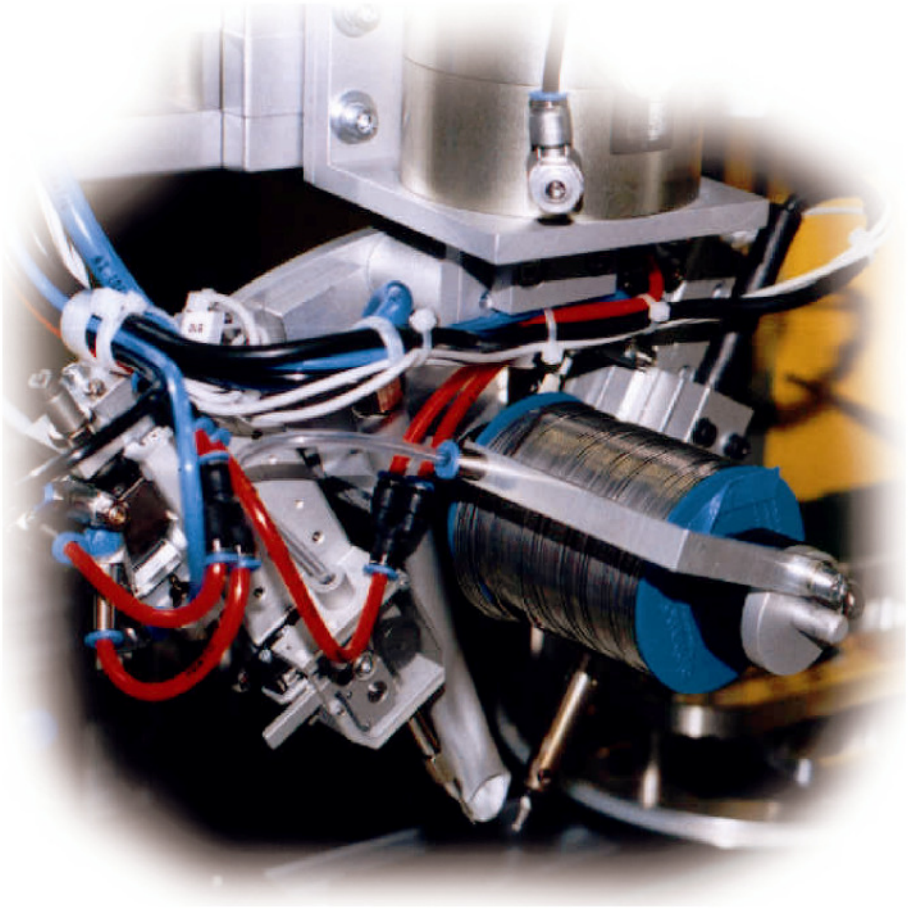
ATN
Automatisierungstechnik
Niemeier GmbH

Automated soldering iron
with the robot tool LK-K



- *150W soldering iron with digital control*
- *standard soldering tips*
- *temperature monitoring*
- *solder feeder Mosquito A25*
- *automatic cleaning of soldering iron*

Automated soldering iron

At a multiplicity of applications there are joints, which must be soldered individually: Cables, plugs, special construction components and modules with only a few solder joints.
A further application is the use of special elements, e.g. plugs and pin-through-hole on SMD-Boards. Often single point soldering is required because of assembling, e.g. if a complete equipped PCB is inserted into a housing and has to be connected with plugs or other components by soldering.

Automation of these single point soldering processes does not only afford a cost-efficient mass production, it is also demanded to obtain a constant high quality. Thus, it cannot be done without automated single point soldering in the modern electronics manufacturing.

Automated soldering with hot iron is not only one of the most applied soldering procedures, it is also an all-purpose method. Due to the high precision of the robot the soldering tip is always working at the same position. The parameters are set reproducibly.

Technical data

Solder Iron	
Power	150 W
Temperature soldering tip	204-464 °C
Stroke pneumatic axis	50 mm
Angle soldering iron	-30° to +30°
Solder feeder (optional)	
Diameter solder wire	0,5-1,5 mm *
Feed	0-24 mm/s *
Power motor	1,7 W
Ration of planetary gear	1:166*
Stroke pneumatic axis	30 mm
Angle solder feeder	-30° bis + 30°
Control Unit	
Dimensions 19“-unit (w x h x d)	440 x 132 x 233 mm 3HE x 84 TE
Dimensions benchtop case(w x h x d)	340 x 135 x 250 mm
Current Connection	223V AC, 100W
Interfaces	24V IO / RS232 (opt.)

Features:

- temperature offset for soldering tip
- pneumatic axis
  for soldering iron and for solder feeder
- universal holder for roles of solder wire
- automated cleaning station for soldering tips
- big variety of stand soldering tips

Options:

- function “pre-tinning”
- solder feeder with pneumatic pressure unit for reduce pressure during production pauses
- RS232-interface
  adjust and control the temperature by machine interface
- Flux Dispenser

Technical description

On soldering with hot iron the soldering iron is put to the solder joint by the pneumatic stroke. When the joint is warmed up to the soldering temperature the solder wire is fed by the automatic feeder. Subsequently, the solder feeder is moved back. The solder tip stays at the joint for a short time, so that the solder wets the whole joint and a meniscus can be formed. The process can be optimally adjusted with the following parameters:

- Preheating time
- Solder feeding time
- After-heating time
- Power
- Solder wire feeding speed

Depending on the geometric tolerances at the solder joint, to feed the solder wire in two steps can be advantageously. After a very short preheating time the solder wire is fed. Then it melts at the solder tip and flows to the solder joint. Thus, the surface is increased and the heat conduction is improved.

The soldering tips are Very important for the automatic process. Because the heater has much power (150W, so heat up time is less than 9s)normal “standard tips” with double coating are used. This increases the life time and reduces the cost. Also the variety of different types is very big. The special mounting system for the soldering allows the correct position of the tip after changing tips.

Soldering with hot iron requires the cleaning of the solder tip. This should be done before each soldering cycle in order to ensure identical conditions for each product. Thereto, the soldering iron is driven to a cleaning station with rotating rolls, where the remaining solder is removed.
In addition to the heat energy, the solder wire feeding is very important for an accurate soldering process. The solder wire is lead between two hardened knurled wheels with adjustable pressure for motion without slip. The pneumatic pressure unit allows a very precise pressure adjustment and a pressure relief during production pauses.

The feed solder is continuously detected with a miniaturised rotary encoder. The microprocessor of the control unit evaluates the signals and compensates any disturbance. Furthermore, the control unit detects every solder wire hold-up and the end of the solder wire.
The process control works with 24V-signals or with the RS232-interface. The integrated microcontroller relieves the superior control unit and permits a reliable soldering process.

The parameters are adjusted by a menu-driven display. In an alternative version, the parameters can be set by RS232-interface.

Figure: control unit and soldering iron

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