General technical details of Pivatic PCC125 Punching Centre for Coils

Ambient temperature

This equipment is designed for the max. ambient temperature of 35 °C.

Main connection details		
Electrical connection,		
TN-S rated (3 phases and PE, N not required)		
voltage	3*400 V	
fluctuation	+6,-10 %	
frequency	50±5 Hz	
Main fuses	125 A	
Pneumatic connection, 500 l/ min at	6 bar	
Hydraulic power	(200 bar)	30 kW
Colour of line components		
Colour of the line is blue acc. to	5015 RAL	
Covers are light grey acc. to	7035 RAL	
Configuration and lay-out		
Punchin station configuration PCC125 TT TTii		
Lay out acc. to drawing number	H1007809	
Material data		
Steel strip, strength up to	450 N/mm²	
Surface pre-painted, plastic covered, galvanised		
Coil weight up to	10 000 kg	
Sheet thickness	0,5....2,00 mm	

The diameter of the inside hole of coils	450...550 mm	
The diameter of the inside hole of coils with adapter piece	550...650 mm	
The outside diameter of coils up to	1 600 mm	
Strip width	60...1 250 mm	
Product data		
Cut blanks up to	2 250 mm	
Punched blanks up to	2 250 mm	

Accuracy of parts produced When using proper material without chamber and internal stress and the strip being stiff enough (thickness/width), following tolerances apply: Hole-to-hole tolerance of up to 2 000 mm long punched blanks ± 0,15 mm in X and Y directions.
Standard components used
• Electrical components Siemens, Telemecanique, Omron, ABB
• Pneumatic components SMC, Festo
• Hydraulic components Rexroth-Bosch, Hydac

	Complete Hydraulic- and Electrical Systems	
PCC1101	Complete Hydraulic- and Electrical Systems of the PCC125 including one punching station (TT or TTi) Hydraulic system	1

-Covered hydraulic power pack equipped either with an air cooler or with a water cooler connected to the cooling water circuit of the factory.
-Designed acc. to demands of the complete line.
-Mainly Bosch-Rexroth valves and a low noise level pump are used.
-Complete pipe lines and hoses between the line components and the power
pack covered with aluminium covers.
-Tank volume 400 litres.
-The motor power of the cooler 1,5 kW, the flow of the oil pump of the cooler 100 l/min.

Electrical system
-Electrical cabinet is placed next to the Power pack with cooler.
-Cables between the line components are in covered aluminium channels. Customer to supply and connect the mains.
-Electrical components are installed on assembling plates leaving space for modifications.
-The electrical components are mainly from Siemens, Omron and Telemecanique.

Pneumatic system
-Hoses between the connection point, valves and cylinders are delivered. Customer to supply and connect the service unit and connection.

Line controller
-Siemens Sinumerik 840 D numerical control and integrated PLC.
-Step 7 programming language
-The Sinumerik controller is installed in a separate control cabin.
-All texts available for the operator are in English.

Industrial PC display
-Installed to the control cabin next to the display of the controller.
-Flat 15” colour display

User Manuals, Instructions and drawings
-Multimedia User Manual, Maintenance Instructions, Electrical, Pneumatic and Hydraulic drawings and Bills of Material
-Delivered in English on a CD disc

Decoiler and Straightener with control Box:

PCC1260

Decoiler and Straightener 1
consisting of the following equipment for decoiling, threading and straightening of the strip

Pick-up Decoiler:
The Decoiler traverses with a gear motor and its mandrel is lifted up and lowered with a cylinder for coil change.
-Coil weight up to 10 000 kg
-Sheet thickness 0,5 ... 2,00 mm
-Expansion range of the mandrel Ø 450…550 mm
-Expansion with a cylinder mounted outside of mandrel, key blocks and machined segments made of cast iron.
-The Mandrel is lowered and lifted with a cylinder for loading and unloading of the coil.
-The Decoiler traverses on rails with gear motor drive for loading and unloading of coils.
Positioning of the coil on the centre line acc. to a scale.
-Fixed brackets on the Mandrel for guiding of the backside of the coil.

Threading devices:
Following equipment are foreseen for threading of the strip from the Decoiler to the Straightener:
-Snubber roll with a cylinder fixed to the Decoiler to prevent the coil from loosening during threading and pull-back of the strip.
-Peeler blade/Threading table with cylinders fixed to the Straightener for threading of the strip.

Straightener:
Following equipment have been mounted on the Entry side of the Straightener:
-Strip guide with 2 hardened rolls, manual adjustment acc. to read-out.
-Two Pinch rolls, upper having diameter of Ø120 mm is lifted and pressed down with pneumatic cylinders and the supported lower roll has a diameter of Ø 60 mm and is driven.

The lower part of the Straightener:
-5 rolls, diameter Ø 60 mm, all driven, supported with double rolls set in one row in the middle.
-All lower rolls are driven by an electrical gear motor, controlled acc. to the height of the loop with 4 photo cells.

The upper part of the Straightener:
-Four straightening rolls having diameter of Ø 60 mm are manually adjustable as a block by lifting, lowering and tilting acc. to mechanical read outs. All upper rolls are supported with double rolls set in one row in the middle.
Opening of the Straightener opens for cleaning of the rolls with cylinders to app. 35 °. The

For taking half finished coil and loading the next

PCC1241 Two Coil cars for 10 ton coils 1

When using two coil cars, one coil car takes the half finished coil coming down and the next coil can be loaded from the second coil car without any other means. Handling of coils is accurate and safe.
-Two similar Coil cars made of thick steel plates.
-Both Coil cars move with gear motor on rails with push button control.
-Movement of the Coil cars is possible during the line operation.
-Both Coil cars are equipped with four Supporting rods for narrow coils.
-The rails can go either straight, Layout A, or in a straight angle, Layout B, in front of the Decoiler.

PCC1281 Extension plates for a single Decoiler 1

Plates are fixed with screws on segments of the mandrel for 550 … 650 mm expansion range for 610 mm coil inside diameter.

PCC1291 Gripper feed and Threading tables for feeding of strip 1

Two Threading tables with cylinder functions between the Straightener and the Feeder for threading and supporting of the strip.

Strip is positioned for punching using a Gripper feeder designed to operate with all material types and thicknesses with same parameters.

The Gripper feeder mounted on a solid steel frame as follows:

-Hydraulic clamps set on both sides of the strip, 1+1 pc. The clamps are positioned manually acc. to a scale for the strip to be processed..
The clamps are set on a bridge moving on precision guides in the feeding direction with an AC-Servomotor and a ball screw.
-The stroke of the Gripper feeder up to 1 000 mm.
-The speed of the feeder is up to 80 m/min.
-Designed for sheet thickness 0,50 … 2,00 mm.

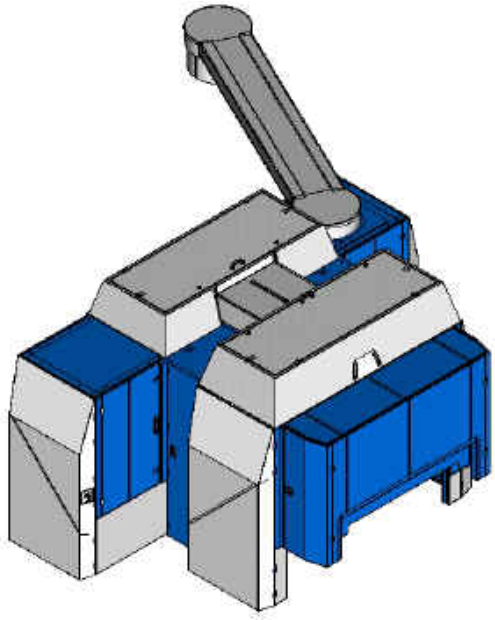
The strip is guided with guiding elements on the entry and on the exit sides of the feeder bed. On the exit side there are cylinders set in the same block with the side guide elements to hold down the strip during the return stroke of the feeder. The side guide elements are positioned manually for the strip

PCC1305 Punching station TTi with Auto-Index (Thick Turret Tooling) 1

Designed for parts and part families demanding flexibility and versatility.
Includes Auto index facility in both units.

Punching, nibbling, embossing, piercing jobs carried out as standard.

DTP (Double Tool Punch) feature minimises cycle times since two tools activated simultaneously when punching symmetric hole patterns like corner notching.

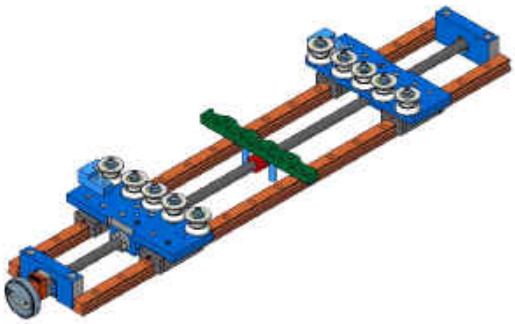


-Solid O-frame made of thick machined steel plates with precision guides for ram plate.
-Ram plate is guided on all four corners with precision guides.
-Ram plate driven by a large diameter hydraulic cylinder controlled by a servo valve.
-Punching force selectable between 150 kN and 400 kN for each tool for different sheet thicknesses and tool sizes for maximum output.
-Stroke length is programmable with parameters for different kind of jobs like punching, nibbling, piercing and embossing.
-Two with servomotors and ball screws traversing slides with Tool Selector Systems and attachments for tool cassettes.
- Both slides are equipped with a servo motor, drive elements and other required construction elements for the indexing tools (Auto-Index) for TTi and TTii tool cassettes.

Thick Turret type tools are set in easy-to-change cassettes which is an ideal solution for product families.
-The Punching station TTi is designed for the following tool cassettes:
--Tool cassettes TT, 2 off, each including 26 tool stations of size A to E.
--Tool cassettes TTi, 2 off, each including 1 indexing station for tool size D and 18 fixed tool stations of size A to E.
--Tool cassettes TTii, 2 off, each including indexing stations of size B and C and 18 fixed tool stations

Designed for punching of large holes, hole groups, corner notching and trimming using dedicated hard tooling.

-Solid O-frame made of thick machined steel plates with precision guides for ram plate.
-Ram plate is guided on all four corners with precision guides.
-Ram plate driven by a large diameter hydraulic cylinder controlled by a servo valve.
-Hydraulic punching force 800 kN
-The upper dead centre and the stroke are programmable for different jobs like punching and embossing, stroke length 3 … 200 mm.
-Distance between the ram plate and the attachment plate up to 440 mm.
-Height of the tool die from the attachment plate 95 mm
-500 mm wide opening for slug in bed covered with a tool specific supporting plate. The y-dimension of the opening designed case by case.
-Tool is fixed with screws on an Attachment plate, which is positioned against datum pins and clamped on the entry, and exit side with Hydraulic clamps for quick change.
-The tool used is kept open with springs and its



HT-Tool

PCC1325	The activator for tool activation in HT station - The width 90 mm - The stroke length 25 mm	1
PCC1326	The activator for tool activation in HT station - The width 140 mm - The stroke length 25 mm	2

For cutting-to-length:

PCC1360	Hydraulic Shear for cutting-to-length	1

mounted on the exit side of the last punching station.
-Down stroking hydraulic shear incl. a with gas springs loaded hold down beam.
-Blade clearance can be set on both ends of the upper blade and blades can be turned for another sharp edge.

-Manually adjustable Strip guide with a read out in front of the Shear.
-Day light opening is 20 mm.
-There is a scrap box set behind the shear for short off-cuts.

PCC04AY	Tool Cassette of type TT - left	1
PCC04AZ	Tool Cassette of type TT - right	1

Designed for Punching stations TT and TTi for 26 Thick Turret tools as follows:
-12 A stations up to Ø12,7 mm diameter
-6 B stations up to Ø31,75 mm diameter
-4 C stations up to Ø 50,80 mm diameter
-2 D stations up to Ø 88,90 mm diameter
-2 E stations up to Ø 114,0 mm diameter

-Reach of all stations, min. 625 mm
-Delivered complete with C-frame, Punch attachment, Die plate and Die support
-The Day-light opening between the punch and the die 10 mm as standard for punching or 20 mm for embossing. To be specified in the order.
-One support plate under the tool cassette is delivered. This plate must be changed when tool cassettes TTi or TTii are used.

PCC0400

Upforming cylinder readiness for TTi punching station

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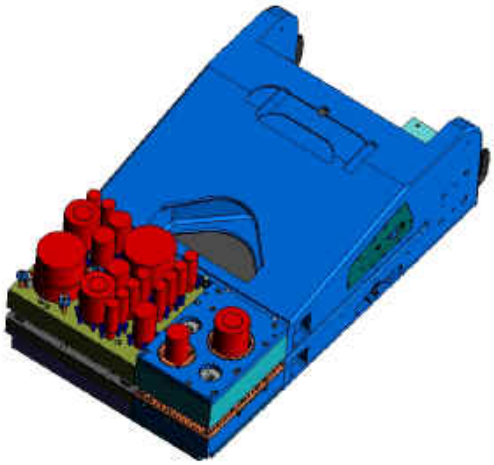
The punching station has been equipped with the hydraulic piping, the valves and the quick connectors for upforming cylinder readiness.
The both TT-cassettes has been machined for later upforming cylinder installation.
Standard die supports have been included to the delivery

PCC04BY	Tool Cassette of type TTii - left	1
PCC04BZ	Tool Cassette of type TTii - right	1



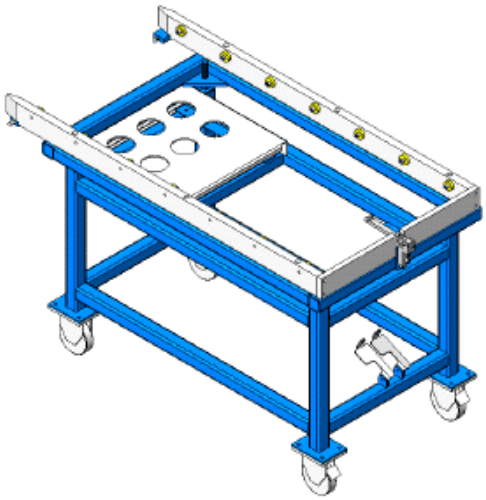
Designed for Punching station TTi for 2 indexing and 18 non-rotating Thick Turret tools as follows:

Non-rotating stations
-10 A stations up to Ø12,7 mm diameter
-4 B stations up to Ø31,75 mm diameter
-2 C stations up to Ø 50,80 mm diameter
-1 D stations up to Ø 88,90 mm diameter
-1 E stations up to Ø 114,0 mm diameter

Rotating stations
1 B stations up to Ø31,75 mm diameter
-1 C stations up to Ø 50,80 mm diameter

-Drive elements for rotation of punch and die
-Reach of all stations, min. 625 mm
-Delivered complete with C-frame, Punch attachment, Die plate and Die support
-The Day-light opening between the punch and the die 10 mm as standard for punching or 20 mm for embossing. To be specified in the order.
-One support plate under the tool cassette is delivered. This plate must be changed when tool cassettes TTi or TT are used.

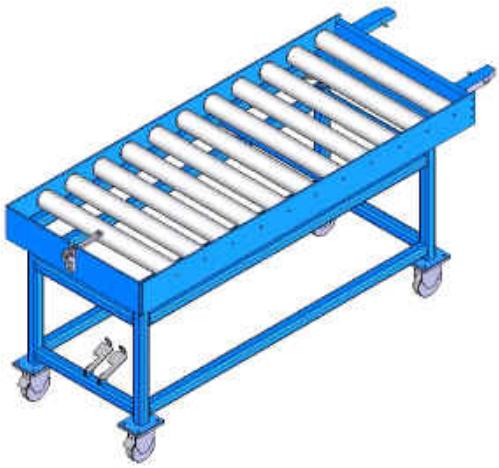
PCC1411	Attachment plate for hard tool for Hydraulic press HT -Thickness 16 mm -Supplied without any slug openings	1
PCC0420	Trolley for handling of Tool Cassettes	2



Designed for handling of all cassette types.
-Carries one cassette.
-Movable on wheels

PCC0421

Trolley for tool attachment plate of the HT station 1



Designed for hard tool handling
-Carries one hard tool
-Movable on wheels
-Adjustable height level

PCC1506

Discharge conveyor and Chute for small blanks 1

-Motor driven conveyor belt, length for up to 2 250 mm long blanks.
-Blanks smaller than 300*200 mm are guided down in a box through a pneumatic Chute.
-Blanks up to 700 mm length can be discharged through the chute.

PCC1530 Turning drum

Turning drum is used for turning blanks up side down to get the burr inside of the product.

It consists mainly of the following equipment:

- Welded steel frame
- Two motorised conveyor belts pressed and released with cylinders
- Motorised turning of the conveyor belts

Blank dimensions:

Width	200 … 1 250	mm

PCC15271 Stacker for piling of punched blanks up to length of 2 250 mm incl. one Lifting table 1

consisting of the following equipment:

-Motorised Roll conveyor for transporting the blank against a gauge in the rear activated in the NC-program.
-There are programmable stops mounted in the Roll conveyor as follows:
--For blank length of app. 700 … 2 250 mm in the rear.
--For blank length of app. 700 … 1 400 mm
--For blank length of app. 700 mm
--Piling is possible to three addresses only.
-Lifting device with suction cups traversing between the Roll conveyor and the Lifting table with the CNC.
-Hydraulic stationary Lifting table fitted for the pallet for blanks to be piled.

Blanks to be piled:
-Width 60 … 1 250 mm
-Length 200 ... 2 250 mm

Dimensions of the pile:
-Overall height incl. blanks and the pallet up to 500 mm (not valid for narrow blanks)

PCC1530	Turning drum for turning blanks to get the burr inside of the product -Two motorised conveyor belts pressed/released with cylinders -Motorised turning of the conveyor belts -Dimensioned for parts, X*Y, 300*200 to 1 250*1 250 mm	1
PCC0541	Motor driven metallic conveyor belts for conveying of slug to a container in front of the machine	1

-Designed for handling of slug coming from two punching stations only.
-Scrap parts of the Shear are guided in a separate scrap box supplied.
-Slug container does not belong to the scope of delivery

Programming software and hardware

PCC0810	PivaCam Software Package	1

- Runs in Windows 2000 and Windows XP user systems. Availability for other user systems proved

-Includes software for Part programming, Order file and down loading of NC-blocks

Part programming software including the following features:

-Introduction of 2D .dxf files for programming

-Tool library and Tool list for the current job

-Tool definition and sorting of tools acc. to shape

-Automatic programming of matching tools

-Programming of odd shapes with macros and subroutines

-Programming of hits with macros and subroutines

-Graphical editing of the punching program

-Down loading of product specific Flexpuch code

Definition of the Order list and calculation of NC-

-Selection of parts and batch sizes. Several batches can be ordered at the same time.

-Postprocessor for calculation of the NC blocks

-Down loading of NC blocks to the controller

	-Parts are run in accordance with the Order list created. **One PivaCam licence is included in the scope of delivery.**	
PCC0850	Micro computer for the Pivatic PCC Microcomputer is used for running of the programming software and Pivatic Multimedia -Industrial type Central unit incl. CD Station, Floppy Disc Station, Hard Disc Drive. -Windows XP User system in English -Data transmission cable, length 2 000 mm. **Safety devices fulfilling the requirements of 98/37 EEC directive acc. to the lay-out drawing:**	**1**
PCC1950	Safety fence of the Pivatic PCC consisting of: -Light curtain components including transmitters, mirror units and receivers mounted in posts made -Fence elements made of steel net and section steel tube frames, Height 2 000 mm, Width 1 000 mm	1