

Power and Control from within – The winning combination

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In addition to a good price/performance ratio, today's professional user of a temperature-controlled soldering station requires, above all, a tool that offers the following:

- 1. Exact temperature control**
- 2. Maximum power**
- 3. System efficiency**
- 4. Repeatable soldering results**
- 5. Calibration capability**
- 6. Ergonomic design**

These are precisely the aspects that received priority during the development of ERSA's NEW DIMENSION products.

Exact temperature control

The more precise the requirements become for a specific temperature level at the solder joint, the more importance the user must attach to choosing a soldering tool with a genuine closed-loop control circuit. To control temperature, it is possible either to make use of physical effects or to work with a closed-loop control circuit. An example of the former method is temperature stabilization using the magnetism of a ferromagnetic alloy around its Curie point (a specific temperature) when high-frequency voltage is applied to it. The accuracy of such a system, however, is constrained by the fact that it is not possible to precisely determine the Curie point or working temperature of the soldering tip. If your goal is to meet stringent international quality standards - you must consider the following ERSA principle:

**Only that which measures precisely can control precisely,
and only that which controls precisely can solder precisely.**

The significance of this statement is impressively illustrated by the comparison between different heating and control systems shown in fig. 1.

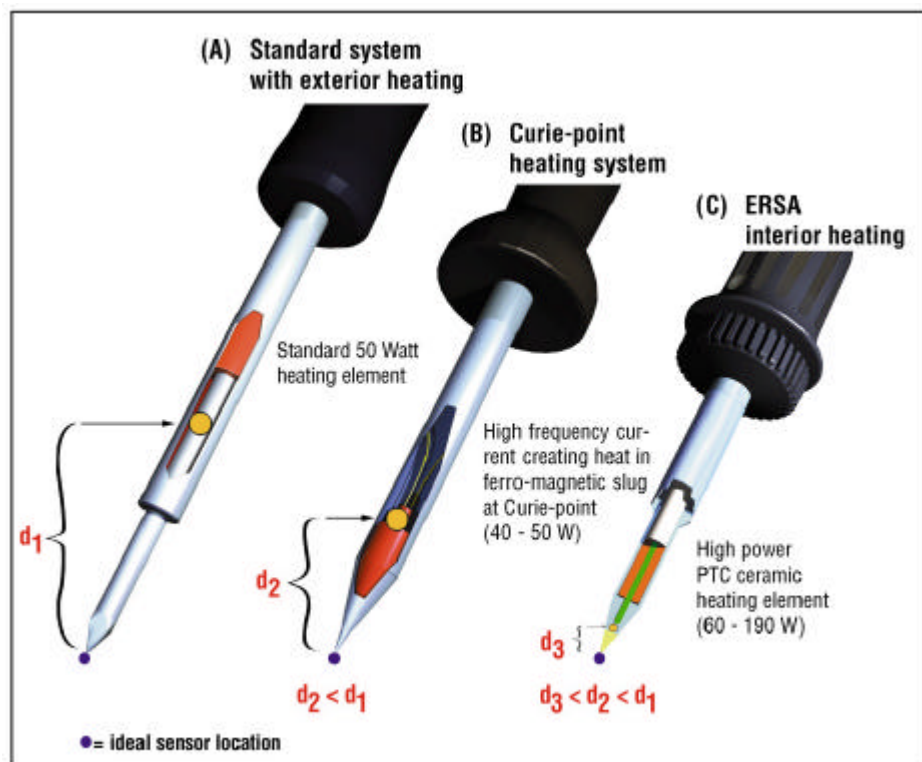


fig. 1: Comparison of the different heating and control systems

The necessity of measuring the temperature by means of a sensor as close as possible to the end of the soldering tip is a fundamental principle of a rapid response system. The closer to the end of the soldering tip the measurement is taken, the quicker the control system can respond. In a system with exterior heating, the entire mass of the soldering tip must have cooled down before a loss of heat can be measured.

Curie point heating systems, are physically constrained due to the lack of a temperature sensor.

ERSA SENSOTRONIC interior heating, in which the high-quality K-type thermocouple is located as close to the end of the soldering tip as possible, offers tremendous advantages in terms of extremely rapid recovery heating. The geometric and physical features of the system make it the nearest thing one can get to a perfect temperature controlled system.

Maximum power

Particularly when soldering large joints, it is essential that the control station compensates for heat loss with rapid heat recovery and maximum power. In contrast to many conventional soldering tools, all Ersa soldering stations are equipped with the unique PTC (Positive Temperature Coefficient) heating elements. Ersa soldering tools can operate for short periods at up to three times the power of the control unit. As a result, heating-up times are extremely short (8-12 sec.) and it is possible to work effectively at an unbelievably low temperature of around 235°C (455°F).

Figure 2 shows the power capacity of PTC heating elements compared with that of normal heating elements. The maximum power capacity of normal heating elements (as in Fig. 1) is that which is provided by the control station. The heating elements used by ERSAs are clearly superior in the heating-up and recovery phase. Fig. 3 gives an impressive indication of how this affects soldering performance.

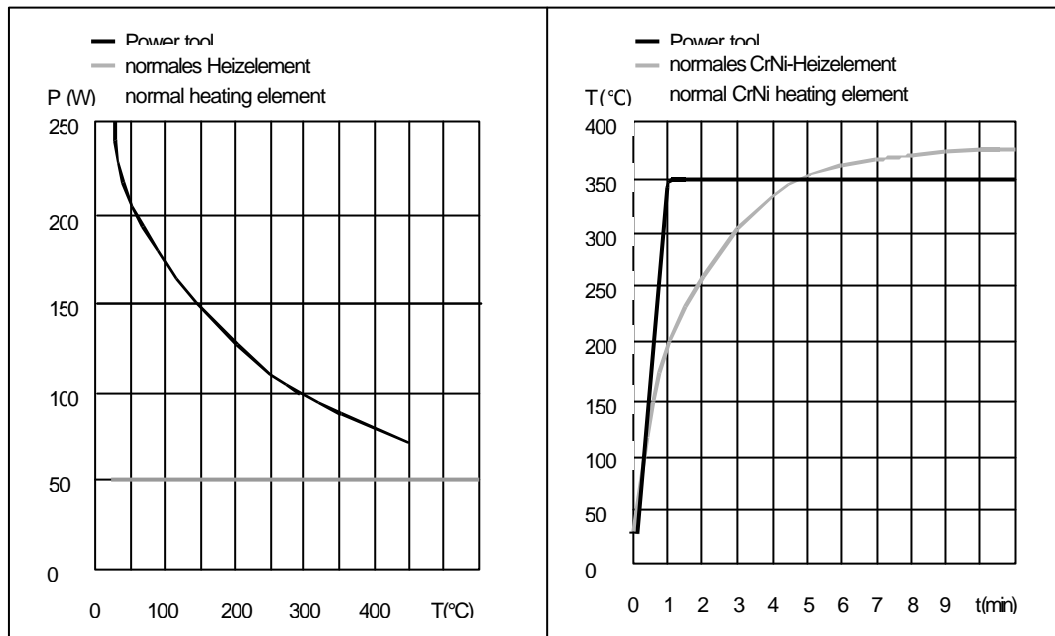


Fig. 2: Power/temperature curve

Fig. 3: Heating curve

System efficiency

ERSA soldering stations work on the principle of interior heating, resulting in as little heat as possible being lost during soldering operations. In contrast to conventional systems with exterior heating, the heat generated in the heating element flows almost entirely to the soldering tip. The response time is so short that standard, conventional copper soldering tips could not withstand this intense flow of heat. The soldering tips of the ERSAs Tech tool have silver cores. This specific choice of material raises the efficiency and response time of the ERSAs interior heating system to an optimum level.

Repeatable soldering results

Today's international quality standards require repeatable results from every user. In other words, the process parameters set for a device must remain within certain tolerance limits after a tool change. Applied to soldering, this means that when a tip is changed for a new application or because it is worn, the settings determined for the soldering joint must be attained and repeated. This demand can only be met by a closed-loop control circuit that provides extremely rapid heat recovery regardless of the thermal mass involved. This is the main prerequisite for repeatable soldering results, and it is fulfilled impressively by all ERSAs SENSOTRONIC and Fuzzy-Logic soldering stations.

Calibration capability

Today's international quality standards, like ISO 9000, demand calibration of factory tools. For a hand soldering operation, this means ensuring that the set or desired working temperature is identical with the actual tip temperature. All ERSA soldering stations allow the user to make this calibration quickly and easily. Systems that use physical effects and do not allow for this critical function can be misleading and dangerous.

Ergonomics

The greatest possible power output, smallest possible grip, and shortest possible distance between the grip and the working point - these are the demands placed on a modern soldering tool. The ERSA soldering irons Micro tool, Tech tool and Power tool fit these requirements perfectly. They are among the smallest and lightest on the market, and their performance is unsurpassed.

“Power and control from within” is more than just a slogan; at ERSA, it is the foundation for a new form of process control at the workbench - to an extent previously only dreamt of.