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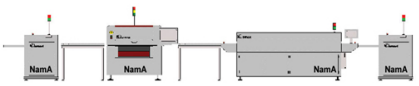
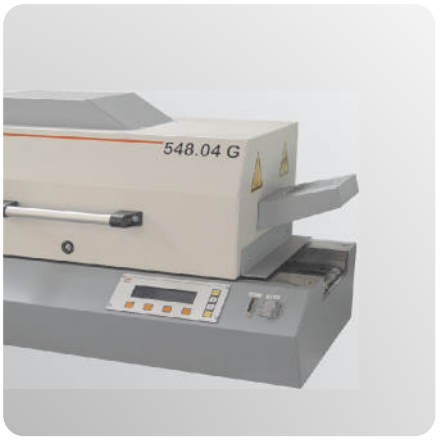
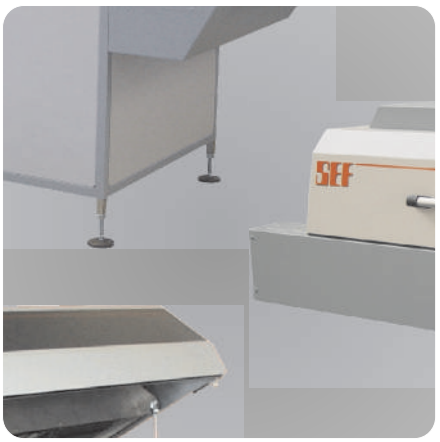


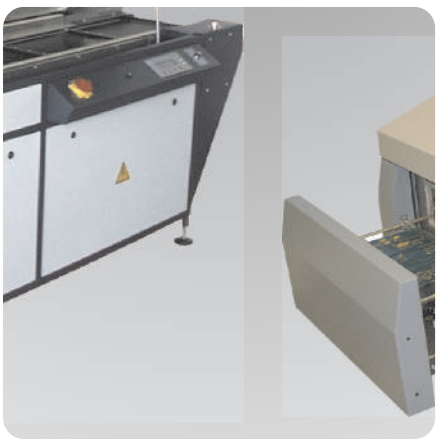
# Reflow-Soldering Systems

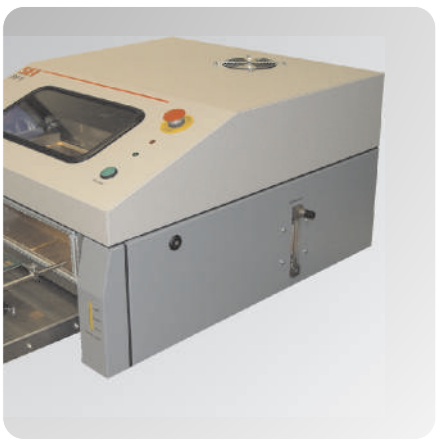
- Free standing models
- Desk models
- Laboratory models







## Overview • Delivery range

Technik aus Norddeutschland High Tech made in Northern Germany

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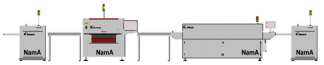
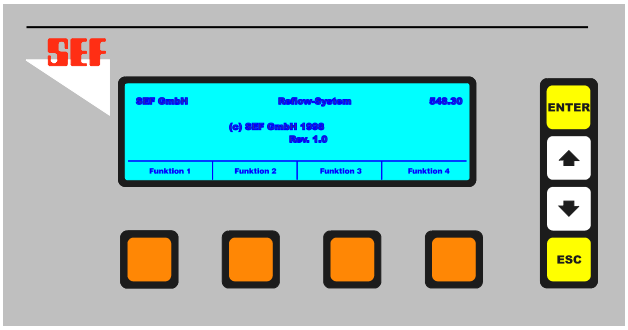







All **SEF Reflow systems**, except the **RP 6**, work with the same controller principle. Main part is the 8-Bit $\mu$P 80C51 with battery backed real time clock. This CPU covers all transducers, setting outputs as well as interfaces for documentation.

A user-friendly operation is ensured by only four function keys, whose respective status is displayed on the graphicable LCD.

The power electronics are completely placed on amodule accessible from the front side in the free standing models, and on a extricable drawer in the desk models. A seperate filter ensures that the application complies with CE standard. The maximum air-temperature is limited to 270°C by software. There is an additional excess temperature protection by hardware to preserve the system from damages in case the chamber sensor is failing. Thus the working range is suitable for leadfree solder pastes.

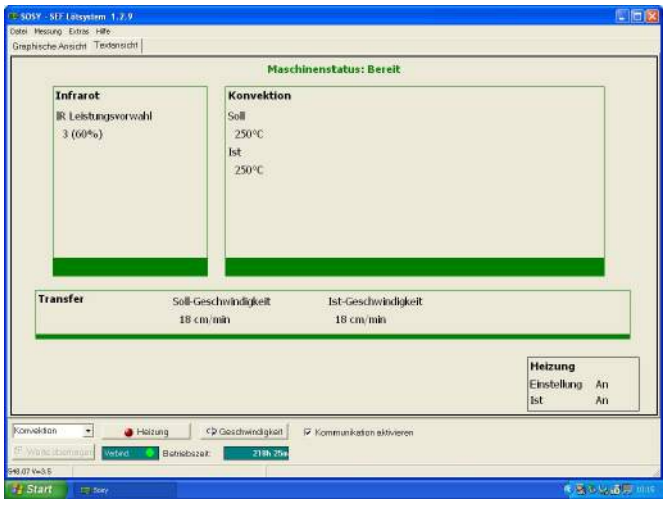
The software allows the storage of up to 16 different programs and 8 temperature profiles. It covers not only the function programming and regulation mathematics, but also the interface drivers and an integrated profile determination whose data is graphically displayed.

**Language selection:** German, English, French, Polish
further languages on request

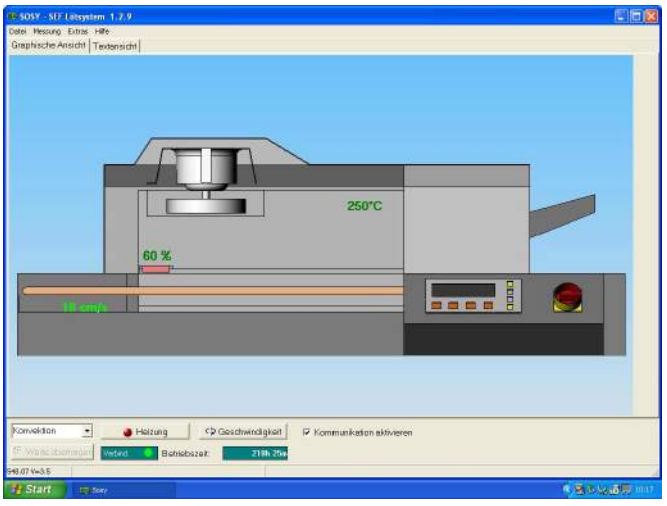
## PC-Software: SOSY

Most SEF reflow systems can be operated with our PC software **Sosy** alternatively. Therefore our ovens are equiped with an USB interface. In addition to the graphical display of the operating panel functions, the **Sosy** software also offers the possibility to print the program parameters, profiles measured by the integrated temperature profiler (only desk models) as well as a protocol (comparison of set values and actual values) via your normal Windows printer.

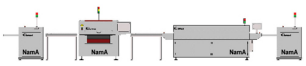
Of course it is possible to store more than 16 programs and 8 temperature profiles on your PC if necessary. Following you will see some screen shots of the **Sosy** software as an example for the oven **548.07**.




Textual view to change parameters




Graphical view to control the actual values





Our well-known desk-models have proved themselves in the manufacturing due to their compact construction and reliable soldering results. With capacities between 0,35 $m^2$/h and 2,1$m^2$/h (use-tracing relation 1:1) and with working widths between 18 cm and 35 cm their are capable for all branches of production, beginning with laboratory use up to bigger series production.

Easy and clear operation grants a use without problems. For easy removal of the PCBs a chute is included in the delivery. The transport occurs via a grid belt conveyor.

With the help of the integrated temperature profiler you can check at the display graphically if you produce within the required process window.

The transport occurs via a grid belt conveyor. Optional the **548.10** is available with a pin chain conveyor and so it is capable of inline production.

Unsere Lötsysteme bieten eine maximale Lufttemperatur von 270 °C im Peakbereich und sind damit auch für den Einsatz von bleifreien Lotpasten geeignet. Im Auslauf werden die Platinen durch Lüfter schonend abgekühlt.

Our soldering systems offer a maximum air temperature of 270 °C in the peak zone and so they are suitable for the use of lead free solder paste. At the outlet the PCBs will be cooled down via ventilators.

Our soldering systems are equipped with two standard soldering programs for solder pastes with and without lead as well as with a curing program which could be used as basic for creating your own programs.

## Heating chamber principle:

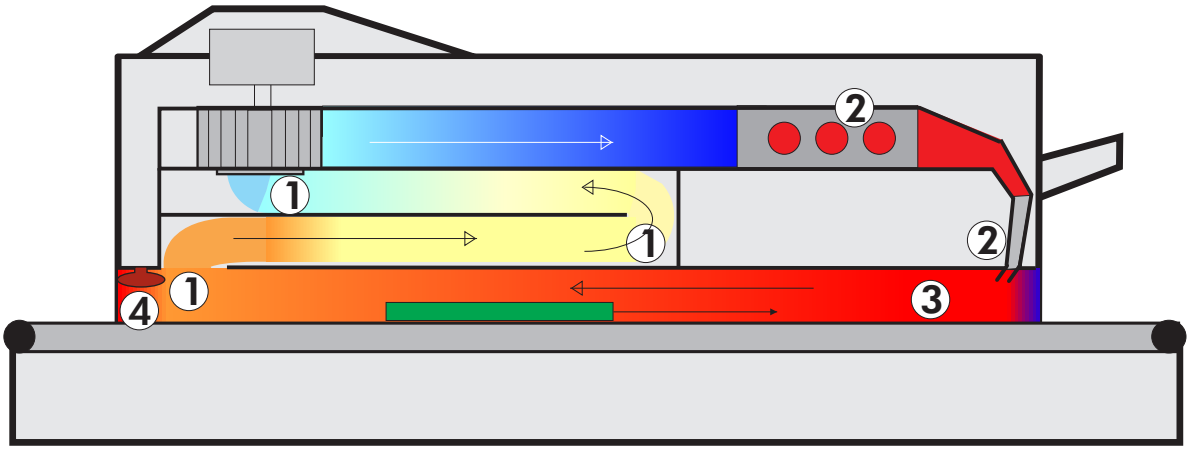
Our desk models are all equiped with our well-proven sliding zone forced convection architecture. This heating chamber principle allows a quick and easy adjustment of your soldering profiles according to your special requirements by the change of only 3 parameters.

**Inlet (1)**

At the inlet the air is sucked in via a nonvertical airshaft by a blower which is adjustable between 50% and 100%.

**Peak nozzle (2)**

Following the air is led through a radiator to the "peak nozzle".




**Inlet heating (4)**

To support the pre-heat, an additional inlet-heater can be activated. For big heat requirements a peak support via IR-heater can be switched on at the **548.10**.

**Pre-Heat-Phase (3)**

After forming the "soldering peak", the air cools down fast under the melting point. It streams contrary to the transport direction and forms the "preheat" phase.

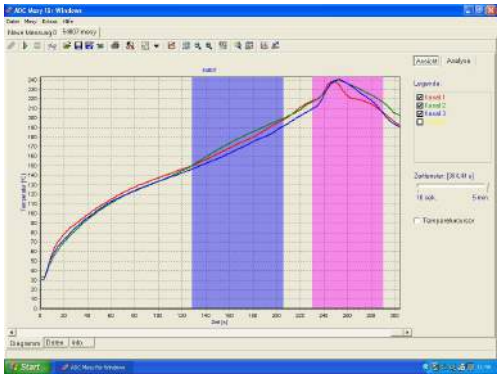
## 548.04 G

Typical lead free profile 548.04G


### Technical data 548.04G

| | |
|---|---|
| Length +210 mm for outlet chute | approx. 1000 mm |
| Width | approx. 600 mm |
| Height | approx. 500 mm |
| Weight | 65 kg |
| Working width | 180 mm |
| Active chamber length | 600 mm |
| Conveyor speed typical | 10 – 60 cm/min approx. 14 cm/min |
| Inlet height | 40 mm |
| Connection value | 3 x 16 A CEECON 230 / 400 V |
| Max. heating power | max. 6,8 kW |
| Exhaust volume | 180 $m^3/h$ |
| Interfaces | 1 x USB 1.1 (only slave operation) |

## 548.07 G

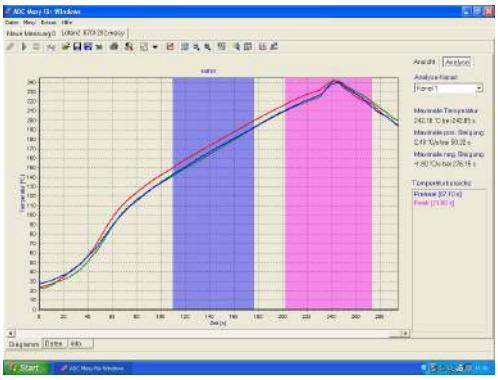


Typical lead free profile 548.07G


### Technical data 548.07G

| | |
|---|---|
| Length +210 mm for outlet chute | approx. 1400 mm |
| Width | approx. 660 mm |
| Height | approx. 530 mm |
| Weight | 90 kg |
| Working width | 250 mm |
| Active chamber length | 680 mm |
| Conveyor speed typical | 10 – 60 cm/min approx. 20 cm/min |
| Inlet height | 40 mm |
| Connection value | 3 x 16 A CEECON 230 / 400 V |
| Max. heating power | max. 6,8 kW |
| Exhaust volume | 180 $m^3/h$ |
| Interfaces | 1 x USB 1.1 (only slave operation) |

548.10 G/K



Typical lead fee profile 548.10G


## Technical data 548.10 G/K

| | |
|---|---|
| Length<br>+210 mm for outlet chute | approx. 2000 mm |
| Width | approx. 862 mm |
| Height | approx. 620 mm |
| Weight | 250 kg |
| Working width | 350 mm |
| Active chamber length | 1300 mm |
| Conveyor speed<br>typical | 10 – 60 cm/min<br>approx. 30 cm/min |
| Inlet height | 40 mm |
| Connection value | 3 x 16 A CEECON<br>230 / 400 V |
| Max. heating power | max. 11,4 kW |
| Exhaust volume | 180 $m^3/h$ |
| Interfaces | 1 x USB 1.1<br>(only slave operation) |

## Additional options: Transfer elongation TFV 200 / TFV 300

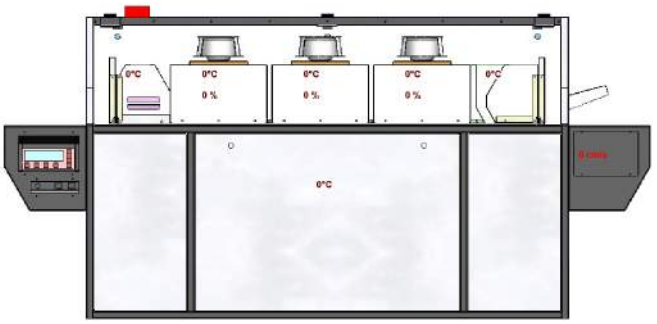

The transfer elongations allow an extension of the grid belt conveyor for approx. 20 cm and 30 cm respectively. Therewith a longer distance is available for the cooling of the PCB after the soldering process which is sometimes necessary when using lead free temperatures. The transfer speed is based on the adjusted speed of the soldering system because the TFV 200 will be connected parallel to the soldering system motor.

| TFV 200 | |
|---|---|
| Capable of soldering system | 548.04 G / 548.07 G |
| Dimensions | 206 x 376 x 160 mm lxwxh |
| Working width | 250 mm |
| min. PCB length | 70 mm |
| Conveyor speed | as adjusted at the soldering system |
| Power supply | 24 V, via soldering system |
| Colour | green or grey |

| TFV 300 | |
|---|---|
| Capable of soldering system | 548.10 G |
| Dimensions | 304 x 478 x 210 mm lxwxh |
| Working width | 350 mm |
| min. PCB size | 70 mm |
| Conveyor speed | as adjusted at the soldering system |
| Power supply | 24 V, via soldering system |
| Colour | green or grey |

## Series manufacturing: 7 ZCR

With a capacity of 2,7m²/h and a use-tracing relation of 1:1, the manufacturing of medium up to bigger series is the optimal application for the **7 ZCR**.



The heating chamber of the **7 ZCR** has 4 heating zones, 2 cooling zones (1x passive, 1x active) and additional bottom heat over the complete heating zones. The heating zones are separated like the following:

**Zone 1**: Start up with IR heaters, max 450°C

**Zone 2**: Preheating 1 with convection heat, max. 290°C

**Zone 3**: Preheating 2 with convection heat, max. 290°C

**Zone 4**: Peak zone with convection heat, max. 290°C

Over the complete length of the 4 zones a heating plate for bottom heat is available, max. 250°C. Thus the **7 ZCR** has enough heating capacity for lead free soldering, also for thicker multilayer boards.

All temperatures of the mentioned heating zones are adjustable separately. In the convection zones the power of the blowers is adjustable, too. After the heating zones 2 cooling zones are following, one inside the chamber and one outside which cools down the PCBs gently to ambient temperature via blowers.

The operation of the **7 ZCR** can be done via the mounted operation panel or via an external PC optionally. Therefore an USB interface and our optional software **Sosy** are availabe.

The work with the operation panel occurs via a simple user guide with four function keys, whose respective status is displayed on the graphicable LCD.

Max. 16 sets of parameters can be stored as a separate program.

For a more comfortable, 3-channel measuring of temperatures our temperature profilers **570.70** and **570.77** are available additionally.

For the communication with upstream machines a potential free ready contact is included.

7 ZCR

7 ZCR

Typical lead free profile 7 ZCR

PC Software Sosy (optional), textual view

## Technical data 7 ZCR

| | |
|---|---|
| Length | approx. 2680 mm |
| Width | approx. 860 mm |
| Height | approx. 1350 mm |
| Weight | 400 kg |
| Working width grid belt | 350 mm |
| Working width pin chain | 35 – 345 mm |
| Active chamber length | 1500 mm |
| Conveyor speed typical | 5 - 50 cm/min approx. 30 cm/min |
| Inlet height | 40 mm |
| Connection value | 3x32 A CEECON 230 /400 V |
| Max. heating power | max. 21 kW |
| Exhaust air volume | 180 m³/h |
| Interfaces | 1x USB 1.1 (only slave operation) |

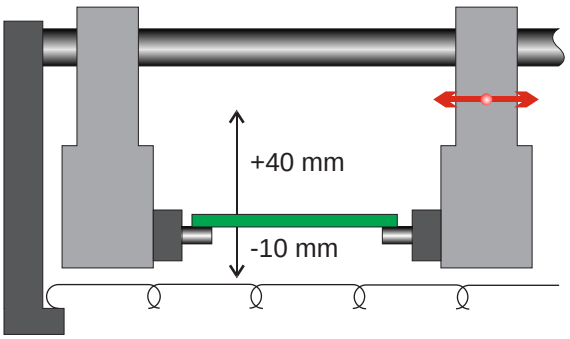
## Duplex conveyor

The system is equipped with a duplex conveyor. The duplex conveyor combines the advantages of the pin chain conveyor and the grid belt conveyor in one machine.

The pin chain conveyor supports the automatic in-line production.

The grid belt can be used for small separated PCBs and acts also as a middle support for wide boards while using the pin chain conveyor.

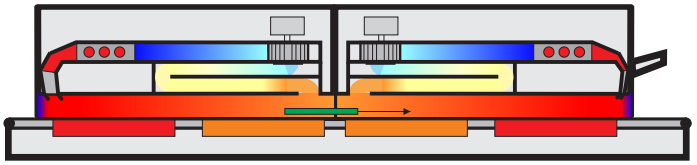
The adjustment of the working width follows by a handwheel.



## Special machine for very big heat requirements: 549.30 B

The **549.30 B** is a special soldering system for series manufacturing with very high energy requirements like aluminium PCBs. The system works with a combination of upper- and bottom heat to supply the necessary heat. For the upper heat we use two of our well-proven sliding zone heating chambers which are arranged inversely.

For the bottom heat four heating plates are used. The temperatures of the heating chambers as well as the temperatures of the heating plates can be adjusted seperately. The conveyor is designed as a teflon bags conveyor to receive an optimal heat transfer from the heating plates to the PCBs. The assembly will be heaten up gently by this way.



You can choose between 12 (standard) and nine teflon bags.. The PCBs will be cooled down to normal temperature in a cooling zone at the outlet of the oven. With a capacity of 2,6 $m^2$/h and a pause tracing relation ship of 1:1, the **549.30 B** is suitable for bigger series.

549.30 B

Typical lead free profile 549.30B


### Technical data 549.30 B

| | |
|---|---|
| Length | approx. 2700 mm |
| Width | approx. 980 mm |
| Height | approx. 1250 mm |
| Weight | 350 kg |
| Working width | 350 mm |
| Bag length with 9 bags | 600 mm |
| Bag length with 12 bags | 450 mm |
| Active chamber length | 1250 mm |
| Conveyor speed<br>typical | 5 – 50 cm/min<br>approx. 35 cm/min |
| Inlet height | 40 mm |
| Connection value | 3 x 16 A CEECON<br>230 / 400 V |
| Max. heating power | max. 16,8 kW |
| Exhaust air volume | 180 $m^3$/h |
| Interfaces | 1 x USB 1.1<br>(only slave operation) |

## Small series, prototypes or component qualification: Batch oven RP 6

new

Our batch oven **RP 6** is the newest model in the SEF reflow family. With its compact dimensions, a max. PCB size of 300x200 mm and its low power consumption it is capable of prototype production, small series production as well as component tests.

The heating chamber works with a mix of radiant heat by IR heaters and convection heat by radiators. Therewith max. reflow temperatures of 280°C-300°C on the PCB are possible. An inspection window in the hood allows to observe the soldering process.

The **RP 6** has an integrated temperature profiler with 3 channels. The sockets for the connection are accessible at the front side of the oven. With the help of the provided thermocouple sensors the actual temperature profiles on the PCB can be measured and faded in the production window additionally. This allows an optimal comparison between set profiles and real profiles on the PCB. The optionally available Software "**Mesy for Windows**" allows the import of the actual profiles and a detailed analysation. With this software it is possible to detect values like max. positive and negative temperature increase, max. peak temperature, time above liquidus and so on.

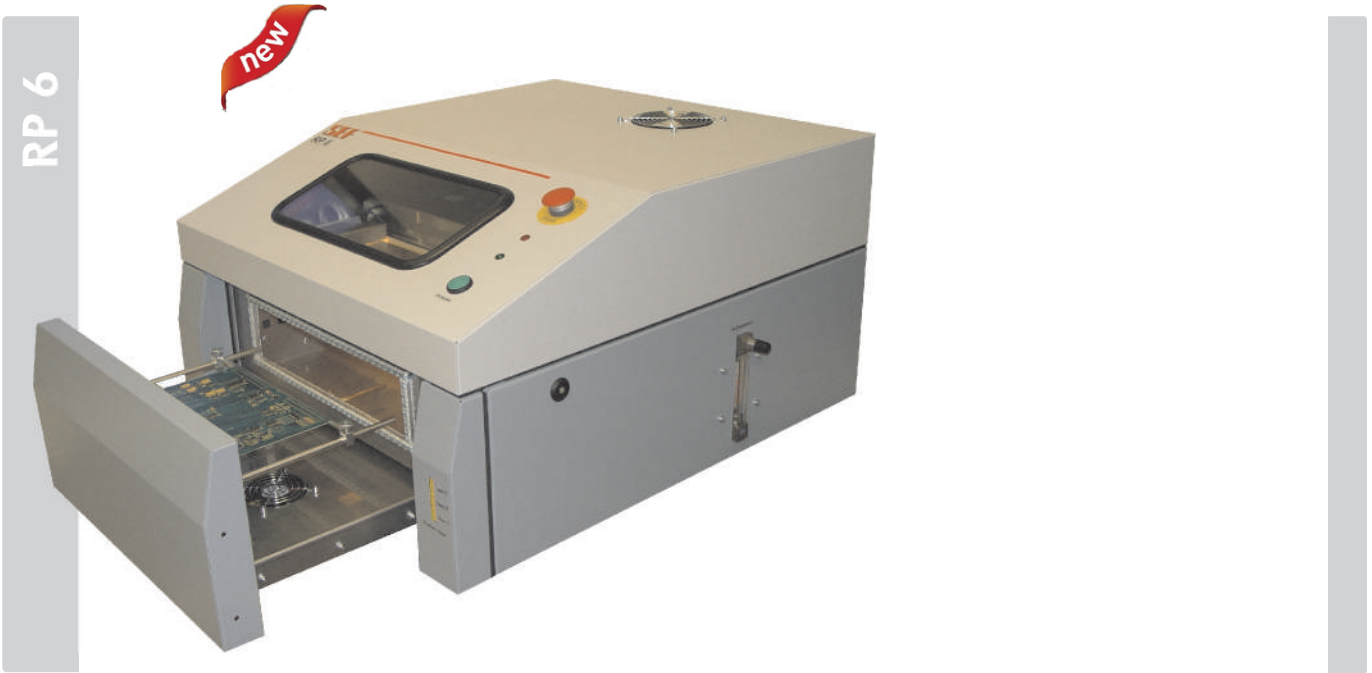
After finishing the soldering process the drawer of the oven will open and two fans, integrated in the drawer and continuously adjustable, will cool down the PCBs to ambient temperature again.

The operation of the oven takes place by a PC or a notebook (not included in the delivery) which will be connected with the oven by a USB interface. The provided PC software offers at a glance all relevant information like oven status, explorer window for the selection of created profiles and a graphical display of the set temperature profiles.

The creation of the profiles takes place via a user-defined number of data points. For each data point you can adjust the temperature and the time so that a large number of profile variations are possible. Since it is possible to adjust the set profiles for the two IR heater fields (top middle and outer) and the two radiators (sidewise left and right) separately, an adjustment of the square profile to different PCB assemblies is also possible.

The normal power supply of the **RP6** is 230 V. For applications with big heat requirements the oven can operated with 400 V (3 phases, N, PE) optionally.

Optionally the oven can be provided with a connection for nitrogen supply and the according flowmeter. With a consumption of approx. 0,5 $m^3/h$ it is possible to reach residual oxygen values of less than 50 ppm.



RP 6

## System data RP6

| | |
|---|---|
| Dimensions (LxWxH) | 750 x 650 x 440 mm |
| Depth (opened) | 1000 mm |
| Weight | approx. 50 kg |
| Min. PCB size | 10 x 10 mm |
| Max. PCB size | 200 x 300 mm |
| Varnish | RAL 7001/7047 |
| Max. Reflow temperature | 280 °C – 300 °C |
| PCB cooling | 2x ventilators continuously adjustable |
| Continuous sound pressure level | < 70 dB(A) |

## System requirements

| | |
|---|---|
| CPU | Pentium IV or similiar |
| RAM | 512 MB |
| Operating system | Windows 2000, XP, Vista |
| Graphic board | Standard graphic board |
| Monitor | Min. 15'', better 17'' resolution min. 1024 x 768 dpi |

## Energy supply

| | |
|---|---|
| Connection value | 230 V /N/PE *optional* 400 V (3 phases/N/PE) |
| Pnominal | 3,5 kW *optional* 8,5 kW |
| Energy consumption in steady-state (at 100 °C) | 0,5 kWh |

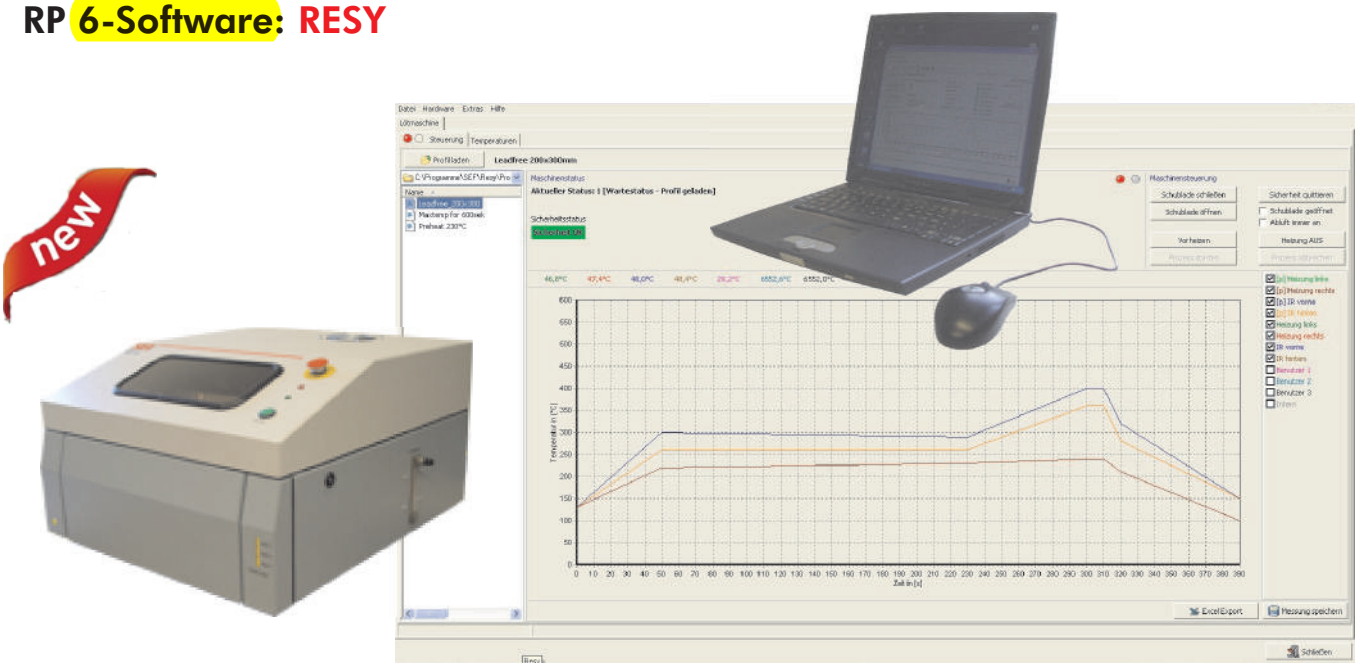
## Media supply exhaust air

| | |
|---|---|
| Exhaust hose connection | 60 mm |
| Necessary exhaust air volume | 40 m3/h (ventilator is already integrated) |

## Media supply nitrogen (optional)

| | |
|---|---|
| Connection fitting | 6 mm hose connection |
| Working pressure (at connection fitting) | 3 bar |
| $N_2$-consumption | approx. 0,5 m3/h |
| Operating state (500 ppm) | approx. 1-2 min. |
| Best value after | approx. 3 min. (approx. 50 ppm) |

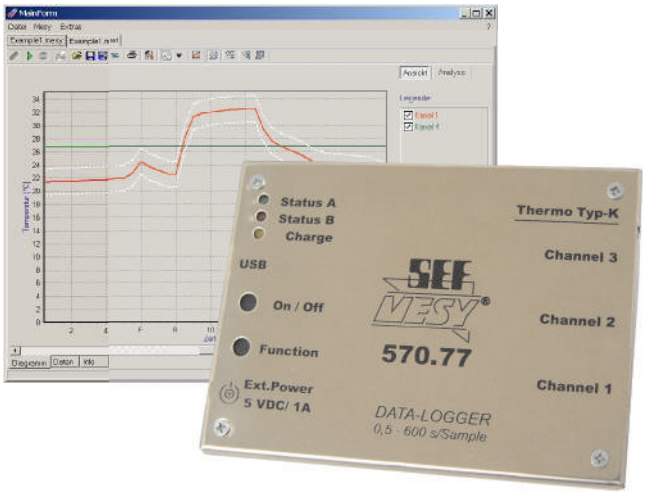
## RP 6-Software: RESY

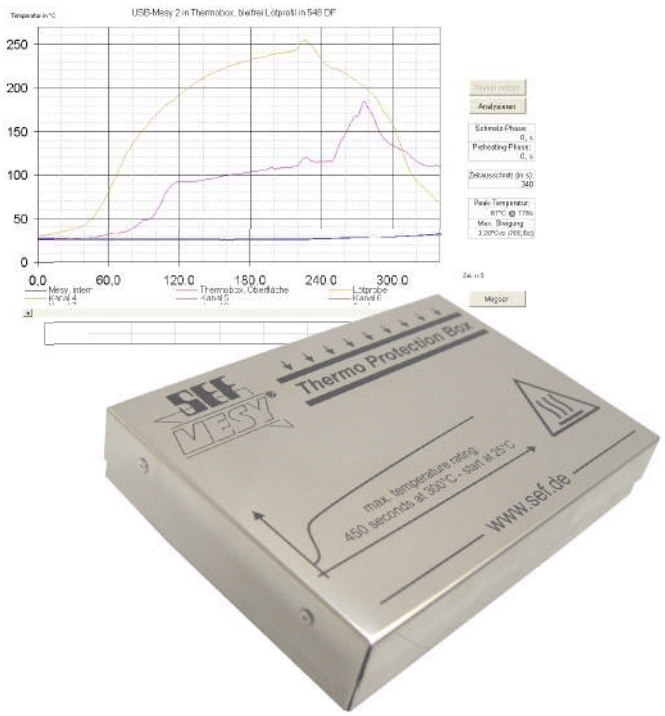


We offer additional equipment to support the production with our soldering systems for, example measuring and printing systems.

## Measuring systems

Our USB-Mesys® **570.70** and **570.77** offer measuring in real-time mode and storage mode respectively. The software runs with Microsoft® Windows 2000 and XP. The reporting of the measuring occurs with the help of na extensive analysis module.

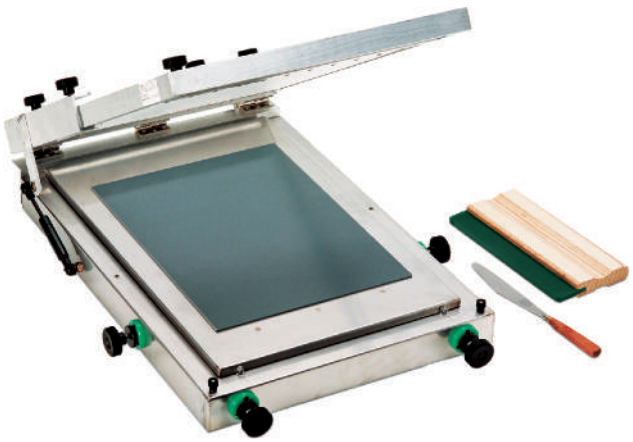



The parameter setting and the analysis takes place via PC. Together with the thermo insulating box **571.77** the Mesy **570.77** is suitable for the use inside reflow and wave soldering systems.

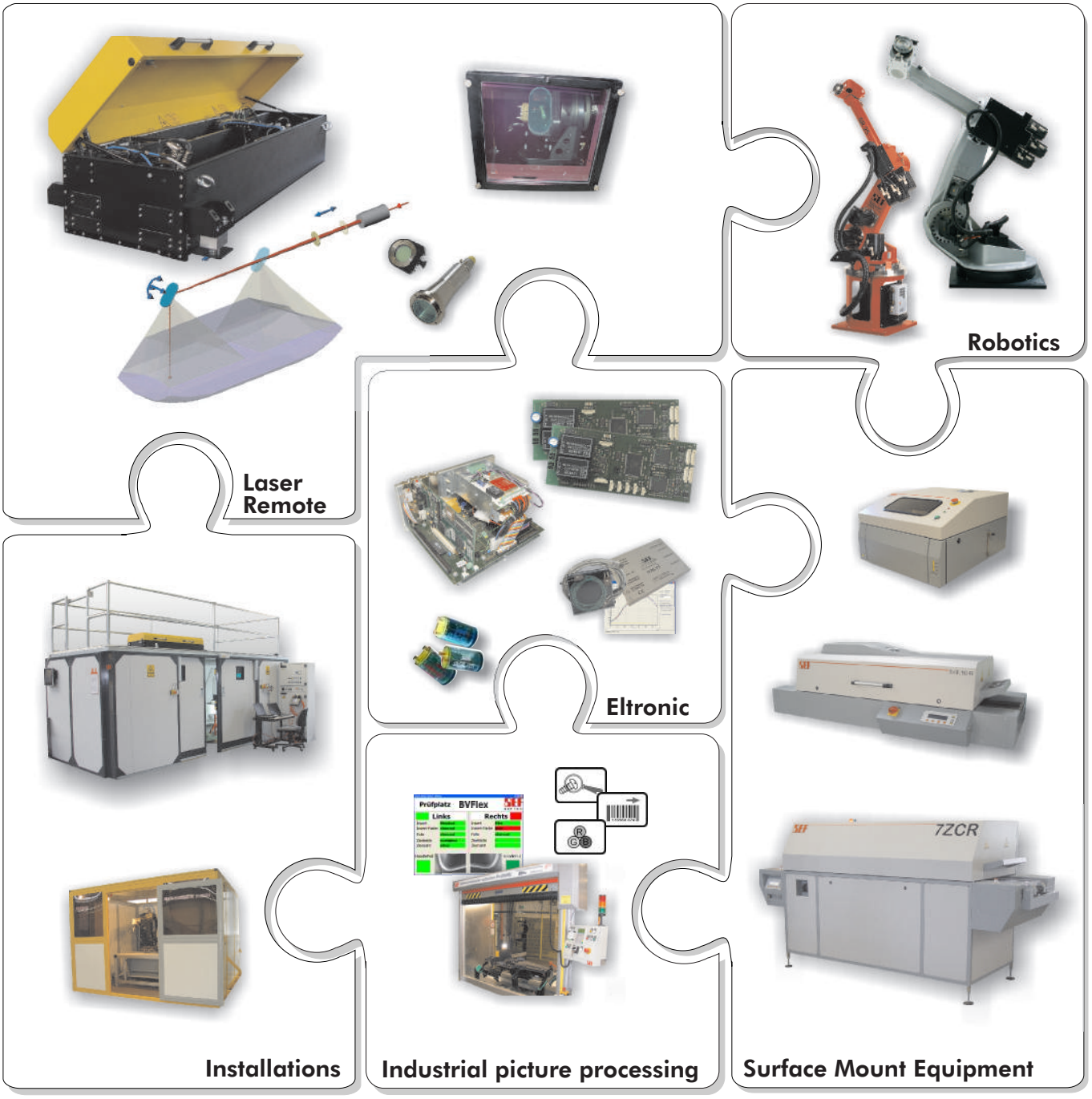
## Printing system

With our printing system we have the right choice for the production of samples and small serie: The set Maxi - Printer **530.03** and the stencil clamping frame **530.13**. This set offers an easy and reliable use, high precision and repeat accuracy.



You will find more technical data about our **SMD accessories** in a special brochure.

## Technik aus Norddeutschland SEF High Tech made in Northern Germany



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