CMA MACHINE TOOLS

SANDFELD A/S
VÆRKTØJSMASKINER
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CMA CNC-controlled gantry drilling center
Model GRD-CNC

The CMA GRD-CNC gantry drilling center is the latest evolution 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).

Unique features of the GRD-CNC gantry 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)
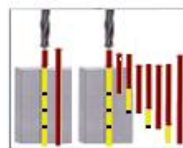- positioning-speed X- and Y-axis 30 m/min
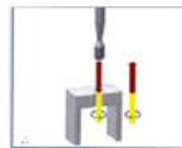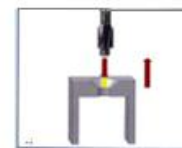

GRD 4517 (X/Y 4,5 x 1,7 m)

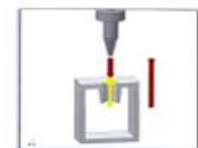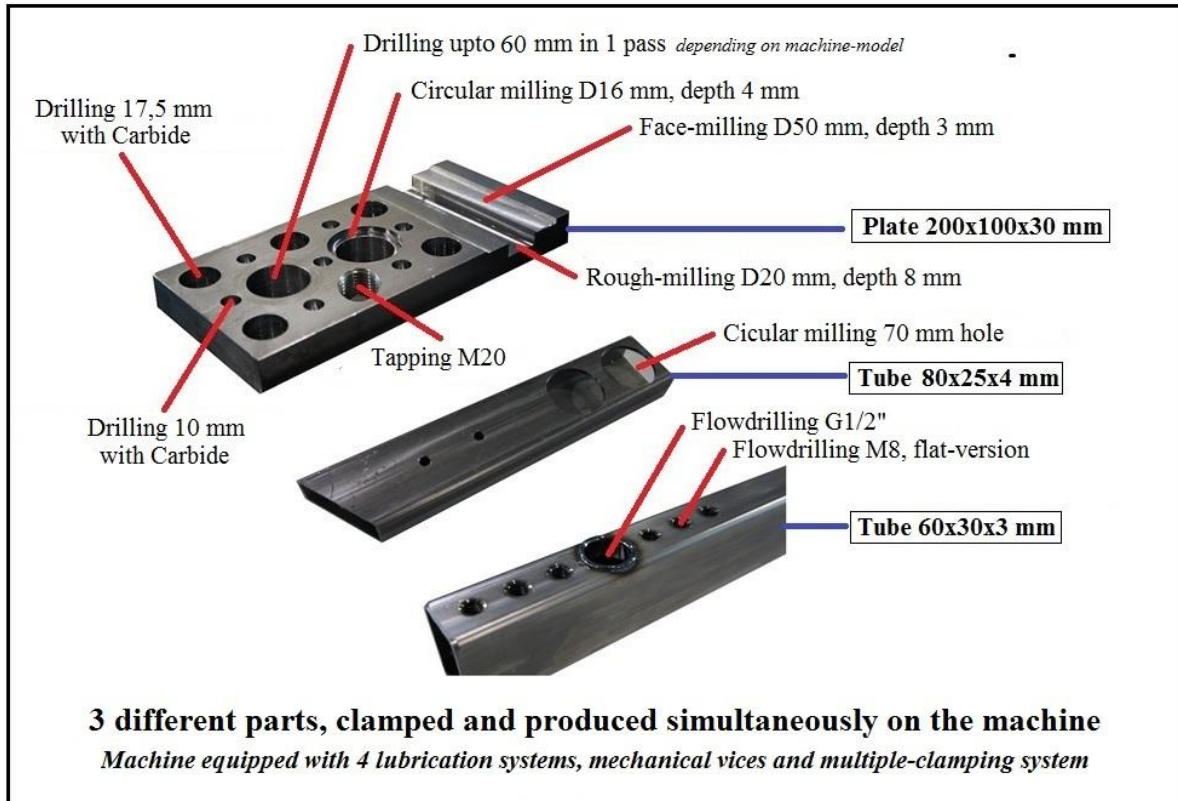drilling | drilling profiles with intermediate rapid-feed | deep-hole drilling | tapping | countersinking | flowdrilling

Flexibility and productivity combined in 1 machine

Drilling upto 60 mm in 1 pass *depending on machine-model*

Circular milling D16 mm, depth 4 mm

Face-milling D50 mm, depth 3 mm

Drilling 17,5 mm with Carbide

Plate 200x100x30 mm

Rough-milling D20 mm, depth 8 mm

Tapping M20

Cicular milling 70 mm hole

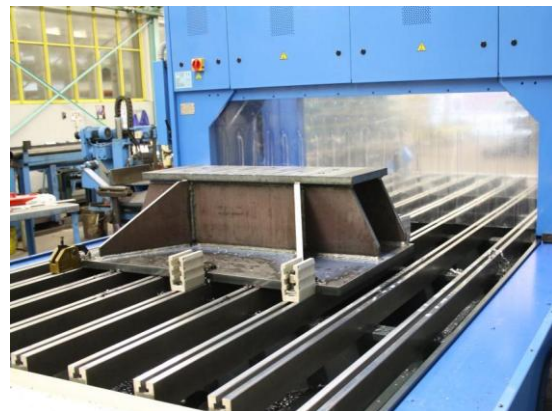Tube 80x25x4 mm

Drilling 10 mm with Carbide

Flowdrilling G1/2"
Flowdrilling M8, flat-version

Tube 60x30x3 mm

3 different parts, clamped and produced simultaneously on the machine
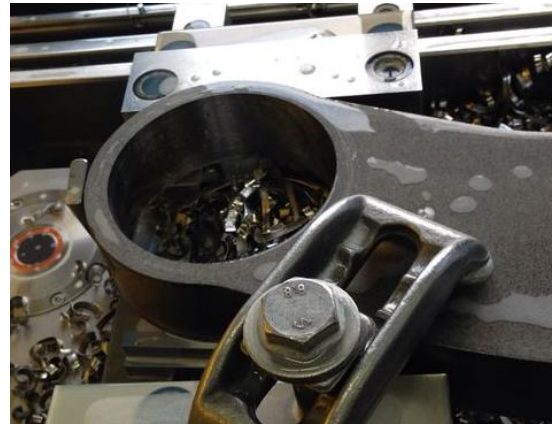*Machine equipped with 4 lubrication systems, mechanical vices and multiple-clamping system*

Drilling 21, 35 and 60 mm, tapping M24

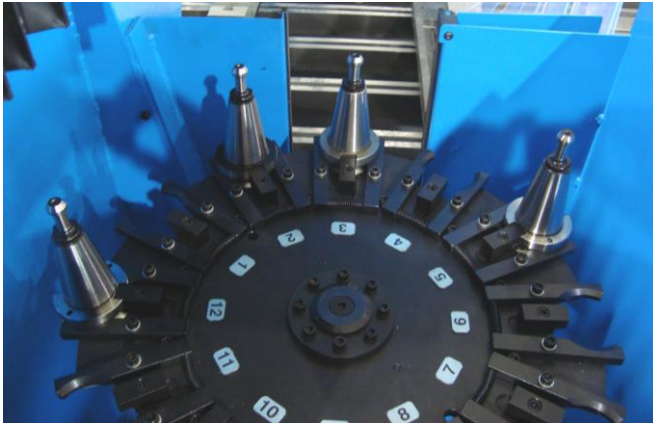*Face-milling 800x400 mm with D50/depth 3 mm*

30 mm material, 46x ⌀26 mm + 12x ⌀14 mm
10 minutes 51 seconds with AMEC GEN3 tooling

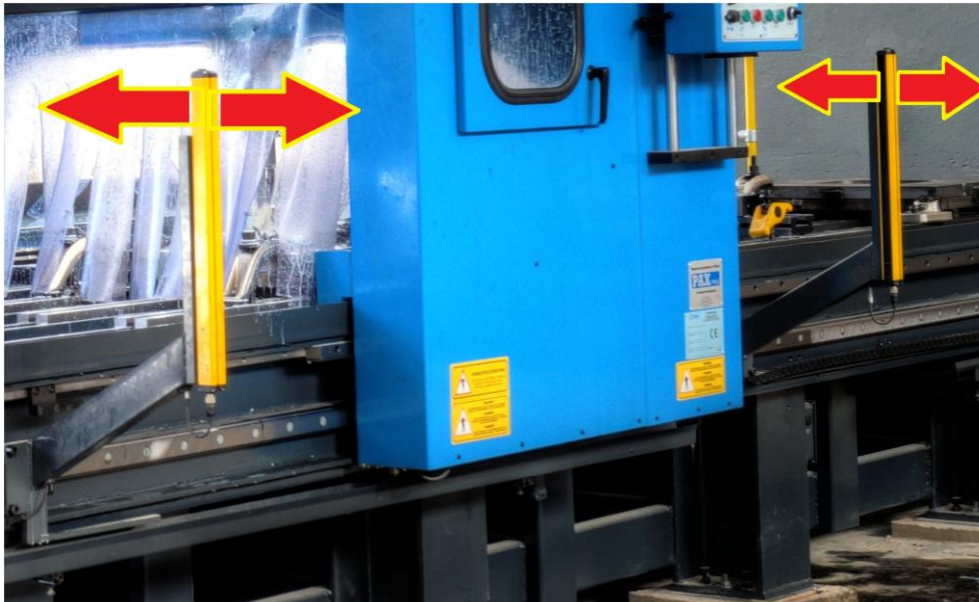*Milling and boring ⌀ 110 mm*

Standard equipment

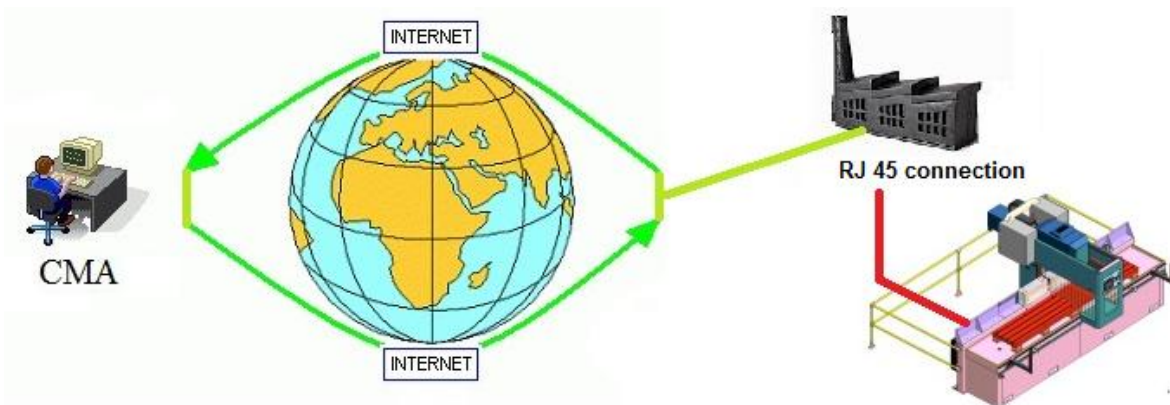- **Automatic rotary toolchanger for 14 tools, mounted on gantry**

- max. diameter toolholder 88 mm
- max. length of tool 450 mm

- **Movable lightcurtain on the front of the machine**
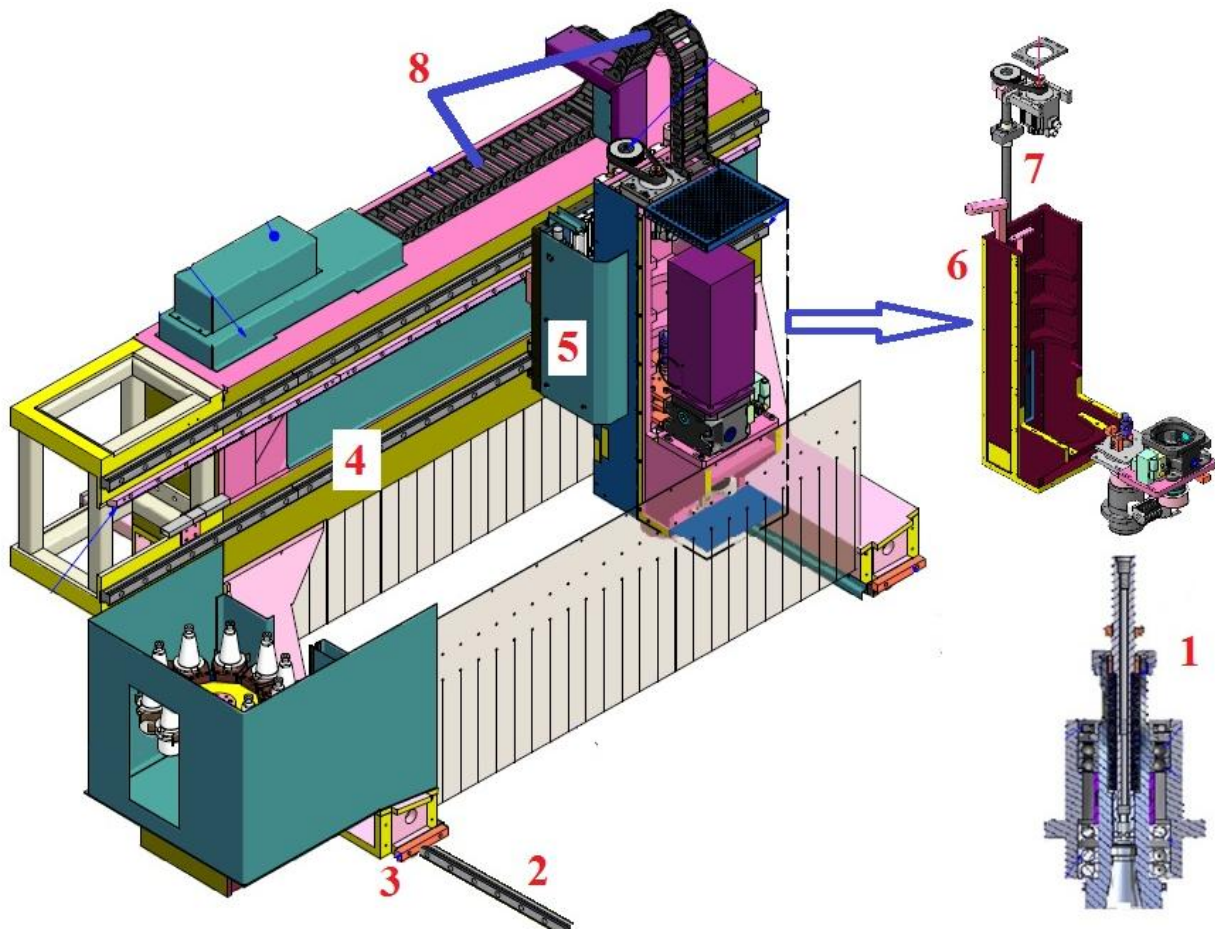

- **Connection and software for teleservice**

Laptop and software are supplied with the machine.
During the warranty-period teleservice is free of charge.

Construction, stability and high quality components without compromise

1. Spindle BT 40 (optional BT 50)

- 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

- 45 mm linearguide with 2 bearingblocks with circulating balls

3. Driving system X-axis

- helical precision rack and pinion, stroke 3-20 m

4. Guidance system Y-Axis

- 2x 45 mm linearguides, each with 2 bearingblocks with circulating balls

5. Driving system Y-axis

- helical precision rack and pinion, stroke 1,2 / 1,7 / 2,4 or 3 m (larger on request)

6. Guidance system Z-axis

- 2x 45 mm linearguides, each with 2 bearingblocks with circulating balls

7. Driving system Z-axis

- 32 mm ballscrew, stroke 500 mm

8. LAPP cables and IGUS energy chains (Germany)

Working area

The GRD is available in sizes (X/Y) 3x1,2 m upto 20x4 m, on request special machines with larger strokes or distance spindle-table delivered.

GRD 6025 (X/Y 6 x 2,5 m)

GRD (X/Y 3 x 3 m, spindle-table 1100 mm)

GRD 13030 (X/Y 13 x 3 m)

GRD 6514 (X/Y 6,5 x 1,4 m)
2 table-heights and vertical table,
spindle-table 660 and 1480 mm

GRD 8006 (X/Y 8 x 0,6 m)
with 4th axis for tubes upto 8 m x 400 mm

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.

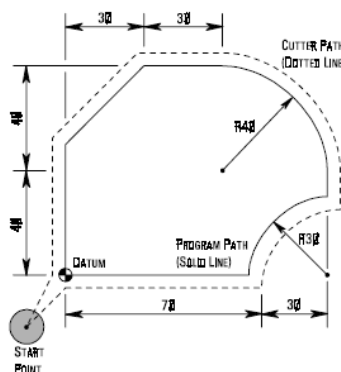**CMA-system dialogue programming of coordinates and standard working cycles**
Simply enter the data in the macro and save under a (logical) name. The complete job (even several different workpieces clamped simultaneously) can be programmed in a sequence. The operator can choose to produce all parts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

➢ programming of coordinates through 3 macro's
• single-hole (random pattern)
• grid of holes (single or multiple lines)
• flange
➢ 99 programmable zero-points.
➢ programming of depth-cycles (operations) through 9 available macro's
• plate drilling
• profile drilling (intermediate rapid-feed)
• tapping (tapping-chuck with compensation on thrust and expansion)
• thermal drilling
• countersinking
• circular milling
• oblong milling
• helical milling
• arc-milling (1 arc only, f.e. for welding rectangular tube on round tube)
➢ programmable JOB table for easy set up of several programs/products which are executed automatically (each line of the JOB consists of zero-point, coordinate, depth (Z), tool,….)

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.

![CMA Machine Tools]

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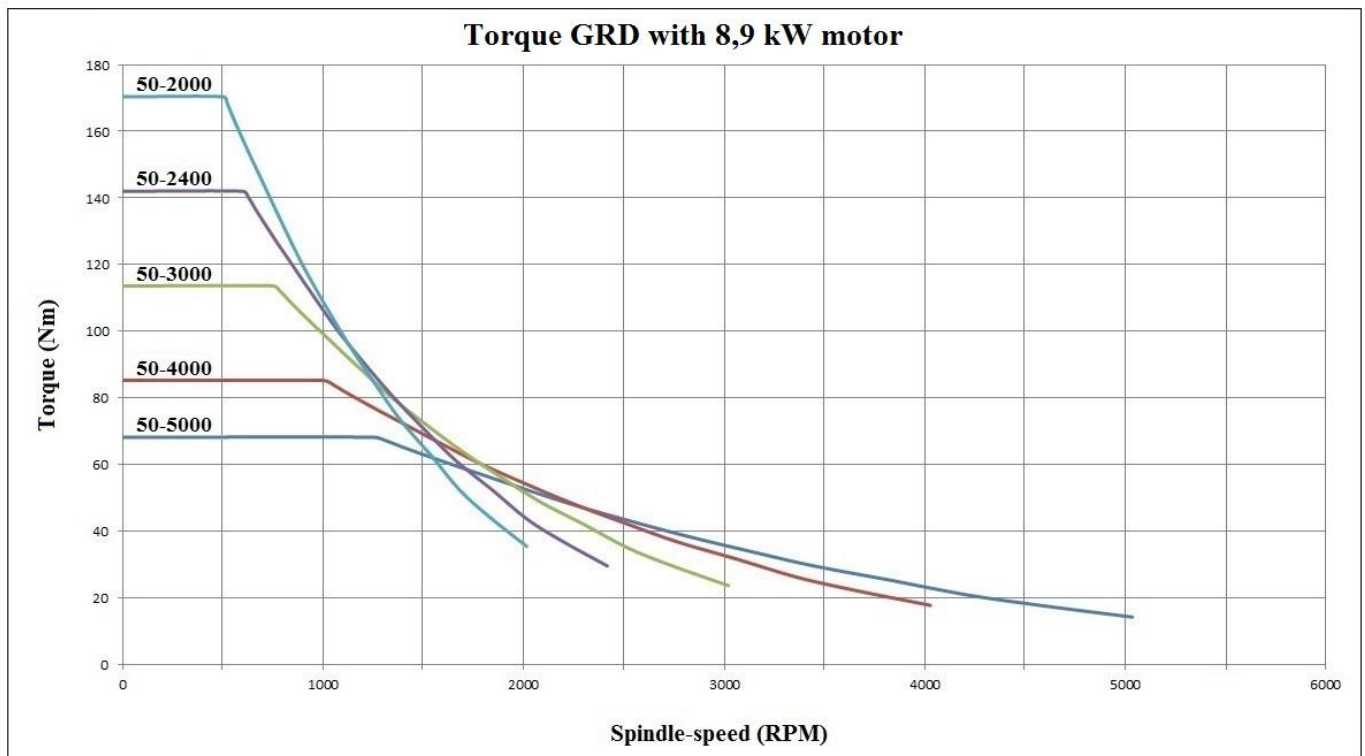
Driving system, RPM-range and drilling capacity

The GRD-CNC is available in several models. RPM-range and torque can be choosen to meet the optimal requirements for the jobs to do.
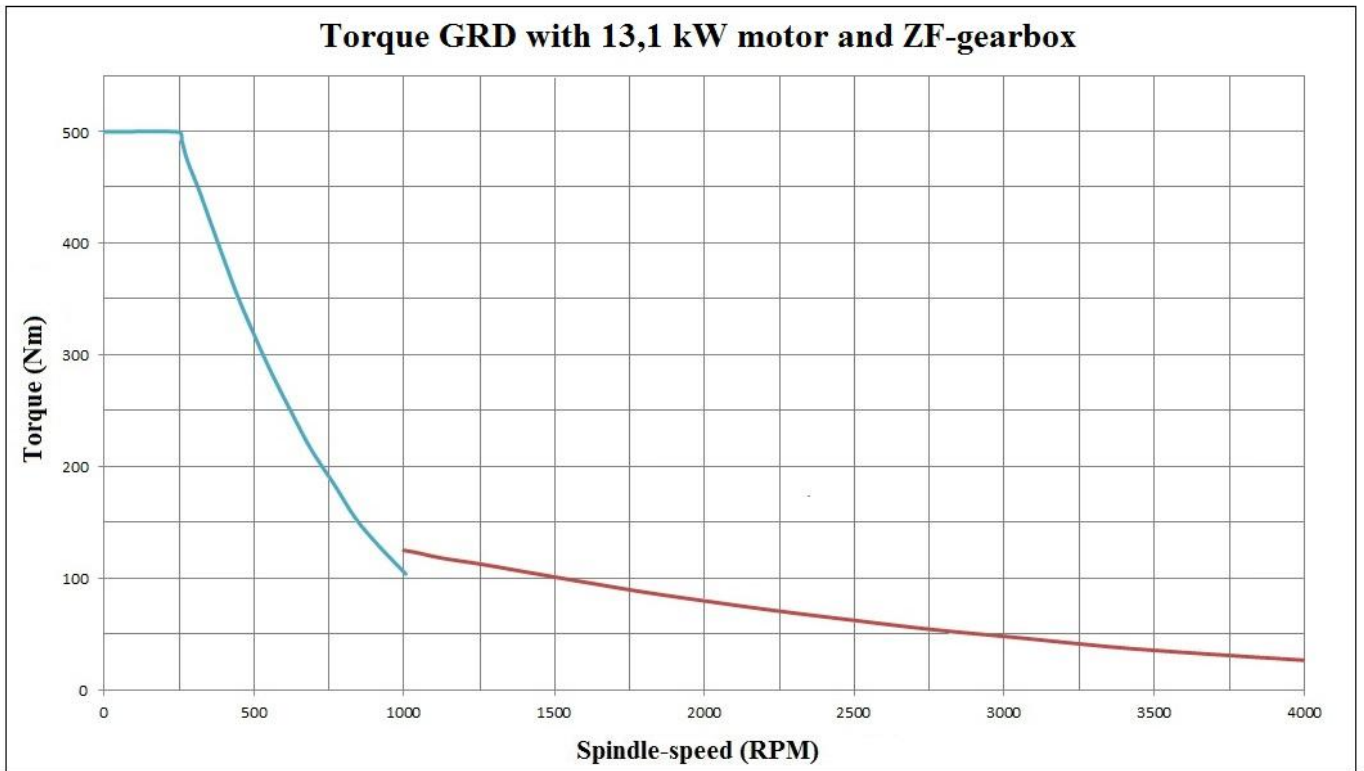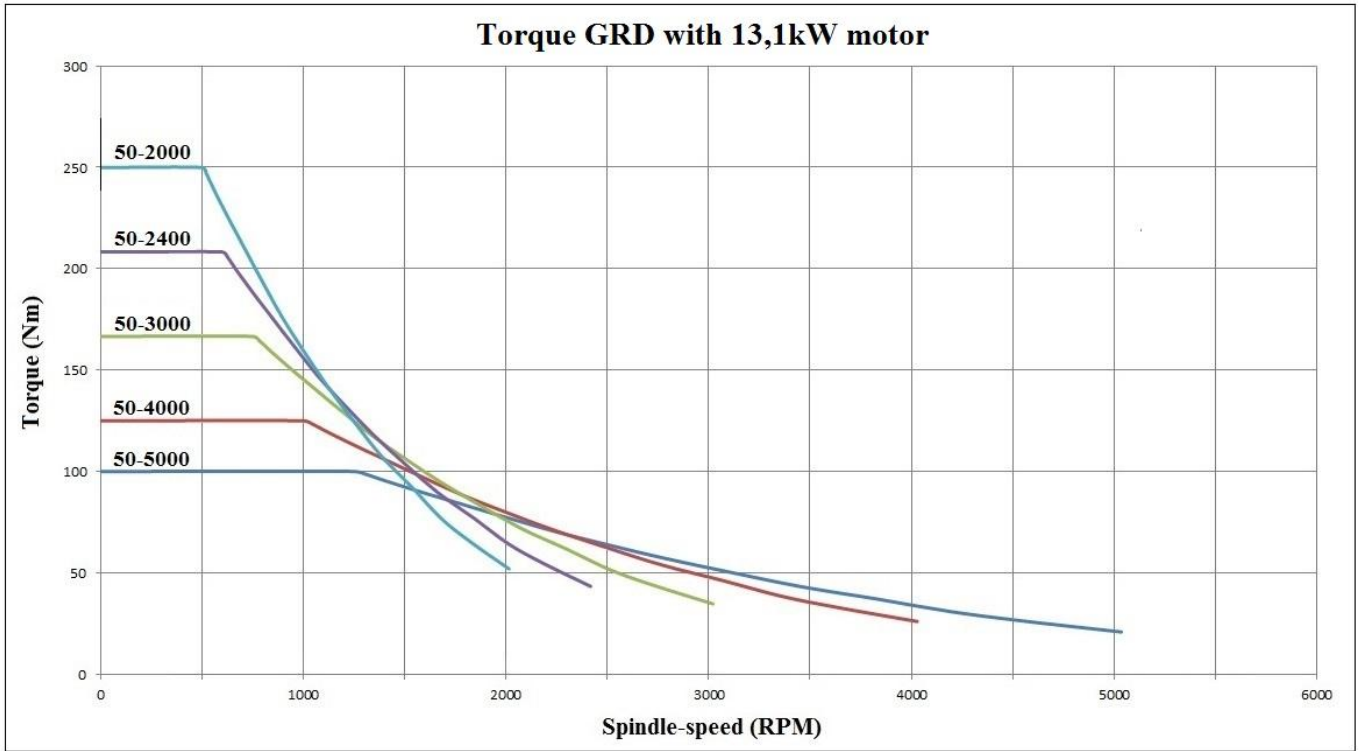
Spindle RPM	5000 rpm	4000 rpm	3000 rpm	2400 rpm	2000 rpm	
STANDARD						
Max Torque (Standard 8,9 kW)	68 Nm	85 Nm	113 Nm	142 Nm	170 Nm	
Indicative drilling and tapping capacity*	25 mm M18	28 mm M20	32 mm M20	38 mm M24	42 mm M27	
						4000 rpm with gearbox
OPTIONAL						
Max torque (with 13,1 kW upgrade)	100 Nm	125 Nm	167 Nm	208 Nm	250 Nm	500 Nm
Indicative drilling and tapping capacity*	30 mm M22	36 mm M24	42 mm M27	42 mm M27	42 mm M30	60 mm M45

*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

Torque GRD with 8,9 kW motor

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Torque GRD with 13,1kW motor

Torque GRD with 13,1 kW motor and ZF-gearbox

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
- automatic rotary toolchanger for 14 tools, mounted on the gantry
- automatic measurement of tool-length (touch-off system)
- manual toolchange through pushbuttons (automatic clamping)
- cover around drilling head
- movable lightcurtains on the front of the machine (working in 2 areas)
- fence 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
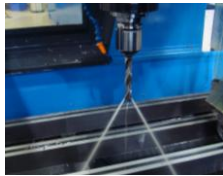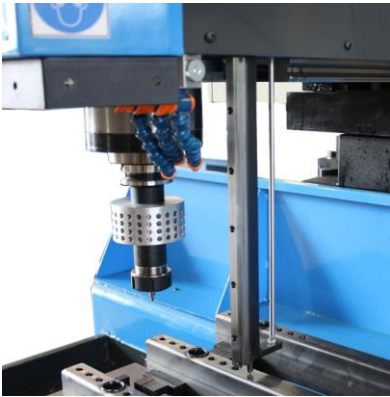Ethernet connection (RJ 45) near the machine, this allows CMA to log in to:
- check/modify machineprograms
- analyse eventual technical problems (limit-switches, drivers etc.)
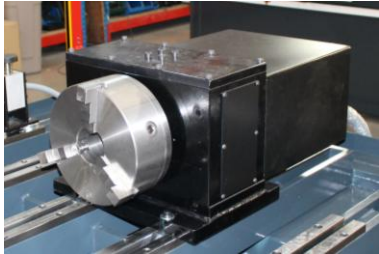- load software-updates

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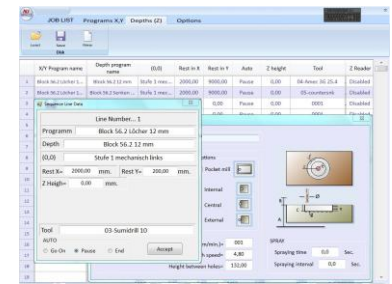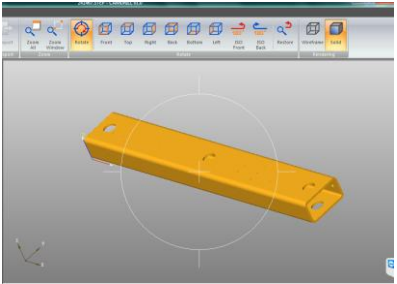
Technical data

Spindle motor	8,9 kW, option 13,1 kW
Spindle type	BT 40 or CAT 40
Length of table	3000 / 4500 / 6000 / 7500 / 9000 mm or customized
Width of table	1200 / 1700 / 2000 / 2500 / 3000 mm or customized
T-slots	6 / 8 / 10 / 11 / 13 - 20 mm - distance 250 mm
Stroke X-axis	3000 / 4500 / 6000 / 7500 / 9000 mm or customized
Stroke Y-axis	1200 / 1700 / 2000 / 2500 / 3000 mm or customized
Stroke Z-axis	500 mm
Distance spindle-table	120-620 mm
Table height	880 mm
Speed X-axis	30 m/min
Speed Y-axis	30 m/min
Speed Z-axis	4,8 m/min

Optional equipment

Code	Picture	Description
Xxx Xxx		Coolant through spindle/tool Pressure 4 Bars Pressure 7 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
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 315 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

Code	Picture	Description
Xxx		External control panel on linear-guide
Xxx		Movable lightcurtain on the rear (instead of fence). Possibility to enter the rear side of the machine for manual clamping when working in 2 stations
Xxx		Lightcurtain in Y-direction 500 mm above the table on both sides of the gantry. Safety measure to protect operators climbing on the table for clamping parts on wider machines
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 Standard on GRD with ZF-gearbox
Xxx		Spindle BT 50, including automatic rotary toolchanger for 10 tools Distance spindle-table 80-580 mm

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