

FRITSCH
COMPLETE AND FLEXIBLE SMT SOLUTIONS



classic LM900



Instruction manual

Innovation and Quality made in Germany

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1 Introduction

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FRITSCH 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 information of the LM900 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 LM900 are constructed for the following intended use:

- pick & place of SMD components
- for dispensing by means of an external control (this is not included in the scope of delivery).

Only in the manual described utilization is allowed.

The Fritsch GmbH 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 FRITSCH 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

FRITSCH 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 Fritsch GmbH.
- 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.
- 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 Fritsch GmbH.
- Please also observe any relevant country specific safety rules.

3.4 Operating and maintenance

The LM900 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 LM900 can be found in the packaging of the pick and place arm.

4.1 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 (2 mm 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.



4.2 Connecting the Manipulator

Please connect the vacuum tube of the Pick&Place arm to the vacuum pump.

Fit one of the supplied pick up nozzles to the vacuum filter housing of the pick and place head 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 LM900.

5.1 Standard filter tube of the LM series

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

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

5.2 Changing the filter

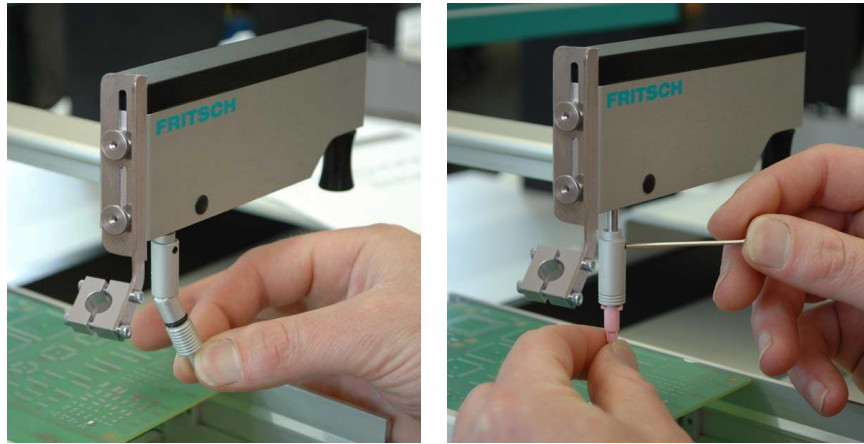
Should the vacuum performance decrease, it can become necessary to replace the integrated finest-filter inside of the filter tube (see therefore also the description „Changing the filter tube“)



Filter tube for nozzles 30 mm

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.

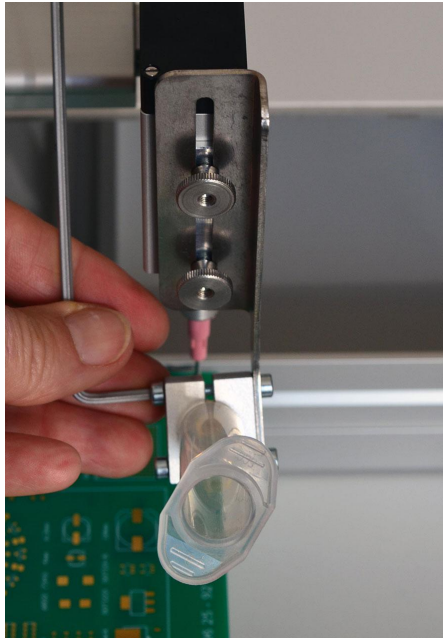
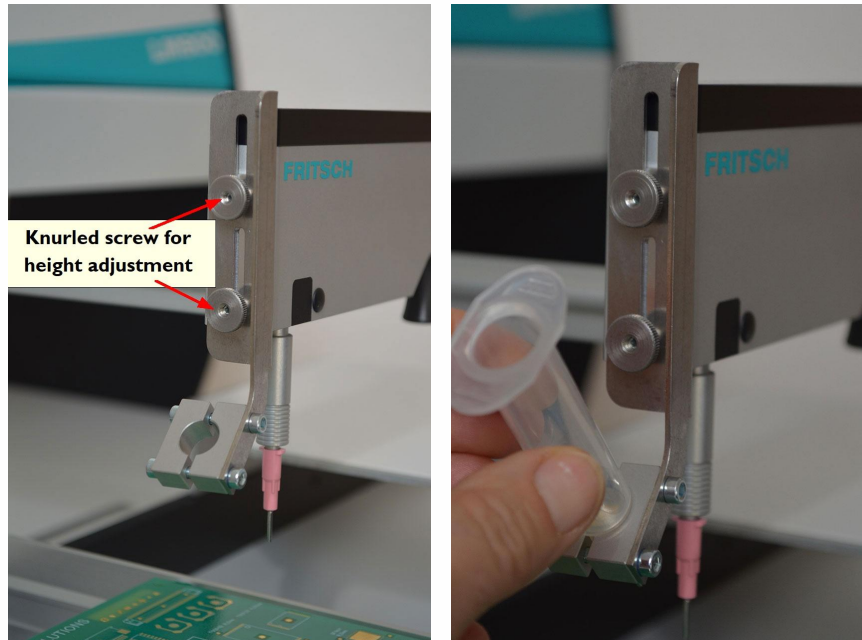


Attention

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.

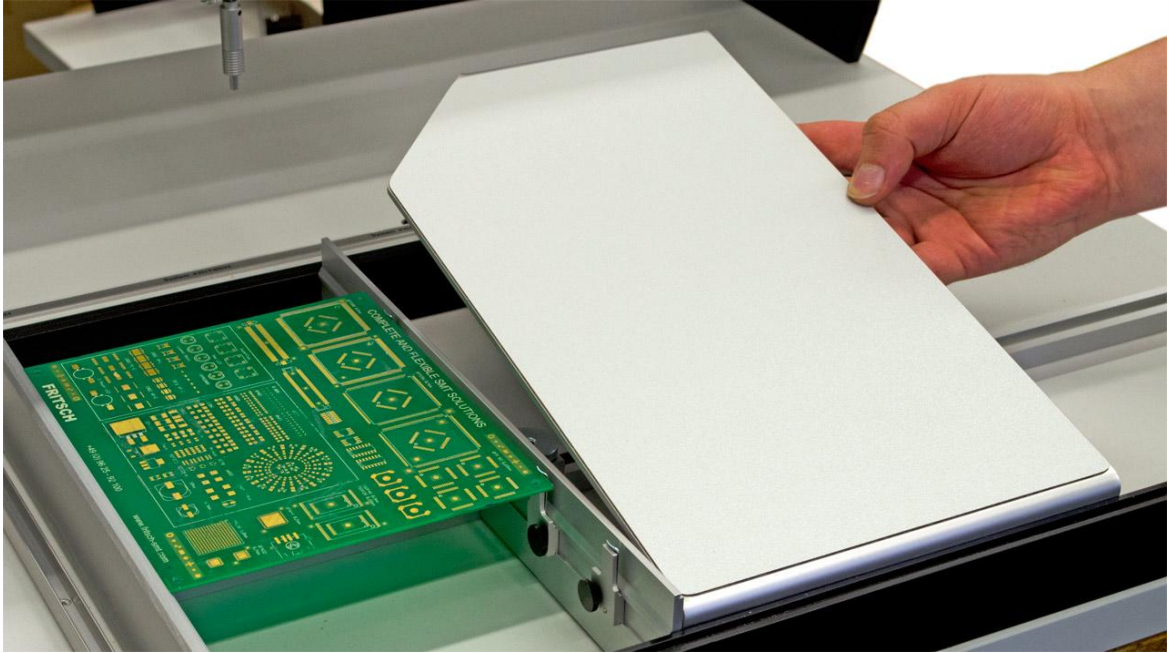
6 Holder for syringes

The head of the LM900 has a holder for a 5/10 cc syringe for dispensing by means of an external control (this is not included in the scope of delivery). The height can be adjusted with the two knurled screws depending on the length of the dispensing nozzle. The syringe can be screwed in with the Allen key after insertion.



7 Description of functions

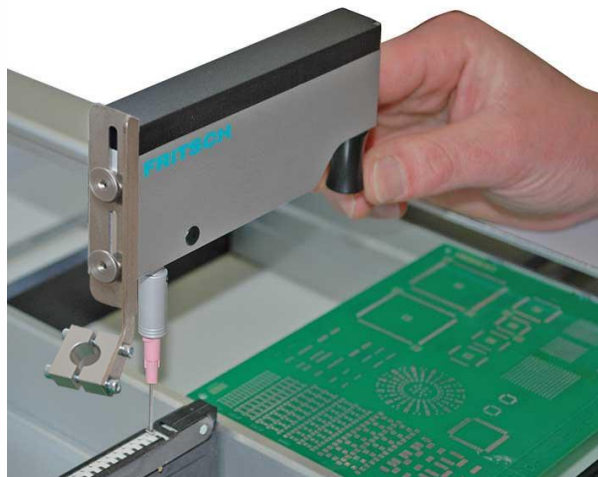
7.1 Put on hand rest



7.2 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.

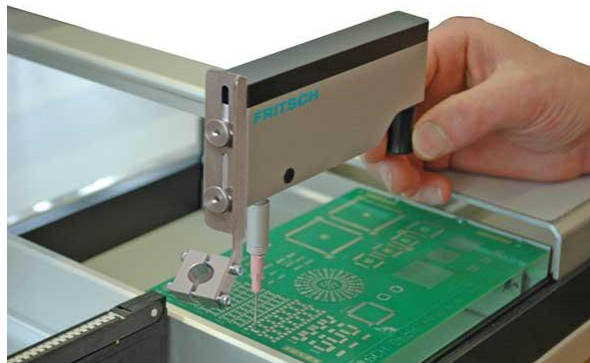
Pull down the head, so that the pipette touches the component slightly only and pick up the component. According to the size of a component it will be picked by a smooth contact, or small components are pulled by the vacuum already before touching by the nozzle.



7.3 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 ~2 mm. 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.



8 Feeder types

Every LM900 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 LM or SM:

- 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

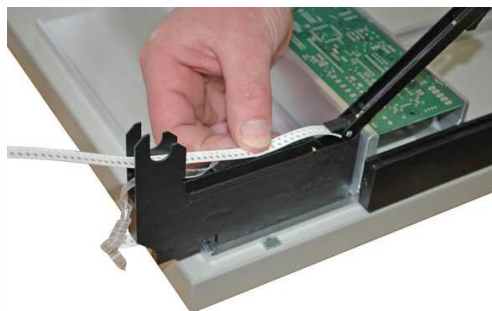
All tape feeders have a quick fastener to be able to assemble tapes within only a few moments. The tape feeders are fixed to the suspension bar by means of a spring mechanism.

Inserting a tape

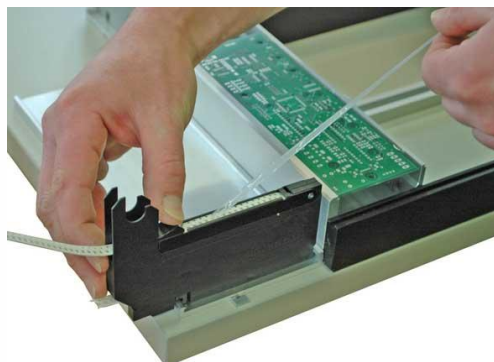
1. Open retaining flap



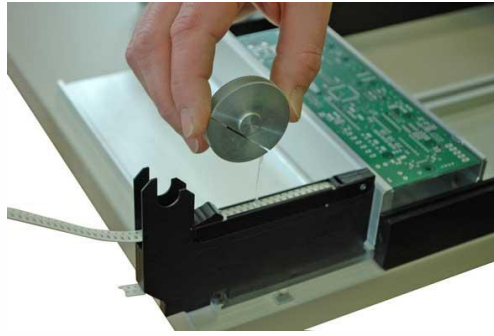
2. Insert tape



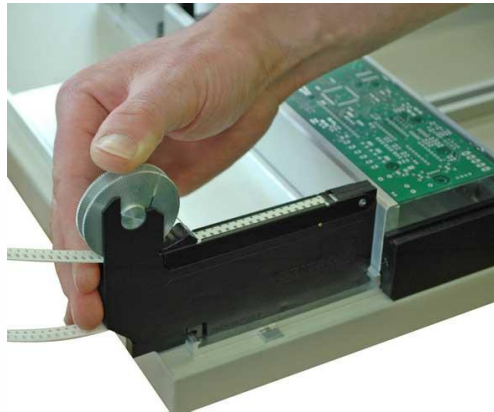
3. Close flap and push backwards until it clicks into place.



4. Remove shrouding and thread onto pinch roll



5. Turning the pinch roll causes the feeding of components



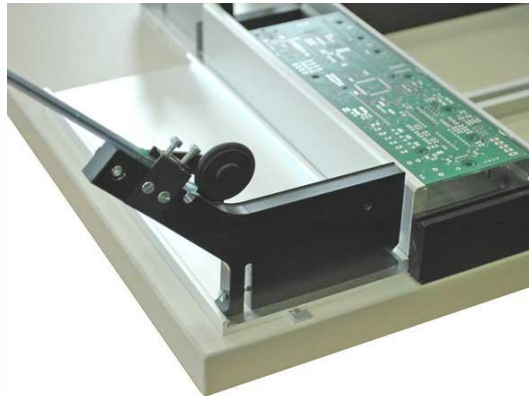
Tape feeders can be used for tape stripes and tape reels of different sizes. In order to store the reels cleanly, reel supports for the various reel sizes can be positioned directly behind the tape feeders.

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

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



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



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



8.3 Loose component container for initial pick & place

The containers are designed to make it easy to process components from small bags. To equip it, you fill the contents of a small bag into the container. Seven containers stacked on top of each other create exactly the pick/place level of the manipulators.

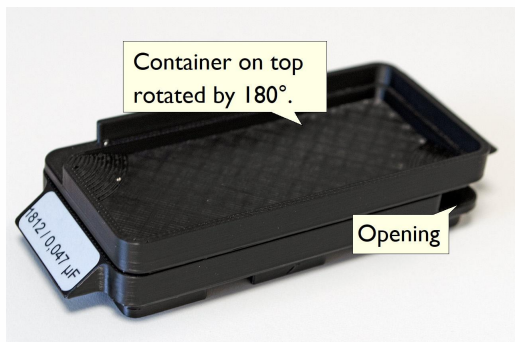


Loose component container for initial pick & place



Single

If you place a second container on top of the container, rotated by 180°, a small opening is created through which it is possible to fill the components back into the bag. Several containers stacked on top of each other can also be used as a storage system.



9 Accessories & spare parts

9.1 Loose component container



CS.0001.00

Container large (on the left in the picture)

Internal dimensions 17 x 74 x 6 mm

CS.0002.00

Container small (on the right in the picture)

Internal dimensions 17 x 24 x 6 mm



922.110

Rail unit with 12 small containers (on the left in the picture)

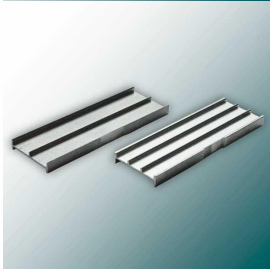
922.310

Rail unit with 3 large containers (on the right in the picture)



CS.0020.00

Loose component container for initial pick & place



922.322

Insert SO 8 - SO 16 for large containers (on the left in the picture)

922.323

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



922.113

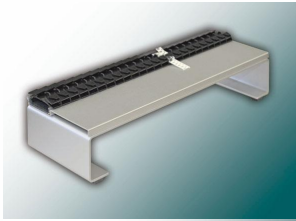
Support with 36 small containers with 3 rail units 922.110



922.313

Support with 9 large containers with 3 rail units 922.310

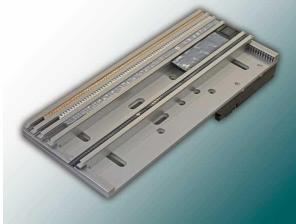
9.2 Tape strip feeder



941.101 Tape strip dispenser
Support and rail with 24 mini-feeder for
tape strips of 8 mm



941.124 Rail with 24 mini-feeder for tape strips of 8
mm



941.112 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)



908.095.023 Adaption rail for tape stripes

9.3 IC-Dispenser - Stick feeding



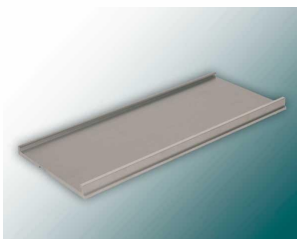
942.208	IC-Dispenser for SO 8, SO 14, SO 16. Tube width 7,9 mm. Overall width 15 mm.
942.220	IC-Dispenser for PLCC 20. Tube width 12,5 mm. Overall width 20 mm.
942.228	IC-Dispenser for SO 8L, SO 16L, SO 20L, SO 24L, SO 28L, VSO 40 packages, PLCC 28. Tube width 15,4 mm. Overall width 22 mm.
942.244	IC-Dispenser for PLCC 44. Tube width 20,1 mm. Overall width 27 mm.
942.252	IC-Dispenser for PLCC 52. Tube width 22,6 mm. Overall width 30 mm.
942.268	IC-Dispenser for PLCC 68. Tube width 27,7 mm. Overall width 35 mm.
942.284	IC-Dispenser for PLCC 84. Tube width 32,8 mm. Overall width 40 mm.
942.901	IC-Dispenser. Custom made.

9.4 Tape feeder



943.008	Tape feeder for 8 mm reels. Overall width 11 mm.
943.012	Tape feeder for 12 mm reels. Overall width 14 mm.
943.016	Tape feeder for 16 mm reels. Overall width 19 mm.
943.024	Tape feeder for 24 mm reels. Overall width 27 mm.
943.032	Tape feeder for 32 mm reels. Overall width 35 mm.

9.5 Mounting Rail



940.255	Mounting rail 255 mm.
940.306	Mounting rail 306 mm.
940.426	Mounting rail 426 mm.
940.470	Mounting rail rear 470 mm.
940.570	Mounting rail rear 570 mm.

9.6 Reel Support Stand



943.101

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



943.103

Reel Support Stand for reels 100 mm OD.



943.102

Reel Support Stand for reels 330 mm OD.

9.7 Pick Up Nozzles



910.308

Pick UP Nozzle 30 mm/1.18" with Rubber
Sucker for SOICs, PLCCs und QFPs
not accordant to ESD



C0.0051.00

Suction cup for pick up nozzle, green

910.302*

Nozzle
violet
pack. 10

30 mm for Chip 0603 bis
0805
OD Ø 0,8 mm
not accordant to ESD



910.303*

Nozzle
blue
pack. 10

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



910.304*

Nozzle
orange
pack. 10

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



910.305*

Nozzle
lilac
pack. 2

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



910.306*

Nozzle
pink
pack. 10

30 mm for Chip 0805 bis
1206
OD Ø 0,9 mm
not accordant to ESD



910.307*

Nozzle
green
pack. 10

30 mm for Chip 1206 up to
SO8
OD 1,3 mm
not accordant to ESD

910.309* Nozzle-Set 30 mm, per 2 x

*Only to use with Filter-Tube LM.0041.00



LM.0028.00

Needle pipe with set screw



LM.0041.00
80.0993.00

Filter-Tube with filter for suction pipe
Vacuum filter, white (no picture)

10 Technical Data

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

Dimensions: 600 x 600 x 230 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. 14 kg

System voltage: 220 – 240 V AC

Input: 5 V

FRITSCH

COMPLETE AND FLEXIBLE SMT SOLUTIONS

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