Q-SERIES

Q5, Q4, Q3
CNC Punching Machines
Sheet Metal

WWW.HACO.COM
For Impressive Performances
Q5: SO MUCH MORE THAN JUST A PUNCH PRESS

With its 22 or 30 ton high-speed hybrid servo hydraulic punching head, Y-axis (throat) of 1600 mm (62.99”) and high speed rotation axis for all tools, the HACO Q5 is the perfect and most flexible CNC turret punching machine. The HACO Q5 series can handle medium and large sheet formats (2.500 x 1.500 mm or 3.000 x 1.300mm) (100” x 60” or 120” x 60”). With a free clearance of 80 mm (3.15”) between brush table and ATC, the Q5 is not only ideal for punching, but also for high forming applications. The giant part chute door and high speed sheet movements guarantee high volume production performances.

STANDARD EXECUTION

- High-speed hybrid servo-electric hydraulic punching head.
- 7 Axes CNC TPS 845 Graphics Control with 22” Touch Screen.
- Double Y-axes gantry for maximum speed and accuracy.
- Standard slug vacuum pump avoids the need of expensive ‘slug stop dies’.
- CE Optical Safety System around machine.
- Double Y-axes Drives System (Y1, Y2).

OPTIONAL

- Toolholders
- Large servo sliding part chute door 725 x 1500 mm (28.54” x 60”) with part detection sensors.
- Automatic oil spray system for tool lubrication.
- Quick tool set for tool alignment

ADVANTAGES

- All tools are 360˚ high speed auto indexable.
- Easy, safe and fast loading of tools into the toolchanger.
- Each tool station takes any tool (also indexable MultiTool).
- No complex toolchanger composition = faster set up.
- No toolchanger station wear, no toolchanger adjustments.
- Better adjustment for punch and die clearance than classic turret punching machines.
- Positive tool clamping (no spring forced return stroke).
- Full control of Z-axis stroke.
- Axis interpolation (application of wheel tools and rigid tapping).
- Stripping plate with hold down function.
- Urethane strippers for scratch free production.
- Programs can be nested at any angle which results in optimal sheet usage and minimum rest sheet.
- Automatic clamp setting by CNC = faster production times.
- Single Clamp repositioning.
- Automatic clamp repositioning by CNC = max. sheet usage.
- Fast toolchange done by bi-directional rotation of the floating tool-changer by means of automatic selection of the shortest rotation to the next tool.
- Standard slug vacuum pump avoids the need of expensive ‘slug stop dies’.
- Double Y-axes gantry for maximum speed and accuracy.
- Helical Rack and pinion drive for X-axis.
- Big part chute door with part sensor and integrated conveyor belt.
- Energy saving via energy recovery from the motor drivers.
- Up to 70 mm (2.75”) bending height

The overdimensioned frame is stress-relieved by thermal treatment before machining, resulting in performant high accuracy. The user friendly graphical programming system, the automatic tool change system, the rotation of all tools, the comfortable sheet loading and the large sheet support brush tables are just some of the characteristics of the HACO Q5.
### TECHNICAL SPECIFICATIONS

#### GENERAL

<table>
<thead>
<tr>
<th>Capacity in tons</th>
<th>22 Ton (24US tons)</th>
<th>30 Ton (33US tons)</th>
<th>22 Ton (24US tons)</th>
<th>30 Ton (33US tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum plate thickness</td>
<td>6,5mm (0,256&quot;)</td>
<td>6,5mm (0,256&quot;)</td>
<td>6,5mm (0,256&quot;)</td>
<td>6,5mm (0,256&quot;)</td>
</tr>
<tr>
<td>Number of indexable tools (standard)</td>
<td>20 - 200*</td>
<td>20 - 200*</td>
<td>20 - 200*</td>
<td>20 - 200*</td>
</tr>
</tbody>
</table>

#### Punching mechanism

- Hybrid servo-electro-hydraulic
- Hybrid servo-electro-hydraulic
- Hybrid servo-electro-hydraulic
- Hybrid servo-electro-hydraulic

#### CNC control

- TPC 84S Graphics
- TPC 84S Graphics
- TPC 84S Graphics
- TPC 84S Graphics

- Full HD touch screen
- Full HD touch screen
- Full HD touch screen
- Full HD touch screen

#### STRIPPERPLATES

- Standard Trumpf® Style
- Standard Trumpf® Style
- Standard Trumpf® Style
- Standard Trumpf® Style

- Optional Urethane Strippers (2-4-1 Style)
- Optional Urethane Strippers (2-4-1 Style)
- Optional Urethane Strippers (2-4-1 Style)
- Optional Urethane Strippers (2-4-1 Style)

#### HITRATES (depending on material thickness, nibbling step, sheet weight)

- Punching/nibbling max. 1200 hpm
- Punching/nibbling max. 1200 hpm
- Punching/nibbling max. 1200 hpm
- Punching/nibbling max. 1200 hpm

#### AXES STROKES

<table>
<thead>
<tr>
<th>Axis</th>
<th>2580 mm (101,57&quot;)</th>
<th>2580 mm (101,57&quot;)</th>
<th>3080 mm (121,25&quot;)</th>
<th>3080 mm (121,25&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1-Y2-Axis</td>
<td>1615 mm (63,58&quot;)</td>
<td>1615 mm (63,58&quot;)</td>
<td>1615 mm (63,58&quot;)</td>
<td>1615 mm (63,58&quot;)</td>
</tr>
<tr>
<td>Axes (fixed rotation)</td>
<td>360°</td>
<td>360°</td>
<td>360°</td>
<td>360°</td>
</tr>
</tbody>
</table>

#### AXES SPEEDS (depending on material thickness, sheet weight)

<table>
<thead>
<tr>
<th>Axis</th>
<th>150 m/min (5905 IPM)</th>
<th>150 m/min (5905 IPM)</th>
<th>150 m/min (5905 IPM)</th>
<th>150 m/min (5905 IPM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1-Y2-Axis</td>
<td>80 m/min (3149 IPM)</td>
<td>80 m/min (3149 IPM)</td>
<td>80 m/min (3149 IPM)</td>
<td>80 m/min (3149 IPM)</td>
</tr>
</tbody>
</table>

#### SHEET DIMENSIONS

<table>
<thead>
<tr>
<th>X-Axis before repositioning</th>
<th>2540 mm (100&quot;)</th>
<th>2540 mm (100&quot;)</th>
<th>2540 mm (100&quot;)</th>
<th>2540 mm (100&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y - Axis (throat depth)</td>
<td>1600 mm (63&quot;)</td>
<td>1600 mm (63&quot;)</td>
<td>1600 mm (63&quot;)</td>
<td>1600 mm (63&quot;)</td>
</tr>
</tbody>
</table>

#### SHEET CLAMPS

- Number of clamps | 3 Hydraulic | 3 Hydraulic | 3 Hydraulic | 3 Hydraulic |
- Position checked by CNC control | YES | YES | YES | YES |
- Automatic repositioning of 3 clamps together | YES | YES | YES | YES |
- Automatic Individual clamp repositioning * | YES | YES | YES | YES |

#### SERVO SLIDING PART CHUTE DOOR DIMENSION

- Servo sliding door * | 725mm x1500mm (28,54" x 59") | 725mm x1500mm (28,54" x 59") | 725mm x1500mm (28,54" x 59") | 725mm x1500mm (28,54" x 59") |

#### ADDITIONAL STANDARD EQUIPMENT

- Air vacuum pump | YES | YES | YES | YES |
- Tool lubrication system * | YES | YES | YES | YES |
- Energy recuperation system | YES | YES | YES | YES |

#### ADDITIONAL MACHINE SPECIFICATIONS

- Weight | 13000Kg (28000lbs) | 14000 Kg (30800 lbs) | 13000 Kg (28000 lbs) | 14000 Kg (30800 lbs) |
- Width (X-direction) | 5600 mm (18,17 ft) | 5600 mm (18,17 ft) | 6400 mm (21 ft) | 6400 mm (21 ft) |
- Length (Y-direction) | 6150 mm (20,17 ft) | 6150 mm (20,17 ft) | 6150 mm (20,17 ft) | 6150 mm (20,17 ft) |
- Height | 2270 mm (7,45 ft) | 2270 mm (7,45 ft) | 2270 mm (7,45 ft) | 2270 mm (7,45 ft) |
- Connection load (50Hz) | 34 kW (46 HP) | 34 kW (46 HP) | 41 kW (55,7 HP) | 41 kW (55,7 HP) |
- Connection load (60Hz) | 41 kW (55,7 HP) | 41 kW (55,7 HP) | 41 kW (55,7 HP) | 41 kW (55,7 HP) |
- Average Power consumption (50Hz) | 7,8 kW (10,44HP) | 7,8 kW (10,44HP) | 7,8 kW (10,44HP) | 7,8 kW (10,44HP) |
- Average Power consumption (60Hz) | 9,4 kW | 9,4 kW | 9,4 kW | 9,4 kW |
- Stendby power consumption | 0,6 kW | 0,6 kW | 0,6 kW | 0,6 kW |
- Compressed air supply | 6 bar (87 psig) | 6 bar (87 psig) | 6 bar (87 psig) | 6 bar (87 psig) |

#### OTHER INFO

- Clearance between table and ATC | 80 mm (3,15") | 80 mm (3,15") | 80 mm (3,15") | 80 mm (3,15") |
- Bending capability | 70mm (2,7") | 70mm (2,7") | 70mm (2,7") | 70mm (2,7") |

* Specifications can be changed without prior notice.

* With indexable Multi-Tool
### Q3-Q4: A perfect punching machine

With its 22 or 30 ton high-speed servo hydraulic punching head, X-axis (throat) of 1600 mm (62.99") and rotation axis for all tools, the HACO Q3-Q4 is the perfect and most flexible CNC turret punching machine. The HACO Q-series converts your workshop into one with the highest productivity and flexibility that can be achieved with CNC sheet metal punching machines, without high investments, but also without the compromises of the conventional turret punching machine. Its optimum price/quality ratio translates itself into a profitable investment.

#### STANDARD EXECUTION

1. **X-axis up to 80” (Q3) and 100” (Q4)**
2. **Y-axis (60’’)**
3. **Standard Part Chute Door (300 mm x 470 mm) (11.8” x 18.5”)**
4. **22-30 ton HS Hybrid Servo-Electric Hydraulic Punching Head**
5. **All tools are 360° Auto Indexable**
6. **12 or 20 Station Automatic Bi-directional Tool Changer**
7. **Output Conveyor for evacuated parts (option)**
8. **Fully supported Brush Tables**
9. **3 Programmable Sheet Clamps**
10. **22” TPS 84S Graphics Control (Siemens 840D)**

#### OPTIONAL

- Programs can be nested at every angle which results in optimal sheet usage and minimum rest sheet.
- Urethane strippers for scratch free production.
- Stripping plate with hold down function.
- Positive tool clamping (no spring forced return stroke).
- Full control of Z-axis stroke.
- Hot striping (application of wheel tools and rigid tapping is possible).
- Automatic clamp repositioning by CNC = max. sheet usage.
- Automatic tool changer system positions the active tool from the toolchanger into the punching head. Traditional ‘turret wear’ is hereby eliminated. The Q-series concept allows rotating (auto-indexing) of all tools at a speed of 122 ms for 90° tool rotation which is considerably increasing the performance and flexible application of the tooling. Moreover, the number of necessary tool change can be reduced with 40 to 70%!

#### ADVANTAGES

- **Up to 70mm (2.75”) bending height.**
- **Energy saving via energy recovery from the motor drivers.**
- **Big part chute door with part sensor and integrated conveyor belt.**
- **Standard slug vacuum pump avoids the need of expensive ‘slug stop dies’.**
- **Easy, safe and fast loading of tools into the toolchanger.**
- **No complex toolchanger composition = faster set-up.**
- **Better adjustment for punch and die clearance than classic turret punching machines.**
- **Complete toolchanger station wear, no toolchanger adjustments.**
- **No toolchanger station wear, no toolchanger adjustments.**
- **Full control of Z-axis stroke.**
- **CNC interpolating (application of wheel tools and rigid tapping is possible).**
- **Up to 70mm (2.75”) bending height.**
- **Automatic oil spray system for tool lubrication**
- **Quick tool set for tool alignment**
- **Automatic tool change system positions the active tool from the toolchanger into the punching head. Traditional ‘turret wear’ is hereby eliminated. The Q-series concept allows rotating (auto-indexing) of all tools at a speed of 122 ms for 90° tool rotation which is considerably increasing the performance and flexible application of the tooling. Moreover, the number of necessary tool change can be reduced with 40 to 70%!**
# TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Section</th>
<th>OS 2021-12</th>
<th>OS 2021-10</th>
<th>OS 2023-10</th>
<th>OS 2023-20</th>
</tr>
</thead>
</table>
## GENERAL
- **Capacity in ton**: 22 Ton (24US tons) / 30 Ton (33US tons)  
- **Maximum plate thickness**: 6.5mm (0.256")
- **Number of indexable tools (standard)**: 12 - 120*  
- **Punching mechanism**: Hybrid servo electro-hydraulic
- **CNC control**: TPC 84S Graphics
- **Maximum tool diameter/diagonal**: 76,4 mm (3")
- **Tool concept**: Standard Trumpf® style
- **Maximum tool diameter/diagonal**: 76,4 mm (3")
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- **Maximum tool diameter/diagonal**: 76,4 mm (3")
- **Numerical control**: TPC 84S Graphics
- **Maximum tool diameter/diagonal**: 76,4 mm (3")
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- **Maximum tool diameter/diagonal**: 76,4 mm (3")
- **Maximum tool diameter/diagonal**: 76,4 mm (3")

## TOOL CONCEPT
- **Maximum tool diameter/diagonal**: 76,4 mm (3")
- **Maximum tool diameter/diagonal**: 76,4 mm (3")
- **Maximum tool diameter/diagonal**: 76,4 mm (3")
- **Maximum tool diameter/diagonal**: 76,4 mm (3")

## STRIPPERPLATES
- **Standard**: Trumpf® Style steel strippers
- **Standard**: Trumpf® Style steel strippers
- **Standard**: Trumpf® Style steel strippers
- **Standard**: Trumpf® Style steel strippers

## STRIPPERPLATES
- **Optional**: Urethane Strippers (2-4-1 Style)
- **Optional**: Urethane Strippers (2-4-1 Style)
- **Optional**: Urethane Strippers (2-4-1 Style)
- **Optional**: Urethane Strippers (2-4-1 Style)

## H.TRATES (depending on material thickness, nibbling step, sheet weight)
- **Punching/nibbling max.** 1200 hpm
- **Tooling** max. 1200 hpm
- **Tooling** max. 1200 hpm
- **Tooling** max. 1200 hpm

## AXES STROKES
- **X-Axis**: 2056 mm (80.94")
- **Y1-Y2-Axes**: 1600mm (63")
- **C1-C2-Axes**: 360°
- **Z-Axis**: 37mm (1.456")
- **X-Axis**: 2056 mm (80.94")
- **Y1-Y2-Axes**: 1600mm (63")
- **C1-C2-Axes**: 360°
- **Z-Axis**: 37mm (1.456")
- **X-Axis**: 2056 mm (80.94")
- **Y1-Y2-Axes**: 1600mm (63")
- **C1-C2-Axes**: 360°
- **Z-Axis**: 37mm (1.456")

## SHEET DIMENSIONS
- **X-Axis before repositioning**: 2032 mm (80")
- **X-Axis**: 2032 mm (80")
- **X-Axis**: 2032 mm (80")
- **X-Axis**: 2032 mm (80")
- **Y-Axis**: 1600mm (63")
- **Y-Axis**: 1600mm (63")
- **Y-Axis**: 1600mm (63")
- **Y-Axis**: 1600mm (63")
- **Max. sheet weight**: 150 kg (330 lbs)
- **Max. sheet weight**: 170 kg (374 lbs)
- **Max. sheet weight**: 170 kg (374 lbs)
- **Max. sheet weight**: 170 kg (374 lbs)

## PROGRAMMING ACCURACIES
- **X-Y Axes**: 0,01 mm (0,0004")
- **X-Y Axes**: 0,01 mm (0,0004")
- **X-Y Axes**: 0,01 mm (0,0004")
- **X-Y Axes**: 0,01 mm (0,0004")

## SHEET CLAMPS
- **Number of clamps**: 3 Hydraulic
- **Clamp settings**: YES
- **Automatic repositioning of 3 clamps together**: YES
- **Automatic individual clamp repositioning**: NO

## PART CHUTE DOOR DIMENSIONS
- **Small part chute door (X,Y)**: 300mm x 470mm (11,8" x 18,5")
- **Small part chute door (X,Y)**: 460mm x 200mm (17,3" x 7,8")
- **Small part chute door (X,Y)**: 460mm x 200mm (17,3" x 7,8")
- **Small part chute door (X,Y)**: 460mm x 200mm (17,3" x 7,8")

## ADDITIONAL STANDARD EQUIPMENT
- **slug vacuum pump**: YES
- **Too lubrification system**: OPTION
- **energy recuperation system**: YES
- **energy recuperation system**: YES

## ADDITIONAL MACHINE SPECIFICATIONS
- **Weight**: 11000 Kg (24200 lbs)  
- **Width (X-direction)**: 4080 mm (13,18 ft)
- **Length (Y-direction)**: 5310 mm (17,42 ft)
- **Height**: 3270 mm (12,8 ft)
- **Connection load (50Hz)**: 25 kW (33,5 HP)
- **Connection load (60Hz)**: 32 kW (43 HP)

## OTHER INFO
- **Clearance between table and ATC**: 25mm (1")
- **Bending capability**: 70mm (2.75")

*Specifications can be changed without prior notice.*
The clamps are set automatically according to the CNC program, minimizing clamp dead zones. When changing production from full size to small sheets, clamp settings can be made automatically without the risk of operator mistakes and without wasting operator time.

* ONLY ON Q5

Every clamp is individually movable while the sheet is still clamped by the two other clamps, resulting in better part accuracy. Traditional repositioning with all clamps together can be made as well.

360° INDEXABILITY OF ALL PUNCHING TOOLS

High speed bidirectional tool rotation

The robust high-speed hybrid servo-hydraulic punching head ensures 22 or 30 tons punching capacity through material thicknesses up to 6.5 mm (0.256”). The programmable punching stroke, tonnage and speed, as well as the indexability of all tools turn the HACO Q5 series into highly flexible punching machines. With the large fully-brushed sheet support tables and the standard repositioning cylinders, all standard sheet sizes can be processed.

PRODUCTIVITY THROUGH FLEXIBILITY... AND INDEXABILITY

AUTOMATIC SINGLE CLAMP MOVE: PART ACCURACY

The punch-holder is clamped automatically into the punching head during the tool change. A hydraulic quick-clamping system is pulling the punch-holder into the punching head, by which the lower part of the punching head (ram) is acting as a mechanical gauge, thus avoiding clearance between punch holder and punching head. While punching, the punch holder and punching head are always connected. The stripper, which is fixed to the punch holder, has two functions:

• It pushes the plate onto the die holder during the punch stroke, serving as a hold-down, leading to minimum material deformation.

• It ensures that the plate is stripped from the punch during the return stroke.

As the punch is connected to the punching head, it always returns to the same position. This prevents the punch to stick in the plate, an inconvenient but unavoidable problem with the traditional spring-forced return stroke of most classic toolchanger machines.

POSITIVE TOOL CLAMPING

Traditional float tapping or rigid tapping with interpolation, your choice. With the Q5 series single head punching machines you can use the traditional float tapping system, using a special tap holder. This special float tapping holder will generate the down and up movement for the tap while the C1 axis generating the tap rotation.

Revolutionary rigid tapping uses the interpolation capability of the Z and C1 Axis. The tap rotation is still generated by the C1 axis while the tap moves down/up through the Z-axis. With rigid tapping you only need a standard punch holder and a tap insert.

REDUCE TAPPING COSTS

More flexibility and reduced labour costs with the Q5 optional giant part chute door. Automatic part chute door with part detection sensor and integrated conveyor belt to unload the finished parts automatically to the front of the machine.

* OPTIONAL, ONLY ON Q5

725 mm x 1500 mm (28.5” x 60”)

More flexibility and reduced labour costs with the Q5 optional giant part chute door. Automatic part chute door with part detection sensor and integrated conveyor belt to unload the finished parts automatically to the front of the machine.

* ONLY ON Q5

To increase its flexibility even more, the HACO Q-series can take 5 or 10 station indexable multitools. We offer a complete range of tools for special applications such as bending, embossing, forming, bending, tapping, 40 character ID stamping, marking and all wheel tools.
The user friendly TPS 84S Graphics control (Siemens 840®D) 22” full HD Touch Screen

The TPS 84S Graphics offers you flexibility, a uniform structure for operation, programming and visualization, and optimum integration into networks. It provides a system platform with trendsetting functions for punching applications.

The TPS84S Graphics’ strongly innovative design, using the know-how and experience of many years, offers everything you need to fit the high demands in contemporary punching. The highspeed control, fast processing and intuitive user interface result in an innovative system capable of handling simple as well as complex tasks.

The controller is driven by high performance, PC-based hardware, allowing very fast processing of data and highly accurate calculation of punching operations.

From the initial idea to the production of parts, The TPS 84S Graphics controller is your ideal partner for punching productions.

Adaptive Stroke Optimizes Productivity and Safety

The software will automatically calculate the optimum retraction height for every ram stroke. This ensures that the tool is kept close to the sheet when travelling from one position to another in order to increase the productivity. The software automatically increases the ram stroke when travelling over deformations to avoid tool collisions.

Fast and simple programming with HACO off-line software HACO Punch Pro

A user-friendly Windows® based software package has been developed for controlling the integrated work-flow and interaction between the different sheetmetal working machines of your workshop. It is available in different flexible modules. In this way, you only need to invest in that software-configuration which suits your specific workshop situation. Additionally, packages can be integrated in case of combination of several machines. From 3D design of the workpiece, over tool-assigning, to nesting and editing of the necessary machine programs and parameters, your work-preparation can be done by one software package.

Advanced User Interface

The highly advanced controller software offers a vast amount of features, making it one of the most complete packages available today. The easy layout of the user interface allows direct access to the desired functions, creating optimum operator convenience. Graphical visualisation and adjustable settings guarantees a continuous monitoring of the entire production process.

Network Support

The TPS 84S Graphics can easily be connected to any new or existing network, resulting in easy data transfer (programs) and machine monitoring between the controller and one or multiple PCs. Access to the control is possible from anywhere on the network. The extensive networking even allows communication between the punching machine and other sheetworking machines, such as press brakes and plasma cutting machines.

Automatic and Semi Automatic Sheet Loading and Unloading System

Automatic systems with part sorting capability and complete warehouse systems are available with the O-series punching machines. Loading and unloading can be done at the same machine side, which results in a minimum space requirement.
HACO ALLOWS OFFERS

Fiber Laser Cutting Machines
HACO introduces innovative fiber laser cutting machines that guarantee unmatched accuracy and speed. Our all-in-one laser cutting cells offer rigidity combined with high dynamics.

CNC Shears
We offer hydraulic sheet metal guillotine shears that can cut up to 32 mm thick mild steel sheets, up to 6 m long.

CNC Press Brakes
HACO is a specialist in sheet metal fabrication and routinely produces press brakes for a diverse group of industries.