

# PRESS-FIT MACHINES

A WIDE RANGE OF PRODUCTION EQUIPMENT  
FOR COMPLIANT PIN CONNECTOR TECHNOLOGY

# LINE OF PRESS-FIT MACHINES

## Family of Press-fit Machines

TE Connectivity boasts a wide range of servo presses designed to insert compliant pin connectors into printed circuit boards. Our family of machines are highly customizable and sure to fit your particular application need.

## Simple Programming and Automatic Setup

Each press is programmed and run via a dedicated PC. All programs, connectors, board layouts, press profiles, tool part numbers, etc. can be stored on the computer, so future applications can be easily adapted from existing programs. Little programming knowledge is required to take advantage of this versatility and it

helps prevent future operator errors by reusing proven data.

## Force Monitoring for Quality Assurance

The most popular feature associated with compliant pin technology is the fact that it is solder free. The processing of compliant pin connectors offers significant processing advantages, too. Especially because the press force can be closely monitored in real time and it can be immediately evident if there is a problem such as a bent pin, an oversized PCB hole, an incorrectly positioned connector, or an error during the press cycle. This process quality assurance provides peace of mind for everyone and can improve yield while cutting costs.

# SENSIPRESS TECHNOLOGY

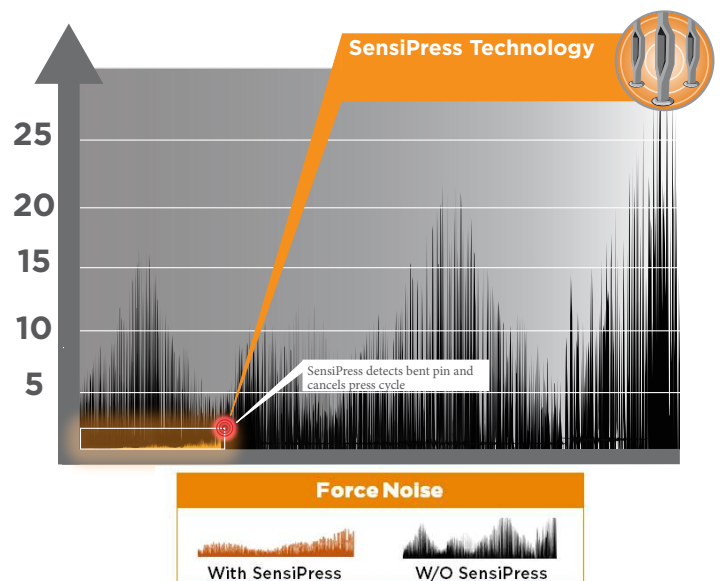
## A SENSIBLE SOLUTION TO REDUCING PC BOARD DAMAGE DUE TO BENT PINS IN CONNECTOR PRESS FIT APPLICATIONS

SensiPress technology from TE Connectivity (TE) is designed to increase defect detection in connector press fit applications by reducing previously unaltered mechanical noise, thereby improving accuracy, reducing scrap and allowing for easier troubleshooting and maintenance.

As the industry moves to high-performance connectors with higher pin densities and smaller pin tails, the ability to detect bent pins at the early stage of the pressing cycle is becoming increasingly more challenging. The high sensitivity measurement capabilities of SensiPress technology enables TE Connector Press Fit machines to more accurately measure press force and halt the seating cycle if it detects early contact with the tool, indicating that one or more pins are bent or out of alignment.

## Cut Through the Clutter for More Accurate Pin Detection

When only three pounds of force can crush small pins, excessive force noise can make detecting a defective pin extremely challenging. With SensiPress technology we optimized our load cell positioning by isolating the force sensors to eliminate excessive force noise, making it easier to detect bent pins and stop the press cycle before damaging expensive PC boards.



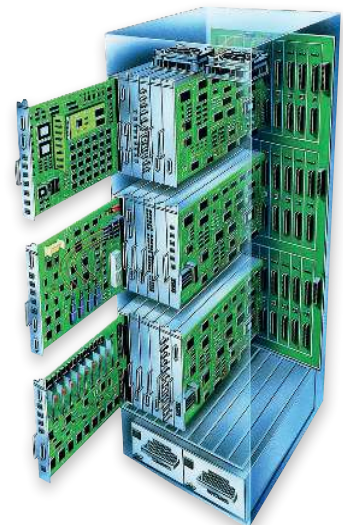
# PRESS-FIT MACHINES COMPARISON CHART



Base Machine	CBP	CSP	CMP-5T	CMP-10T
System Type	Semi-automatic press, bench-top	Semi-automatic press, standalone with shuttle	Semi-automatic press, standalone	Semi-automatic press, standalone
Footprint (W x L X H)	785 x 610 x 840 mm (3 x 24 x 33 in)	785 x 965 x 1.625 mm (31 x 38 x 64 in)	965 x 915 x 1.780 mm (38 x 36 x 60 in)	1.095 x 1.095 x 1.855 mm (43 x 43 x 73 in)
Estimated Cycle Speed	3 - 5 sec/connector	6 - 8 sec/stroke including shuttle of product	3 - 5 sec/connector	3 - 5 sec/connector
PCB Size	460 x 610 mm (18 x 24 in)	Application dependent	610 x 915 mm (24 x 36 in)	760 x 915 mm (30 x 36 in)
Force Capability	44 kN (5 tons)	44 kN (up to 5 tons)	44 kN (5 tons)	89 kN (10 tons)
Electrical Requirements	208/240 V AC, 1 ph, 6 amps, 50/60 Hz	208/240 V AC, 1 ph, 6 amps, 50/60 Hz	208/240 V AC, 1 ph, 15 amps, 50/60 Hz	208/240 V AC, 1 ph, 15 amps, 50/60 Hz
Air Requirements	0.6 Mpa (80 - 120 psi) dry air	0.6 Mpa (80 - 120 psi) dry air	0.6 Mpa (80 - 120 psi) dry air	0.6 Mpa (80 - 120 psi) dry air
Pin Defect Detection	SensiPress (standard)	Pin Penetration (optional)	SensiPress (standard)	SensiPress (standard)



Base Machine	CAP-6T	CAPI-6T
System Type	Automatic press, standalone	Automatic, in-line press
Footprint (W x L X H)	1.525 x 1.910 x 1.830 mm (60 x 75 x 72 in)	1.525 x 2.184 x 1.830 mm (60 x 86 x 72 in)
Estimated Cycle Speed	3 - 5 sec/connector	3 - 5 sec/connector
Housing Size	760 x 915 mm (30 x 36 in)	711 x 863 mm (28 x 34 in)
Force Capability	53 kN (6 tons)	53 kN (6 tons)
Electrical Requirements	208/240 V AC, 1 ph, 20 amps, 50/60 Hz	208/240 V AC, 1 ph, 20 amps, 50/60 Hz
Air Requirements	0.6 Mpa (80 - 120 psi) dry air	0.6 Mpa (80 - 120 psi) dry air



# LINE OF PRESS-FIT MACHINES

## CBP Electric Bench-Top Press

### Machine

The CBP servo electric press provides the ability to process most compliant pin connector applications in a compact bench-top system. Board size capacity and press force range allows the system to handle a wide range of applications for low to medium production volume operations.

### Servo Drive Precision

Each system is supplied with a servo electric drive with force feedback control. The CBP is available in 44 kN (5 ton) force capacity to handle compliant pin connectors. With PC control, the servo driven CBP provides an easily programmed press system with automatic set up from press cycle to press cycle. The system reaches levels of precision and accuracy not available in a pneumatic or hydraulic press.

### Monitor and Control for Quality

Force, distance and speed are the core parameters of any press cycle. With feed back and PC control, the CBP system can monitor and control each characteristic of every press stroke run on the press in real-time. If any aspect of that press cycle is outside of specified limits, the CBP can stop the press, mid-stroke, to prevent damage to the PCB, thereby reducing or eliminating rework and/or scrap. Common problems such as PCB holes out of tolerance, missing connectors, improper connectors used and, in some cases, bent pins can be detected and reported to eliminate quality problems.

### Eliminate Operator Error

By pre-programming the parameters of connector applied, the CBP will automatically adjust set-up parameters from one press cycle to the next. There is no need for (therefore no chance of operator error associated with) adjusting stroke, stops or force adjustments from one cycle to the next. Even simple errors of using the wrong connector or tool can be eliminated to assure proper application of every connector and avoid costly scrap.



With SensiPress Technology

### Product Features

- Servo electric press
- PCB capacity of 460 x 610 mm (18 x 24 in)
- Press force capacity of 44 kN (5 tons)
- Ability to monitor and control force, distance and speed for every press cycle
- Full SPC data of every component pressed for quality assurance and traceability
- Database driven software for simple programming and automatic setup
- Small foot-print for low to medium volume product levels

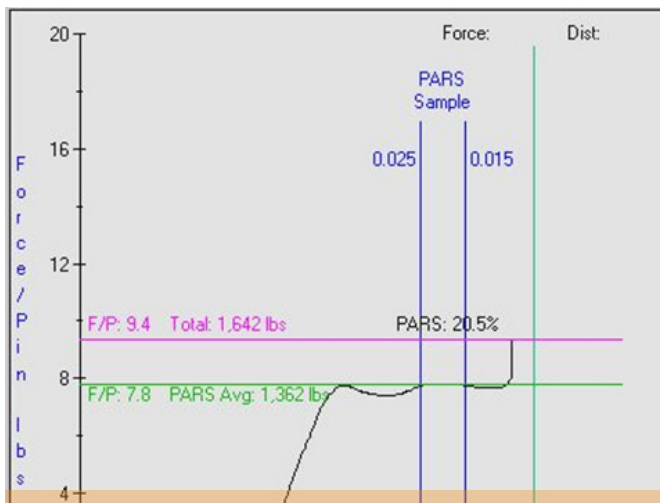


## Simple Operation

PC control of CBP systems allows for simple and flexible programming. All data for connectors and tools are entered and stored in databases. These specifications allow the CBP to automatically set up and control each press cycle to reduce operator intervention and human error. Every press cycle completed can be serialized and stored for full quality traceability.

## Run Time Press Monitoring

The run time screen provides complete operator interface and feedback. Each press cycle is monitored for Force vs Distance and data is clearly displayed. Press stroke status is shown to acknowledge proper application or error information. A picture of the end product can also be used to guide the operator through the pressing sequence to reduce operator error.



## Features

### Light Curtain

The CBP system is supplied with standard 2 hand tie-down activation. A standard safety light curtain prevents the start of the press cycle and will stop the system if at any time the light curtain is broken.

### Tool In Place Sensor

This sensor system assures the insertion tool being used is centered under the press ram to avoid damage to the connector or PCB. This system uses a light source in the press ram to interact with reflective tape (not provided) on the insertion tool. If the tool is not properly centered and the light reflection is not detected, the press will not begin a press cycle.

### Air Table with Foot-switch

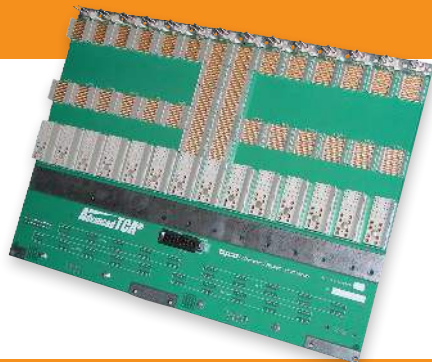
This feature provides pneumatic plumbing in the press tabletop and an activation foot-switch to allow for an "air bearing" surface between the support fixture and the tabletop. This greatly reduces the effort to slide the PCB, fixture, connector and tool stack-up under and back out of the press during each cycle.

### Touch Screen Monitor

Provides a touch screen monitor in place of the standard non-touch screen. Allows for simple input for programming and operation of the press system.

### Bar-code Scanner (Optional)

Provides bar code scanner system to allow for serialization of PCBs.





# LINE OF PRESS-FIT MACHINES

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## CSP Shuttle Electric Press

### Machine

The CSP incorporates an automatic shuttle system and customized tooling fixtures into the proven TE press-fit line for fast and simple product presentation. Focused at the application of PCB's onto compliant pin housings, this system is provided with full control and monitoring of force, distance and speed for quality assurance of every product applied.

### Servo Drive Precision

Each system is supplied with a servo electric drive with force feedback control. Force capacity is available up to 44 kN (5 tons) to handle a range of compliant pin housings and connectors on the market today. Compared to pneumatic or hydraulic systems, the CSP press is quiet, efficient, and does not suffer from oil leaks that can damage PCBs. With PC control, the servo driven CSP press provides an easily programmed press system with automatic set up from press cycle to press cycle.

### Monitor and Control For Quality

Force, distance and speed are the core parameters of any press cycle. With feed back and PC control, CSP systems can monitor and control each characteristic of every press stroke run on the press in real-time. If any aspect of that press cycle is outside of specified limits, the system can stop the press, mid-stroke, to prevent damage to the product and reduce or eliminate scrap. This gives CSP systems a distinct advantage over pneumatic or hydraulic systems which can not offer the same level of control. Optional pin penetration sensing (PPS) tools also allow the CSP to assure that every pin has properly penetrated the PCB a predetermined minimum distance. Any missing, bent or improperly seated pins will be detected and illustrated to the operator.

### Faster Processing

The CSP is supplied with an automatic product shuttle that locates the product stack up under the ram and upper insertion tool. The operator loads the PCB and housing/connector into a lower support fixture that is mounted on the shuttle and hits the start switch.



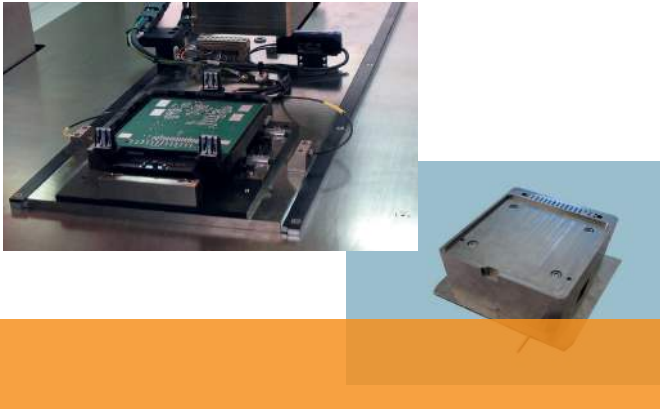
The system ensures part presence and then shuttles the product under the ram mounted upper tool to complete the press cycle. This allows the system to automatically press the product while the operators hands are free to perform other tasks such as preparing the next product to be applied. The end result is increased quality by assuring proper product location and decreased processing time.

### Eliminate Operator Error

Quality is provided not only through the monitoring and control of the press cycle, but also through the avoidance of operator error. By pre-programming the parameters of the product applied, the CSP will automatically adjust set-up parameters from one press cycle to the next. There is no need for (and therefore no chance of operator error associated with) adjusting stroke stops or force adjustments from one cycle to the next. Even simple errors of using the wrong product can be eliminated to assure proper application and avoid costly scrap.

### Optional Pin Penetration Sensing Tooling (PPS)

Our patented pin penetration sensing (PPS) tooling provides an additional quality check for products applied on a CSP. PPS tools are specifically designed for the product applied to verify that every pin properly penetrates the PCB by a predetermined distance. Coupled with force monitoring, PPS tools give assurance of the proper location, penetration and application of every compliant pin on every product applied. The PPS check is performed in real-time without the need for an additional or destructive quality test.



### Product Features

- Shuttle system for product location under press ram
- Housing capacity of 75 x 150 mm (3 x 6 in)  
Other sizes are possible. Please contact your local TE representative for assistance
- Press force capacity up to 44 kN (5 tons)
- Ability to monitor and control force, distance and speed for every press cycle
- Option pin penetration sensing (PPS) tooling assure proper pin penetration
- Full SPC data of every component pressed for quality assurance and traceability
- Database driven software for simple programming and automatic setup
- Small foot-print, self contained system can be easily located on operation floor

### General Specifications

#### Description

Shuttle servo electric press for the application of compliant pin products. Typical applications include the application of PCBs to compliant pin housings and connectors. System is capable of monitoring and controlling the force, distance and speed of a press cycle and maintaining quality records of every press cycle in real-time. Optional pin penetration sensing tooling can assure the proper location and penetration of every pin applied through the PCB.

#### Performance

Drive Z: Electric servo drive, ball-screw  
Housing size: 150 x 75 mm (6 x 3 in)  
Force capacity: Up to 44 kN (5 tons)  
Speed: Application dependent. Typical time for shuttle in, press and shuttle out is 6 - 10 seconds.

#### Tooling

Insertion tool type: Fixed (to ram)  
Support tool: Shuttle mounted fixture  
Standard (non-sensing) and PPS (pin penetration sensing) tools are available.

#### Control and Interface

Parameters: Force, distance, speed, pin penetration (optional)  
Controller: PC  
Operating system: Windows based platform  
Interface: Mouse and keyboard (touch screen monitor is optional).

#### Services

Power: 208/240 V AC, 1 ph, 6 A, 50/60 Hz  
Air: Shop air of 5 CFM at 80 psi

#### Dimensions (W x L x H)

760 x 965 x 1.625 mm (30 x 38 x 64 in)  
Weight: 272 kg (600 lbs)



# LINE OF PRESS-FIT MACHINES

## CMP Manual Electric Servo Presses

### CMP Machines

The CMP manual electric servo presses are designed with a rigid “H” frame to minimize deflection. The CMP-5T press provides 44 kN (5 tons) of force while the CMP-10T press provides 89 kN (10 tons) of force. The operator is able to manually adjust the press head and/or the PCB between connector press cycles.

An air bearing system provides effortless press head positioning. The PCB capacity of the CMP-5T press is 610 x 915 mm (24 x 36 in) and the PCB capacity of the CMP-10T press is 760 x 900 mm (30 x 36 in). The SPC feature within the CMP’s included software provides a press log and in addition, allows press force plotting for every connector.

The product setup for these machines is accomplished without any required hardware adjustments. The use of tool and connector databases, and a press sequence program, provides a fully data driven press cycle.

There is a wide range of insertion tools available for these machines for both TE and non TE products.

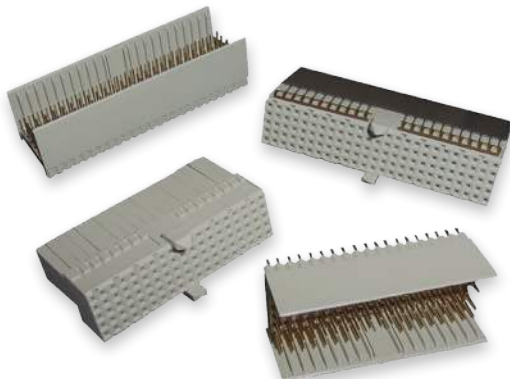
The machine features a touch screen monitor for enhanced machine operation, an air table option that assists the operator when positioning product under the press head, and an optional bar code scanner, which provides fast PCB serial number entry,



With SensiPress Technology



With SensiPress Technology



### Product Features

- 44 kN force (5 tons) CMP-5T
- 89 kN force (10 tons) CMP-10T
- Board capacity of 610 x 915 mm (24 x 36 in) CMP-5T
- Board capacity 760 x 915 mm (30 x 36 in) CMP-10T
- Computer controller
- Automatic setup - no adjustments
- Speed, height & force control
- SPC on pressing force
- Wide range of insertion heads for TE Connectivity and non TE Connectivity products available
- Versatile interface for the incorporation of other tools
- Easy-to-use operator interface
- Insertion force monitoring



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## CAP-6T Automatic Electric Press CAPI-6T In-line Version

### Machine

The CAP-6T/CAPI-6T automatic electric press combines the proven force control capabilities and quality assurance of the TE connector press-fit lineup with the speed of an automatic press. The automatic pressing capabilities of the CAP-6T/CAPI-6T press provide the end user with greater control and simplified processing to help improve quality, lower rework and prevent rejects. This provides users with lower true applied cost and higher end profits.

### Capable

The CAP-6T/CAPI-6T press was designed to apply compliant pin connectors to a wide range of PCBs. It is fully capable of handling demanding applications today from daughter cards to mid-planes to back-planes. With board capacity up to 760 x 915 mm (30 x 36 in) and a press force up to 53 kN (6 tons), the CAP-6T/CAPI-6T press is focused at all but very large board applications. The CAP-6T/CAPI-6T press can also hold up to 12 insertion tools and uses a lower support fixture.



Dedicated support fixture  
for quick product changeover

### Product Features

- Electric press automatically selects proper insertion tool and press program information for each connector pressed
- Board capacity of 760 x 915 mm (30 x 36 in)
- Press force capacity of 53 kN (6 tons)
- Ability to monitor and control force, distance and speed for every press cycle
- Full SPC data of every component pressed for quality assurance and traceability
- Database driven software for simple programming and automatic setup
- Tool holder with ID verification feature for up to 12 insertion tools
- Manual loading drawer for simple loading and unloading of PCBs
- X/Y gantry locates press head to automatically press connector

# LINE OF PRESS-FIT MACHINES

## CAP-6T Automatic Electric Press CAPI-6T In-line Version

### Quality

Compliant pin technology has distinct advantages versus through hole solder products. A key advantage is the ability to monitor and control the press cycle in real-time to provide high quality assurance.

The CAP-6T/CAPI-6T press gives your operation the ability to maximize this advantage with higher quality, higher yield and lower applied cost production line.

The key is the CAP-6T/CAPI-6T's ability to precisely and accurately apply each connector to the pre-programmed force, height and speed requirements. Each parameter can be individually programmed for each connector. Connectors can be pressed to height or force based upon their individual specifications.

If an error is encountered during the press stroke, the cycle is stopped immediately to help prevent damage to the PCB and allow for the minimum amount of re-work. This allows the CAP-6T/CAPI-6T to detect problems and avoid damage to the PCB due to common errors such as PCB holes out of tolerance (too big or too small), missing connectors, improper connectors used and, in some cases, bent pins.

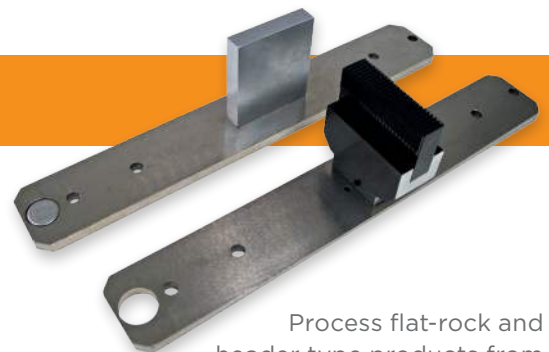
Quality is provided not only through the monitoring and control of the press cycle, but also through the avoidance of operator error. By automatically pressing the pre-loaded connectors, the CAP-6T/CAPI-6T eliminates operator intervention and damage to the PCB through common handling of the board. Also, with automatic set-up, the CAP-6T/CAPI-6T does not require input from the operator such as adjusting the force or distance travel on the press stroke. This is done automatically by the software to eliminate the potential error of an incorrect operator adjustment. Finally, a tool ID system assures that the correct tool is used for every stroke to eliminate damaging a very expensive connector with the wrong tool.

### Simple

All of the features of the CAP-6T/CAPI-6T can not be fully utilized unless the overall process and interface are simple and easy to use. The design of the system focuses on providing a simple interaction and common sense programming approach to allow the user to take full advantage of the CAP-6T/CAPI-6T features.

All programming is done through a touch screen interface (a keyboard and touch-pad mouse are also provided) with logical icon driven programming. All information is entered into and stored in a database. This allows for the specific connector and tool data to be entered once into the computer. If a future board uses the same tool and/or connector, the data is simply pulled up from the specific database and is not required to be re-entered.

During operation, all of the necessary adjustments to the press stroke are automatically adjusted without operator intervention. Tool selection, starting clearances, min and max force requirements, height requirements, speed and press cycle logic are automatically adjusted eliminating the scrap and re-work from common operator error.



Process flat-rock and header type products from TE Connectivity and other suppliers

### Easy as 1-2-3

Once all of the programming for the connectors, tools, and PCB application is complete, applying the connectors is as easy as 1-2-3.

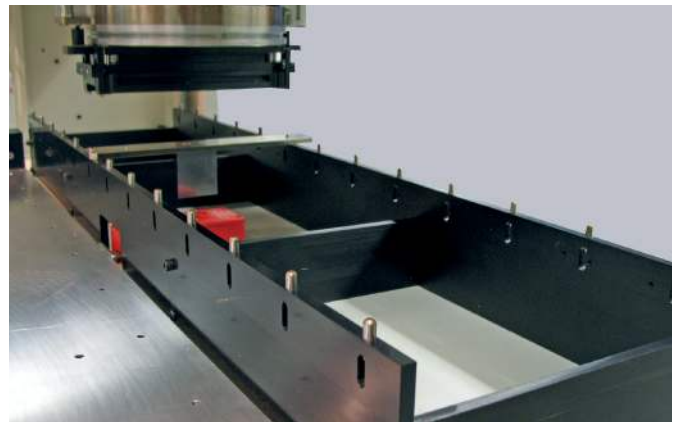
1. The operator loads the required tooling on the insertion tool rack, and mounts the required lower support fixture to the PCB drawer.
2. The operator selects the proper press program on the touch screen interface.
3. The operator opens the PCB drawer and places a populated PCB onto the lower fixture, closes the drawer and hits start ... and the CAP-6T does the rest.

### In-Line Press Option

The CAPI-6T can also be upgraded with an automatic transport system used to increase throughput capabilities.

Once a press sequence has completed, the machine will unload the PCB, load the next one into pressing area, and gently descend the PCB onto the press fixture.

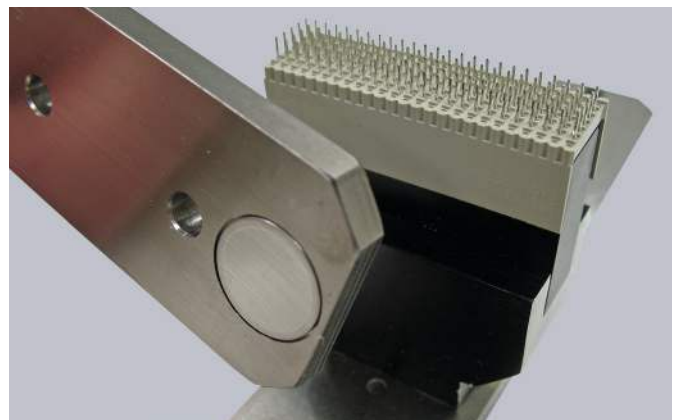
The in-line CAPI-6T can also be configured in shuttle model using an additional bi-directional buffer. In that case, the operator place the PCB to be pressed on the outside buffer, press the start button, which will start the press process. The machine will then load the PCB onto the fixture, execute the press sequence, and upon completion will return the PCB on the out-side buffer allowing a more comfortable handling of large PCB.



Hold up to 12 upper insertion tools



Linear XY drives for fast and accurate movement



Tool ID feature to assure proper tool is used



## Let's Connect

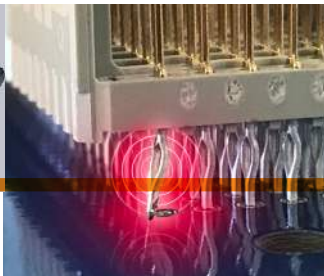
Learn more about our comprehensive line of tooling solutions at [www.tooling.te.com/ConnectorPress](http://www.tooling.te.com/ConnectorPress).

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



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### Waste Not. Want Not.

Whether it's time or scrap, in manufacturing everyone knows that waste costs money. With our on-site certification and consultation services, we can help you:

- Reduce downtime
- Reduce scrap
- Maintain crimp quality
- Improve manufacturing efficiency



### Time is Money.

In manufacturing downtime can be expensive. That's why TE is constantly working to improve product availability and delivery rates. With a strong global footprint, short lead times and a strong distribution channel, TE has the equipment and the accessories to keep production online.

To check distributor stock and availability for your tooling needs go to: [www.te.com/commerce/sck/cdi.do](http://www.te.com/commerce/sck/cdi.do)

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For additional information download catalog no.

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