

CAMPAIGN OFFER from DMG MORI Nordic and DMG MORI Finance

CMX 800 V

Project no: 330/657671

We are pleased to present the following quotation of the above mentioned machine with the following specification:

CMX 800 V



Highlights

- _ **3D control technology with the new DMG MORI SLIMline® multi-touch control**
(19" / Operate on SIEMENS 840D SL or HEIDENHAIN TNC 620)
- _ **Machine bed in C-frame design with Dual Support**
FEM-optimised for maximum stiffness and best kinematics
- _ **CMX V series for maximum precision and 12,000 rpm spindle as standard**
- _ **Tool magazine 30 pos.** with double gripper as standard
- _ **Best positioning accuracy of 6 µm** (according to ISO 13041-4) in standard.
Optional linear scales available
- _ **30 m/min rapid traverse in all axes**
- _ **Possibility of complete automation with the DMG MORI automation solutions**

DMG MORI CMX 800 V

Basic machine

- C-A3362F* Vertical Machining Centre
CMX 800 V
Axes travel:
X / Y / Z - 800 / 560 / 510 mm
Standard Equipment:
1. Table dimensions: 1100 x 560 mm
2. Rapid Feed Linear Axes 30 m/min
3. Spindle speed range 20 to 12.000 rpm
4. AC Main Drive:13/9 kW (40/100% ED)
5. Tool Taper SK40 DIN 69871
Tool Clamping according to DIN69872
6. Tool Magazine 30 Places, chain with pockets and
with double gripper
7. Coolant Air-Blast Changeover
external switchable via M-Function;
8. Chip tank

Control

- C-B3093F* DMG MORI SLIMline® Multi-Touch control
(19" / HEIDENHAIN TNC 620)

Packages

- C-K3624F* Production Package 2
Option includes:
- Internal coolant supply 20 bar;
- Tank capacity: 600l with papertype filter;
- Chip conveyor (scraper type) with tank capacity: 220
l
(left)
- Bed and ATC arm flushing via M-Function
- Coolant spray gun for swarf removal
- External electronic handwheel
- Cabin roof (automatic via M-Function)
- Signal lamp with 4 colours

Note:

Additionally to this option, the "automatic magazine shutter in working area (instead of brushes)" is recommended, especially for production conditions with high amounts of chips.

In combination with automation package or Machine preparation for DMG MORI Pallet loading / unloading system PH 150 the price will be reduced for overlapping cost.

Please contact FAMOT Commercial Sales

Measuring / Monitoring

- C-K3232F Direct Measuring System X, Y, Z
inclusive air purge for measuring system
- C-K4218F Renishaw Touch probe-kit for HEIDENHAIN control
Option includes:
- PP40 Touch probe with optical signal transmission;
- OTS Probe for tool measurement;
- Calibration tool;
- Calibration ring;
- Case for equipment.

Note:
Direct measuring system recommended

Automation

- C-L3044F Tool (Un-) Loading through Magazine Door
during AUTO Mode
Option includes:
- Tool magazine door
- Automatic magazine shutter (instead of brushes)
- Buttons for magazine rotation
For HEIDENHAIN control

General options

- C-K3530F Additional Window on the right side of the machine

Software options for HEIDENHAIN

- C-G3074F Software Option - DXF Import (Option number #42)
Possibility to open DXF files directly on the controller
in order to extract contour and import it to the
program.
For HEIDENHAIN control

DMG MORI Software Solutions

- D-NT401* **DMG MORI Netservice - client**
Qualified support by Internet-based
remote diagnostics
Will be installed on an external PC!
- D-ME405* **DMG MORI Messenger V2**
Installation kit for the connection of one machine.
- D-SA300* **DMG MORI Service Agent**
Warning in advance - Service on time

Special constructions services

- SK001 Documentation in local language

Sales company services

- 1 Transportation of machine and accessories, DAP customer's site (INCOTERMS 2010)
Excl. unloading and transport to installation point
- 2 Installation of all quoted equipment at customer's site
Incl. travel and accommodation costs
- 3 Training at customer's site, 4 days
Incl. travel and accommodation costs
To be performed at one single occasion and within six months from delivery

Campaign offer from DMG MORI Nordic & DMG MORI Finance

Cost per production hour (based on 3000 hrs / year)	9,08 EUR
Monthly cost	2.270,22 EUR

0% down payment, the first invoice will arrive 3 months after the machine installation

What does this offer mean?

- ✓ **One invoice of 2.270,22 EUR x 60 months will be sent to you and this is what you agree to pay.**

After 60 months has passed you can either chose to return the machine and have no other costs than the agreed 2.270,22 EUR x 60, or if you want to keep the machine after 60 months we are happy to offer you a financing solution.

Attachment

Technical Description

C-A3362F **Technical Data for Vertical Machining Center CMX 800 V**

Vertical Machining Center	CMX 800 V with C-Frame design
Working Area	
Axes travel:	X = 800 mm Y = 560 mm, Z = 510 mm
Distance Spindle nose to Table:	120 - 630 mm
Clamping area:	1100 x 560 mm 5 T-slots (18H7 and 4 slots 18H12), distance between slots 100 mm
Max. table load:	800 kg
Main Drive	
Type of Drive:	Digital AC motor with hollow shaft coupled directly with machine spindle
Speed range:	20 to 12.000 rpm
Spindle power:	13 kW (40% ED) 9 kW (100% ED)
Torque:	83 Nm (40% ED) 57 Nm (100% ED)
Tool clamping force:	9 kN
Tool taper	SK40 DIN69871 Spring clamping for pull studs according to DIN69872 with pneumatic control

Note:
Machining performance depends on spindle power, torque, tools and tool interface.

Tool Magazine

Description	Tool magazine with double gripper Tool change is programmed and controlled via control panel Tools are loaded to the magazine through the spindle
Magazine capacity	30 tool pockets, SK40 in standard (BT40 as an option)
Max. tool diameter	80 mm (130 mm with free adjacent pockets)
Max. tool length	300 mm (from the spindle face)
Max. tool weight	8 kg
Tool change time	2,4 s (for tools with diameter less than 80 mm without ATC shutter)
Tool change time From chip-to-chip	6,7 s (for tools with diameter less than 80 mm without ATC shutter) according to VDI2852-1 T1/T2/T3
Tool change time	

From chip-to-chip 9,7 s (for tools with diameter less than 80 mm with ATC shutter) according to VDI2852-1 T1/T2/T3

Note:

For speed up to 12.000 r.p.m tool mounting fixtures and tools should have a balancing grade of G6,3. At a tool weight higher than 5 kg a balancing grade G2,5 is necessary.
The following tool dimensions should be chosen for:

up to 8.000 rpm	max.tool length 300 mm, max.tool diameter 130 mm
up to 10.000 rpm	max.tool length 250 mm, max.tool diameter 100 mm
up to 12.000 rpm	max.tool length 250 mm, max.tool diameter 80 mm

Feed Drives

Drive type	AC drives; motion is transmitted via ball screws (size D40 x 12 mm)
Feed rate (X;Y;Z)	max. 30 m/min
Rapid traverse (X;Y;Z)	30 m/min
Max. force (40% ED) (X;Y;Z)	5 kN

Measuring System

Standard / option Indirect measuring system / Direct measuring system

Bidirectional accuracy of positioning
A = 6 µm (according to ISO 10791-4)

Bidirectional repeatability of positioning
R = 5 µm (according to ISO 10791-4)

Linear scales (direct measuring system) provide long-term accuracy for the machine even after long use.

Accuracy depends mostly on thermal influence.

The greatest accuracy is achieved in the temperature range of 20°+/-2° C. Direct sunlight, strong draughts, vibrations from other machines and build-up of heat should be eliminated.

Accuracy of positioning (defined for single machine axis) is not equal to accuracy of machining / workpiece. Accuracy of machining and surface quality depends on other issues, f.e. material, tools, technology, etc. Test cut and pre-acceptance tests in factory necessary in case of special customer requirements.

Temperature Compensation

Electronic temperature sensors (including evaluating unit) compensates for geometric changes occurring due to heat increase at the spindle. Permanent monitoring and control by machine control. The solid and intelligent construction of the machine elements helps to reduce heat build-up to a minimum and ensures that influence of heat is efficiently removed.

Coolant Supply

Chip Tank (standard)	Tank capacity: 140 l 6 external nozzles for coolant supply Flow rate: 22 l/min at 3,7 bar
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Chip Removal

Standard	Coolant tank
Option	Scraper type chip conveyor

Central Lubrication

Automatic minimum lubrication for guideways and recirculating ball-screw

Cooling of Electrical Cabinet

Cooling by fan

Note:

For ambient temperatures above 35° Centigrade an additional cooling unit is required

Working Hour Recording	Counter of machine working hour: - Total machine working hours - Spindle working hours
Machine Lamp	LED 24V, 66 Watt
Air requirement:	6 ÷ 8 bar
Air Consumption Average:	Approx. 30 m³/h with air blast option additionally 20 m³/h
Guideways and Bed Covers	Telescopic guides of X axis, specially shaped covers to provide perfect chip fall
Painting	
Machine Base:	Calcit white (DMG MORI-specific special colour)
Castings:	Titan grey (DMG MORI-specific special colour)
Back Wall of Cabin, Electrical Cabinet, Media Supply:	Calcit white (DMG MORI-specific special colour)
Working Space:	Calcit white (DMG MORI-specific special colour)
Outer Covers of Headstock:	Deep black + calcit white with design elements
Covers of Standing Base:	Calcit white (DMG MORI-specific special colour)
Machine Table:	Titan grey (DMG MORI-specific special colour)
Main Door:	Design specific
Installation Dimensions and Weight:	
Machine with chip tank:	W x D x H 3295 x 3490 x 2935 mm
Machine with chip tank and production package 1:	W x D x H 3742 x 3490 x 2935 mm
Machine with chip conveyor, and production package 1	W x D x H 4275 x 3490 x 2935 mm
Machine with production package 2, 3 or 4:	W x D x H 4780 x 4168 x 2935 mm
Required space for machine with chip tank:	W x D 4500 x 4800 mm
Required space for machine with chip tank and production package 1	W x D 4900 x 4800 mm
Required space for machine with chip conveyor and production package 1	W x D 5500 x 4800 mm
Required space for machine with production package 2, 3 or 4. Base machine weight without	W x D 6000 x 5500 mm

accessories: approx. 5550kg

Connection Values

Power input: 32 kVA
In max: 52 A
Pre-fuse: 63 A at 400 V

Operating voltage: 3 / N / PE / 400 V / 230 V 50 Hz
max. permissible deviation: + 6% / - 10%

Note:

Load-carrying neutral conductor N (zero conductor) or special transformer necessary.

Electrical connection:

The power supply for our machines has to meet the requirements of standard EN 50160 "Voltage characteristics of electricity supplied by public distribution systems." For electrical installation ensure that point 18.2 "control of the conditions for protection by automatic switch off of power supply" is observed. See IEC 364-4-41. (DIN 57 100, VDE 0100, Part 410).

The recommended short-circuit performance must be available at the power supply of the machine.

The machine may not be connected to a network with fault-protection circuitry (see EN 50178, section 5.3.2.3. Old VDE 0160, section. 5.5.3.4.2).

The electrical equipment must be connected to a TN-S system with three conductors (L1, L2, L3) and neutral (N) and place protective earth (PE).

Due to the EMC measures, the machine has leakage currents of 3.5 mA AC and must therefore be connected.

Furthermore, one of the measures listed below, according to EM 50178, section 5.3.2.1 (old VDE 0160, section 5.5.3.4.1 and 6.5.2.1) has to be performed:

a) protective conductor profile at least 10 mm² Cu (copper) or
b) control of the protective conductor by means of a device, which leads to shut-down of the machine in case of an error or
c) installation of a second conductor, which is electrically connected in parallel to the protective conductor, using separate clamps. This conductor must independently meet the requirements of protection conductors acc. To paragraph 543

of the harmonization document (HD) 384.5.54 S1 for protective wires (before: DIN VDE 0100, part 540).

A detailed description of the machine connection can be found in the planning documents.

Transport mean
Noise measuring:
Machine Installation:

Gantry
max. 78 dB (A) according to ISO 230-5:2000
4 Levelling pads (height adjustable)

Vertical Machining Center CMX 800 V

Mechanical Design

The CMX 800 V is based on a C-Frame-design with Dual Support in a ingenious robust cast construction. The independent concept is a clear differentiation from the cross-table design used by most other suppliers of machine tools.

The quality of the casted machine bed ensures a permanent high quality and cutting capacity over the whole lifetime. The wide 4-point-support of the vibration damping machine bed, generous webbing and ribs in all main parts and the thermo-symmetrical concept in connection with balanced construction are prerequisites for high rigidity and torsional strength, thermal stability and guideways accuracy.

A special feature is the wide distance between the guideways. Especially the X-axis is outstanding through the used angular base for the machine table to extend the width for the guideways.

The machine table has a rigid table guidance, which guides the table over the whole traverse range inside the machine base and allows high table load.

The elaborate concept is the basis for a compact machine with a small footprint, inherent rigidity, precision and long life-time. Short installation and setup time are another benefit. A sufficient range of Option-packages and further selectable options ensure best usability in application.

Linear Guideways in all Axes

Recirculating ball-screws in the linear axes transmit the feed force via robust bearings and components. The linear guideways are especially known for low heat production, low friction, no stick-slip effect, permanent accuracy (low wear) and extremely low lubrication requirement.

Central Lubrication

The lubrication system for the linear guideways and the recirculating ball-screws is based on a minimal lubrication supply.

Measuring System

Standard is indirect measuring system. For the optional direct linear measuring system air purge is provided for additional protection

Feed Drives

Digital AC drives for high dynamics and less maintenance. Quick response times between Drives and Control ensure high acceleration and accuracy. Together with the linear guideways and ball-screws resulting in high surface quality and contour accuracy of the work-piece.

Inline Spindle

AC motor with hollow shaft is directly coupled with the spindle. The spindle is air-cooled. The solid working spindle is of a robust design and equipped with precision lifetime lubricated bearings. The robust construction and the special bearings guarantee a high cutting performance.

Thermal Compensation in standard

Machines are equipped with an electronic temperature sensor (including evaluating unit) compensates for geometric changes occurring due to heat increase at the milling spindle. Permanent monitoring and control by machine control. The solid and intelligent construction of the machine helps to reduce heat build-up to a minimum and ensures that influence of heat is efficiently removed.

Tool Clamping

Clamping by mechanical disc-spring assembly. Release cylinder is operated pneumatically.

Tool Magazine

The 30-places tool magazine is located inside working space, but well protected against cooling liquid and chips. The tool change procedure uses a double gripper for fast tool change time. The tools are held in position by the spring. The magazine is filled through the main spindle. During each tool change the tool holder is cleaned by air blast. SK40 and BT 40 clamping systems are available.

Coolant Unit

Wet machining is possible with large amounts of coolant. The large sealed tank, an efficient pump, short supply pipes and the location of multiple jets guarantee a plentiful coolant supply. Inside the tank are sieves, which are easy to clean, for the share of chips and reflowing cooling media.

Machine Covers / Working Area

The machine is equipped with a compact cabin with sliding door. Optimal access to the machining area, easy cleaning and good access for maintenance are outstanding features of this machine.

Documentation

1 set of documentation are contained within the standard scope of supply.

Available language versions: Polish, German, English.

Electrical schemes versions: Polish, German, English.

Quality

During manufacture, the machine undergoes several intermediate tests and a stringent final examination. A test certificate for this final examination is given to the customer on delivery.

C-B3093F HEIDENHAIN TNC 620

Operator Panel:	DMG MORI SLIMline® Multi-Touch control
Hardware:	Processor Intel Celeron 1,4 GHz 2 Cores, 2 GB RAM
Screen:	19" TFT colour flat screen (vertical), resolution 1024 x 1280 pixels vertical and horizontal softkeys
Keyboard:	TNC keyboard and ASCII keyboard integrated in the screen softkeys for HEIDENHAIN plain text Optional usb - keyboard
DMG SMARTkey	Personalized operator authorization with corresponding access
Block Processing Time:	<= 1,5 ms
Look Ahead Function:	The TNC 620 calculates the geometry ahead of time in order to adjust the feed rate (max. 5000 blocks). In this way directional changes are detected in time to accelerate or decelerate the appropriate NC axes. Feed speed is adapted automatically to the dynamics of the machine. Direction changes are checked by the control at least 99 NC blocks in advance (Option number #21). Interpolation

Interpolation

- Straight:	3 NC axes
- Circle:	2 NC axes circular interpolating, 3 NC axes with swiveled plane (Option number #8).
- Helical	Overlapping of circle and straight line
NC Data Memory:	1,8 GB Compact Flash Card
Operator Guidance:	Dialogue, cycle input with graphic support
Programming:	HEIDENHAIN plain text conversational language, DIN/ISO 66025, Milling and drilling cycles, (Option number #19 – in standard). contour calculator, (Option number #19 – in standard). Geometry calculations, parameter programming
Free contour Programming FK :	Free contour programming FK in HEIDENHAIN conversational with graphical support for workpieces which are not dimensioned according to NC standards (Option number #19 – in standard).
Program Structure:	Sub-programs, conditional and unconditional program jumps
Co-ordinate System:	Cartesian, polar
Co-ordinate Transformations:	Shifting, rotating, mirroring, scaling (axis-specific) tilting the working plane, PLANE function (Option number #8)
Plane Definition:	Definition of a machining plane with any three-dimensional arrangement. automatic transformation of machining steps from X/Y plane to a newly defined plane in space.
TCPM:	Tool Centre Point Management. The displacement of the rotary-/swivel axis is compensated in a way that the position of the tool axis is maintained relative to the contour. Tool length is compensated in direction of the tool axis and the tool radius in direction of the normal vector. (Option number #9)
Contour Control:	Circular interpolation in any plane, helical interpolation, linear interpolation of up to 5 axes (Option number #9)
Collision Monitoring:	Not available
Service Support:	Display of memory function after 250 and 2000 operation hours. Optionally: DMG - ServiceAgent with the functions Notification, instruction and support for spare part ordering
Tool Memory:	Tool table with unlimited number of entries.
Simulation:	1-side display, 3D display, three-dimensional presentation (Option number #20 – in standard).

Calculator Functions:	Basic operations, trigonometric functions with reverse functions, radical functions, rounding and smoothing functions
Data Interfaces:	Ethernet interface: Fast Ethernet 10/100 BaseT (100 mBaud) 2 x USB- 3.0 (memory sticks, keyboard) Network protocol: TCP/IP Data transfer: The TNC 620 communicates with personal computers like windows networks(integrated SMB server).

C-K3624F
Production Package 2

Inner coolant supply with High pressure pump and with cartridge filter. Internal coolant is supplied through the spindle centre. It is necessary to use the right Tool holder with the correct pull-studs.

Note:
For Tool clamping use Pull-stud DIN69872 Form A.

- Pump pressure 20 bar
- Flow rate 23 l/min
- Tank capacity: 600 l
- Filterfineness: 50µm
- safety to work without coolant,
- control feedrate paper filter

The filter is no endless filter paper, this subject has to replace by the operator according to the maintenance manual.

- Option includes:
- Internal coolant supply 20 bar;
 - Tank capacity: 600l with papertype filter;
 - Chip conveyor (scraper type) with tank capacity: 220 l (left)
 - Bed and ATC arm flushing via M-Function
 - Coolant spray gun for swarf removal
 - External electronic handwheel
 - Cabin roof (automatic via M-Function)
 - Signal lamp with 4 colours

D-NT401
The DMG MORI Netservice establishes a secure VPN connection to the DMG MORI Service installed on an external Computer.

- By the help of the online connection:
- an immediate and comprehensive problem analysis,
 - direct troubleshooting on machine control or
 - software adaption can be managed.

System requirements of your computer system:

Operating system: Windows 7
Memory: At least 1GB Ram
Hard disc space: At least 20MB

Furthermore the Java Runtime Environment has to be available.

Note:

To guarantee a smooth installation, the checklist of the DMG MORI Netservice has to be completed before setting-up the machine.

After warranty, a monthly fee in the amount of 25 EUR (net) per machine will be incurred. The calculation is performed automatically after successful connection, unless terminated earlier.

The delivery and terms of use of the DMG MORI Netservice is based on the scope of supply and services for the DMG MORI Netservice.

This information and the checklist for the installation of the DMG MORI Netservice will be sent with the order confirmation of our machine or even go to www.dmgmori.com/produkte/software/dmg-mori-netservice#Downloads

On request we are glad to provide you with this information, please feel free to ask for it.

**D-ME405
DMG MORI Messenger V2**

Clear display of the "live" machine status on smartphones, tablets and PCs allows the evaluation of machine time, downtime and disruption.

Installations package with all necessary software tools.

Supported controls: Siemens 840D Powerline*, Siemens 840D Solutionline, Heidenhain iTNC530**;
Heidenhain MillPlus iT V600, Heidenhain TNC620/640, Heidenhain CNC Pilot 620/640***, MAPPS über MTConnect****

Scope of delivery:

- 1x Software "DMG MORI Messenger on DVD"
- 1x licence code (machine specific)
- 1x manual on DVD

The software must be installed and configured by the customer.

For questions regarding this matter, the support of DMG MORI Software Solutions GmbH can be contacted by phone.

Note: Internet access is to be configured by the customer.

System requirements:

SERVER:

- Windows 7 Professional/ Windows Server 2008 R2 / 2012
- At least 8GB RAM
- At least 80GB free space

* Not PCU 20

** From version 340 49x-03 SP/DP

*** NC V688945 V03 or higher

***** To connect a Mori Seiki-machine it has to be checked whether the MTConnect interface is enabled. If no MTConnect interface is enabled, it must be ordered by cost (J-G01209). To do this please contact your next DMG MORI representation.

Further information at <https://messenger.dmgmori.com>

D-SA300

DMG MORI Service Agent - This software is an intelligent early warning system to increase your machine availability and notifies you of any future maintenance needs after the installation on an external PC.

Feature:

Support for spare parts procurement:

With an advance notification, which can be configured, the spare parts required can be determined in good time before the upcoming maintenance jobs and a proposed order prepared.

Included:

- 1x DMG MORI Service Agent Box

- 1x Licence Code

(german, english, italian, french, spanish, portuguese, czech, polish, turkish, russian, danish, hungarian, romanian, swedish)

Note: The startup (D-IB003) can be done by DMG MORI Service as well.
Siemens PCU20 is only available in an offline-mode.

GENERAL CONDITIONS

For this quotation concerning conditions under NL 09 and NLT 09, with the following exceptions;
If the buyer has the right to liquidated damages the calculation of the penalty amount shall start 14 calendar days from the day delivery should have taken place.

Instead of, as stated in paragraph 13 of NL 09 and section 6 paragraph 3 of NLT 09 relating to maximization of liquidated damages due to the late delivery, the following shall apply; The liquidation damages shall be payable at a rate of 0.5% of the agreed price excluding installation for each commenced week of delay. The liquidation damages shall not exceed 5%.

WARRANTY

18 months on machine and control system, starting from date of completed installation.

PAYMENT TERMS

According to campaign offer conditions

VALIDITY OF THE QUOTATION

This quotation is valid one month from quotation date but the validity is limited with reservation of in between sales.

DELIVERY TERMS

DAP according to INCOTERMS 2010, incl. packing, excl. unloading and transportation to installation point.

DELIVERY TIME

To be discussed

The delivery time is valid after the return of the signed order confirmation.

INSTALLATION

Installation of all quoted equipment is included.

Switching in the master power is not included.

Planning and transportation documentation will be sent before hand, at the latest one month before machine delivery occurs. Please note the sections regarding floor and foundation requirements as well as anchoring and connection to water and electrical supply.