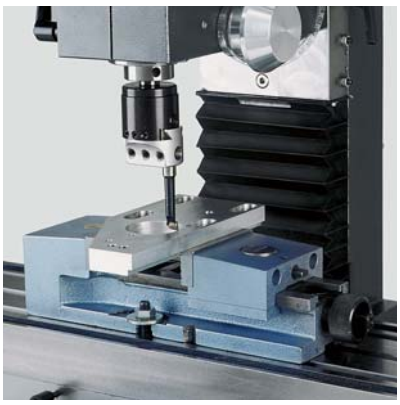
Milling machines

Vertical milling

Gear milling attachment

Inclined drilling 45°



Disengaging spindle with draw-out head

You want to mill with precision!
WABECO milling machines guarantee you ultimate precision covering the entire working range of the milling machine. **Production in Germany** on state-of-the-art machine tools guarantees this. The result is WABECO milling machines made to toolmaker's accuracy.

You want qualitiy!
WABECO milling machines are produced on state-of-the art machine tools with extreme care with a milling machine precision in accordance with DIN (German Industrial Norm). In order to guarantee our quality, we run tests during assembly and carry out a written final test report. This is composed of, among other things, (declaration of average-value specifications): truth of rotation of the work spindle 0.01 mm.

You want a robust milling machine!
By means of the powerful and infinitely variable drive, it is possible, for example, to mill material made of steel to a depth of 10 mm using a 10 mm shell end-mill. The machine column and cross table remain rigid during such cutting operations. **We would be pleased to proof it to you.**

You want precise control!
You can choose between play-free adjustable **dovetail guides** **or** permanently play-free **linear guides**.

You want precise spindles!
You can choose between **trapezoid thread spindles** with adjustable bronze nut and counter nuts **or** non-wearing **ball screws**.

You want generations of use!
This is guaranteed by in-house design and construction. The supply of replacement parts is also guaranteed for decades.

You want expert advice!
If you have technical inquiries or you wish to be specially advised in selecting the most suitable milling machine and the corresponding accessories for your requirements, our WABECO team is at your disposal for advice.

You want safety!
The milling machines' electrical systems have been constructed in accordance with VDE (Association of German electrical technicians' regulations).

You want a warranty!
We offer you a **5-year warranty** - the warranty does not cover parts subject to wear.

Construction - the machine column and cross table are produced from annealed high-quality ribbed grey cast iron. The spindle milling carriage with vertical milling spindle is guided along a vertical column.
The advantage of this type of construction is that there is good absorption of the cutting force and the weight of the work piece. The height of the work piece remains constant, making both work piece and chucking fixture easy to handle.

High torque on the work spindle allows working without problems even in the lower speed ranges for example when machining materials which are hard and difficult to cut.

A **wide toothed belt** between the motor and the work spindle provides for slip-free drive.

Extremely silent running by means of modern electronically regulated drive technology.

Large dimension work spindle drive in extendable quill - The work spindle is precision ground with an exactness of 0.01 mm and mounted in a generously dimensioned drilling and milling quill with adjustable anti-friction bearings.

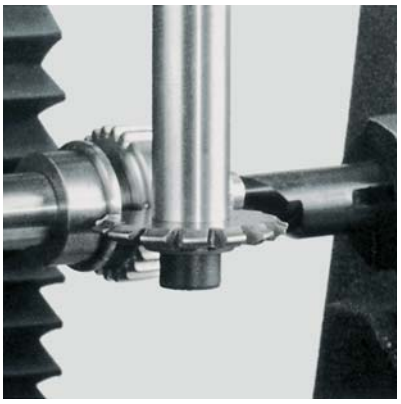
Universal milling head adjustment - the milling head can be rotated 90° in both directions. This allows milling and drilling operations at any angle. The angle position can be easily read off the large scale. The vertical position can be set by means of a conical index pin.

Functional tool clamping - the work spindle is equipped with a new tool clamping and ejection system. This system makes it possible to mount tools (milling cutter, drills, chukks, etc) in the tool spindle and eject them again with little force even after many years. This makes any knocking out of tools with a hammer causing damage to the spindle bed, unnecessary.

Exact reading - due to milled graduations on the scale rings.

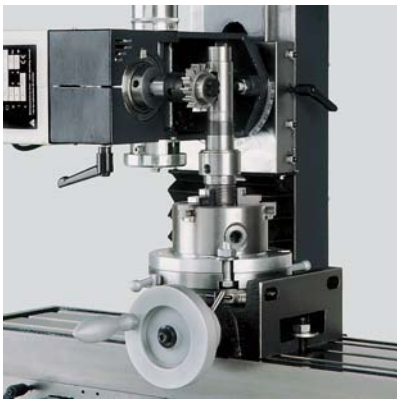
Electronic equipment - The ON-OFF switch is equipped with a low voltage release, i.e. the milling machine does not restart automatically in the event of a power failure. The drive electronics are equipped with a multiple fault monitoring circuit which allows a smooth start under all operating conditions.

Easy maintenance - WABECO milling machines are easy to maintain because all the modules are easy to reach. The modules can easily be removed for repair purposes.

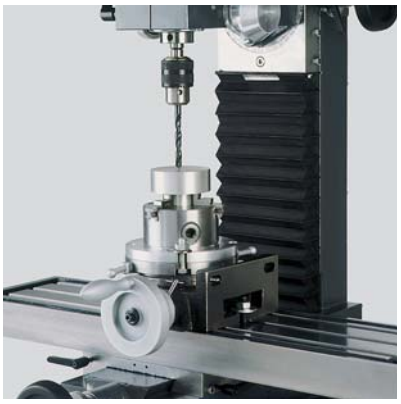


Gear milling - module mill

Milling with dividing attachment



Slot milling - milling head rotated 90°



Coordinate drilling

WABECO milling machines

F1200 E
with base cabinet and coolant unit

F1210 E
with 3-axis digital readout system, base cabinet and coolant unit

F1210 E high speed

with automatic feed in all 3 axes,
base cabinet and coolant unit

F1410 LF high speed

with linear guide and ball screws
in all 3 axes,
base cabinet and coolant unit

Milling machines with dovetail guide

F1200 E

F1200 E high speed

F1210 E

F1210 E high speed

… for all milling machines

- 5-year warranty
- we guarantee ultimate precision due to **production in Germany** on state-of-the-art machine tools
- made to toolmaker's accuracy with test report
- tool holder MT2 (optional MT3 or SK30)
- protective hood prevents unintentional touching of the spindle while in operation. Swivels for quick tool change
- adjustable play-free dovetail guides in all 3 axes
- adjustable feed screws free of play in all 3 axes using adjustable bronze nut and counter nuts
- milling head can be swivelled 90° to both sides
- slow forward feed in Z-axis
- drilling depth end stop
- 2 concertina covers to protect guides
- exact clamping of the quill on the total surface area in the milling head
- clean surface of milled work using individual guides which can be clamped
- constant torque throughout the entire speed range

… especially for milling machines F1200 E and F1210 E

- with electronically infinitely variable drive **140 - 3000 r.p.m**. Equipped with a strong work spindle drive with dynamic, speed-controlled main drive motor, which can be adjusted by means of a potentiometer over a wide range of cutting speeds.
- with single-phase inverse-speed motor **1.4 kW, 230 V, 50 Hz** as direct current model with continuous r.p.m. surveillance
- also available 110V - 60 Hz and inch model

Milling machine F1200 E	milling table 450 x 180 mm	Order No. 11200
with automatic feed in all 3 axes and factory-installed control unit		Order No. 11201

Milling machine F1210 E	milling table 700 x 180 mm	Order No. 11400
with automatic feed in all 3 axes and factory-installed control unit		Order No. 11401

… especially for milling machines F1200 E high speed and F1210 high speed

- robust, speed-regulated motor, which can be adjusted by means of a potentiometer over a wide range of cutting speeds. Power **2.0 kW, 230 V, 50 Hz**
- spindle speed **100 - 7500 r.p.m**.
- suitable for small tools (e. g. for engraving) due to high speed
- suitable for boring threads due to clockwise and anticlockwise rotation

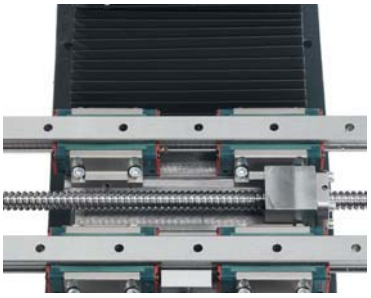
Milling machine F1200 E high speed	milling table 450 x 180 mm	Order No. 11202
with automatic feed in all 3 axes and factory-installed control unit		Order No. 11203

Milling machine F1210 E high speed	milling table 700 x 180 mm	Order No. 11402
with automatic feed in all 3 axes and factory-installed control unit		Order No. 11403

Milling machines with linear guides for ultimate precision

F1410 LF

Linear guide system



F1410 LF high speed

… for all milling machines

- 5-year warranty
- we guarantee ultimate precision due to **production in Germany** on state-of-the-art machine tools
- made to toolmaker's accuracy with test report
- tool holder MT2 (optional MT3 or SK30)
- protective hood prevents unintentional touching of the spindle while in operation. Swivels for quick tool change
- **hardened and ground linear guides with telescopic ball bearing travellers in all 3 axes**

high precision and rigidity
high accuracy of repetition due to smooth running
wear-free and maintenance-free to a great extent
ultimate guide precision
prolonged life cycle
no”stick-slip” effect
improved part quality
improved part accuracy
improved surface quality

- adjustable feed screws free of play in all 3 axes using adjustable bronze nut and counter nuts
- milling head can be swivelled 90° to both sides
- slow forward feed in Z-axis
- drilling depth end stop
- 4 concertina covers to protect guides
- exact clamping of the quill on the total surface area in the milling head
- clean surface of milled work using individual guides which can be clamped
- constant torque throughout the entire speed range

… especially for milling machines F1410 LF

- with electronically infinitely variable drive **140 - 3000 r.p.m**. Equipped with a strong work spindle drive with dynamic, speed-controlled main drive motor, which can be adjusted by means of a potentiometer over a wide range of cutting speeds
- with single-phase inverse-speed motor **1.4 kW, 230 V, 50 Hz** as direct current model with continuous r.p.m. surveillance
- also available 110V - 60 Hz and inch model

Milling machine F1410 LF	Order No. 16400

… especially for milling machine F1410 LF high speed

- robust, speed regulated motor, which can be adjusted by means of a potentiometer over a wide range of cutting speeds. Power **2.0 kW, 230 V, 50 Hz**
- spindle speed **100 - 7500 r.p.m**.
- suitable for small tools (e.g. for engraving) due to high speed
- suitable for boring threads due to clockwise and counterclockwise rotation

Milling machine F1410 LF high speed	Order No. 16402

Technical data

	F1200 E	F1210 E	F1410 LF
Longitudinal X-axis	260 mm	500 mm	500 mm
Vertical Z-axis	280 mm	280 mm	280 mm
Transverse Y-axis	150 mm optional 180 mm	150 mm optional 180 mm	200 mm
Power 230 V, 50 Hz	1.4 kW	1.4 kW	1.4 kW
Spindle speed infinitely variable	140 - 3000 r.p.m.	140 - 3000 r.p.m.	140 - 3000 r.p.m.
Swivel range of the milling head to both sides	90°	90°	90°
Tool holder	MT2 tightening thread M10 optional MT3 or SK30 tightening thread M12	MT2 tightening thread M10 optional MT3 or SK30 tightening thread M12	MT2 tightening thread M10 optional MT3 or SK30 tightening thread M12
Drilling stroke	55 mm	55 mm	55 mm
Milling table	450 x 180 mm	700 x 180 mm	700 x 180 mm
Number of T-slots	3	3	3
Width of T-slots	12 mm	12 mm	12 mm
Truth of rotation of spindle nose	0.01 mm	0.01 mm	0.01 mm
Distance between milling machine table and spindle nose	min. 100 mm max. 380 mm	min. 90 mm max. 370 mm	min. 65 mm max. 350 mm
Working range of spindle nose and support column	185 mm	185 mm	185 mm
Machine dimensions (W x D x H)	650 x 640 x 960 mm	900 x 610 x 960 mm	950 x 600 x 950 mm
Weight without packing	85 kg	101 kg	118 kg

	F1200 E high speed	F1210 E high speed	F1410 LF high speed
Power 230 V, 50 Hz	2.0 kW	2.0 kW	2.0 kW
Spindle speed	100 - 7500 r.p.m.	100 - 7500 r.p.m.	100 - 7500 r.p.m.
Machine dimensions (W x D x H)	700 x 600 x 1100 mm	950 x 600 x 1100 mm	950 x 600 x 1100 mm
Weight without packing	96 kg	112 kg	127 kg
	For other technical details see F1200 E	For other technical details see F1210 E	For other technical details see F1410 LF

- Technical details are subject to change -

Options

Ball screws

- no retrofitting
- for all 3 axes
- very high pitch and positioning precision
- down-cut milling and counter milling possible
- wear-free
- for all milling machines with linear guides with counterweight in Z-axis

for all F1200 E	Order No. 11245
for all F1210 E	Order No. 11445
for all F1410 LF	Order No. 16445

Transverse extension for Y-axis

- no retrofitting
- maximal travel path 180 mm
- **for all milling machines F1410 LF, the transverse Y-axis is standard 200 mm**

Order No. 11235

Tool holder MT3

- no retrofitting
- morse taper MT3 and tightening thread M12

Order No. 11230

Tool holder SK30

- no retrofitting
- quick-release taper SK30 and tightening thread M12

Order No. 11231

Retrofit set for automatic feeds

- for optional retrofitting
- to be retrofitted by the customer
- for all axes
- control unit with ON-/OFF switch, toggle switch for all 3 axes directions, potentiometer as well as electronic unit for controlling drive
- pre-selectable feed direction, feed speed infinitely variable from 0 - 800 mm/min
- overload clutch - when overloading or when colliding against the end position of the bed, an overload clutch comes into effect
- automatic feed and manual operation can be freely selected
- **not possible in combination with milling machines F1410 LF**

Illustration F1200 E with automatic feeds

Control unit	Order No. 11279
Automatic feed X-axis (feed spindle and motor)	
■ for all F1200 E	Order No. 11276
■ for all F1210 E	Order No. 11476
Automatic feed Y-axis (feed spindle and motor)	Order No. 11277
Automatic feed Z-axis (feed spindle and motor)	Order No. 11278

Options

Illustration F1200 E

Illustration
F1210 E high speed

3-axis digital readout system and linear measuring scales

- switchable from lathes to milling machines
- for a precise, fast and reliable production
- smooth installation by exact positioning
- no parallax or reading errors
- absolute accuracy of repeat machining
- glass measuring scales are protected against shock and dirt
- colour display, 7-digit position indicator
- resolution 0.005 mm
- ergonomically designed folio keyboard - dust and splash guard
- reversible metric/inch
- reversion of count (up or down) by means of operation sign change
- coordinates value setting or zero setting
- data is preserved in the fixed set point memory in the case of a power cut
- incremental or absolute measurement input
- parameter input
- tool memory for 100 tools with independent coordinate reference points
- tool number readout
- coordinate reference points
- calculator function (addition; subtraction ect.)
- trigonomic functions (sine; cosine; tangent)
- pitch circle calculation with indication of individual coordinates
- input and sonsideration of shrink factors
- can be installed by the customer

3-axis digital readout system		Order No. 10280
Linear measuring scales for longitudinal X-axis		
▪ for all F1200 E	measuring length 270 mm	Order No. 10285
▪ for all F1210 E and F1410 LF	measuring length 520 mm	Order No. 10287
Linear measuring scales for transverse Y-axis		
▪ for all F1200 E and F1210 E	measuring length 170 mm	Order No. 10284
▪ for all F1410 LF	measuring length 270 mm	Order No. 10285
▪ for all milling machines with transverse extension	measuring length 270 mm	Order No. 10285
Linear measuring scales for vertical Z-axis	measuring length 320 mm	Order No. 10286
Bracket for readout system and protective cover for the glass measuring scales		
▪ for all F1200 E		Order No. 11289
▪ for all F1210 E		Order No. 11489
▪ for all F1410 LF		Order No. 16489
Factory-installed readout system and glass measuring scales		Order No. 11288

Options

Digital measuring gages

- for optional retrofitting
- the digital measuring gages make a precise and exact processing of the work piece possible, e.g. without monitoring spindle play
- the digital measuring slide shows values with a reading accuracy of 0.01 mm on the LCD display
- reversible metric/inch
- all digital measuring gages are equipped with an interface for postion read out
- zero setting
- can be installed by the customer

Digital measuring gage - Longitudinal X-axis		
▪ for all F1200 E	measuring length 300 mm (with measuring gage cut to 500 mm)	Order No. 11365
▪ for all F1210 E and F1410 LF	measuring length 500 mm	Order No. 11365
Digital measuring gage - Transverse Y-axis	measuring length 200 mm	Order No. 11362
Digital measuring gage - Vertical Z-axis with vertical LCD display	measuring length 300 mm	Order No. 11373
Set of fastenings for all 3 axes		
▪ for all F1200 E and F1210 E		Order No. 11299
▪ for all F1410 LF		Order No. 16299
Factory-installed of measuring gages		Order No. 11298

CNC retrofitting kit **for all WABECO milling machines**

- for optional retrofitting
- CNC milling software and connection cable between PC and control system, control unit with stepper motors, motor cover, gear wheels and drive belts for all axes
- for milling machine models **from 1998** onwards (with graduated collars Ø 50 mm)
- with nccad basic software or nccad professional software
- description page 74 onwards

with nccad basic Software	
▪ for all F1200 E	Order No. 1120016
▪ for all F1210 E	Order No. 1140016
▪ for all F1410 LF	Order No. 1640016
with nccad professional Software	
▪ for all F1200 E	Order No. 1120017
▪ for all F1210 E	Order No. 1140017
▪ for all F1410 LF	Order No. 1640017

Options

Base cabinet

- H 85 x W 70 x D 45 cm
- with lockable door and 2 shelves
- made of powder-coated sheet steel

Order No. 11267

Levelling elements

- vibration pick up and absorption element
- Ø 80 mm, thread M10
- prevents the machine and cabinet moving
- for precise height adjustment on uneven ground
- 4 levelling elements are required per cabinet/machine

pack. unit: 1 piece Order No. 10268

Coolant unit

- for cooling and lubrication
- complete with feed pump 230 V, 50 Hz
- flexible hose with stop valve and nozzle
- content coolant: 13 litres

Application: i.e. when processing high alloy steel and aluminium, improves the surface finish, increases tool endurance, prevents built-up edges, maintains dimensional accuracy of work pieces

Order No. 11264

Coolant return plate

- for WABECO milling machines F1210 E and F 1410 LF
- is hooked into the coolant unit
- the coolant is returned to the coolant unit

Order No. 11265

Cover rail for T-slots

- pack. unit:3 pieces
- length pro cover 400 mm
- anodised aluminium
- prevents chips from getting into the T-slots
- with borings for draining off coolant
- the cover rails are placed in the T-slots
- can be cut as necessary

for 12 mm T-slot width	Order No. 11259
for 14 mm T-slot width	Order No. 11260
for 16 mm T-slot width	Order No. 11261

Start set 1

consisting of:

- machine vice 100 mm
- precision spring collet chuck with key
- collets Ø 6 mm - Ø 10 mm - Ø 12 mm - Ø 16 mm
- shell end mill set 20-pieces "TITAN" coated

Order No. 11999

Start set 2

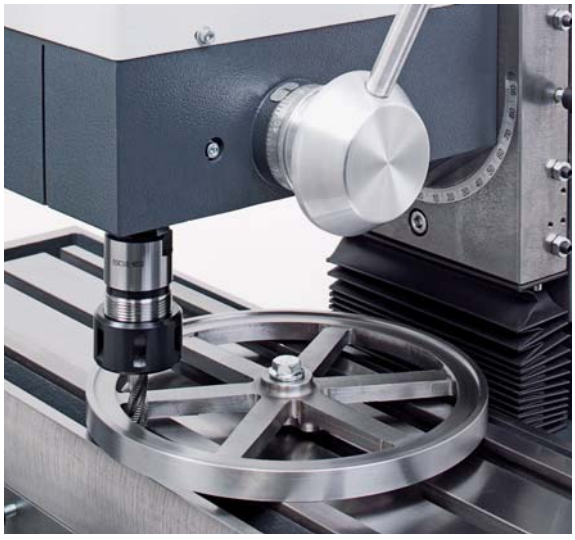
consisting of:

- machine vice 100 mm
- precision clamping set 16-pieces
- clamping kit 58-pieces
- precision quick-action drill chuck
- taper shaft for drill chuck
- shell end mill set 20-pieces "TITAN" coated

Order No. 11998

CNC milling machines

Pocket milling



Milling of segments into a drive wheel

Milling of the outer contour

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Construction - the machine column and cross table are produced from annealed high-quality ribbed grey cast iron. The spindle milling carrige with vertical milling spindle is guided along a vertical column.
The advantage of this type of construction is that there is good absorption of the cutting force and the weight of the workpiece. The height of the work piece remains constant, making both work piece and chucking fixture easy to handle.

High torque on the work spindle allows working without problems even in the lower speed ranges for example when machining materials, which are hard and difficult to cut.

A **wide toothed belt** between the motor and the work spindle provides for a slip-free drive.

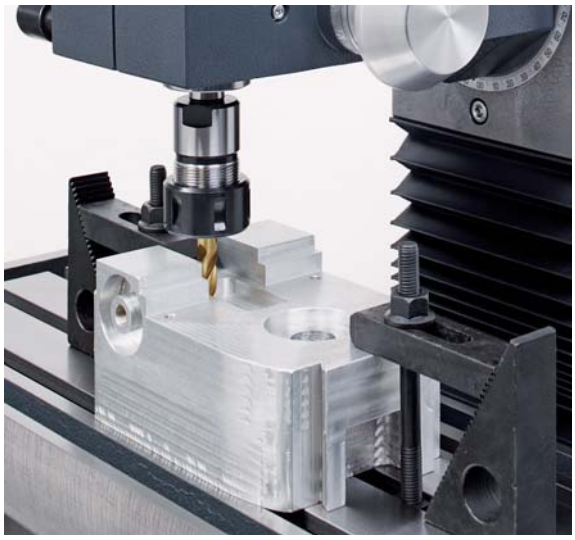
Extremely silent running by means of modern electronically regulated drive technology.

Large dimension work spindle drive in extendable quill - The work spindle is precision ground with an exactness of 0.01 mm and mounted in a generously dimensioned drilling and milling quill with adjustable anti-friction bearings.

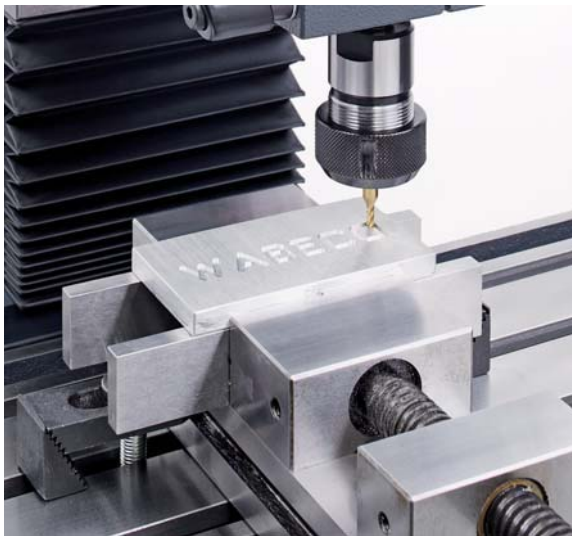
Universal milling head adjustment - The milling head can be rotated 90° in both directions. This allows milling and drilling operations at any angle. The position angle can be easily read off a large scale. The vertical position can be set by means of a hardened and ground conical index pin.

Axis drive - strong, maintenance-free feed motors, which drives the axes via the toothed belts, providing high feed rates and acceleration values.

Milling of a form plate

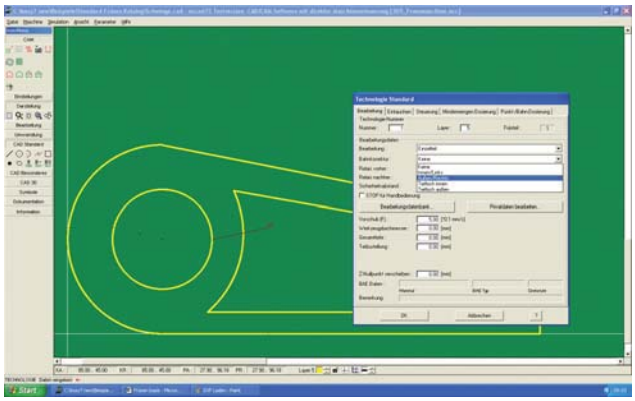


Milling of a gear block



Engrave milling

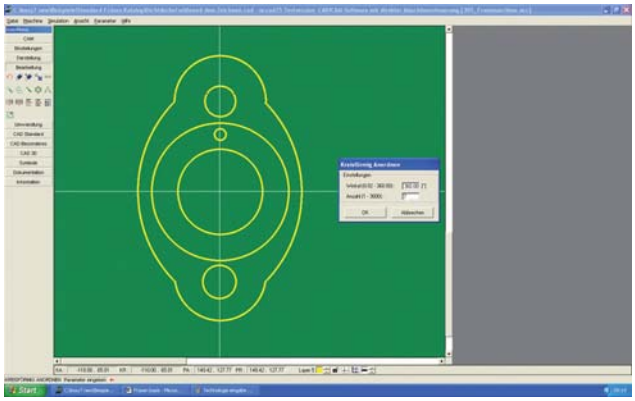
CNC milling software nccad basic



Software - the CNC lathe software ***nccad basic*** allows the easy creation of milling contours. By offering the possibility of backlash compensation, ***nccad basic*** provides for high accuracy when machining with a machine tool equipped with trapezoid spindles (backlash).

Network compatible software

An Update to nccad professional can be installed at any time (provided that ball screws are used).

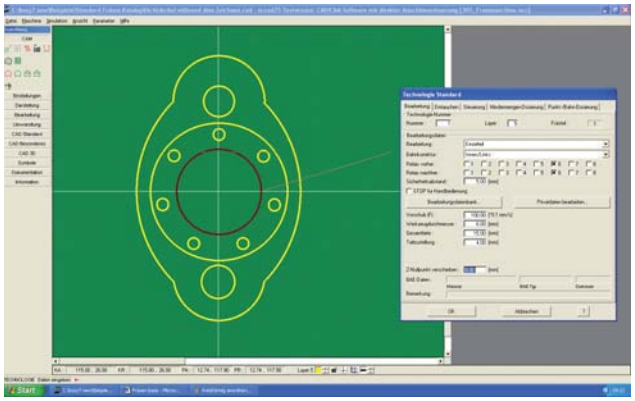


Type of control - 2 ½ D interpolation, i. e. two axes can be displaced simultaneously. The 3rd axis can be advanced when required. By supporting the microstepping feature, this control type guarantees a smooth run and high position resolution.

Conventional machining – is possible with the controller switched off.

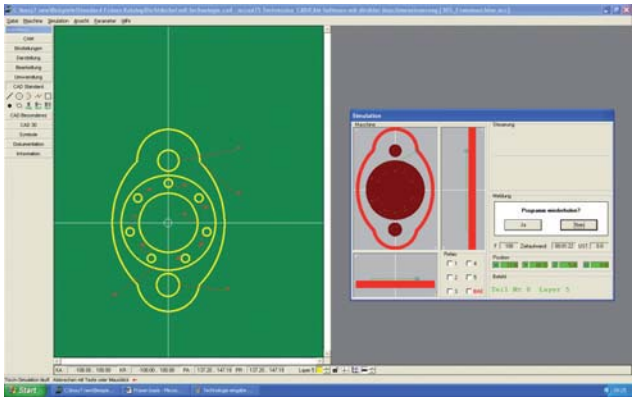
Dialogue-oriented operator guidance

Program input - according to DIN 66025 with G- and M functions as well as graphical programming.

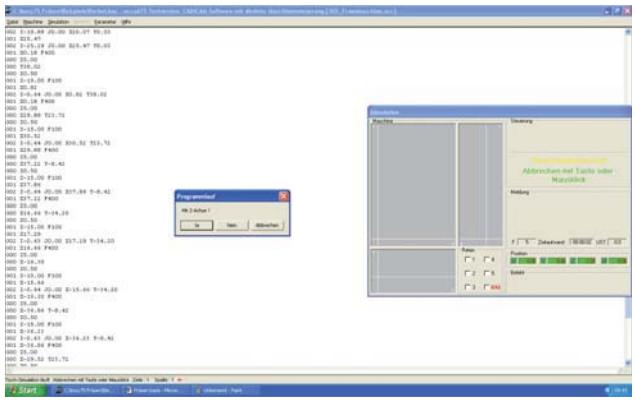


Data import - the contour is imported in form of dxf files from a CAD system such as Auto CAD or HPGL in case of Corel Draw or as a STL file from inventor. ***nccad basic*** automatically converts these files into an executable program. Designing may also be done in the comfortable CAD mode.

Contour designing - CAD mode allows the input or modification of coordinates i. e. instructions can be modified, added and/or deleted. With ***nccad basic,*** the contour to be milled can be drawn and displayed on the monitor by using the mouse or the keyboard. As a standard, the CAD mode offers the drawing of straight lines, arches, circles, polygons, engravings etc. The contours can be moved, rotated, copied, mirrored and trimmed.

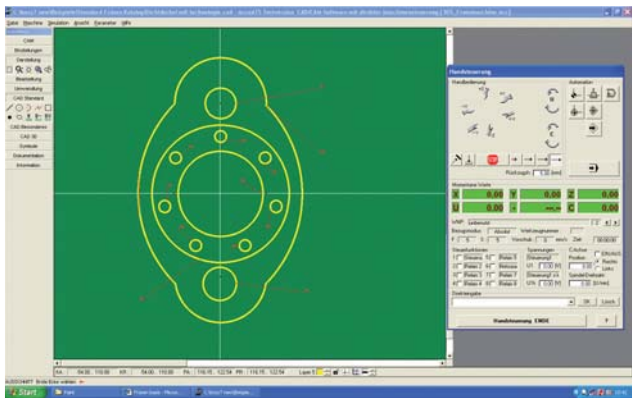


Input of technological values for the drawn contour e.g. feed, tool ∅, total depth, part in-feed and the lapping factor of the tool in the case of pocket milling, processing sequence etc. The machining process can be influenced by the factors individual part, step drilling, pocket angle parallel and pocket contour parallel. Furthermore, there operator can choose between inside or outside machining. Down-cut milling or standard milling can be set.



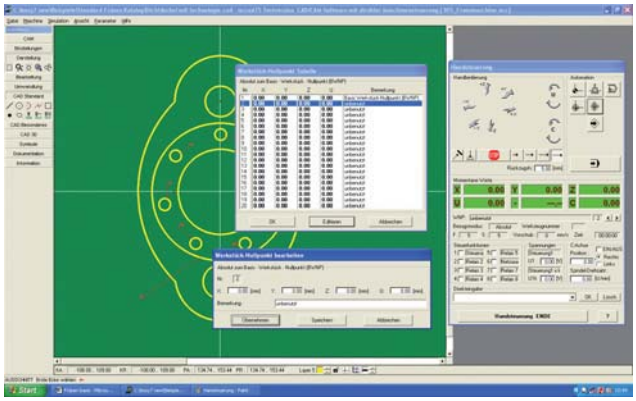
Automatic creation of CNC programs on the basis of a designed contour according to DIN 66025.

Graphic simulation - prior to the actual machining of a work piece the operator may run a simulation. By means of this method potential programming errors can be eliminated in a quick and easy way and an unnecessary collision can be avoided.



Operating panel - via the operating panel the CNC milling machine can even be run without a program either by direct input of the displacement value via the keypad or by using the arrow keys of the operating panel. The current values are displayed on the monitor.

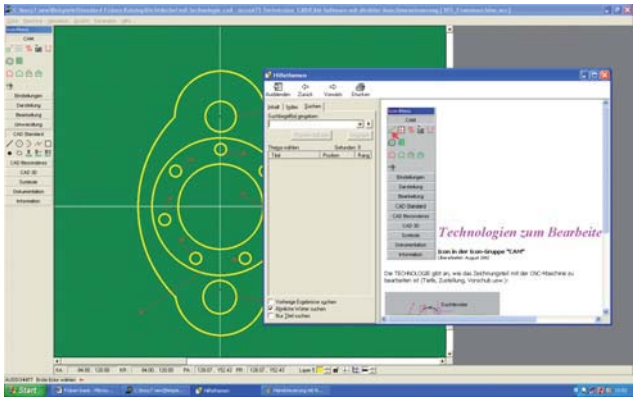
Tool specification - serves for the administration of the tools.



Machine zero point – is interrogated by means of a reference travel via limit switches. Up to 20 further zero points can be set.

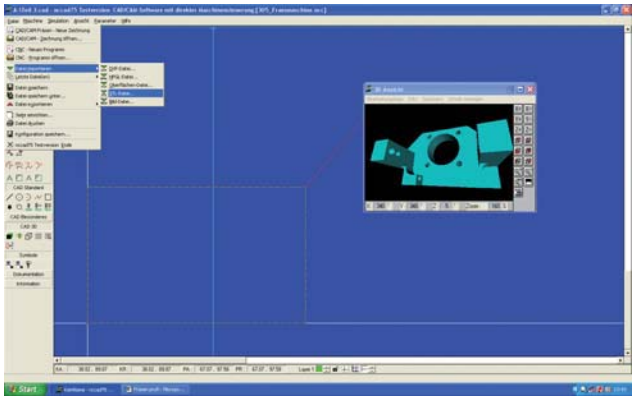
Help functions - comfortable direct help functions within the software. Direct access to icon explanation via the F1 key.

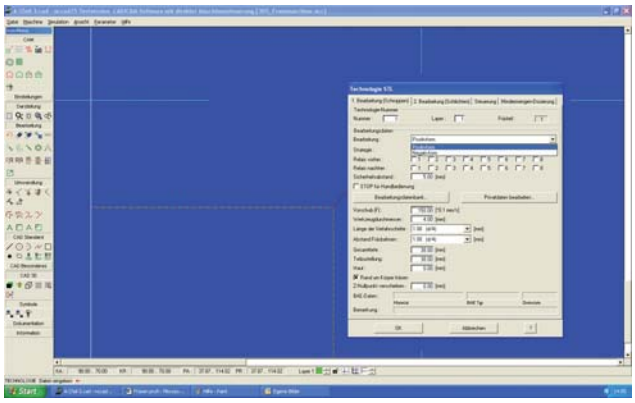
System requirements - Pentium 2 min., at least 600 MHz, working memory min. 64 MB RAM, CD drive, serial interface, graphic resolution min. 1024 x 768, 60 MB left on main board. Open GL simulation requires a fast graphic card with a large memory such as GeForce2 made by NVIDIA.

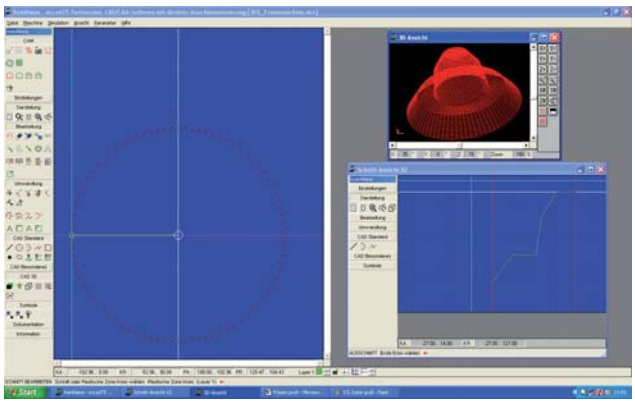


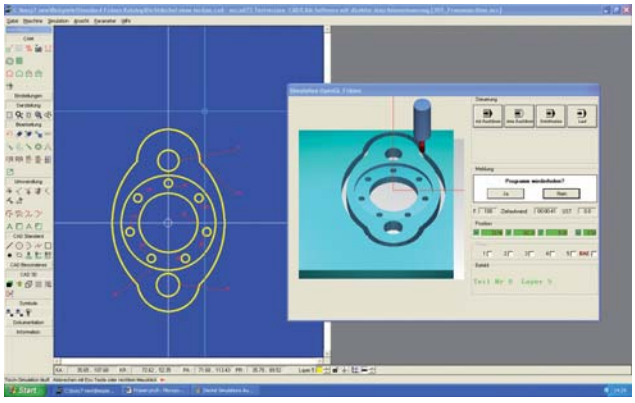
Operating system – Windows XP and Windows NT.

CNC milling software nccad professional









Software - the CNC milling software ***nccad professional*** allows the easy creation of milling contours and simple 3D drawings. The Helix function is also available. CAD is provided with the special features toothed wheel, ellipse, curve interpolation, engraving, circuit board milling etc.

Network compatible software

Type of control - 3D interpolation i. e. 3 axes can be displaced simultaneously. The 4th axis is programmable in CAD mode. In CNC mode (DIN 66025) all 4 axes can be displaced simultaneously in one sentence. By supporting the microstepping and the Look A-head feature, this control type guarantees a smooth run and high position resolution as well as an anticipatory program process. With ***nccad professional*** the machine runs at a very high speed on all axes and the work spindle can optionally be turned on or off as well.

Conventional machining – possible with the controller switched off.

Dialog-oriented operator guidance

Program input to DIN 66025 with G and M functions as well as graphical programming.

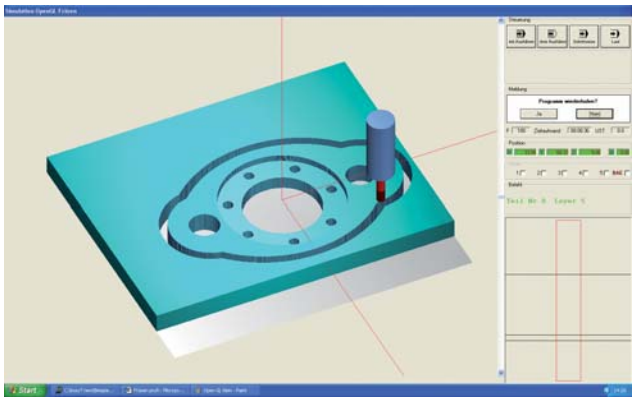
Data import - the contour is imported in form of dxf files from a CAD system such as Auto CAD or HPGL files in case of Corel Draw or as a STL file from inventor. ***nccad professional*** automatically converts these files into an executable program. Designing may also be done in the comfortable nccad CAD mode.

Contour designing - CAD mode allows the input or modification of coordinates i. e. instructions can be modified, added and/or deleted. With ***nccad professional,*** the contour to be milled can be drawn and displayed on the monitor by using the mouse or the keyboard. As a standard, the CAD mode offers the functions drawing of straight lines, arches, circles, polygons, engraving etc. The contours can be moved, rotated, copied, mirrored and trimmed.

Input of technology values for the drawn contour e.g. feed, tool Ø, total depth, part in-feed and the lapping factor of the tool in the case of pocket milling, processing sequence etc. The machining process can be influenced by the factors individual part, step drilling, pocket angle parallel and pocket contour parallel. Furthermore, the operator can choose between inside or outside machining. Down-cut milling or standard milling can be set.

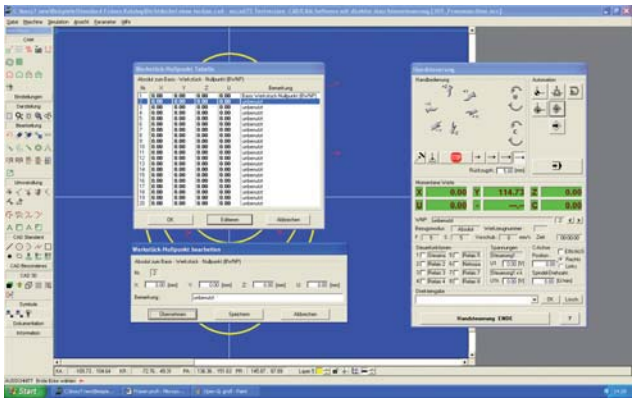
Automatic creation of CNC programs the basis of a designed contour according to DIN 66025.

Graphic simulation with Open GL - prior to the actual machining of a work piece the operator may run a simulation. By means of this method potential programming errors can be eliminated in a quick and easy way and an unnecessary collision can be avoided.



Operating panel - via the operating panel the CNC milling machine can even be run without a program either by direct input of the displacement value via the keypad or by using the arrow keys of the operating panel. The current values are displayed on the monitor.

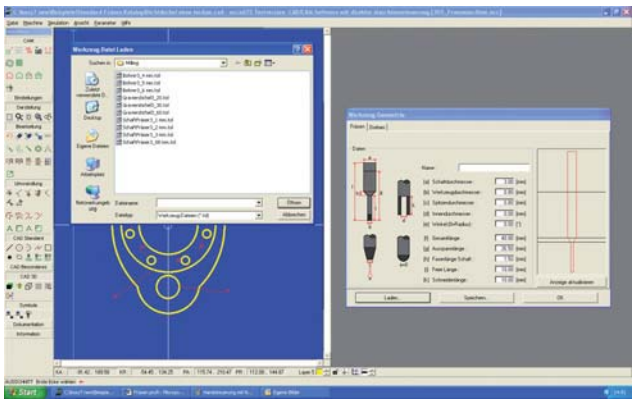
Tool specification - allows the definition of tools by entering the angle, length and shape of cutting edges etc.



Machine zero point – is interrogated by means of a reference travel via **limit switches**. Up to 20 further zero points can arbitrarily be set.

Help functions - comfortable direct help functions within the software. Direct access to icon explanation via the F1 key.

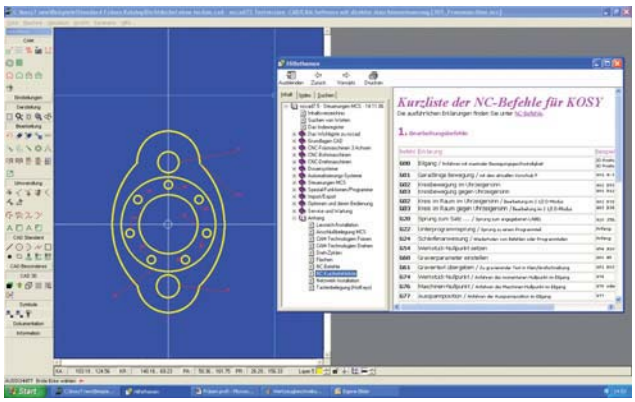
System requirements - Pentium 2 min., at least 600 MHz, working memory min. 64 MB RAM, CD drive, serial interface, graphic resolution min. 1024 x 768, 60 MB left on main board. Open GL simulation requires a fast graphic card with a large memory such as GeForce2 made by NVIDIA.



Operating system – Windows XP and Windows NT.

Tool memory - the administration of up to 20 different tools. The fully automatic tool memory calculates the deviations between the tools on the basis of the tool dimensions.

NC rotary table – (optional) controlled via the 4th axis



Electronic hand wheels – (optional) needed for the zero point travel.

CNC milling machines with dovetail guides

CC-F1200 E

CC-F1200 E high speed

CC-F1210 E

CC-F1210 E high speed

… for all CNC milling machines

- 5-year warranty
- we guarantee ultimate precision due to **production in Germany** on state-of-the-art machine tools
- made to toolmaker's accuracy with test report
- protective hood prevents unintentional touching of the spindle while in operation. Swivels for quick tool change
- tool holder MT2 (optional MT3 or SK30)
- adjustable play-free dovetail guides in all 3 axes
- adjustable feed screw free of play using adjustable bronze nut and counter nuts in all 3 axes
- milling head can be swivelled 90° to both sides
- slow forward feed in Z-axis
- drilling depth end stop
- 2 concertina covers to protect guides
- exact clamping of the quill on the total surface area in the milling head
- clean surface of milled work using individual guides which can be clamped
- constant torque throughout the entire speed range

- **CNC milling software and connection cable between PC and control system**
- **factory-installed control unit with integrated operational control and interval motor**
- the CNC milling machines can be used **conventionally as well as in CNC**
- **the use of ball screws is essential for the highest positioning accuracy**

- **PC control**
  The PC assumes the administration of the program and the archiving of the data.
  For programm creating independent from the machine - with the aid of the milling software, CNC programs can be produced on several PCs, independent of the CNC milling machine. This means that new programs can be created on other PCs while the CNC milling machine is performing machining operations on the work piece. This increases the productivity of your CNC milling machine.
- **PCs are not included in our range of goods**

… especially for CNC milling machines CC-F1200 E and CC-F1210 E

- with electronically infinitely variable drive **140 - 3000 r.p.m.** Equipped with a strong work spindle drive with dynamic, speed-controlled main drive motor, which can be adjusted by means of a potentiometer over a wide range of cutting speeds.
- with single-phase inverse-speed motor **1.4 kW, 230 V, 50 Hz** as a direct current model with continuous r.p.m. surveillance
- also available in 110V - 60 Hz and inch models

CNC milling machines CC-F1200 E

- **milling table 450 x 180 mm**

with nccad basic software	Order No. 1120050
with nccad professional software	Order No. 1120011

Basic equipment

… especially for CNC milling machines CC-F1200 E and CC-F1210 E

CNC milling machine CC-F1210 E

- **milling table 700 x 180 mm**

with nccad basic software	Order No. 1140050
with nccad professional software	Order No. 1140011

… especially for CNC milling machines CC-F1200 E high speed and CC-F1210 high speed

- robust, speed-regulated motor, which can be adjusted by means of a potentiometer over a wide range of cutting speeds. Power **2.0 kW, 230 V, 50 Hz**
- spindle speed **100 - 7500 r.p.m.**
- due to high speed, suitable for small diameter tools e.g. for engraving
- suitable for boring threads due to clockwise and anticlockwise rotation

CNC milling machine CC-F1200 E high speed

- **milling table 450 x 180 mm**

with nccad basic software	Order No. 1120052
with nccad professional software	Order No. 1120013

CNC milling machines CC-F1210 E high speed

- **milling table 700 x 180 mm**

with nccad basic software	Order No. 1140052
with nccad professional software	Order No. 1140013

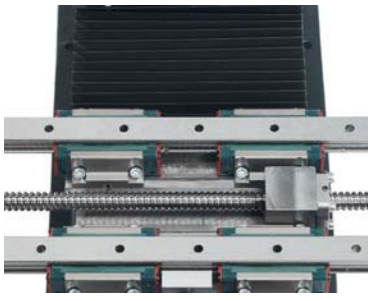
CC-F1200 E with safety machine cabin and integrated coolant unit, ball screws and base cabinet

CC-F1210 E high speed with safety machine cabin and integrated coolant unit, industry monitor and folio keyboard and base cabinet

CNC milling machines with linear guideways for ultimate precision

CC-F1410 LF

Linear guide system



CC-F1410 LF high speed

… for all CNC milling machines

- 5-year warranty
- we guarantee ultimate precision due to **production in Germany** on state-of-the-art machine tools
- made to toolmaker's accuracy with test report
- tool holder MT2 (optional MT3 or SK30)
- protective hood prevents unintentional touching of the spindle while in operation. Swivels for quick tool change
- **hardened and ground linear guides with telescopic ball bearing travellers in all 3 axes**

high precision and rigidity	no “stick-Slip”effect
high accuracy of repetition due to smooth running	improved part quality
wear-free and maintenance-free to a great extent	improved part accuracy
ultimate guide precision	improved surface quality
prolonged life cycle	

- adjustable feed screws free of play using adjustable bronze nut and counter nuts in all 3 axes
- milling head can be swivelled 90° to both sides
- slow forward feed in Z-axis
- drilling depth end stop
- 4 concertina covers to protect guides
- exact clamping of the quill on the total surface area in the milling head
- constant torque throughout the entire speed range

- **CNC milling software and connection cable between PC and control system**
- **factory-installed control unit with integrated operational control and interval motor**
- the CNC milling machines can be used **conventionally as well as in CNC**

- **PC control**
  The PC assumes the administration of the program and the archiving of the data.
  For programm creating independent from the machine - with the aid of the milling software, CNC programs can be produced on several PCs, independent of the CNC milling machine. This means that new programs can be created on other PCs, while the CNC milling machine is performing machining operations on the work piece. This increases the productivity of your CNC milling machine.
- **PCs are not included in our range of goods**

… especially for CNC milling machines CC-F1410 LF

- with electronically infinitely variable drive **140 - 3000 r.p.m.** Equipped with a strong work spindle drive with dynamic, speed-controlled main drive motor, which can be adjusted by means of a potentiometer over a wide range of cutting speeds
- with single-phase inverse-speed motor **1.4 kW, 230 V, 50 Hz** as a direct current model with continuous r.p.m surveillance
- also available in 110V - 60 Hz and inch models

with nccad basic software	Order No. 1640050
with nccad professional software	Order No. 1640011

… especially for CNC milling machines CC-F1410 LF high speed

- robust, speed-regulated motor, which can be adjusted by means of a potentiometer over a wide range of cutting speeds. Power **2.0 kW, 230 V, 50 Hz**
- spindle speed **100 - 7500 r.p.m.**
- due to high speed, suitable for small diameter tools e.g. for engraving
- suitable for boring threads due to clockwise and anticlockwise rotation

with nccad basic software	Order No. 1640052
with nccad professional software	Order No. 1640013

Technical data

		CC-F1200 E
Longitudinal X-axis		260 mm
Vertical Z-axis		280 mm
Transverse Y-axis		150 mm optional 180 mm
Power 230 V, 50 Hz		1.4 kW
Spindle speed infinitely variable		140 - 3000 r.p.m.
Swivel range of milling head both sides		90°
Tool holder		MT2 tightening thread M10 optional MT3 or SK30 tightening thread M12
Drilling stroke		55 mm
Milling table		450 x 180 mm
Number of T-slots		3
Width of T-slots		12 mm
Truth of rotation of the spindle nose		0.01 mm
Distance between milling machine table and spindle nose		min. 100 mm max. 380 mm
Working range spindle nose - support		185 mm
Positioning accuracy		± 0.015 mm
Path feed rate for X- and Y-axis	nccad basic	30-600 mm/min
	nccad professional	30-1200 mm/min
Path feed rate for Z-axis	nccad basic	30-400 mm/min
	nccad professional	30-800 mm/min
Machine dimensions (W x D x H)		700 x 600 x 950 mm
Weight without packing		106 kg

	CC-F1200 E high speed
Power 230 V, 50 Hz	2.0 kW
Spindle speed	100 - 7500 r.p.m.
Machine dimensions (W x D x H)	700 x 600 x 1100 mm
Weight without packing	115 kg
	For other technical details see CC-F1200 E

- Technical details are subject to alteration -

CC-F1210 E	CC-F1410 LF
500 mm	500 mm
280 mm	280 mm
150 mm optional 180 mm	200 mm
1.4 kW	1.4 kW
140 - 3000 r.p.m.	140 - 3000 r.p.m.
90°	90°
MT2 tightening thread M10 optional MT3 or SK30 tightening thread M12	MT2 tightening thread M10 optional MT3 or SK30 tightening thread M12
55 mm	55 mm
700 x 180 mm	700 x 180 mm
3	3
12 mm	12 mm
0.01 mm	0.01 mm
min. 90 mm max. 370 mm	min. 65 mm max. 350 mm
185 mm	185 mm
± 0.015 mm	± 0.015 mm
30 - 600 mm/min 30 - 1200 mm/min	30 - 600 mm/min 30 - 1200 mm/min
30 - 400 mm/min 30 - 800 mm/min	30 - 400 mm/min 30 - 800 mm/min
950 x 600 x 950 mm	950 x 600 x 950 mm
122 kg	139 kg

CC-F1210 E high speed	CC-F1410 LF high speed
2.0 kW	2.0 kW
100 - 7500 r.p.m.	100 - 7500 r.p.m.
950 x 600 x 1100 mm	950 x 600 x 1100 mm
131 kg	148 kg
For other technical details see CC-F1210 E	For other technical details see CC-F1410 LF

- Technical details are subject to alteration -

Options

Ball screws

- no retrofitting
- for all 3 axes
- very high pitch and positioning precision
- down-cut milling and counter milling possible
- on all mills with linear guides and counterweight balance on the Z-axis
- wear-free
- **the use of ball screws is essential for the highest positioning accuracy**

for all CC-F1200 E	Order No. 11245
for all CC-F1210 E	Order No. 11445
for all CC-F1410 LF	Order No. 16445

Transverse extension

- no retrofitting
- max. travel 180 mm
- **for all CC-F1410 LF the transverse Y-axis standard 200 mm**

Order No. 11235

Tool holder MT3

- no retrofitting
- morse taper MT3 and tightening thread M12

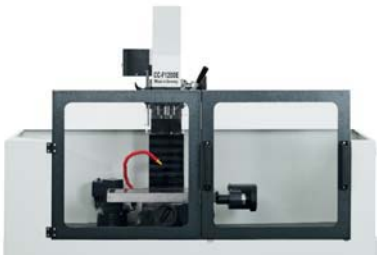
Order No. 11230

Tool holder SK30

- no retrofitting
- quick-release taper SK30 and tightening thread M12

Order No. 11231

Safety machine cabin



- no retrofitting
- with integrated coolant unit
- content coolant: 42 litres
- control unit with machine operating elements
- the safety machine cabin prevents accidents

for CC-F1200 and CC-F1210	Order No. 1140090
for CC-F1410 LF	Order No. 1640090

Industry monitor and folio keyboard

- no retrofitting
- in an ergonomic control unit housing
- with integrated machine operating elements
- with adjustable swivel arm
- replaces conventional monitors and keyboard
- **PCs are not included in our range of goods**
- **only in connection with the safety machine cabin**

Order No. 1140095

Options

Base cabinet

- H 85 x W 70 x D 45 cm
- with lockable door and 2 shelves
- made of powder-coated sheet steel

Order No. 11267

Base cabinet

- H 85 x W 106 x D 45 cm
- with lockable door and 2 shelves
- made of powder-coated sheet steel
- **in combination with the safety machine cabin for all CC-F1200 E and CC-F1210 E**

Order No. 10267

Base cabinet

- H 85 x W 100 x D 70 cm
- with 2 lockable doors and 2 shelves
- made of powder-coated sheet steel
- **in combination with the safety machine cabin for all CC-F1410 LF**

Order No. 1090510

Levelling elements

- vibration pick up and absorption element
- Ø 80 mm, thread M10
- prevents the machine and cabinet moving
- for precise height adjustment on uneven ground
- 4 levelling elements are required per cabinet/machine

pack. unit: 1 piece Order No. 10268

Coolant unit

- for cooling and lubrication
- complete with feed pump 230 V, 50 Hz
- flexible hose with stop valve and nozzle
- content coolant: 13 litres

Application: i.e. when processing high alloy steel and aluminium, improves the surface finish, increases tool endurance, prevents built-up edges, maintains dimensional accuracy of work pieces

Order No. 11264

Options

Update CNC Milling Software

from nccad basic to nccad professional

Order No. 1140301

Electronic hand wheel

- for 3 axes
- for manual displacement of the axes
- serves for the positioning of the CNC milling machine during the setup mode (work piece zero point)

Order No. 1140130

3-axis digital readout system and linear measuring scales

- for optional retrofitting
- discription see page 90

Illustration CC-F1200 E

CC-F1210 E high speed

3-axis digital readout system		Order No. 10280
Linear measuring scales for longitudinal X-axis		
▪ for all CC-F1200 E	measuring length 270 mm	Order No. 10285
▪ for all CC-F1210 E and CC-F1410 LF	measuring length 520 mm	Order No. 10287
Linear measuring scales for transverse Y-axis		
▪ for all CC-F1200 E and F1210 E	measuring length 170 mm	Order No. 10284
▪ for all CC-F1410 LF	measuring length 270 mm	Order No. 10285
▪ for all milling with transverse extension	measuring length 270 mm	Order No. 10285
Linear measuring scales for vertical Z-axis	measuring length 320 mm	Order No. 10286
Bracket for readout system and protective cover for the glass measuring scales		
▪ for all CC-F1200 E		Order No. 11289
▪ for all CC-F1210 E		Order No. 11489
▪ for all CC-F1410 E		Order No. 16489
Factory-installed readout system and glass measuring scales		Order No. 11288

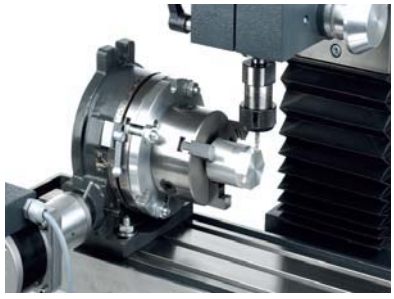
Options

Digital measuring gage

- for optional retrofitting
- digital measuring gages for precise and exact processing of a work piece, without monitoring the spindle play
- the digital measuring slide shows values with a reading accuracy of 0.01 mm on the LCD display
- reversible metric/inch
- all digital measuring gages are equipped with an interface for position readout
- can be installed by the customer
- reset funktion

Digital measuring gage - Longitudinal X-axis		
▪ for all CC-F1200 E	measuring length 300 mm (with measuring gage cut to 500 mm)	Order No. 11365
▪ for all CC-F1210 E and CC-F1410 LF	measuring length 500 mm	Order No. 11365
Digital measuring gage - Transverse Y-axis	measuring length 200 mm	Order No. 11362
Digital measuring gage - Vertical Z-axis with vertical LCD display	measuring length 300 mm	Order No. 11373
Set of fastenings for all 3 axes		
▪ for all CC-F1200 E and CC-F1210 E		Order No. 11299
▪ for all CC-F1410 LF		Order No. 16299
Factory-installed of measuring gages		Order No. 11298

NC rotary table controlled via the 4th axis



Example of use

- for optional retrofitting for milling machines manufactured as from October 2004
- **only in connection with nccad professional**
- the NC rotary table is essential for the all-round machining in one clamping position
- can be fixed to the milling table vertically or horizontally
- closed model prevents incoming swarf
- table diameter 150 mm
- height 80 mm
- width of T-slots 10 mm
- number of T-slots 4
- through spindle bore MT2
- hardened and ground adjustable worm
- truth of rotation of the milling table 0.02 mm

with nccad software	Order No. 1140085