

# PIN INSERTION MACHINES

A WIDE RANGE OF PRODUCTION EQUIPMENT  
FOR COMPLIANT PIN TECHNOLOGY

# LINE OF PIN INSERTION MACHINES

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## Quality Management

- Fitting into Industry 4.0 trend of automation
- Customized for individual Manufacturing Execution Systems (MES) solutions
- Tool management to support optimum quality management
- Quality monitoring functions, like
  - Pin penetration sensing
  - Pin presence detection
  - Electrical continuity sensing
  - Force vs. distance monitoring
  - Vision system for accuracy
- Quality control data stored in the system for future traceability
- No loss in time, since going parallel to pin insertion

## Flexibility for Production

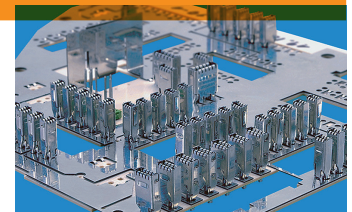
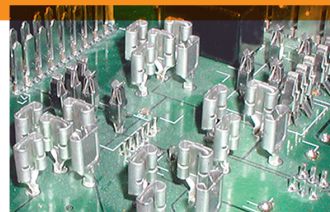
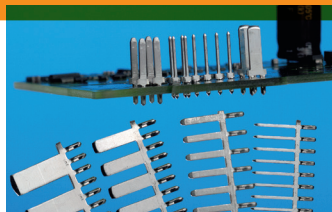
- Modular machine concept
- Modular tool concept
- Extremely wide range of conversion kits available
- Application of up to 6 different contacts on one machine
- Easy and quick change product tool pack

## TE Connectivity (TE) insertion machines

- Flexible configuration of machines
- Full range of machine portfolio from manual repair and low volume systems up to highly configurable systems with all grades of automation and max performance of up to 15 pins per second
- Accessories enhancing flexibility and productivity
- Highest performance and quality
- World wide field service available to maximize uptime

## Applied Cost Savings

- Rotary insertion finger applies products at different angles without decreasing insertion rate
- Product specific tooling
- Easy change from one product to another



# LINE OF PIN INSERTION MACHINES

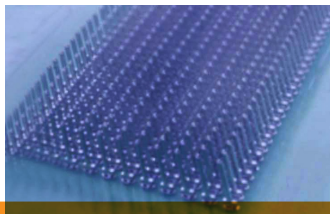
## P10 Single Pin Insertion Station

### Machine

- For repair of very low volumes
- Manual press with ratchet mechanism
- Adapter for product specific insertion fingers (also used on TE Connectivity P300 insertion machines)
- Force versus distance monitoring on touch screen monitor
- Application of a single pin, manually loaded into the insertion finger
- PCB positioned on support tool
- Separate tool available to cut contacts from carrier strip

### Product Features

- Convenient and easy operation due to a touch screen monitor
- Single pins can be interchanged on a complete equipped PCB
- High insertion quality due to press cycle monitoring with PQM



### Products which can be processed

- ACTION PIN contacts
- AMPMODU contacts
- Cross contacts
- EON board to board
- EON board to housing
- FEC pins
- GDS contacts
- Junior Timer
- Junior Power Timer
- MQS pins
- PCB contacts
- PCB coupler
- Solder tabs
- Spring contacts
- Tabs
- Please contact your local TE Connectivity representative for your special requirement

# LINE OF PIN INSERTION MACHINES

## P100 Pin Insertion Machine

### Machine

- Stand alone
- Manual PCB/panel loading
- For mid-volume level production up to 5 million contacts per shift and year
- Up to 2 insertion heads

### Standard Features

- Servo driven base insertion head
- Conversion kits compatible with P300/P360/P550
- Freely programmable insertion angle
- Easy changeover of the conversion kits within < 10 min
- Adjustable PCB support to provide production flexibility
- Lower support tool equipped with pin presence check
- Clinching in lower tooling possible
- Easy-to-use touch screen allowing simple programming and automatic setup

### Quality Management

- In line with Industry 4.0 standards
- Customized for individual Manufacturing Execution Systems (MES) solutions
- Force monitoring
- Force vs. distance monitoring
- Pin presence detection
- Vision system for accuracy
- Tool management
- Machine capability study



### Products

#### Tools for wide range of TE and non-TE contacts available for:

- Press-fit contacts
- Solder contacts
- Pins and tabs
- Sockets
- Spring contacts
- Continuous wire
- F-post

#### Options for P100

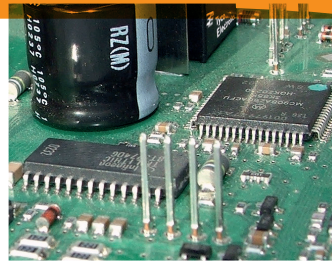
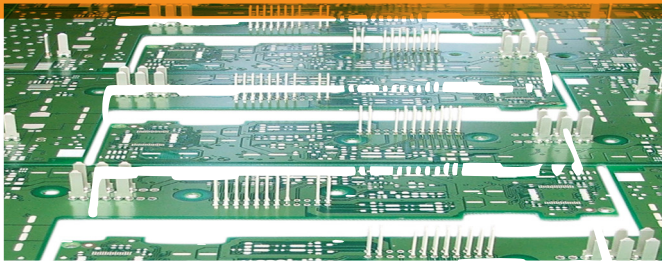
- 1.5 insertion cycles per second at 5.08 mm pitch
- Fixed base tool
- Max number of base tools: 2
- Reel unwinder
- XY table
- Manual loading of PCB
- Light curtain
- Pneumatic anvil
- Vision system
- Insertion force monitoring
- Force vs. distance monitoring
- Tool setup check
- PCB scan
- Data collect
- MES connector
- Production data

### Machine Performance of P100

- Insertion force max 900 N
- PCB size max 420 x 360 mm (16.5 x 14 in)
- PCB size min 30 x 30 mm (1.2 x 1.2 in)
- Insertion area 300 x 310 mm (11.8 x 12 in)
- Camera inspection area without tool changer  
400 x 310 mm (15.8 x 12.2 in)
- PCB thickness : 1 - 4 mm (.04 - .157 in)
- Max height of components/top side: 30 mm (1.2 in)
- Max height of components/bottom side:  
25 mm (.985 in)
- Insertion speed of pin : max 150 mm/sec (5.9 in/sec)
- Reel/outer diameter : < 800 mm (31.5 in)

### General Machine Data of P100

- Supply voltage: 230 V
- System frequency: 50/60 Hz
- Phases: 1
- Power consumption during production: 1.8 kW
- Power consumption during standby: 600 W
- Air pressure: 500 - 800 kPa
- Air consumption : 100 l/min
- Operating temperature: 10 - 35 °C
- Storage temperature: 10 - 50 °C
- Humidity: 10 - 60 % (non-condensing)
- Footprint (W x D x H):  
143 x 110 x 170 cm (56.3 x 43.3 x 67 in)
- Sound pressure level (machines with light curtain):  
< 80 dB(A)
- Painted surfaces RAL 7035



# LINE OF PIN INSERTION MACHINES

## P300 Pin Insertion Machine

### Machine

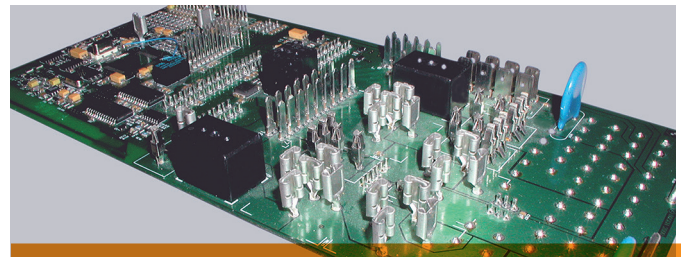
- Automatic pin insertion machine for the application of reeled pins, tabs, receptacle and similar products into PCBs
- Flexible and fully automatic insertion machine
- Available either as stand alone unit or integrated into a production line
- For mid and high volume level production (up to 15 million insertions per shift and year)
- Up to 4 insertion heads
- (up to 6 different contacts with Twin Feed)
- Double and Triple pin insertion

### Standard Features

- Servo driven base insertion head
- Conversion kits compatible with P100/P360/P550
- Freely programmable insertion angle (rotation having no influence on insertion rate)
- Easy changeover of the conversion kits within < 10 minutes
- Adjustable PCB support to provide production flexibility
- Lower support tool equipped pin presence check
- Clinching in lower tooling possible
- Easy-to-use touch screen allowing simple programming

### Quality Management

- Fulfilling Industry 4.0 requirements
- Customized MES solutions
- Force monitoring and Force vs distance monitoring
- Pin presence detection
- Vision system for accuracy
- Tool management
- Machine capability study



### Options for P300

- 1.5 insertion cycles per second at 5.08 mm pitch
- Tool changer
- Fixed base tool
- Max number of base tools: 4
- Motor driven feed of pins
- Twin feed tool
- Triple pin mode
- PCB flip unit
- Simultaneous PCB transfer/In-line
- Manual loading
- Light curtain
- Servo anvil
- Servo Anvil with Rotation
- Anvil changer
- Vision system
- PCB thickness measurement
- Insertion force monitoring
- Force vs. distance monitoring

### Machine Performance of P300

- Insertion force max 900 N
- PCB size max: 420 mm x 360 mm (16.5 x 14 in)
- PCB size min: 80 mm x 80 mm (3.15 x 3.15 in)
- PCB size max for P300 with flip unit:  
340 mm x 220 mm (13.4 x 8.7 in)
- Insertion area (P300 without flip unit):  
410 mm x 340 mm (16.15 x 13.4 in)
- Camera inspection area without tool changer:  
330 mm x 340 mm (13 x 13.4 in)
- PCB thickness: 1 - 4 mm (.04 up to .157 in)
- Max height of components/top side: 30 mm (1.18 in)
- Max height of components/bottom side:  
25 mm (.985 in)
- Insertion cycles per second in a pitch  
of max 5.08 mm: 3
- Insertion speed of pin:  
0 - max 300 mm/sec (max 11.8 in/sec)
- Reel / outer diameter: < 800 mm (31.5 in)

### Machine Data of P300

- Supply voltage: 400 V
- System frequency 50/60 Hz
- 3 Phases
- Power consumption during production: 2.8 kW
- Power consumption during standby: 700 W
- Air pressure: 500 - 800 kPa
- Air consumption: 100 liters/min
- Operating temperature: 10 - 35 °C
- Storage temperature : 10 - 50 °C
- Humidity: 10 - 60 % (non-condensing)
- Sound pressure level (machines with light curtain ):  
< 75 dB (A)
- Sound pressure level (machines with light curtain):  
< 80 dB(A)
- Painted surfaces: RAL 7035

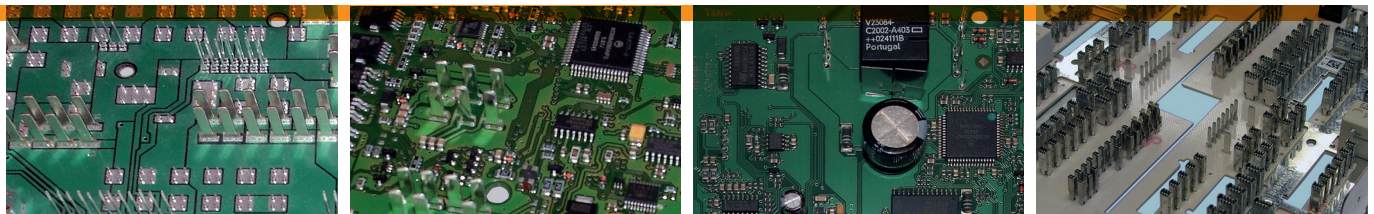
### Physical Dimensions of P300 insertion machine

- Width: 1.500 mm (60 in)
- Depth: 1.700 mm (67 in)
- Height: 2.200 mm (87 in)
- Weight: Approx.: 1.600 kg (3520 lb)

### Products processed by P300

- Press-fit contacts
- Solder contacts
- Pins and tabs
- Sockets
- Spring contacts
- Continuous wire
- F-post

**Tools designed for wide range of reeled components (TE and non-TE contacts.) Processing of loose piece components and continuous wire is also possible and available upon request.**



# LINE OF PIN INSERTION MACHINES

## P360 Pin Insertion Machine

### Machine

- Modular high speed insertion machine
- Available as stand alone unit or integrated into production line
- Fully automatic and flexible
- For high volume level production (up to 25 million insertions/shift and year)
- Ideal for broad variety of line configurations
- Single insertion head (up to 2 different contacts with twin feed)
- Double and triple pin insertion

### Standard Features

- Servo driven base insertion head
- Conversion kits compatible with P100/P300/P550
- Freely programmable insertion angle (Rotation has no influence on insertion range)
- Easy changeover of the conversion kits within < 10 minutes
- Adjustable PCB support to provide production flexibility
- Lower support tool equipped with pin presence check
- Clinching in lower tooling possible
- Easy-to-use touch screen allowing simple programming

### Options for P360

- 5 insertion cycles per second at a distance of 30mm from position to position (.2 in) pitch
- Fixed base tool
- Max number of base tools: 1
- Motor driven feed
- Twin feed tool
- Triple pin mode
- PCB transfer/in-line
- Servo anvil
- Servo anvil with rotation
- Vision system
- PCB thickness measurement
- Insertion force monitoring
- Force vs distance monitoring



## Line Configurations

### Stand alone



### Modular line





## Line Configurations

### Extension of 3 Head Machine

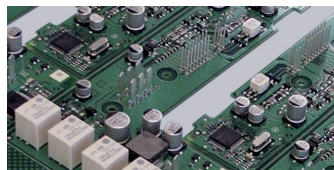


### Extension of 4 head Machine



### Quality Management

- Fulfilling Industry 4.0 requirements
- Customized MES solutions
- Force monitoring and Force vs distance monitoring
- Pin presence detection
- Vision system for accuracy
- Tool management
- Machine capability study



### Machine Performance of P360

- Insertion force max 900 N
- PCB size max: 420 x 360 mm (16.5 x 14.2 in)
- PCB size min: 80 x 80 mm (3.15 x 3.15 in)
- PCB size max with flip unit:  
200 x 200 mm (7.85 x 7.85 in)
- Insertion area (P300 without flip unit):  
410 x 340 mm (16.15 x 13.4 in)
- Camera inspection area with tool changer:  
410 x 340 mm (16.15 x 13.4 in)
- Camera inspection area without tool changer:  
330 mm x 340 mm (13 x 13.4 in)
- PCB thickness: 1 - 4 mm (.04 - .157 in)
- Max height of components/top side: 30 mm (1.2 in)
- Max height of components/bottom side:  
25 mm (.985 in)
- Insertion cycles per second in a pitch of max  
5.08 mm (.2 in): 4.5
- Insertion speed of pin:  
0 - max 450 mm/sec (0 - 17.7 in/sec)
- Reel/outer diameter: < 800 mm (31.5 in)

### Machine Data of P360

- Supply voltage: 400 V
- System frequency 50/60 Hz
- 3 Phases
- Power consumption during production: 2.8 kW
- Power consumption during standby: 700 W
- Air pressure: 500 - 800 kPa
- Air consumption: 100 liters/min
- Operating temperature: 10 - 35 °C
- Storage temperature: 10 - 50 °C
- Humidity: 10 - 60 % (non-condensing)
- Footprint: W x D x H:  
240 x 190 x 220 mm (9.5 x 7.5 x 8.7 in)
- Sound pressure level (machines with light curtain):  
< 75 dB (A)
- Painted surfaces: RAL 7035

### Products processed by P360

- Press-fit contacts
- Solder contacts
- Pins and tabs
- Sockets
- Spring contacts
- Continuous wire
- F-post

# LINE OF PIN INSERTION MACHINES

## P550 Pin Insertion Machine

### Machine

- Flexible and fully automatic high speed operation machine for application of reeled components
- For integration into production line
- For high volume level production
  - Up to 4 insertion heads
  - Up to 6 different contacts with Twin Feed
- Double and triple pin insertion

### Standard Features

- Servo driven base insertion head
- Conversion kits compatible with P100/P300/P360
- Freely programmable insertion angle (Rotation has no influence on insertion range)
- Easy changeover of the conversion kits within < 10 minutes
- Adjustable PCB support to provide production flexibility
- Lower support tool equipped with pin presence check
- Clinching in lower tooling possible
- Easy-to-use touch screen allowing simple programming

### Quality Management

- Fulfilling Industry 4.0 requirements
- Customized MES solutions
- Force monitoring and Force vs distance monitoring
- Pin presence detection
- Vision system for accuracy
- Tool management
- Machine capability study

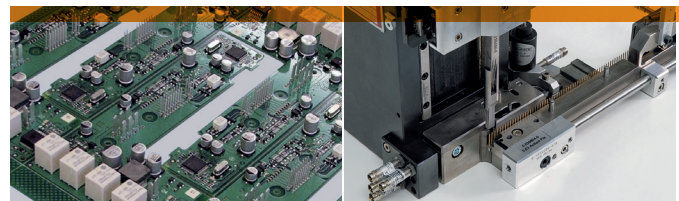
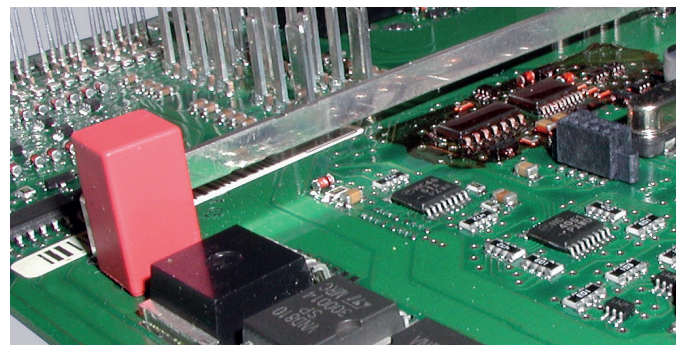


### Component Capability

Reeled components. Can be press-fit or through-hole solder components such as pins, tabs and receptacles. Can apply products from TE Connectivity or other manufacturers. Processing of loose piece components and continuous wire is available upon request.

### Physical Dimensions

- Width: 2.400 mm (102 in)
- Depth: 3.000 mm (118 in)
- Height: 2.200 mm (87 in)
- Weight: Approx. 2.200 kg (4410 lb)



### Options for P550

- 4.5 insertion cycles per second at 5.08 mm pitch
- Tool changer
- Fixed base tool
- Max number of base tools: 4
- Motor driven feed
- Twin feed tool
- Triple pin mode
- PCB flip unit
- Simultaneous PCB transfer/in-line
- Servo anvil
- Servo anvil with rotation
- Anvil changer
- Vision system
- PCB thickness measurement
- Insertion force monitoring
- Force vs distance monitoring

### Machine Performance of P550

- Insertion force max 900 N
- PCB size max: 420 x 360 mm (16.5 x 14.2 in)
- PCB size min: 80 x 80 mm (3.15 x 3.15 in)
- Insertion area (P300 without flip unit):  
410 x 340 mm (16.15 x 13.4 in)
- Camera inspection area with tool changer:  
410 x 340 mm (16.15 x 13.4 in)
- Camera inspection area without tool changer:  
330 mm x 340 mm (13 x 13.4 in)
- PCB thickness: 1 - 4 mm (.04 - .157 in)
- Max height of components/top side: 30 mm (1.2 in)
- Max height of components/bottom side:  
25 mm (.985 in)
- 5 insertion cycles per second at a distance of 30mm  
from position to position (.2 in) pitch
- Insertion speed of pin:  
0 - max 500 mm/sec (0 - 17.7 in/sec)
- Reel/outer diameter: < 800 mm (31.5 in)

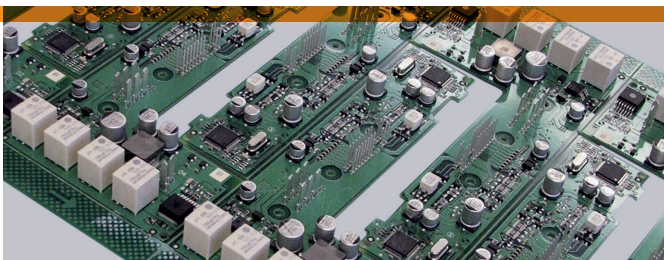
### Machine Data of P550

- Supply voltage: 400 V
- System frequency 50/60 Hz
- 3 Phases
- Power consumption during production: 2.8 kW
- Power consumption during standby: 700 W
- Air pressure: 500 - 800 kPa
- Air consumption: 100 liters/min
- Operating temperature: 10 - 35 °C
- Storage temperature: 10 - 50 °C
- Humidity: 10 - 60 % (non-condensing)
- Footprint: W x D x H:  
240 x 190 x 220 mm (9.5 x 7.5 x 8.7 in)
- Sound pressure level (machines with light curtain):  
< 75 dB (A)
- Painted surfaces: RAL 7035

### Products processed by P550

- Press-fit contacts
- Solder contacts
- Pins and tabs
- Sockets
- Spring contacts
- Continuous wire
- F-post

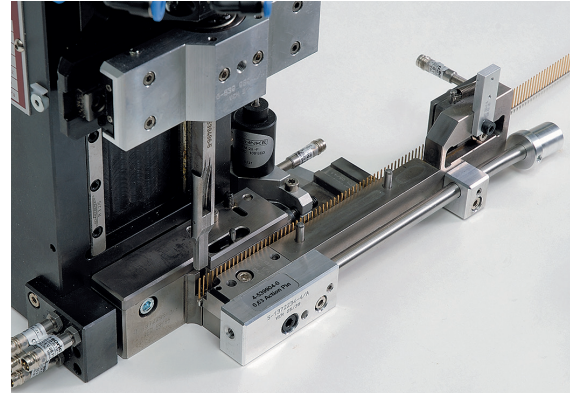
**Tools designed for wide range of reeled components (TE and non-TE contacts.) Processing of loose piece components and continuous wire is also possible and available upon request.**



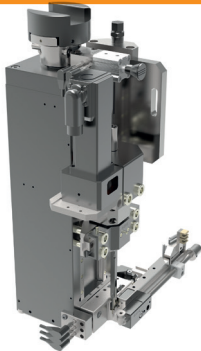
# LINE OF PIN INSERTION MACHINES

## Insertion Heads - Conversion Kits

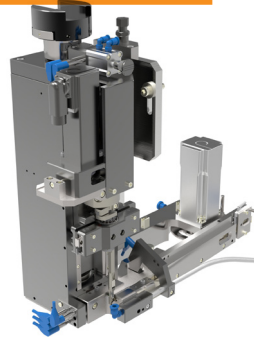
- Modular insertion tools for P100/P300/P350/P550
- Quick tooling change on the insertion head possible by concept of product specific conversion kits
- Conversion kit consisting of cutting unit and feeding mechanism
- Product specific insertion finger mounted onto base head
- Base tool provides the power for all movements of the conversion kit
- Simple coding system for automatic identification by the machine control
- Wide range of conversion kits for various TE Connectivity and non TE Connectivity products



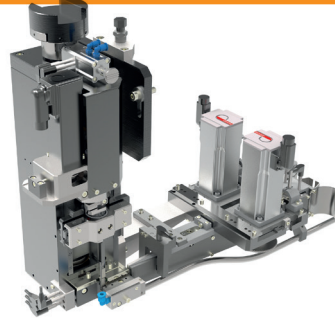
**Conversion Kit Mechanical Feed**



**Conversion Kit Motor Feed**



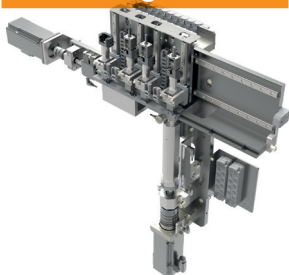
**Conversion Kit Twin Feed for 2 Contacts**



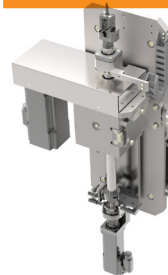
**Servo Anvil**



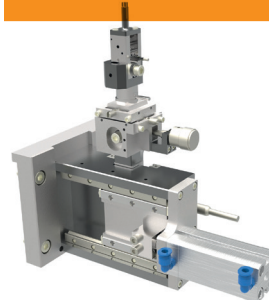
**Servo Anvil with Anvil Changer**



**Servo Anvil with Rotation**



**Pneumatic Anvil**



Base Machine	Pin Insertion Machine			
	P100	P300	P360	P550
Pneumatic Anvil	X	—	—	—
Servo Anvil	—	X	X	X
Servo Anvil with Rotation	—	X	X	X
Anvil Changer	—	X	—	X

Please contact your local TE Connectivity representative for details on tooling for a specific product.



Base Machine	P100	P300	P360	P550
Insertion Cycles per Second (5.08 mm Pitch)	1.5	3	5	5
Pitch	5mm	5mm	30mm	30mm
Tool Change	X	X	X	X
Fixed Base Tool	X	X	X	X
Maximum Number of Base Tools	2	4	1	4
Motor Driven Feed	—	X	X	X
Twin Feed Tool	—	X	X	X
Triple Pin Mode	—	X	X	X
Reel Unwinder	X	X	X	X
XY Table	X	X	X	X
PCB Flip Unit	—	X	—	—
PCB Transfer / In-line	—	X	X	X
Manual Loading	X	X	—	—
Light Curtain	X	X	—	—
Pneumatic Anvil	X	—	—	—
Servo Anvil	—	X	X	X
Servo Anvil with Rotation	—	X	X	X
Anvil Changer	—	X	—	X
Vision System	X	X	X	X
PCB Thickness Measurement	—	X	X	X
Insertion Force Monitoring	X	X	X	X
Force vs. Distance Monitoring	X	X	X	X
Tool Setup Check	X	X	X	X
PCB Scan	X	X	X	X
Reel Scan	X	X	X	X
Data Collect	X	X	X	X
MES Connector	X	X	X	X
Production Data	X	X	X	X

# REQUEST FOR QUOTE

## Details of requested Insertion Machines

	Requested (x)	Comments
Servo driven anvil with freely programmable rotation		
Anvil changer for 3(4) anvils		
Insertion force monitoring		
Force vs distance monitoring		
PCB thickness measuring (inlet)		
PCB thickness measuring (XY)		
Vision system		
PCB transfer belts		
PCB flip unit		
Cata collect		
PCB bar-code scan		
Reel scan		
Connection to MES system		
Production Data Acquisition		
i-Button for conversion kits		
Tool setup check		
Off-line programming tool		
Transformer (if 3 x 400 V supply not available at final location)		
Translation into other Language		
Warranty extension to 24 month		
Packaging		
Transport		
Training in Feuchtwangen		
Training on site in final location		
Installation on site		
Same side in-out PCB pallet handling (P360 & P550 only)		
Automatic first cut		
Reel changeover without process interruption (P360 only)		
Contact bending (90°)		

# REQUEST FOR QUOTE

## Questionnaire for Insertion Machines

To get a budgetary quote for an insertion machine P100/P300/P350/P360, please answer the following questions and fax the questionnaire to **TE Connectivity Europe +49(0)7964-201-6002 or - 6004** or email a copy to our **Tooling Assistance Center**, email address: **tac-emea@te.com**.

Company Name \_\_\_\_\_

Customer Contact \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ ZIP Code \_\_\_\_\_ Country \_\_\_\_\_

Phone Number \_\_\_\_\_ Fax Number \_\_\_\_\_

TE Customer Acct Number \_\_\_\_\_ E-Mail Address \_\_\_\_\_

TE Representative \_\_\_\_\_

Product to apply: \_\_\_\_\_ P/N: \_\_\_\_\_

Product to apply: \_\_\_\_\_ P/N: \_\_\_\_\_

Product to apply: \_\_\_\_\_ P/N: \_\_\_\_\_

Size of PCB(s): \_\_\_\_\_ Please attach drawings , CAD models (stp files) of printed circuit boards and contacts

Number of printed circuit boards per year or expected cycle time: \_\_\_\_\_

Position of the PCB in the panel, positions of the contacts to be placed (x,y,rotation, height), clamping hole positions, position of PCB bar-code, position of thickness measuring, already existing components with their dimensions (might interfere with tools), flow direction of PCB. \_\_\_\_\_

Height of components already on PCB: \_\_\_\_\_ Application side: \_\_\_\_\_ [mm] Solder side: \_\_\_\_\_ [mm]

Number of products per PCB: \_\_\_\_\_ Number of PCBs per year: \_\_\_\_\_



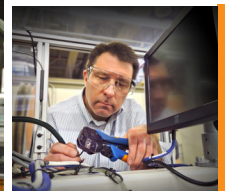
## Let's Connect

To learn more about the right TE tooling for your needs, call us at 717-810-2082 or email [ToolingSales@te.com](mailto:ToolingSales@te.com)



## TE Technical Support Center

USA:	1.800.522.6752	UK:	+44.0800.267666
Canada:	1.800.522.6752	France:	+33.1.34.20.8686
Mexico:	+52.55.11.06.0800	Netherlands:	+31.73.624.6999
Latin/S. America	+55.11.3404.6261	China:	+86.400.820.6015
Germany:	+49.6151.607.1999		



## Maintenance and Service

### Customer Service

- Error/Malfunction Diagnosis and Repair
- On site support
- Software upgrades and updates

### Maintenance

- Contracts for regular maintenance on yearly basis
- Base insertion head maintenance and reconditioning
- Analysis and documentation of machine condition
- Frame contracts about maintenance on request

### Training Service

- Training for operators
- Training for process and production engineering
- Training for maintenance personnel

### Calibration

- Calibration check of force meters by comparative measurement
- ESD Audit
- Machine capability studies based on standardized procedures

### Upgrading Service

- Upgrade of operation system up to complete change of computer system
- Upgrade of waste disposal system
- Upgrade double pin feeder system
- Upgrade to simultaneous transport

### Spare Parts Service

### Field Service

TE Application Tooling has a broad network of field service engineers who cover almost all the countries worldwide. The engineers have all the knowledge to help you on a professional level with your equipment and may be able to improve the manufacturing efficiency. In addition to installation and repair service, we can assist with equipment selection, training, troubleshooting, service contracts and spare parts.

### Field Service Main Categories

- Standard Service
- Express Service
- Installations
- Operating, Maintenance and Training
- Repair
- Contract Service
- Standard Training Courses

### Technical questions or problems?

Contact the EMEA Field Service Hotline.

Opening Hours

Monday - Thursday 08:00 - 16:00

Friday 08 - 14:00

Phone: +49-6151-607-1518

E-Mail: [FieldServiceEMEA@te.com](mailto:FieldServiceEMEA@te.com)

Please note that the service hotline staff speaks English or German.

## tooling.te.com

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