CMA CNC-controlled drilling-center
Model 3RD-CNC

The CMA 3RD-CNC drilling center is the third generation of succesful predecessor models used daily on all continents of the world. The machine is equipped with the latest generation industrial PC-control, servodrivers en servomotors produced by OMRON (Japan).

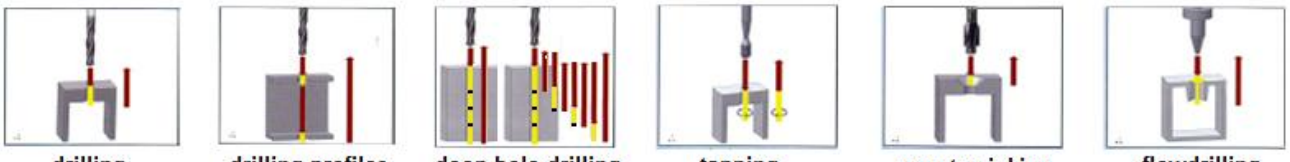
Which capabilities should a drilling-center offer?

- fast and easy drilling on the ***exact position*** (an incorrect positioned hole leads to problems during assembly and high additional costs)
- suitable for ***single-parts*** (1 or 2 holes drilled in manual-mode) and for ***small and large series***
- possibility to use ***conventional HSS-drills as well as modern Carbide-drills*** for fast production
- production of ***(several) small as well as large workpieces***
- suitable for ***drilling, tapping, countersinking and flowdrilling***
- perform ***light milling-jobs*** to avoid product must be clamped / set-up on 2 machines

Unique features of the TRD-CNC drilling-center:

- easy intuitive graphical programming, including GoTo-function in manual mode
- free programming in ISO-language (G-codes), f.e. complex milling-shapes, threadmilling, use of special tooling like deburring-tools
- 2-axis interpolation on X/Y-axis, 3 axis interpolation for helical milling (X/Y/Z-axis)
- positioning-speed X-axis = 30 m/min., Y-axis = 30 m/min.

3RD 4506 CNC with options



CMA MACHINE TOOLS

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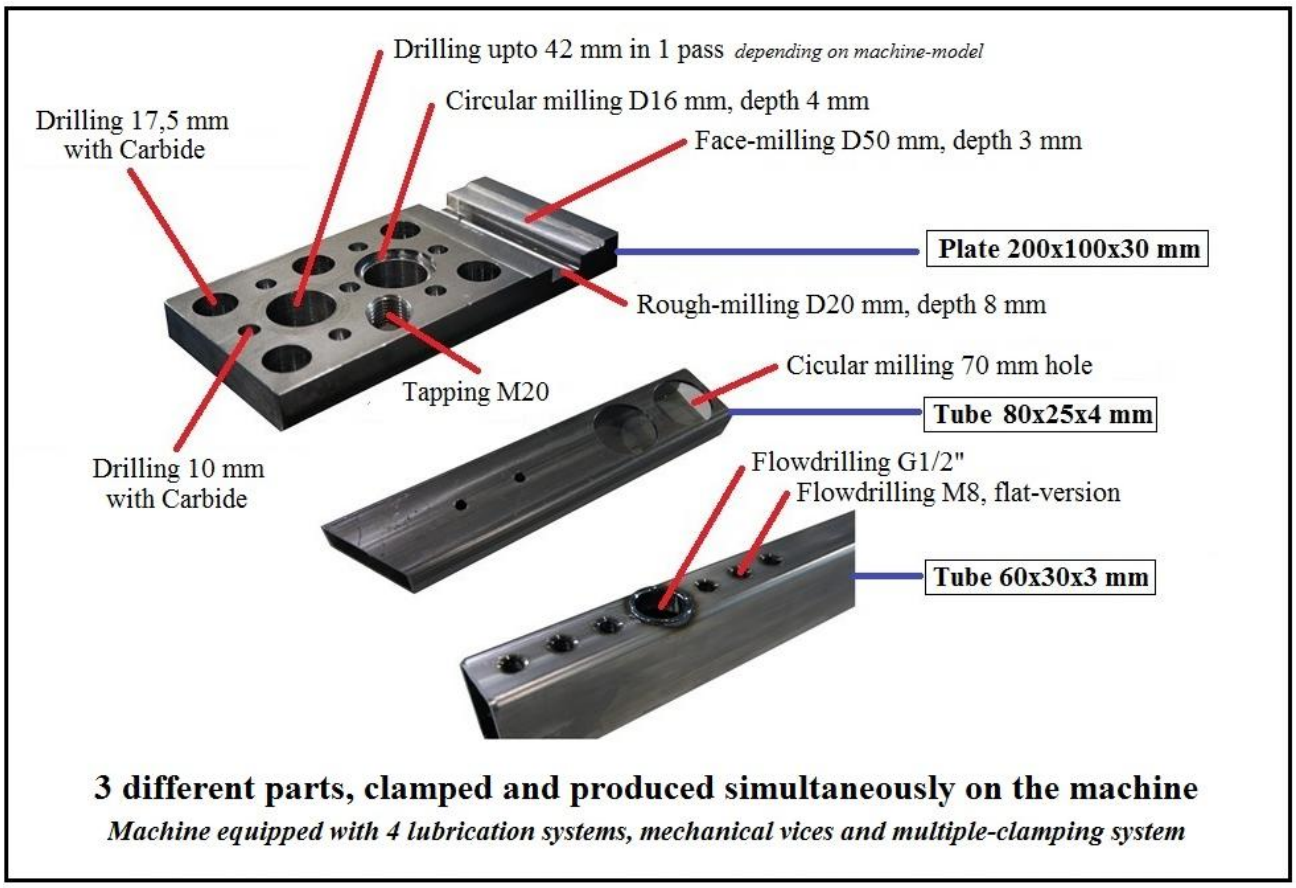
Flexibility and productivity combined in 1 machine



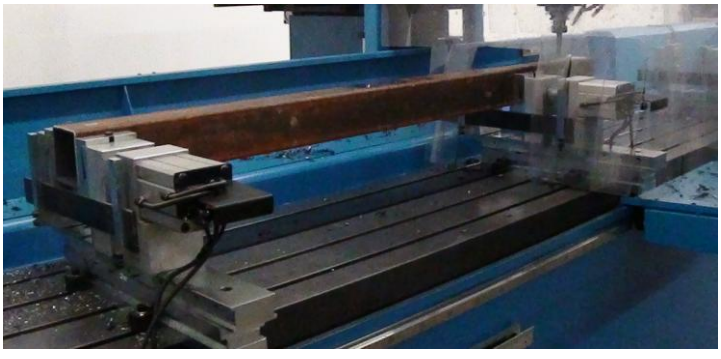
3 different parts, clamped and produced simultaneously on the machine

Machine equipped with 4 lubrication systems, mechanical vices and multiple-clamping system

Round tube with 4 axis, set-up <5 minutes

Multiple clamping of small parts on jig

Flange in Hardox 400



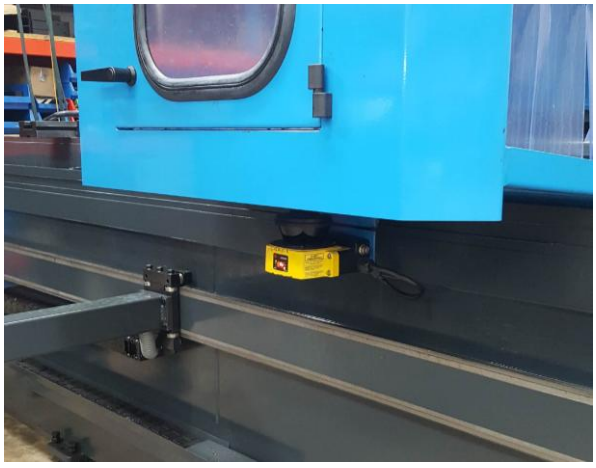
Square tube 150 mm, length 2,5 m

Standard equipment

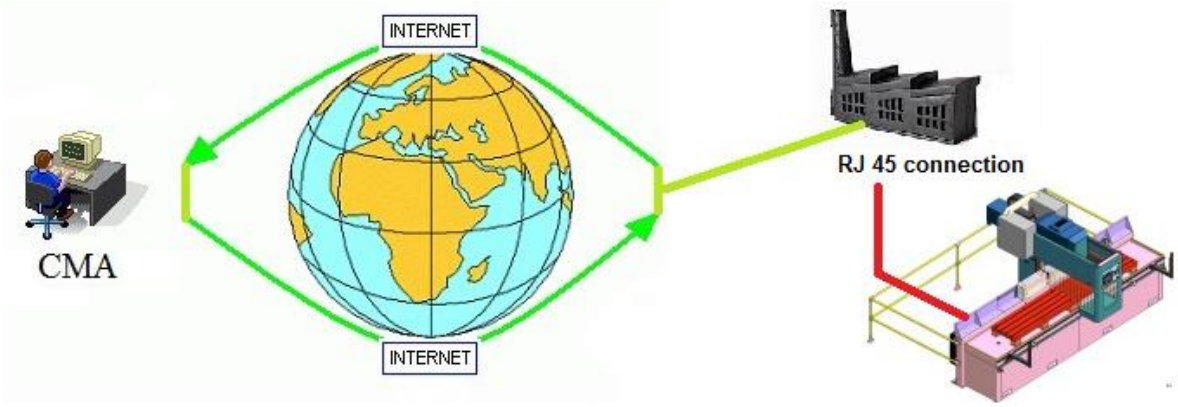
- **Automatic rotary toolchanger with 10 positions, fitted in the column of the machine**


- max. diameter of toolholder 88 mm
- max. length of tool 300 mm

- **Laser-scanner for working in 2 areas, including cover around drilling head**




- **Connection and software for teleservice**



All software is supplied with the machine.
During the warranty-period teleservice is free of charge.

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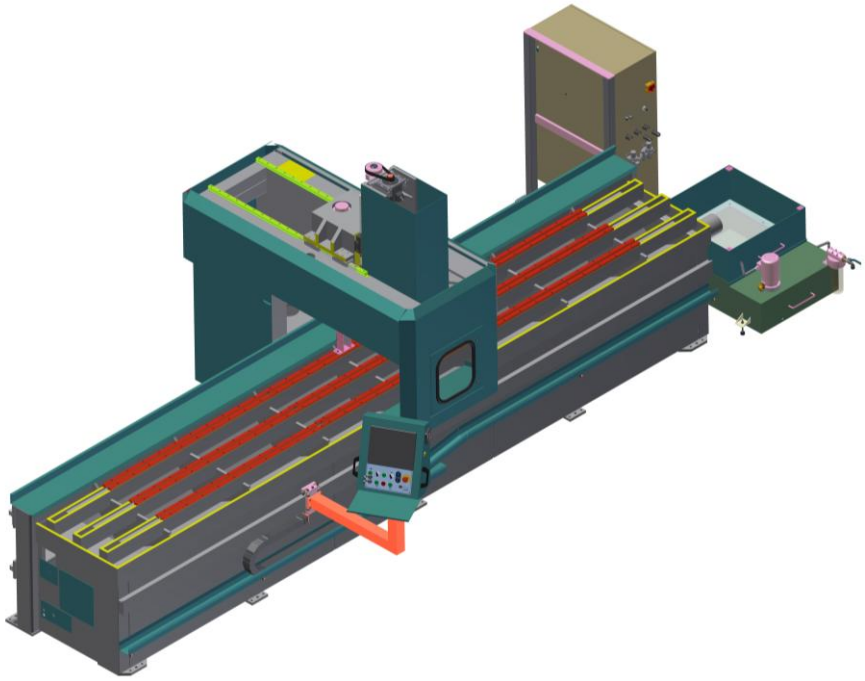
Construction, stability and high quality components without compromise



1. Spindle BT 40
- 5-bearings diameter 110/60 mm (3x angular contact type 7212, 2x standard type 6212)
- suitable for high axial and radial loads = drilling and milling

2. Guidance system X-axis
- 2x 45 mm linearguides, each with 2 bearingblocks with circulating balls

3. Driving system X-axis
- helical precision rack and pinion, stroke 3000-16500 mm

4. Guidance system Y-Axis
- 2x 35 mm linearguides, each with 2 bearingblocks with circulating balls

5. Driving system Y-axis
- 25 mm ballscrew, stroke 600 mm

6. Guidance system Z-axis
- 2x 35 mm linearguides, each with 2 bearingblocks with circulating balls

7. Driving system Z-axis
- 32 mm ballscrew, stroke 450 mm

8. LAPP cables and IGUS energy chains (Germany)

The machine is available in lengths from 3 to 16,5 m

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OMRON industrial 12“ Touchscreen PC (Windows 7) with 128 GB memory

Dialogue- and ISO programming, the best of both

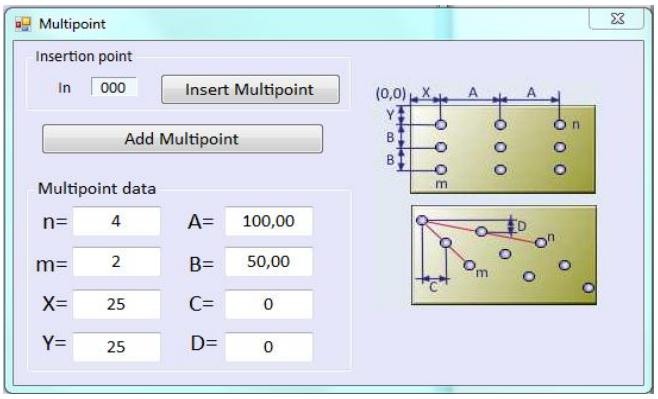
The control, in multiple aspects, is the heart of the machine. Because of that, it has to offer a combination of flexibility and ease of working, precision and reliability.

CMA-system dialogue programming of coordinates and standard working cycles

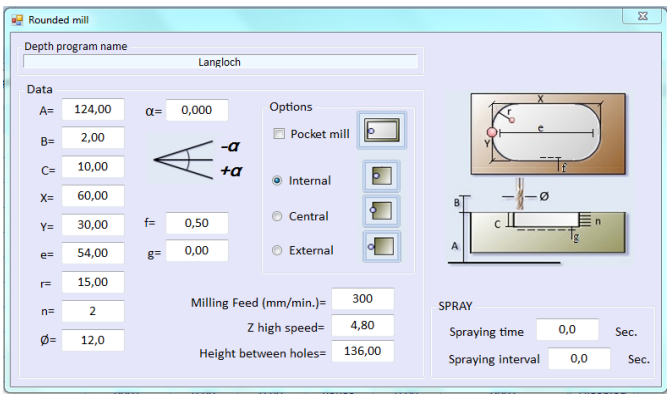
Easy to program means several things: All applications have to be completely programmed in a simple fashion. During the programming, the operator should not be burdened by hundreds of possibilities to choose from and that he doesn’t need for the job or that he needs to enter as routines that are superfluous because they don’t play a roll.
The control should only show the required functions that are needed and ask for the data needed to perform that function. In short: Just the required data, no more no less.

Simply enter the data in the macro and save under a (logical) name. The complete job (even several different workpieces clamped simultaneously) can be programmed in a sequence. The operator can choose to produce all parts in 1 run or work in 2 areas (loading new parts while machine is producing in the other area).

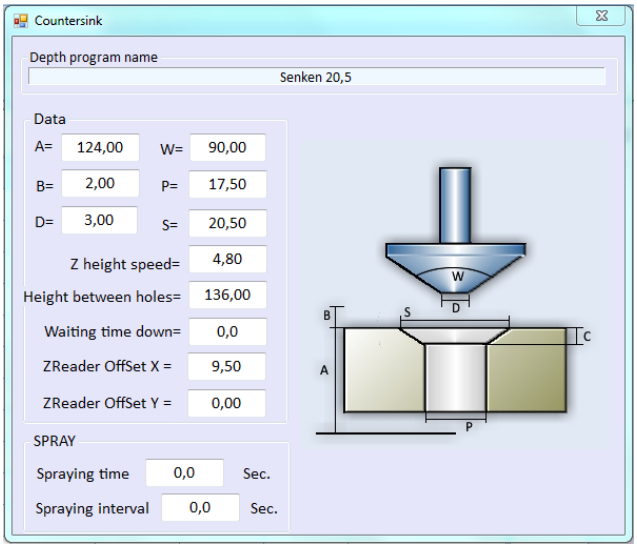
Examples of some standard macros



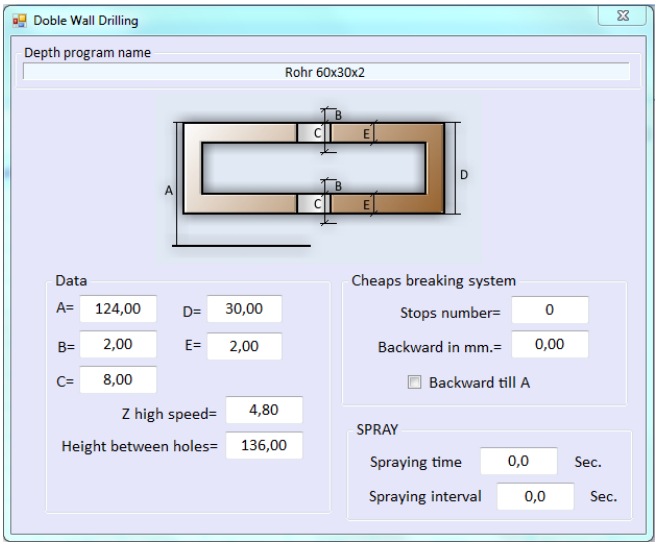
Grid



Oblong holewith programmable finish-run

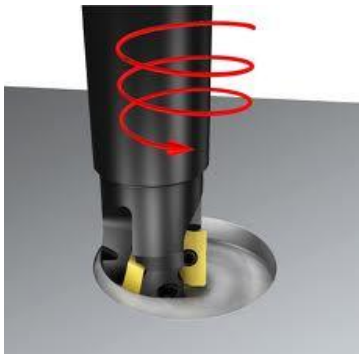


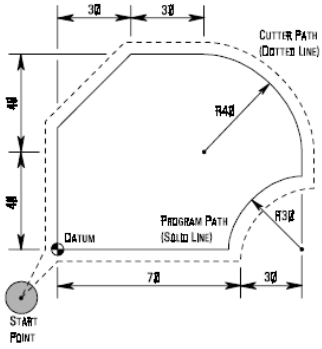
Countersinking, depth is calculated automatically

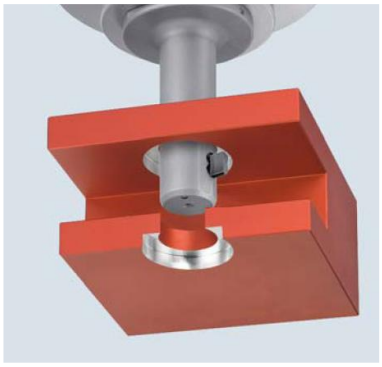


Profile with intermediate rapid movement

Free programming in ISO (G-codes)
Drilling, peck-drilling, tapping, flowdrilling, reaming, boring and back-boring are programmable through canned cycles. In ISO it's possible to program complex shapes with interpolated X/Y-movements. The system offers 3-axis (X/Y/Z) interpolation for helical milling of large holes and threadmilling.







Large holes
Holes above the drilling-capacity of the machine can be made by helical milling. Advantage is that with 1 tool a large range of hole-diameters can be made (f.e. 25 mm mill, range in 1 pass 32-50 mm, 35 mm mm range in 1 pass 52-70 mm). In multiple passes it's possible to mill even larger holes.

Beispiele 20 mm Materialstärke:
40 mm Loch mit 25 mm Fräser: 24 Sekunden
75 mm Loch mit 42 mm Fräser: 50 Sekunden

```
O1234
N10 M7 T2
N20 G52 Q200
N30 G0 G90 G54 X50 Y50 Z50 M3 H1
N40 Z2 M12
N50 G1 G91 G42 X-25 F500
N60 G2 X0 Y0 Z-1 F3000 L20
N70 G1 G40 X20 F500
N80 G0 Z50 M9
N90 M30
```

OMRON Touch-Screen-Control
- industrial PC-control with 12" Touchscreen (Windows 7) and 128 GB memory
- GoTo-function in manual-mode (fast and easy drilling/tapping of single-holes with controlled RPM and feed without necessity to write a complete sequence)
- easy graphical Dialogue-Programming of cycles
- free programming in ISO
- 99 programmable zeropoints

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External programming

DrillWin NJ 13

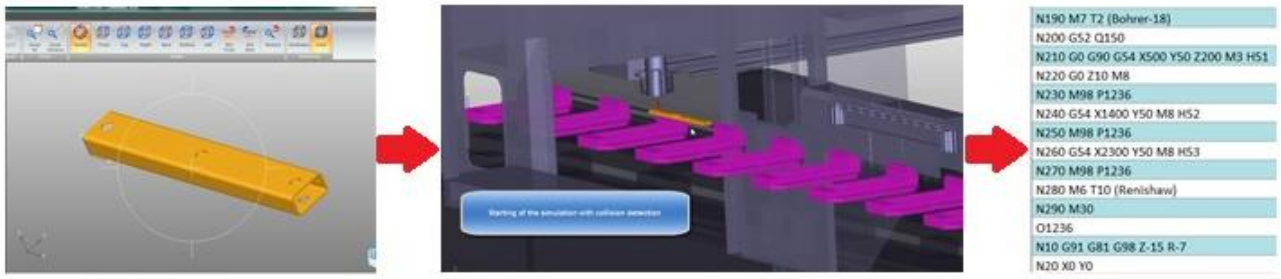
Write programs on external PC

- Coordinate-programs
- Depth-programs (drilling-cycles)
- Sequences

Programs can be saved on and loaded from the external PC through the Ethernet connection

DrillCam

Complete CAD-CAM software for converting 2D DXF, DWG, DSTV, NC, NC1 or 3D STEP, IGES files into ISO machine-programs. Loading of programs into the control of the machine through Ethernet connection. Speed (rpm) and feed of tools are automatically set based on programmable library for different types of tools and materials. Including 3-D simulation, collision-warning, multiple table-settings (vices and or other clamping systems)



drawing *3-D simulation* *ISO-program*

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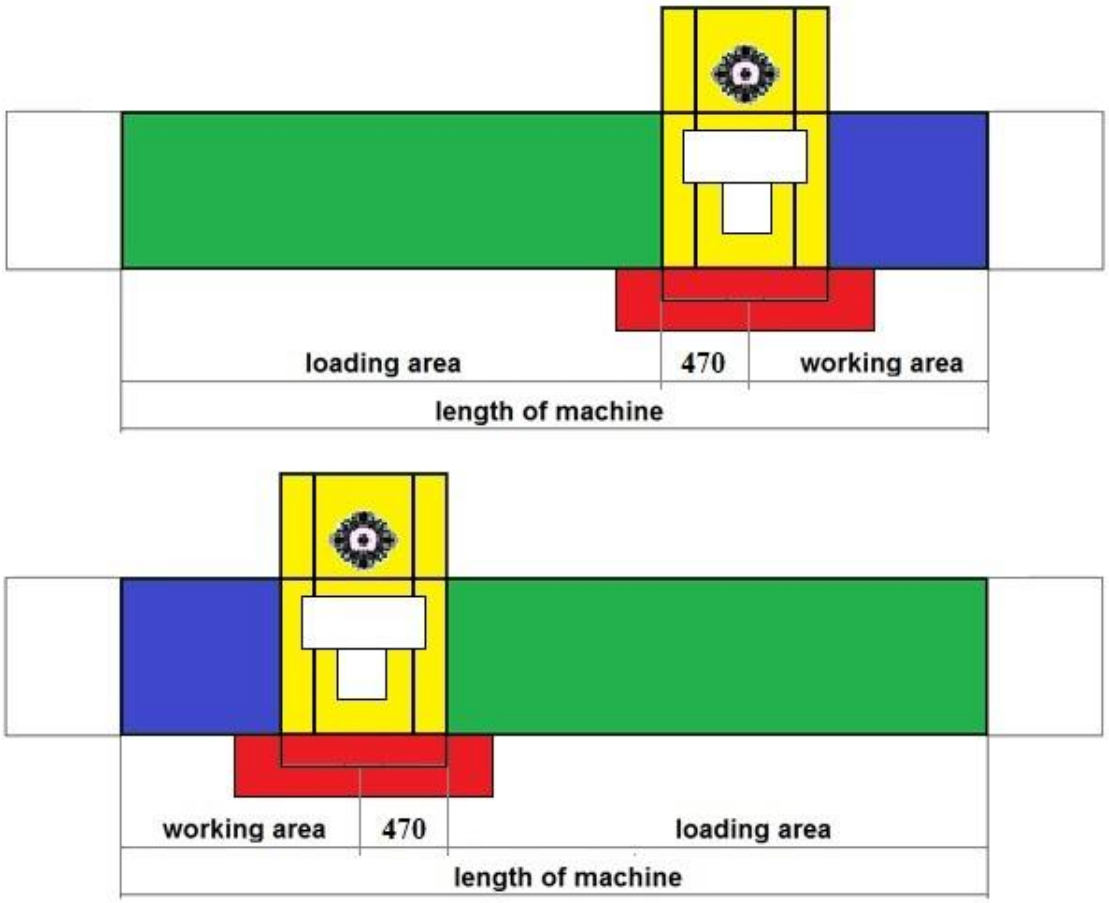
Working in 2 areas on 3RD drilling centers

More spindle-time = more production
Working in 2 areas is one of the biggest advantages of the CMA drilling centers. It offers the possibility to unload and load products while the machine is producing. Results is a higher output and a lower production cost per product.

Dimensions of the loading and working area
For the 3RD drilling centers we standard offer a rotary toolchanger fitted in the column.
The available working and loading area are explained below.

3RD with rotary toolmagazine for 10 tools
- Maximum toollength : 300 mm
- Maximum tooldiameter : 88 mm

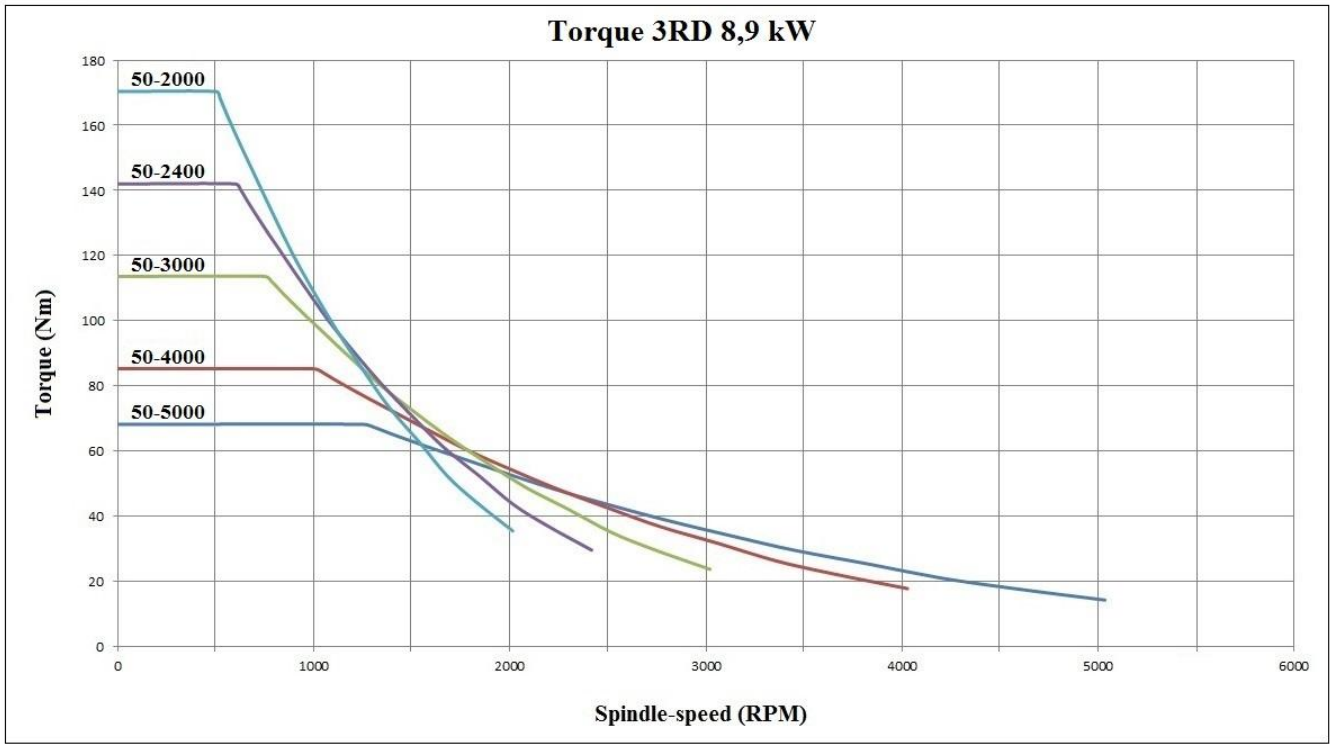
Since the toolmagazine is fitted in the column only the Y-axis has to move during a toolchange. Advantage is that the dimensions of the loading and working area are flexible based on the dimensions of the products.

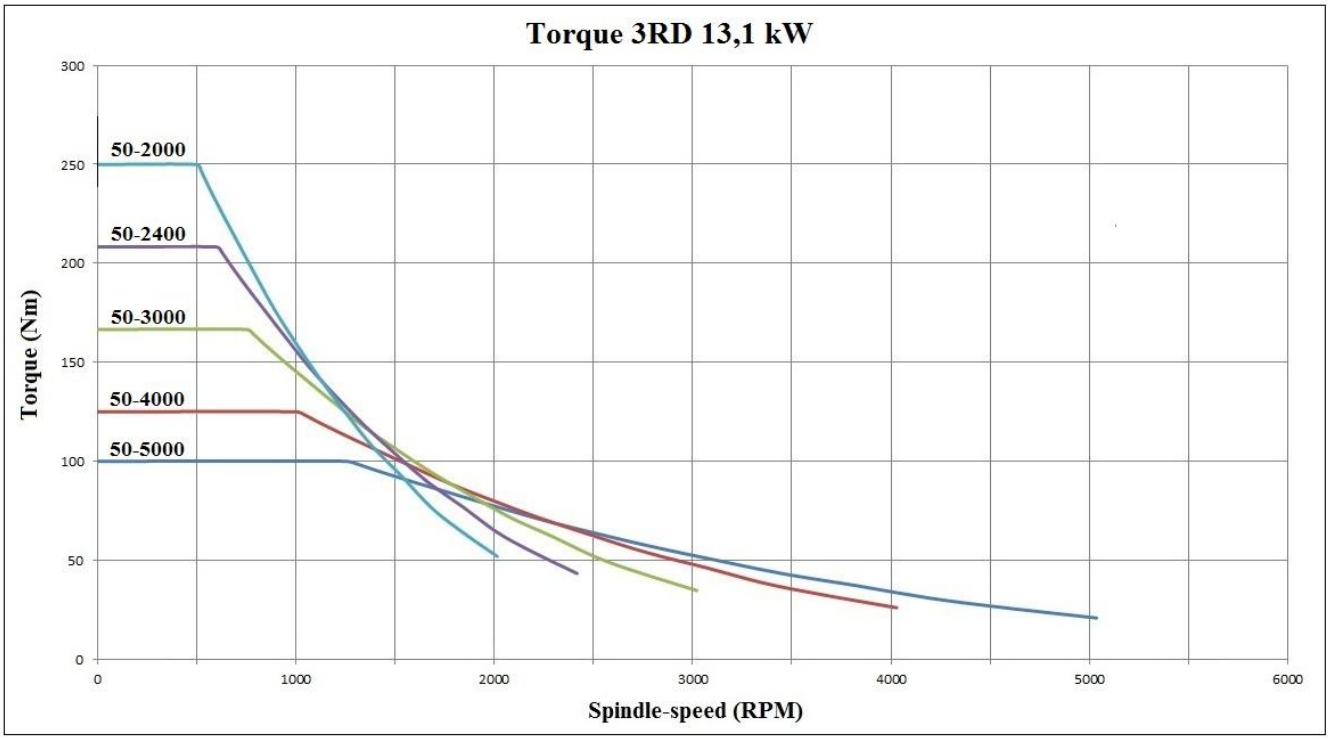


Example 3RD 6006 (6x0,6m):
- Working area right side 1700 mm: loading area left side = 6000 - 1700 - 470 = 3830 mm
- Working area left side 2100 mm: loading area right side = 6000 - 2100 - 470 = 3430 mm
- Maximum length of 2 identical products: (6000 – 470) / 2 = 2765 mm
  or half machine length - 235

Driving system, RPM-range and drilling capacity

The 3RD-CNC is available in several models. RPM, torque and speed-range can be choosen to meet the optimal requirements for the jobs to done.





Spindle RPM	6000 rpm	5000 rpm	4000 rpm	3000 rpm	2400 rpm	2000 rpm
STANDARD						
Max Torque (Standard 8,9 kW)	57 Nm	68 Nm	85 Nm	113 Nm	142 Nm	170 Nm
Indicative drilling and tapping capacity*	22 mm M16	25 mm M18	28 mm M20	32 mm M22	38 mm M24	42 mm M27
OPTIONAL						
Max torque (with 13,1 kW up-grade)	83 Nm	100 Nm	125 Nm	167 Nm	208 Nm	250 Nm
Indicative drilling and tapping capacity*	28 mm M20	30 mm M22	36 mm M24	42 mm M27	42 mm M27	42 mm M30

**Capacities are valid for:*
- Steel upto 60 kg/mm² tensile stength
- Drills: Insert-type HSS-Co with TiCN-coating, V= 45 m/min, F= D/125 mm/rev
- Taps: HSS-Co with coating, cutting speed 20 m/min

For other types of materials and/or tools contact your dealer or CMA

Standard configuration
- controlled X-, Y- and Z-axis
- OMRON 12“ Touchscreen PC (Windows 7), memory 128 GB
  - 2 axis interpolation for X/Y-axis, including arcs
  - 3 axis linear interpolation (X/Y/Z)
  - 3 axis interpolation (X/Y/Z) for helical milling
- movable external control panel, fitted on linearguide
- automatic rotary toolchanger for 10 tools
- automatic measurement of tool-length (touch-off system)
- manual toolchange through pushbuttons (automatic clamping)
- cover around drilling head in combination with safety laser-scanner (working in 2 areas)
- light-curtain safety-barrier on the rear of the machine
- coolant system (emulsion) and chip-conveyor
- LED-machinelight
- RJ45 connection for teleservice, incl. all necessary software

To be supplied by customer

Ethernet connection (RJ 45) near the machine, this allows CMA to log in for:
- checking/modifying machineprograms
- analyse eventual technical problems (limit-switches, drivers etc.)
- load software-updates

Without this connection CMA will not supply support and eventual traveling-costs of technician will be invoiced.

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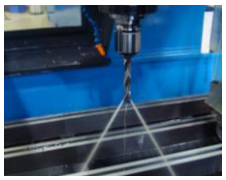
Technical data

Model	3RD-3006	3RD-4506	3RD-6006	3RD-7506	3RD-9006	3RD-105-06
Spindle motor	8,9 kW, option 13,1 kW					
Spindle type	BT 40 or CAT 40					
Length of table	3000 mm	4500 mm	6000 mm	7500 mm	9000 mm	10500 mm
Width of table	580 mm					
T-slots	3 T-slots 20 mm, distance 250 mm					
Stroke X-axis	3000 mm	4500 mm	6000 mm	7500 mm	9000 mm	10500 mm
Stroke Y-axis	600 mm					
Stroke Z-axis	450 mm					
Spindle-table	150-600 mm					
Speed X-axis	30 m/min					
Speed Y-axis	30 m/min					
Speed Z-axis	9,6 m/min					
Weight	3750 kg	4500 kg	5250 kg	6050 kg	6800 kg	7550 kg

Optional equipment

Code	*Picture*	*Description*
Xxx		Coolant through spindle/tool Pressure 4 Bars
Xxx		Spraying system (minimum lubrication system with air+oil) for drilling/milling in profiles upto approximately 6 mm wall-thickness. Spraying-time and –interval programmable in the CNC-control
Xxx		Paste-shot-sytem for flowdrilling Spraying-time and -interval programmable in the CNC-control
Xxx		Oil-shot-sytem for threadforming Spraying-time and -interval programmable in the CNC-control

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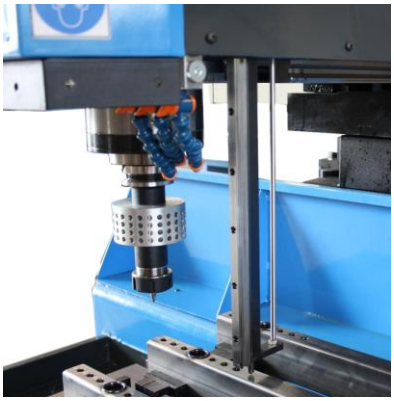
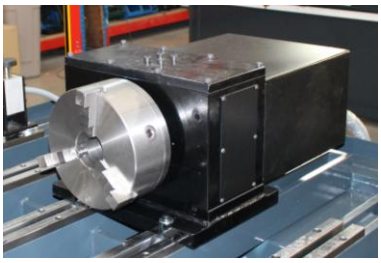
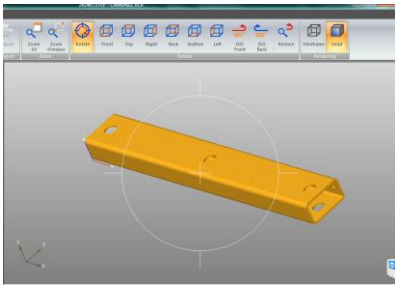
Code	*Picture*	*Description*
Xxx		Automatic system for measuring height of the workpiece (Z-reader) - 100% accurate flowdrilling and countersinking. Tolerances in height of material and/or clamping systems are automatically compensated - Avoids crash of tool in case of eventual programming-mistakes. Max. allowed tolerance can be set in the parameters. In case the height of the product is out of tolerance the program will be interrupted and an error-message appears. Maximum tool-length 275 mm
Xxx		Renishaw probe type RMP 40 automatic setting of zeropoints, finding center of workpieces, skewing etc. - Programming through macros in dialogue - Programming through G65 function in ISO-programming Additional software-option: Using the Renishaw-probe for inspection of the workpiece, including printable report
Xxx Xxx		4th axis (tube rotation), including selfcentering 3-jaw chuck. The rotary table is mounted on table with linearguides for fast set-up. - diameter 250 mm - diameter 400 mm
Xxx		13,1 kW spindle-motor for higher torque, useful for working with U-type carbide drills with indexable inserts and increasing the tapping-capacity

Code	*Picture*	*Description*
Xxx		External software DrillWin NJ13 Write programs on external PC - Coordinate-programs - Depth-programs (drilling-cycles) - Sequences Programs can be saved on and loaded from the external PC through the Ethernet connection or USB-stick The software is delivered with 2 licenses
Xxx		DrillCam Complete CAD-CAM software for converting 2D DXF, DWG, DSTV or 3D STEP, IGES files into ISO machine-programs. Loading of programs into the control of the machine through Ethernet connection. RPM and feed of tools are automatically set based on programmable library for different types of tools and materials