



# SIPLACE D1

Highest Flexibility

**SIEMENS**



# SIPLACE D1

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# Machine Description

## Overview

### Description

The **SIPLACE D1** placement machine combines high flexibility and precision with an attractive price/performance ratio. Two placement methods are used:

- the **Collect & Place** method for fast placement of standard components
- the **Pick & Place** method for fast placement of special fine-pitch and super-fine pitch components

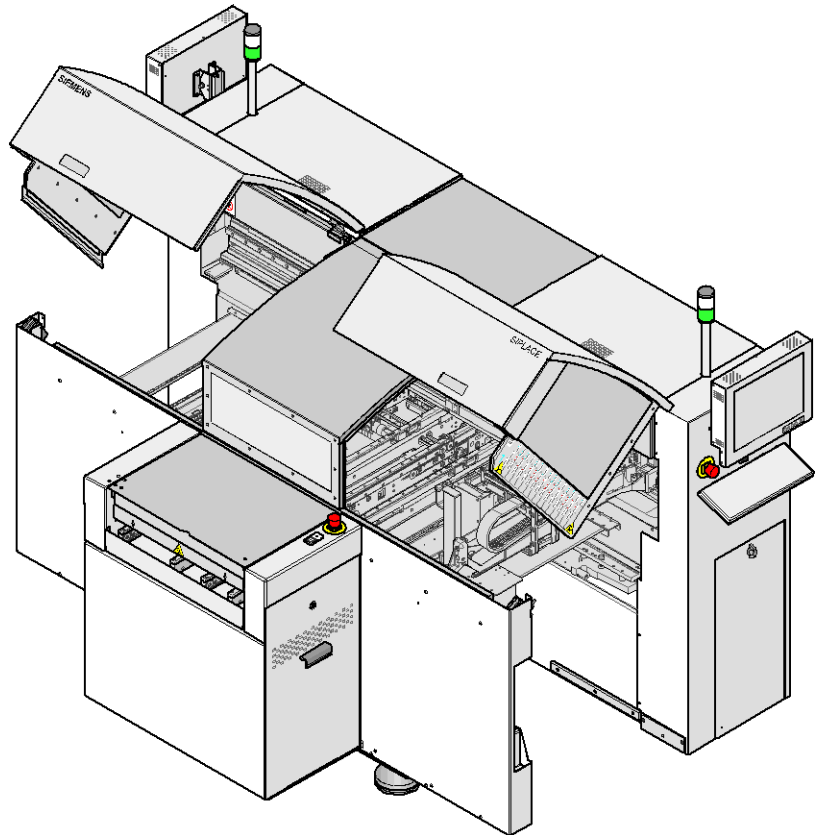
The SIPLACE D1 placement machine is equipped with one gantry which can be positioned quickly and accurately in the X and Y directions. The gantry is equipped with one 6 or 12-nozzle Collect & Place head and/or one Pick & Place head.

The head modularity principle allows the C&P head to be reconfigured to suit changing requirements. The table Technical Data on page 7 contains a list of the possible placement head configurations and the resulting placement rate.

The components are optically centered using a digital vision module.

There are two different digital component cameras available for the placement heads: a standard camera and a high-resolution component camera.

A three-part PCB conveyor, consisting of input belt, processing belt and output belt, carries the PCB into the processing position. As a further



variant, it is also possible to choose between the single conveyor or flexible dual conveyor with stationary side on right or left. The PCBs are optically centered with the digital PCB camera.

The PCB conveyor also acts as a buffer; in the event of minor faults, the PCBs can be parked in this buffer. The total output of the line is not affected by this.

The moving placement head picks up the components from their stationary feeder, and places them on the PCB, which is also stationary. This proven SIPLACE principle has many advantages:

- Short down times for refilling or splicing

- Even the smallest components are picked up reliably
- The components cannot slip on the PCB
- Minimal traversing paths

High flexibility, cost-effectiveness and set-up reliability guarantee that the SIPLACE D1 placement system will be highly productive. The minimal down times increase utilization, thus further increasing productivity.

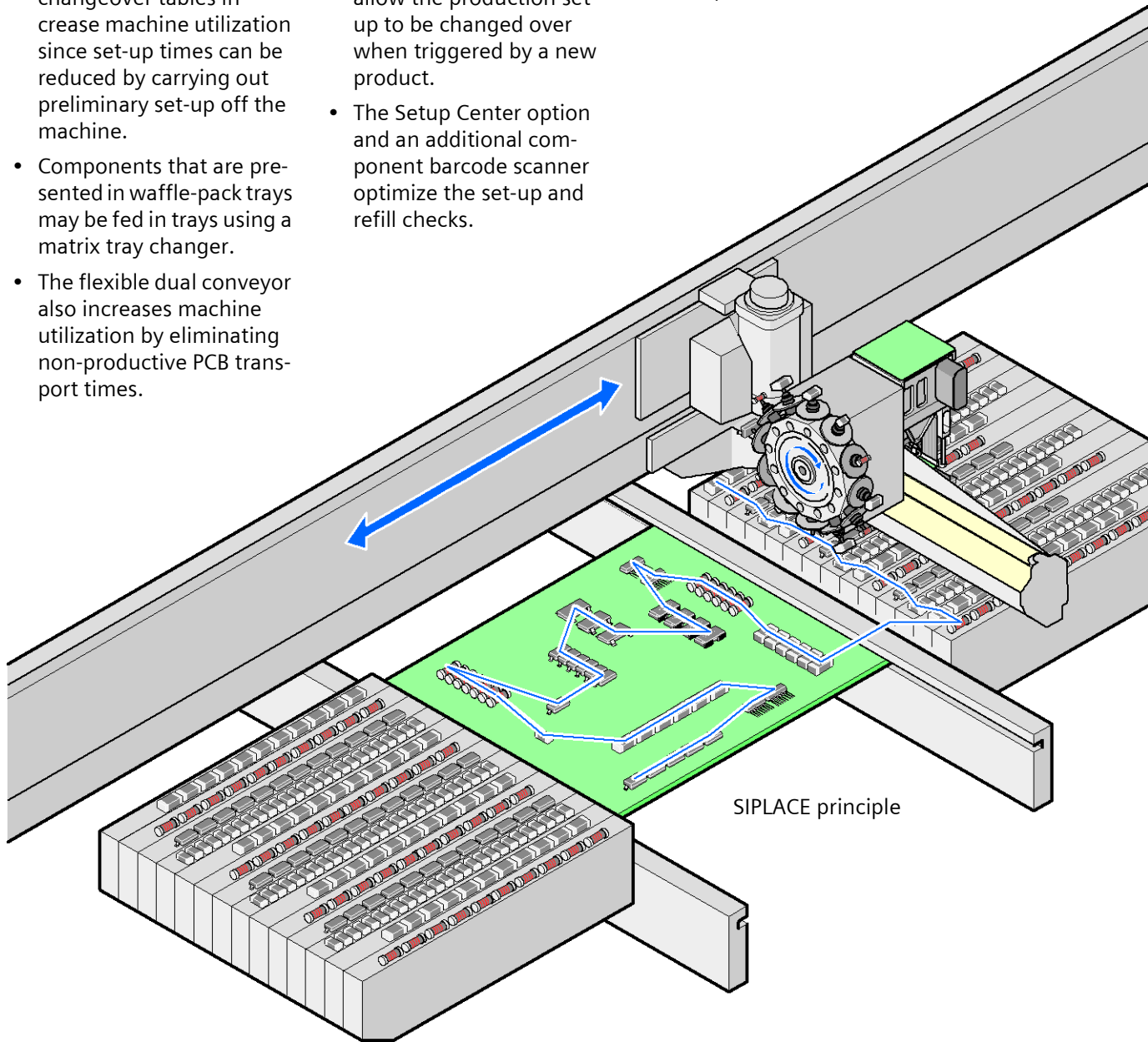
# Machine Description

## Extensions

### Extensions

The options available to extend the functionality of the placement machine include the following:

- Additional component changeover tables increase machine utilization since set-up times can be reduced by carrying out preliminary set-up off the machine.
- Components that are presented in waffle-pack trays may be fed in trays using a matrix tray changer.
- The flexible dual conveyor also increases machine utilization by eliminating non-productive PCB transport times.
- Automatic nozzle changers speed up and optimize the nozzle configuration process.
- PCB barcode scanners allow the production set-up to be changed over when triggered by a new product.
- The Setup Center option and an additional component barcode scanner optimize the set-up and refill checks.
- The productivity lift implements the **concept of parallel placement**, and thus improves the ratio between productive and non-productive times.



# Machine Description

## Technical Data

Types of placement head	12-nozzle Collect & Place head (C&P12) 6-nozzle Collect & Place head (C&P6) SIPLACE Pick&Place head (P&P)								
Number of gantries	1 (see Fig. page 9)								
Placement head configuration and placement rate <sup>a</sup> (Benchmark test)	<table> <thead> <tr> <th></th> <th>Placement rate</th> </tr> </thead> <tbody> <tr> <td>C&amp;P12</td> <td>15,000 comp./h<sup>b</sup></td> </tr> <tr> <td>C&amp;P6</td> <td>9,800 comp./h<sup>b</sup></td> </tr> <tr> <td>P&amp;P</td> <td>2,400 comp./h<sup>b</sup></td> </tr> </tbody> </table>		Placement rate	C&P12	15,000 comp./h <sup>b</sup>	C&P6	9,800 comp./h <sup>b</sup>	P&P	2,400 comp./h <sup>b</sup>
	Placement rate								
C&P12	15,000 comp./h <sup>b</sup>								
C&P6	9,800 comp./h <sup>b</sup>								
P&P	2,400 comp./h <sup>b</sup>								
Placement positions	6,000 for the Collect&Place head 2,000 for the Pick&Place head								
Range of components	0.6 x 0.3 mm <sup>2</sup> (0201) <sup>c</sup> to 85 x 85 mm <sup>2</sup> or max. 200 x 125 mm <sup>2</sup> (with restrictions)								
Component height	C&P12: 6 mm C&P6: 8.5 mm P&P: 19 mm								
Placement accuracy / angular accuracy	<p>C&amp;P12: <math>\pm 67.5 \mu\text{m}</math>, <math>\pm 0.53^\circ</math> / (3<math>\sigma</math>), <math>\pm 90 \mu\text{m}</math>, <math>\pm 0.71^\circ</math> / (4<math>\sigma</math>) (standard camera)</p> <p>C&amp;P12: <math>\pm 60 \mu\text{m}</math>, <math>\pm 0.53^\circ</math> / (3<math>\sigma</math>), <math>\pm 80 \mu\text{m}</math>, <math>\pm 0.71^\circ</math> / (4<math>\sigma</math>) (high-resolution camera)</p> <p>C&amp;P6: <math>\pm 52.5 \mu\text{m}</math>, <math>\pm 0.225^\circ</math> / (3<math>\sigma</math>), <math>\pm 70 \mu\text{m}</math>, <math>\pm 0.3^\circ</math> / (4<math>\sigma</math>)</p> <p>P&amp;P: <math>\pm 37.5 \mu\text{m}</math>, <math>\pm 0.053^\circ</math> / (3<math>\sigma</math>), <math>\pm 50 \mu\text{m}</math>, <math>\pm 0.071^\circ</math> / (4<math>\sigma</math>) (fine-pitch camera)</p> <p><math>\pm 30 \mu\text{m}</math>, <math>\pm 0.053^\circ</math> / (3<math>\sigma</math>), <math>\pm 40 \mu\text{m}</math>, <math>\pm 0.071^\circ</math> / (4<math>\sigma</math>) (flip-chip camera)</p>								
Component feeding	2 component changeover tables with tape reel holders and integral waste containers, 15 slots, 30 mm wide per changeover table or 1 waffle-pack changer in place of one component changeover table (location 1), 5 additional locations for 30 mm wide feeder modules								
Feeder module types	Tapes, bulk cases, stick magazines, application-specific OEM feeder modules, surf-tape feeder modules (8, 12, 16 mm), waffle-pack tray in location 1								
Feeding capacity	30 tape feeder modules 3 x 8 mm S (90 tracks) 30 tape feeder modules 2 x 8 mm S (60 tracks) 30 tape feeder modules 12/16 mm S (30 tracks) 20 tape feeder modules 24/32 mm S (20 tracks) 14 tape feeder modules 44 mm S (14 tracks) 12 tape feeder modules 56 mm S (12 tracks) 10 tape feeder modules 72 mm S (10 tracks) 8 tape feeder modules 88 mm S (8 tracks)								

a) According to the definition in the SIPLACE Scope of Service and Delivery

b) Single head machine on request

c) With 0201 package

# Machine Description

## Technical Data

<p>PCB format (LxW)</p> <p>PLEASE NOTE: With PCB widths &gt; 450 mm make sure that the peripheral modules are also able to process these widths.</p>	<p>Single conveyor 50 x 50 mm<sup>2</sup> to 460 x 460 mm<sup>2</sup> 50 x 80 mm<sup>2</sup> to 610 x 460 mm<sup>2</sup> (Long board option) Width up to 508 mm for Wide board configuration</p> <p>Flexible dual conveyor 50 x 50 mm<sup>2</sup> to 460 x 216 mm<sup>2</sup> 50 x 80 mm<sup>2</sup> to 610 x 216 mm<sup>2</sup> (Long board option) Width up to 242 mm for Wide board configuration</p> <p>Flexible dual conveyor in Single conveyor mode 50 x 50 mm<sup>2</sup> to 460 x 380 mm<sup>2</sup> 50 x 80 mm<sup>2</sup> to 610 x 380 mm<sup>2</sup> (Long board option) Width up to 430 mm for Wide board configuration</p>
<p>PCB thickness</p>	<p>0.3 - 4.5 mm (thicker PCBs on request)</p>
<p>Electrical ratings and compressed air supply</p>	<p>see page 38</p>
<p>Dimensions of the placement systems</p>	<p>see figure page 41</p>



# Placement Heads

## Head Modularity

### Description

Another important feature of the SIPLACE family is their head modularity. The placement heads on the D1 machines are configurable:

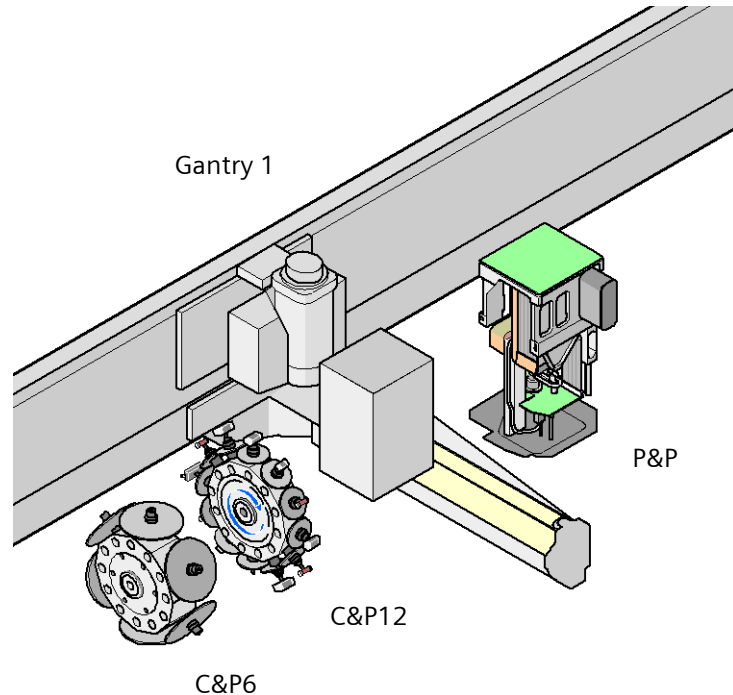
- 12-nozzle Collect & Place head and Pick&Place head
- 6-nozzle Collect & Place head and Pick&Place head
- 12-nozzle Collect & Place head only
- 6-nozzle Collect & Place head only
- Pick&Place head only

When you order a SIPLACE D1 placement system, you can select the ideal head configuration for your needs.

The placement system will then be configured and supplied as per your order.

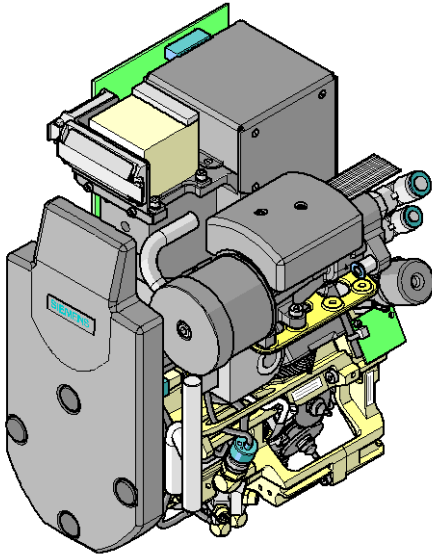
There is also a [reconfiguration kit](#) if you wish to change the placement head locally. This package contains assembly parts, cables, etc, in addition to the placement head.

Head modularity provides an easy way to match the placement system to your production needs without having to invest in additional machines.



# Placement Heads

## 12-Nozzle Collect & Place Head for High-Speed Placement



### Description

The 12-nozzle Collect & Place head works on the Collect & Place principle. This means that, within each cycle, twelve components are picked up by the placement head, are optically centered on the way to the board and are rotated into the required placement angle. Lastly, the air kiss sets down the component gently and accurately on the board.

### Checking and self-learning functions

The reliability of the Collect & Place head is increased by various checking and self-learning functions.

- For example, vacuum checks at the nozzles indicate whether the component was picked up correctly.
- A digital component camera on the placement head determines the precise position of each component at the nozzle. Any deviations from the

required pick-up position are corrected before placement takes place.

- The package form is also checked and the component is not placed if the geometric data thus determined differs from the programmed data.

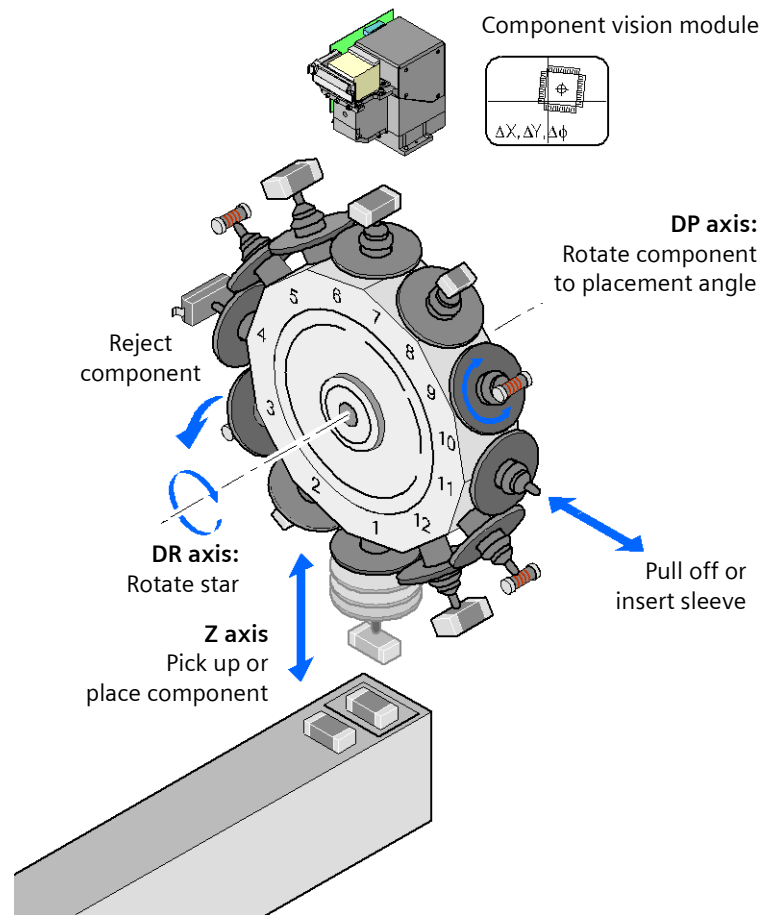
The vertical axis for picking up and placing the component works in sensor stop mode, in which differences in height during pick-up and any unevenness of the PCB surface are compensated during placement.

In addition to the vacuum check, an optional com-

ponent sensor may be used to check for the presence of a component at the nozzle. The use of a component sensor is recommended, particularly when placing small components, such as 0201.

### High-resolution camera option

The high-resolution component camera allows the 12-nozzle Collect & Place head to optically center and place component sizes ranging from 0201<sup>a</sup> to 18.7 x 18.7 mm<sup>2</sup>.



a) With 0201 package

# Placement Heads

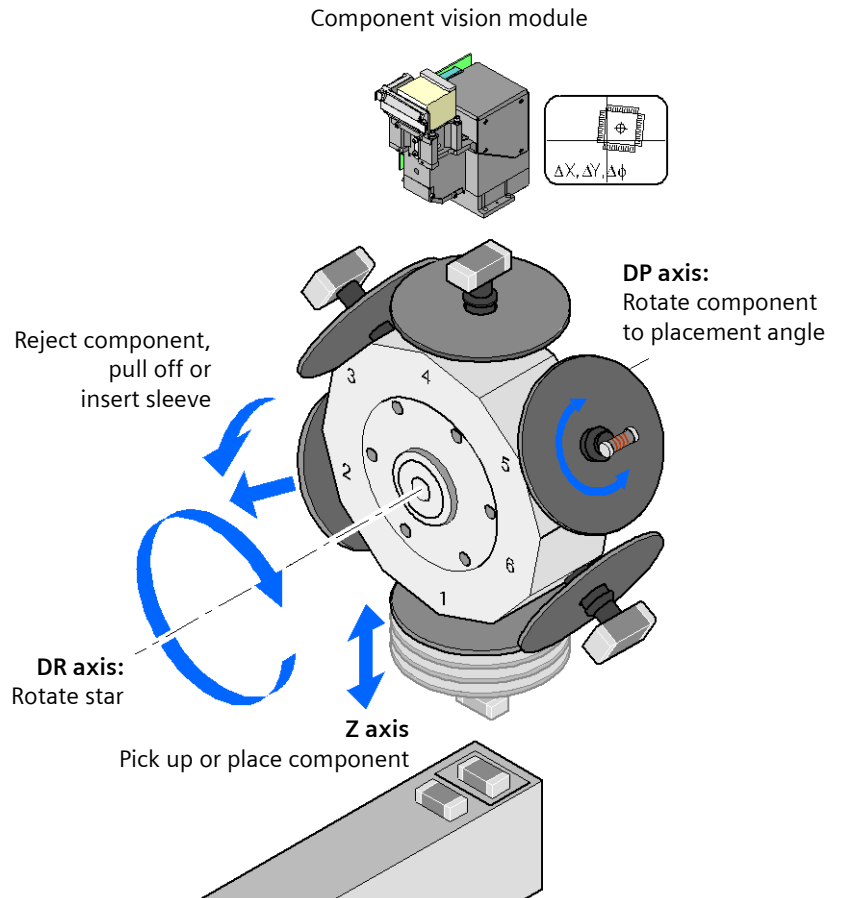
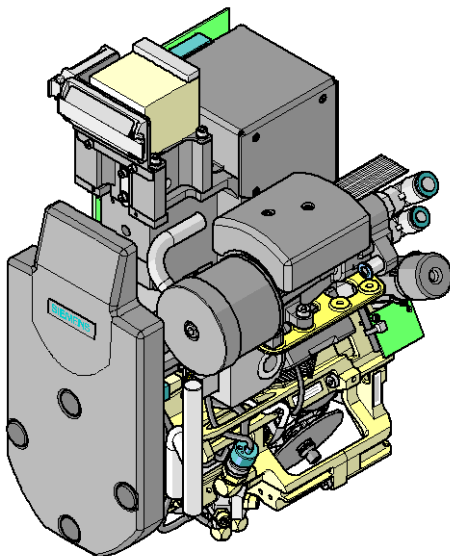
## 6-Nozzle Collect & Place Head for High-Speed IC Placement

### Description

The 6-nozzle Collect & Place head also works on the Collect & Place principle. The high-resolution digital component camera allows the 6-nozzle Collect & Place head to optically center and place component sizes ranging from 0201 to 27 x 27 mm<sup>2</sup>.

### Checking and self-learning functions

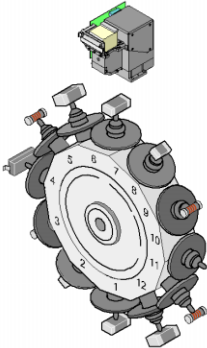
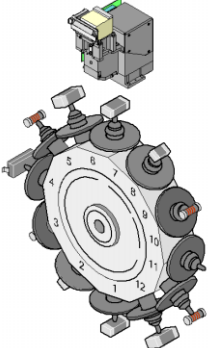
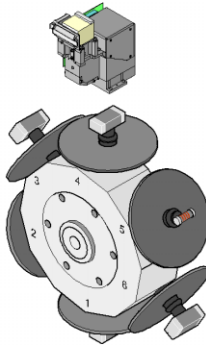
The checking and self-learning functions described on page 10 for the 12-nozzle Collect & Place head also apply to the 6-nozzle Collect & Place head.



# Placement Heads

## Collect&Place Heads

### Technical Data for the C&P Heads

	12-nozzle Collect & Place head (standard- component camera)	12-nozzle Collect & Place head (high-resolution component camera)	6-nozzle Collect&Place head
			
Component range <sup>a</sup>	0402 to PLCC44, BGA, $\mu$ BGA, flip-chip, TSOP, QFP, SO to SO32, DRAM	0201 <sup>b</sup> to flip-chip, bare die, PLCC44, BGA, $\mu$ BGA, TSOP, QFP, SO to SO32, DRAM	0201 to 27 x 27 mm <sup>2</sup>
Component specification			
max. height	6 mm	6 mm	8.5 mm
min. lead pitch	0.5 mm	0.3 mm	0.3 mm
min. lead width	0.2 mm	0.15 mm	0.15 mm
min. ball pitch	0.35 mm	0.25 mm	0.25 mm <sup>c</sup> 0.35 mm <sup>d</sup>
min. ball diameter	0.2 mm	0.14 mm	0.14 mm <sup>c</sup> 0.2 mm <sup>d</sup>
min. dimensions	1.0 x 0.5 mm <sup>2</sup>	0.6 x 0.3 mm <sup>2</sup>	0.6 x 0.3 mm <sup>2</sup>
max. dimensions	18.7 x 18.7 mm <sup>2</sup>	18.7 x 18.7 mm <sup>2</sup>	27 x 27 mm <sup>2</sup>
max. weight	2 g	2 g	5 g
Programmable set-down force	2.4 N - 5.0 N	2.4 N - 5.0 N	2.4 N - 5.0 N
Nozzle types	9 xx	9 xx	8 xx, 9 xx
X/Y accuracy	$\pm 67.5 \mu\text{m}/3\sigma$ $\pm 90 \mu\text{m}/4\sigma$	$\pm 60 \mu\text{m}/3\sigma$ $\pm 80 \mu\text{m}/4\sigma$	$\pm 52.5 \mu\text{m}/3\sigma$ $\pm 70 \mu\text{m}/4\sigma$
Angular accuracy	$\pm 0.53^\circ/3\sigma$ $\pm 0.71^\circ/4\sigma$	$\pm 0.53^\circ/3\sigma$ $\pm 0.71^\circ/4\sigma$	$\pm 0.225^\circ/3\sigma$ $\pm 0.3^\circ/4\sigma$

a) Please note that the range of components that can be placed is also affected by the pad geometry, customer-specific standards, component packaging tolerances and component tolerances.

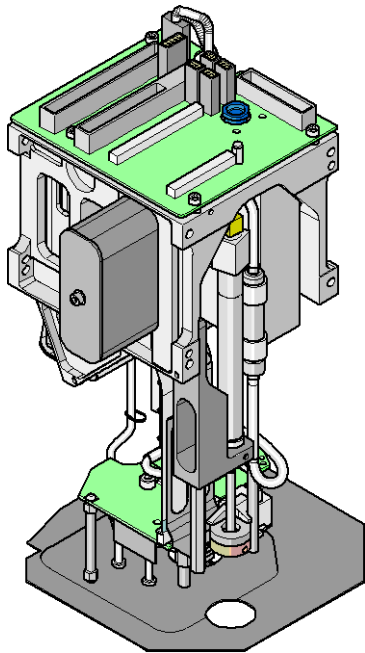
b) With 0201 package

c) For components < 18 x 18 mm<sup>2</sup>

d) For components  $\geq 18 \times 18 \text{ mm}^2$

# Placement Heads

## Pick&Place Head for High-Precision IC Placement



### Description

This sophisticated placement head works on the Collect & Place principle. It is suitable for processing particularly difficult or large components. The components are picked up by the placement head, optically centered on the way to the placement position and rotated into the necessary placement angle. The components are then placed gently and accurately on the board.

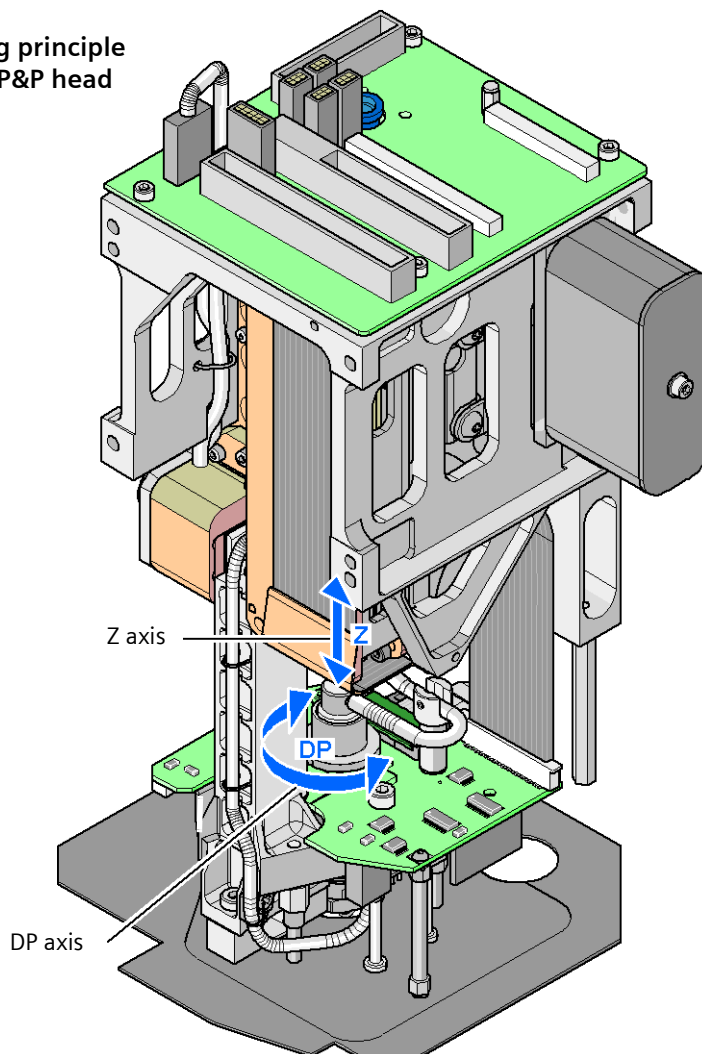
The placement head can also use the nozzles for the Pick & Place head (used on the F5 HM) in addition to the new type 5xx nozzles. It is also possible to fit an adapter (optional) and then use the nozzles for the Collect&Place heads.

### Checking and self-learning functions

The reliability of the Pick & Place head is increased by various checking and self-learning functions.

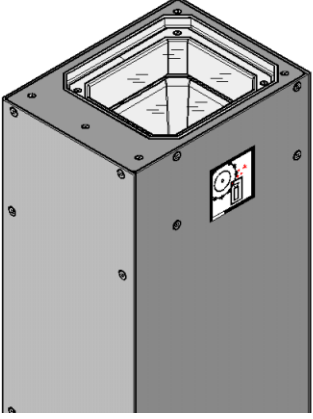
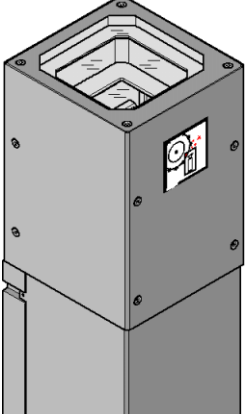
- For example, vacuum checks at the nozzles indicate whether the component was picked up correctly.
- High-resolution, digital component vision cameras such as the fine-pitch and flip-chip vision cameras (optional) identify the smallest deviations in the component position. The digital vision system corrects such deviations, thus guaranteeing a correct placement position. The digital component cameras are permanently fixed to the machine frame.
- The component package form is also checked and the component is not placed if the geometric data thus determined differs from the programmed data.
- A force sensor measures and monitors the specified component placement forces.

### Working principle for the P&P head



# Placement Heads

## P&P Head for High-Precision IC Placement Technical Data, P&P Head

Optical centering with digital	Fine-pitch camera	Flip-chip camera (optional)
		
Component range <sup>a</sup>	0603 to SO, PLCC, QFP, BGA, special components, bare dies, flip-chips	0402 to SO, PLCC, QFP, sockets, plugs, BGA, special components, bare dies, flip-chips, shields
Component specification		
max. height	19 mm	19 mm
min. lead pitch	0.4 mm	0.25 mm
min. lead width	0.24 mm	0.1 mm
min. ball pitch	0.56 mm	0.14 mm
min. ball diameter	0.32 mm	0.08 mm
min. dimensions	1.6 x 0.8 mm <sup>2</sup>	1.0 x 0.5 mm <sup>2</sup>
max. dimensions	32 x 32 mm <sup>2</sup> (single measurement) 85 x 85 mm <sup>2</sup> or max. 200 x 125 mm <sup>2</sup> (with restrictions)	16 x 16 mm <sup>2</sup> (single measurement)
max. weight	100 g <sup>b</sup>	100 g <sup>b</sup>
Programmable set-down force	1.0 N - 15 N	1.0 N - 15 N
Nozzle types	5 xx (standard) 4 xx + adapter 8 xx + adapter 9 xx + adapter	5 xx (standard) 4 xx + adapter 8 xx + adapter 9 xx + adapter
X/Y accuracy	± 37.5 μm/3σ ± 50 μm/4σ	± 30 μm/3σ ± 40 μm/4σ
Angular accuracy	± 0.053°/3σ ± 0.071°/4σ	± 0.053°/3σ ± 0.071°/4σ

a) Please note that the range of components that can be placed is also affected by the pad geometry, customer-specific standards, component packaging tolerances and component tolerances.

b) if standard nozzles are used

# Placement Heads

## Nozzle Changers for the Collect&Place Heads

### Description

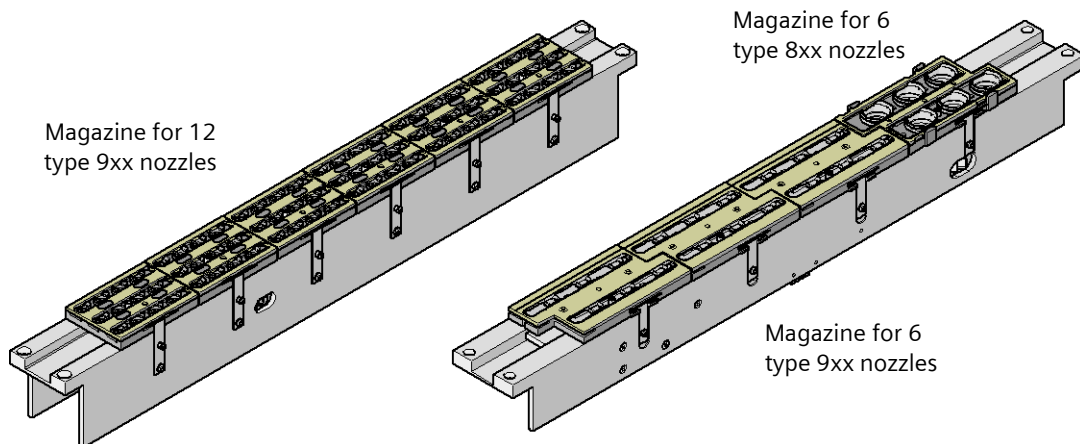
Nozzle changers increase the flexibility of placement heads when processing different components. The nozzle configuration can be quickly modified for new placement jobs.

Exactly defined positions and the perfect seating of the nozzle in the garage guarantee minimal radial eccentricity at the placement head.

One nozzle changers can be installed for the 6-nozzle or 12-nozzle Collect & Place heads (C&P6 OR C&P12) at location 2.

Nozzle changer for the  
12-nozzle Collect&Place head (NC12)  
(6 magazines → 72 nozzle holders in total)

Nozzle changer for the  
6-nozzle Collect&Place head (NC6)  
(4 magazines → 24 nozzle holders in total)



# Placement Heads

## Nozzle Changer for the Pick&Place Head

One nozzle changer (NCP&P) may be installed for the Pick & Place head at location 2.

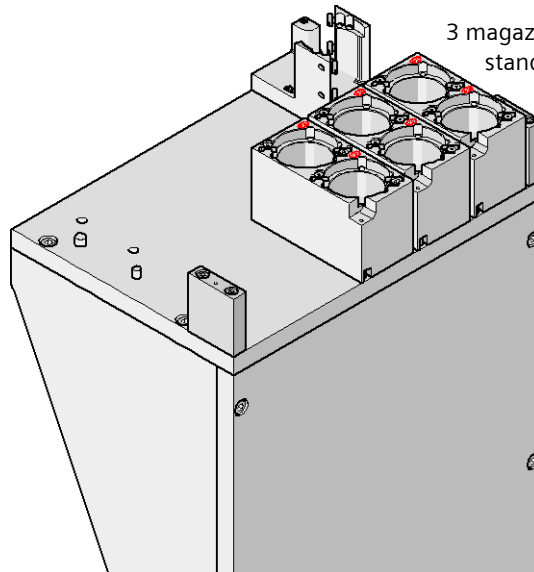
The supporting plate can hold up to 10 magazines for standard or special nozzles or grippers.

Standard configuration:

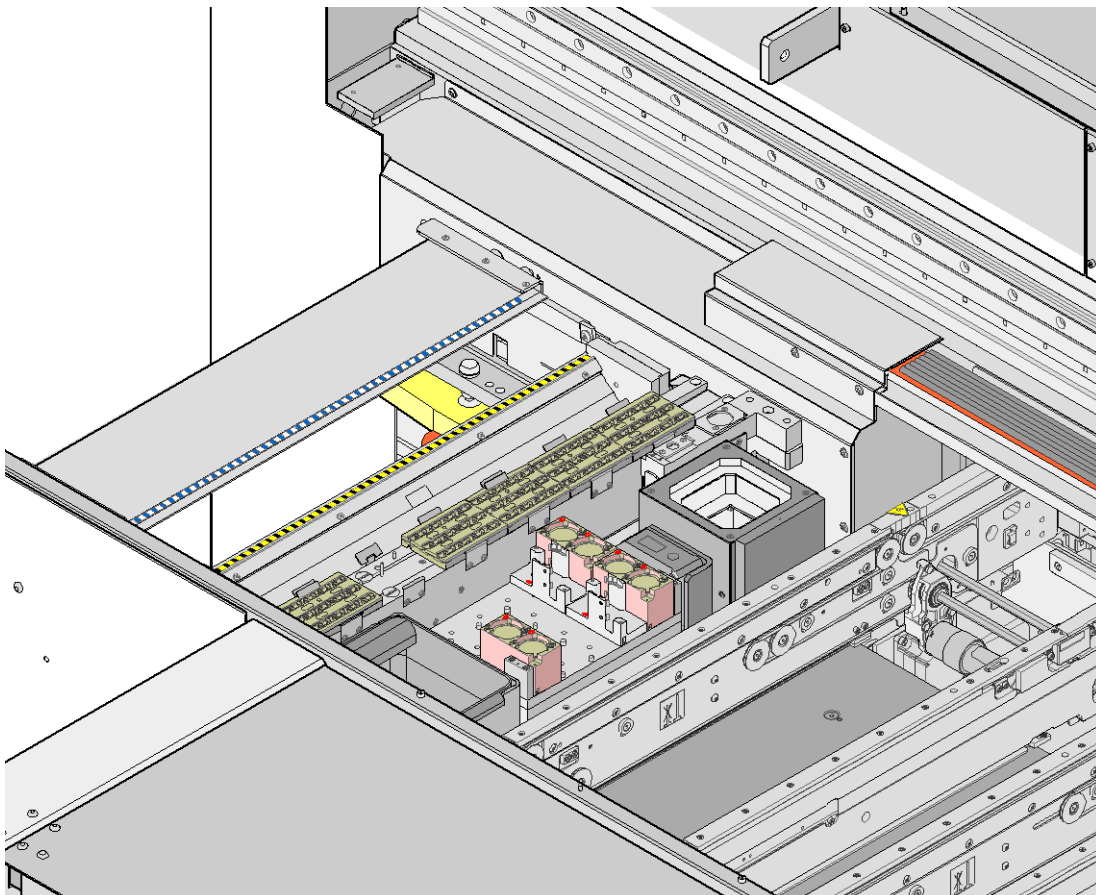
3 x standard magazine  
1 x special nozzle

1 magazine for one special nozzle, gripper

3 magazines for two standard nozzles



### Position of the nozzle changer on the SIPLACE D1 placement machine





# Placement Heads

## Nozzle Changers

### Technical Data for the Nozzle Changers

<b>Nozzle changer for the 12-nozzle Collect&amp;Place head</b>	
Dimensions (length x width x height)	565 x 63 x 78 mm <sup>3</sup>
Number of magazines	6, each with 12 nozzle holders
Nozzle types	9 xx
Nozzle changeover time	approx. 2 s per nozzle
Compressed air connection	0.48 MPa (4.8 bar)
<b>Nozzle changer for the 6-nozzle Collect&amp;Place head</b>	
Dimensions (length x width x height)	565 x 69 x 87 mm <sup>3</sup>
Number of magazines	4, each with 6 nozzle holders
Nozzle types	8 xx, 9 xx
Nozzle changeover time	approx. 2 s per nozzle
Compressed air connection	0.48 MPa (4.8 bar)
<b>Nozzle changer for the SIPLACE Pick&amp;Place head</b>	
Dimensions (length x width x height)	192 x 138 x 314 mm <sup>3</sup>
Number of magazines	max. 10
Number of nozzle holders	Standard: 3 x 2 standard nozzles and 1 x special nozzle
Nozzle types	4 xx with adapter 5 xx (standard) 9 xx with adapter Special nozzle, gripper
Nozzle changeover time	approx. 2 s per nozzle

# PCB Conveyor

## Single Conveyor

### Description

For placement, the PCB is clamped from below. The distance between the top of the PCB and the placement head thus remains unchanged for each PCB, and is not dependent on the thickness of the PCB. The **placement rate** is also independent of the PCB thickness.

Since the distance between the PCB surface and the PCB camera remains the same, the PCB camera is always focussed on the PCB surface with the same level of sharpness.

The **PCB fiducial contours** are optimally mapped on the CCD chip of the PCB camera.

The inline PCB conveyor system quickly adapts to a wide range of PCB widths.

The setting is made using the placement program or via the station software menu. The width of the PCB conveyor is monitored by an **integral control circuit**.

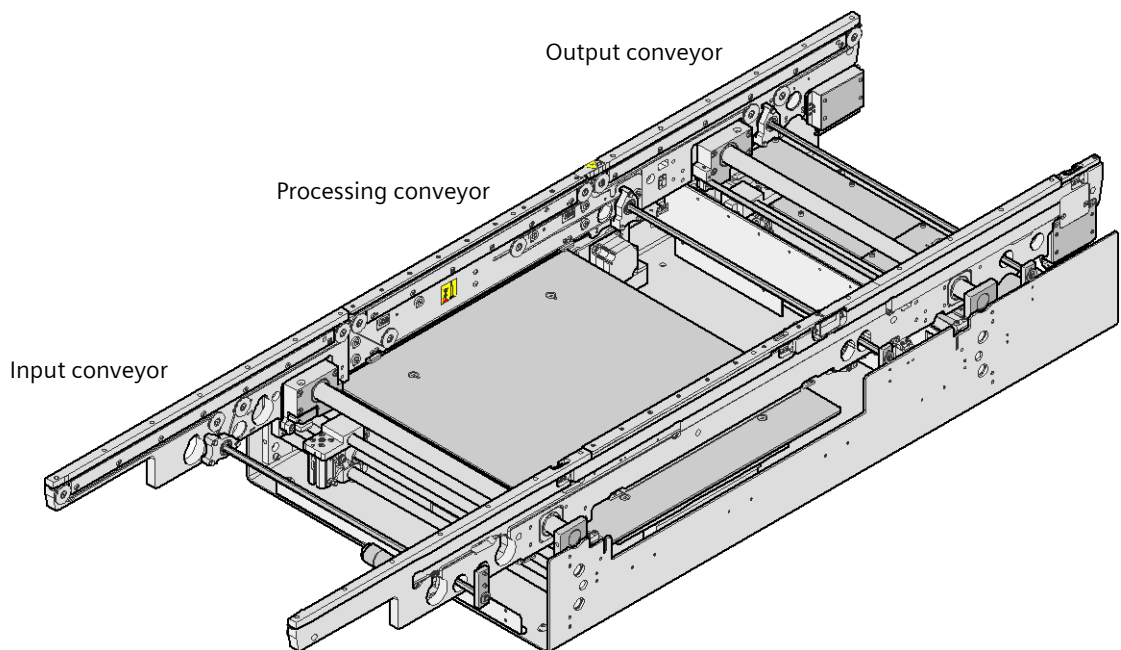
The machine height can be modified, thus allowing the machines to be integrated into lines with a transport height of 830, 900, 930 or 950 mm.

The PCB conveyors of the individual machines communicate via the Siemens interface (optional SMEMA interface).

The **stationary conveyor side** can be located on the left or right for both the dual conveyor and the single conveyor.

With this conveyor, the stationary side can be easily switched from right to left or vice versa.

Movement and clamping of the PCBs are monitored. When the board has reached the placement area and passed the light barrier, it is braked. A laser light barrier determines the position of the board. As soon as the circuit board has reached its target position, the conveyor belt is stopped and the board is clamped from the underside. The placement process then starts immediately.



# PCB Conveyor

## Single Conveyor

### Technical Data for the Single Conveyor

Stationary conveyor side	Right or left
PCB format	
Standard (length x width)	50 x 50 mm <sup>2</sup> to 460 x 460 mm <sup>2</sup> <sup>a</sup>
Wide board configuration	50 x 50 mm <sup>2</sup> to 460 x 508 mm <sup>2</sup> <sup>a</sup>
Long board option	50 x 80 mm <sup>2</sup> to 610 x 460 mm <sup>2</sup> <sup>a</sup>
Long board option and Wide board configuration	50 x 80 mm <sup>2</sup> to 610 x 508 mm <sup>2</sup> <sup>a</sup>
PCB thickness	
Standard	0.3 to 4.5 mm (± 0.2 mm) (thicker PCBs on request)
PCB weight	max. 3 kg
Clearance on PCB underside	
Standard	25 mm ± 0.2 mm
Option	max. 40 mm ± 0.2 mm
Component-free PCB handling edge	3 mm
PCB changeover time	2.5 s
PCB positioning accuracy	± 0.5 mm
PCB transport height	830 mm ± 15 mm (standard) 900 mm ± 15 mm (optional) 930 mm ± 15 mm (optional) 950 mm ± 15 mm (SMEMA: optional)
Type of interface	Siemens / SMEMA <sup>b</sup>
Bad fiducial detection	possible
Automatic width adjustment	possible

a) With PCB widths > 450 mm make sure that the peripheral modules are also able to process these widths.

b) Option

# PCB Conveyor

## Flexible Dual Conveyor

### Description

The PCB dual conveyor can greatly increase throughput with shorter down times - depending on the placement program. It allows two PCBs to be carried simultaneously (synchronously) or alternately (asynchronously) through the placement machine.

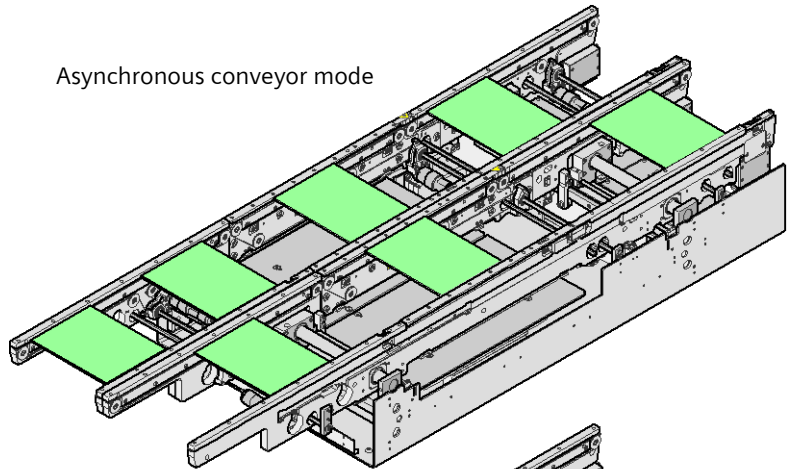
In **asynchronous mode**, only one PCB in a transport track is processed while another PCB in the second transport track is moved into the placement position. This saves the full conveying time of one PCB, thus considerably increasing performance, particularly for PCBs with a short cycle time. The placement process starts as soon as one PCB is transported into the processing area.

In **synchronous mode**, two PCBs are moved into the placement position at the same time. They are processed as a common panel.

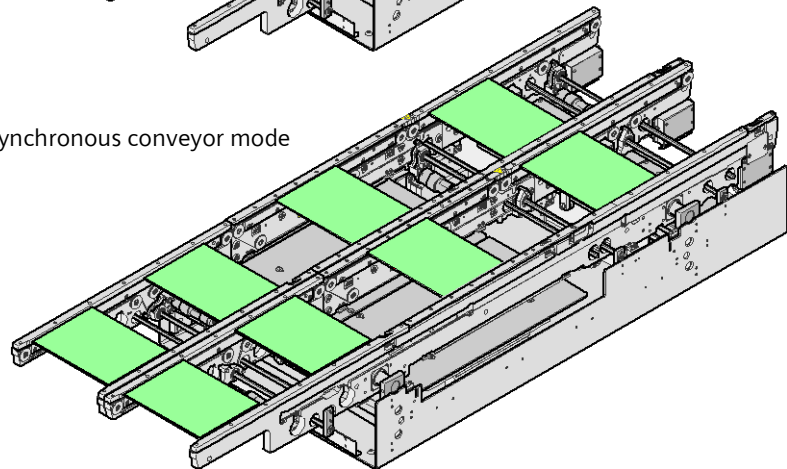
In this way, the top and bottom of a PCB can be processed on a single line. The proportion of non-productive time is reduced as two circuit boards are always conveyed simultaneously.

With the flexible dual conveyor, one conveyor track may spread further than the standard width of 216 mm in **single conveyor mode**. The side panels of the second conveyor track are moved fully together and the second conveyor track is disabled. This allows overdue PCBs to be processed in machines with a dual conveyor.

Asynchronous conveyor mode



Synchronous conveyor mode



# PCB Conveyor

## Flexible Dual Conveyor

### Technical Data for the Dual Conveyor

Stationary conveyor side	Right or left
PCB format	
Standard (length x width)	50 x 50 mm <sup>2</sup> to 460 x 216 mm <sup>2</sup>
Wide board configuration	50 x 50 mm <sup>2</sup> to 460 x 242 mm <sup>2</sup>
Long board option	50 x 80 mm <sup>2</sup> to 610 x 216 mm <sup>2</sup>
Long board option and Wide board configuration	50 x 80 mm <sup>2</sup> to 610 x 242 mm <sup>2</sup>
Dual conveyor in Single conveyor mode	
Standard	50 x 50 mm <sup>2</sup> to 460 x 380 mm <sup>2</sup>
Wide board configuration	50 x 50 mm <sup>2</sup> to 460 x 430 mm <sup>2</sup>
Long board option	50 x 80 mm <sup>2</sup> to 610 x 380 mm <sup>2</sup>
Long board option and Wide board configuration	50 x 80 mm <sup>2</sup> to 610 x 430 mm <sup>2</sup>
PCB thickness	
Standard	0.3 mm to 4.5 mm ( $\pm 0.2$ mm) (thicker PCBs on request)
PCB weight	max. 3 kg
Clearance on PCB underside	
Standard	25 mm $\pm 0.2$ mm
Option	max. 40 mm $\pm 0.2$ mm
PCB transport height	830mm $\pm 15$ mm (standard) 900mm $\pm 15$ mm (optional) 930mm $\pm 15$ mm (optional) 950mm $\pm 15$ mm (SMEMA: optional)
Type of interface	Siemens / SMEMA <sup>a</sup>
Component-free PCB handling edge	3 mm
PCB changeover time	2.5 s
PCB positioning accuracy	$\pm 0.5$ mm
Conveyor mode	synchronous or asynchronous
Components on each conveyor	same or different
PCB width on each conveyor	same or different
Bad fiducial detection	synchronous: not possible, asynchronous: possible
Automatic width adjustment	synchronous: possible, asynchronous: possible

a) Option

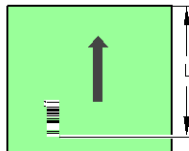
# PCB Conveyor

## SIPLACE PCB Barcode for Product-Controlled Production (Option)

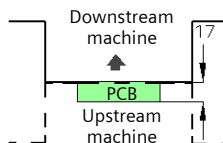
Label dimensions	Stroke width (W): $0.19 < W \leq 0.3$ mm (corresponds to high and medium density), stroke length: $\geq 4$ mm, length of the barcode template window: $\leq 90$ mm
Recommended label colors	Coding: black, dark green, dark blue, background: white, beige, yellow, orange (contrast ratio $> 70\%$ to DIN 66236)
Code types	Code 39, Code 128 / EAN 128, Codabar, 2/5 IATA 2/5 industrial, 2/5 interleaved, UPC, EAN, Pharma Code, EAN Addendum (others available on request), max. 25 digits, a barcode filter may be defined
Laser scanner safety	Laser diode 670 nm (red) / 1.2 mW Laser protection class 2, degree of protection IP65



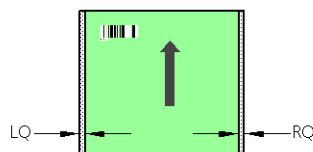
PCB barcode reader	Q [mm]
2D on top	390
1D on top	390
2D on bottom	430
1D on bottom	430



PCB barcode reader	L [mm]
1D on top	320 - 350
1D on bottom	380 - 410

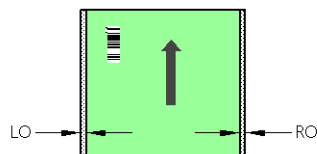


PCB barcode reader	PCB rear projection [mm]
2D on bottom (dual conveyor)	17



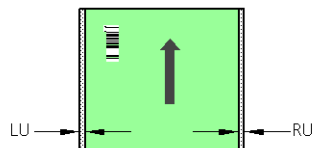
PCB barcode reader	LQ [mm]	RQ [mm]
2D on top	3	3
1D on top	3	3
2D on bottom	5	5
1D on bottom	5	5

PCB barcode scanner 1D on top



PCB dimensions/conveyor	LO [mm]	RO [mm]
460 mm SC	3	20
508 mm SC	3	44
216 mm DC1	3	24
242 mm DC1, 380 mm SM1	3	58
216 mm DC2	3	3
242 mm DC2, 380 mm SM2	3	3

PCB barcode scanner 1D on bottom



PCB dimensions/conveyor	LU [mm]	RU [mm]
460 mm SC	20	3
508 mm SC	44	3
216 mm DC1	3	3
242 mm DC1, 380 mm SM1	3	3
216 mm DC2	24	3
242 mm DC2, 380 mm SM2	58	3

# Component Feeding

## Component Changeover Table

### Description

Two component changeover tables may be docked in the machine. Optionally, a waffle-pack changer (WPC4) may be installed at location 1. The component changeover tables are stand-alone modules that can be set up at an external set-up area with feeder modules. In this way, changes only interrupt the production process for a short time. The chassis runs smoothly and is easy to maneuver.

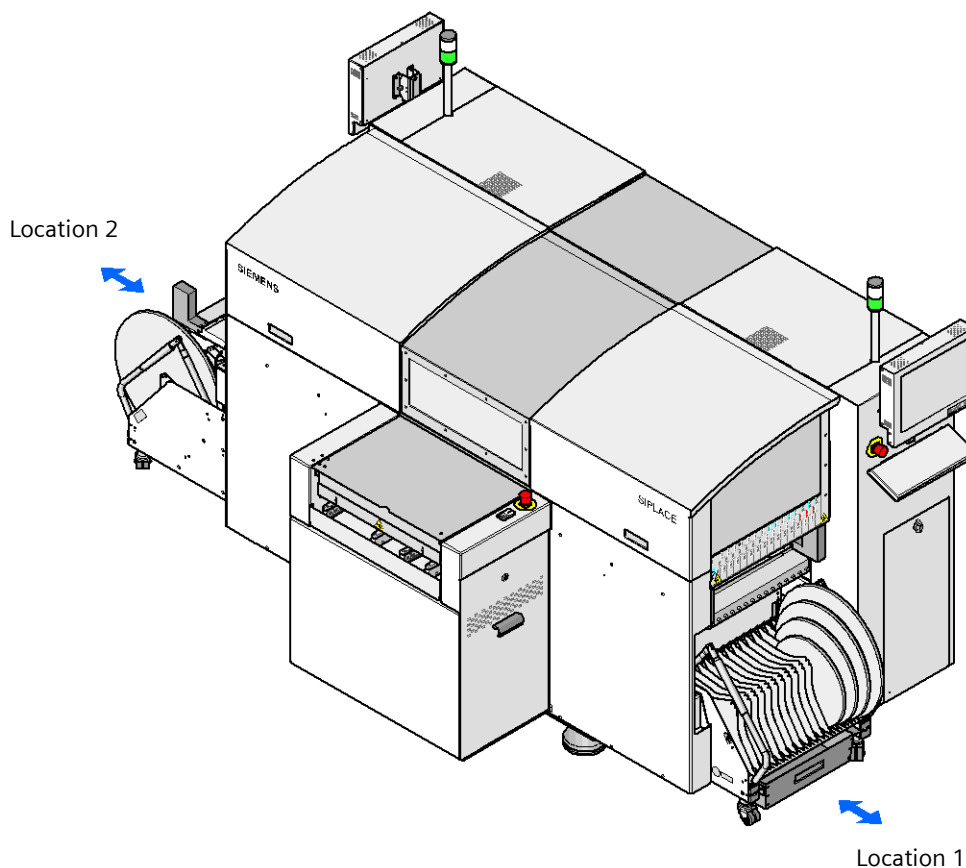
The component table has a capacity of up to 15 locations for 30 mm tape feeder modules. The total capacity with two component changeover tables is thus 90 x 8 mm tracks.

Bulk case feeder modules, linear vibratory feeders, Surf-tape feeder modules, dipflux modules, component disposal modules and waffle-pack trays can all be set up in addition to the tape feeder modules. Dummy feeder modules are used at unassigned locations to protect the operators.

The communication unit sends the necessary voltages and control signals to the feeder modules.

The component feeders are at rest during the placement process, which means that components can be refilled (in sticks, for example) and tapes may be spliced without stopping the machine.

If an optional component barcode reader and the Setup Center option are installed, it is possible to read and check the barcodes on the tape reels. This guarantees that the components will be allocated to the right track.

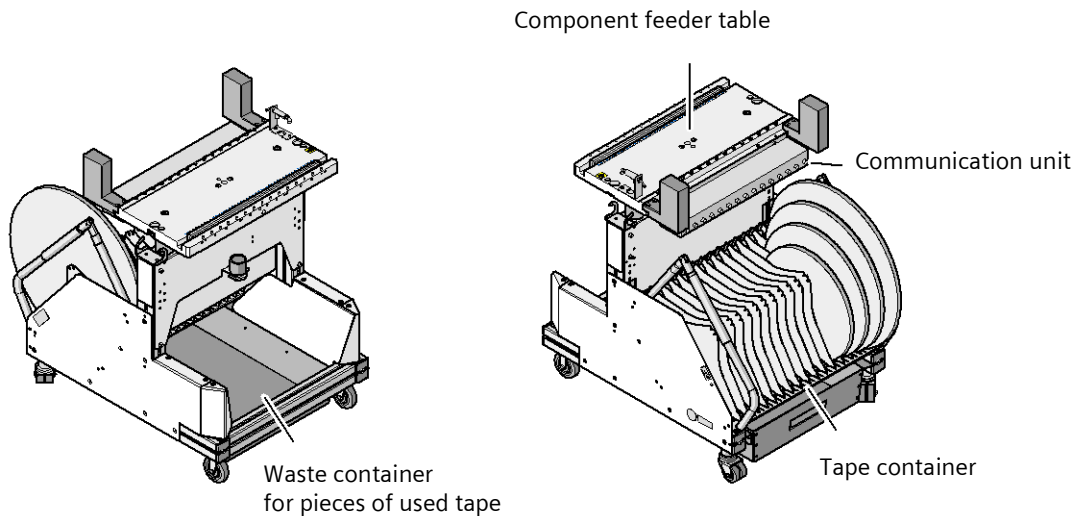


# Component Feeding

## Component Changeover Table

### Technical Data

Length	715 mm
Length with handles folded up	881 mm
Width	570 mm
Height of bottom edge of table bed	680 mm for 830 mm PCB transport height 750 mm for 900 mm PCB transport height 780 mm for 930 mm PCB transport height 800 mm for 950 mm PCB transport height
PCB transport height	830 mm $\pm$ 15 mm (standard) 900 mm $\pm$ 15 mm (option) 930 mm $\pm$ 15 mm (option) 950 mm $\pm$ 15 mm (SMEMA option)
Weight	
without feeder modules	77.5 kg
with feeder module at all locations	132.0 kg
Reel diameter	
standard	up to 432 mm (17")
maximum	483 mm (19")
Locations for feeder modules	max. 15
Changeover time	less than 1 min.





# Component Feeding

## S Tape Feeder Modules

### Technical data

Packaging	Model	Locations	Transport distance	Max. CO height
Paper and blister tapes	2 x 8 mm S <sup>a</sup>	1	2/4 mm	2.5 mm
	3 x 8 mm S	1	2/4/8 mm	2.5 mm
	3 x 8 mm S <sup>b</sup>	1	2/4 mm	0.7 mm
	1 x 12/16 mm S	1	4/24 mm <sup>c</sup>	14 mm
Blister tapes	1 x 24/32 mm S	1.5	4/40 mm <sup>c</sup>	14 mm
	1 x 24/32 mm S DP <sup>d</sup>	1.5	4/40 mm <sup>c</sup>	24 mm
	1 x 44 mm S	2	4/52 mm <sup>c</sup>	14 mm
	1 x 44 mm S DP <sup>d</sup>	2	4/52 mm <sup>c</sup>	24 mm
	1 x 56 mm S	2.5	4/68 mm <sup>c</sup>	14 mm
	1 x 56 mm S DP <sup>d</sup>	2.5	4/68 mm <sup>c</sup>	24 mm
	1 x 72 mm S	3	4/80 mm <sup>c</sup>	14 mm
	1 x 88 mm S	3.5	4/96 mm <sup>c</sup>	14 mm
Tape reels	178 - 483 mm diameter (7" - 19")			
Feeder module cycle	S feeder modules up to 20 mm transport distance < 150 ms			

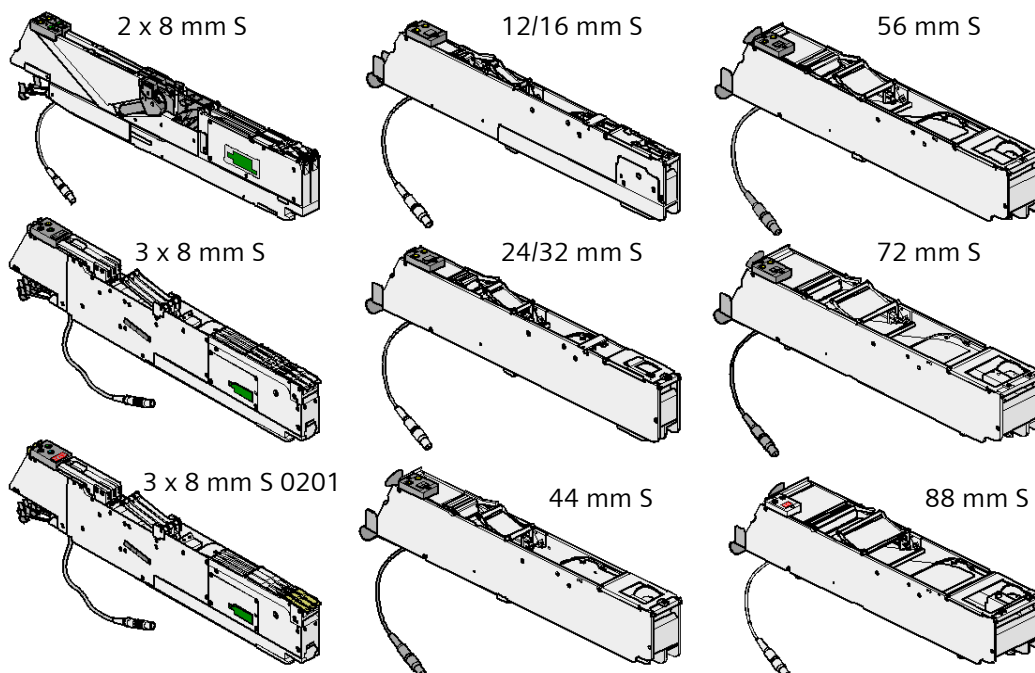
- a) Fiducial for feeder module position recognition
- b) For 0201 and 0402 only;
- c) Variable in 4 mm increments;
- d) DP = Deep pocket.

### Description

The SIPLACE S feeder modules process component tapes from 8 to 88 mm wide. The feeder module reels are kept in the tape container on the component changeover table.

A cutting device automatically cuts the used tape. SIPLACE S feeders have short cycle times and high-precision pick-up positions. Even multiple products and small batch sizes are easy to handle since the feeder modules can be quickly changed over. Both the tape cycle increment and the use of tape materials are variable. SIPLACE S feeder modules are suitable for both paper and plastic tapes. This represents a significant benefit in terms of both cost and logistics. When activated by a signal from the communication interface, the feeder modules automatically control the entire feeder sequence, including automatic film tear-off.

S feeder modules with the additional designation DP (Deep Pocket) transport component tapes up to 25 mm in height.



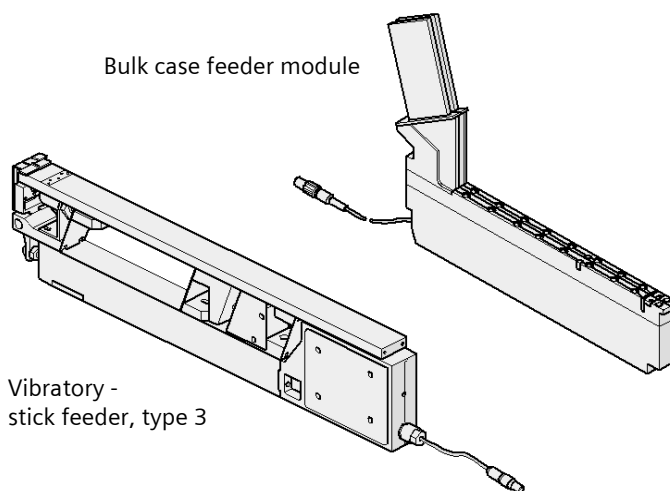
# Component Feeding

## Bulk Case and Vibratory Stick Feeder Modules for the Component Changeover Table

### Technical data

Bulk case feeder modules <sup>a</sup>	
Packaging form	Bulk case
Feeder rails	Chip 0402, CO height: 0.35 mm Chip 0402, CO height: 0.50 mm Chip 0603, CO height: 0.45 mm Chip 0603, CO height: 0.80 mm Chip 0805, CO height: 0.45 mm Chip 0805, CO height: 0.60 mm Chip 0805, CO height: 0.85 mm Chip 0805, CO height: 1.25 mm Micro-Melf: $1.05 \pm 0.05$ mm Mini-Melf: $1.4 \pm 0.1$ mm
Location	1 location for 2 different component types
Vibratory stick feeder, type 3	with control circuit
Number of tracks and width	3 x 9.5 mm 2 x 15 mm 1 x > 15 mm 1 x 30 mm
Location	1 location

a) Fiducial for feeder module position recognition



### Description

The SIPLACE bulk case feeder module processes bulk cases on two tracks. It feeds rectangular and round, passive components. The PCB magazines (bulk cases) are simply replaced for refilling - without stopping the machine.

The module essentially consists of the basic element plus two feeder rails and PCB magazines to suit the component type and height. The components are separated and fed along the rails by compressed air.

The principle of the stationary component table has proven its worth, even when bulk cases are used: the vibrations that can occur with other placement machine concepts can have a highly detrimental effect on the component quality due to abrasion, for example.

Even with stick magazines, the stationary component supply has significant advantages: the universal vibratory stick feeder can be topped up during placement.

# Component Feeding

## Dummy Feeder Modules

The following dummy feeder module variants are available for component changeover tables:

SIPLACE dummy feeder module for 1 location

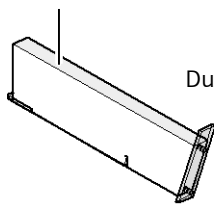
SIPLACE dummy feeder module for 6 to 10 locations

SIPLACE dummy feeder module for 11 to 20 locations

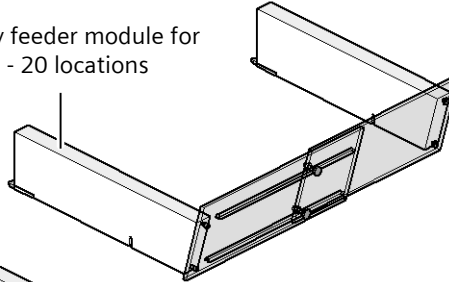
### Danger

To ensure that your SIPLACE placement machine runs safely, a feeder must be assigned to every location on the component changeover table. If you do not have enough feeder modules, then you should use dummy feeder modules as space holders.

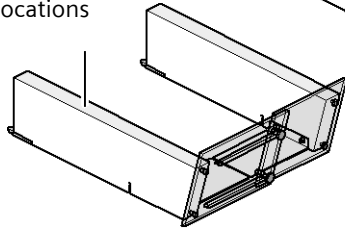
Dummy feeder module for 1 location



Dummy feeder module for 11 - 20 locations



Dummy feeder module for 6 - 10 locations



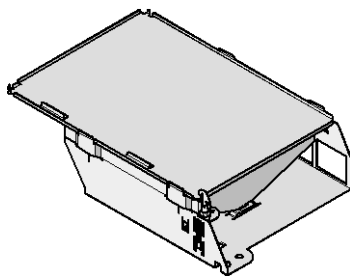
# Component Feeding

## Waffle-Pack Tray Holder

### Description

The waffle-pack tray holder is a device for holding JEDEC trays used to supply components. The holder is placed on the component table like a feeder module and the waffle-pack trays are changed manually.

The tray holder set-up is recommended if there are just a few component types to be placed from a waffle-pack tray.



Waffle-pack tray holder

### Technical data

#### Waffle-pack tray holder for large waffle-pack trays

Dimensions (LxWxH)	425 x 264 x 113 mm <sup>3</sup>
Locations filled on the component table	9
Possible positions	Location 1
Range of placement heads	P&P, C&P6, C&P12

#### Waffle-pack tray holder for small waffle-pack trays

Dimensions (LxWxH)	425 x 140 x 113 mm <sup>3</sup>
Locations filled on the component table	5
Possible positions	Location 1
Range of placement heads	P&P, C&P6, C&P12

# Component Feeding

## Wafflepack Changer

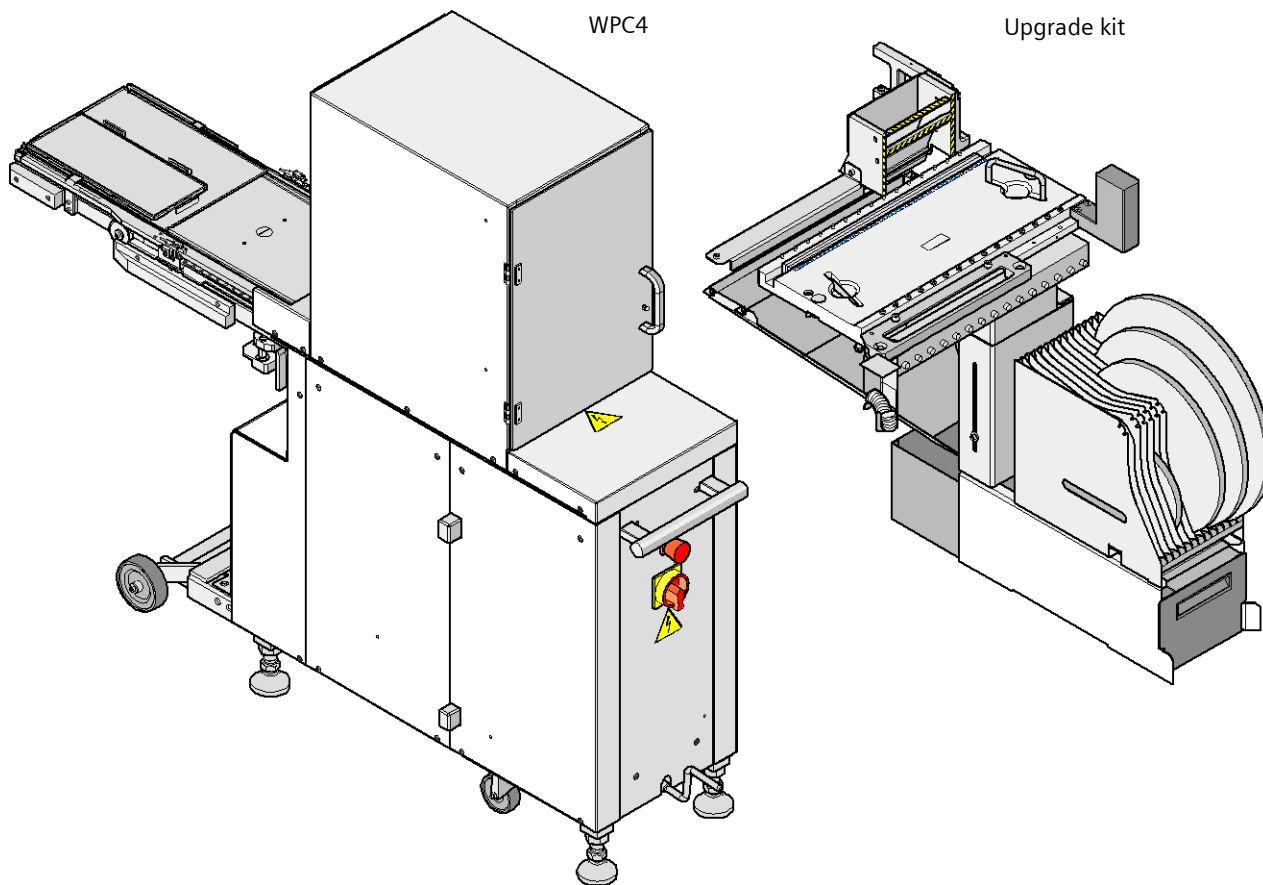
### Description

For numerous tray fed components we recommend an automatic tray change using a waffle-pack changer (WPC). The WPC set-up is precisely matched to the placement sequence in order to optimize the timings and distances traveled. One bin with component trays moves in the vertical direction until the desired magazine is within the range of the feed axis.

The horizontal feed axis transports the tray from the tray supply to within the range of the placement head. The first magazine is made available as soon as a PCB moves onto the PCB conveyor, and valid panel and set-up data is available. All other magazine changes are carried out time-neutrally during the placement process. The magazines can be refilled without stopping the

machine. Defective components are returned to the original tray.

The wafflepack changer can be docked into location 1 on the D1 machine. It does not take up the entire width of the location. The component table integrated into the upgrade kit has a capacity of 5 locations for feeder modules.



# Component Feeding

## Wafflepack Changer

### Technical Data

#### Dimensions, weight

Dimensions (L x W)	1560 x 360 mm <sup>2</sup>
Height	
830 mm ± 15 mm PCB transport height	1360 mm ± 15 mm
900 mm ± 15 mm PCB transport height	1430 mm ± 15 mm
930 mm ± 15 mm PCB transport height	1460 mm ± 15 mm
950 mm ± 15 mm PCB transport height	1480 mm ± 15 mm
Weight	approx. 240 kg
Load per unit area	4.19 kN/m <sup>2</sup>
Dimensions of the waffle-pack tray carrier (L x W x H)	360 x 260 x 6 mm <sup>3</sup>
Weight of the waffle-pack tray carrier	0.8 kg
Waffle-pack tray dimensions including components	341 x 235 x 15 mm <sup>3</sup> max. 341 x 235 x 23 mm <sup>3</sup>
Weight of the waffle-pack tray carrier including waffle-pack trays and components	max. 1.2 kg
Storage capacity	max. 28 WTC
Total weight of the 28 waffle-pack tray carriers	27.6 kg
Weight for magazine storage unit, waffle-pack tray carriers, waffle-pack trays and components	max. 50 kg
Changeover time for waffle-pack tray carrier	
over 1 level	1.9 s
over 10 levels	2.3 s
over 27 levels	2.9 s

#### Electrical ratings

Supply voltage	3 x 208 VAC ± 5 %, 50/60 Hz (U.S.A. version) 3 x 230 VAC ± 5 %;50/60 Hz 3 x 380 VAC ± 5 %;50/60 Hz 3 x 400 VAC ± 5 %, 50/60 Hz (European version) 3 x 415 VAC ± 5 %;50/60 Hz
Nominal apparent power	800 VA
Rated current	0.7 A at 3 x 400 VAC
Fuses	3 x 10 or 3 x 16 A

#### Noise emissions

Maximum noise emissions	74 dB (A)
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#### Permitted environmental factors

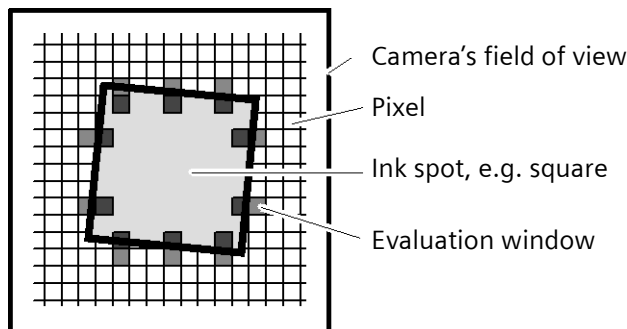
Room temperature	between 15 °C and 35 °C
Atmospheric humidity	30 - 90 % (No higher than 45% on average to prevent any possibility of condensation on the machine)

# Vision Sensor Technology

## PCB Position Recognition

### Technical data

PCB fiducials	up to 3 (subpanels and multiple panels) up to 6 for the Long board option (Optional PCB fiducials are output by the optimization.)
Local fiducials	up to 2 per PCB (may be of different type)
Library memory f. recognition of bad panels	up to 255 fiducial types per subpanel
Image analysis	Edge detection method (Singular feature) based on grayscale values
Lighting method	Front lighting
Fiducial recognition time	0.1 s
Field of vision	5.78 x 5.78 mm <sup>2</sup>



Edge detection method

### Description

SIPLACE has a number of vision modules and a central vision system to evaluate the recorded image data ensuring high placement accuracy. At the machine's X-gantry the PCB vision module is mounted. It is used to find the PCB's positioning-offsets within the conveyor system.

This vision module is also required to measure the machine origin and/or the feeder module positions on one side of the table. Each vision module consists of a

single CCD camera with integrated lighting and optics.

The offsets in the position of the PCBs are determined with the help of at least two but generally three reference fiducials on the PCB. When the PCB arrives at the placement area the positioning system with its PCB vision module moves to the programmed fiducial.

The edge detection method allows to choose predefined fiducials from a menu (e.g. cross, circle, square).

The size of the fiducial is programmed at the station computer. From this time on form and size of the fiducial is defined and known. With these data the PCB vision module is able to search and recognize the fiducial at the predefined position on the PCB or ceramic substrate without further assistance. For this reason it places several small evaluation windows at the assumed border of the fiducial. Within these evaluation windows the vision system looks for contrast transitions between bright and dark. After finding such contrasts the actual position of the fiducial can be assigned by comparison with the predefined – and thus known – shape and size.

The analysis operations can be used to determine any offset with respect to the DESIRED position in the X and Y directions and the angular position.

Alternatively, a fiducial may be taught as a pattern.

Additional functions of the PCB vision module are recognition of the position of the feeder modules and ceramic substrate (optional) and recording of the machine data including mapping.

The bad board detector (GOOD/SCRAP scan) is also moved over the ink spot using the PCB vision module.

# Vision Sensor Technology

## PCB Position Recognition

### Fiducial criteria

Locate 2 fiducials	X-/Y-position, rotation angle, mean PCB distortion	
Locate 3 fiducials	in addition: shear, distortion in X- and Y-direction separately	
Fiducial shapes	Synthetic fiducials: circle, cross, square, rectangle, rhombus, circular, square, and rectangular contours, double cross, any pattern	
Fiducial surface:		
copper	without oxidation and solder resist	
tin	Warp $\leq 1/10$ of structure width, both with good contrast to environment	
Dimensions of synthetic fiducials		
min. X/Y size for circle and rectangle:	0.25 mm	
min. X/Y size for annulus and rectangle:	0.3 mm	
min. X/Y size for cross:	0.3 mm	
min. X/Y size for double-cross:	0.5 mm	
min. X/Y size for lozenge:	0.35 mm	
min. frame width for annulus and rectangle:	0.1 mm	
min. bar width / bar distance for cross, double-cross:	0.1 mm	
max. X/Y size for fiducial shapes:	3 mm	
max. bar width for cross / double-cross:	1.5 mm	
min. tolerances, general:	2% of nominal dimension	
max. tolerances, general:	20% of nominal dimension	
Dimensions of patterns		
min. size	0.5 mm	
max. size	3 mm	
Fiducial environment	Clearance around reference fiducial not necessary if there is no similar fiducial structure in the search area	

### Description

Different fiducial shapes prove to be optimal depending on the condition of the surface.

Particularly advisable for bare copper surfaces with little oxidation is the single cross.

Maximum accuracy is achieved due to the high information content. Rectangle, square and circle are less "informative" but save space and can even be used when oxidation is at an advanced stage.

Advisable for tinned structures are circle or square because in this case the ratio of the fiducial dimensions to the presolder thickness is particularly favorable.



# Vision Sensor Technology

## Bad Board Recognition

### Position Recognition for Feeder Modules

#### Ink spot criteria

Methods	<ul style="list-style-type: none"> <li>• Synthetic fiducial recognition method</li> <li>• Mean grayscale value</li> <li>• Histogram method</li> <li>• Template matching</li> </ul>
Shapes and sizes of fiducials/structures for	
synthetic fiducials	For dimensions of synthetic fiducials, see page 32
other methods	min. 0.3 mm max. 5 mm
Masking material	good coverage
Recognition time	depends on the method: 20 ms - 0.2s

#### Description

In the cluster technology each subpanel is assigned an ink spot. If this is present during the measurement via the PCB vision module, the corresponding subpanel is populated.

It is also possible to accomplish the population of the subpanel when the ink spot is missing. With this function it is possible to eliminate costs due to unnecessary population of faulty subpanels.

#### Global Ink Spot

Each GOOD/SCRAP scan takes some time, and the time required is even greater if there are a large number of subpanels on a PCB. Using the global ink spot can result in a significant reduction of these secondary times.

The PCB vision module searches at positions taught before for the defined fiducial. In case of recognition there is no following evaluation of subpanels. The system allows the operator to choose also the reverse interpretation.

#### Recognition of the position of the feeder modules

The pick-up position of the components can be determined precisely with the aid of the position recognition for the feeder. The offset in position relative to the stored ideal position is determined on the basis of fiducials on the feeder modules using the PCB vision module. With 0201 components, the position deviation is determined by the component pocket detection. This provides very high pick-up reliability even for the very first component.

# Technical Data

## Siemens Signal Interface Connector Assignment

### Signal interface (20-pole ribbon cable connector)

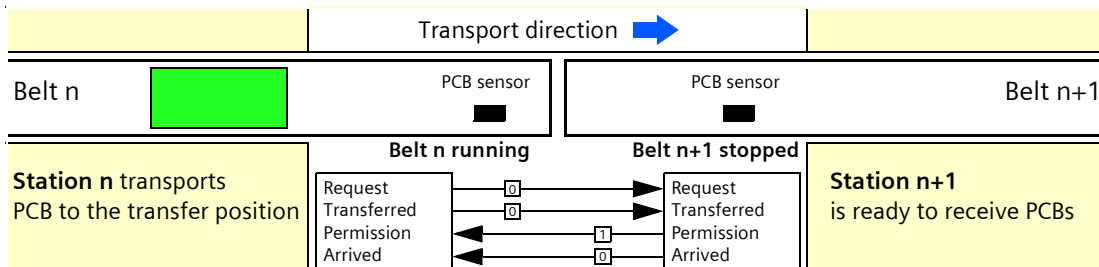
Upstream station X1		Downstream station X2	
Pin 1	Reserved	Pin 1	Reserved
Pin 2	GND 24 VDC	Pin 2	Reserved
Pin 3	+ 24 VDC	Pin 3	Reserved
Pin 4	Reserved	Pin 4	Reserved
Pin 5	Reserved	Pin 5	GND 24 VDC
Pin 6	Reserved	Pin 6	+ 24 VDC
Pin 7	Reserved	Pin 7	Reserved
Pin 8	Reserved	Pin 8	Reserved
Pin 9	Reserved	Pin 9	Reserved
Pin 10	Reserved	Pin 10	Reserved
Pin 11	Interfering signal loop	Pin 11	Interfering signal loop
Pin 12	Interfering signal loop	Pin 12	Interfering signal loop
Pin 13	GND 24 VDC	Pin 13	GND 24 VDC for permission / arrived (galvanic isolation)
Pin 14	Arrived	Pin 14	Arrived
Pin 15	Permission	Pin 15	Permission
Pin 16	Reserved	Pin 16	Reserved
Pin 17	Reserved	Pin 17	Reserved
Pin 18	Transferred	Pin 18	Transferred
Pin 19	Request	Pin 19	Request
Pin 20	GND 24 VDC for request / transferred (galvanic isolation)	Pin 20	GND 24 VDC

# Technical Data

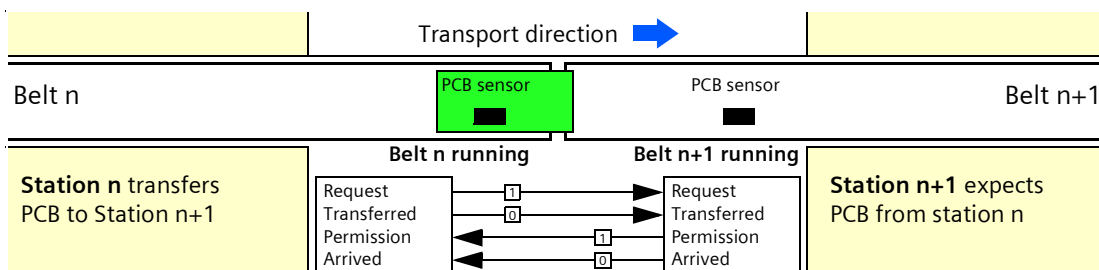
## Siemens Signal Interface

### Signal Curve

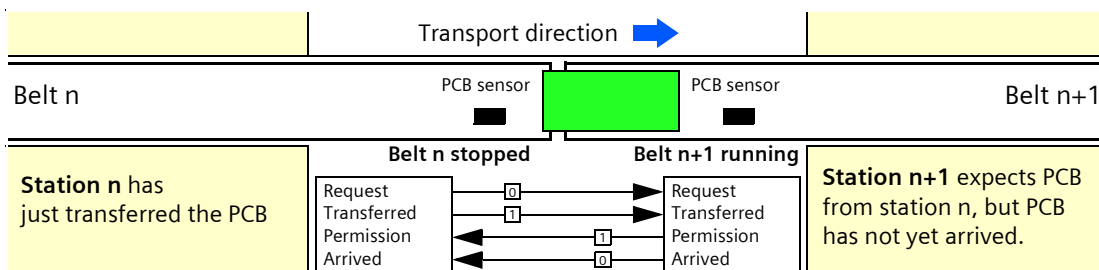
#### 1. After switching on the station



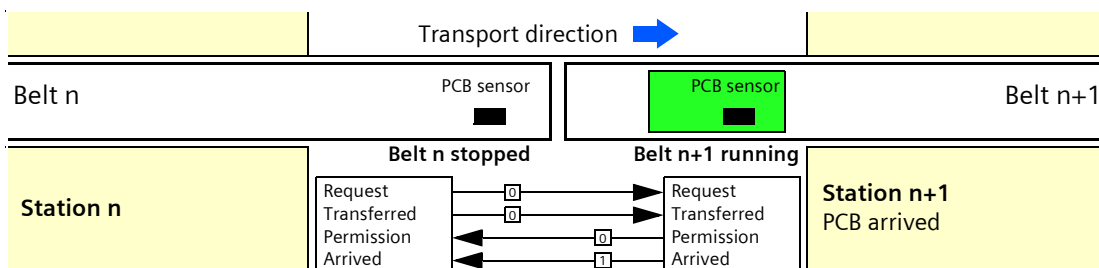
#### 2. The PCB transfer has started



#### 3. PCB is transferred



#### 4. PCB transfer is complete



# Technical Data

## SMEMA Interface

### Connector Assignment

#### Signal interface (14-pole connecting socket, interface standard 1.2)

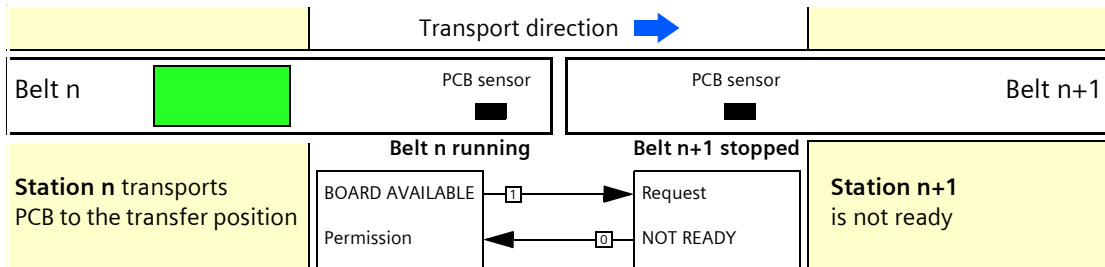
Upstream station X1		Downstream station X2	
Pin 1	NOT READY +	Pin 1	NOT READY +
Pin 2	NOT READY –	Pin 2	NOT READY –
Pin 3	BOARD AVAILABLE +	Pin 3	BOARD AVAILABLE +
Pin 4	BOARD AVAILABLE –	Pin 4	BOARD AVAILABLE –
Pin 5	Not used	Pin 5	Not used
Pin 6	Not used	Pin 6	Not used
Pin 7	Not used	Pin 7	Not used
Pin 8	Reserved	Pin 8	Reserved
Pin 9	Reserved	Pin 9	Reserved
Pin 10	Reserved	Pin 10	Reserved
Pin 11	Reserved	Pin 11	Reserved
Pin 12	Reserved	Pin 12	Reserved
Pin 13	Reserved	Pin 13	Reserved
Pin 14	Reserved	Pin 14	Reserved

# Technical Data

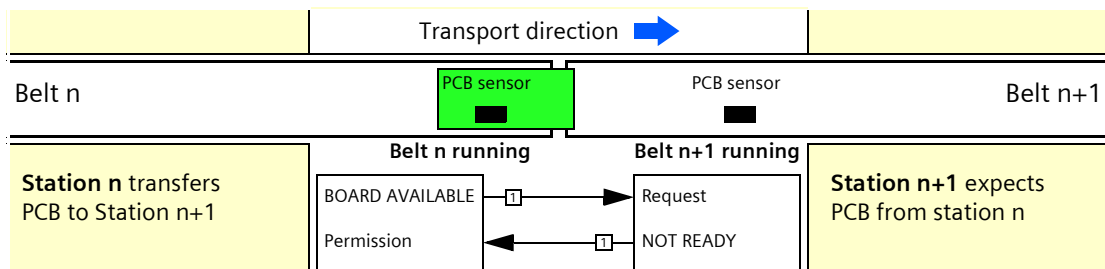
## SMEMA Interface

### Signal Curve

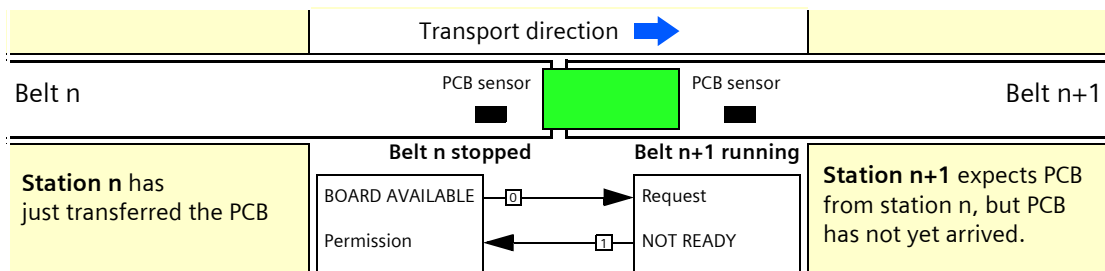
#### 1. After switching on the station



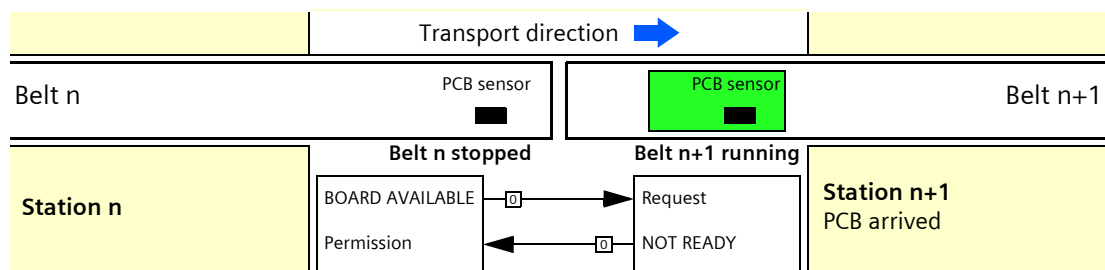
#### 2. The PCB transfer has started



#### 3. PCB is transferred



#### 4. PCB transfer is complete



To start a new PCB transfer, both signals must be "0" for at least 50 ms.

# Technical Data

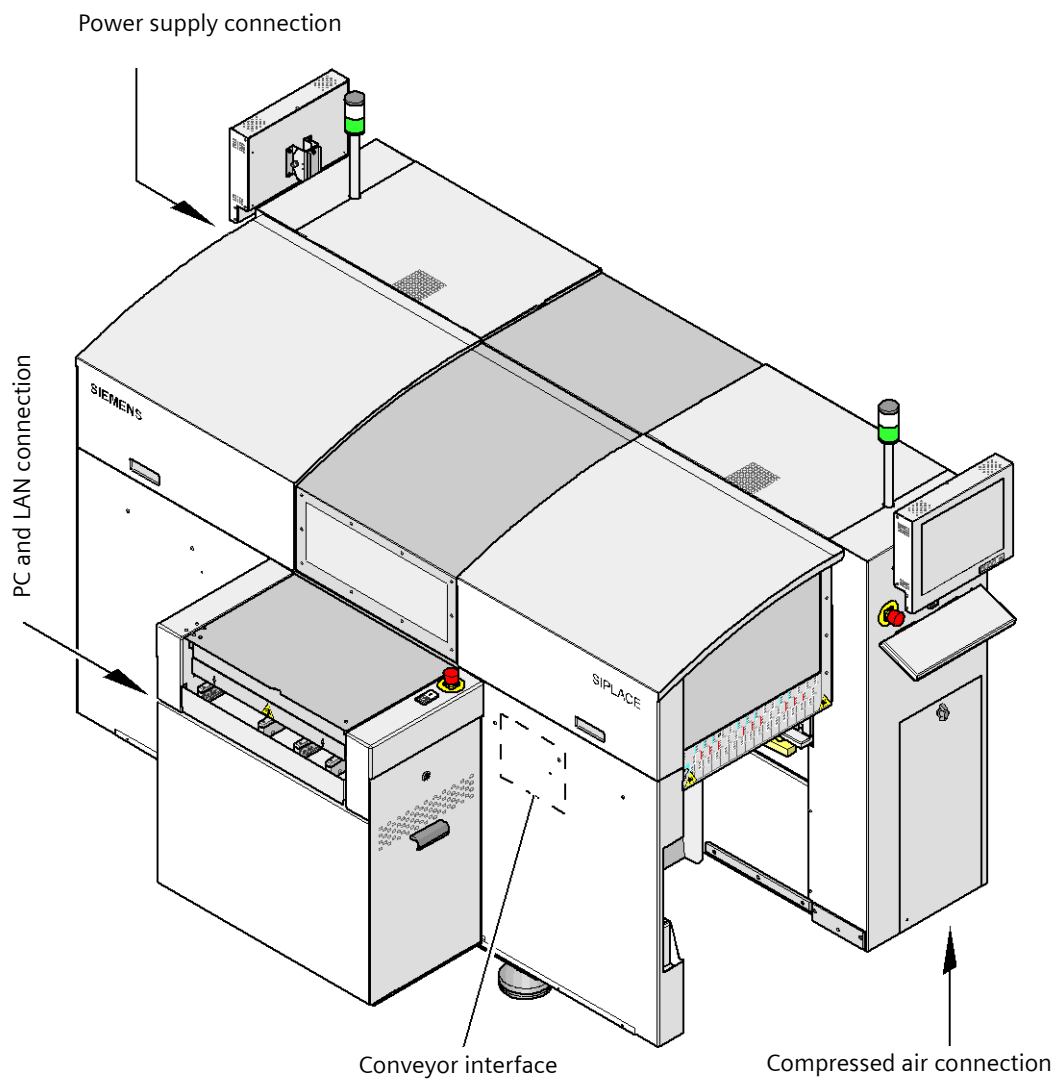
## Electrical Ratings and Compressed Air Supply

<b>Electrical ratings</b>	
Supply voltage	3 x 208 VAC $\pm$ 5 %, 50/60 Hz (U.S.A. version) 3 x 230 VAC $\pm$ 5 %;50/60 Hz 3 x 380 VAC $\pm$ 5 %;50/60 Hz 3 x 400 VAC $\pm$ 5 %, 50/60 Hz (European version) 3 x 415 VAC $\pm$ 5 %;50/60 Hz
Fuses	3 x 16 A (3 x 208 VAC / 3 x 230 VAC / 3 x 380 VAC / 3 x 400 VAC / 3 x 415 VAC)
Nominal apparent power	2 - 3 kVA
Rated current consumption	3 - 5 A / 3 x 400 VAC
Power failure	max. 20 msec
<b>Compressed air supply</b>	
Compressed air ratings	
P <sub>min</sub>	0.55 MPa = 5.5 bar
P <sub>max</sub>	1.0 MPa = 10 bar
Compressed air connection	3/4" thread with 1/2" hose connection
Compressed air consumption with 2 tape cutters and C&P/P&P heads	345 st. l/min 205 st. l/min with vacuum pump
Operating pressure	0.52 MPa $\pm$ 0.01 MPa (5.2 bar $\pm$ 0.1 bar)
<b>Compressed air specification</b>	
Particle size	0.1 $\mu$ m
Particle density	0.1 mg/m <sup>3</sup>
Maximum oil content (class 1)	Particle density 0.01 mg/m <sup>3</sup>
Pressure dewpoint (class 4)	Dewpoint + 3°C

# Technical Data

## Electrical Connection, Interfaces and Compressed Air Connection

Power connector  
5 x 4 mm<sup>2</sup> cable with CEKON plug 5 x 16 A  
(3 x 208 VAC / 3 x 230 VAC / 3 x 380 VAC / 3 x 400 VAC / 3 x 415 VAC)



# Technical Data

## Dimensions and Set-up Conditions

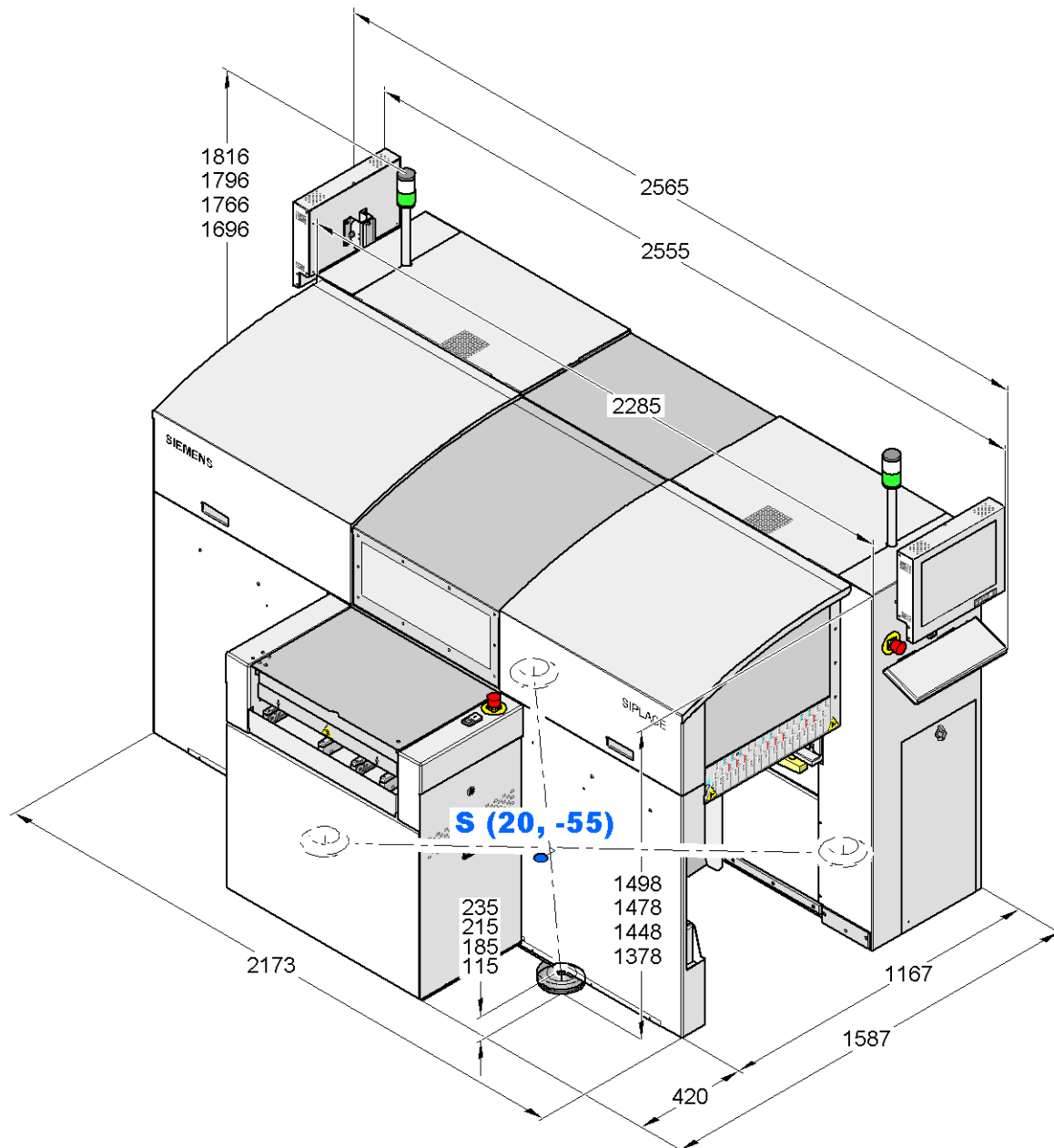
Length of the basic machine without extension kit	1587 mm 1167 mm
Width of the basic machine with component changeover table including monitors with keyboards	2285 mm 2636 mm 2555 mm 2565 mm
Height of the machine with warning lamp with protective covers folded up	max. 1816 mm 1881 mm (PCB conveyor height 830 mm) 1911 mm (PCB conveyor height 900 mm) 1981 mm (PCB conveyor height 930 mm) 2001 mm (PCB conveyor height 950 mm)
Machine ground clearance	115 mm (PCB conveyor height 830 mm) 185 mm (PCB conveyor height 900 mm) 215 mm (PCB conveyor height 930 mm) 235 mm (PCB conveyor height 950 mm)
Weight Basic machine with 2 CO changeover tables Full configuration with feeder modules	2325 kg 2516 kg
Footprint	4.18 m <sup>2</sup>
Load per unit area <sup>a</sup>	5.41 kN/m <sup>2</sup>
Number of machine feet	4
Maximum noise emissions	74 dB (A)
Room temperature	between 15 °C and 35 °C
Atmospheric humidity	30 to 75 % (no higher than 45% on average to prevent any possibility of condensation on the machine)

a) The load per unit area calculation included an additional working space of 0.5 m on each side of the machine. Further data available on request.



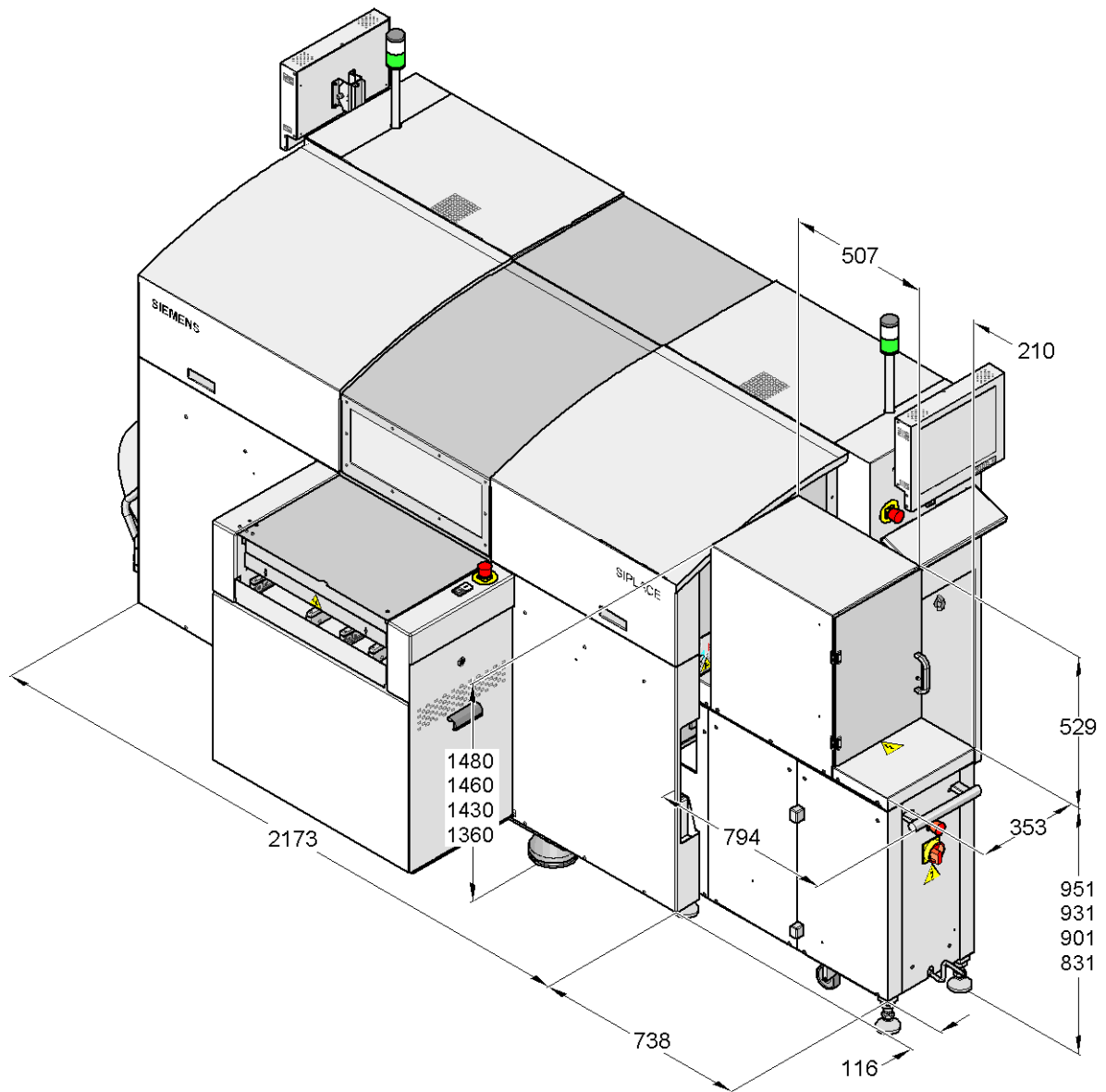
# Technical Data

## Dimensions and Set-up Conditions Machine's Center of Gravity



# Technical Data

## WPC4 Dimensions and Set-Up Conditions



# Technical Data

## Transport and Delivery Configuration

### Transport dimensions and weight

	Crate for the machine	Crate for the CO changeover tables
Length	2570 mm	1700 mm
Width	1860 mm	1200 mm
Height	1600 mm	1300 mm
Weight	Dispatch within Europe	Dispatch overseas
Placement machine	2240 kg	2604 kg
CO table	370 kg	450 kg

### Means of transport

A fork-lift truck with the following specification will be needed to carry the machine in its crate:

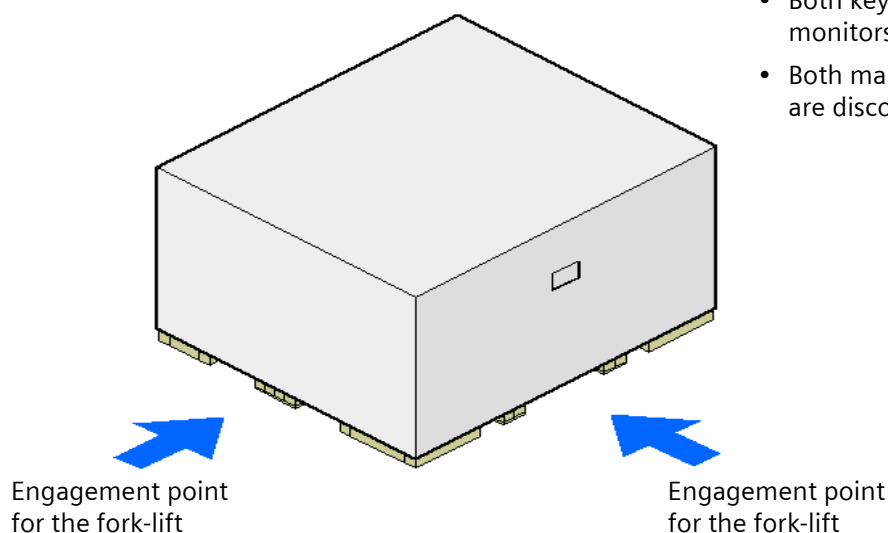
Fork length	min. 2500 mm
Lifting power	min. 3000 kg
Clear fork width	min. 350 mm

### Description

The machine and the component changeover tables will be supplied on two pallets on mainland Europe. They will be dispatched overseas in two robust wooden crates.

### Configuration when delivered

- Both keyboards and the monitors are disconnected.
- Both main fault indicators are disconnected.



# Sample Configuration

## Services

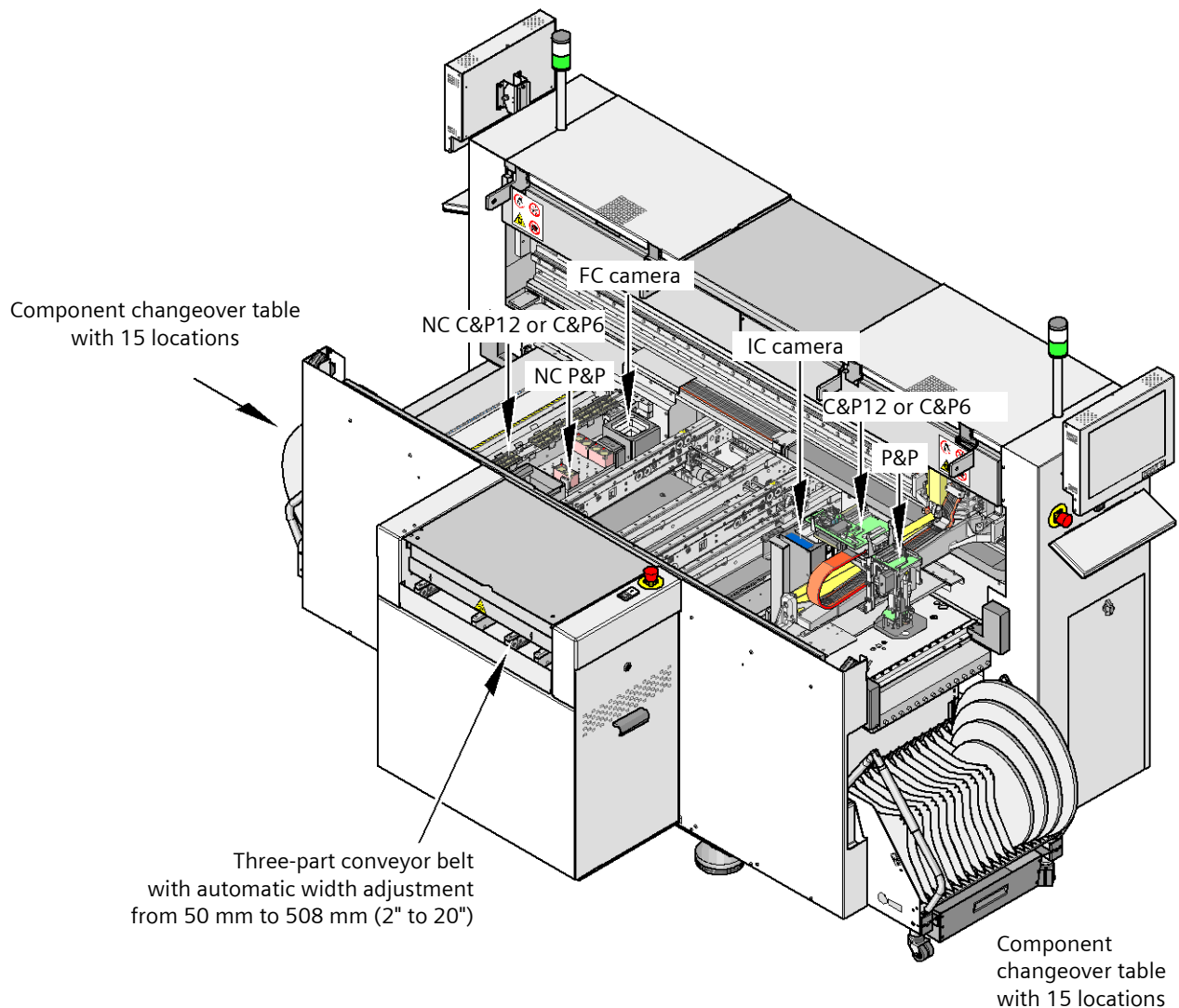
As a service, SIEMENS A&D EA can fully integrate the SIPLACE D1 placement machine into your production line. With our extensive expertise and by using the right tools and equipment, we can ensure that the instal-

lation process runs smoothly and efficiently.

However, this will require you to clarify the infrastructure aspects in advance and make any necessary changes at your production facility.

## Safety instructions

Read the operating instructions before starting to set up and commission the placement machine. The applicable accident prevention regulations concerning the transportation of heavy goods must be followed.



NC C&P12	Nozzle changer for the 12-nozzle Collect&Place head
NC C&P6	Nozzle changer for the 6-nozzle Collect&Place head
NC P&P	Nozzle changer for the Pick & Place head

# SIPLACE D1 Option List

Available options	Notes	
Transport height (900, 930, 950)	X	
Single conveyor, stationary side right	X	
Single conveyor, stationary side left	X	
Flexible dual conveyor, stationary side right	X	
Flexible dual conveyor, stationary side left	X	
Siemens/SMEMA interface	X	
PCB alignment, single conveyor	X	
PCB alignment, dual conveyor	X	
Long board option	X	
Wide board configuration	X	
PCB barcode scanner, 1D	X	
PCB barcode scanner, 2D	X	
PCB barcode scanner, assembly kit	X	
Magnetic pin support	X	
12-nozzle Collect & Place head	X	
High-resolution component camera, type 29 (for C&P12)	X	
Component sensor, C&P12	X	
0201 package	X	
6-nozzle Collect & Place head	X	
Pick&Place head	X	
Stationary P&P component camera, type 25, 16 x 16, digital	X	for the Pick&Place head only
Coplanarity module	X	for the Pick&Place head only
Nozzle changer (according to the head)	X	
SIPLACE component changeover table	X	
Dip module	X	
External power supply for the component changeover table	X	
Compressed air distributor, bulk case feeder modules	X	
Tape reel holder, 3 x 8 mm feeder module, V2	X	
Tape reel holder adapter plate	X	
Feeder module cover flap <sup>a</sup>	X	
Feeder module fixing	X	
Waffle-pack tray holder	X	
Setup Center	X	
Splice detection, table controller	X	
110/208 V conversion kit	X	
Vacuum pump	X	Not possible on the Pick&Place head
Vacuum pump connection kit	X	
SIPLACE Wafflepack Changer (WPC4)	X	At location 1 only
Productivity lift	X	max. PCB width: Single track 460 mm Double track 216 mm max. CO height: 17 mm on the underfloor section

a) Optional from April 2007





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