

Wave

Reflow

Selective



Selective Soldering System SEHO POWERSELECTIVE



Soldering is our Passion

## Maximum Flexibility In Your Production

# POWERSELECTIVE

- **Modular system which ideally fits into each production concept.**
- **The machine can be upgraded any time to minimize cycle times or to increase the production volume.**
- **High precision portal axis system which provides maximum flexibility.**
- **Wide field of application: for dip soldering processes, miniwave soldering or for conventional wave soldering.**
- **Multiple soldering units may be integrated into one machine.**
- **Wetted or non-wetted solder nozzles can be used.**
- **The rotating and tilting function of the gripper allows ideal peel-off to reduce solder bridges.**
- **Solder waves with touchless wave height control and nitrogen inertion, for best possible soldering results and highest reliability.**
- **Maximum machine availability due to quick change nozzles, and product change-over or maintenance "on-the-fly".**
- **User-friendly operating interface and easy-to-handle teaching function, online or offline.**
- **Automatic process control with embedded AOI system, flux quantity control and many more.**
- **Minimum maintenance requirements and ideal accessibility.**
- **Available for inline or batch operation and flexible lean production concepts.**
- **For maximum board or carrier dimensions of 500 x 500 mm [19.68" x 19.68"].**

### For the Flexible Production with High Throughput

SEHO PowerSelective is featured with an outstanding modular machine construction which ensures highest flexibility. The basic system can ideally be configured to meet different specific production requirements and provides the opportunity to be upgraded step by step at a later date to suit subsequent production developments.

The PowerSelective may be equipped with up to two different soldering units. Thus, miniwave soldering processes and dip soldering processes can be covered with only one machine, even conventional wave soldering processes may be performed with the PowerSelective.

Flexibility is also given in the handling of the assemblies. Both, bare boards as well as assemblies in carriers can be processed with the PowerSelective.

Worldwide unique are the PowerSelective's outstanding features for process control. Flux quantity control, intelligent tool management, automatic board alignment via fiducial recognition, warpage compensation and an integrated AOI system for optical control of the solder joints are only some of the PowerSelective's highlights.

**Highest Flexibility, absolutely reproducible results, high soldering quality and low investment costs sum up to one result: SEHO PowerSelective.**

### Made in Germany:

#### Precision in Manufacturing = Quality Results

A highly precise portal axis system with a repeatability of  $\pm 0.1$  mm ensures an accurate and reliable positioning of the assemblies at the different working stations.

The gripper is mounted at the z axis. After the fluxing and preheating process the gripper takes the assembly to be processed from the conveyor system, positions it precisely at the soldering units and finally deposits the printed circuit board back onto the transport system. Depending upon requirement, there are different grippers available which can be used for the handling of carriers, or direct gripper systems that are designed for the handling of bare boards.

If needed, the grippers may be equipped with additional functions, such as fixation of components or a correction function for printed circuit boards which show deformation after the reflow soldering process.

The gripper is provided with a rotating function up to 270° and may be tilted up to 12° to obtain an ideal solder angle even when processing demanding assemblies.

### Precise to the Point:

#### The Fluxer Area

The PowerSelective is equipped with a coordinate micro drop jet fluxer unit which may either be integrated in the inlet conveyor of the machine or in a separate fluxer module in front of the PowerSelective, depending on your requirements. This ensures lowest cycle times. The micro drop jet fluxer targets the flux to the exact point and avoids wetting of surrounding areas.

Several nozzle heads may be installed. Each nozzle head thereby can be equipped with up to three micro drop jet nozzles to further reduce cycle times.

The function of the fluxer nozzle can be monitored by means of a capacitive sensor.

Maximum process reliability without any influence on the cycle time is given with the real quantity control for drop jet fluxers, winner of the 2010 NPI award.

This unique high precision fluxer control system not only monitors the actual function of the micro-drop nozzle, but also measures the flux quantity that actually leaves the nozzle



during the fluxing process. Any deviation from a preassigned reference value is immediately detected. Additionally, the system software clearly indicates which part of the printed circuit board has not been fluxed correctly.

### **Ensures Defined Temperature Profiles: The Preheat Area**

The preheat area of the PowerSelective presents itself very flexible.

Depending on your production requirements several quartz heater cassettes or convection preheat units may be installed either at the inlet conveyor of the PowerSelective or in external preheater modules. For printed circuit boards requiring high heat energy, top side heatings are available as well.

The quartz preheat units may be monitored by a pyrometer to ensure the precise control of the temperature profile.

### **High Precision and Maximum Quality: The Soldering Area**

The state-of-the-art solder nozzle technology developed by SEHO ensures maximum precision in the soldering area.

Depending on your manufacturing requirements, up to two soldering units may be integrated into the PowerSelective, which are designed for miniwave soldering processes, dip soldering or even conventional wave soldering.

The solder nozzle technology of the PowerSelective permits very small distances between the solder joints thus it is possible to also precisely solder points which generally are difficult to get to.

For electronic productions with high throughput and small product range, product-specific multi-nozzle tools ensure short cycle times as all joints are soldered simultaneously.

The SEHO solder nozzle design features internal circulation of the liquid solder, ensuring fresh and always exactly tempered solder being continuously supplied to the nozzles. This guarantees optimum energy transfer with minimum clearance requirements for neighboring SMD components. Thus, perfect through-hole penetration is achieved, even when processing high mass connectors or pins located at the outer edges of a printed circuit board. Due to the special nozzle tool design, formation of solder balls is reduced remarkably.

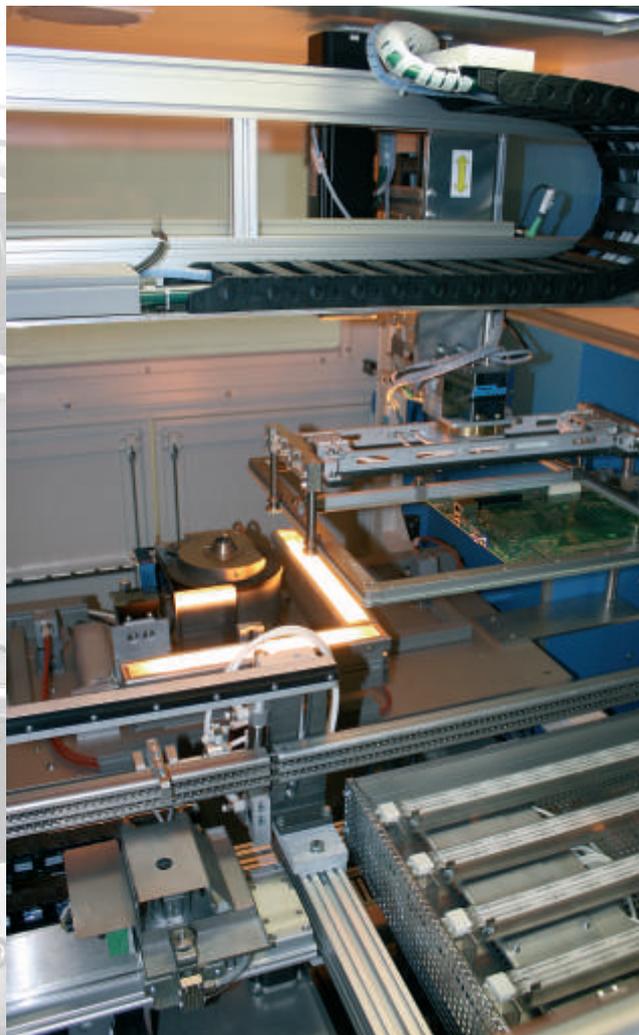
For productions with a wide range of assemblies, miniwave solder nozzles guarantee highest flexibility.

Alternatively, there are two different solder nozzle types available. Non-wetted solder nozzles are nearly maintenance-free and they are featured with an almost unlimited lifetime. Wetted solder nozzles stand out due to the possibility that even extremely small pitches can be processed without any difficulties.

Of course, both the product-specific multi-nozzle tools for dip soldering processes as well as the various miniwave solder nozzles are quickly exchangeable.

Change of nozzles or maintenance works can be made "on-the-fly" thus reducing production downtimes to zero.

Permanent touchless wave height control systems guarantee precise process conditions, without having any influence on the cycle time.



### **Simple and Comfortable: Programming**

The PowerSelective is equipped with up-to-date technology of control units.

Teaching of the solder joints is particularly easy with the PowerSelective.

A camera is used to identify the solder joints and read their position into the software. In case of pin rows it is sufficient to teach the first and the last point. The software then automatically recommends default values for e.g. solder direction and soldering angle, dwell time and soldering speed.

In case of a wide range of assemblies there is an offline teach program available. The special feature of this software tool is that the soldering program may be edited in any PC removed from the actual machine. Thus, the machine is used exclusively in the production process without interruption by any programming. The offline teach program can process image data from cameras and scans, eliminating common picture distortions automatically.

An innovative feature of the offline teach program is the passage optimization. After teaching of all solder points the program computes independently the fastest way to minimize handling times.

Using the USB interface or network connection, takeover of soldering programs out of the offline teach program into the machine and vice versa is possible fast and trouble-free without further conversions.

Every taught solder point can be displayed simultaneous to the soldering process, captured with the real-time camera. Any adjustment of parameters which might be necessary to improve the process can be done immediately to ensure that the following incoming printed circuit board already will be soldered with perfect results.



*real quantity control  
for drop jet fluxers*

### Maximum Process Reliability

The automatic circuit board position correction via fiducial recognition ensures maximum precision and process reliability. Various types of misalignment such as offset, position error and linear distortion of the circuit board automatically will be detected and incorrectly positioned assemblies will not be soldered. Simultaneously this software feature verifies the assembly is corresponding to the actually loaded soldering program.

The z-height correction function compensates warpage of assemblies, caused by previously performed thermal or mechanical processes.

Additional process safety is given by the intelligent tool management systems, particularly for machines being

equipped with two soldering units, or for electronic manufacturing companies running a mixed production with frequently changing printed circuit boards. The PowerSelective recognizes each coded assembly and automatically allocates it to the soldering unit with the corresponding solder nozzle tool. Another coding, for example, can be used to assign product-specific nozzle tools or grippers to the adequate soldering program.

Worldwide unique is an AOI system that can be embedded directly into the soldering process. The AOI system is used for the detection of soldering defects such as insufficient wetting, missing pins or solder bridges.

Recognizing its outstanding performance, the system won a NPI Award and the EM Asia Innovation Award.

### Technical Data and Machine Options

#### Gripper Guidance System

3 axis double portal system for installation of different gripper tools	●
repeatability	± 0.1 mm
rotating function	0 - 270°
soldering angle set-up by tilting the gripper	0 - 12°

#### Conveyor Variants

batch conveyor for processing of carriers	○
inline conveyor for processing of carriers	○
inline conveyor for processing of carriers or bare boards	○
max. board / carrier dimensions	500 x 500 mm [19.68" x 19.68"]

#### Micro Drop Jet Fluxer

wetting width on PCB	2 - 4 mm
automatic level control with capacitive sensor	●
multiple nozzle heads	○
flux types, alcohol or water based	up to 5 % solids content
real quantity control for drop jet fluxers	○

#### Preheating

quartz heating cassette internal or in separate preheater module	○
pyrometer control for quartz preheating	○
convection heating cassette in separate preheater module	○
top-side heating installed in the mask gripper or in the preheat area	○

#### Soldering Units

solder pot compatible for lead free soldering	●
max. solder pot temperature	up to 350°C
quick change solder nozzles and multi-nozzle tools	○
automatic wave height control with laser micrometer	○
automatic solder level control	○

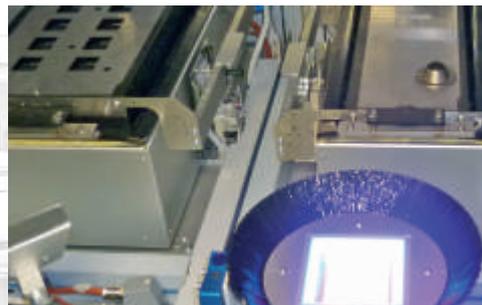
#### Control Unit and Features

touch screen with comfortable user interface	●
online teach system with camera and offline teach program	●
process visualization	○
automatic PCB alignment with fiducial recognition	○
intelligent tool management	○
AOI system for post soldering control	○

#### Connections and Machine Dimensions

nitrogen supply	R 1/4", min. 4 bar
nitrogen consumption (single nozzle)	approx. 1.5 - 2.0 m³/h
required particle cleanliness	5.0 recommended
compressed air supply	R 1/4", min. 6 bar
exhaust	1 x 500 - 600 m³/h
voltages	230/400 V-50 Hz-3 Phase+N+PE 3 x 208 V-60 Hz-4 Phase
machine dimensions - small production cell w x l	2170 x 2110 mm [85" x 83.1"]
machine dimensions - large production cell w x l	2570 x 2210 mm [101" x 87.0"]

Further options upon request. ● Standard ○ Option



#### Headquarters Germany

**SEHO Systems GmbH**  
 Frankenstrasse 7 - 11  
 97892 Kreuzwertheim  
 Germany  
 Phone +49 (0) 93 42-889-0  
 Fax +49 (0) 93 42-889-200  
 Mail info@seho.de  
 Web www.seho.de

#### Americas

**SEHO North America, Inc.**  
 1420 Jamike Drive, # 300  
 Erlanger, KY 41018  
 USA  
 Phone +1-859-371-7346  
 Fax +1-859-282-6718  
 Mail sehona@sehona.com  
 Web www.sehona.com

