FRITSCH
PRECISE AND FLEXIBLE DISPENSING SOLUTIONS

Dispensing machine
dispenseALL420

Innovation and quality made in Germany

dispenseALL420

Platform

The full-automatic dispensing system dispenseALL420 is a flexible machine for dispensing of solder paste, glue, sealant, underfill, conformal coating and more. The range of application are prototyping, serial production, special applications or the extension of production lines. Dispensing tasks are as individual as the used media. Therefore the dispensing machine dispenseALL420 offers a lot of options for every application.

Range of applications

Flexible system for the dispensing of lines, circles and areas for underfill, coating, dam and fill, potting and more.

Drive

X-Y Axis: Direct-current motors with contactless linear encoder, resolution 0.5 µm.
Z-Axis: Direct-current motors with encoder, resolution 1.6 µm.
Direct-current motors with encoder 0.005°.

Economics

Modular system, shortest set-up times, user friendly software.

Overview

Dispensing heads

The basic equipment of the dispensing machine dispenseALL420 offers a unit with up to 2 dispensing heads. It can be enlarged optionally up to 3.

Dispensing valves

The dispenseALL420 covers a wide spectrum of tasks and can therefore individually adapted to respective application.
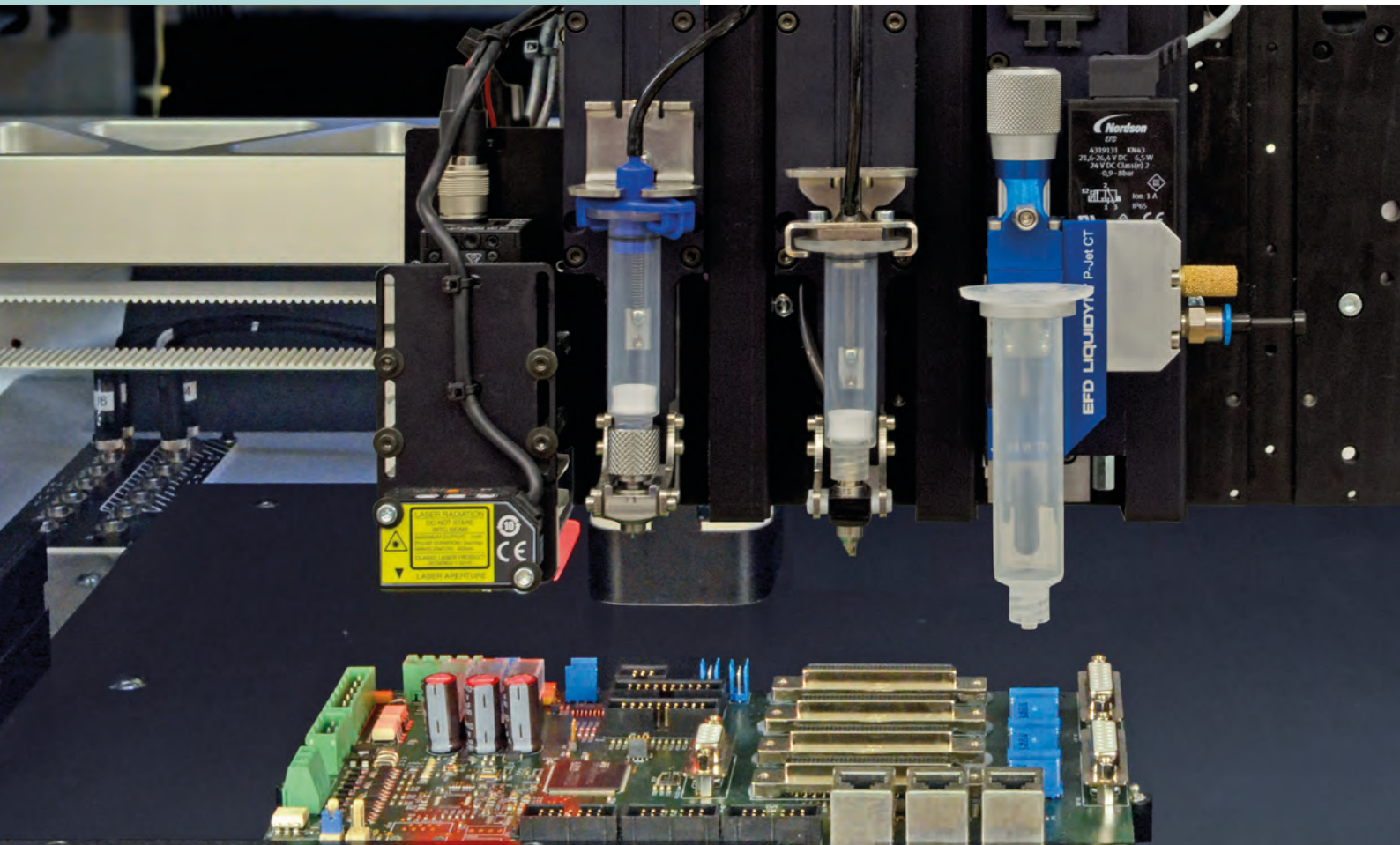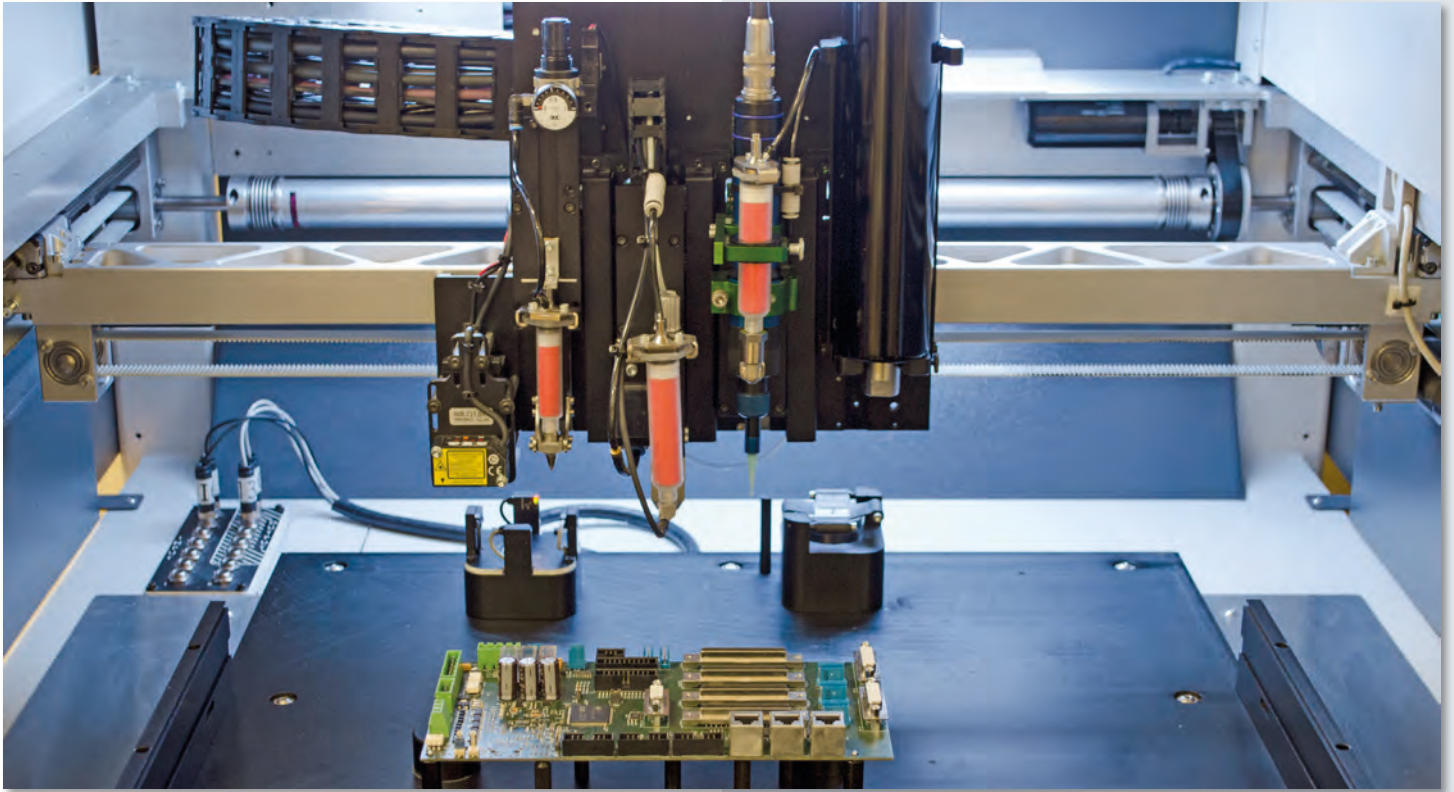
Application

The flexibility and adaptability of the dispenseALL420 enables a cost-effective and fast realisation of most varied uses in the automated assembly and production.

Software

The structured software applications combined with different features offer the user a significant facilitation of daily production.

The dispenseALL axis have ultramodern belt drives which are moved by DC-motors in combination with a high resolution linear measure system which is fixed along the axis. The axis are constructed weight-optimized to minimize the acceleration forces while dispensing. This enables the use of a belt-drive and a screw drive isn't necessary. With regard to Cost of Ownership this is an enormous advantage and offers in case of service and repair work a high potential of cost saving compared to screw drive.

The axis of the dispenseALL combinate the two advantages of both systems optimal:
High dynamic of the belt drive with the accuracy of the linear measurement. The high resolution of the encoder system of only 0.5 µm is optimal completed by the axis controller with a scanning frequency of 100µ each axis. Because of this also high dynamic drives can be performed extreme accurately.
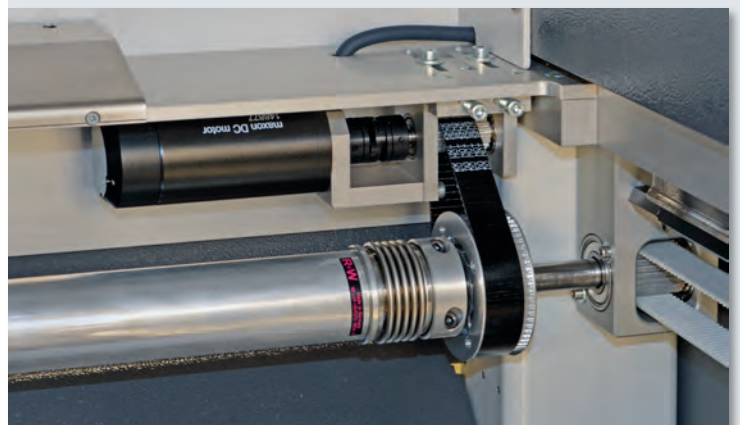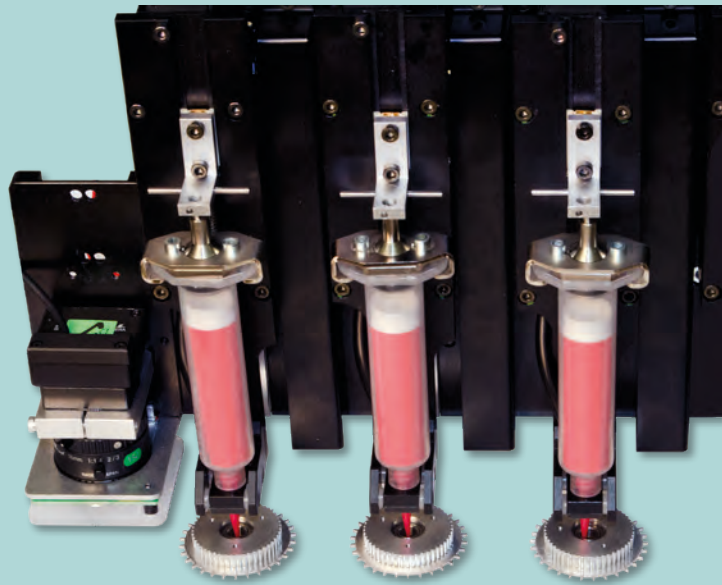
Dispensing heads
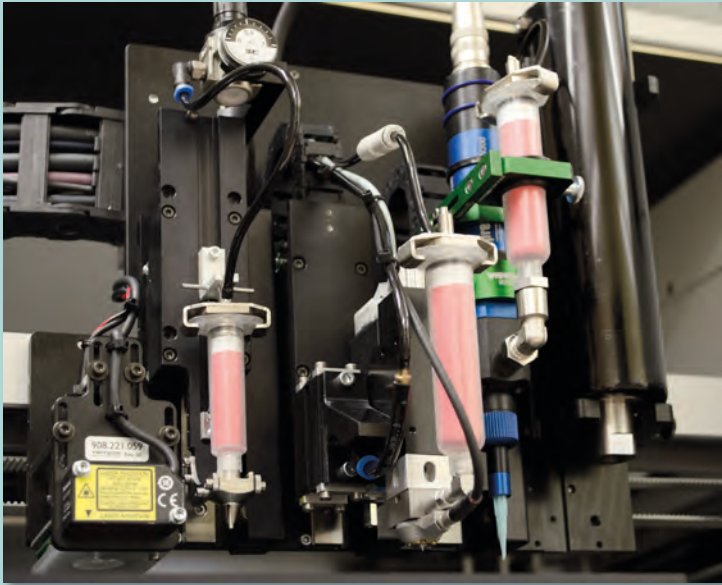
Standard dispenser head

Each dispenser head has it´s own axis-drive. A DC-motor with encoder is therefore in use and enables a free head positioning at any height. The motor-axis allowes the fast as well as very exact positioning of the dispensing valves for dispensing. The valves' slim construction make the simultanous use of the carrier unit possibe.

Parallel dispensing

The dispensing machine software supports simultaneous dispensing on all dispensing heads. This allows recurrent dispensing to be made on up to three different uses simultaneously. The valves are arranged on the carrier unit in a row. Thus, only the appropriate distances between the metering valves need to be adjusted. In series production, the dispensing capacity can be almost tripled.

Universal platform

The universal carrier unit is the centrepiece of the dispenseALL. Depending on application up to 3 dispensing axis and heads can be installed. Each axis has a motor-drive with encoder to move freely to any height. Therefore contactless dispensing operations are possible.

Time-pressure dispenser valve

The simple means of attaching the valve makes it particularly robust and low-maintenance. The adjustable pressure affects the cartridge after a short period. The desired amount can easily be set in the software. Typical applications for this dispensing valve are dot- and line dispensing.

Precision dispenser valve

In the case of the precision dispenser valve, additional parameters such as temperature and the fill level of the cartridge are collected. The processor control regulates these values, the pressure and the time of the dispensing impulse in order to achieve the highest repeat accuracy. The processor control enables the dispenser valve to be mounted very easily. This makes the valve remain robust and low-maintenance in spite of the highest accuracy.
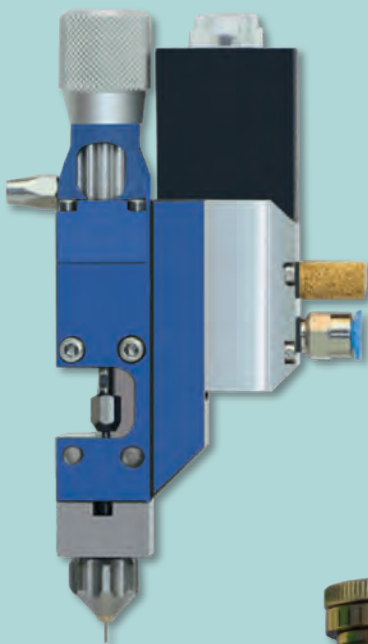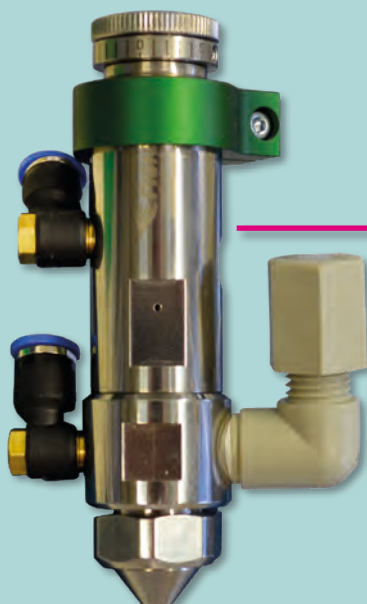
Dispensing valves

Volumetric dispensing system

Suitable for the accurate dispensing of watery to pasty media such as SMD adhesive, soldering paste or silver conductive adhesive. The medium is transported with as little application of pressure as possible. The actual dispensing is carried out by being transported by the spindles. This means the application of pressure of the material is kept as low as possible.

Jet dispensing system

The very fast piezo dispenser valve dispenses amounts at a very high speed. In the case of a dispensing frequency of up to 150 dots/second, it is possible to constantly apply very small amounts. The high dispensing frequency enables the apply of smallest quantities as well as larger quantities with only one head.

Spray dispensing

The spray valve can handle low to medium viscosity materials. It is most suitable for oils, separating agents and alcohol. The valve is made for the attachment to a controller and a material feeding container like a syringe or pressure tank. The slim construction allows to easily retrofitting to existing systems.
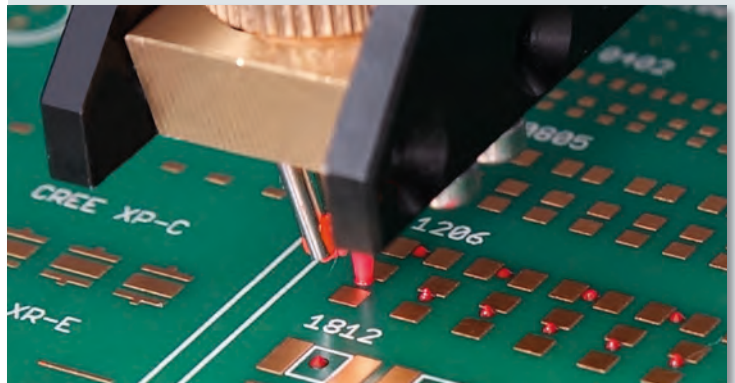
Dispensing solder pastes

In applications where no stencils can be used for the paste print, dispensing the solder paste by way of a dispenser is a flexible and accurate alternative. The highest level of precision is necessary when manufacturing interconnect devices. Besides the positioning accuracy of the machine, even the smallest amounts of paste need to be dispensed with a high level of repeat accuracy and long-term stability.
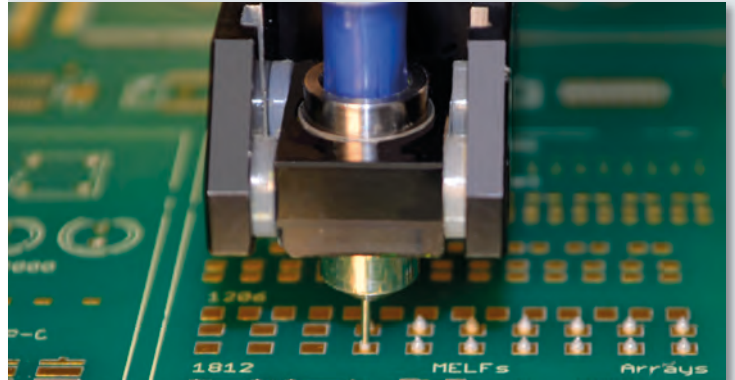

SMD glue dispensing

Although in the meantime, components are no longer glued in the production of SMTs where possible, in order to alleviate subsequent repair work, for example, there still are applications where components are glued. Especially with heavy structural shapes such as power components or plugs, gluing ensures the mechanical stability of the circuit. In addition, mechanical powers can be dissipated better even in smaller components.

Silver conductive paste dispensing

Silver conductive pastes can be applied as an alternative to traditional solder paste anywhere that interconnect devices or components are sensitive to temperature and a standard soldering process cannot be used. In comparison to solder paste, silver conductive pastes are more cost-intensive and require more care in handling and storing.
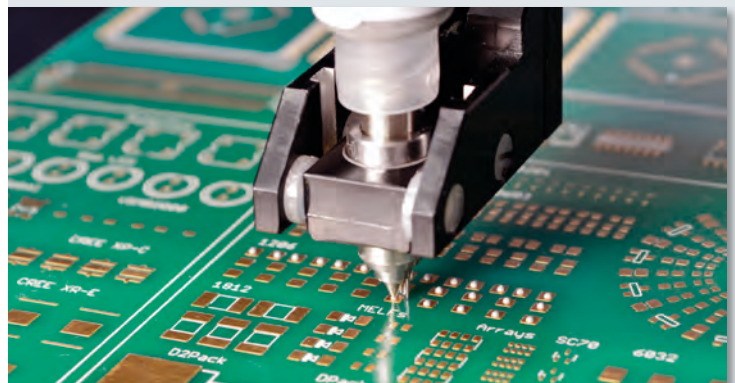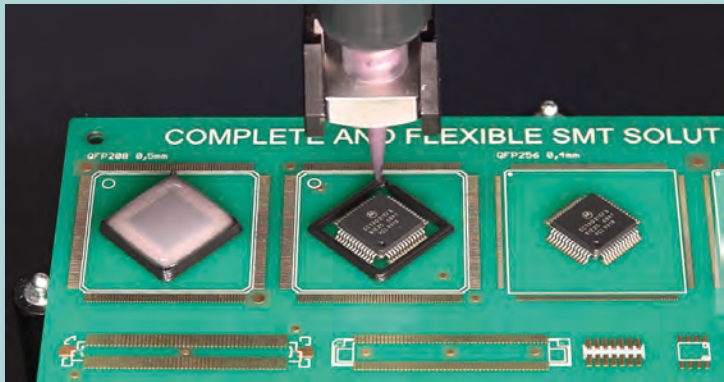

Underfill dispensing

Underfill is used in interconnect devices for example with BGAs and flip chips to compensate the temperature expansions between the actual chip and the interconnect device. The underfill significantly improves the reliability and the service life.

Applications

Dam and fill

Two different materials are used in the dam and fill process. A high and a low-viscous substance. First the material with high vicousity is dispensed as a dam around. Than the area inside of the dam is filled with the low viscous material (fill) to coat the circuit completely.


Potting

Components and top performers are mounted in cases which are filled with different media to enlarge their life-time. Therefore FRITSCH offers the ideal solution to guarantee a solid and safe processing. In one or more operations the potting can be made with different media. The potting process is mainly used by higher-volume packages like the encapsulating of spools but also in power electronics.
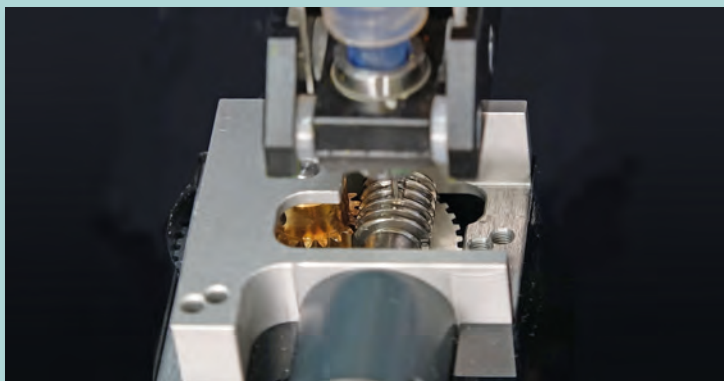
Dispensing lubricants

A safe and precise support respectively treatment of gears is a special daily task for the user and no longer a rarity. Processing-safe alternatives are necessary to replace the manual apply of lubricants. The automized applying of lubricants guarantees constant conditions to increase the life-time of components.
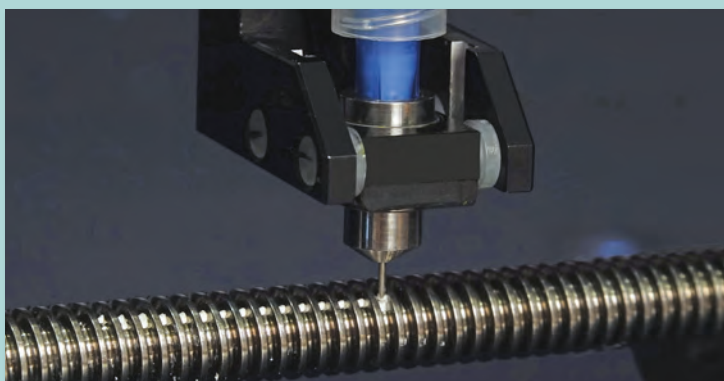

Dispensing locking varnish

Dispensing mechanical components requires regularly the application in depressions and holes or along existing contours. The easy-to-handle Software of the dispense-ALL enables the programing by teach in as well as the grafical editing similar to a CAD-program.

Operation and programming

The clearly laid out software guides the user step by step to his goal. To setup a new project or alter an existing one, the parameters can be simply chosen with a mouse click. There is also a detailed help menu for each function.
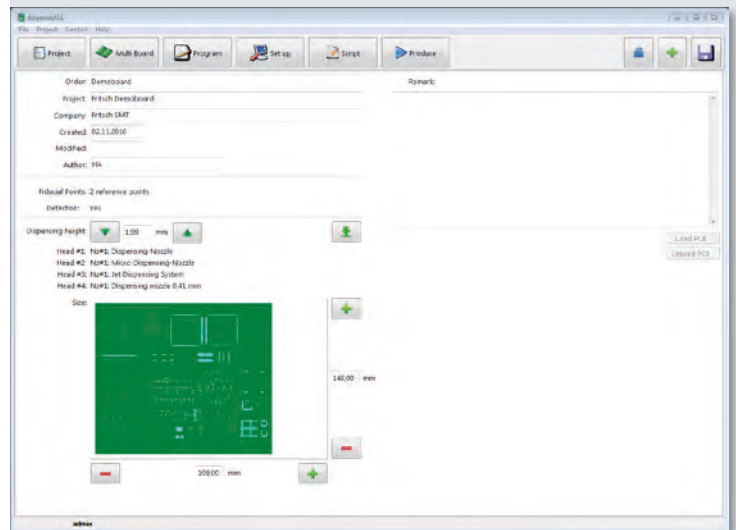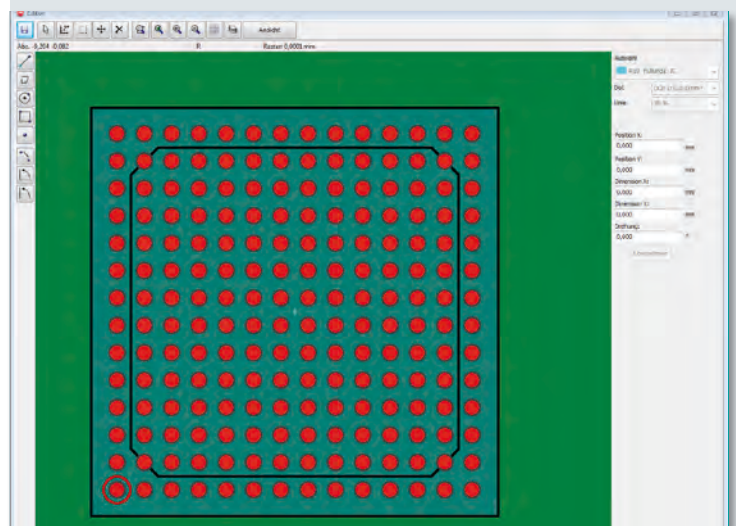

Component library

The integrated component library contains over 450 component models. This represents one of the largest libraries on the market today. All content items can be edited or new ones can be created.
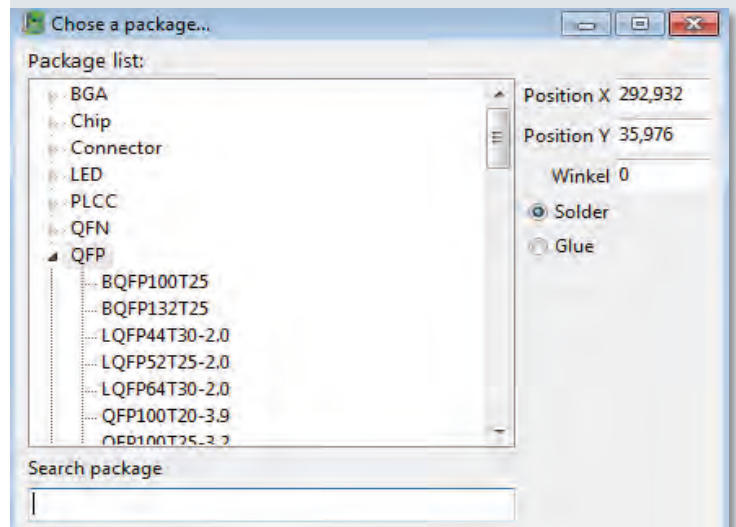
Component editor

If components, which are not part of the default library, need to be placed, a graphical editor is used to create a new component body in just a few steps.

Simple project developement

Easy programming

Depending on application the user has various possibilities to design the program. Lines and curves can be drawn easily in the virtual editor. Dispensing dots can be taken from existing data or teached in.

Data transfer

By means of a format editor, files from all CAD systems can be adapted with a few self-explanatory operating steps. The conversion process takes very little time and can be done offline on a separate PC.

Gerber data conversion

Common Gerber files are used to create dispensing points using template thickness and SMD pad information. Dot size, size and shape are easy to set and optimize for each component and pad on the board.

Dxf-Data conversion

By means of the X/Y-center coordinate and the drawing layer the allocation of the dosing position and quantity takes place.
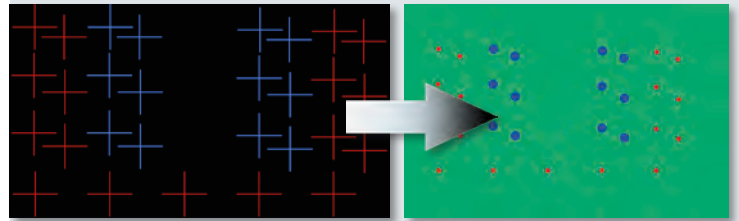
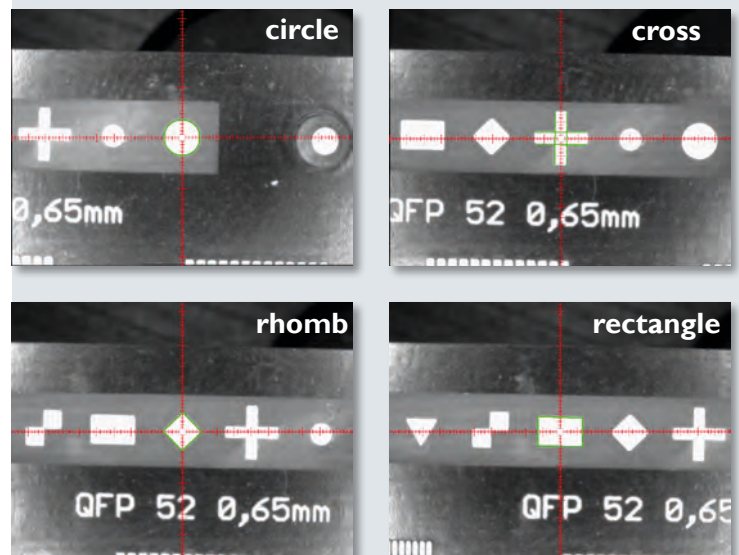## Automatic fiducial recognition

To correct positions reference marks such as crosses, circles, rhombi etc. can be read in automatically. The camera captures the exact position of the circuit board before the dispensing begins.

Teach in

To create a project, the user drives to the particular position; a virtual dot is shown as an overlay in the camera window. The virtual dot can now be adjusted exactly and brought into the right position. After that, its position is logged into the dispensing project file.

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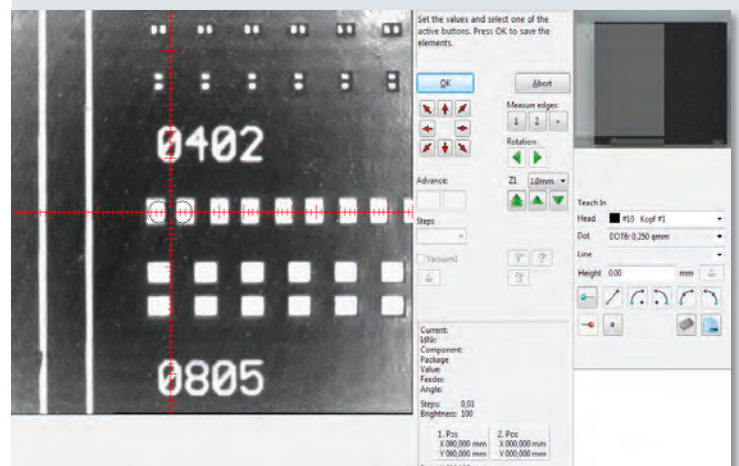
Software options

Badmark recognition

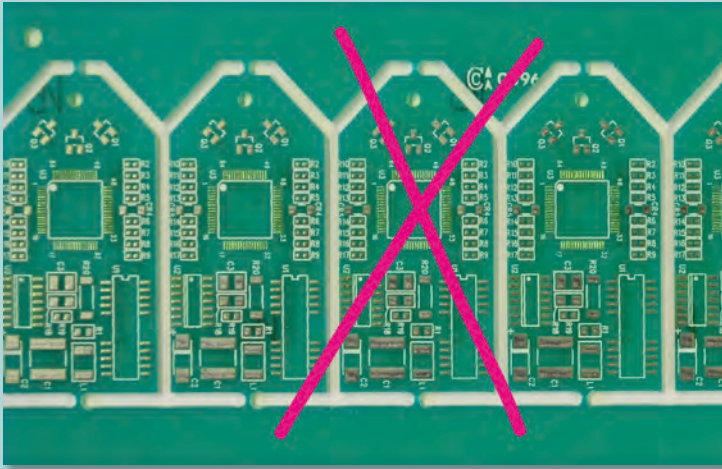The recognition is searching automatically for a mark on a defined position whether the PCB should by signed as bad and shouldn't be dispensed. The sign is identified in cause of its brightness. Light or dark marks (made with labels, pens or ink pints) can be recognized.

Offline programming

With this CAD conversion, the dispense data as well as the whole libraries can be edited at a separate work-station. The processed data can be transmitted to the dispensing machine afterwards.

PANetState

All machine messages are transferred to a separate PC on the network and displayed there. The user is informed i.e. if production is finished and can initiate further steps.

Customization

By request the conveyor can be equipped with a customized intake for workholding fixture. This enables to handle even heavy or customized workholding fixture in the dispenseALL.

Fast and easy

Especially in small series the stand- and changeover times should be reduced. Therefore the various conveyor systems are optimized. The justage of the PCB width as well as the positioning of the supporter pins below the circuit can be done without tools. Depending on application and local conditions the best conveyor for optimal transportation can be chosen:

- 3 Zone-Conveyor
- Batch-Conveyor from left or right

Inline-System

Batch-System

Stressless motion

To bring sensitive PCBs such as ceramic subtrates or partial assembled PCBs safely to the dispensing position, the PCBs are slowly moved through a ramp of deceleration to the stopper and so the mechanical load is reduced to a minimum. All conveyors are fully programmable. The rate of feed, ramps and waiting times can be adapted to the application.

SMEMA interface

Each conveyor has the standard SMEMA interface. Thus, machines can easily be integrated into any production lines or even combined with a loader and unloader to automate partial the dispensing process.
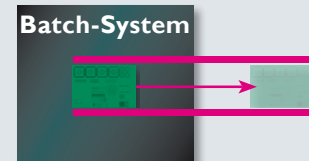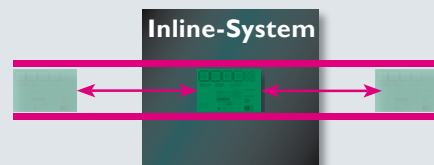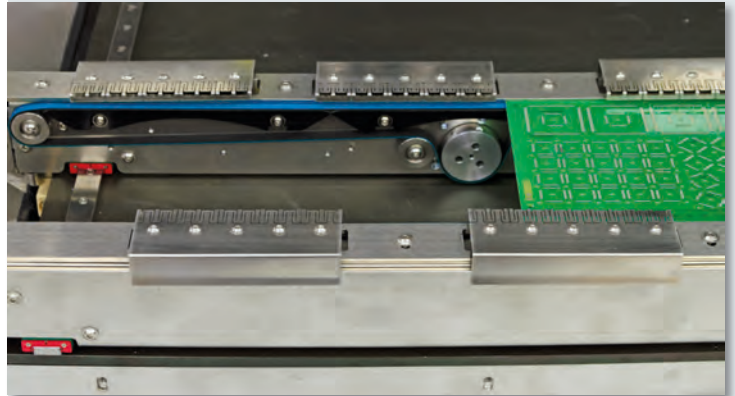
Advanced working assistance
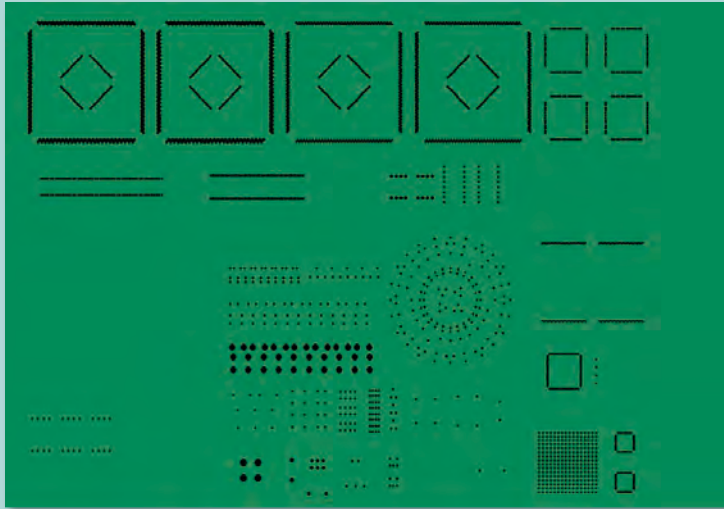
Virtual dispensing plan

The virtual dispensing plan enables the preview of the dispensing result before the process starts. An image of the real PCB can be used as template. Therefore a fast and easy control of the dispensing 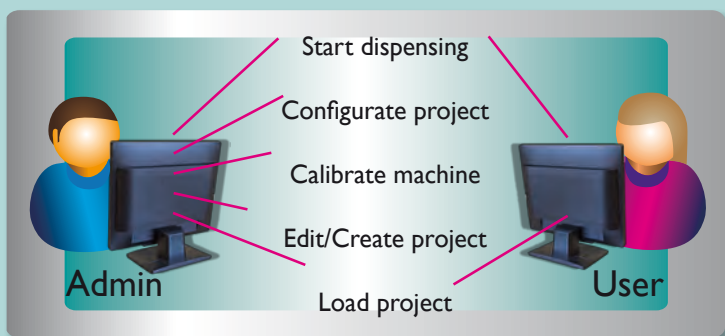result is possible. Editing capabilities like for example the moving and rotating of dots or lines complete the virtual circuit diagram to a valuable tool.

User management

The user administration makes it possible to assign different rights to different users. The person who is able to edit programs or update component libraries can be defined, and other users can be locked out of these functions. These rights can be easily edited by clicking on the different production steps in the software.
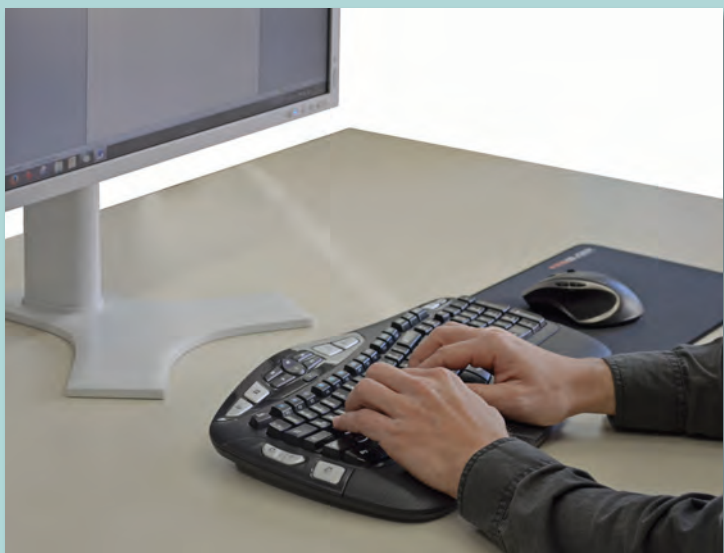

Remote Support

Remote access to your machine by our technicians is possible using the service kit, after having your approval. This connects us directly into your dispenseALL and the installed software to rapidly provide an overview of the machine's status if any questions occur. The remote support is free of charge while the warranty period.

Laser height sensor

This sensor is for measurement of height an can be used by the dispenseALL420 because of very tight design. This option allows the operator a more exact and quicker measurement of reference surfaces like PCB level. A steady distance between PCB and needle tip is basis for a repeatable dispening result. The user friendly integration in software eliminates false measurements and reduces set-up time.
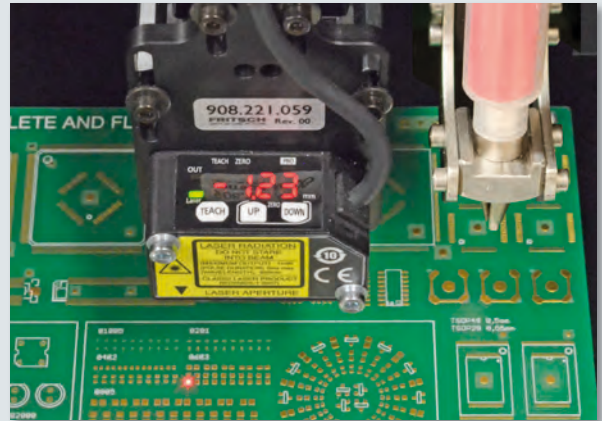
Automations Interface

The module Automation Interface enables the control of more features and options for example customized measuring instruments.

Connection for suction

Coating with varnish or activators causes sometimes explosive fumes. A typical example are fluids based on alcohol. For a safe operation the dispenseALL420 is equipped with a connection for suction by standard.
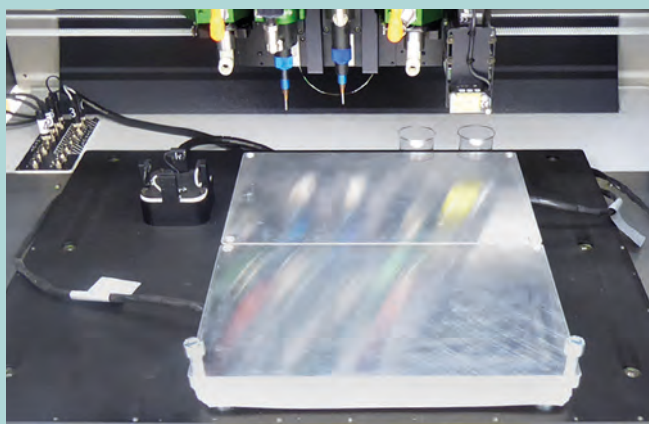

Nozzle compensation

The nozzle compensation is a full-automatic sensor for adjusting the nozzle position in the Z-axis.
Advantages:
• full-automatic nozzle measurement
• reduction of set-up times
• increase of process-safety

Accessories

Media temperature control

Soldering paste, adhesive and other dispenser media change their viscosity depending on the temperature. In order to achieve constant results, the temperature of the media can be kept constant.

Suck Back for low viscosity media

The suck back module prevents thin liquids (like oil or water) from leaking or dripping out of the syringe.

Heating plates

Dispensing media change their viscosity at elevated temperature. The up to 200°C controllable electric heating plates are used to heat assemblies, substrates, etc.

PCB fixture

The rapid clamping system enables an intake of one- or double sided PCBs in various forms. Therefore diverse magnetic holder freely fix and position them in the machine interior space.

- PCBs up to 580 mm x 480 mm
- Free height below the PCB: 52 mm
- Free height above the PCB: 30 mm
- One- and double-sided PCBs

Vacuum table

For the handling of flexible PCBs a vacuum table can be integrated. There are variants for a complete vacuum suction of PCBs as well as for a partial vacuum suction. The attachement of the vacuum table is possible without the use of tools. A changing from vacuum table to the conventional PCB intake happens with the help of the grips just in a few moments.

General

Dispensing heads..........................max. 3 heads
Dimensions (LxWxH)................1010 x 1020 x 1570 mm
Weight ....ca. 450 kg
Speed of axes ....max. 1.0 m/sec.

Dispensing area

Dispensing area
2 heads...510 x 440 mm
3 heads...410 x 440 mm
Min. PCB size
- stand alone................................5 x 5 mm
- inline ....50 x 30 mm
Max. PCB size
- stand alone................................580 x 480 mm
- inline ....900 x 400 mm

Dispensing capacity

Smallest dot volume 0.001*
Dot diameter ....min. 0.13 mm*
Line pressure...............................0.1 - 5.0 bar
Temperature control.................10 - 90°C
Temperature compensation......0 - 50°C
Syringes ....3 ccm, 5 ccm, 10 ccm,
....30 ccm, 55 ccm, 310 ccm

*depending on valve and medium

Dividable machine frame

To pass through door frames with less than 80 cm in width, the **dispenseALL420** machine frames can be built dividable, each part being smaller than 80 cm.
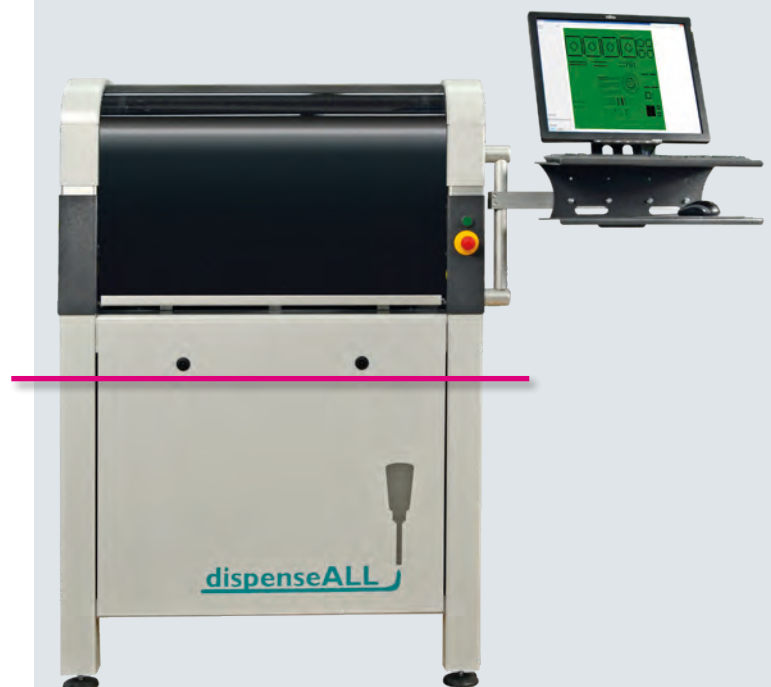
Measurement system

Resolution X-Y-Axis ....0.5 µm
Resolution Z-Axis.......................1.6 µm

Software

dispenseALL ....dispenseALL
Operating system........................Windows 10

Connectors

Electrical..230 V/110 V max. 1.33 kW
Compressed air ....6 bar, 75 psi, 0.01 micron
                                                         Filter, max 60 L/min

Noise level ....50 - 70 dB

< 80 cm

< 80 cm

Other machines
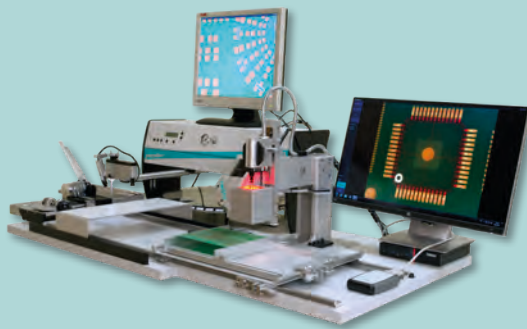
Automatic pick & place systems

The FRITSCH placeALL® is the standardized platform for flexible, high-precise and cost-effective Pick & Place of electronic components in prototyping and the production of small and medium series. All types of machines have he same software for setting, adjustment and production. The own high depth of production enables a fast customized implement.

Manual pick & place systems

We have manual and semi-automatic manipulators in our product range for prototyping or small series. All process steps like dispensing of welding pastes / glue up to pick & place of components inclusive Fine Pitch can be performed. Depending on application the machines can be equipped with feeders for rolls and sticks.

Reflow Oven

There are various stand-alone or inline reflow solder systems with the established heating system available for leaded or lead-free soldering and glue-hardening. Temperature sensors record profiles of components and analyse them. Several measuring instruments enlarge the offering.

Productionline

Any machines can be chained to reach a higher assembling performance and flexibility. The positions are devided according to demand.
Prototyping or a full-automatic productionline: depending on the customer request individual lines can be constructed.

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