



Bungard Pick & Place SMT3000

Instruction Manual

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1 Introduction

Bungard GmbH & Co.KG (called „Bungard“ in the following text) reserves the right to change or enhance its machines or machine specifications according to its judgment, if necessary. Bungard cannot be held responsible to implement aforesaid changes into machines sold already.

Bungard products and services are liable to the current prices and conditions, which are subject to change.

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2 General

Before installation, connection to the mains or starting this equipment please read all of these instructions.

These instructions should always be available to operators, as they are necessary for the safe operation of this equipment and because they can assist in diagnosing any problems that might occur.

This manual contains informations of the Bungard Pick&Place SMT3000 and is the translated English version.

- For use by the user and associated personnel.
- Copying and distribution is permitted only for internal company use.

2.1 Intended use

The manipulators Bungard Pick&Place SMT3000 are constructed for the following intended use:

- pick & place of SMD components

Only in the manual described utilization is allowed.

The Bungard GmbH & Co. KG assumes no liability for damages made by not correct use of the machine.

2.2 Standard text symbols

This manual uses different symbols to characterize important information:



Attention

This symbol shows the user, that the FEEDER could be damaged if the user doesn't follow the exact procedure.



Warning

Marks, if the user could be hurt or the machine could severely damaged when the user doesn't follow the exact procedure.



Important

The marked information should be read carefully to ensure a correct function of the machine.



Tips and Tricks

This symbol marks useful information and helpful hints for the user.

2.3 Customer service

There is a return to factory service available for Bungard SMD Pick & Place equipment. In the unlikely event of your machine needing to be repaired please send it to your supplier, area representative or direct to us.

To accept a repair item, we use a RMA form. Please request this form before returning the goods to us. Without RMA we can not ensure that the repairs are carried out correctly. For a quick and inexpensive repair a meaningful error description is essential. Please refer to this RMA form.

2.4 Warranty and Liability

Please regard the "Sales terms and delivery conditions". These are available after fulfillment of the contract. We don't furnish a guarantee or warranty in cause of damages at material or hurts of people because of

- Incorrect use of the machine
- Wrong setup, installing and operating of the machine or incapable service
- Use of the machine with defective safety equipment
- Nonobservance of the service manual in regard to transport, stocking, setup, installation and service of the machine
- Unlicensed modifications at the machine
- Incorrect or incomplete repairs
- Destructive force effect at the machine in cause of foreign objects or external use of force
- Use of non-original spare parts

3 Safety

Bungard machines may only be operated, repaired and maintained by skilled personnel.

3.1 Responsible behavior

Consider please the following guidelines for responsible behavior:

- While maintenance, follow the instructions in the attachment.
- Keep away from moving parts.
- Before operating or try to repair the machine, all manuals and signs has to be read and understood.
- Make sure, that the relevant qualifications and the functions and safety components of the machine are present. If it is necessary, ask a superior.
- Do not misuse the machine. Apply the machine only after its sense of use according to the manual.
- Repairing the devices is only permitted to service technicians of the Bungard GmbH & Co. KG.
- Consider if necessary also the special safety regulations of your country.

3.2 User training

- Only trained and competent persons are allowed to actuate the machine.
- The persons in authority for rebuild, installation, operation, service and repair have to be exactly identified.

3.3 Safety and maintenance



Warning

To maintain the required operational safety please note the following:

- The tips of the pick up and dispensing nozzles should be handled with care since their small diameters can easily damage human skin.
- Please carefully close the clamping lever of the syringe adapter before attempting to use it. Failure to ensure that the syringe is securely retained can allow the applied pressure to separate adapter and syringe.
- This machine uses electricity, which necessitates some internal parts being at dangerous voltages.
- Non conformance with these instructions can lead to death, severe injuries or considerable damage!
- Do not open the housing.
- Do not use the equipment for purposes other than those it was intended for as outlined in the operating instructions.
- The repair of this equipment may only be carried out by persons authorised by the manufacturers Bungard GmbH & Co.KG.
- Please also observe any relevant country specific safety rules.

3.4 Operating and maintenance

The Bungard Pick&Place SMT3000 pick and place machine does not contain any parts requiring routine maintenance.

To ensure trouble free operation over a number of years please observe the following points:

- Please keep the work space clean. Contamination of the pick and place machine or the vacuum pump could lead to premature wear. Examples: corrosion of metal parts, wear of bearings or failure of vacuum pump.
- Please check regularly that no excessive play has arisen in the guides for the pick and place arm. Such clearances can be removed by making appropriate adjustments at the carriage below the gantry.
- Please check the available vacuum. Should, for example, there be insufficient vacuum to pick up larger components any more the vacuum available at the pump should be checked. If this appears to be acceptable please check the vacuum nozzle and filter for accumulations of contaminants.



Please note !

Should you have any problems with your pick and place machine or need some advice on

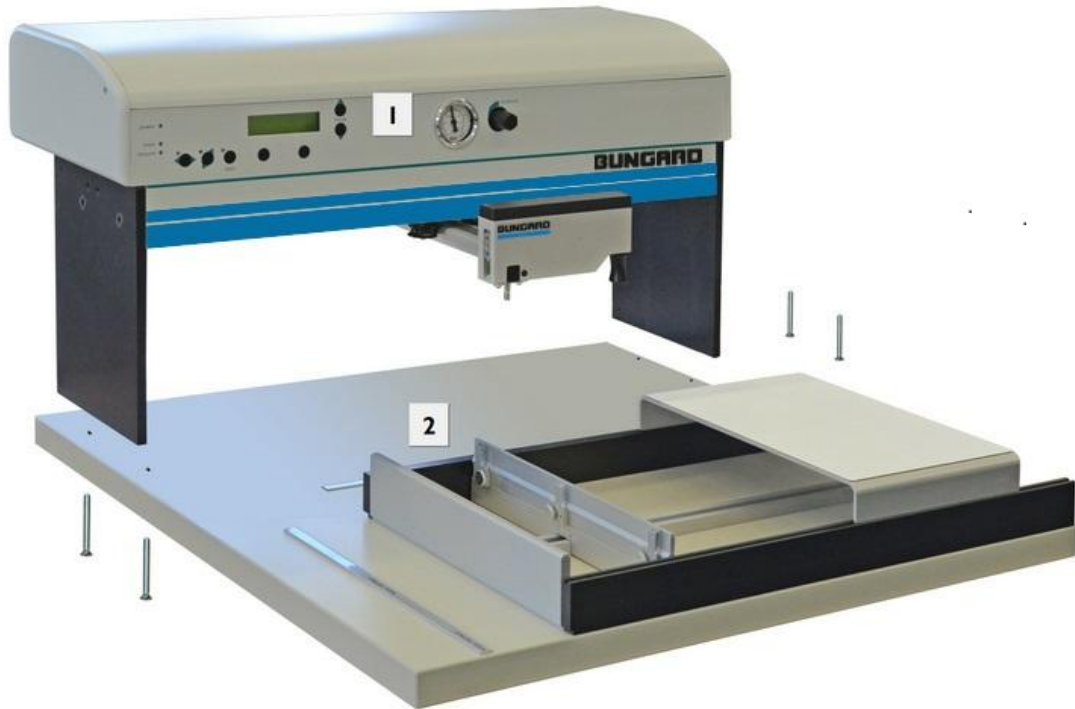
its use we shall be happy to be of assistance to you.

4 Installation

The equipment is shipped partly assembled. To ensure complete function and speedy assembly please follow the instructions below carefully. Fixing screws for the Bungard Pick&Place SMT3000 can be found in the packaging of the pick and place arm.

4.1 Assembling the Gantry unit unto the Base Plate

Please attach the gantry unit (1) to the machine base (2) at the correct position, using the supplied counter sunk screws.



4.2 Fitting the Pick and Place Arm

Please take the Pick and Place Arm from its packaging and remove the End Stop, using one of Allen keys (2mm AF) provided.

Slide the arm from the front of the machine through the guide rollers of the carrier under the gantry and replace the stop.

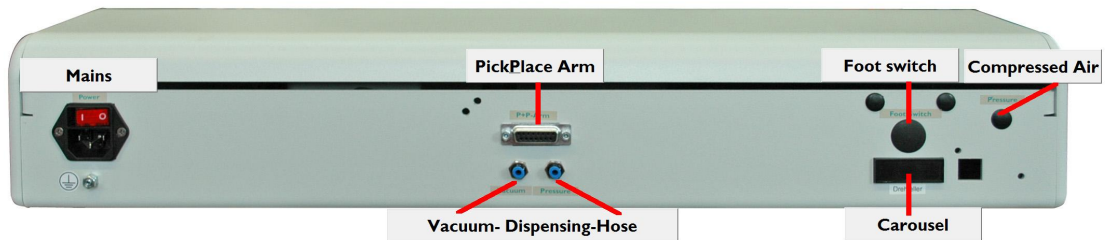


4.3 Connecting the Manipulator

Please insert the Pick and Place Arm plug into the corresponding socket (please see illustration) at the rear of the gantry.

When dispensing options are fitted to your Pick and Place Machine please connect clean, oil free compressed air (max. 6 bar).

Finally the machine can be connected to the mains.



Please fix the supplied Vacuum Adapter for the Nozzles unto the Vacuum Spindle and check that vacuum is present.



Attention

Please ensure that the pick and place machine is sited level and securely as otherwise its function may be impaired.

5 Pick & Place Nozzles

There are various Pick & Place Nozzles available for the manipulator Bungard Pick&Place SMT3000.

5.1 Standard filter tube of the LM series

There are Pick & Place Nozzles available for the SMT series in various sizes. Depending on component package to be assembled, the Nozzles have one of 2 different lengths (38mm & 30mm).

A filter tube for 38 mm is included in the scope of delivery.

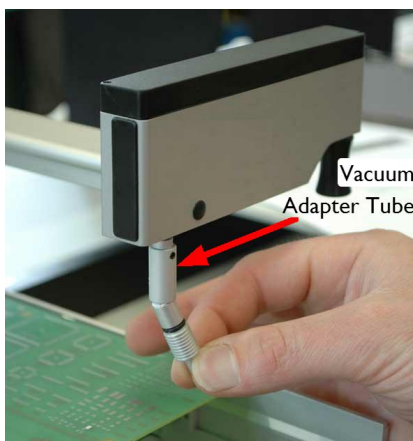
5.2 Changing the filter

Should the vacuum performance decrease, it can become necessary to replace the integrated finest-filter inside of the filter tube (see therefore also the description „Changing the filter tube“)



5.3 Changing the filter tube

In order to attach another filter tube, the existing filter tube can be pulled down with a screwing rotation up from the Vacuum Adapter Tube, because it is fixed by O-Ring only. Hold on between the assembling head and the Vacuum Adapter Tube. The new filter tube can then be slid on now.



Attention

If the mechanical switch point for deactivating the vacuum is not reached by the nozzle making contact with the PCB, the height must be adjusted. For this purpose, there is the set screw on the Vacuum Adapter and the corresponding allen key.

6 Description of functions

6.1 Put on hand rest



6.2 Set up PCB

6.3 Pick up a component

Make sure first, that the vacuum pump is switched on. Take the manipulator head at the rotary knob (on the right of head) and guide the pick & place nozzle to the component feeder.

Pull down the head, so that the pipette touches the component slightly only and pick up the component. According to the size of a component it will be picked by a smooth contact, or small components are pulled by the vacuum already before touching by the nozzle.



6.4 Placing the component

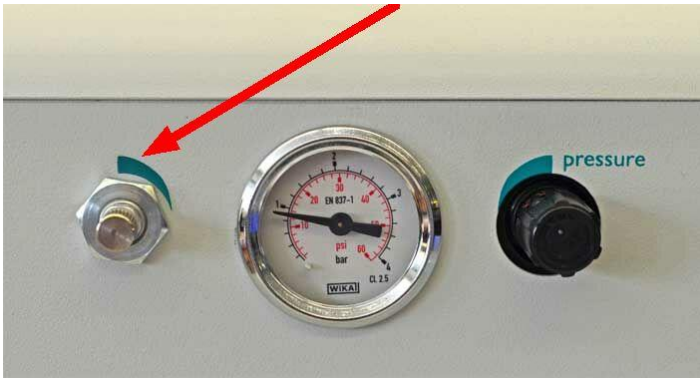
After picking up a component, guide the manipulator head to the assembly position and place the component.

Pull down the assembly head until the nozzle slightly immerses into the head ~2mm. Through this the vacuum is interrupted mechanically and the component is placed. By allowing the head to its upper position the vacuum is thereby activated again automatically.

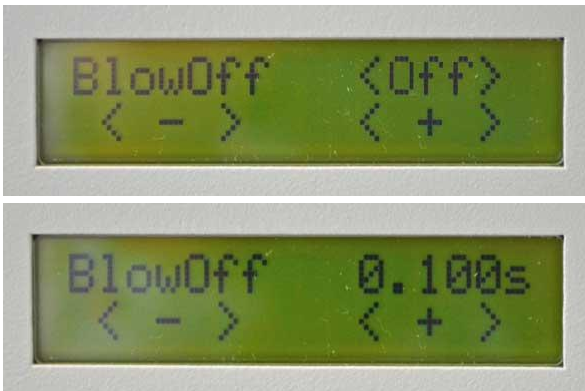


6.5 BlowOff function (optional)

This function is used to guarantee an easier releasing of very small components (<0603) from the nozzle. The air volume is regulated by the left control dial.



The function and the time setting are selected via menu navigation.



Important

Please note by using the BlowOff function to choose a higher time setting for the autovacuum (ca. >0,45s). If the chosen time setting for the autovacuum is too low it may happen that the component doesn't release from the nozzle.

6.6 Operation of the Dispenser

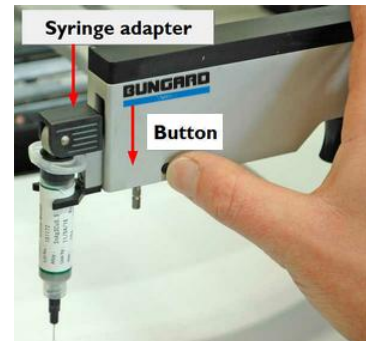
The amount to be dispensed is to be determined by means of the adjustable time target, adjustable pressure, varying needle diameters and varying viscosity of the solder paste or glue. Experience with the dispenser showed that with a time setting between 0.20 and 0.40 seconds and a pressure of 2bar, produce good results.



1. Put syringe adapter into the left hand side of the assembly head.



2. Activate the dispenser and lower the syringe adapter by pressing the button at the front of the head.



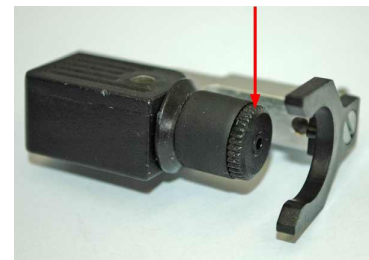
3. Now pull down the head. When the obliquely dispensing needle makes contact with the PCB, the set dot size is dispensed.



When not in use, push the adapter upwards until it clicks where it will stay in place.

6.7 Changing the syringe

If the syringe has been clamped in for a longer period, after opening the lock rod, you should slowly push the syringe back and forth applying only a little pressure until the rubber boot detaches itself from the syringe interior. Then pull the syringe off the syringe adapter. The pressure applied to the rubber boot can be altered by means of the knurled screw below it (see picture).



When not in use for a longer period, the dispensing needle should be dismounted and the syringe closed with the sealing cap included. The life span is increased by storing the syringe in an upright position in a cool place.

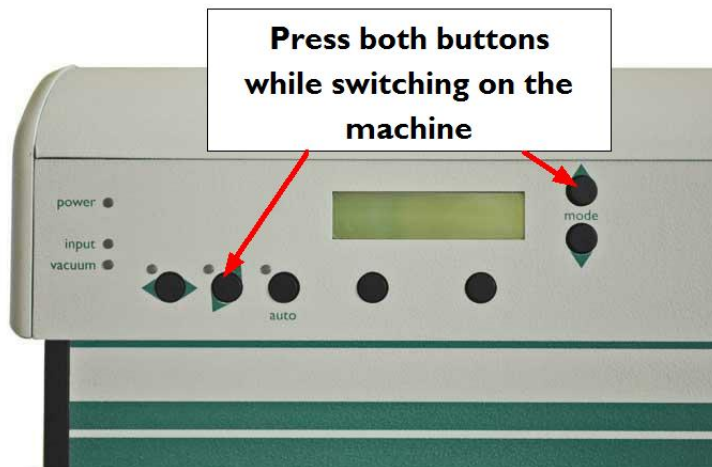
The diameter of the dispensing needle can be recognized by the colour of it.

7 Menu functions

The Bungard Pick&Place SMT3000 is designed that the basic functions (pick & place and dispensing) are automatically activated on the assembly head. Further functions are to be activated, according to the machinery, in the manipulator front panel.



7.1 Language selection (german/english)



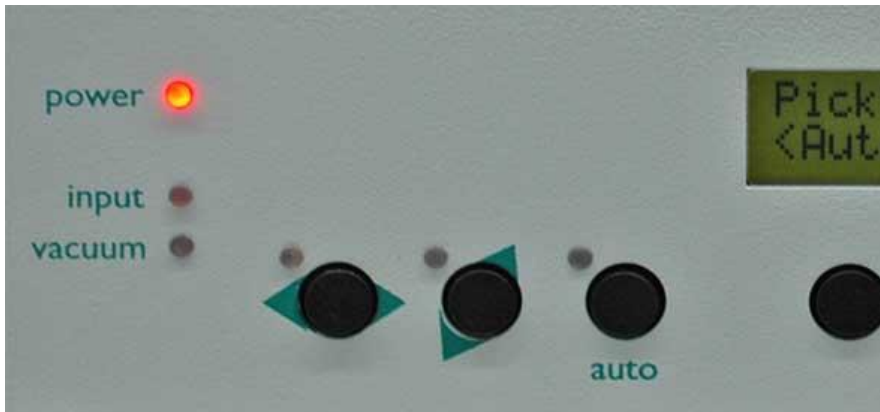
The display shows the selection for German (DE) and English (EN) which must be confirmed with the buttons beneath.



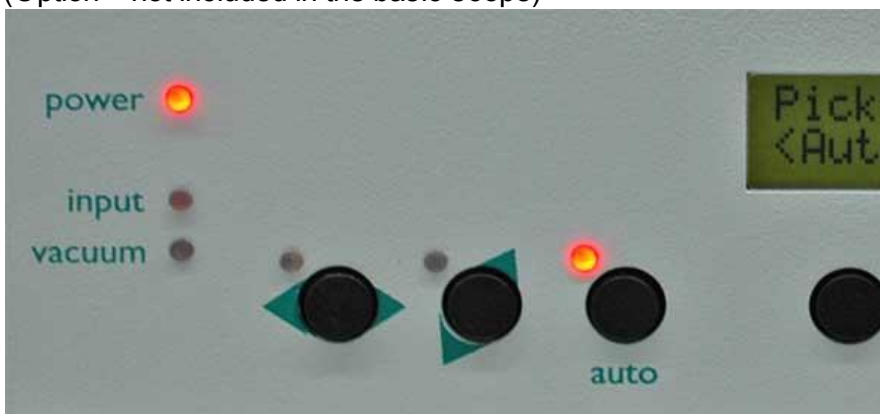
After choosing the language, the machine demands a restart. Switch the machine off and on and now it works in the selected language.



7.2 Locking device

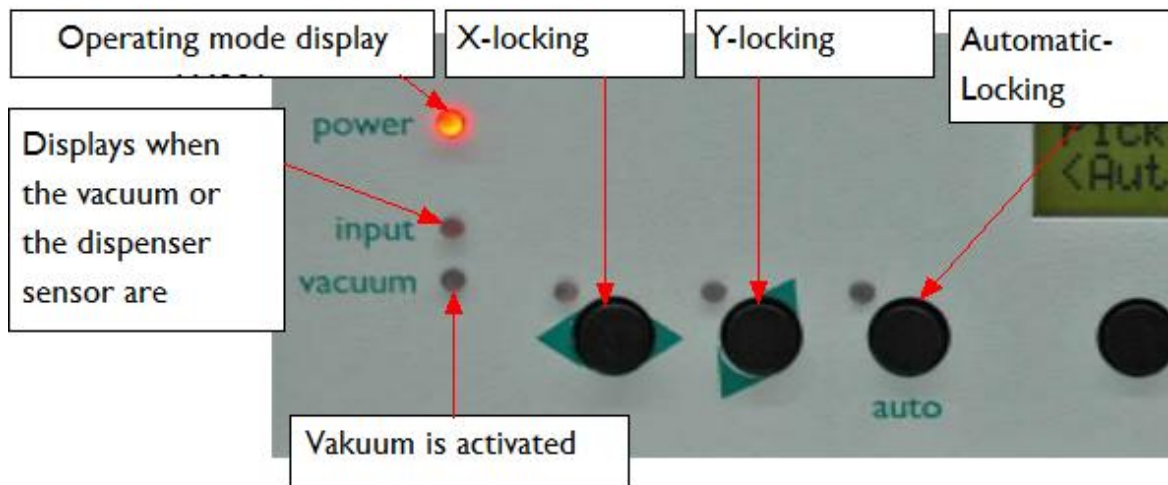


With the help of the magnetic brakes, the moving X and Y axes of the LM can be locked. Particularly in the case of dispensing ICs, this enables the highest of dispensing precision. (Option – not included in the basic scope)

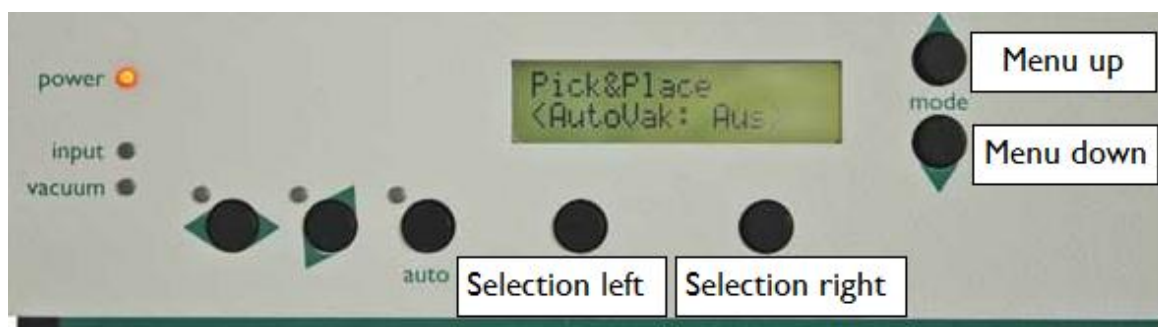


The automatic function of the locking device activates the brakes as soon a component is touched. This enables an exact placing of, for example, MELF components without the assembly head moving.

7.3 Operating mode displays



7.4 Using the menu



The following menu items are available:

- Pick & Place
- Dispensing time 1
- Dispensing time 2
- Dispensing time 3
- Line dispensing
- Selection carousel
- Head lighting
- Automatic vacuum

7.5 Pick & Place

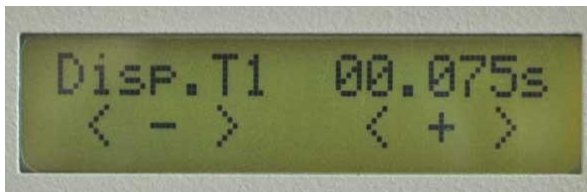
In this operating mode, components can be placed with the assembly arm. The “automatic vacuum” function can be activated by selecting “left” (see below).



7.6 Dispensing time 1 – 3

The LM 901 has 3 different dispensing times. These different dispensing times enable the fast switch-over between different dot sizes.

The respective dispensing time can be set in 25ms steps via the selection keys. The currently displayed dispensing time is automatically used the next time the syringe dispenses.



7.7 Line dispensing

With this optional module, lines can be dispensed. The dispense impulse is activated by means of the foot switch included. It is not necessary to set a dispensing time in this mode. (Option: 930.006 Line dispensing)



7.8 Selection of carousel

In this menu item, the motorized carousel is selected. In order to inform the LM 901 which carousel is used, the number of containers can be set via the selection keys. Possible options available are "no carousel", "45 container" and "90 container".



7.9 Head lighting (optional)

Via this menu item, head lighting can be switched on or off. (Option: 913.004 Head light)



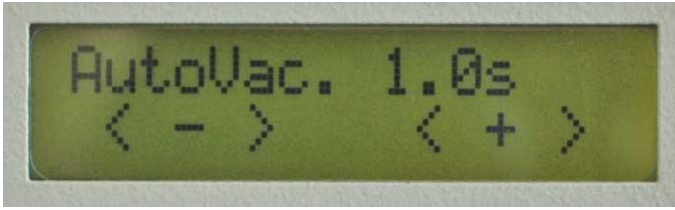
After switching on the brightness can be chosen from 0 up to 20.



7.10 Automatic vacuum

If this function is activated, after placing a component the vacuum is automatically activated again after a set period of time. Particularly when processing loose materials, this alleviates the picking of a component. The waiting time can be set via the selection keys.

It can be activated in the menu item "Pick & Place".



8 Feeder types

Every SMT3000 has suspension bars that are integrated to the left and behind the PCB holder in the machine basic plate.



The following feeder types can be directly fixed to the suspension bars:

- Paternoster
- Automatic carousel drive
- Manual carousel
- Component test station
- Tray holder

Other feeders require a support rail to be fixed to the SMT3000:

- Tape feeder
- Stick feeder
- Component flipping station
- Universal tape strip feeder

A third group of feeders can be placed directly on the basic plate:

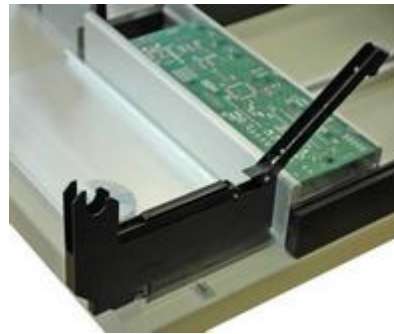
- Loose component feeders with container system
- Tape strip feeder

8.1 Tape feeder

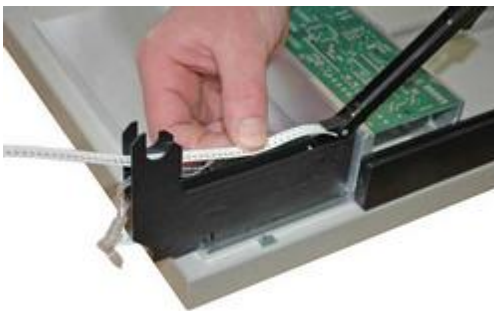
All tape feeders have a quick fastener to be able to assemble tapes within only a few moments. The tape feeders are fixed to the suspension bar by means of a spring mechanism.

Inserting a tape

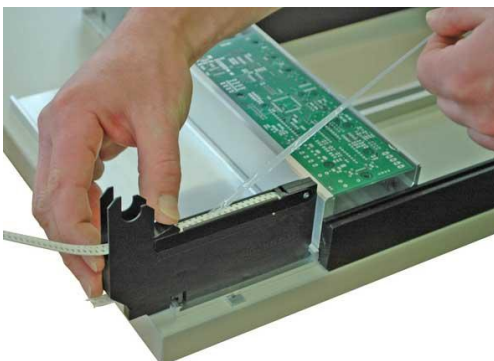
1. Open retaining flap



2. Insert tape



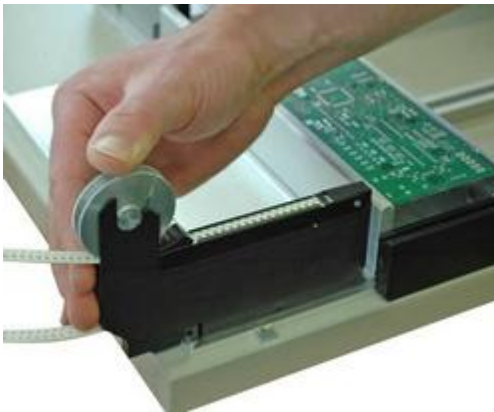
3. Close flap and push backwards until it clicks into place



4. Remove shrouding and thread onto pinch roll



5. Turning the pinch roll causes the feeding of components



Tape feeders can be used for tape stripes and tape reels of different sizes. In order to store the reels cleanly, reel supports for the various reel sizes can be positioned directly behind the tape feeders.

8.2 Stick feeder

The stick feeders have a feeding wheel as well as fastening screws to clamp the sticks in the feeder. The stick feeders are fixed on the suspension bars via clamping screws.

Assembling component sticks

Insert the component stick into the clamping device. Make sure no components can slip out of the front of the stick. Tilt if necessary.



Fix the stick in the feeder by using the clamping screws.



The feeding wheel on the feeder causes the feeding of components. The spring lever makes sure that no other components slide in after



9 Accessories & Spare Parts

9.1 IC-Dispenser - Stick feeding



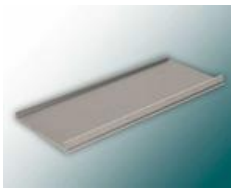
942.SMT2 08	IC-Dispenser for SO 8, SO 14, SO 16. Tube width 7,9 mm. Overall width 15 mm.
942.SMT2 20	IC-Dispenser for PLCC 20. Tube width 12,5 mm. Overall width 20 mm.
942.SMT2 28	IC-Dispenser for SO 8L, SO 16L, SO 20L, SO 24L, SO 28L, VSO 40 cabinet, PLCC 28. Tube width 15,4 mm. Overall width 22 mm.
942.SMT2 44	IC-Dispenser for PLCC 44. Tube width 20,1 mm. Overall width 27 mm.
942.SMT2 52	IC-Dispenser for PLCC 52. Tube width 22,6 mm. Overall width 30 mm.
942.SMT2 68	IC-Dispenser for PLCC 68. Tube width 27,7 mm. Overall width 35 mm.
942.SMT2 84	IC-Dispenser for PLCC 84. Tube width 32,8 mm. Overall width 40 mm.
942.SMT9 01	IC-Dispenser. Custom made.

9.2 Tapefeeder



943.SMT0 08	Tapefeeder for 8 mm tape. Overall width 11 mm.
	Tapefeeder for 12 mm Rollen. Overall width 14 mm.
943.SMT0 12	Tapefeeder for 16 mm Rollen. Overall width 19 mm.
943.SMT0 16	Tapefeeder for 24 mm Rollen. Overall width 27 mm.
	Tapefeeder for 32 mm Rollen. Overall width 35 mm.
943.SMT0 24	
943.SMT0 32	

9.3 Mounting Rail



940.SMT2
55 Mounting rail 255 mm.

Mounting rail 306 mm.

940.SMT3
06 Mounting rail 426 mm.

940.SMT4
26 Mounting rail rear 470 mm.

Mounting rail rear 570 mm.

940.SMT4
70

940.SMT5
70

9.4 Reel Support Stand



943.SMT1
01 Reel Support Stand for all Tapefeeder TF943, for example for five 8mm reels 180mm OD.



943.SMT1
03 Reel Support Stand for reels 100mm OD.



943.SMT1
02 Reel Support Stand for reels 330mm OD.

9.5 Loose component container



CS.0001.
SMT00 Container large (on the left in the picture)
Internal dimensions 17 x 74 x 6 mm

CS.0002.
SMT00 Container small (on the right in the picture)
Internal dimensions 17 x 24 x 6 mm



922.SMT1
10 Rail unit with 12 small containers (on the left in the picture)

922.SMT3
10 Rail unit with 3 large containers (on the right in the picture)



922.SMT3
22 Insert SO 8 - SO 16 for large containers (on the left in the picture)

922.SMT3
23 Insert SO 16L - SO 28 for large containers (on the right in the picture)

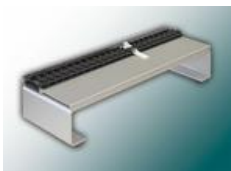


922.SMT1
13 Support with 36 small containers with 3 rail units 922.110



922.SMT3
13 Support with 9 large containers with 3 rail units 922.310

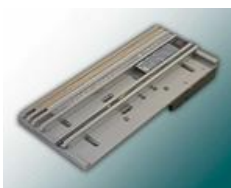
9.6 Tape strip feeder



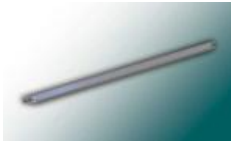
941.SMT1
01 Tape strip dispenser
Support and rail with 24 mini-feeder for tape strips of 8 mm



941.SMT1
24 Rail with 24 mini-feeder for tape strips of 8 mm



941.SMT1
12 Universal holding fixture for tape strips in any widths with 6 rails for the adaption of 5 tapes (max. 11 x 8 mm tape possible)



908.095.S
MT023

Adaption rail for tape stripes

9.7 Pick Up Nozzles



910.SMT301

Pick UP Nozzle 38mm/1.5" for SMDs to SO8 (in the picture on the left)

910.SMT308

Pick UP Nozzle 30mm/1.5" with Rubber Sucker for SOICs, PLCCs und QFPs.

910.SMT311

C0.0051.SMT00

Pick UP Nozzle 38mm/1.5" with Rubber Sucker for SOICs, PLCCs und QFPs.

Suction cup for pick up nozzle, pink



910.SMT302*

Nozzle
blue/violet
pack. 10

30mm
for Chip
0603 bis
0805
OD Ø
0,51 mm
not



910.SMT303*

Nozzle
black/blue
pack. 10

accorda
nt to
ESD
30mm
for Chip
0603
OD Ø
0,7 mm
not



910.SMT304*

Nozzle
lightblue/orange
pack. 10

accorda
nt to
ESD
30mm
for Chip
0402
OD Ø
0,6 mm
not



910.SMT305*

Nozzle
lightblue/lilac
pack. 2

accorda
nt to
ESD
30mm
for Chip
0201
OD Ø
0,33 mm
not
accorda
nt to



910.SMT306*

Nozzle
yellow/pink
pack. 10ESD
30mm
for Chip
0805 bis
1206
OD Ø
0,9 mm
not
accorda
nt to
ESD
30mm
for Chip
1206 up
to SO8
OD 1,3
mm
not
accorda
nt to
ESD

910.SMT307*

Nozzle
pink/green
pack. 10910.309* Nozzle-Set 30mm, per 2x
*Only to use with Filter-Tube LM.0041.00LM.0028. Needle pipe with set screw
SMT00LM.0041. Filter-Tube with filter for suction pipe
SMT00
80.0993. Vacuum filter, white (no picture)
SMT00

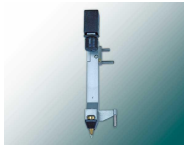
9.8 Syringes and Accessories for Dispensing



- 931.SMT0 Syringe Adapter 5cc for all Syringes 5cc
10
931.SMT0 Syringes Adaptor 3 cc (no picture)
03



- 931.SMT0 Syringe Adaptor 10 cc for Syringe 932.102
11



- 931.SMT2 Syringe Adaptor 5 cc for Series Dispensing for
12 Syringes 932.101 and 932.102

Dispensing nozzles

For adapter 931.010, 931.003, 931.011



- | | | | |
|-----------------|--------------------|---------------------------------|---------------|
| 931.SM
T006* | Dispens.
nozzle | outside 0,6mm
inside 0,4mm | light
blue |
| 931.SM
T007* | Dispens.
nozzle | outside 0,7mm
inside 0,5mm | black |
| 931.SM
T008* | Dispens.
nozzle | outside 0,8mm
inside 0,6mm | blue |
| 931.SM
T009* | Dispens.
nozzle | outside 0,95mm
inside 0,75mm | yellow |
| 931.SM
T013* | Dispens.
nozzle | outside 1,0mm
inside 1,3mm | pink |

* packed in 10 pieces

- 931.SM Dispensing nozzle-set per 2x light blue, black, blue,
T015 yellow, pink



- 931.SM Syringe 5cc, empty
T101
931.SM Syringe 10cc, empty
T102

10 Technical Data

The capacity of assembling is from experience 300-600 SMDs per hour

Dimensions:	600 x 600 x 320 mm (L x W x H)
Max. size of PCB:	440 mm x 245 mm
Max. assembling area:	350 mm x 245 mm
Recommended rails for holding fixture :	left: 940.255 backside: 940.470 Max. Z stroke: 26 mm
Weight:	ca. 23 kg
System voltage:	100 – 230 V AC, automatic
Input:	max. 50 VA
(Only by dispensing):	clean, oilfree pressure air max. 6 bar

11 ESD Certificate

Produktzertifikat

Die

ESD  AKADEMIE

bescheinigt hiermit, dass das Produkt

**Bungard
Pick&Place SMT3000**

nach den Ergebnissen einer Baumusterabnahme, dokumentiert in einem Bericht, die

**Anforderungen zur Handhabung ESD-sensitiver Produkte
(ESDS) und zur Verwendung in ESD-Schutzbereichen
(EPA) gemäß der Norm DIN EN 61340-5-1 Teil 5-1**
(Ausgabe Juli 2008 / Entwurf Juni 2011)

erfüllt.

Dieses Produktzertifikat bestätigt die Güte des überprüften Anlagenmusters.
Die laufende Fertigungsüberwachung und die Qualitätssicherung obliegen dem Hersteller.

Zertifikat-Register-Nr.: ESD-PZ-41020112-F-LM901
Dierdorf, den 21. Oktober 2014


Torsten Röder
(Akademieleitung)
European-state-certified-Engineer BVT
Akkreditierter Auditor QM/UM/OHSAS/EnMS
gemäß EOQ / ISO 19011



ESD  AKADEMIE Königsberger Straße 39 - 56269 Dierdorf / Germany


DMSZ
Zertifiziert nach
ISO 9001
QM 00715

The ESD-safety and the safety of operation must be verified yearly. The machine has only be connected to a by law controlled power network (operator protection).



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