. 📋 This is what the curriculum covers: Electronics tools & manual skills

📌 **Source & Legal Basis: Source:** *Framework curriculum for preparing for the master craftsman's examination in agricultural and construction machinery mechatronics* **Publisher:** German Association of Agricultural and Construction Machinery Mechatronics Engineers (LandBauTechnik-Bundesverband e. V.), Alfredstraße 102, 45131 Essen (as of February 25, 2025) **Regulation:** *Master Craftsman Examination Regulation (LandBauMechMstrV)* of September 9, 2024 (Federal Law Gazette 2024 I No. 277, effective August 1, 2025)

3.1 🎯 Practical and manual skills are integrated into the 2025 curriculum

The mechatronics trade combines mechanics, electronics, and control technology. In the new 2025 curriculum framework, the **practical and manual skills** of wiring, crimping, soldering, circuit board assembly, and the professional use of workshop measuring instruments are **direct prerequisites** for completing the master craftsman's project (Part I) and for proper workshop maintenance (Part II).

Master craftsmen and women must professionally manufacture cable harnesses, crimp gas-tight connectors, repair/assemble circuit boards, and perform diagnostics using oscilloscopes and laboratory power supplies.

3.2 🧰 Three categories of tools in master craftsman training

This wiki covers all three tool categories required by the 2025 curriculum framework:

1. 🔬 **Measuring & diagnostic tools (analytical tools):**

- **Oscilloscopes:** CAN bus waveform analysis, PWM verification.
- **CAN Testers & Interfaces:** PEAK, Busmaster, AEF Check Tool for bus diagnostics.
- **Multimeters:** Voltage, current, resistance, continuity, frequency.
- **Digital Microscopes:** Optical quality inspection of SMD solder joints and crimp contacts.

1. **Production & Manufacturing Tools (Processing Tools):**

- **Soldering Technology:** JBC/Aixun/Ersa soldering stations, hot air rework, hot plates (preheating plates), desoldering braid.
- **Crimping Technology:** 4-notch hand crimpers for Deutsch connectors (DT/DTM), AMP Superseal, hydraulic crimping pliers for large cross-sections.
- **Hand Tools:** Precision tweezers, side cutters, wire strippers.

1. ⚡ **Workshop Infrastructure & Equipment (Supply Tools):**

- **Laboratory Power Supplies:** Current-limited power supplies for safe initial setup.
- **Compressors & Solder Paste Dispensers:** Pneumatic tools.
- **ESD Equipment:** Protection against electrostatic discharge.

3.3 📚 Curriculum Modules & Focus Areas

3.3.1 1. 🔌 Crimping Technology & Cable Harness Manufacturing

- **Curriculum Reference:** Part I LE 1.3 (40 units) | Part II LE 1.2 (40 units)
- **Focus Areas:** Manufacturing of cable harnesses, professional crimp connections (Deutsch connectors DT/DTM, AMP Superseal), hydraulic crimping pliers for large cross-sections, pin removal tools, strain relief & protective tubing.

3.3.2 2. 🔪 Soldering Techniques, PCB Assembly & Rework

- **Curriculum Reference:** Part I LE 1.3 & LE 2.2 | Part II LE 1.2 (40 hours)
- **Focus Areas:** Soft & hard soldering, PCB assembly (THT/SMD), ECU repair, hot air stations (hot air rework), hot plates, JBC/Aixun/Ersa soldering systems, desoldering braid & microscopy.

3.3.3 3. 🔬 Measuring Instruments & Workshop Equipment

- **Curriculum Reference:** Part I LE 2.1 & LE 2.2 | Part II LE 1.3 (100 hours)
- **Focus Areas:** Diagnostic technology, oscilloscope measurements on the CAN bus and sensors, laboratory power supplies for component testing, multimeter functions, tool maintenance & workshop organization.

3.4 ⏱️ Relevant teaching hours in the curriculum

Field of activity / Learning unit	Total hours	Practical relevance (soldering / crimping / measuring)
Part I – LE 1.3 (Practical Installation)	**40 hours**	Practical cable harness fabrication, crimping, installation of mechatronic components
Part I – LE 2.2 (Troubleshooting & Repair)	**40 hours**	Repair of plug connectors, soldering of replacement components, signal measurement
Part II – LE 1.2 (Maintenance)	**40 hours**	Quality Assurance of Soldered/Crimped Connections, Tool Selection & Maintenance
Part II – LE 1.3 (Diagnostic Technology)	**100 hours**	Use of Oscilloscopes, Laboratory Power Supplies & Desoldering Tools

** —

3.4.1 🌐 Related Topic Subpages on ms-muc-docs.de

- 🌐 Interactive JBC Soldering Tip Guide & Infographic on ms-muc-docs.de
- 🌐 Eclipse 4diac IDE & Color Reference on ms-muc-docs.de
- 🌐 PCB Design & Assembly on ms-muc-docs.de
- 🌐 The PWM Signal & Infographic on ms-muc-docs.de

3.5 🔗 Main Portal & Direct Links to the 6 Wikis

Wiki	Topic / Description	Link

Wiki 0	**Master Schools Wiki** General information, Curriculum 2025 & Main Wiki.	📖 Open
Wiki 1	**C Programming in ISOBUS** Fundamentals of C programming and the ISOBUS environment.	🚜 Open
Wiki 2	**ISOBUS Virtual Terminal** User interfaces, ISO Designer & VT objects.	🖥️ Open
Wiki 3	**ISOBUS Technology & Machine Systems** Hydraulics, pneumatics, motors, high-voltage technology, gearboxes & machine safety.	📡 Open
Wiki 4	**Visual Programming Languages** Low-code development, IEC 61499 & 4diac IDE (main curriculum topic).	🧩 Open
Wiki 4.1	**4diac Library Reference** Function block & adapter reference for the 4diac libraries.	🧩 Open
Wiki 4.2	**4diac Exercises: Training Solutions** Exercises and sample solutions for training with 4diac.	🧩 Open
Wiki 5	**Electronic Tools & Measuring Instruments** Handbook for crimping technology, soldering stations, oscilloscopes & microscopes.	🛠️ Open

3.5.1 📄 PDF Downloads for All Wikis

Wiki	PDF (DE)	PDF (EN)
Wiki 0 – Main Wiki	📄 DE	📄 EN
Wiki 1 – C Programming in ISOBUS	📄 DE	📄 EN
Wiki 2 – ISOBUS Virtual Terminal	📄 DE	📄 EN
Wiki 3 – ISOBUS Technology & Machine Systems	📄 DE	📄 EN
Wiki 4 – Visual Programming Languages	📄 DE	📄 EN
Wiki 4.1 – 4diac Library Reference	📄 DE	📄 EN
Wiki 4.2 – 4diac Exercises	📄 DE	📄 EN
Wiki 5 – Electronic Tools	📄 DE	📄 EN

🌐 **Central Portal of the Munich Master Schools:**
Visit the main platform: **www.ms-muc-docs.de** | 📋 Interactive Curriculum Framework 2025 | 📚 Wiki Overview | 📄 PDF Downloads

4. Electrical

4.1 Crimping

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4.1.1 Hand pliers

4.1.1.1 amp

🎧 **Podcast**

- Industrial Revolutions: From Steam Engine to AI – A Deep Look into 250 Years of Automation
- From Steam to IoT: The Evolution of Industrial Automation and PLCs
- Ada Lovelace: The Poet of Science – Visionary, Programmer, and the Fight for Digital Heritage
- Bronze Giant and Culture Clash: The Spectacular Creation of the Bavaria Statue, and the Impact Between
- Hot-Bulb Engine: The Ingenious Third Way Between Diesel and Gasoline – Lanz Bulldog, Blowtorch, and the Hot-Bulb Engine
-

4.1.1.2 German

🎧 **Podcast**

- [The Technology Panorama of 1863: Lanz & Comp. and the Revolution of German Agriculture through Import, Innovation, and Guano
- [Industry 4.0: Hype or Revolution? What's Really Happening in German Factories
- [Assembly Tractors: How Small Manufacturers with Purchased Engines and Transmissions Are Influencing German Agriculture
- [Learning to Learn as a Master Craftsman: Self-Directed Through the German Curriculum for Agricultural and Construction Machinery Mechatronics Technicians
- [Oskar von Miller: Genius, Power Player, Visionary – How the Man Behind the German Museum Bavaria

German crimping tool set

https://de.aliexpress.com/item/1005001309669223.html]

4.1.2 hydraulic

4.1.2.1 Hydraulic crimping pliers

https://www.ebay.de/itm/134330427208

4.2 measuring devices

4.2.1 Combination device

https://www.youtube.com/watch?v=uXhDyImpS9M https://www.amazon.de/Handheld-Oszilloskop-Oszilloskop-1-Universalpr%C3%BCfger%C3%A4t-Typ-C-Schnittstelle-5-Zoll-Farb-LCD-Display/dp/B08ZHV4CS1 https://www.reichelt.de/handheld-oszilloskop-25-mhz-1-kanal-multimeter-utd-1025-cl-p123967.html https://www.reichelt.de/3-in-1-geraet-oszilloskop-signalgenerator-dmm-70-mhz-2-kanal-joy-it-dmso2d72-p268021.html

5. Electronics

Electronics is an essential part of modern life. It's all around us, enabling us to control and operate our devices and machines. In this section of the tool documentation, you'll find all the information you need to deepen your knowledge of electronics. From the basics to advanced topics, you'll learn everything you need to know to successfully plan and implement electronic projects. So, let's get started! Electronics are an integral part of our modern lives. It's all around us, allowing us to control and operate our devices. In this section, you'll find all the information you need to deepen your knowledge of electronics. From the basics to advanced topics, you'll learn everything you need to know to successfully plan and implement electronic projects. So, let's get started! ...

5.1 🎧 Podcast

- Bipolar vs. FET: Why your smartphone doesn't glow and how transistors shape our electronics
- Kirchhoff's Voltage Law: How forklifts & electronics understand voltage / Kirchhoff's Second Law (Kirchhoff's Voltage Law)
- Electronics Primer Compact: Voltage, current, resistance and the diode
- Soldering Masterclass: Professional tricks for precision electronics
- Mastering Ohm's Law: The Electronics Primer explains series circuits, parallel circuits and the Me

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5.1.1 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Ohm's Law & Formula Wheel on ms-muc-docs.de
- 🌐 Kirchhoff's Laws on ms-muc-docs.de
- 🌐 Total Resistance in Series & Parallel Circuits on ms-muc-docs.de
- 🌐 Diode & Semiconductor Fundamentals on ms-muc-docs.de

5.2 Hand tools

5.2.1 Tweezers

5.2.2 Side cutters

5.3 Soldering

Quote:

> Soldering is a thermal process for joining materials by creating a metallurgical bond. A liquid phase is formed either by melting a solder (soldering) or by diffusion at the interfaces (diffusion soldering). This creates a surface alloy, but the workpiece is not melted to its core: the liquidus temperature of the base materials is not reached. After the solder solidifies, a metallurgical bond is formed, similar to welding. The difference from welding lies in the fact that in welding, the liquidus temperature of the components to be joined is significantly exceeded, while in soldering, although the chemical bond may be the same, the liquidus temperature is hardly or not at all exceeded. The chemical composition of the joint differs depending on the materials used (welding wire in welding, solder paste or solder wire in soldering). Source: https://de.wikipedia.org/wiki/L%C3%B6ten

5.3.1 Soft Soldering

Soft soldering is a common method for connecting electronic components. Here are the steps for soft soldering:

1. **Prepare Materials**:

- **Soldering Iron**: A soldering iron with a fine tip is required.
- **Solder**: Use high-quality solder with a suitable flux.
- **Flux**: Flux helps clean the surfaces and facilitates the soldering process.
- **Circuit Board and Components**: Ensure the circuit board is clean and free of oxidation.

1. **Position Components**:

- Place the components in the desired locations on the circuit board.

1. **Heat and Solder**:

- Heat the soldering iron and touch the solder pad on the circuit board.
- Add the solder so that it melts and connects the components.
- Be careful not to use too much solder.

1. **Cooling**:

- Allow the solder joint to cool so that the solder hardens.

1. **Cleaning**:

- Remove excess solder and clean the circuit board.

5.3.2 Soldering on Circuit Boards

Soldering on circuit boards requires special techniques, especially when dealing with **printed circuit boards (PCBs)**. Here are some important points:

- **Traces**: PCBs have copper traces that connect the components.
- **Component Placement**: Place the components on the circuit board according to the schematic.
- **SMD Technology**: Modern PCBs often use **surface-mount devices (SMDs)**. Precision is essential here.

5.3.2.1 Tips

- **Practice makes perfect**: Try soldering on old circuit boards or practice boards.
- **Safety**: Pay attention to safety precautions, especially when using soldering irons.

If you have any further questions or need specific details, I'm happy to help! 😊
Source: Conversation with Copilot, October 6, 2024

1) Getting Started with Soldering - Tutorial for Beginners - Part 2: Hot Air Soldering a Circuit Board. https://www.youtube.com/watch?v=cD-h0lzCGmE.

2) Soldering Explained Simply - Soft Soldering. https://www.youtube.com/watch?v=b0AT86CDySY.

3) Soft Soldering Part 2... Soldering a Vertical Solder Joint. https://www.youtube.com/watch?v=61Zk8QZ6A_Y.

4) Soldering Circuit Boards in 7 Steps - DIY Tutorial - Bonedo. https://www.bonedo.de/artikel/diy-tutorial-platinen-loeten-in-7-schritten/.

5) Instructions for proper soldering – it's that easy - professional guide. https://www.jh-profishop.de/profi-guide/richtig-loeten/.

6) Soldering correctly – tips and tricks for home use - OBI. https://bing.com/search?q=Einf%c3%bchrungsblock+L%c3%b6ten+Weichl%c3%b6ten+L%c3%b6ten+auf+Platinen.

7) Soldering correctly explained step by step | hagebau.de. https://www.hagebau.de/beratung-loeten/.

5.3.3 Information

5.3.3.1 🌐 Relevant topic subpages on ms-muc-docs.de

- 🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)
- 🌐 Circuit board design & assembly on ms-muc-docs.de

5.3.4 Hot Tool

5.3.4.1 hotair

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HotairRework

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5.3.4.2 Hotplate

Hot Plate Mechanic IX5

The **Mechanic IX5** is a versatile hot plate commonly used for preheating printed circuit boards (PCBs) and other soldering tasks. Here are some key features and available attachments:

- **Power**: The hot plate has a maximum temperature of 260 °C[1].
- **Size**: The heating area measures 6 cm x 8 cm[1].
- **Power Supply**: It is available in 110V and 220V versions[2]. Various attachments and accessories are available for the Mechanic IX5, specifically designed for this platform: **PCB Holder**: A holder for PCBs that need to be stabilized during the preheating process[1].

These accessories are typically available directly from the manufacturer or from specialized retailers.

Are you planning a specific project for which you'd like to use the Mechanic IX5? Perhaps I can offer some further advice!

[1]: Mechanic IX5 Ultra Universal Preheating Platform - Mini Hot Plate [2]: Amazon.com: Mechanic IX5 Ultra, Universal Preheating Platform

Source: Conversation with Copilot, October 6, 2024

1) Mechanic IX5 Ultra Universal Preheating Platform - Mini Hot Plate. https://www.youtube.com/watch?v=QQ9InzwVL2g.
2) Mechanic IX5 Ultra Heating Platform Universal PCB Welding Table | REVIEW AMD EXPLANATION VIDEO. https://www.youtube.com/watch?v=B4IVOOXwd7o.
3) Unboxing Mechanic IX5 Pre-Heating Platform for iPhone X/X11/X12 Pro Max. https://www.youtube.com/watch?v=F0ilRPweCDQ.
4) Amazon.com: Mechanic IX5 Ultra, Universal Preheating Platform .... https://www.amazon.com/Universal-Preheating-Platform-Desoldering-Motherboard/dp/B0CNXFDVPC.
5) undefined. https://simlockcommunication.com/product/mechanic-ix5-ultra-heating-platform-universal-pcb-welding-table/.
6) undefined. https://simlockcommunication.com/product/mechanic-ix5.
7) Mechanic IX5 Max - first impression. https://www.youtube.com/watch?v=3PojLW8XlpE.
8) MECHANIC IX5 MINI 10 IN 1... - ATI - Micro Soldering Tools. https://www.facebook.com/atheeqtechnicaltools/videos/mechanic-ix5-mini-10-in-1-preheater-x-to-12-pro-max/488860232113224/.
9) Mechanic IX5 Ultra Heating Platform Universal PCB Welding Table. https://www.diyfixtool.com/products/mechanic-ix5-ultra-heating-platform-universal-pcb-welding-table.
10) Mechanic IX5 iPhone Logic Board Heater - store.rossmanngroup.com. https://store.rossmanngroup.com/ab14-mechanic-ix5-iphone-board-heater.html.

🌐 Related topic subpages on ms-muc-docs.de

- 🌐 PCB design & assembly on ms-muc-docs.de

Mini Hot Plate Preheater MHP30

Miniware also offers a hot plate: https://e-design.com.cn/en/Mini-Hot-Plate-Preheater-MHP30-PG9226717 https://youtu.be/jTQjTvJe_UE https://www.aliexpress.com/item/1005001665675952.html With 60W, it is powered via PD, making it the Miniware device that draws the most power via PD.

The soldering irons can handle a maximum of 30W or 45W.

It is well-suited for desoldering individual chips.

It can also be used to populate small circuit boards up to approximately 35x35mm.

However, it is no longer suitable for larger boards! It's a mini, after all! …


B
A


MHP30



🌐 Related topic subpages on ms-muc-docs.de

- 🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)

Mini Hot Plate Preheater MHP50

https://e-design.com.cn/en/Mini-Hot-Plate-Preheater-MHP50-PG9555615

Hotplate Station

A hotplate should be available in every workshop. Applications:

- Soldering (e.g., SMD assembly, repairs)

- BUT: this only works with single-sided circuit boards.
- – Preheating ball bearings or other rings (https://www.ludwigmeister.de/de/blog/entry/Waelzlager_thermische_Montage - https://www.youtube.com/watch?v=JsVh7m2qA-8])
- Removing LCD screens, e.g., when repairing a phone
- Heating
- liquids, e.g., keeping soup, coffee, or similar warm...
- Heating food, e.g., the cool glasses from Würth: https://www.wuerth.de/web/de/bpm/bpm_lunch2go/lunch2go.php (that's Julia Schäfer, by the way: https://www.tiktok.com/@tschulique))])

Advantages:

- 2 displays: Target and actual temperature display!
- Controlled temperature, much more precise than an oven plate
- Much more even than a hot air gun or a flame.

Sources for Hotplates

####### ET-10

The ET-10 and the ET-20 are used @franz-ms-muc regularly. They work well, however, the slow initial heating is a disadvantage.

https://de.aliexpress.com/i/1005002313668029.html ET-10: €50

####### ET-20

https://de.aliexpress.com/item/1005001582512314.html ET-20: €70

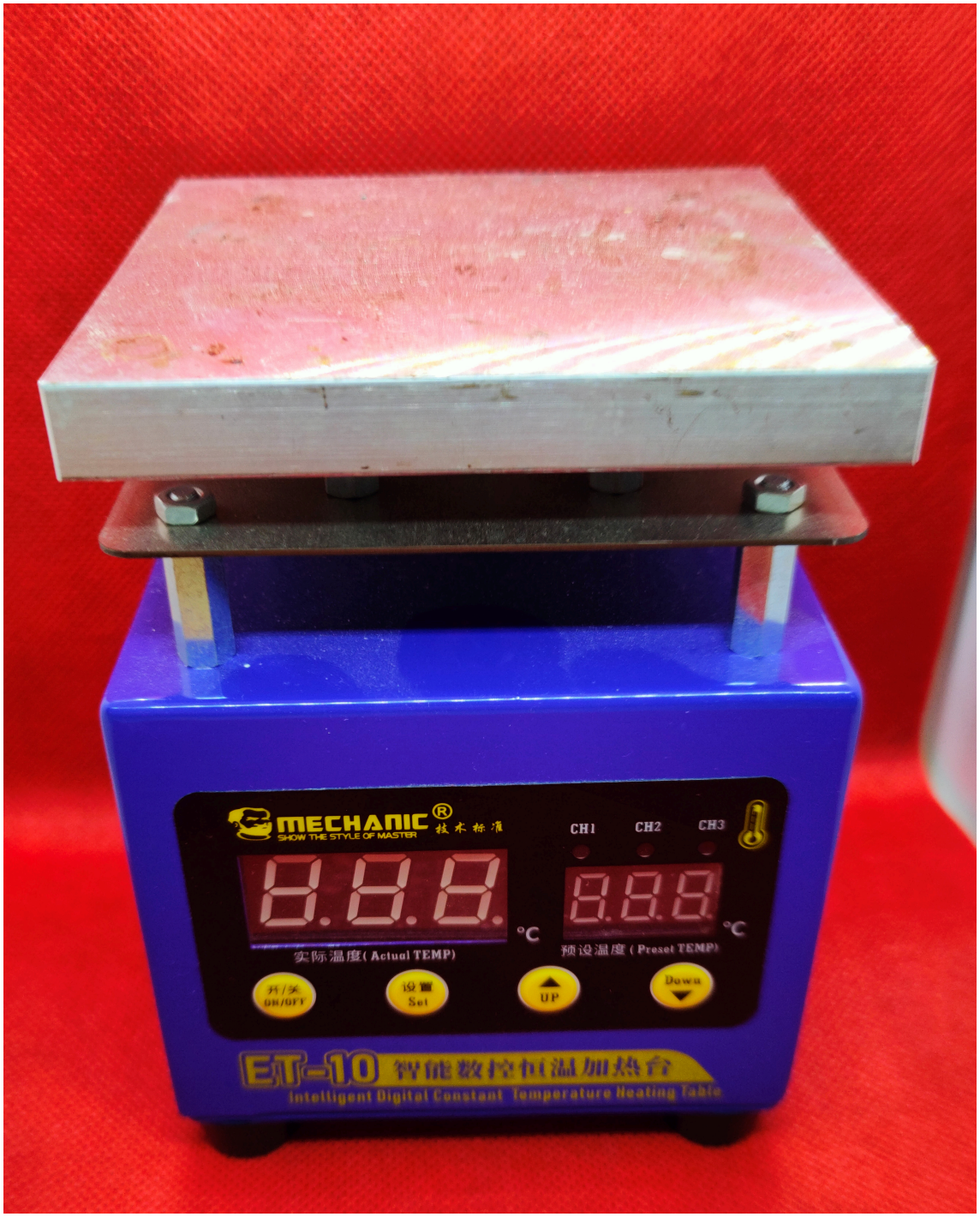
other hotplate

https://de.aliexpress.com/item/1005003126092677.html also has a 100x100 table like the ET-10, but seems to be better in terms of electrical safety!

The scald protection on the side is also an advantage.

Photos ET-10


MECHANIC®
SHOW THE STYLE OF MASTER
技术标准
CH1
CH2
CH3
°C
°C
实际温度(Actual TEMP)
预设温度 (Preset TEMP)
开/关
ON/OFF
设置
Set
UP
Down
ET-10 智能数控恒温加热台
Intelligent Digital Constant Temperature Heating Table



The insulation of the heating wires doesn't make the best impression! Electrical safety Questionable!



Photos ET-20

The ET-20 already has a fairing here; no wires are sticking out anymore!


MECHANIC
合格证
QUALIFIED CERTIFICATE
4006-883-993
Made in China


MECHANIC
CH1 CH2 CH3
实际温度(Actual TEMP)
预设温度(Preset TEMP)
开/关 ON/OFF
设置 Set
UP
Down
ET-20
Intelligent Digital Constant Temperature
智能数控恒温加热台
HEATING TABLE
香港维修佬H.K.MECHANIC COMPANY
realme Shot on realme GT 5G
2022.11.13 19:21



5.3.4.3 Infrared Rework Stations

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Infrared Rework Station T862

The **IR Rework Station T862++** is a versatile and powerful station designed for reworking SMD and BGA components. Here are some key features and specifications:

- **Power**: The station has an output power of 800 W[2].
- **Temperature Range**: The infrared lamp temperature is adjustable from 100 °C to 350 °C, while the preheating plate can reach temperatures from 60 °C to 200 °C[2].
- **Power Supply**: It operates with an input voltage of AC220V/50Hz or AC110V/60Hz[2]. Various attachments and accessories are available for the T862++, specifically designed for this station. These include:
- **Focusing Unit**: Enables precise work by accurately focusing the infrared radiation[2].
- **Various Lenses**: Lenses with different diameters (e.g., 28 mm, 38 mm, 48 mm) are available, which can be used depending on the size of the component being processed.[2]
- **PCB Holder**: A holder for printed circuit boards that need to be stabilized during the rework process.[2]

These accessories are usually available directly from the manufacturer or from specialized distributors.

Are you planning a specific project for which you'd like to use the T862++? Perhaps I can offer some further advice!

Source: Conversation with Copilot, October 6, 2024

1) TAIAN PUHUI T862++ USER MANUAL PDF Download | ManualsLib. https://www.manualslib.com/manual/1133800/Taian-Puhui-T862PlusPlus.html.

2) IRDA SMD & BGA Rework Station T862 User Manual - Happylab: Your 900m² .... http://wiki.happylab.at/images/a/a8/T-862Man.pdf.

3) IRDA SMD & BGA Rework Station T-862++ User Manual - PUHUI T. http://www.puhuit.com/videos/700MBCD/T862++/T-862++%20Manual.pdf.

4) undefined. http://www.puhuit.com.

Versions

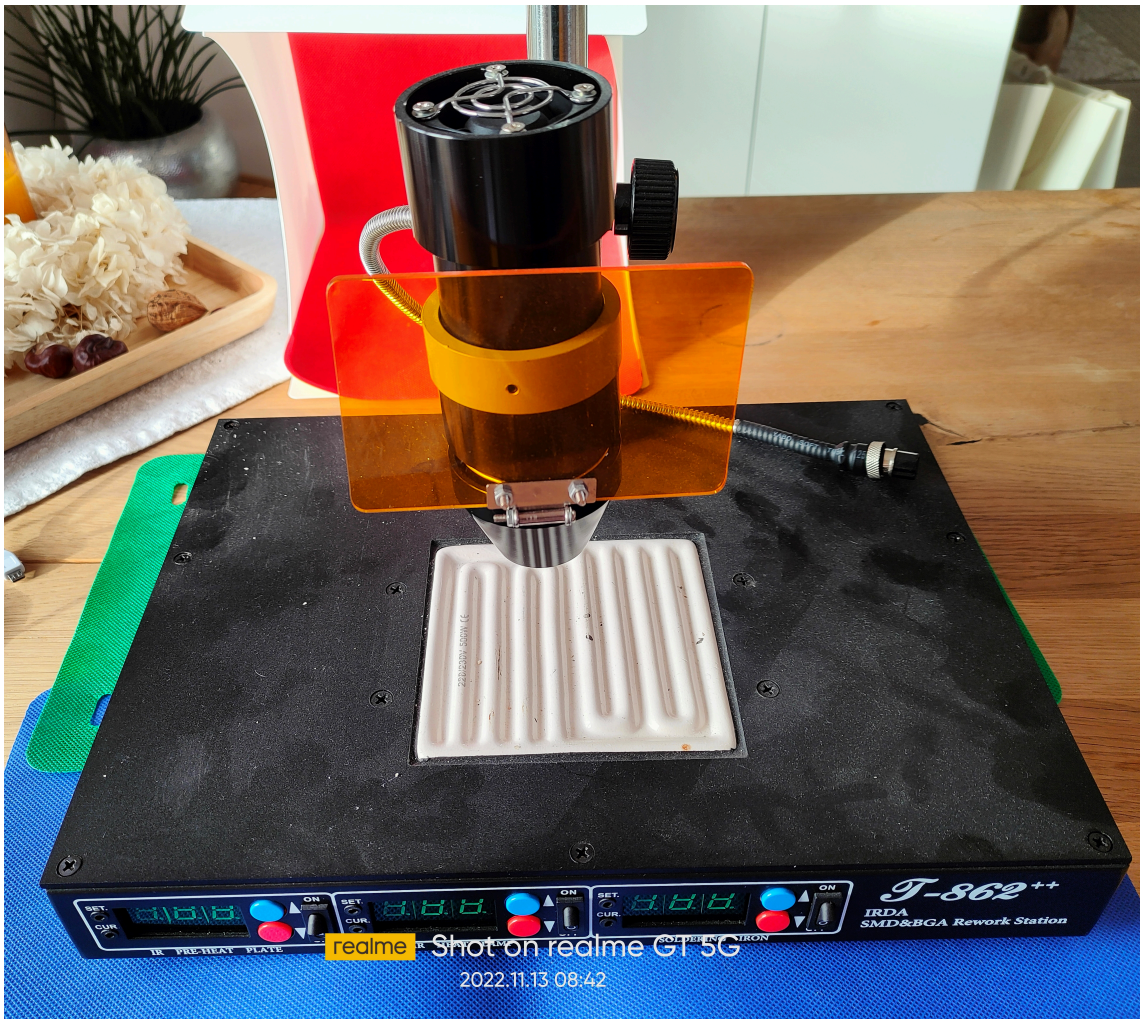
####### T862
####### T862++

Sources for the T862++

https://www.ebay.de/sch/i.html?_nkw=T862%2B%2B&_sacat=0&_from=R40&_trksid=m570.l1313

Since this device is too heavy to ship from China, eBay with shipping from the Czech Republic is recommended.

Photos T862



####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 PCB design & assembly on ms-muc-docs.de

5.3.4.4 Soldering Irons

Welcome to the page about soldering irons! Soldering is an important technique in electronics, allowing us to connect electronic components. A soldering iron is the primary tool used for this. On this page, we'll take a closer look at soldering irons and explain how to use and maintain them correctly. So, if you're new to soldering or simply want to learn more about this useful tool, then read on!

Brand	Name	Power	Tips	Remarks	Link
Weller	WX Line	—	RT active (Weller)	High-End, Smart	weller/
Weller	WT Line	—	LT/XNT passive	Standard Prof.	weller/
Weller	WE 1010	70W	LT/XNT passive	Entry Prof.	weller/
Ersa	i-TOOL (i-CON)	—	Series 102 / 142	German, indoor	ersa/
JBC	T210 (C210)	40W	JBC active C210	Precision	jbc/
JBC	T245 (C245)	130W	JBC active C245	General Purpose (recommended)	jbc/
JBC	T470 (C470)	250W	JBC active C470	High power	jbc/
miniware	TS80P	30W	Weller-like	USB-C PD/QC	miniware/TS-80.md
miniware	TS-100	65W DC	TS100 Series	miniware / IronOS	miniware/TS-100.md
miniware	TS-101	45-90W	TS100 Series	USB-C PD + DC	miniware/TS-101.md
miniware	TS1M	—	JBC		miniware/TS1M.md
miniware	TS21	—	JBC		miniware/TS21.md
miniware	TS1C	—	Weller-like	Battery, cordless	miniware/TS1C.md
PINE64	Pinecil V2	65–88W	TS100 series	Open Source	pinecil/PINECIL-BB2.md
fnirsi	HS-02A	100W PD	JBC C245	2 versions!	fnirsi/HS-02.md
fnirsi	HS-02B	100WPD	JBC C210	2 versions!	fnirsi/HS-02.md
fnirsi	HS-01	65WPD	proprietary	predecessor	fnirsi/HS-01.md
fnirsi	DWS-200	200W	JBC C245/C210	Soldering station	fnirsi/DWS-200.md
I2C PDK	PDK-1200	300W	JBC C210/C115/C245	2 handles	i2c-pdk/PDK-1200.md
I2C PDK	PDK-1200R	300-400W	JBC C470	1 handle + suction cup	i2c-pdk/PDK-1200R.md
AiXun	T208	—	JBC	mobile USB-C	aixun/T208.md
AiXun	T380	—	JBC	compact	aixun/T380.md
AiXun	T413	—	JBC		aixun/T413.md
AiXun	T400	320W	JBC	1 handle	aixun/T400.md

AiXun	T420	400W	JBC	2 handles	aixun/T420.md
Aifen	A902 Pro	—	JBC C210/C245/C115	Dual Station	aifen/
Yihua	982	—	JBC		yihua/YIHUA-982.md
sunshine	S210	110W	JBC C210		sunshine/
sunshine	S245	110W	JBC C245		sunshine/
sequre	S99	—	TS100 compatible		sequre/sequre-S99.md

🌐 Related topic subpages on ms-muc-docs.de

- [🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- [🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)

Aifen

All models: **JBC tips** Link: https://www.sugoncn.com/AifenProducts/list.aspx Soldering irons: https://www.sugoncn.com/AifenProducts/list.aspx?lcid=9

Models

####### AIFEN A902 Pro
Double Welding Station, compatible with C210, C245, and C115.
Link: https://www.diyfixtool.com/products/aifen-a902-pro-double-welding-station-c210-c245-c115-soldering-tool

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####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- 🌐 The right soldering tip for the mechatronics engineer (web app & comparison on ms-muc-docs.de)

AiXun

All models: **JBC tips** Link: https://www.aixun.com/ AiXun is building a highly customized ecosystem – with stations, handles, and even voice control.

Models

Model	Type	Handles	Power
T208	USB-C portable soldering iron	—	—
T380	Compact station	T225	—
T413	Station	T225, T245	—
T400	Station	T225	320W
T420	Dual-Channel Station	T245, T210, T115	400W
BS08	Voice Control / Hub	—	—

Handles T225

Special handles with gyroscope and buttons:
https://www.aixun.com/product/t225-intelligent-4in1-soldering-handle-7-core-plug-soldering-iron/

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- 🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)

AiXun BS08

Voice control for AiXun soldering station. Link: https://www.aixun.com/product/smart-ai-voice-center-control-bs08-aixun-smart-multilanguage-voice-assistant-/

####### Hub EB01

Dual-channel hub for soldering station (purpose unclear): Link: https://www.aixun.com/product/eb01-smart-docking-station-dual-channel-sixintwo-hub-ports-for-soldering-station/

AiXun T208

Portable soldering iron with USB-C, comparable to the TS-101 or FNIRSI HS-02. Soldering tips: **JBC tips** Link: https://www.aixun.com/product/t208-mini-portable-smart-soldering-station-lcd-screen-soldering-iron/

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- 🌐 The right soldering tip for the mechatronics engineer (web app & comparison on ms-muc-docs.de)

AiXun T380

Very compact model. Suitable for **T225 handle**. Soldering tips: **JBC tips** Link: https://www.aixun.com/product/t380-portable-smart-soldering-station-with-t210-t115-handle-welding-tools/

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

AiXun T400

Connection for **1 handle**. Suitable for **T225 handle**. 320W. Soldering tips: **JBC tips** Link: https://aixun.com/product/smart-soldering-workstation-t400-320w-soldering-iron-kit-for-repair-aixun/

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

AiXun T413

Suitable for **T225 handle** and **T245 handle**. Soldering tips: **JBC tips** Link: https://www.aixun.com/product/t413-integrated-smart-soldering-station/

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

AiXun T420

Connection for **2 handles**. Compatible with T245, T210, and T115 (apparently not suitable for T225 handles). Parallel operation, max. **400W**. Soldering tips: **JBC tips** Link: https://www.aixun.com/product/t420d-200w-dual-channel-electronics-soldering-station-with-t245-handle/

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

Ersa

ERSA is a leading German manufacturer of soldering technology and, as part of the Kurtz Ersa technology group, a global leader in electronics manufacturing. ERSA is a leading German manufacturer of soldering technology and part of the Kurtz Ersa Group, a global leader in electronics manufacturing. Link: https://kurtzersa.de/

Product Lines

- **Soldering Stations (i-CON Series):** i-TOOL, i-TOOL NANO, i-TOOL PICO
- **Regulated Power Soldering Irons:** MULTI-TC, PTC 70, MULTI-TIP
- **Standard Power Soldering Irons:** ERSA 30 S / 40 S / 50 S / 80 S / 150 S
- **Workshop Soldering Irons:** ERSA 200, 300, and 550
- **Universal Soldering Irons:** ERSA 15+ and 25+

- **Gas Soldering Irons:** INDEPENDENT 75 / 130

Soldering Tips

Link: https://kurtzersa.de/produkte/elektronikfertigung/loetwerkzeuge/loetspitzen-entloetspitzen
Current Series: **Series 102** and **Series 142**

- **Series 142:** For i-TOOL MK2 and i-TOOL TRACE. Latest generation, fastest response time.
- **Series 102:** For i-TOOL, i-TOOL NANO, i-TOOL PICO (first generation). Internally heated, high-performance soldering tips.

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####### 🌐 Related topic pages on ms-muc-docs.de

- [🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

Ersa Soldering Irons

####### i-CON Series (Soldering Stations)
The corresponding i-TOOL, i-TOOL NANO, and i-TOOL PICO handheld soldering irons are the most powerful and advanced tools that connect to the electronically controlled soldering stations (i-CON 1/2/Vario, i-CON NANO, i-CON PICO). They utilize internally heated soldering tips for maximum efficiency.
####### Ersa Soldering Tip Series
######## Series 142 (current)
Designed for the latest generation of i-CON soldering stations: **i-TOOL MK2** and **i-TOOL TRACE**.
These tips represent the latest generation of active soldering tips from Ersa and offer the fastest response time.
####### Series 102 (predecessors)
Designed for the earlier models of the i-CON series: **i-TOOL**, **i-TOOL NANO**, and **i-TOOL PICO** (first generation).
These are also considered "active" (or rather, **internally heated**) high-performance soldering tips, as the heating element is positioned very close to the tip.
####### Note: Are the 142 and 102 TRUE active soldering tips?

- **Ersa Series 102:** Not a true active soldering tip in the sense of Weller (Active-Tip Technology) or JBC (Active Cartridge Technology).
- **Ersa Series 142:** Not classified as a classic "active cartridge tip," but thanks to its patented design, it offers virtually the same performance – and lower operating costs, as the heating element remains in place when changing the tip.

ERSA refers to this principle as **"internally heated soldering tip technology for optimal energy efficiency."**

######## 🌐 Related topic subpages on ms-muc-docs.de

- [🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- [🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)

FNIRSI

http://www.fnirsi.cn/ http://www.fnirsi.cn/lxwm https://chat.whatsapp.com/H7dlYzTYzWmGaSvlN8OMAb https://vk.me/join/AJQ1d0yrQhneCCOVKp1ooJeh

🎧 Podcast

- FNIRSI DWS-200 Soldering Station Review: 200 Watts of Power and the Truth from User Reviews
- FNIRSI® DWS-200 Soldering Station: Precision & Performance
- Soldering with Style – The FNIRSI HS-01 Review
-

FNIRSI DWS-200

Soldering Tips: **JBC Tips**

- Link: https://www.fnirsi.com/de/products/dws-200

- Wiki: https://meisterschulen-am-ostbahnhof-munchen-docs.readthedocs.io/projects/werkzeug-docs/de/latest/elektronik/loeten/heisses_werkzeug/loetkolben/fnirsi/DWS-200.html

ATTENTION! Different versions with different soldering handles. Intelligent, stationary soldering station with separate base unit.

Feature	Description
Type	Stationary, intelligent soldering station (with separate base unit).
Performance	High, suitable for larger and more demanding soldering jobs.
Compatibility	Compatible with various soldering handles (e.g., F245 and F210).
Operation	Multiple preset temperature settings and adjustable modes.
Temperature Control	Precise digital temperature control.
Target Audience	Primarily for professional use or demanding hobbyists.

####### Podcast

- FNIRSI DWS-200 Soldering Station Review: 200 Watts of Power and the Truth from User Reviews
- FNIRSI® DWS-200 Soldering Station: Precision & Performance

######## 🌐 Related Topic Subpages on ms-muc-docs.de

- 🌐 Interactive JBC Soldering Tip Guide & Infographic on ms-muc-docs.de

FNIRSI HS-01

Soldering Tips: Special, **proprietary tips** (not JBC compatible!)

- Link: https://www.fnirsi.com/de/products/hs-01
- Wiki: https://meisterschulen-am-ostbahnhof-munchen-docs.readthedocs.io/projects/werkzeug-docs/de/latest/elektronik/loeten/heisses_werkzeug/loetkolben/fnirsi/HS-01.html **Special Feature:** Aluminum cap – the soldering iron can be placed in a tool bag even when hot. Previous to the HS-02. Smart, portable soldering iron.

Feature	Description
Type	Smart, portable soldering iron.
Power	Up to 65W (USB-C PD).
Power Supply	USB-C (PD-enabled).
Temperature Range	Approx. 80–420°C.
Display	OLED display (slightly smaller than the HS-02).
Speed	Fast heat-up (approx. 8 seconds to melt tin at 65W).
Features	Compact and lightweight, integrated PID control system for precise temperature control.

####### Podcast

- Soldering with Style – The FNIRSI HS-01 in Review

######## 🌐 Related Topic Subpages on ms-muc-docs.de

- 🌐 Interactive JBC Soldering Tip Guide & Infographic on ms-muc-docs.de
- 🌐 The Right Soldering Tip for the Mechatronics Engineer (Web App & Comparison on ms-muc-docs.de)

FNIRSI HS-02

####### Attachment for the FNIRSI HS-02 Soldering Station and Tips C115, C210, C245

The **FNIRSI HS-02** is an intelligent, portable soldering station characterized by its high performance and ease of use. With a power output of 100 watts and a temperature range of 100°C to 450°C, it is suitable for a wide variety of soldering applications.[12] This soldering station offers both precision and general soldering capabilities and is compatible with C245 tips, but not with C115 and C210 tips.[12] ...

######## **FNIRSI HS-02 Features**

- **Power**: 100 Watts
- **Temperature Range**: 100°C - 450°C
- **Heat-Up Time**: 4 seconds
- **Display**: 0.96-inch IPS display
- **Modes**: Automatic standby and sleep modes[12]

######## **Tip Compatibility**

- **C115 Tips**: These tips are suitable for high-precision soldering of small components. They are ideal for applications performed under a microscope and offer the highest precision[3]. However, the FNIRSI HS-02 is not compatible with these tips[12].
- **C210 Tips**: These tips offer a good balance between precision and power. They are suitable for general precision soldering but are not supported by the FNIRSI HS-02[12].
- **C245 Tips**: These tips are designed for general soldering and offer a wide range of tip shapes and sizes. They are ideal for a variety of soldering applications, from fine to larger solder joints.[12] The FNIRSI HS-02 supports these tips, providing high flexibility and versatility for soldering.[12]

######## **Tip Similarities and Differences**

- **Similarities**: All three types utilize JBC's advanced technology, enabling rapid temperature recovery and extended tip life.[3] They benefit from the FNIRSI HS-02's sleep and sleep modes, further extending tip life.[12]
- **Differences**: The C115 tips are designed for the smallest and most precise work, the C210 tips offer a good balance for precision work, and the C245 tips are suitable for general soldering.[123] The FNIRSI HS-02, however, only supports C245 tips.[12]

The FNIRSI HS-02 soldering station is therefore an excellent choice for various soldering applications that require both precision and versatility. With its compatibility with C245 tips, it offers a comprehensive solution for professional soldering work.

Source: Conversation with Copilot, October 6, 2024

1) Fnirsi HS-02A Soldering Iron - Eleshop. https://eleshop.de/fnirsi-hs-02a-lotkolben.html.
2) Fnirsi HS 02 | Price comparison at idealo.de. https://www.idealo.de/preisvergleich/Liste/120838055/fnirsi-hs-02.html.
3) FNIRSI HS-02 Soldering Iron Kit DC/PD (96W/65W). https://fnirsi.de/en/products/fnirsi-hs-02-lotkolben-kit-dc-pd-96w-65w.

The **FNIRSI HS-02** is a smart, portable soldering iron distinguished by its ergonomic design and high performance. Here are some of the key features:

- **Power**: The soldering iron has a maximum power output of 100 W, making it suitable for various soldering tasks[1].
- **Temperature Range**: It offers a wide temperature range from 100 °C to 450 °C, allowing for flexible use[2].
- **Heat-Up Time**: The soldering iron reaches its operating temperature in approximately 4 seconds[1].
- **Power Supply**: The HS-02 supports PD/QC protocols for fast and efficient charging via a USB Type-C cable[2].
- **Display**: It features a 0.96-inch IPS HD color display, enabling easy monitoring of power and temperature[2].
- **Material**: The housing is made of CNC-machined aluminum, ensuring durability and a comfortable feel[2].

The kit includes the soldering iron, a 100W power supply, a USB Type-C cable, and several soldering tips suitable for various applications[1].

Do you plan to use the soldering iron for a specific project?

1) FNIRSI HS-02 Soldering Iron Kit DC/PD (96W/65W). https://fnirsi.de/en/products/fnirsi-hs-02-lotkolben-kit-dc-pd-96w-65w.
2) Fnirsi HS-02B Soldering Iron - eleshop.de. https://eleshop.de/fnirsi-hs-02b-lotkolben.html.

3) FNIRSI DWS-200 Soldering Iron – Fnirsi Store. https://fnirsi.de/en/products/fnirsi-dws-200-lotkolben.

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- 🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)

I2C PDK

All models: **JBC Tips** Link: https://i2c123.com/ Professional high-performance soldering stations from China.

Models

Model	Power	Handles	Tips
PDK-1200	300W	2	C210, C115, C245
PDK-1200R	300–400W	1 (+vacuum cleaner)	C470

Sleep Base

Tip: If you're using the FNIRSI DWS-200, you'll find "wider" bases here:

- https://www.diyfixtool.com/products/i2c-rs300-rs400-c115-c210-c245-c470-soldering-handle-sleep-base?variant=42280640708837
- https://www.diyfixtool.com/products/i2c-rs300-rs400-c115-c210-c245-c470-soldering-handle-sleep-base?variant=42280640610533

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

I2C PDK 1200

Link: https://i2c123.com/en/product/pdk1200/ Professional **300W high-performance soldering station** with precise I2C control.

- Simultaneous connection of **2 handles** (presumably 2 x 150W – parallel operation would need to be tested)
- Suitable tips/handles: **C210**, **C115**, **C245** Fast heating and high thermal capacity – ideal for demanding soldering tasks, electronics professionals, and repair shops.
-

I2C PDK 1200R

Link: https://i2c123.com/en/product/pdk1200r/ **300W, maximum 400W** (short-term). Incredibly robust device.

- Only **one handle** can be connected!
- Second connector reserved for **desoldering pump suction**
- Suitable tips/handles: **C470**

jbc

🎧 Podcast

- JBC Soldering Tips C470 vs. C245 vs. C210 vs. C115: Which tip is the all-rounder and when do you need the nano specialist?
- JBC Soldering Tip Technology Revealed: Five Times Longer Lifespan and 2-Second Turbo Heat – What the Guide Reveals About Efficiency and Maintenance
- JBC's Soldering Secret: 350 Degrees in 2 Seconds and Why the Tip Determines Efficiency and Lifespan
- Soldering Iron Analysis: Active vs. Passive, Weller, Ersa, JBC and the USB-C Revolution – The Professional Guide for Mechatronics Engineers

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####### 🌐 Related Topic Subpages on ms-muc-docs.de

- [🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- [🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)
- The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)
-

JBC Soldering Irons

####### Tips

JBC offers various tips, which they call Cartridges]. The three most important are:

- C115
- C210
- C245

The advantage is that you can use original JBC cartridges in aftermarket soldering irons, and you can also use aftermarket tips in JBC soldering irons.

######## **C115 Cartridges**

- **Features**: These cartridges are suitable for high-precision soldering and reworking very small components, even under a microscope[3]. They are compatible with the Nano-Handles B·NANO, NT115 and the Nano-Tweezers NP115, AN115[3].
- **Application**: Ideal for applications requiring the highest precision, such as soldering microelectronics[3].

######## **C210 Cartridges**

- **Features**: These cartridges are designed for precision soldering and are compatible with the T210 Precision Handles[1]. They offer a good balance between precision and performance.
- **Application**: Suitable for general precision soldering applications that require a slightly larger tip than the C115[1].

######## **C245 Cartridges**

- **Features**: These cartridges are designed for general soldering applications and are compatible with the T245 General Purpose Handles[1]. They offer a wide range of tip shapes and sizes.
- **Application**: Ideal for a variety of soldering applications, from fine to larger solder joints[1].

######## **Common Features**

- **Technology**: All three types utilize JBC's advanced technology, which enables rapid temperature recovery and long tip life[1].
- **Sleep and Sleep Mode**: The cartridges benefit from the sleep and sleep modes of JBC soldering stations, which extends the tip lifespan[1].

######## **Differences**

- **Size and Precision**: The C115 is designed for the smallest and most precise jobs, the C210 offers a good balance for precision work, and the C245 is suitable for general soldering[13].
- **Compatibility**: Each cartridge series is compatible with different handles and tools, reflecting their specific applications and precision requirements[13].

I hope this helps! If you have any further questions, please let me know.

Source: Conversation with Copilot, October 6, 2024

1) C115 - Cartridge Range. https://www.jbctools.com/c115-cartridge-range-product-1354-design-iron.html.
2) Cartridge Guide - jbctools.com. https://www.jbctools.com/pdf/brochures/catalog-cartridge-guide-EN-0028198_ID-219650.pdf.
3) good jbc c210,c245 clone tips / cartridges? : r/soldering - Reddit. https://www.reddit.com/r/soldering/comments/18z9mu7/good_jbc_c210c245_clone_tips_cartridges/.
4) AIFEN A9 Soldering Station Compatible with JBC Soldering Iron Tips C210/C245/C115... https://dr-repair.de/werkstatt/allgemein/315/aifen-a9-loetstation-kompatibel-mit-jbc-loetkolbenspitzen-c210/c245/c115-griff-elektronische-schweissst.
5) JBC C115 C210 C245 Soldering iron Tips JBC I2C Soldering Station. https://www.diyfixtool.com/products/jbc-c115-c210-c245-soldering-iron-tips-jbc-i2c-soldering-station.

####### Soldering Irons
I have no personal experience with JBC:
Recommendations from colleagues:
DDE-2B
https://www.jbctools.com/dde-2b-2-tools-control-unit-product-1011.html
T245-B
https://www.jbctools.com/t245-b-non-slip-handle-product-675-category-5-menu-70.html
The tips on JBC soldering irons can also be changed while hot, not without tools, but integrated into the soldering station.
Known copies are available from Sugong, Aixun, and I2C.
I have no experience with these either!

######## 🌐 Related topic subpages on ms-muc-docs.de

- [🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- [🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)

Miniware

- Link: https://e-design.com.cn/en/
- Soldering Iron: https://e-design.com.cn/en/Product/555595.html

Miniware (Guangzhou e-Design Intelligent Technology Co., Ltd.) is a Chinese brand known for **compact and intelligent tools** for electronics engineers, hobbyists, and DIY enthusiasts.

Soldering Iron Models

Model	Tips	Power Supply	Wattage	Firmware
TS-80P	Weller-like	USB-C PD/QC	30W	miniware / IronOS
TS-100	TS100 Series	DC 5525	65W	miniware / IronOS
TS-101	TS100 Series	USB-C PD + DC	45–90W	miniware / IronOS
TS1M	JBC	—	—	miniware
TS21	JBC	—	—	miniware
TS1C	Weller-like (battery)	Battery	—	miniware

SA Adapter (for MHP50 hot plate)

Model	Tips	Remarks
SA80	TS80P	Turns MHP50 into a soldering iron
SA115	JBC C115	Handle separate, not interchangeable
SA210	JBC C210	Handle separate, not interchangeable
SA245	JBC C245	Handle separate, not interchangeable

Podcast

- Miniware TS101: The Mobile Soldering All-Rounder – Strengths, Weaknesses, and the USB-C Revolution

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####### 🌐 Related Topic Subpages on ms-muc-docs.de

- 🌐 Interactive JBC Soldering Tip Guide & Infographic on ms-muc-docs.de
- 🌐 The Right Soldering Tip for the Mechatronics Engineer (Web App & Comparison on ms-muc-docs.de)

Miniware SA115

Soldering tips: **JBC C115** Adapter for the MHP50 hot plate.

- Note: Handle, tips, and the MHP50 hot plate are required in addition.
- Note: The handle cannot be replaced with a different size.

####### 🌐 Related topic subpages on ms-muc-docs.de

- [🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

Miniware SA210

Soldering tips: **JBC C210** Adapter for the MHP50 hot plate.

- Note: Handle, tips, and the MHP50 hot plate are required in addition.
- Note: Handle cannot be replaced with a different size.

####### 🌐 Related topic subpages on ms-muc-docs.de

- [🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

Miniware SA245

Soldering tips: **JBC C245** Adapter for the MHP50 hot plate.

- Note: Handle, tips, and the MHP50 hot plate are required in addition.
- Note: Handle cannot be replaced with a different size.

####### 🌐 Related topic pages on ms-muc-docs.de

- [🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

Miniware SA80

Link: https://e-design.com.cn/en/MHP50-Mini-Soldering-Station-Adapter-PG10435436 Soldering tips: **TS80P tips** (Weller-like) Adapter that turns an **MHP50 hot plate** into a soldering iron compatible with TS80P tips. No extra handle required.

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- 🌐 The right soldering tip for the mechatronics engineer (web app & comparison on ms-muc-docs.de)

miniware TS-100

The miniware TS-100 is a portable, USB-powered soldering iron with a 65W output. It features digital temperature control, allowing for precise setting and maintenance of the soldering temperature. The TS-100 is small and light enough to be easily transported and used anywhere soldering work is required. It is popular with electronics enthusiasts and professionals and has received good reviews and recommendations in forums and communities. As mentioned above, Weller is the Mercedes of soldering irons, but it's in a price range that isn't something you buy on a whim. Further down, we'll see that many soldering stations from Asia are simply junk or offer very poor performance, in addition to very high wear and tear. A very good compromise is offered by miniware with its TS-100. This is available as:

- Soldering iron set with one tip,
- Soldering iron set with one tip and power supply,
- Case with soldering iron set with 9 tips

Useful accessories include various carrying cases if you plan to use the device while traveling.

There is also an adapter cable for operating the soldering iron with an 18V battery, which can be quite useful because you don't always need a power supply for small repairs.

Of course, there are also adapters for powering it from a 12V cigarette lighter socket.

####### Advantages

From the perspective of @franz-ms-muc], the advantages are as follows:

- High performance
- ATTENTION! The soldering iron can be used with various power supplies. The performance decreases with the power supply's wattage.
- Compact
- The soldering station is essentially integrated into the handle of the soldering iron.
- Easy to take with you when traveling
- Integrated tip

- As with Weller, the temperature sensor and heating element are integrated into the tip.
- This results in faster heating times and more precise temperature control

####### Where to buy the TS-100
A highly recommended retailer is
https://novellife.de.aliexpress.com/store/1703233
NovelLife.
This set is: https://de.aliexpress.com/item/32860309312.html Complete with a tip and a power supply.
The advantages of this retailer's power supplies are listed in the last photo:

- These are:
- The silicone cable,
- so that the cable doesn't melt upon first contact with the hot tip
- because it is much more flexible than a PVC cable
- no "balls"
- the absence of a ferrite core, which also improves handling.

####### Links TS-100
####### Photos TS-100




TS100


realme Shot on realme GT 5G
2022.11.13 08:19


T S100



######## 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)

miniware TS-101

The miniware TS-101 is the latest successor to the successful TS-100 soldering iron. This new soldering iron offers a multitude of improvements compared to its predecessor. One of the most significant innovations is its enhanced performance, achieved through the use of state-of-the-art thermal paste. This allows the TS-101 to heat up faster and more precisely, making soldering considerably easier. Another key feature of the TS-101 is its improved handling. Thanks to a new, ergonomic handle design and a lightweight construction, the soldering iron is lighter and more comfortable to hold. The soldering iron's controls

have also been improved, enabling precise temperature adjustment. The miniware TS-101 also features an integrated LED display that shows the current temperature of the soldering iron. This allows the user to monitor the temperature at all times and ensure it is always at the correct level. Overall, the miniware TS-101 is a state-of-the-art and powerful tool that significantly simplifies and improves soldering. It's the perfect choice for anyone who wants to achieve high-quality results and work more efficiently and precisely. The TS-101 is a copy of a copy,

or a reverse copy.

After Pinecil copied the TS-100 and replaced the USB interface with USB-C,

miniware implemented the same change in the TS-101.

Advantages of the TS-101 over the TS-100:

- Larger display
- Same soldering tips as the TS-100
- Can be powered via AC adapter (barrel jack like the TS-100) or USB-C
- ATTENTION
- Barrel jack: 65W like the TS-100
- USB-C: only 45W
- Special USB-C: 90W
- Quick tip change like the TS-80 via ejector ring

####### 90W for the TS-101

ATTENTION! It's not that simple.

You need a PD 3.1 power supply with 28V and 90W. These are the 140W devices.

Additionally, the cable must be rated for 240W.

Many power supplies only go up to 20V.

Software version 2.0 or 2.01 must also be installed.

See https://www.youtube.com/watch?v=CZJDwvrm3pw]

I was able to successfully test it with this power supply; the 28V is displayed, but it's unstable during operation. :

https://www.amazon.de/gp/product/B0BX9751BT Ywcking 140W USB-C Charger Compatible with MacBook Pro/Air 13/14/15/16 inch (2016-2023), Compatible with iPad Pro, HP, Lenovo, Fast Charging Power Adapter, 2M USB-C to C Charging Cable

Stable:

Recommendation:

This cable:

https://www.banggood.com/de/PD-240W-5A-USB-Type-C-Cable-C-to-C-High-Temperature-Resistant-Siliceous-Built-in-E-MAKER-Chip-for-PD-Soldering-Iron-TS101-p-1981525.html PD 240W 5A USB Type-C Cable C to C High Temperature Resistant Silicone Built-in E-MAKER Chip for PD Soldering Iron TS101

This power adapter

https://www.amazon.de/dp/B0B127GW4D UGREEN Nexode 140W USB-C Charger PD 3.1 USB-C Power Adapter GaN 3-Port Power Adapter Compatible with MacBook Pro 16“ 2021, Dell XPS, iPhone 14 Pro Max/Pro/14, Galaxy S23 Ultra/S23+/S23/S22 Ultra etc.

The included cable is very stiff.

####### Links TS-101

https://e-design.com.cn/en/Smart-Soldering-Iron-TS101-PG9226715

https://www.youtube.com/watch?v=e7saVBTAgEg

####### Photos TS-101


MINIWARE
TS101
SMART
SOLDERING
IRON



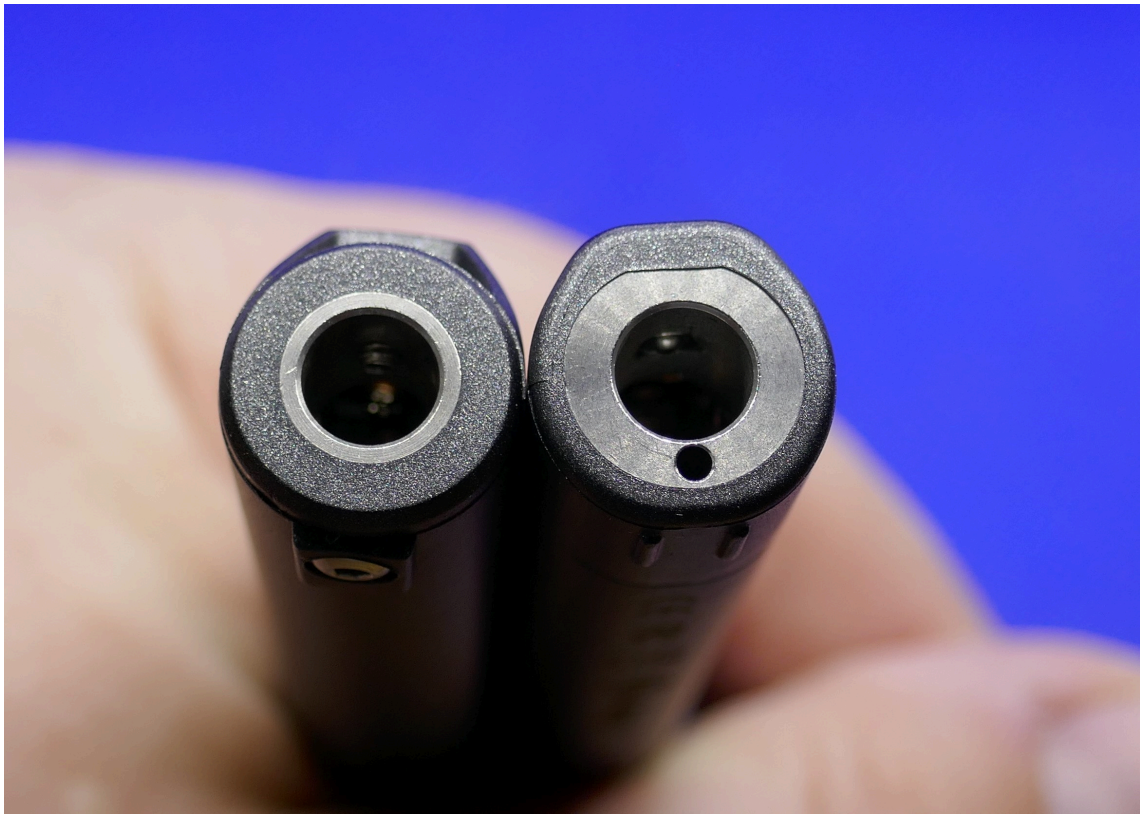




The following photo shows a TS-101 at the top and a TS-100 at the bottom. The larger display is clearly visible here.



####### ⚖ Comparison of the soldering tip holder
TS-101 on the right, TS-100 on the left TS-100



It's nice to see that the TS-101 no longer has a clamping screw, but instead a "ball screw" or "spring-loaded pressure piece."

See also https://www.ganternorm.com/de/produkte/3.1-Rasten-Arretieren-Sperren-mit-Bolzen-und-Kugeln/Federnde-Druckstuecke

This eliminates the need for a wrench when changing the soldering tip.

####### Power Supply

######## Power supply via barrel connector



######### Power supply via USB-C



######## Where to buy the TS-101

https://www.aliexpress.us/item/1005004795605009.html

####### Warning

I once ordered from Gunners Tool Store instead of NovelLife, and I was burned:

The soldering iron is perfectly fine, but the power supply is incredibly flimsy, and the cable is also very flimsy. Rigid.



https://de.aliexpress.com/item/1005004802776765.html

On the right: Gunners Tool Store, on the left: NovelLife. The more flexible silicone cable is a must for comfortable working.



######## 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- 🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)

miniware TS-80

The TS-80 was released after the TS-100, but it is not its successor. It differs from the TS-100 in its soldering tips. Here, miniware copied the Weller RT soldering tip system and incorporated a 3.5 mm jack plug. The advantages over the TS-100 are obvious:

- No Allen key is required to change the soldering tip.
- The front ring allows the tip to be ejected even when hot.

The disadvantage is the slightly lower power output of the TS-80 compared to the TS-100.

A mobile phone charger is used as the power supply; in the newer version, one with Power Delivery (PD).

Note that standard mobile phone charging cables are so stiff that they are not pleasant to use. A silicone USB-C cable is required.

... There are two versions of the TS-80:
####### TS-80 Versions
######## **TS-80**
The TS-80 is the older model, which supports Quick Charge. https://de.wikipedia.org/wiki/Quick_Charge]
######## **TS-80P**
The TS-80P, on the other hand, also supports PD (Power Delivery). https://de.wikipedia.org/wiki/Universal_Serial_Bus#Höhere_Leistungen, https://www.elektronik-kompendium.de/sites/com/1809251.htm]
####### Where to buy the TS-80
https://de.aliexpress.com/item/32904980528.html]
€87.50 with power adapter and silicone cable.
####### Links TS-80
https://e-design.com.cn/en/Smart-Soldering-Iron-TS80P-PG9226712
https://www.youtube.com/watch?v=9TvgolijzUY
####### Photos TS-80


TS-KA
C210


TS80P


TS80P



TS-80 with silicone cable:



TS-80 with a standard PD cable: much too stiff!



######## 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

Miniware TS1C (Battery-Powered)

Soldering Tips: Special tips similar to those from Weller – identical to the TS-80/TS-80P. Link: https://e-design.com.cn/en/Cordless-Soldering-Station-TS1C-PG9226730 Battery-powered cordless soldering iron

####### 🌐 Related Topic Subpages on ms-muc-docs.de

- 🌐 Interactive JBC Soldering Tip Guide & Infographic on ms-muc-docs.de
- 🌐 The Right Soldering Tip for Mechatronics Engineers (Web App & Comparison on ms-muc-docs.de)

Miniware TS1M

Soldering Tips: **JBC Tips** Link: https://e-design.com.cn/en/TS1M-Multi-Function-Mini-Soldering-Station-PG11183673 Miniware followed suit after virtually everyone else switched to JBC-compatible tips.

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC Soldering Tip Guide & Infographic on ms-muc-docs.de

Miniware TS21

Soldering tips: **JBC tips** Link: https://e-design.com.cn/en/TS21-Precision-Soldering-Iron-PG10747407

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

pinecil

🎧 Podcast

- [Pinecil Power Guide: USB-C PD, Batteries & DC Traps – Maximum Performance for Your Soldering Iron
- [Pinecil Power Supply: Safe, Efficient, Durable – The Ultimate Guide
- [PINECIL: The Intelligent RISC-V Soldering Iron

####### 🌐 Related Topic Subpages on ms-muc-docs.de

- [🌐 The Right Soldering Tip for the Mechatronics Engineer (Web App & Comparison on ms-muc-docs.de)

PINECIL-BB2

####### Links PINECIL-BB2

https://pine64.com/product/pinecil-smart-mini-portable-soldering-iron/



In the following photo: A TS-100 is shown above, and a Pinecil below.

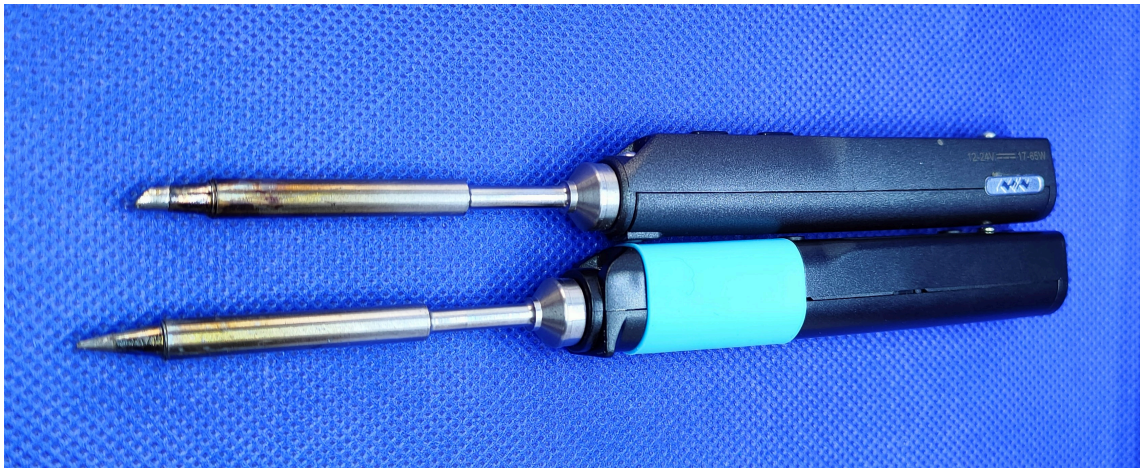


Photo:

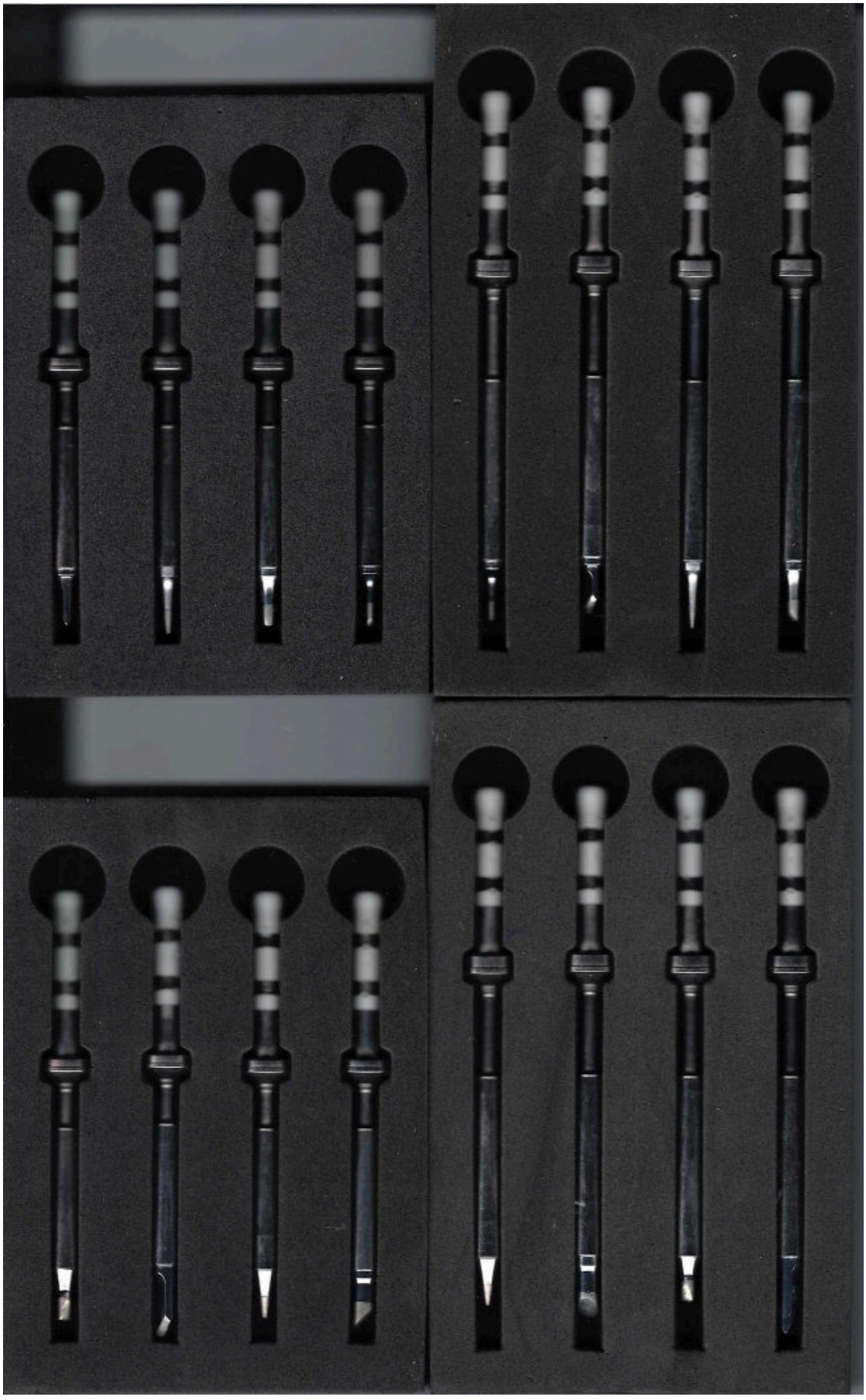

DC5525
12-24V 18-88W
RoHS

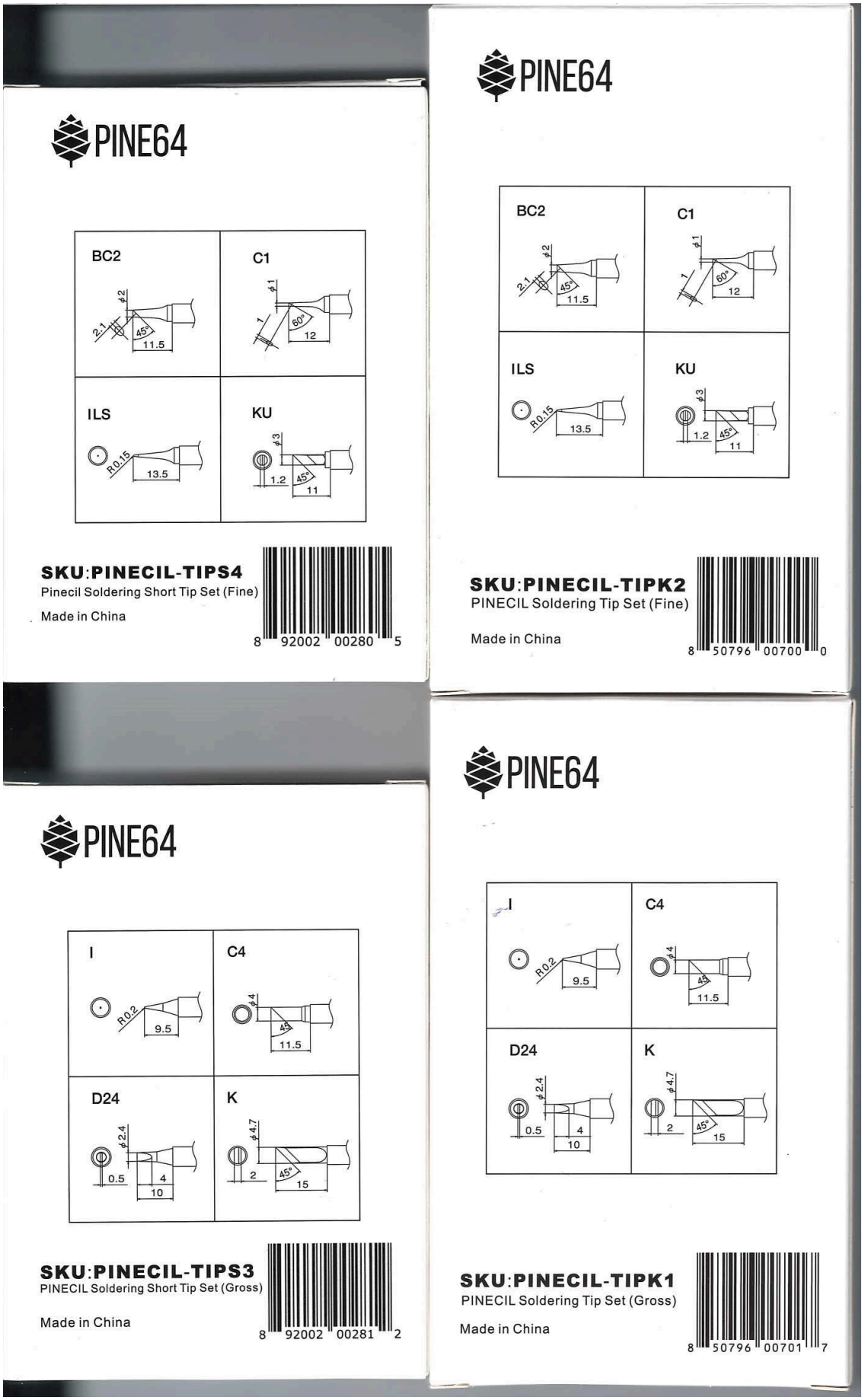

PINE64
Pinecil
Smart Soldering Iron



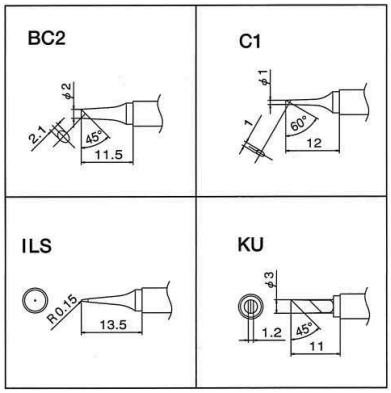
Accesories:
starting from the top left:

- S4 short-tip-set-fine
- K2 long-tip-set-fine
- S3 short-tip-set-gross
- K1 long-tip-set-gross



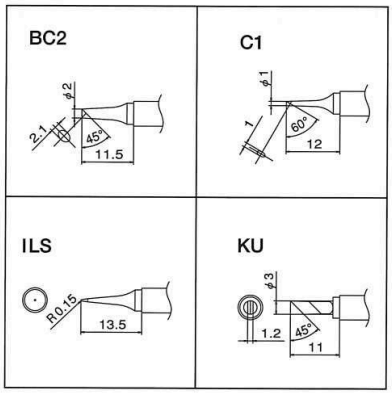

PINE64
BC2
C1
ILS
KU
SKU:PINECIL-TIPS4
Pinecil Soldering Short Tip Set (Fine)
Made in China
8 92002 00280 5
PINE64
BC2
C1
ILS
KU
SKU:PINECIL-TIPK2
PINECIL Soldering Tip Set (Fine)
Made in China
8 50796 00700 0
PINE64
I
C4
D24
K
SKU:PINECIL-TIPS3
PINECIL Soldering Short Tip Set (Gross)
Made in China
8 92002 00281 2
PINE64
I
C4
D24
K
SKU:PINECIL-TIPK1
PINECIL Soldering Tip Set (Gross)
Made in China
8 50796 00701 7

PINE64



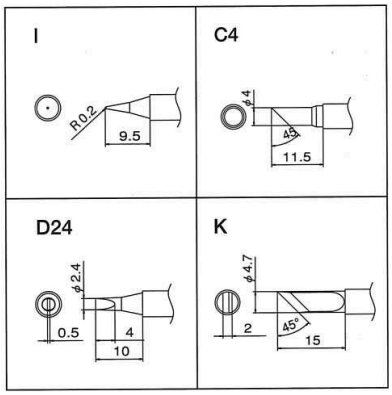
PINECIL-TIPS4

PINE64



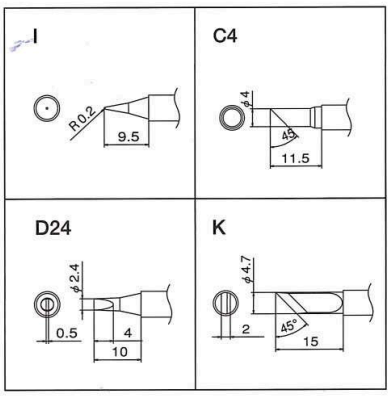
PINECIL-TIPK2

PINE64



PINECIL-TIPS3

PINE64



PINECIL-TIPK1

Secre

Chinese manufacturer of portable soldering irons and measuring instruments. Link: https://sequremall.com/

Models

Model	Tips	Power Supply
S99	TS100/TS101 compatible	USB-C PD / DC

–

####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 The right soldering tip for the mechatronics engineer (web app & comparison on ms-muc-docs.de)

Secre S99

Soldering tips: compatible with **TS100 / TS101 / Pinecil** Link: https://sequremall.com/products/sequre-sq-001-soldering-iron Compact portable soldering iron, similar to the Miniware TS101. Supports USB-C Power Delivery and DC power supply

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####### 🌐 Related topic pages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- 🌐 The right soldering tip for the mechatronics engineer (web app & comparison on ms-muc-docs.de)

standard

🎧 Podcast

- 4diac IDE: How the IEC 61499 standard is revolutionizing industrial automation
- IEC 61499 vs. 61131: Do we need a new standard for IIoT? Analysis of a heated debate about distributed intelligence
- IEC 61499: Is the new standard liberating industrial automation? A comparison with IEC 61131 and the bridge between OT & IT.
- IEC 61499: Revolutionizing industrial automation – Why the new standard makes your systems future-proof
- The Alarm Mask object: Your standardized sentinel for warnings on agricultural machinery

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####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Eclipse 4diac IDE & color reference on ms-muc-docs.de

Standard Soldering Iron

In this chapter, I want to summarize everything that's out there regarding "classic" soldering irons, with which @franz-ms-muc] has had rather mediocre to poor experiences. Certainly, you can solder with them, but the disadvantages are:

- High wear on the soldering tips
- Slow heating
- Large footprint on the desk (except for JCD)
- Relatively stiff cable
- Slow reaction time when touching the soldering point
- Slow temperature control

####### Examples

- ATTEN ST-60 / 60 W Soldering Station, ESD-safe
- The ATTEN ST-100 / 100 W soldering iron/station does NOT belong in this list.
- It has improved tip technology.
- YIHUA 926LED-III Digital Electric Soldering Iron
- JCD 908S
- and many, many more!!!!

####### Similarities

All of them have in common that the same soldering tips fit,
these are extremely cheap:
https://de.aliexpress.com/item/1005004404569421.html
In daily use, you'll need about one tip per day, and these aren't up to the task of handling aggressive solder.

The soldering tips are purely passive components that are attached to a ceramic heating element with a relatively large amount of play.

####### Sources

JCD 908S:
https://de.banggood.com/JCD-908S-220V-80W-LCD-Electric-Welding-Soldering-Iron-Adjustable-Temperature-Solder-Iron-With-Soldering-Iron-Tips-p-1697041.html?cur_warehouse=CN&ID=47184514182&rmmds=search

€13 for a tool set with a soldering iron: https://de.aliexpress.com/item/1005004418391691.html This could be quite useful, for example, for a fleet of service vehicles that don't normally need to solder.

€25 for a soldering station: https://de.aliexpress.com/item/4001283051045.html]

€80 for a soldering station that's no better: https://www.reichelt.de/loetstation-st-60-1-kanal-60-w-station-st-60-p290555.html] -> I worked with this one for years. It works, but it has the disadvantages mentioned above.

€135 is the price for the ST-100: https://www.reichelt.de/loetstation-st-100-1-kanal-100-w-station-st-100-p290558.html] Unfortunately, I have no personal experience with it. The tips of the ST-100 are different!!!

€80 for a soldering station that's no better: https://www.reichelt.de/loetstation-st-100-1-kanal-100-w-station-st-100-p290558.html]

####### Photos of Standard Soldering Irons




realme Shot on realme GT 5G
2022.11.13 17:43

######## 🌐 Related Topic Subpages on ms-muc-docs.de

- 🌐 Interactive JBC Soldering Tip Guide & Infographic on ms-muc-docs.de
- 🌐 The Right Soldering Tip for the Mechatronics Engineer (Web App & Comparison on ms-muc-docs.de)

SUNSHINE

https://www.youtube.com/watch?v=I3HfrmbF1BA

SUNSHINE S210

The Sunshine S210 is surprising in two ways:

- With 3 tips, it's incredibly affordable at €51.40
- At 110W, it's almost twice as powerful as other common soldering irons that only deliver 65W

####### Features of the SUNSHINE S210

- A magnet in the station switches the soldering iron off
- A 2-second heat-up time is excellent
- Stand and cleaning wool included

####### Disadvantages of the SUNSHINE S210

- While the USB-C connector is standard, the power adapter is proprietary. This means you can't use it for anything else, and you can't operate the S210 with other power adapters.
- While the USB-C connector is standard, the power adapter is proprietary.

####### Links SUNSHINE S210
https://www.aliexpress.com/item/1005004883524600.html
https://www.sunshinerepairtools.com/sunshine-s210-smart-portable-soldering-iron-p4384457.html
####### Photos SUNSHINE S210


SUNSHINE
S210


SUNSHINE
S210





The power supply has the following information:




REMINDER
S210/S245
S210/S245 special socket for soldering
station, please do not use it to charge
other electronic products!
Input voltage/输入电压 AC 100~240V
The output voltage/输出电压 DC 15V
Frequency/频率 50~60HZ
MADE IN CHINA
CE



A magnet leads to the standby mode. Shutdown

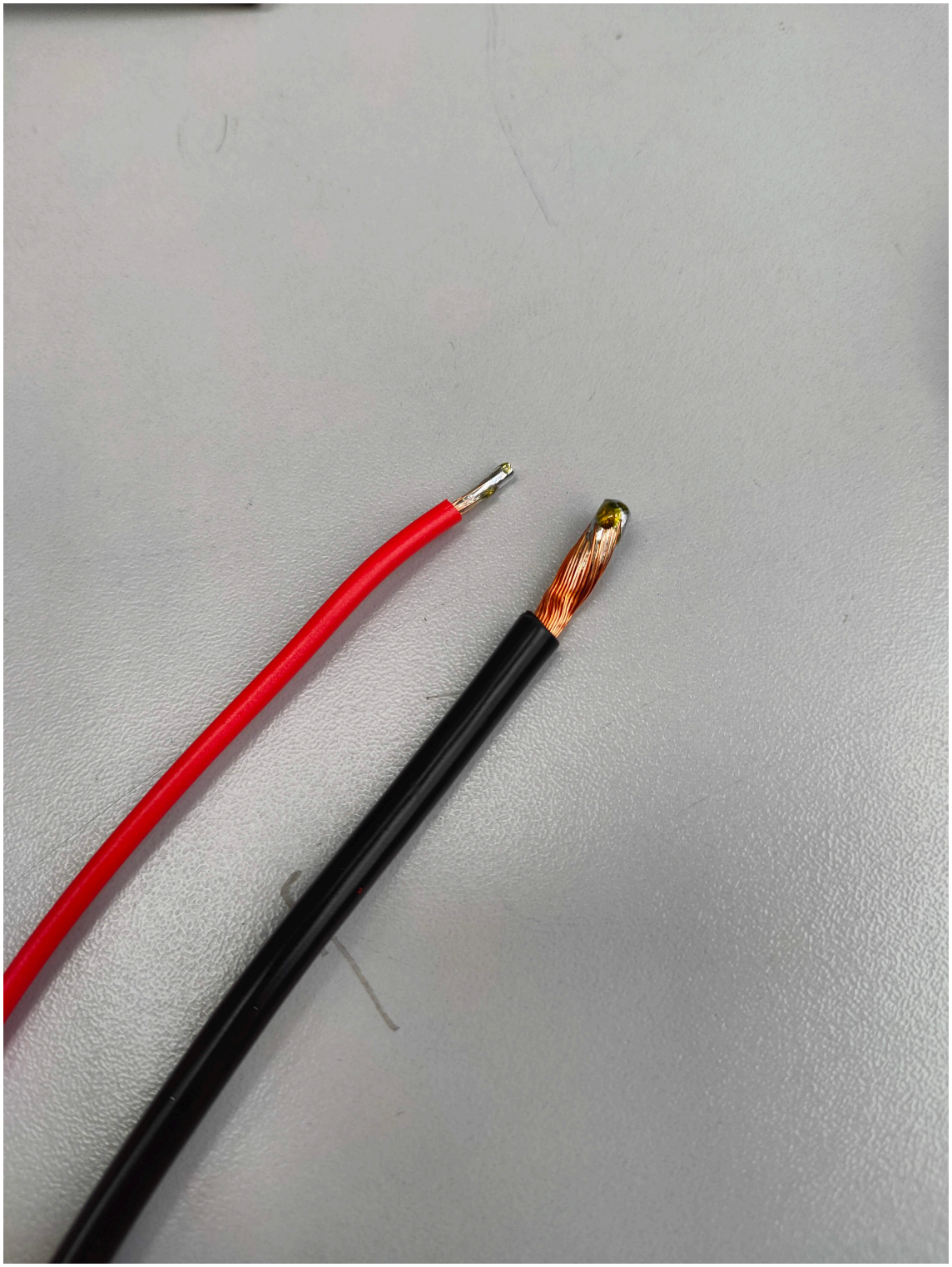

SUNSHINE
S210


SUNSHINE
S210


30
31
SUNSHINE
S-210



With some effort: a 6mm² cable could be tinned.
The soldering iron works well with 0.75mm².



######## 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)

SUNSHINE S245
On the left, the tip of the S210; on the right, the tip of the S245.



The S210 seems to have a very practical sleep function. The S245 seems to be missing it. –> It turns out this is a defect; a second S245 has the sleep function.


SUNSHINE
S245
SUNSHINE
S210

####### Left SUNSHINE S245
https://www.aliexpress.com/item/1005005007871843.html
https://www.sunshinerepairtools.com/sunshine-s245-portable-soldering-iron220v-eu-standard-p4477287.html

weller

🎧 Podcast
- [Soldering Iron Analysis: Active vs. Passive, Weller, Ersa, JBC, and the USB-C Revolution – The Professional Guide for Mechatronics Engineers

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####### 🌐 Related Topic Subpages on ms-muc-docs.de

- [🌐 Interactive JBC Soldering Tip Guide & Infographic on ms-muc-docs.de
- [🌐 The Right Soldering Tip for Mechatronics Engineers (Web App & Comparison on ms-muc-docs.de)

Platino Soldering Iron

In the previous chapter, we already discussed the advantages of "active tips." Now, a Weller soldering station can easily cost €1000! So, enthusiasts took matters into their own hands and reasoned: the technology is in the tip: Weller RT soldering tips work with the Platino. A similar article can be found at Heise under the name **Corncob**

Report:
https://www.elektormagazine.de/magazine/elektor-201507/27879
https://www.elektormagazine.de/magazine/elektor-69/42252
https://www.heise.de/ratgeber/Platine-zum-Artikel-Loetstation-selbstgebaut-3569923.html

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####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- 🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)

Weller WX Series

In the author's opinion, the best soldering station in the world is the Weller WX, with Weller RT soldering tips. These tips can be changed while hot, the heat-up time is a sensational 5 seconds,
and even a small soldering tip can be used for relatively large jobs; the station delivers extremely high heat.
No other manufacturer makes such powerful tips: for example, the RTU032SMS can deliver up to 150W of power!
Unfortunately, this equipment comes at a price:
https://www.weidinger.eu/de/p/wl48188 The station with handle and tip costs around €1000,
each soldering tip costs between €30 and €40.
https://www.myvolt.de/Loettechnik/Loetspitzen/Loetspitzen-Weller/Loetspitzen-Weller-Serie-RTM-RT/
https://www.weller-tools.com/eu/de/industrielles-loeten/produkte/loetstationen?family%5B0%5D=WX%20Line%20L%C3%B6tstationen

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####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de

Yihua

All Models: **JBC Tips** Link: http://yihua-soldering.com/ Yihua (Guangzhou Yihua Electronic Equipment Co., Ltd.) is a Chinese company specializing in soldering equipment and DC power supplies. Known as a supplier of:

- Hot Air Soldering Stations
- 2-in-1 or 3-in-1 Soldering and Rework Stations (SMD Components, BGA Repairs)
- Soldering Irons
- DC Power Supplies

Serving both hobbyists and professional workshops worldwide.

Models

Model	Description
YIHUA-982	Soldering Iron

####### 🌐 Related topic subpages on ms-muc-docs.de

- [🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- [🌐 The right soldering tip for the mechatronics technician (web app & comparison on ms-muc-docs.de)

YIHUA-982

All models: **JBC Tips** Link: http://yihua-soldering.com/ *(No further content was available for this model on the source page.)*

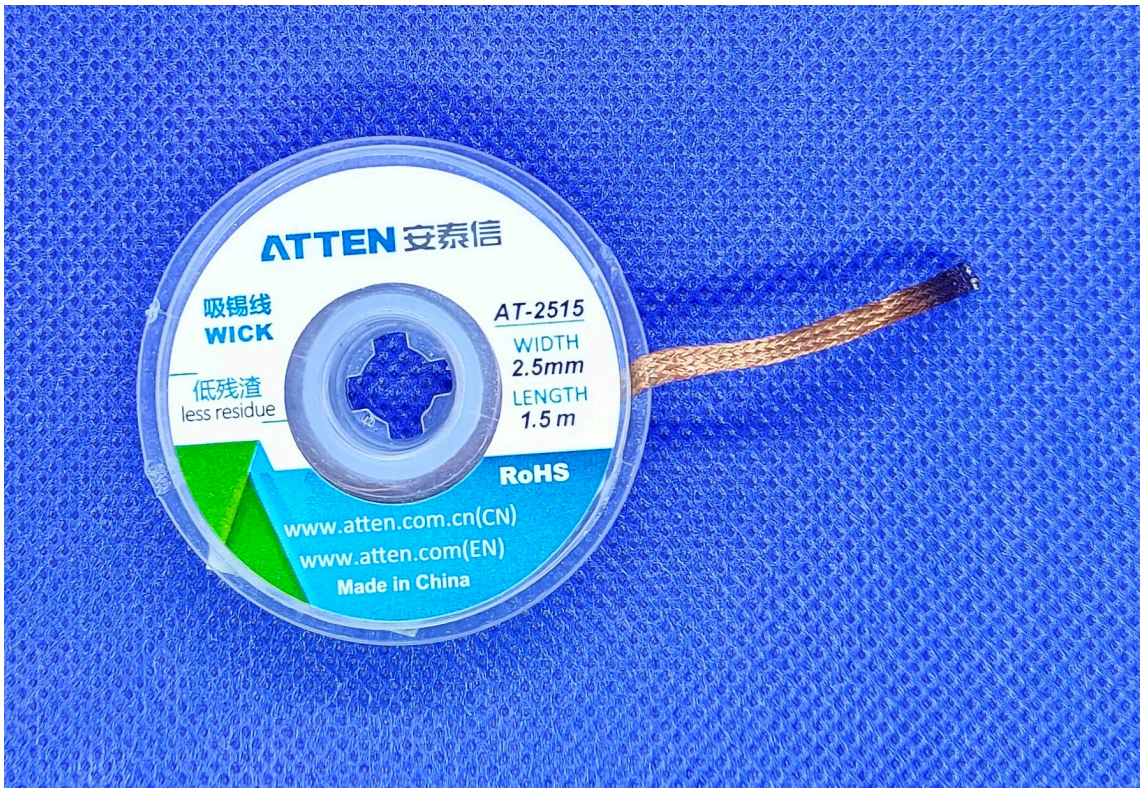
####### 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC Soldering Tip Guide & Infographic on ms-muc-docs.de

5.3.5 miscellaneous

5.3.5.1 Desoldering braid

https://de.wikipedia.org/wiki/Entl%C3%B6tlitze



5.3.5.2 Compressor

Uses of a compressor:

- Blowing off circuit boards after cleaning
- Adhesive and solder paste dispensers require compressed air. See: https://werkzeug-docs.readthedocs.io/de/latest/elektronik/loeten/sonstiges/SolderPasteDispenser.html There isn't much to say about the compressor itself, except that the smallest model you can find will definitely suffice.

Certain budget brands, such as Güde, also offer tankless compressors.

I tested this one: https://www.guede.com/artikel/Kompressor-Airpower-200-08-6_50079_0.htm], and returned it after two hours.

Reason: the motor runs constantly, which is not only annoying due to the noise, but also likely results in excessive power consumption.

One model that's quite good: https://www.guede.com/artikel/Kompressor-Airpower-190-08-6_50089_0.htm

You can do repairs yourself fairly easily. For example, I once replaced the safety valve, here https://www.amazon.de/dp/B00CD3ZIZY].

I also had to replace the pressure switch once. I couldn't find an alternative replacement part, but Güde readily supplies all the parts.

I'm currently testing another model:
https://aerotec.info/index.php/component/k2/item/257-aerotec-supersil-6

It's very similar in design to the Güde model. Since both are "Made in China," it raises suspicions that they come from the same factory, or at least the same city.

The Aerotec is quite expensive online. I recommend contacting Grasser; I was able to get it significantly cheaper there. https://grasser-elektrotechnik.de/

The Güde is much noisier, the Aerotec runs significantly quieter, but is also larger (due to the larger 2-cylinder engine) and much heavier. This is unlikely to matter much in an office or laboratory, as it's always on the floor anyway.

Güde specifies a noise level of LWA: 97 dB

Metabo with a sound pressure level of 82 dB(A) and a sound power level (LwA) of 94 dB(A)

Aerotec with a sound pressure level of LWA/59 dB

https://de.wikipedia.org/wiki/Schalldruckpegel

The Aerotec feels about 20% louder than the Güde. This isn't so much due to the sheer volume, but rather the smoother running. The Güde has a more pronounced knocking sound.

Metabo has a sound pressure level of 82 dB(A) and a sound power level of 94 dB(A).

] The Aerotec feels about 20% louder than the Güde. This isn't so much due to the sheer volume, but rather the smoother running. The Güde has a more pronounced knocking sound.

... If Aerotec's advertising is to be believed, it can be even quieter: (unbelievable): https://aerotec.info/index.php/produkte/kompressoren/silentkompressoren?id=96&pid=2009528

Just by looking at it, this appears to be a refrigerator compressor, which are indeed very quiet; these days you hardly notice refrigerators anymore.

Metabo offers a very similar device: https://www.metabo.com/de/de/maschinen/druckluft/kompressoren/mobile-werkstatt-kompressoren/basic-160-6-w-of-601501000-kompressor.html

Many more similar ones can be found: https://www.amazon.de/Stanley-B2BE104STN703-Silent-Compressor-Giallo/dp/B07SHGZF2V?th=1


AIR POWER
190/08/6
ON
OFF
Ps: 8 bar
Tmin: -10°C
Tmax: +100°C
V: 6 L
05/2019
Lot. 506394
KOMPRESSOR



5.3.5.3 Microscope

Some models

https://de.aliexpress.com/item/1005001572737660.html https://de.banggood.com/MUSTOOL-G1200-Digital-Microscope-12MP-7-Inch-Large-Color-Screen-Large-Base-LCD-Display-1-1200X-Continuous-Amplification-Magnifier-with-Aluminum-Alloy-Stand-Power-Supply-Version-p-1593162.html?cur_warehouse=CN https://www.elektor.de/products/andonstar-ad210-10-1-digital-microscope


ANDONSTAR



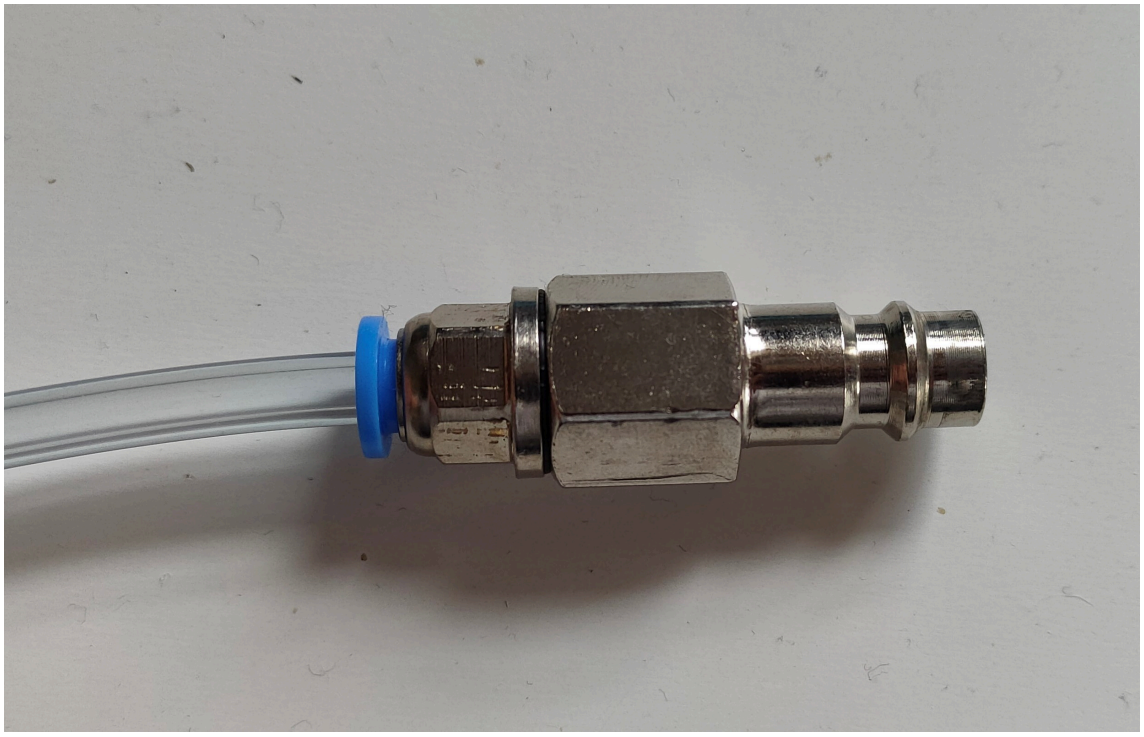
5.3.5.4 Solder Paste Dispenser

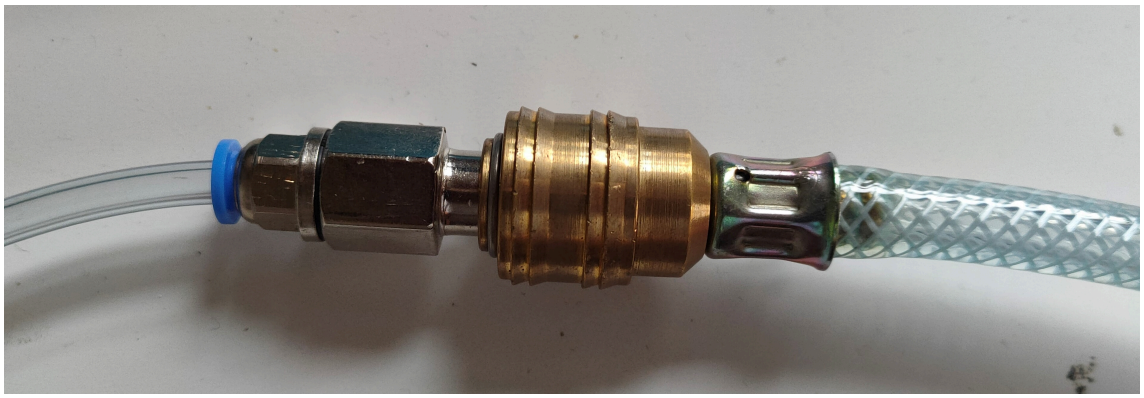
Also available on eBay https://de.aliexpress.com/item/32554182628.html It requires a 230V power supply and compressed air. The “vacuum” function is useless, as the device will constantly draw compressed air. The connector didn’t fit mine, so I improvised like this:

https://www.amazon.de/gp/product/B07T6ZYJ8D

plus

https://www.amazon.de/gp/product/B0108HHGPG





You'll also need these syringe tubes: you can find them on eBay.
You'll also need needles for the syringe,
for example:
https://www.buerklin.com/de/p/metcal/dosiergeraete-und-zubehoer/900-nk/03L6036/


CAUTION
ON
AUTO
TIME
AIR
PRESSURE
VACUUM
ESD
SAFE
OFF
MAN



5.4 Power supply

5.5 Oscilloscope

5.6 Software

5.6.1 🎧 Podcast

- Taming the Software Dragon: Industrial Automation and the Future of Production
- Eclipse 4diac: Your Bike for Industry 4.0 – Mastering Software Complexity and Controlling Distributed Systems
- Taming the Software Dragon: Why IEC 61499 Could Revolutionize Industry
- Automation 4.0: Why Software Is Overtaking Hardware and What That Means for Your Skills
- DIN EN 61499-1: Function Blocks and the Paradigm Shift in Industrial Software Development

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5.6.1.1 🌐 Related Topic Subpages on ms-muc-docs.de

- 🌐 Eclipse 4diac IDE & Color Reference on ms-muc-docs.de

5.6.2 Eagle

5.6.2.1 🎧 Podcast

- [From a Bavarian village to the Autodesk Cloud: The fascinating metamorphosis of the software legend EAGLE CAD

5.6.2.2 📺 Video

- [EAGLE CAD: A Legend

5.6.3 Fusion 360 Electronics

Fusion 360 Electronics How to Migrate From Autodesk EAGLE to Fusion 360 Electronics

6. Lehrplan praxis

6.1 🔌 Crimping Technology & Cable Harness Manufacturing

📌 **Source & Legal Basis: Source:** *Framework Curriculum for the Preparation for the Master Craftsman Examination in Agricultural and Construction Machinery Mechatronics* **Publisher:** German Association of Agricultural and Construction Machinery Mechatronics Engineers (LandBauTechnik-Bundesverband e. V.), Alfredstraße 102, 45131 Essen (as of February 25, 2025) **Regulation:** *Master Craftsman Examination Regulation (LandBauMechMstrV)* of September 9, 2024 (Federal Law Gazette 2024 I No. 277, effective August 1, 2025)

Framework Curriculum Category: Part I LE 1.3 (40 teaching units) | Part II LE 1.2 (40 hours)
Relevance: Gas-tight, corrosion-resistant, and vibration-resistant electrical installations on agricultural and construction machinery.
–

6.1.1 1. Industrial Crimp Connections

6.1.1.1 Crimping Tools & Connector Systems

- **Deutsch Connectors (DT, DTM, DTP):** Standard in commercial vehicle and agricultural machinery manufacturing. Uses 4-notch crimping tools for twisted contacts.
- **AMP Superseal 1.5:** Waterproof connectors for outdoor sensors (individual conductor sealing).
- **Hydraulic Crimping Tools:** For large conductor cross-sections (battery cables, high-voltage cables from 16 mm^2 to 95 mm^2).

6.1.2 2. Quality Criteria for Crimp Connections

6.1.2.1 Testing according to standard (DIN EN 60352-2)

- **Crimp Height & Crimp Width:** Compliance with manufacturer specifications.
- **Pull-Out Force Test:** Mechanical strength test.
- **Cross-Section Analysis:** Visual inspection for correct crimping without voids.

6.2 🔪 Soldering Techniques, Circuit Board Assembly & Rework

📌 **Source & Legal Basis: Source:** *Framework Curriculum for the Preparation for the Master Craftsman Examination in Agricultural and Construction Machinery Mechatronics* **Publisher:** German Association of Agricultural and Construction Machinery Mechatronics Engineers (LandBauTechnik-Bundesverband e. V.), Alfredstraße 102, 45131 Essen (as of February 25, 2025) **Regulation:** *Master Craftsman Examination Regulation (LandBauMechMstrV)* of September 9, 2024 (Federal Law Gazette 2024 I No. 277, effective August 1, 2025)

Framework Curriculum Category: Part I LE 1.3 & LE 2.2 | Part II LE 1.2 **Relevance:** Repair of control units, sensor modules, and prototype circuit boards.

6.2.1 1. Soldering & Assembly Technology

6.2.1.1 Soldering Processes & Tools

- **Temperature-Controlled Soldering Systems:** JBC, Aixun, Ersa, Weller WX for lead-free soldering (SAC305).

- **THT & SMD Assembly:** Manual assembly of through-hole (THT) and surface-mount components (SMD 0805, SOIC).

6.2.2 2. Desoldering & Rework Processes

6.2.2.1 Rework Stations & Preheating Plates

- **Hot Air Stations:** Non-destructive desoldering of multi-pin SMD components.
- **Hot Plates:** Uniform heating of circuit boards to prevent thermal shock.
- **Optical Inspection:** Use of digital microscopes for inspecting solder joints.

6.2.2.2 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 Interactive JBC soldering tip guide & infographic on ms-muc-docs.de
- 🌐 PCB design & assembly on ms-muc-docs.de

6.3 🔬 Measuring & Diagnostic Tools and Workshop Equipment

📌 **Source & Legal Basis: Source:** *Framework Curriculum for Preparation for the Master Craftsman Examination in Agricultural and Construction Machinery Mechatronics* **Publisher:** German Association of Agricultural and Construction Machinery Mechatronics Engineers (LandBauTechnik-Bundesverband e. V.), Alfredstraße 102, 45131 Essen (as of February 25, 2025) **Regulation:** *Master Craftsman Examination Regulation (LandBauMechMstrV)* of September 9, 2024 (Federal Law Gazette 2024 I No. 277, effective August 1, 2025)

6.3.1 🎯 Role of Measuring & Diagnostic Tools in the Curriculum

Measuring and diagnostic tools are **essential tools** in the mechatronics trade. The following diagnostic and testing equipment is required for master craftsman trainees according to the 2025 curriculum framework (Part I LE 2.1, LE 2.2 & Part II LE 1.3):

6.3.2 1. 🔍 Overview of all diagnostic and measuring tools in the Wiki

6.3.2.1 1.1 Oscilloscopes

- **Application:** Signal waveform analysis on the CAN bus (CAN-High / CAN-Low), hysteresis determination for PWM proportional valves, Hall sensor ignition signals.
- **Link in the Wiki:** `elektronik/oszilloskop/index.md`

6.3.2.2 1.2 Multimeters & Combination Measuring Devices

- **Application:** Precise measurement of DC/AC voltage, resistance, continuity testing, insulation resistance measurement on high-voltage systems.
- **Link in Wiki:** `elektrik/messgeraete/index.md`

6.3.2.3 1.3 CAN Testers & Protocol Analyzers

- **Application Area:** PEAK adapter cables, bus masters, AEF-ISOBUS-CHECK tool for monitoring PGNs, frames, and bus idle status.
- **Link in Wiki:** *(See also Wiki 3 ISOBUS Technology)*

6.3.2.4 1.4 Digital Inspection Microscopes

- **Application Area:** Optical quality control of SMD solder joints, cold joints, crimps, and cross-sectional images.

6.3.2.5 - Link in Wiki: `elektronik/loeten/sonstiges/Mikroskop.md`

6.3.3 2. ⚡ Workshop Infrastructure & Laboratory Power Supplies

6.3.3.1 2.1 Current-Limited Laboratory Power Supplies

- **Function:** Supply of defined voltages (e.g., 12V / 24V) with adjustable current limiting to prevent component damage during the initial testing of control units.
- **Link in Wiki:** `elektronik/netzteil/index.md`

6.3.3.2 2.2 Compressors & Solder Paste Dispensers

- **Function:** Compressed air supply for pneumatic desoldering units, paste dispensers, and workshop cleaning.

6.3.3.3 🌐 Related topic subpages on ms-muc-docs.de

- 🌐 The PWM signal & infographic on ms-muc-docs.de

7. Mechanics

7.1 🎧 Podcast

- Switches, Stuttering, Stability: The Phenomenon of Contact Bouncing and its Debouncing in Mechanics and Electronics]